

Philippine Society for the Study of Nature, Inc.

CONFERENCE PROGRAMME

14th Annual National Scientific Convention

Theme:

***“Public-private partnership:
creating possibilities for a
responsible resource use”***

May 20-24, 2014

Benguet State University - Main Campus
La Trinidad, Benguet

in cooperation with

PSSN Northern Luzon Chapter & Benguet State University





BSU MULTI PURPOSE COOPERATIVE (BSU MPC)

BSU Compound, Balili Road, La Trinidad, Benguet

Telephone no.: (074) 422-1504 / Telefax: (074) 442-1846

Email: jbsucoop@yahoo.com

Website: www.bengsumpc.com

Satellite Offices:

2ND Floor Lesino Building

Abatan, Buguias, Benguet

BSU Buguias Campus

Loo, Buguias, Benguet

PROGRAMS AND SERVICES

Accepts:

- ∞ Share Capital (CBU)
- ∞ Savings Deposit
- ∞ Time Deposit
- ∞ Bills Payment (BENECO)
- ∞ Money Remittance (Western Union)

Extends:

- ∞ Agricultural Loan
- ∞ Business Loan
- ∞ Salary Loan
- ∞ Other Loans
 - ⊗ Grocery
 - ⊗ Appliance
 - ⊗ Emergency

Social Services:

- ∞ Mutual Assistance
- ∞ Hospital Assistance
- ∞ Scholarship to deserving students

Other Services

- ∞ Commercial spaces for rent
- ∞ Apartment / Boarding house for rent

BSU MPC Values

Business with a Heart

Self-help and self-responsibility

United for a cause

Meritorious (praiseworthy)

Pro people

Caring for others

"Kooperatibang May Katatagan, Sandigan ng Mamayan"



Republic of the Philippines
PROVINCE OF BENGUET
La Trinidad
OFFICE OF THE GOVERNOR



MESSAGE

We extend our warmest greetings to all the participants to the 14th National Scientific Conference to be held at the Benguet State University (BSU), La Trinidad, Benguet on May 20-24, 2014 with the theme, "Private-public partnership: creating possibilities for a responsible resource use".

To the Board of Directors and Officers of the Philippine Society for the Study of Nature Inc., we are proud of your organization because its programs and other endeavors are worth supporting. We hope that you will continue hold and conduct programs that provide an impact on the lives of our people and more importantly, stir the consciousness of young generations towards environment protection and nature conservation.

May the vision and objectives of PSSN, INC. as an organization remains and be fruitful as ever, with a hope that it will be a source of inspiration for all of us to aspire for the common good.

Thank you.


NESTOR R. FONGWAN
Provincial Governor



Republic of the Philippines
Province of Benguet
MUNICIPALITY OF LA TRINIDAD
OFFICE OF THE MUNICIPAL MAYOR



MESSAGE

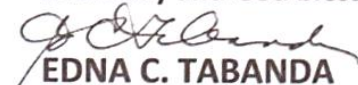
My warmest greetings to the Philippine Society for the Study of Nature, Inc. on the occasion of its 14th Annual Scientific Meeting and Conference with the theme - Public-Private Partnerships: Creating Possibilities for Responsible Resource Use.

Indeed, there is a great deal to be done in terms of arresting Climate Change and its ill-effects. Unless any serious and sustained effort is done by all of humanity, the consequences of our inaction and dereliction would lead to the irreparable destruction of our world, as we know it.

Thus, holding activities such as this is always a welcome idea and a step in the right direction. For in a significant way, it educates our people, increases their sense of socio-civic consciousness and helps change their attitude toward their responsibility to the environment.

During the entire length of my life in public service hitherto, I have always advocated and practiced judicious use of materials and resources. It is our sincere hope that this would be instilled to all who have participated in this Conference and, enlightened, would share the same to the rest of their communities.

Mabuhay and God bless!


EDNA C. TABANDA
Municipal Mayor



Republic of the Philippines
BENGUET STATE UNIVERSITY
La Trinidad, 2601, Benguet Province
Office of the President



MESSAGE

In behalf of the Benguet State University Administration, Staff, Faculty and Students, I extend my warm greetings to the Philippine Society for the Study of Nature, Inc. (PSSN), on the occasion of its 14th National Scientific Conference on May 20-24, 2014.

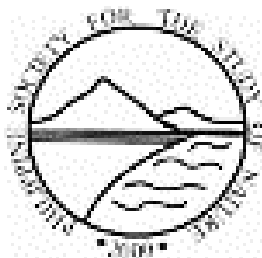
The Benguet State University (BSU) is honored and privileged to host this event, likewise proud that one of our faculty members, in the person of Prof. Romeo Gomez, Jr., Ph.D. has been elected as President of the PSSN.

We welcome all the participants and guests to BSU. We hope that you will enjoy your five day conference in our campus.

Your conference theme: "Public-Private Partnerships: Creating Possibilities for Responsible Resource Use" is relevant to the times. Indeed, a complementation between the two sectors is one avenue to strengthen responsible resource use. The public sector through the State Universities and Colleges (SUCs) and concerned government line agencies (GLAs) generate technology and the public sector on the other hand can be a partner in the promotion and commercialization of such technology. Other means of partnership is through collaborative research and development and information sharing. There may be more engagements for collaboration and partnership towards responsible resource use, and it is hoped that this conference will usher in these strategies.

On a final note, I wish to congratulate the organizers and sponsors of this event! Welcome once again and Mabuhay.

BEN D. LADILAD, Ph.D., CESO III
President




MESSAGE



My warmest welcome to the guests, participants, officers, and members of the Philippine Society for the Study of Nature for our forthcoming 14th Annual National Scientific Conference to be held at the main campus of the Benguet State University in La Trinidad, Benguet. Indeed it is a great pride and honor to hold such a prestigious event here at the university, whose constituents—the leadership and administration officials, faculty, staff, students, and alumni—meet with scientists, researchers, government officials, community people, industry players and other important partners. Such forum is aimed at information exchange, popularizing research results and mature technologies on environment as well as discussing relevant issues and challenges confronting our present and future. Let us reap the rewards of a more empowered local and global community through sound participatory environment management which is real essence of public-private partnerships.

Mabuhay po tayong lahat!


ROMEO A GOMEZ, JR
President
PSSN, FY 2013-2014



PHILIPPINE SCIENCE FOR THE STUDY OF NATURE, INC
“Public-Private Partnership: Creating Possibilities for a Responsible Resource Use”

CONFERENCE PROGRAMME | May 20-24, 2014

TUESDAY - May 20, 2014	
MORNING ACTIVITIES	ARRIVAL OF PARTICIPANTS <i>BSU ADMINISTRATION BUILDING FACADE</i>
	PRE-CONFERENCE ACTIVITY : GARDEN GET-AWAY AT MICRO-ECO GARDEN <i>PUGUIS, LA TRINIDAD, BENGUET</i>
	COURTESY CALL TO GOVERNOR, MAYOR AND BSU PRESIDENT <i>(PSSN BOARD OF TRUSTEES)</i>
AFTERNOON ACTIVITIES	REGISTRATION FOR THE CONVENTION/SEMINAR PROPER <i>COLLEGE OF TEACHER EDUCATION – FUNCTION HALL</i>
	INGRESS OF POSTERS <i>CTE-FUNCTION HALL</i>
	MEETING OF PSSN BOARD OF TRUSTEES AND CONSULTANTS
WEDNESDAY - May 21, 2014	
7:00 -8:30	REGISTRATION
8:30 -10:00	OPENING PROGRAM Welcome address by the BSU President Opening Remarks by the PSSN President Messages from the Governor and Mayor Introduction of the Keynote Speaker: ALEX B. BRILLANTES, JR., Ph.D. CHED Commissioner Awarding of Plaque of Appreciation



10:00-10:15	COFFEE BREAK
10:15-12:00	<p>PLENARY SESSION (Environmental Governance and People's Participation)</p> <p>BEN D. LADILAD, Ph.D.-CESO III President, Benguet State University</p> <p>Open Forum</p> <p>Awarding of Plaque of Appreciation to the Plenary Speaker</p> <p>Briefing for the Election on Day 3</p>
12:00 -1:00	LUNCH BREAK
1:00 - 5:00	<p>BEST PAPER COMPETITION</p> <ul style="list-style-type: none"> • BIOLOGICAL <ul style="list-style-type: none"> ➤ TRUE MEASURE OF LITHOPHYTES DIVERSITY ACROSS MICROCLIMATE Norbert Q. Angalan and Gaudelia A. Reyes ➤ IMPACTS OF DIFFERENT FISHING PRACTICES ON THE POPULATION DYNAMICS OF PAPHIA TEXTILE (GMELIN 1792) (BIVALVIA: VENERIDAE) IN TWO SITES IN ZAMBOANGA DEL NORTE, SOUTHERN PHILIPPINES Francis Albert T. Argente and Janet S. Estacion ➤ GENETIC CHARACTERIZATION OF HALF-SIB PROGENIES OF THREE EUCALYPTUS (<i>Eucalyptus deglupta</i> x <i>E. pellita</i>) HYBRIDS PLANTED IN NORTHERN MINDANAO Albert A. Piñon, Wilfredo M. Carandang, Edwino S. Fernando, Cesar C. Nuevo, Manuel L. Castillo, Marco A. Galang, and Marilyn O. Quimado • SOCIAL <ul style="list-style-type: none"> ➤ COLLABORATION AMONG STAKEHOLDERS: KEY TO THE ORGANIC AGRICULTURE MOVEMENT IN NEGROS OCCIDENTAL Gasmen, A and R. Baconguis ➤ ALLOCATION AND USAGE OF WATER FOR IRRIGATION WATER GOVERNANCE IN STA. CRUZ RIVER WATERSHED, LAGUNA, PHILIPPINES Lynlei L. Pintor, Josefina T. Dizon, Maria Ana T. Quimbo, Agnes C. Rola, and Quyen Dinh Ha ➤ INDIGENOUS FARMING PRACTICES FOR SUSTAINABLE AGRICULTURE: THE CASE OF T'BOLI FARMERS IN LAKE SEBU, SOUTH COTABATO, PHILIPPINES Evelie P. Serrano • INTEGRATIVE <ul style="list-style-type: none"> ➤ RICE STRAW COMPOST AS AMENDMENT TO REDUCE SOIL COPPER TOXICITY IN LOWLAND RICE PADDY FIELD Virginia C. Cuevas , Frances Grace E. Malamnao, Joey I. Orajay and Cirilo A. Lagman, Jr.



	<ul style="list-style-type: none"> ➤ CHARACTERIZATION OF POINT SOURCE EFFLUENTS, AND THE PHYSICO-CHEMICAL AND MICROBIOLOGICAL ASSESSMENT OF ITS EFFLUENT-RECEIVING BRACKISHWATER IN BULUA, CAGAYAN DE ORO CITY, PHILIPPINES Mark John T. Gabule and Alma N. Abug ➤ POLLIMAC II: A MODULAR VERSION OF AN AUTOMATED POLLEN IMAGE CLASSIFIER Reginald C. Recario, John Emmanuel I. Encinas, Janelle Cristine M. Barro, Janine DG. Villate, Arian J. Jacildo, Jasmin S. Baladad, Alejandro C. Fajardo Jr., Jaderick P. Pabico, Analinda C. Manila-Fajardo , and Cleofas R. Cervancia • UNDERGRADUATE <ul style="list-style-type: none"> ➤ SHORT PERIOD GROWTH RESPONSE OF SEXUALLY IMMATURE MALE AND PRE-LAY PATEROS DUCKS (<i>Anas platyrhynchos</i>) TO AMARANTH LEAF-MEAL SUPPLEMENTED COMMERCIAL FEED ADMINISTRATION Christal Joy U. Caballero and Henry I. Rivero ➤ ASSESSING THE TOXICITY OF <i>Pyrodinium bahamense</i> var <i>compressum</i> CULTURES IN VARYING TEMPERATURE AND CO₂-pH CONDITIONS Camille Cleo L. Lamera, Rumalyn A. Mabute, Faye Merced F. Remon and Nigel Aleksei B. Tabion ➤ EGG PRODUCTION OF PATEROS DUCKS ON A SMALL SCALE BASIS UNDER A SHORT-TERM AMARANTHUS SP. FEED SUPPLEMENTATION: SUSTAINING BALUT PRODUCTION IN ILIGAN CITY Gleeza L. Manulat and Henry I. Rivero • HIGHSCHOOL <ul style="list-style-type: none"> ➤ CYANOGENIC ASSESSMENT AND TOXICITY EFFECT OF THE VARIOUS CASSAVA (<i>Manihot esculanta</i>) AS IT AFFECTS THE MORTALITY RATE OF MOSQUITO WRIGGLERS: A PREVENTIVE MEASURE FOR DENGUE FEVER Prince Harvey Arellano, Pia Lorraine Saliente, Jana Jezelle Jare Kinazo, Jeusa Ortueste, Merlyn Leysa
5:30 -9:00	POSTER VIEWING, COCKTAILS & SOCIALIZATION

THURSDAY - MAY 22, 2014					
8:00 -9:00	PLENARY SESSION (Green Technology and Economy) YASAKU FUJII, Ph.D. <i>Professor, Gunma University, Japan</i>				
	LEGEND: # - Undergraduate Papers * - Environmental Governance and People's Participation ^ - Green Technology and Economy ∞ - Environmental Education and Advocacy ☀ - Partnerships for the Environment no symbol – Environmental Research and Methods				
	HALL 1	HALL 2	HALL 3	HALL 4	HALL 5
9:15 – 9:30	*HOUSEHOLD SOLID WASTE MANAGEMENT IN RELATION TO HEALTH STATUS BaiSaguira M. Abdulah, Zainudin M. Adam, Lumina D. Cabilo, O.S. Corpuz	^ORGANIC FARMING STRATEGIES FOR SUSTAINABLE LOWLAND RICE SEED PRODUCTION Analie B. Castillo and Jesusa D. Ortuoste	^DETECTION OF <i>Staphylococcus aureus</i> FROM PACKED DRIED SIGANIDS Jean F. Nebrea, Corazon P. Macachor and Cecilio S. Baga	BIODIVERSITY OF MACRO-INVERTEBRATES IN BALAY SA AGTA CAVE, SOUTHERN CEBU, PHILIPPINES Steve Michael T. Alcazar, Adela C. Duran, Rosalyn P. Alburo, and Hemres M. Alburo	ISOLATION AND IDENTIFICATION OF <i>Bacillus licheniformis</i> ISOLATED FROM A GROW-OUT POND IN STA. LUCIA, MAGALANG, PAMPANGA AND ITS DENITRIFYING POTENTIAL Rose Anne C. Bognot and Monaliza M. Cayanan
9:30 – 9:45	*THE SOLID WASTE MANAGEMENT PRACTICES OF URBAN BARANGAYS IN LA TRINIDAD, BENGUET Dwight A. Daodao	^APPLICATION OF VERMICOMPOST DERIVED FROM BANANA PSEUDOSTEM WITH ANIMAL MANURE IN TOMATO (<i>Lycopersicon esculentum</i> L.)	^GENOTOXIC EFFECTS OF <i>Jatropha curcas</i> Linn. SEED EXTRACT ON THE MERISTEMATIC ROOT CELLS OF <i>Allium cepa</i> Pedro M. Gutierrez, Jr., Franco G. Teves,	MORPHOLOGICAL ANALYSIS OF <i>Keratella cochlearis</i> AND <i>Lecane bulla</i> (ROTIFERA) FROM LAKE LANAO, MINDANAO, PHILIPPINES Sittie Aisah U. Balt	IDENTIFICATION OF ASPERGILLUS SECTION FLAVI IN PHILIPPINE PEANUTS THROUGH MORPHOLOGICAL CHARACTERIZATION AND REP-PCR DNA



		Sansaluna Punto Dalanda and Jesusa D. Ortuoste	Ruben F. Amparado, Roberto M. Malaluan, Ma. Luisa S. Orbita	and Ephrime B. Metillo	FINGERPRINTING Luis, J. S., Luis, Jm S., Glenn, A.E. and R.C. Kemerait, Jr.
9:45 – 10:00	*HOUSEHOLD PARTICIPATION OF LUYANG, CARMEN CEBU RIVER CLEAN UP Corazon P. Macachor, Cecilio S. Baga, Miguelito A. Lauglaug, Pedro P. Cuizon and Rubie Bongo	^GROWTH AND YIELD RESPONSE OF ADLAI (<i>Coix Lacryma – jobi L.</i>) ON VERMICOMPOST AND VARIOUS LIQUID ORGANIC EXTRACTS Paz A. Cutamora and Junito P. Marcelino	^GREEN MUSSEL AS A NEW EMERGING MOLLUSK SPECIES IN THE COASTAL WATERS OF BOLINAO, PANGASINAN Sotero M. Aban, Richmel Mercado, Michael M. Ferrer and Joemark C. Oclima	PROSPECTS OF MAINTAINING VERMIVOROUS CONE SNAIL, <i>Conus ebraeus</i> , IN THE LABORATORY Zenaida G. Baoanan, Zarah A. Alaska, Lulubelle B. Flojo And Rose Anne S. Galapia	THE EFFECTS OF EFFECTIVE MICROORGANISMS ON SOIL PHYSICAL AND CHEMICAL PROPERTIES Leonora E. Ngilangiland Desiree A. Vilar
10:00 – 10:15	*WOMEN'S PARTICIPATION AS SOCIAL VULNERABILITY INDICATOR IN COASTAL WATER MANAGEMENT Rhodora Lynn C. Lintag, Zenia Rodriguez, and Arlen Ancheta	^PEST AND DISEASE SEVERITY INCIDENCE OF OPV WHITE MAIZE (<i>Zea mays</i>) AS INFLUENCE BY ORGANIC FERTICIDES Lodifel c. Deypalan, and Junito p. Marcelino	^RHIZOSPHERE BACTERIAL SPECIES DIVERSITY IN TWO RICE CROPPING SYSTEMS UNDER THREE DIFFERENT NUTRIENT MANAGEMENT SCHEMES CAG Perez and CGB Banaay	DISTRIBUTION OF CHIROPTERA SPECIES AT MALAGOS WATERSHED, DAVAO CITY Patrishia Marie E. Carilhay, Einan G. Chavez, Giovanna G. Viti and Geonyzl Alviola	ISOLATION AND CHARACTERIZATION OF ARBUSCULARMYCORRHIZAL FUNGI (AMF) ASSOCIATED WITH WILD LEGUMES AND COGON GRASS Precelita L. Osillos and Asuncion L. Nagpala
10:15 – 10:30	*DEFINING STAKEHOLDERS' PARTICIPATION IN BUENLAG-SABANGANRIVER'S CONSERVATION AND MANAGEMENT: A MULTIDISCIPLINARY APPROACH	^SEED TREATMENTS ON THE GERMINATION AND GROWTH OF RUBBER (<i>Hevea brasiliensis</i>) WITH DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA	^EFFICACY OF ORGANIC BASED-TEAS FOR THE CONTROL OF BACTERIAL LEAF BLIGHT DISEASE OF SALINAS RICE CAUSING <i>Xanthomonas oryzae pv. oryzae</i> IN INTERMITTENTLY	ECTOPARASITES OF COMMENSAL RODENTS FROM BACKYARD FARMLANDS IN BAGUIO CITY Imee Rose B. Estrada, John Edward L. Felipe, and Aris A. Reginaldo	ANALYSIS/SYNTHESIS OF RAINFALL TIME SERIES USING THE BOX-JENKINS METHODOLOGY J. E. Acosta , V.B. Ella, D. T. Franco

	Shella C. Parreño and Romeo A. Gomez	Olive G. Gomez and Romualdo M. Ortuoste	FLOODED AREAS OF COTABATO CITY Zainodin M. Kusin		
10:30 – 10:45	*HUMAN-ENVIRONMENT INTERACTION IN THE RIPARIAN BUFFER ZONE IN BARANGAY BAMBANG, LOS BAÑOS, LAGUNA Ana Rosa Carmona, Jose Limbay Lahi Espaldon, Eric Jason Lagrimas, Nguyen Xuan Huu, Albert Paul Puncia, Kathlene Faith Sanchez, Ye Min Htwe and Carmelita M. Rebancos	^EFFECT OF VERNIMAL MANURE ON THE GROWTH AND YIELD OF SWEET CORN (<i>Zea mays var. Saccharata</i>) Roy A. Signacion, Aizel Y. Celeste, and Carlos E. Lacamento	^SPECIES COMPOSITION AND VOLUME OF FISH CAUGHT IN PAYAOS INSTALLED IN THE WEST PHILIPPINE SEA Dante M. Mendoza, Gerondina R. Casaclang, John Rey R. Flores, Jocelyn B. Camero and Sotero M. Aban	SPECIES OF BIVALVES AND GASTROPODS IN DASOL BAY Sotero M. Aban, Armando C. Garcia, Cornelia E. Ibarra, Rey S. Raguindin, Rene B. De Vera and Dante M. Mendoza	THE PHYSICAL CHARACTERISTICS OF UPPER SALTAN RIVER, BALBALASANG, BALBALAN, KALINGA Tules P. Banwa, Angelle Mae L. Allao, Marjonnete N. Dunol & Gilma Marcos
10:45 – 11:00	*COMMUNITY AWARENESS ON RASA ISLAND PROTECTION PROGRAM Celia R. Ignacio, Nathaniel I. Lepasana, Raymund De La Rosa, and Amabel S. Liao	^EFFECT OF LIQUID ORGANIC FERTILIZER OBTAIN FROM FISH WASTE TO GROWTH PERFORMANCE OF PECHAY IN SANDY SOIL OF PSU-BINAMLEY CAMPUS BINMALEY, PANGASINAN Rey S. Raguindin	^OPTIMIZATION OF THE GROWTH CONDITION FOR RAPID MICROPROPAGATION OF LILIUM PHILIPPINENSE USING PLANT GROWTH FACTORS Jo-Ann Licay, Jace Maica Palpallatoc and Karen Ballada	DIVERSITY AND DISTRIBUTION OF BATS DURING WET SEASON WITHIN THE SMALL-SCALE GOLD MINING AREA OF MASABONG, ROSARIO, AGUSAN DEL SUR, PHILIPPINES Marian G. Ibarra, Rosalinda L. Olor, Gloria R. Valeroso, Sherryl L. Paz	ASSESSMENT OF ABALONE FISHERY AND MARICULTURE AS A RESOURCE CONSERVATION STRATEGY IN CAROT, ANDA, PANGASINAN Emmanuel C. Capinpin Jr.
11:00 – 11:15		^PLANTING SYSTEM AND RATES OF VERMICOMPOST ON RAINFED LOWLAND RICE	^PHYTOHORMONE APPLICATION AND MYCORRHIZAL INOCULANT ON ROOTING OF	PHILIPPINE-ENDEMIC AND MINDANAO-ENDEMIC BIRD COMMUNITY WITHIN	CHARACTERIZATION OF FISH AND MACRO INVERTEBRATES SPECIES POPULATION IN



		Cherubin M. Alonzo and Jesusa D. Ortuoste	DIMORPHIC ROBUSTA CUTTINGS Ray A. Rodriguez and Jesusa D. Ortuoste	AND THE SURROUNDING ENVIRONS OF A SMALL-SCALE GOLD MINING SITE OF MASABONG, BAYUGAN 3, ROSARIO, AGUSAN DEL SUR, PHILIPPINES Sherryl Lipio-Paz, Fe Colas and Aiza Calub	SIBONGA AND CARCAR, CEBU, CENTRAL PHILIPPINES Mario S. Marababoland Ferdinand T. Abocejo
11:15 – 11:30			ENVIRONMENTAL ADVOCACY: AN EXPERIENCE FROM THE PROPOSED COAL-FIRED POWER PLANT IN ABORLAN, PALAWAN Glenn O. Sopsop and Lita B. Sopsop:	AQUATIC MACROINVERTEBRATES AS INDICATORS OF POLLUTION IN BAROBBOB AND NAGSABARAN STREAMS OF NUEVA VIZCAYA USING THE HILSENHOFF FAMILY BIOTIC INDEX Ryan Padilla Manuel	PHYTOCHEMICAL SCREENING, RADICAL SCAVENGING ACTIVITY, TOTAL PHENOLICS, AND BIOACTIVITY ASSAY OF <i>Jacquemontia paniculata</i> (Burm. f.) Hall f. (Convolvulaceae) EXTRACTS Julien Joy Clemeña, Paul Venson C. Rara, Van Ryan Kristopher R. Galarpe, Ronnie L. Besagas
11:30 – 11:45					
11:45 – 12:00					
12:00 – 1:00	LUNCHBREAK				
1:00 -2:00	PLENARY SESSION (Environmental Education and Advocacy) PETER M. COSALAN, Ph.D. Adjunct Professor, BSU Open University (BSU OU)				
	HALL 1	HALL 2	HALL 3	HALL 4	HALL 5
2:15- 2:30	*PHILIPPINE FLOOD INSURANCE NOTES: PRICING BASED ON	^CACAO AND TABLEA TSOKOLATE: SPANISH	∞ENVIRONMENTAL EDUCATION: IT'S ROLE FOR	MICROHABITAT AND DIVERSITY OF REPTILIAN SPECIES	RELATIVE DENSITY AND DIVERSITY OF MEIOFAUNA FROM

	MONTE CARLO SIMULATION Hans Gerth V. Garcia, Robin James Dasmariñas, and Jonathan B. Mamplata	CONTRIBUTION TO PANGASINAN AGROFORESTRY, CULINARY, AND ECONOMY Irene A. De Vera	SUSTAINABLE DEVELOPMENT Leah V. Carballo	IN AGUSAN MARSH BUNAWAN, AGUSAN DEL SUR, MINDANAO, PHILIPPINES Meconcepcion M. Ngilangil and Lilia Z. Boyles	RIVER SEDIMENTS OF DIFFERENT DETRITAL SOURCES IN BINMALEY, PANGASINAN Lemark M. Bautista, Maricel S. Ferrer, Jomari O. Soriano, and Sotero M. Aban
2:30 – 2:45	*ENVIRONMENTAL PROTECTION PRACTICES OF DANAOK CITY BEACH RESORTS Corazon P. Macachor, Cecilio S. Baga, Cristeodoflor A. Ramos, Aquilino M. Enriquez and Kathleen S. Camaongay	^INFLUENCE OF TEMPERATURE ON THE QUALITY OF QUESEO Michelle G. Capuyan, Maria Luisa T. Jopia and Corazon P. Macachor	∞ENVIRONMENTAL AWARENESS AND ENVIRONMENT-RELATED BEHAVIOR OF STUDENTS IN SELECTED PRIMARY SCHOOLS IN BOGOR, WEST JAVA, INDONESIA Imelda Siregar and Maria Ana T. Quimbo	ECOTOXICITY EVALUATION OF LAKE BUHI, CAMARINES SUR USING PROLONGED ZEBRAFISH (<i>Danio rerio</i>) EMBRYO ASSAY Joseph Martin Q. Paet	WATER QUALITY CHARACTERISTICS OF BOLINAO BAY IN WESTERN PANGASINAN Sotero M. Aban, Rene B. De Vera, Cornelia E. Ibarra, Francis Albert T. Argente and Armando C. Garcia
2:45 – 3:00	*INDIGENOUS FARMING FAMILIES: PARTNERS IN SAFEGUARDING THE SUSTAINABLE USE OF NATURAL RESOURCES Sherry B. Marasigan and Joane V. Serrano	^MILK YIELD OF DAIRY COW FED WITH VARYING LEVELS OF CORN HUSK SILAGE AND MORINGA LEAF MEAL Aileen Malasador and Ne Velasco	∞IMPROVING STUDENTS PERFORMANCE IN ECOLOGY THROUGH CULTURE-BASED SCIENCE PEDAGOGY Harold O. Buenvenida	SPECIES DISTRIBUTION AND ABUNDANCE OF AMPHIBIANS USING GEOGRAPHIC INFORMATION SYSTEM MAP IN AGUSAN MARSH Rainer P. Sularte and Lilia Z. Boyles	BALILI RIVER'S PHYSICO-CHEMICAL CHARACTERISTICS: THE EFFECT ON THE RIVER'S BIOLOGICAL CHARACTERISTIC Bretel B. Dolipas, Jovalson Abiasen, Joel V. Lubrica, and Jennifer Lyn S. Ramos
3:00 – 3:15	*COMMUNITY-LEVEL CLIMATE CHANGE VULNERABILITY AND ADAPTIVE CAPACITY ASSESSMENT OF VEGETABLE	^INFLUENCE OF CARRAGEENAN FROM <i>Kappaphycus cottonii</i> ON THE FLAVOR OF DRIED TILAPIA <i>Oreochromis spp.</i>	∞REVEALING PRE-SERVICE TEACHERS' PERFORMANCE IN THE CLIMATE CHANGE CONCEPT INVENTORY (CCCI): THE CASE OF TWO	<i>PREVALENCE OF Enterobius vermicularis</i> IN THE PROVINCE OF ALBAY, PHILIPPINES Jeffrey A. Toledo, Ma. Carmela	WATER QUALITY EVALUATION OF NAM XONG RIVER IN VANGVIENG DISTRICT, VIENTIANNE PROVINCE, LAO



	AGROECOSYSTEMS IN BENGUET Ben D. Ladilad, Maria Luz D. Fang-asan, Mursha D. Gapasin, Carlito C. Laurean, Marissa R. Parao	Corazon P. Macachor and Benjie Oncienes	UNIVERSITIES IN EASTERN VISAYAS Minerva E. Sañosa, Ian Phil M. Canlas and Elfred E. Olaer	L. Loares, Ma.DonnaZaira M. Acebar, Mark R. Villanueva, Nikko B. Ciruelos, Valerie Mae M. Marbella, Richelle M. Moral, Rhomeneo L. Verzosa, Salvacion B. Rafanan, Mae Ai P. Sauro, John Alfred N. Lleno and Ma. Teresa A. Mirandilla,	PEOPLE'S DEMOCRATIC REPUBLIC Keosangkhom Phommaseng and Carmelita M. Rebancos
3:15 – 3:30	*UNDERSTANDING SOCIO-CULTURAL ENVIRONMENT THROUGH ARCHIVING LAGAYLAY, AN ORAL TRADITION IN CANAMAN, CAMARINES SUR Jiye A. Margate	^INFLUENCE OF FREEZING OF COCONUT MEAT ON THE QUALITY OF VIRGIN COCONUT OIL Jelly Mae Colipano and Jason Hermosilla	∞AN ASSESSMENT ON THE ENVIRONMENTAL AWARENESS AND ENVIRONMENTAL EDUCATION OF COLLEGE STUDENTS IN DE LA SALLE ARANETA UNIVERSITY Roland S. Cartagena	TEMPORAL POPULATION ANALYSIS OF LEPIDOPTERANS (BUTTERFLIES SPECIES) IN THE NORTHWESTERN SLOPE OF MT. ARAYAT Evelyn V. Totaan, Ma. Margarita Hayna N., Caballero, Jacqueline V. Bagunu and Darwin E. Totaan	LAND USE PATTERN ANALYSIS IN ARGAO RIVER WATERSHED RESERVE (ARWR) Archiebald Baltazar B. Malaki
3:30 – 3:45	*BIODIVERSITY CONSERVATION AND TOURISM DEVELOPMENT IN BARANGAY TALOOT, ARGAO, CEBU Edgardo P. Lillo, Steve Michael T. Alcazar, Archiebald Baltazar B. Malaki, and Ritche U. Nuevo	^SUBMERGENCE – TOLERANT RICE VARIETIES AS INFLUENCED BY PLANT SPACING Norodin G. Palti and Romualdo M. Ortuoste	∞BLENDED LEARNING CONTEXT: A MEDIATED DELIVERY IN THE NEXT GENERATION WASTE-FREE CLASSROOM Daniel D. Dasig, Jr., Paulino H. Gatpandan, Arlene Mae C. Valderama,	NICKLE ACCUMULATION IN PLANTS GROWING IN SOILS DERIVED FROM SERPENTINITE IN TANAUAN, LEYTE, PHILIPPINES Pearl Aphrodite Bobon-Carnice	INFLUENCE OF NUTRIENT LOAD ON THE AQUATIC LEAF LITTER DECOMPOSER COMMUNITY Mendoza RM, Husana DEM and Banaay CGB

			Mengvi P. Gatpandan, Mary Ann Bernadette Taduyo, Roel Trballo		
3:45 – 4:00	*CHILD LABOR CONTRIBUTIONS TO THE HOUSEHOLD PRODUCTIVITY AND INCOME OF RUBBER FARMERS IN THE ARAKAN VALLEY COMPLEX, PROVINCE OF COTABATO Helen Alojado Puno	^SENSORY QUALITIES OF BANANA <i>Musa balbisiana</i> COOKIES Corazon P. Macachor, Cecilio S. Baga, Angelica A. Villazorda and Jean F. Nebrea	∞DISASTER PREPAREDNESS OF SELECTED ELEMENTARY SCHOOLS IN THE COASTAL MUNICIPALITY OF GENERAL NAKAR, QUEZON Rowena Yap-Bernal and Maria Ana T. Quimbo	ORGANIC MANAGEMENT OF TOMATO DISEASES GROWN UNDER PROTECTIVE AND OPEN FIELD CULTIVATION. Lucia M. Borines, Rezel M. Sagarino, Othello B. Capuno, Zenaida C. Gonzaga, Reny G. Gerona, Gordon Rogers, Sandra McDougall and Len Tesoriero.	PESTICIDE RESIDUES IN VEGETABLES, SOIL, AND WATER SAMPLES FROM FOUR VEGETABLE- PRODUCING AREAS OF NEGROS ORIENTAL, PHILIPPINES Jose Edwin C. Cubelo and Teodora A. Cubelo
4:00 – 4:15		^VARIETAL TRIAL OF UPLAND RICE CULTIVARS IN SURALLAH, SOUTH COTABATO Jean S. Salazar and Carlos E. Lacamento	∞ASSESSING THE PATTERNS, MOTIVATIONS AND BARRIERS IN THE TEACHING OF CLIMATE CHANGE AMONG ELEMENTARY CLASSROOMS Ian Phil Canlas	FLORAL MORPHOLOGY AND SOME ASPECTS OF FLORAL PHENOLOGY OF <i>Hoya cumingiana</i> Decne. (Apocynaceae) Rachel Anna T. Bustos, Faith S. Maranan and Jennelyn M. Carandang	HORSETAIL STALK (<i>Equisetum Arverse</i> Linn.) AS AN ANTI- OXIDANT Dunamis Ruth A. Dumlao
4:15 – 4:30			∞MATERNAL HEALTH CARE SERVICES IN SELECTED MUNICIPALITIES OF PANGASINAN	THE FLORAL COVER OF SANTA VICTORIA CAVES ILAGAN SANCTUARY: BASELINE DATA FOR CONSERVATION OF	SPACE OBSERVATION OF CARBON DIOXIDE CONCENTRATIONS (XCO ₂) OVER THE PHILIPPINES:



			Maria Rhodora E. Malicdem	PRIORITY SPECIES OF INDIGENOUS TREES Marie Grace S. Cabansag, Candida U. Magbaleta, Gizel R. Santiago, Jerry B. Tolentino, Roldan S.Cardona, Edilberto M. Andres, Jr., Clemente M. Aguinaldo, Jr., and Jesus D. Gonzales	SETTING STRATEGIES FOR CLIMATE CHANGE MITIGATION OR ADAPTATION Ryan Padilla Manuel
4:30 – 4:45				FROM OLD TO NEW, HARNESSING GENES FROM HISTORICAL SAMPLES Juan Carlos T. Gonzalez	AUSTRALIAN PEANUT (<i>Arachis pinto</i> L.): ITS EFFECT ON THE PHYSICO-CHEMICAL PROPERTIES OF SOIL E.D Tumindog, E. L Abas, and J.C Bangi, O.S Corpuz
4:45 – 5:00					
7:00-9:00	NEWLY ELECTED officers/ BOT Meeting				
FRIDAY MAY 23, 2014					
8:00 – 9:00	PLENARY SESSION (Partnerships for the Environment) PACIENCIA MILAN, Ph. D. Former President, Leyte State University				
	HALL 1	HALL 2	HALL 3	HALL 4	HALL 5
9:15 – 9:30	*KNOWLEDGE, ATTITUDE AND PRACTICES OF RICE AND CORN FARMERS ON THE UTILIZATION OF	^MUSTARD (<i>Brassica juncea</i>) PRODUCTION GUIDE USING AMINO ACID-BASED NITROGEN UNDER	^EFFICACY OF ORGANIC FERMENTED MATERIALS FOR DESHOOTED TOMATO	*WILLINGNESS TO PAY (WTP) AMONG THE CITIZENS OF VILLASIS, PANGASINAN FOR THE	URBAN AGRICULTURAL LANDSCAPE DYNAMICS AND ITS IMPLICATIONS IN LOCAL COMMUNITY

	BIOMASS FOR RENEWABLE ENERGY IN SCIENCE CITY OF MUNOZ, NUEVA ECIJA Ma. Theresa R. Sawit	DROUGHT CONDITION Roger Rico Alferez	(<i>Lycopersicon esculentum</i>) Fordan, Nessie F. Dr. Jesusa D. Ortuoste	ESTABLISHMENT OF A SANITARY LANDFILL Jan Ramel A. Tumbaga	FOOD SECURITY: A GIS-BASED ANALYSIS Ricardo T. Bagarinao
9:30 – 9:45	*AGRICULTURAL WASTE MANAGEMENT OF RICE FARMERS IN CAMARINES SUR, PHILIPPINES Narses S. Detera	^POST HARVEST LOSS ASSESSMENT OF COFFEE IN SENATOR NINOY AQUINO Leah Astrologo and Romualdo M. Ortuoste	^HATCHERY PERFORMANCE OF F1 AND F2 GIANT FRESHWATER PRAWN (<i>Macrobrachium Dacqueti</i> SUNIER, 1925) BREEDERS IN CONCRETE TANKS Roy C. Villanueva and Sotero M. Aban	✧THE DYNAMICS OF NETWORKING IN A COASTAL COMMUNITY: BASECO AS CONTEXT Ma. Cherina S.B. Dionisio, Ma Jovi P. Jore, Hannah Julia Padolina and Arlen A. Ancheta	FRACTIONS AND SORPTION OF CADMIUM IN SOILS DERIVED FROM LIMESTONE Ariel B. Bolledo and Beatriz C. Jadina
9:45 – 10:00	*FACTORS ASSOCIATED WITH PESTICIDE USE AMONG VEGETABLE FARMERS IN NEGROS ORIENTAL, PHILIPPINES Jose Edwin C. Cubelo	^POTENTIALS OF VERMICAST AS FEED SUPPLEMENT FOR A THREE-WAY CROSSED CHICKEN (PARAOAKAN X KABIR X SASSO/COBB) RAISED UNDER MODIFIED FREE-RANGE SYSTEM Julie Dizon And Ne B. Velasco	∞ENVIRONMENTAL ADVOCACY: AN EXPERIENCE FROM THE PROPOSED COAL-FIRED POWER PLANT IN ABORLAN, PALAWAN Glenn O. Sopsop and Lita B. Sopsop	✧PROSPECTS AND CHALLENGES OF PUBLIC-PRIVATE PARTNERSHIP FOR SUSTAINABLE FOREST MANAGEMENT IN THE PHILIPPINES: CASE OF THE DBP-FOREST PROGRAM ¹ Leila D. Landicho, Lutgarda L. Tolentino, Rowena D. Cabahug, Roselyn F. Paelmo and Catherine C. de Luna	SIXTEENTH CENTURY PHYSICAL ENVIRONMENT OF THE PHILIPPINES ACCORDING TO THE CHRONICLES OF PIGAFETTA, DE SANDE, AND DE MORGA April Hope T. Castro



10:00 – 10:15	*MANAGEMENT OF CABBAGE PESTS IN AN ORGANIC FARM L.M. Villanueva, J.C. Perez, J. Ibis	^THE RETURN OF ORGANIC AGRICULTURE IN BENGUET: A CHRONICLE OF THE FARMERS' JOURNEY IN ORGANIC AGRICULTURE Michelle B. Gatab-Laruan	∞A STUDY ON THE ADAPTATION OF PROJECT-BASED LEARNING IN THE DEVELOPMENT OF RENEWABLE ENERGY PROJECTS AND SUSTAINABLE ENGINEERING SOLUTIONS Daniel D. Dasig, Jr., Arlene Mae C. Valderama, Mengvi P. Gatpandan, Mary Ann Bernadette Taduyo, Liza Reyes and Paulino H. Gatpandan	RADIATION CYTOGENETIC STUDIES ON PHILIPPINE ASHITABA (<i>Gynura nepalensis</i> DC) Gracilla D.E. and Bagunu J.V.	CHEMICAL WASTE OF SELECTED UNIVERSITIES IN THE PHILIPPINES Van Ryan Kristopher R. Galarpe
10:15 – 10:30	*CROP DIVERSITY OF UPLAND FARMS IN APAYAO, NORTHERN PHILIPPINES David A. Rodolfo	^ENHANCING UPLAND RICE PRODUCTION IN VARIOUS AGRO-ECOSYSTEMS IN ARAKAN VALLEY COMPLEX Onofre S. Corpuz, Samson L. Molao, Zainudin M. Adam, Pendatun E. Dalam, Abddul S. Sangcupan	∞MOTHER EARTH: THROUGH THE UPOU EARTH AMBASSADOR'S EYES Joane V. Serrano, Larry N. Cruz, Jeniffer F. De Pasion, and Ma. Joanna G. Vinas	LARVICIDAL ACTIVITY OF SELECTED PLANT EXTRACTS AGAINST THE DENGUE VECTOR <i>Aedes Aegypti</i> MOSQUITO Pedro M. Gutierrez, Jr., Aubrey N. Antepuesto, Bryle Adrian L. Eugenio, Maria Fleurelle L. Santos	PRODUCTIVITY AND LIVELIHOOD ANALYSIS OF SELECTED AREAS OF LIBON, ALBAY Hanilyn A. Hidalgo, Charlie P. Nacario, Emma G. Jarcia
10:30 – 10:45	*ASSESSMENT OF AQUATIC FAUNA IN THE RIVER SYSTEM OF DAGUPAN CITY	^RAPID MULTIPLICATION TECHNIQUES OF WHITE POTATOES (<i>Solanum tuberosum</i> Linn.) AS	∞COMPARISON BETWEEN KNOWLEDGE AND PRACTICE OF RURAL WOMEN IN NUTRITION	ASSESSMENT AND CHARACTERIZATION OF A LANDSCAPE IN RELATION TO ENVIRONMENTAL DEGRADATION IN	DIVERSITY ASSESSMENT OF FLORAL TREES AND SHRUBS: ITS IMPACT ON RESOURCE

	Marjorie A. Villanueva and Sotero M. Aban	INFLUENCED BY DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA Josalyn Jomud and Jesusa D. Ortuoste	EDUCATION AT TNAOT CHUM COMMUNE, KROKOR DISTRICT, PURSAT PROVINCE, CAMBODIA Mourng Kagna and Josefina T. Dizon	SOUTHERN LEYTE, PHILIPPINES Beatriz Cuevas Jadina	MANAGEMENT Dr. Onofre S. Corpuz, Dr. Samson L. Molao, For. Merly C. Remollo, Carlou E. Terado
10:45 – 11:00	*GENETIC CHARACTERIZATION OF TREES FOR BETTER MANAGEMENT OF PLANTED FOREST IN SOUTHERN PHILIPPINES Albert A. Piñon, Wilfredo M. Carandang, Edina S. Fernando, Cesar C. Nuevo, Manuel L. Castillo, Marco A. Galang and Marilyn O. Quimado	^FLOWERING AND YIELD OF TWO TOMATO VARIETIES TO VARYING WATERING SCHEDULES AND FERTILIZERS Pet Roey L. Pascual and Jingjing P. Cabahug	∞FOOD SAFETY PRACTICES AMONG NATIVE DELICACY PRODUCERS AND VENDORS IN THE PUBLIC MARKET OF BAYAMBANG, PANGASINAN Catalina C. Platon and Raquel C. Pambid	COPPER CONCENTRATION IN MOLAWIN CREEK, U.P. LOS BAÑOS: DETERMINATION BY ATOMIC ABSORPTION SPECTROSCOPY AND VISUALIZATION OF THE DYNAMICS OF CONCENTRATION AS WATER FLOWS Elmer A. Polintan, Jose Rene L. Micor, Arian J. Jacildo, and Jaderick P. Pabico	SPECIES COMPOSITION OF SEAGRASSES ALONG ALBAY GULF, ALBAY, PHILIPPINES Ann Retuerma-Dioneda and Ida F. H. Revale
11:00 – 11:15	#ELECTRIC CONSUMPTION AND CONSERVATION PRACTICES AMONG BAGUIO – BENGUET RESIDENTS Jehan K. Laoyan, Jovelyn B. Layogan, Divina P. Felino, and Miga Ray Mindaro	^VARYING WATERING SCHEDULES AT DIFFERENT FERTILIZER SCHEMES: IMPLICATION OF TOMATOES' RESPONSE TO WATER SHORTAGE Pet Roey L. Pascual and Jingjing P. Cabahug	∞QUALITY OF WATER SUPPLY FROM DEEP WELLS OF PUBLIC ELEMENTARY SCHOOLS IN PANGASINAN Wilma M. De Vera and Racquel C. Pambid	CORRELATION STUDY OF FERTILIZER APPLICATION PRACTICES ON SOIL QUALITY AND YIELD OF POTATO IN THE TWO FARMERS' FIELD IN PAOAY, ATOK, BENGUET Addisson Kyle B. La-	VISUALIZATION OF THE UPTAKE OF PESTICIDES IN COMBINATION WITH ADJUVANTS THROUGH CONFOCAL LASER MICROSCOPY Pieter Spanoghe and Chime Mora-Garcia



11:15 – 11:30	#USE OF PLASTIC AND ALTERNATIVE BAGS: THE CASE OF CONSUMERS AND BUSINESS ESTABLISHMENTS Aiko F. Claudio, Abegail B. Palcongan, Mary Luz M. Salis, and Dina C. Tomin	^INFLUENCE OF SCENT CONCENTRATION ON <i>Citrus microcarpa</i> PEEL EXTRACT-BASED- HAND WASH Chrisnan Daren A. Ramos		Ao EVALUATION OF MANGROVE DAMAGE DUE TO SUPER TYPHOON YOLANDA (HIAYAN) IN THE LEYTE GULF AND EASTERN SAMAR, PHILIPPINES Facundo Rey M. Ladio, and Geraldine O. Macawile	MOLECULAR AND BIOCHEMICAL CHARACTERIZATION OF A NOVEL ACTIN BUNDLING PROTEIN IN <i>ACANTHAMOEBA</i> Joanna I. Alafag, Hyun-Hee Kong
11:30 – 11:45	#PETROLEUM PRODUCT CONSUMPTION AMONG RESIDENTS OF RURAL AND URBAN COMMUNITIES OF LA TRINIDAD, BENGUET Christine Laurie L. Canuto, Kaycee O. Gaspili, and Jiban C. Oway	^REARING OF PUPAL PARASITOID (<i>Tetrastichusbrontispae</i>) USING DIFFERENT LEVELS OF HONEY CONCENTRATION Ryan P. Plenciano and Dr. Jesusa D. Ortuoste	BIOPESTICIDAL EFFECT OF KANTUTAY (<i>Lantana camara</i>) LEAF EXTRACT ON COCONUT LEAF BEETLE (<i>Brontispa longissima</i>) Eulenia C. Pizaña	ROLE OF LIGHT SPECTRUM IN INDUCING PHENOTYPIC PLASTICITY IN <i>Hoya albida</i> KLOPPENBURG, SIAR, CAJANO AND CARANDANG 2012 Rubyann Robelle L. Polido, Faith S. Maranan and Jennelyn M. Carandang	ETHNOBOTANY OF COMMONLY USED BAMBOO VARIETIES AND THEIR UTILIZATION IN REGION XII Anacelle Lorente Dagon and Jesusa D. Ortuoste
11:45 – 12:00					
12:00 – 1:00	LUNCHBREAK				
1:00 -2:00	PLENARY SESSION (Environmental Research and Methods) PASTOR L. MALABRIGO, Ph.D. Assistant Professor, University of the Philippines at Los Banos				
	HALL 1	HALL 2	HALL 3	HALL 4	HALL 5
2:15- 2:30	*REDISCOVERING ALMACIGA (<i>Agathis</i>	^ <i>Carissa carandas</i> FRUIT EXTRACT AS A	^SCREENING AND DISTRIBUTION OF	LEVEL OF NITROGEN IN	HEALTH EXPOSURE OF LABORATORY

	<i>philippinensis</i>): MOTHER TREE DOCUMENTATION AND SELECTION IN LUNA, APAYAO David A. Rodolfo	NATURAL FABRIC DYE Mary Felma A. Aliño	POTENTIAL NICKEL HYPERACCUMULATO R PLANT SPECIES IN SELECTED MINING AREAS IN CLAVER, SURIGAO DEL NORTE A. A. Along, M. T. Demetillo and K. L. Ciudad	WATER HYACINTH (<i>Eichhornia crassipes</i> [Mart.] Solms) IN SELECTED LAKESHORES OF LAKE MAINIT Ivy Mae Batoon, Laverne Lyn Odchigue, Jessa Salvador, and Chime Mora-Garcia	STAFF IN SELECTED CHEMICAL FACILITIES Alday, Kristeen Y., Cailing, Aldin E., Ebueza, Sheleen P., Pacaña, Jinebeth M., Pantallano, Karen B., Pingol, Alden Ray C., Samarista, Quizalaine Mae L., and Galarpe, Van Ryan Kristopher R.
2:30 – 2:45	*ETHNOBOTANICAL USES AND PHYTOCHEMICAL ANALYSIS OF TWO <i>Amorphophallus</i> SPECIES (BALBAG) IN PALAWAN, PHILIPPINES Josephine M. Magay- Salmo¹ and Mildred Palatino-Palon	^PROPAGATION OF <i>Vitex parviflora</i> Juss. IN NON-MIST TECHNIQUE TREATED WITH IBA CONCENTRATION Allihasgar M. Limanay and Farida K. Dimalen	^DUCK EMBRYONIC DEVELOPMENT UNDER A SIMULATED POWER SHORTAGES IN MINDANAO, PHILIPPINES Ma. Abegail Bastigu, and Henry I. Rivero	PRELIMINARY STUDY ON BIODIVERSITY LOSS ASSESSMENT, UTILIZATION AND CONSERVATION OF INDIGENOUS FOOD CROPS IN THE CORDILLERA ADMINISTRATIVE REGION (CAR) Belinda A. Tad-awan, Esther Josephine D. Sagalla, Ritcher B. Batalao	RESPIRATORY HEALTH ASSESSMENT OF SELECTED HOUSEHOLDS IN MAJOR STREETS AND ACCESS ROADS IN CAGAYAN DE ORO, PHILIPPINES April Rose T. Cahucom, Melvin L. Canoy, DJ Casiño, Ellen Kieth S. Dapin, Vanessa Lacre, Queenie Jyne R. Lucagb, Sheena Jane S. Sabejon, and Van Ryan Kristopher R. Galarpe
2:45 – 3:00	*EVALUATION OF THE DEVOLVED AGRICULTURAL SERVICES ON THE JOB	^IMPLEMENTING BIOGAS TECHNOLOGY PROJECT: THE	^SHORT PERIOD GROWTH RESPONSE OF SEXUALLY IMMATURE MALE AND PRE-LAY	ORGANIC FERTILIZER ON PECHAY HOMEGARDEN Mosib M. Tagotong,	GAUGE ANALYSIS OF FORMALDEHYDE IN AIR IN SELECTED HOSPITAL-



	PERFORMANCE OF EXTENSION WORKERS Pasigan U. Buisan	MALVAR EXPERIENCE J.G. Mojares	PATEROS DUCKS (<i>Anas platyrhynchos</i>) TO AMARANTH LEAF- MEAL SUPPLEMENTED COMMERCIAL FEED ADMINISTRATION Christal Joy U. Caballero and ¹Henry I. Rivero	Onofre S. Corpuz Pendatun E. Dalam.	HISTOPATHOLOGY LABORATORIES, CAGAYAN DE ORO, PHILIPPINES Jenny G. Jerusalem and Van Ryan Kristopher R. Galarpe
3:00 – 3:15	*TIGER GRASS PLANTATIONS: IMPLICATIONS FOR CALSANAG WATERSHED FOREST RESERVE MANAGEMENT Eddie G. Fetalvero	^DEVELOPMENT OF PRINTER INK FROM CEPHALOPODS Romeo P. Montecillo, Cecilio S. Baga, Joseph C. Pepito, Pedro P. Cuizon and Corazon P. Macachor	^RESOURCE ASSESSMENT OF TAMBAC BAY IN WESTERN PANGASINAN Sotero M. Aban, Armando C. Garcia, Richmel A. Mercado and Michael M. Ferrer	PLANT DIVERSITY AND CARBON STOCKS ASSESSMENT OF BENGUET PINE (<i>Pinus kesiya</i>) IN BUSOL WATERSHED AND FOREST RESERVE Christopher J. Tapnio	LINE LOSS REDUCTION IN ELECTRICITY DISTRIBUTION USING BINARY INTEGER LINEAR PROGRAMMING Ma. Leah Zilpah M. Jacela, Julius H. Sayseng, and Prof. Rey Bryan M. Cubero
3:15 – 3:30					
3:30 – 3:45					
3:45 – 4:00					
4:00 – 6:00	BUSINESS MEETING Approval of the Agenda Matters Arising from the Minutes of the 2013 General Assembly Meeting at Cebu				
6:00-8:00	CLOSING CEREMONIES, AWARDS NIGHT AND BANQUET Egress of posters				
SATURDAY - MAY 24, 2014					
	PLANNING MEETING OF OLD AND NEW BOT POST CONFERENCE TOUR Option 1: Ben Cab Museum with eco-tour Option 2: Nature trails and zip lines at WINACA, Acop.				



FINALISTS FOR THE BEST PAPER COMPETITION

BIOLOGICAL SCIENCE STUDIES CATEGORY

- ✎ Norbert Q. Angalan and Gaudelia A. Reyes: **True Measure of Lithophytes Diversity Across Microclimate**
- ✎ Francis Albert T. Argente and Janet S. Estacion: **Impacts of Different Fishing Practices on the Population Dynamics of Paphia Textile (Gmelin 1792) (Bivalvia: Veneridae) in Two Sites in Zamboanga Del Norte, Southern Philippines**
- ✎ Albert A. Piñon¹, Wilfredo M. Carandang², Edwino S. Fernando², Cesar C. Nuevo³, Manuel L. Castillo², Marco A. Galang², and Marilyn O. Quimado: **Genetic Characterization of Half-sib Progenies of Three Eucalyptus (Eucalyptus deglupta x E. pellita) Hybrids Planted in Northern Mindanao**

SOCIAL SCIENCE STUDIES CATEGORY

- ✎ Lynlei L. Pintor, Josefina T. Dizon, Maria Ana T. Quimbo, Agnes C. Rola, and Quyen Dinh Ha: **Allocation and Usage of Water for Irrigation Water Governance in Sta. Cruz River Watershed, Laguna, Philippines**
- ✎ Dr. Evelie P. Serrano: **Indigenous Farming Practices for Sustainable Agriculture: The Case of T'boli Farmers in Lake Sebu, South Cotabato, Philippines**
- ✎ Gasmen, A and R. Baconguis: **Collaboration Among Stakeholders: Key to the Organic Agriculture Movement in Negros Occidental**

INTEGRATIVE STUDIES CATEGORY

- ✎ Virginia C. Cuevas, Frances Grace E. Malamnao, Joey I. Orajay, Cirilo A. Lagman, Jr: **Rice Straw Compost As Amendment To Reduce Soil Copper Toxicity In Lowland Rice Paddy Field**
- ✎ Mark John T. Gabule and Alma N. Abug: **Characterization of Point Source Effluents, and the Physico-chemical and Microbiological Assessment of its Effluent-Receiving Brackishwater in Bulua, Cagayan de Oro City, Philippines**
- ✎ Reginald C. Recario, John Emmanuel I. Encinas, Janelle Cristine M. Barro, Janine DG. Villate, Arian J. Jacildo, Jasmin S. Baladad, Alejandro C. Fajardo Jr., Jaderick P. Pabico, Analinda C. Manila-Fajardo, and Cleofas R. Cervancia: **POLLIMAC II: A Modular Version of an Automated Pollen Image Classifier**

UNDERGRADUATE THESIS

- ✎ Christal Joy U. Caballero and Henry I. Rivero: **Short Period Growth Response of Sexually Immature Male and Pre-lay Pateros ducks (Anas platyrhynchos) to Amaranth Leaf-Meal Supplemented Commercial Feed Administration**
- ✎ Lamera, Camille Cleo L., Mabute, Rumalyn A., Remon, Faye Merced F., Tabion, Nigel Aleksei B.: **ASSESSING THE TOXICITY OF Pyrodinium bahamense var compressum CULTURES IN VARYING TEMPERATURE AND CO₂-pH CONDITIONS**
- ✎ Gleeza L. Manulat and Henry I. Rivero: **Egg Production of Pateros Ducks on a Small Scale Basis under a Short-term Amaranthus sp. feed supplementation: Sustaining Balut Production in Iligan City**



COMPETING PAPERS

BIOLOGICAL CATEGORY

TRUE MEASURE OF LITHOPHYTES DIVERSITY ACROSS MICROCLIMATE

Norbert Q. Angalan and Gaudelia A. Reyes

School of Natural Sciences, Saint Louis University, Baguio City, Philippines
bienvenue_norbert@yahoo.com

ABSTRACT

Microclimate is an important factor for the establishment of lithophytes. The main objective of the study is to scrutinize different measures of lithophytes diversity as influenced by air temperature and humidity. Microclimate and lithophytes diversity are described along 8 sampling sites extending 400 m from the upper to lower reaches of the headwater. Different measures of diversity were performed and subjected to clear analysis. A total of 20 lithophytes within 9 families were recorded. There were 10 species for Polypodiaceae; 2 for each Orchidaceae and Liliaceae; and 1 for each Amaryllidaceae, Begoniaceae, Caprifoliaceae, Crassulaceae, Piperaceae and Sellaginellaceae. Lithophytes from upper reaches exhibited higher measures of diversity, whilst the lower reaches. Chronological ranking between species richness (S_r), and Shannon entropy (H') and Gini-Simpson (HGS) diversity indices revealed inconsistencies. H' and HGS have the same ranking with their equivalent effective number of species (N_qH' and N_qHGS). Microclimate demonstrates significant relationships with lithophytes diversity where high humidity and low temperature provides suitable environment. Confidence interval difference (CID) of N_qH' and N_qHGS are narrower as compared to S_r , H' and HGS . Effective number of species established certain measures incrementally shifting relationships between microclimate and diversity on a more realistic scales.

Key words: Diversity, Microclimate, Lithophyte



IMPACTS OF DIFFERENT FISHING PRACTICES ON THE POPULATION DYNAMICS OF *PAPHIA TEXTILE* (GMELIN 1792) (BIVALVIA: VENERIDAE) IN TWO SITES IN ZAMBOANGA DEL NORTE, SOUTHERN PHILIPPINES

Francis Albert T. Argente*,^{1,2} and Janet S. Estacion²

¹Institute of Environmental and Marine Sciences, Silliman University, Dumaguete City, Negros Oriental

²Department of Fisheries Science, Pangasinan State University Binmaley, Pangasinan

*faargente@gmail.com

ABSTRACT

Paphia textile is a commercially-important bivalve in Zamboanga Del Norte, Philippines. In two coastal municipalities, different types fishing methods are practiced by *Paphia* fishers. Hookah diving is rampant in Manukan while only free-diving is allowed in Pres. Manuel A. Roxas. Higher degree of human disturbance was experienced by *P. textile* population in Manukan. Some aspects of growth, mortality and recruitment were studied in both clam beds to assess the effects of the fishing activities. Higher L8 (69.95 mm) but lower K (0.64 yr⁻¹) values were estimated in Roxas than in Manukan (L8 = 67.90 mm; K = 0.80 yr⁻¹). Estimated fishing mortality was high in Roxas (F = 1.65 yr⁻¹) but it appeared that the clam bed can still sustain the fishery. Recruitment in Manukan showed two seasonal pulses while one main recruitment pulse was derived in Roxas. Significantly higher ($P < 0.05$) clam density and more larger-sized individuals were observed in Roxas. The estimated MSY in Roxas was 5.54 times higher than in Manukan. Environmental conditions were similar in both clam beds. Differences in the dynamics of *P. textile* populations in the clam beds were influenced by density-dependent processes enhanced by the degree of human exploitation.

Key words: Venus textile clam, fishing pressure, FiSAT, population biology, CPUE



GENETIC CHARACTERIZATION OF HALF-SIB PROGENIES OF THREE EUCALYPTUS (*Eucalyptus deglupta* x *E. pellita*) HYBRIDS PLANTED IN NORTHERN MINDANAO

Albert A. Piñon¹, Wilfredo M. Carandang², Edwino S. Fernando², Cesar C. Nuevo³, Manuel L. Castillo², Marco A. Galang², and Marilyn O. Quimado²

¹ Ecosystems Research and Development Bureau, Department of Environment and Natural Resources, Los Baños, College, Laguna, Philippines.

² CFNR, University of the Philippines Los Baños, Laguna, Philippines.

³ Forestry Consultant, Cagayan de Oro City, Philippines.

ABSTRACT

Appropriate utilization and management of planted trees are realized when seedlings used are properly characterized. This study used the Random Amplified Polymorphic DNA Analysis (RAPD) to genetically characterized trees in the context of forest genetic improvement. Using three F₁ mother trees and seventy-four F₂ progenies of *E. deglupta* x *E. pellita* hybrids, genetic variants such as the number of detected bands (B), percent polymorphic loci (L), percent polymorphism (P), dendrogram and genetic diversity index (H') were identified. Maternal, non-maternal and pure-maternal bands were also determined. Outcome of the RAPD analysis revealed that F₁ hybrids were relatives and Inbreeding Depression (ID) reduced the performance of the F₂ generation. Among the F₁ hybrid parents, EDP3_{F1} undergone selfing as it recorded with the most number of pure-maternal bands. Constructed dendrograms proved the occurrence of ID due to narrowed genetic distance between the F₁ and F₂ generations. Characterization between the F₂ generations showed the superiority of the EDP2_{F1} hybrid parent. Results suggest that best-performing tree plantation may be established when planting materials to be used are collected from the EDP2 population.

Key words: Venus textile clam, fishing pressure, FiSAT, population biology, CPUE



SOCIAL CATEGORY

COLLABORATION AMONG STAKEHOLDERS: KEY TO THE ORGANIC AGRICULTURE MOVEMENT IN NEGROS OCCIDENTAL

A. Gasmen¹ and R. Baconguis²

¹ Agricultural Training Institute, ² University of the Philippines, Los Banos

ABSTRACT

The organic agriculture movement can be traced in the 1970's through the advocacy of the civil society. The movement received significant push when the local government issued policies and formulated programs that supported organic agriculture, and when the private sector joined by supporting the marketing of the produce. This paper investigates the important collaboration within the government sector, the private sector and between the government and the private sector, which is represented by individuals and groups. The research is an *intrinsic case study* as it investigates organic agriculture through in-depth data collection involving multiple sources of information. Results show that programs such as the Organic Agriculture Development Program were integral in bringing together stakeholders which thus created opportunities for collaboration. The need to comply with certification was also an area for collaboration between the government and the private sector as both strategized to adhere to standards. Despite active collaboration, certification remains a problem. The paper proposes a model to maximize local market potentials through partnership between big and small farmers.

Key words: linkages, partnerships, interactions, collaboration, organic agriculture, innovation system, organic practitioners



ALLOCATION AND USAGE OF WATER FOR IRRIGATION WATER GOVERNANCE IN STA. CRUZ RIVER WATERSHED, LAGUNA, PHILIPPINES

Lynlei L. Pintor¹, Josefina T. Dizon², Maria Ana T. Quimbo², Agnes C. Rola²,
and Quyen Dinh Ha³

¹Ecosystems Research and Development Bureau, DENR, ²College of Public Affairs and Development, University of the Philippines Los Banos; ³Hanoi University of Agriculture

ABSTRACT

Farm irrigation has the highest total water consumption. Water governance for irrigation in this community development study delved on water allocation and water usage in Sta. Cruz River Watershed, Laguna-Philippines. Methods used were household interview, key informant interview, focus group discussion, review of documents, and observation. Results revealed that water is always available for farm irrigation. Immediate repair of damaged irrigation canal was identified to reduce water wastage. Farmers are aware that water is an economic good and rice production will be affected when there is limited water supply. This leads to proper use of water. Water distribution by schedule served as a measure to control water. Irrigation water is being used freely for other purposes. Water is equitably and efficiently allocated among farmers except during the dry season where there is limited or no water supply. In such cases, farms located in the downstream were affected. The damaged canals that were not immediately repaired causes wastage of irrigation water. Others have free access in the use of irrigation water resulting to competition among farmers. The paper recommends the maintenance of irrigation canals and coordination with the Department of Environment and Natural Resources for the rehabilitation of the watershed.

keywords :Water governance, water allocation, water usage, irrigation, Philippines



INDIGENOUS FARMING PRACTICES FOR SUSTAINABLE AGRICULTURE: THE CASE OF T'BOLI FARMERS IN LAKE SEBU, SOUTH COTABATO, PHILIPPINES

Dr. Evelie P. Serrano

University of the Philippines Los Baños

ABSTRACT

This study aimed to analyze the use of indigenous farming practices among T'boli rice and corn farmers in Lake Sebu, South Cotabato, Philippines to enhance sustainable agriculture. Through key informant interviews and other personal communications, data were collected primarily from T'boli rice and corn farmers, extension workers, and community leaders. Data were analyzed qualitatively.

Results show that T'boli farmers still adopt indigenous farming practices and respect their indigenous belief systems. For instance, using dried leaves and twigs to keep the soil fertile and planting trees to prevent soil erosion are still common practices. Farmers believe that indigenous farming practices help protect the environment and allow them to make the most efficient use of available resources. It was also found out that indigenous farming practices are combined with modern farming practices to achieve better results.

Since indigenous farming practices may result to sustainable agriculture, they should be given more importance in agricultural extension. Policymakers should thus work at integrating IK to the current agricultural knowledge and information systems.

Key words: Indigenous knowledge, indigenous farming practices, sustainable agriculture, agricultural extension



INTEGRATIVE CATEGORY

RICE STRAW COMPOST AS AMENDMENT TO REDUCE SOIL COPPER TOXICITY IN LOWLAND RICE PADDY FIELD

Virginia C. Cuevas^{*1}, Frances Grace E. Malamnao², Joey I. Orajay², Cirilo A. Lagman, Jr.^{*3}

¹*Institute of Biological Sciences, CAS, UPLB, College, Laguna, Philippines,*

**Corresponding author, Email: vccuevas@yahoo.com;*

²*Crop Protection Cluster, CA, UPLB, College, Laguna, Philippines,*

³*Department of Soil Science, BSU, La Trinidad, Benguet, Philippines*

ABSTRACT

One pot and two rice paddy field experiments were conducted in Mankayan, Benguet to test the efficacy of reducing available soil Cu using rice straw-manure (3:1) compost as amendment, its effect on rice yield and brown spot disease incidence. Cu contamination came from mine tailings of adjacent large mine tailing pond.

The 1st field experiment was conducted in 2012 dry season in RCBD with four replicates with compost application at 0, 16 and 32 kg m⁻² as treatments. Mineral fertilizer was applied in all treatments. Compost application significantly increased mean grain yield by 23.0% compared to control. Mean soil Cu content was significantly reduced from 281 ppm in the control to 25 ppm in 16kg m⁻² and 15 ppm at 32 kg m⁻² compost applications. Mean soil pH after harvest also significantly improved with compost application. The rice plants in all treatments suffered from brown spot disease induced by Cu toxicity.

The 2nd field experiment was conducted in 2013 wet season. Compost was applied at 0, 1, 2, and 4 kg m⁻² in RCBD with three replicates. A pot experiment was also done to study the effect of compost treatments on brown spot disease incidence. Data again showed that compost amendment even at reduced rate significantly decreased soil Cu content and disease severity. Results of these studies suggest that compost amendment is a promising method to rehabilitate copper contaminated areas, improve overall plant health, and restore agricultural land productivity.

Key words: rice straw compost, soil amendment, copper toxicity, mine tailings, brown spot of rice

CHARACTERIZATION OF POINT SOURCE EFFLUENTS, AND THE PHYSICO-CHEMICAL AND MICROBIOLOGICAL ASSESSMENT OF ITS EFFLUENT-RECEIVING BRACKISHWATER IN BULUA, CAGAYAN DE ORO CITY, PHILIPPINES

¹Mark John T. Gabule and ²Alma N. Abug

*Department of Environmental Science & Technology, Mindanao University of Science and Technology
Lapasan, Cagayan de Oro City*

¹markjohn_23@yahoo.com

²alma_abug@yahoo.com

ABSTRACT

The two identified point sources of effluents; and the water and effluent quality of six sampling stations in the brackishwater of Bulua, Cagayan de Oro City were assessed in terms of their physico-chemical and microbiological variables during low tide and high tide. Collection of algal samples using cell density method was conducted to determine the phytoplankton density of the same area at different periods. ANOVA, Mann-Whitney U test, Regression Analysis and Correlation Coefficient were used to test the significance of the environmental variables as it influences the presence of phytoplankton density.

Majority of the effluent quality parameters have exceeded the prescribed normal range values in both sampling areas. The current conditions of the brackishwater was supported by the findings that majority of its water quality variables exceeded the tolerable limits. Microbiological examination recorded a very high level of total coliform count both tempo-spatial variations and has exceeded both the water and effluent quality standards.

Moreover, effluents substantially impacted the surface water as revealed by the Mann-Whitney U Test. The phytoplankton density varies significantly in terms of sampling period and the sampling areas. The highest recorded cell density was observed during high tide for both sampling areas. Blue-green algae (an algal bloom-forming species) obtained the highest planktonic cell density with reference to temporal variations. Results revealed an indication of a potential formation of harmful algal bloom. *Oscillatoria* sp., a well-documented bloom-forming species, with *Nitzschia* sp. and *Navicula* sp., both pollution-sensitive species.

A strong positive correlation coefficient, (r) of 0.875 exist between phytoplankton density and the nitrates & phosphates and a positive correlation, (r) of 0.615 between phytoplankton density and the amount of lead (Pb) content.

Four significant physico-chemical parameters explain the variability of phytoplankton density in the brackishwater. It showed that phytoplankton density was significantly influenced with nitrates (p£.01), phosphates (p£.05), lead (p£.05) and salinity (p£.01).

Key words: effluents, phytoplankton, brackishwater, physico-chemical, point sources



POLLIMAC II: A MODULAR VERSION OF AN AUTOMATED POLLEN IMAGE CLASSIFIER

Reginald C. Recario^{1,*}, John Emmanuel I. Encinas¹, Janelle Cristine M. Barro¹, Janine DG. Villate¹, Arian J. Jacildo^{1,*}, Jasmin S. Baladad¹, Alejandro C. Fajardo Jr.², Jaderick P. Pabico¹, Analinda C. Manila-Fajardo², and Cleofas R. Cervancia²

¹ Institute of Computer Science,² Institute of Biological Sciences, University of the Philippines Los Baños
* rncrecario@gmail.com, arian.jacildo@gmail.com

ABSTRACT

The identification of plant resources utilized by bees is of great importance to the conservation and management of bees species. Palynological studies rely on manual classification of pollens using key characters gathered from reference slides of various plant species. While the advent of digital techniques for imaging pollen simplified the work, identifying pollen types from hundreds of microscopic images gathered still required time and skill. There is however a demand for a rapid honey source identification system from the beekeeping and related industries, and the solution is to automate.

In this paper, we present POLLIMAC II, an improved version of an automated pollen image classification system that uses artificial neural networks and digital image analysis. POLLIMAC II has a modular interface for the dynamic integration of additional classifiers. It also provides automated segmentation of pollen images from raw images captured from a microscope with attached microncam. Previous version of the system provided only a limited set of classifiers and they could not automatically process raw images as inputs.

This study is part of the ongoing interdisciplinary research collaboration of the UPLB Bee Program with the computer science field.

Key words: *palynology, pollen image classification, artificial neural networks*

UNDERGRADUATE

SHORT PERIOD GROWTH RESPONSE OF SEXUALLY IMMATURE MALE AND PRE-LAY PATEROS DUCKS (*Anas platyrhynchos*) TO AMARANTH LEAF-MEAL SUPPLEMENTED COMMERCIAL FEED ADMINISTRATION¹Christal Joy U. Caballero* and ¹Henry I. Rivero¹Department of Biological Sciences, College of Science and Mathematics, Mindanao State of University – Iligan Institute of Technology, Andres Bonifacio Avenue, Tibanga, Iligan City

*cchristaljoy@gmail.com

ABSTRACT

The influence of *Amaranthus spinosus* leaf meal (ALM) in commercial feed (CF) mix on the growth performance of pre-lay and sexually immature male Pateros ducks *Anas platyrhynchos* over a one-month period (fifth to sixth month period) for a 48-head (24 immature males and 24 pre-lay hens) flock were randomly assigned to four different treatments as: 0% (T1), 5% (T2), 10% (T3), and 15% (T4) ALM-CF mixes. One month feed administration showed that live weights increased from the initial without significant differences ($p>0.05$) in both sexes. The highest mean body mass was seen in both T3 male and female and the least was recorded in female T4 and T2 male. The average daily gain (ADG) recorded was significantly different ($p<0.05$) in both sexes: highest in T3 male and female while the least was in T2 male and female. The abdominal fat accumulation was significantly different ($p<0.05$) between the pre-lay hens and the sexually immature male Pateros ducks; where both T3 male and female gained the most abdominal fat and the least was in pre-lay T1 and sexually immature male T2 ducks. Based on these observations, supplementation with 10% Amaranth leaf-meal was optimally acceptable if the one aims to hasten weight as body weight would correspond to sexual maturity in birds. This study also proved that Amaranth leaf-meal is a good protein source to supplement the commercial feed for backyard grown ducks.

Keywords: abdominal fat, ADG, body weight, duck, feed supplement**ASSESSING THE TOXICITY OF *Pyrodinium bahamense var compressum* CULTURES IN VARYING TEMPERATURE AND CO₂-pH CONDITIONS**Camille Cleo I. Lamera, Rumalyn A. Mabute,
Faye Merced F. Remon and Nigel Aleksei B. Tabion**ABSTRACT**

The growth, toxin content and toxin composition of *Pyrodinium bahamense var compressum* were studied under conditions affected by varying temperature and carbon dioxide induced pH. The *P. bahamense* cells were able to grow at both 24°C and 28°C with an optimum growth at 24°C. Temperature showed marked effects in *Pyrodinium* cells on the different sampling periods. During the lag phase, when the temperature increases, the toxin content also increases but during the early exponential phase, inverse relationship between temperature and toxin content was observed. At pH 6 and pH 8, the *P. bahamense* cells were able to grow, reaching its peak at pH 8 with higher toxin content observed. On the different sampling periods, pH displayed no significant effects. For the control group, saxitoxin (STX) showed the highest production for the profile of toxin composition. STX derivatives, GTX1 and GTX4 were not detected in all the cultures grown at varying temperature and CO₂-pH conditions. It was observed that NEOSTX was the only saxitoxin derivative constantly present in all conditions of the experiment. This study serves as a basis for further management and control of harmful algal blooms (HAB).



EGG PRODUCTION OF PATEROS DUCKS ON A SMALL SCALE BASIS UNDER A SHORT-TERM *AMARANTHUS* SP. FEED SUPPLEMENTATION: SUSTAINING BALUT PRODUCTION IN ILIGAN CITY

¹Gleeza L. Manulat+*, ¹Henry I. Rivero

¹Department of Biological Sciences, College of Science and Mathematics, Mindanao State
University- Iligan Institute of Technology, A. Bonifacio Avenue, Tibanga, Iligan City

*gleemanulat@gmail.com

ABSTRACT

This study was carried out to assess the efficiency of *Amaranthus* leaf meal to 64 sexually mature Paterosducks (48 females and 16 males in a 3:1 ratio/cage) as well as the effects of varying *Amaranthus* concentrations on a commercial feed: 15% (T1), 10% (T2), 5% (T3) and pure commercial feed: 0% (T4) to the egg production performance of ducks and the embryonic status of the eggs produced. The ducks were grouped according to their corresponding treatment with four replicates. Egg production was the focus of the study to aid Balut Industries in Mindanao in propagating its success. There were 108 eggs collected throughout the study period but did not differ significantly in each treatment. Ducks from T2 laid the most number of eggs (33) followed by T4 (30), T3 (27) and T1 with only 18 eggs. Overall Percent fertility (%F) shown through candling on the 7th day of incubation was only 20.8% with a significant difference ($p=0.00023$) on overall assessed fertile and infertile eggs. Hatchability of duck eggs was 0%. Up to 5%-10% *Amaranthus* in feeds was observed to improve laying performance of ducks. Variations in %F could be primarily attributed to the mating potential of ducks in cages while varying factors are considered for unsuccessful hatching such as the effect of incubation, handling and storage, and nutritional factors. Therefore, *Amaranthus* feeding to ducks at particular concentrations can contribute to efficient egg production that can sustain small and backyard livelihood in Mindanao particularly the balut industry.

Key Words: alternative plant feed additive, candling, egg production, embryonic development, incubation

HIGH SCHOOL

CYANOGENIC ASSESSMENT AND TOXICITY EFFECT OF THE VARIOUS CASSAVA (*Manihot esculanta*) AS IT AFFECTS THE MORTALITY RATE OF MOSQUITO WRIGGLERS: A PREVENTIVE MEASURE FOR DENGUE FEVER

Prince Harvey Arellano, Pia Lorraine Saliente, Jana Jezelle Jare Kinazo, Jeusa Ortueste, Merlyn Leysa

ABSTRACT

Plants are not only known as herbal medicine but it has also great application in controlling pest. The extracts of this plant parts could provide great ability in solving problems on the use of chemical pesticides and other synthetic defecting chemicals. Many of the medicinal plants are selectively toxic to some insects that have insecticidal properties that could be used as an alternative synthetic chemical. The effect of it may equal or even more effective than petroleum-based insecticides. In this premise the researchers come up to study on the "Cyanogenic Assessment and Toxicity Effect of Cassava (*Manihot esculenta*) Plant parts against Mosquito Wrigglers: A Preventive Measure for Dengue Fever" which generally aimed to produce an organic and economical larvicide against mosquito wrigglers.

Specifically it aimed (1) to determine if cassava plant parts can be utilized as an organic and economical larvicide against mosquito wrigglers, (2) to determine which cassava plant part is effective as a larvicide and (3) to determine if there is a significant difference between treatments of different cassava plant parts.

The researchers used three trials with four treatments replicated three times. The treatments conducted were as follows: Treatment 1 – 20 ml of cassava leaves extract with 30 wrigglers on 200 ml water, Treatment 2 – 20 ml of cassava root meat extract with 30 wrigglers on 200 ml water, Treatment 3 – 20 ml of cassava root peelings extract with 30 wrigglers on 200 ml water and Treatment 4 – 20 ml of commercial larvicide with 30 wrigglers on 200 ml water. The study is experimental in nature and the data gathered was computed using a simple mean method and One-way Analysis of Variance (ANOVA). Results of the study revealed that, the different cassava plant parts can be used as an organic and economical larvicide against mosquito wrigglers in terms of mortality. Statistical analysis showed that there were significant differences among treatments of different cassava plant parts. Based on the findings, the researchers conclude that the different cassava plant parts can be utilized as a larvicide against mosquito wrigglers. Specifically, the root peelings extract which obtained the highest mortality rate of 94.81% and the highest mean of 28.45. Therefore, the researchers strongly recommend the use of different cassava plant parts specifically the root peeling extract as larvicide against mosquito wrigglers. Since it is economical, easy to acquire and abundant in the locality. It is further recommended to use this organic larvicide which is environmentally safe, no health hazards especially to those people who cannot to buy the commercial one in controlling the breeding places of mosquitoes as the most effective, preventive measure in the spreading pathogens that causes malaria, filariasis and dengue fever.

Because of the timely situation we are encountering here in the Philippines, dengue cases were enormously reported and recorded throughout the region. A total of 46,651 dengue cases was reported nationwide from January 1 to July 7, 2012. This is 13.85% higher compared to the same time period last year (40,975). Most of the cases were from the following regions: National Capital Region (23.1%), Region III (15.06%) and Region IV-A (13.3%). Ages of cases ranged from less than 1 month to 90 years old (median = 12.75 years). Majority of cases were male (53%). Forty percent of cases belonged to the 1 to 10 years age group. There were 294 deaths (CFR 0.63%) reported. Reported cases with CFR greater than 1 came from Regions IVB, VI, XI, CARAGA and ARMM. It yields to a greater concerns for its numebr kept on increasing all the way thrrough and it decline seems to be slowly in spite of them interventions the government initiated on preventing the spread of diseases. Yet, the problem is always present and unstoppable. So, greater attention was given to totally eradicate this issue. It became the basis on the making of this research. To equipped many individuals on how to fight against the presence of dengue.

With the use of Cassava plant parts particularly the root peeling extracts would not only lessen our problem on dengue fever and mosquitoes but it lead us to an economical and environment-friendly solution that could decrease the presence of mosquito wrigglers without harming the environment and the human health as well. It also offers a larvicide which is very convenient compared to the commercial larvicide but not too expensive. With the use of this plant, we degrade our problems and upgrade our way of living. Furthermore, by this we could eventually replace chemical-based larvicide to a safer and cleaner one.



ORAL PRESENTATION ABSTRACTS

SUB-THEMES/TOPICS

With the theme “Private-public partnership: creating possibilities for a responsible resource use,” the Conference will be highlighted with a keynote speech on how PPP can create the possibility of bringing each stakeholder to a responsible use of the remaining environmental and natural resources. Likewise, the Conference will feature plenary speeches on the following sub-themes:

Environmental Governance and People's Participation

This will include but not limited to the following topics:

Environmental Policies
People's/Community's/Institutional Initiatives In Environmental Protection And Conservation
Environmental Management Strategies
Indigenous Knowledge And People In Environmental Management
Impacts Of International Treaties On The Environment

Green Technology and Economy

This will include but not limited to the following topics:

Industrial Ecology
Environmental And Natural Resources Accounting
Environmental Impact Assessment (Project-Based And Programmatic)
Environmental And Natural Resources Economics
Land And Environmental Resources Valuation
Ecotourism
Cross-Country Waste Exchange

Environmental Education and Advocacy

This will include but not limited to the following topics:

Environmental Advocacy
Social Media And Environmental Management
Ict For Environmental Education
Environmental Knowledge Management System
Innovations And Advances In Environmental Science, Biodiversity, And Other Related Fields
Socio-Cultural Perspectives On The Environment
Roles Of The Society In Environmental Education
Multi-Cultural Environmental Education And Advocacy
Human And Environmental Wellness Program

Partnerships for the Environment

This will include but not limited to the following topics:

Private-Public Initiatives For Environmental Restoration, Conservation, And Management
Academe-Business Sector Partnership For The Environment
Cross-Cultural Collaborations

Environmental Research and Methods

This will include but not limited to the following topics:

Researches Involving The Environment
Advances In Research Methodologies
Grounded Theory In Environmental Science And Other Related Fields
Emerging Concepts, Principles, And Strategies In Environmental Science, Studies, Management, Conservation, Waste Management, Risk Management, And Disaster Reduction And/Or Management

HOUSEHOLD SOLID WASTE MANAGEMENT IN RELATION TO HEALTH STATUS

BaiSaguira M. Abdulah, Zainudin M. Adam, Lumina D. Cabilo, O.S. Corpuz

ABSTRACT

This study aimed to determine the influence and correlation of household Solid Waste Management and Socio-Demographic Profile of Respondents to Health Status. There were 150 respondents obtained through multistage sampling having 50 respondents in each selected municipality of Arakan Valley Complex. Pearson Product Moment Correlation was utilized to measure the relationship of variables; while the regression was used to test the influence of predictors to the dependent variables.

Majority of the respondents were college graduate, farmers and a resident for 20 years and above in the locality. Landfill was highly done to biodegradable materials. Whereas on non-biodegradable, incineration; landfill and recycling were the method used. Majority of respondents do not practiced proper solid waste management. Finding disclosed that health status was influenced by educational attainment, occupation and number of years as residence in the place also solid waste management. Stomach ache and diarrhea were the most prevalent ailments in the locality. Findings further revealed that the relationship between the socio-demographic factor and the segregation of waste was evident. Findings also revealed that solid waste management disposal had significant influence on the health of respondents.

It is concluded that the higher the educational attainment, the better occupation and long stay in place had a proper solid waste management practices and lesser it's susceptible to ailments.

Key words: solid waste management, land fill, recycling, health status



CHILD LABOR CONTRIBUTIONS TO THE HOUSEHOLD PRODUCTIVITY AND INCOME OF RUBBER FARMERS IN THE ARAKAN VALLEY COMPLEX, PROVINCE OF COTABATO

Helen Alojado Puno

*Cotabato Foundation College of Science and Technology, Doroluman, Arakan,
Cotabato, punohelen@gmail.com*

ABSTRACT

The study entitled, "Child Labor Contributions to the Household Productivity and Income of Rubber Farmers in Arakan Valley Complex, Province of Cotabato", was conducted to describe the socio-demographic characteristics of the rubber farmers; determine the labor contributions of parents and children in rubber farming and in the different farming activities; the household productivity and income of rubber farmers; difference between the parents and child labor contributions; influence of the child labor contributions on the household income derived from rubber farming and from other farming activities; influence of the number of working children on the household farming productivity; and influence of the number of working children on the number of household farming activities.

Rubber grower respondent had an average age of 46. Majority 81.8% of the respondents were male and 82.8% were married, 84.8% were Catholic and 64.6% belonging to the Ilonggo tribe. Most of the respondents attained elementary and high school education with an average household size of 6 and an average farm size of 1.86. About 76.54% of the total labor input in rubber farming and other farming activities were contributed by the child labor, while only 23.46% of the total labors were contributed by the parents. Rubber had the highest yield per year followed by corn, rice, fruits and lastly vegetables. Only rubber farming showed a significant difference between the parents and the child labor contributions. In rubber farming, only care and maintenance and acid treatment showed a significant influence on the household income, while the total labor cost contributed by the children from the other farming activities had also significantly influenced the household income. Result of the ANOVA revealed that as the number of working children increased, the household income also increased. Duncan's Multiple Range Test (DMRT) showed that the number of children 4-6 and 7-9 had substantially increased the household income. The analysis of variance (ANOVA) result also showed that the number of working children significantly contributed to the increase of the household farming activities. The DMRT, on the other side, indicated that the two higher categories of the number of working children, 4-6 and 7-9 had significantly contributed to the increase in the number of farming activities done by the household.

Key words: child labor, household income, rubber, Cotabato



EVALUATION OF THE DEVOLVED AGRICULTURAL SERVICES ON THE JOB PERFORMANCE OF EXTENSION WORKERS

Pasigan U. Buisan

Cotabato City State Polytechnic College, Cotabato City, Email: pasbuisan@yahoo.com

ABSTRACT

The study aimed to evaluate the effects of the devolved agricultural services, administrative and facilities support of the local government units on the job performance of extension workers of the Department of Agriculture in Cotabato Province. The respondents of the study were 65 extension workers and 84 farmer leaders. They were chosen through stratified random sampling by proportionate allocation and equal allocation respectively. Interview schedule was the main instrument used in the data gathering. Also key informant interview and secondary data gathering were undertaken. The data were analyzed using frequency counts, percentage, and mean as well as T-test for independent sample and ANOVA. The agricultural services of the Local Government Units through the Department of Agriculture are effective although the facilities and administrative support was poorly provided. The effective delivery is a factor that affects very satisfactory performance of extension workers. Facilities and administrative support must be adequate in order to affect very significant performance of the extension workers. Thus, LGU should provide additional support for the extension workers.

Key words: evaluation, devolved agricultural services, job performance, extension workers

PETROLEUM PRODUCT CONSUMPTION AMONG RESIDENTS OF RURAL AND URBAN COMMUNITIES OF LA TRINIDAD, BENGUET

Laurie L. Canuto, Kaycee O. Gaspili, Jiban C. Oway

Benguet State University

ABSTRACT

The growing dependence of individuals on petroleum products escalates consumption in the Philippines. Consequently, prices of most commodities fluctuate rapidly as prices of petroleum products change. This study aimed to determine the rate of use of petroleum products among residents of urban and rural communities, identify the alternatives of petroleum products that they use, and verify the influence of some factors on their consumption of petroleum products, particularly number of household members, monthly income, and awareness on the environmental effects of petroleum products. This study employed causal-comparative research design with 100 randomly selected residents from urban and rural communities of La Trinidad, Benguet. Structured questionnaire and guided interview were used to gather data. Findings show that liquefied petroleum gas (1.61 L/wk) and diesel (1.21 L/wk) are the top petroleum products used by urban and rural communities. Cooking and transportation were identified as main uses of petroleum products and that electricity and wood were the principal alternatives. It was also found that number of household members and monthly income are directly associated with consumption of petroleum products, but no significant association exists between awareness on the effects of petroleum product consumption and rate of consumption.

Key words: petroleum products, alternatives of petroleum, rural and urban communities



HUMAN-ENVIRONMENT INTERACTION IN THE RIPARIAN BUFFER ZONE IN BARANGAY BAMBANG, LOS BAÑOS, LAGUNA

Ana Rosa Carmona, Jose Limbay Lahi Espaldon, Eric Jason Lagrimas, Nguyen Xuan Huu, Albert Paul Puncia, Kathlene Faith Sanchez, Ye Min Htwe and Carmelita M. Rebancos

School of Environmental Science and Management, University of the Philippines, Los Baños, College, Laguna

ABSTRACT

This study explores the impact of human activities on the condition of the lakeshore riparian buffer zone. Community structure of the riparian vegetation and its physical attributes associated to its ecological functioning were evaluated using rapid riparian assessment methods. A household survey was conducted to describe the socio-economic and food security status of the lakeshore community and to identify activities that impact the riparian area. Results revealed poor riparian buffer zone condition as most of its attributes were moderately altered by human activities. Riparian vegetation was predominantly herbaceous, dominated by invasive species, lacked woody species, and provided 45% vegetative cover. The lakeshore community had higher population density, average household size, and younger population compared to the national data. Eighty-nine percent of the households belonged to the lowest socio-economic classes while eighty-five percent experienced food insecurity. Correlation analysis showed that households' mean distance from riparian buffer zone does not affect riparian quality, vegetation species richness, total cover, average height, and frequency, while land cover/use was found to have an effect on these variables. Resorts and private properties had greater impact on the riparian zone. Settlement expansion and other forms of encroachment should be restricted or regulated within the 76-meter buffer zone.

Key words: riparian buffer zone, lakeshore communities, lakeshore riparian vegetation, rapid riparian assessment, socio-economic profile, food security status

USE OF PLASTIC AND ALTERNATIVE BAGS: THE CASE OF CONSUMERS AND BUSINESS ESTABLISHMENTS

Aiko F. Claudio, Abegail B. Palcongan, Mary Luz M. Salis, and Dina C. Tomin

Benguet State University

ABSTRACT

Plastic bag ban, now implemented in some cities and municipalities in the Philippines, intends to lessen the hazard caused by plastic bags by encouraging the use of alternative bags. This study was conducted to determine the alternative bag that consumers and business establishments prefer to use; identify the average amount of plastic bag used by consumers and business establishments; and verify the influence of factors such as gender, age, and number of household members to use of bags. This study employed the mixed method research design. Semi-structured questionnaire and interview were used to gather data. Thematic analysis was used to analyze qualitative data; descriptive statistics and bivariate correlation were used for quantitative data. Findings reveal that consumers prefer non-biodegradable plastic bags because these are cheaper; business establishments prefer to use biodegradable plastic bags because these are environment-friendly. It was also found that age and gender are not significantly correlated with preference of bag while number of household members is significantly correlated with amount of bags used.

Key words: plastic bag ban, alternative bag



PESTICIDE RESIDUES IN VEGETABLES, SOIL, AND WATER SAMPLES FROM FOUR VEGETABLE-PRODUCING AREAS OF NEGROS ORIENTAL, PHILIPPINES

Jose Edwin C. Cubelo¹ and Teodora A. Cubelo²

Silliman University College of Agriculture¹ and Institute of Clinical Laboratory Sciences²

ABSTRACT

A survey was conducted among vegetable farmers in four vegetable growing areas in the province of Negros Oriental, Philippines in order to examine the extent of pesticides use by farmers and determine the presence of pesticide residues in vegetables, soils, and water samples. One hundred nineteen (119) freshly harvested samples of cabbage, Chinese pechay, cauliflower, broccoli, eggplant, and ampalaya, 22 soil and 17 water samples were collected from randomly selected farms and submitted at the National Pesticide Analytical Laboratory (NAPL), Laboratory Services Division, Bureau of Plant Industry in Quezon City, Manila for the analysis of organophosphates, organochlorines and pyrethroids residues using Gas Liquid Chromatography. Results of the survey show that insecticide use was pervasive among the surveyed vegetable farmers, with pesticide application averaging more than 10 applications per cropping season. The most frequently used group of insecticides were pyrethroids, phenoxy-derivatives, and organophosphates. Results of multi-residue analysis indicate that 28 of 119 vegetable samples tested showed positive readings for the presence of profenofos, chlorpyrifos, and lambdacyhalothrin residues, with eight samples containing residue levels that exceeded the Maximum Residue Limit (MRL). A water sample obtained from one of the farms also showed positive reading for malathion residues, while a soil sample also tested positive for the presence of difenoconazole. Thus, evidence of pesticide contamination on vegetables, soil, and water samples from the surveyed farms existed at the time of the study. Findings call for Local Government Units to draft and implement local policies that will regulate the sale and use of pesticides in farms, create incentives for reduced pesticide usage, and set-up mechanisms for regular monitoring of the level of pesticide contamination in vegetables, farm soils, and ground water resources.

Key words: pesticides, pesticide residues, pesticide contamination



FACTORS ASSOCIATED WITH PESTICIDE USE AMONG VEGETABLE FARMERS IN NEGROS ORIENTAL, PHILIPPINES

Jose Edwin C. Cubelo

Silliman University College of Agriculture, Dumaguete City, Philippines, e-mail: sircubs@yahoo.com

ABSTRACT

Averse to pest-related risks, farmers commonly resort to the use of pesticides despite the existence of alternative strategies to crop pest management. The study sought to determine factors related to vegetable farmers' decisions to use pesticides as a principal pest control strategy. Face to face interviews with 151 commercially-oriented vegetable farmers from four vegetable growing municipalities in the province of Negros Oriental were conducted to gather data needed for the study. Results show that the vast majority (88%) of the surveyed farmers employed the use of pesticides as a main pest control strategy. Socio-economic factors such as gender, number of land parcels cultivated, and level of household income of the surveyed farmers were found to be associated with their decision to use pesticides for pest control. Farmers' assessment of the extent of pest and disease infestation on their vegetable crops, and their perceived effects of pests on crop yield were found to be significantly associated with pesticide use. Other factors influencing farmers' decision to use pesticide were their regard of pests as severely destructive, the perceived increase in pest populations, and their desire to prevent, control or eradicate pests to ensure better crop yield. Information sources, frequency of contact with pesticide dealers, and membership in farmers' organization were also found to be significant influences on farmers' decision to use pesticides. It is recommended that appropriate government agencies should sustain, expand, and be more aggressive in promoting IPM practices among vegetable farmers to minimize or stop their dependence on pesticides and to encourage the use other non-chemical pest control methods that do not compromise farmers' health, food safety and environmental quality.

Key words: vegetable pests, pesticides, pest control



THE SOLID WASTE MANAGEMENT PRACTICES OF URBAN BARANGAYS IN LA TRINIDAD, BENGUET

Dwight Antero Daodao

Local Government Unit of La Trinidad

ABSTRACT

The study assessed the solid waste management practices of urban barangays in La Trinidad, specifically to determine the level of knowledge of the respondents, the level of effectiveness of the solid waste management practices, the problems encountered, and the impacts of the solid waste management practices among the urban barangays of La Trinidad. The study also looked into the relationship between the factors affecting the solid waste management practices. The respondents were composed of 360 residents, 6 barangay officials, and 3 municipal employees. The study was both a quantitative and a qualitative research. Findings reveal that the residents of the urban barangays in La Trinidad are very much knowledgeable on some of the provisions of Republic Act 9003, the level of effectiveness in the implementation of the solid waste management practices among urban barangays is moderately effective, the most common problems arising from the implementation of the solid waste management practices is the absence of a material recovery facility. The level of effectiveness in the implementation of the solid waste management practices among the urban barangays of La Trinidad, according to source of knowledge was found to be statistically significant. As for the impacts of the solid waste management practices, overall improvement on the aesthetics of the municipality has been noted, however lack of financial resources and low compliance rate of residents on laws are the main obstacle in sustaining an acceptable impact. Recommendations include sustaining or even improving on the various solid waste management practices; source out financing institutions or explore a possibility of a private-public partnership to finance solid waste management programs; conduct of a more thorough study on solid waste management policy; and formulation of an action plan for the both the municipal and barangay local government units.

Key words: solid waste, management practices, effectiveness, urban barangays



AGRICULTURAL WASTE MANAGEMENT OF RICE FARMERS IN CAMARINES SUR, PHILIPPINES

Narses S. Detera

Central Bicol State University of Agriculture, San Jose, Pili, Camarines Sur, narsesdetera@yahoo.com

ABSTRACT

Soil fertility will depend on the replenishment of the nutrients used up by the plants. One way is returning back to the soil what the plant took out during its growth and development. This is one of the methods to manage agricultural wastes. This paper will answer the following questions: (1) How do farmers dispose their rice straw? (2) How many farmers burn their rice straw? Incorporate the rice straw prior to planting? Are there other ways? The study area covered Pili, Bula, Baao, Minalabac, Libmanan and Nabua.

The farmers gave eight answers, namely: (1) burning; (2) incorporate prior to planting; (3) piling and composting; (4) combination of 1 and 2; (5) combination of 2 and 3; (6) combination of 1, 2 and 3; (7) combination of 2 and 3; and (8) farmers did not indicate his practice. Rice straw burning ranked first in Baao, Bula, Minalabac and Nabua. In Pili, the farmers who did not indicate their practice ranked first. In Libmanan, the farmers' practice of incorporation prior to planting and did not indicate practice tied, ranked 1.5. Farmers burning their rice straw in all areas ranged from 13.16 to 41.18 percent, with lowest from Pili and highest from Nabua. Farmers' topmost practices in Baao, Bula, Nabua and Pili are burning piling and composting. A farmer in Minalabac practices combination of 1, 2 and 3.

Composting and incorporation of rice straw prior to planting can help sustain the farm, and decrease pollution due to rice straw burning.

Key words: rice straw, burning, agricultural wastes management, replenishment

ENVIRONMENTAL PROTECTION PRACTICES OF DANAOCITY BEACH RESORTS

Corazon P. Macachor, Cecilio S. Baga, Cristeodoflor A. Ramos, Aquilino M. Enriquez and Kathleen S. Camaongay

Cebu Technological University, Danao City, cora_macachor@yahoo.com

ABSTRACT

Environmental protection is one of the concerns of Cebu Technological University, Danao Campus, researchers. The research is focused on how the identified beaches of Danao City, protected the environment. In this study, the researchers conducted baseline data on how the operators and tourists protected the area like waste segregation, cleaning and landscaping activities and the application of the 3R's of waste management. Out of the identified five (5) Danao City beaches, including El Salvador, Danao City privately-owned beach resort protected the area by landscaping the whole portion of the resort and reforestation with endemic species of trees. The common environmental practices of the Danao City beach resorts made the ecotourism successful. Thus, the environmental protection practices of the identified tourist destination should be sustained.

Key words: beach resort, eco-tourism, environment, protection, Danao City

TIGER GRASS PLANTATIONS: IMPLICATIONS FOR CALSANAG WATERSHED FOREST RESERVE MANAGEMENT

Eddie G. Fetalvero

College of Education, Romblon State University, Odiongan, Romblon

ABSTRACT

This case study is built upon a resource survey and mapping of tiger grass plantations in Northern Tablas in the province of Romblon from 2010 to 2012. Tiger grass, *Thysanolaena maxima*, (Roxb.) O. Kuntze or *luway* in the vernacular is a perennial, high value, non-perishable cash crop for wide range agro-climatic conditions that are found to be in abundance within and outside the CALSANAG Watershed Forest Reserve (WFR), the largest of the remaining forest cover in the island. This paper attempts to provide an explanation as to why tiger grasses are growing where they are. The concept of ecological niche was used as framework in explaining their occurrence and distribution alongside the environmental parameters within the watershed which also approximate the conditions surrounding the protected area. The eco-physiological characteristics of tiger grass were discussed and linked to their ecological functions and services. These functions were used as bases in drawing the implications of tiger grass plantations to the CALSANAG WFR management in the aspects of disturbance regulation, reduction of dependence on forest products while safeguarding biodiversity, and restoration and sustainable use of fragile and degraded lands - conservation strategies that are nature-friendly, cost-effective and sustainable.

Keywords: watershed management strategy, tiger grass, *T. maxima*, ecological niche concept, CALSANAG WFR

PHILIPPINE FLOOD INSURANCE NOTES: PRICING BASED ON MONTE CARLO SIMULATION

Hans Gerth V. Garcia, Robin James Dasmariñas, and Jonathan B. Mamplata

Institute of Mathematical Sciences and Physics, University of the Philippines Los Banos

ABSTRACT

The Philippines, a country geographically located at a region susceptible to calamities, suffer large economic losses. One way of minimizing economic losses due to calamities is by purchasing treasury notes. A treasury note is a marketable debt security with a fixed interest rate and a maturity between one and ten years. Catastrophe notes are treasury notes contingent on losses brought about by catastrophe. These are good ways to compensate losses brought by natural disasters. This paper determined the distribution of the economic losses and the probability distribution of flooding in the Philippines using the data from The International Disaster Database. Also, this paper constructed yield rates and prices of flood disaster risk notes using Monte Carlo Simulation in three different cases: principal guaranteed, 50% principal guaranteed and non-guaranteed notes. The two asset models used, Capital Asset Pricing Model and Bond Pricing Model, revealed different types of flood disaster notes suited for different kinds of investors.

Key words: insurance, catastrophe, flood, flooding, notes, pricing



COMMUNITY AWARENESS ON RASA ISLAND PROTECTION PROGRAM

Celia R. Ignacio¹, Nathaniel I. Lepasana¹, Raymund De La Rosa², and Amabel S. Liao³

¹PSU Narra, ²SB Office Municipality of Narra, and ³Office of Special Projects and Concerns, PSU Main

ABSTRACT

This study was conducted to determine the community awareness of Narra residents on Rasa Island protection program. Specifically, it aimed to determine the awareness of the residents on the protection program implemented in the Rasa Island Wildlife Sanctuary as well as determine the difference in the level of awareness on Rasa Island protection program of the residents in the coastal and mainland areas of Narra, Palawan. Residents of Narra, Palawan served as respondents of the study. Sampling procedure was done from each target area/cluster and a total of 168 residents comprised the sample size of the study. The descriptive survey research design was used in this study. BAPS and BEED students of PSU Narra assisted in the distribution, gathering, and tallying of data under the supervision of the main author. Frequencies, means, and t-test were used to analyze the data.

Results showed a very slight difference in the awareness of residents in the coastal with 2.33 mean (uncertain) and mainland barangays with 2.35 mean (aware); while the grand mean shows 2.34 result which shows that residents in both areas are aware of the program. Hence, there is no significant difference between the awareness of the residents in the coastal and mainland barangays of Narra, Palawan on the Rasa Island Protection Program as seen in the t-test results (0.178382, 0.192783, 0.448813). Narra residents are aware of Rasa Island being a protected area and the abode of the Philippine Cockatoo (Katala), flora and fauna, mangrove trees, and other endangered species. However, the uncertainties on some of the policies, ordinances, sanctions, and activities in the island show that the residents are not fully aware of the Rasa Island Protection Program. Nevertheless, the awareness of the residents determined in this study was due to the effective campaign of the local and national agencies in the preservation and protection of the Rasa Island.

Key words: Rasa Island Wildlife Sanctuary, Rasa Island Protection Program, community awareness, coastal barangay, mainland barangay



COMMUNITY-LEVEL CLIMATE CHANGE VULNERABILITY AND ADAPTIVE CAPACITY ASSESSMENT OF VEGETABLE AGROECOSYSTEMS IN BENGUET

Ben D. Ladilad, Maria Luz D. Fang-asan, Mursha D. Gapasin, Carlito C. Laurean, Marissa R. Parao

Benguet State University

ABSTRACT

This study aimed to determine the exposure, sensitivity and adaptive capacity to climate change of agricultural communities in the province of Benguet. Eight Barangays representing the high hill, low, medium and high mountain elevations were selected from the 13 municipalities of the province. With participatory communication as framework, this study intended to involve the local communities in the identification of climate change perceptions, hazards and vulnerability. Using the VAST-AGRO tool, vulnerability indices of the selected communities were generated. While elevation features affected susceptibility to climate change hazards, the availability of support systems, resources and coping strategies of agricultural communities played a significant role in helping them deal with climate change to minimize its destructive impacts. Interviews were also conducted to ascertain local understanding of climate change. Information education campaign (IEC) materials were developed and recommendations relevant to the study findings were presented.

Key words: climate change, vulnerability, adaptive capacity assessment, agroecosystem

ELECTRIC CONSUMPTION AND CONSERVATION PRACTICES AMONG BAGUIO – BENGUET RESIDENTS

Jehan K. Laoyan, Jovelyn B. Layogan, Divina P. Felino, and Miga Ray Mindaro

Benguet State University

ABSTRACT

Human beings maintain an intimate relationship with electricity. In fact, some consider it virtually impossible to separate life with it. Generation of electricity, however, poses damage to the environment. Thus, conservation of electricity is advocated. This study aimed to identify the uses, rate of electric consumption and conservation practices among Baguio-Benguet residents and determine differences among respondents grouped according to age, gender, type of community, number of household members, and employment status. This study employed causal-comparative research design, with 100 respondents from three barangays of Baguio City and three municipalities of Benguet. Structured questionnaire was used to gather data. Findings reveal that most of residents consume about 80 kilowatt-hours per month. Communication, entertainment, and cooking were leading uses of electricity among residents. Respondents conserve electricity primarily by unplugging electric appliances when not in use. It was also found that there are significant differences in the extent of compliance in the conservation practices among age and gender groups, type of community, employment status, and number of household members.

Key words: electric conservation practices, energy-efficient products, energy scarcity



HOUSEHOLD PARTICIPATION OF LUYANG, CARMEN CEBU RIVER CLEAN UP

Corazon P. Macachor, Cecilio S. Baga, Miguelito A. Lauglaug, Pedro P. Cuizon and Rubie Bongo

Cebu Technological University, R. Palma St. Cebu City, cora_macachor@yahoo.com

ABSTRACT

Household wastes are polluters of Luyang, Carmen, Cebu river. Environmental awareness on the attitudes towards the environment should be shared to all riverbank residents especially those river which still belongs to Class A. This study investigated the midstream and downstream part of Luyang, Carmen riverbanks household members' role on river clean-up. Thirty respondents were able to provide their awareness on attitudes towards environment and water utilization. Married women of Carmen, Cebu, are the ones who are mainly responsible for the housekeeping with part-time sources of income. Most of them think on green and pleasant environment, however the downstream part of Luyang River, Carmen, Cebu City households respondents the quality of life where they live. The five main environmental issues that the respondents are worried about were climate change, water pollution, loss in biodiversity, water pollution, growing waste and depletion of natural resources. The attitudes of respondents towards environment were correctly disposal of hazardous household products at home, maintain septic systems properly in the yard and contact the public officials and attend hearing to encourage the community to support laws and programs to protect water. The Local Government Unit of Luyang, Carmen, and Cebu, Philippines provide an avenue to sustain the river clean-up with the Carmen, Cebu Environment Management Board.

Key words: household, clean-up, upstream, midstream, downstream, river

BIODIVERSITY CONSERVATION AND TOURISM DEVELOPMENT IN BARANGAY TALOOT, ARGAO, CEBU

Edgardo P. Lillo¹, Steve Michael T. Alcazar¹, Archiebald Baltazar B. Malaki¹, and Ritche U. Nuevo²

¹College of Forestry and ²College of Agriculture, Cebu Technological University-Argao Campus,
email: lillo_edgardo@yahoo.com

ABSTRACT

Biodiversity is both essential for our existence and intrinsically valuable in its own right. Through the conservation of biodiversity the survival of many species and habitats, which are threatened due to human activities, can be ensured. Ecotourism is often one component of conservation and development programs. The study aimed to conserve biodiversity and develop tourism in Barangay Taloot, Argao, Cebu. The study includes the survey on the natural tourism resources in the site.

There were 22 species of Mangrove in Taloot, Argao under 11 families and 14 genera. Three species fall under the Near Extinct category. A total of 401 individuals of birds were recorded in the study site that constitutes 17 bird species representing 15 families. A total of 34 individuals of bats belonging to four species were recorded in the study site. The *Cynopterus brachyotis* relatively abundant with (64.70%).

The species of corals include the live hard species which compose of the massive and branched hard corals, 34 species of fish identified in site under 10 families and 20 genera. For sea grass species it includes 8 species with 4 genera and *E. acoroides* as the most abundant.

Identified Potential Ecotourism sites include: walking along the cemented road from Taloot barangay hall to seaport for Loon Bohol, boat riding from Taloot fish sanctuary to Sambrea Lake, diving in the fish sanctuary, and trekking from the highway to the beautiful Taloot spring called "Leke". Twenty (20) volunteer residents from the barangay were trained as tour guide. The ecotourism industry of Barangay Taloot has the bigger potential in biodiversity conservation and linkages among government and private agencies.

Key words: ecotourism, biodiversity, conservation, and Barangay Taloot, Argao, Cebu



WOMEN'S PARTICIPATION AS SOCIAL VULNERABILITY INDICATOR IN COASTAL WATER MANAGEMENT

Rhodora Lynn C. Lintag, Zenia Rodriguez, and Arlen Ancheta

Faculty of Arts and Letters, University of Santo Tomas

ABSTRACT

This paper presents women's participation in the management of the coastal waters along Manila Bay, Metro Manila. It focuses on community participation through collaboration and cooperation with the local government unit and other non-government agencies. The central issue of the paper is to bring out the voices of these women as socially vulnerable group in the management of coastal waters. Specifically, the study takes off from the participation of the women members of Kabalikat, an active NGO in BASECO, Tondo, and the women member-beneficiaries of the Villar Foundation in Las Pinasin the projects related to coastal environment. It employs qualitative approach using various methods such as interviews, direct observation, and review of secondary data.

Results of the study reveal that women as highly vulnerable members of the society play important roles in community development. As stakeholders, they take active voices in the planning, decision-making and implementation of the programs on health and safety related to climate change. It is recommended that the presence of the women in community activities should be recognized because listening to their voices could provide more opportunities for vulnerable groups to collaborate in planning and implementation of community development programs.

Key words: women, participation, social vulnerability, collaboration



ETHNOBOTANICAL USES AND PHYTOCHEMICAL ANALYSIS OF TWO *Amorphophallus* SPECIES (BALBAG) IN PALAWAN, PHILIPPINES

Josephine M. Magay-Salmo¹ and Mildred Palatino-Palon²

¹Western Philippines University-Puerto Princesa Campus, Sta. Monica, Puerto Princesa City, Palawan; E-mail address: phinesmagay@yahoo.com; ²Palawan Ethnobotanical Research Center

²Holy Trinity University, Puerto Princesa City, Palawan, E-mail address: mppalon@yahoo.com

ABSTRACT

The *Amorphophallus* species in Palawan is still utilized by the indigenous people as famine food and feed extender to hogs. The study was conducted to find out the medicinal and industrial potential of the plant species not only as a famine food and a “hog meal.” The study dealt only on the ethnobotanical uses and phytochemical analysis of two *Amorphophallus* species found in Palawan, Philippines. Actual collection of *Amorphophallus* species was done by the researchers. Air-dried plants parts were used to test for inorganic substances like iron and calcium. Alcohol extract of leaves, stalks and corm of two plant species were used to test its phytochemical content. The tests followed the standard procedures in plant screening for its inorganic substances and phytochemicals.

Based on the findings of the study, one of the species of *Amorphophallus* has more phytochemicals particularly saponin than the other species. But both *Amorphophallus* species contains inorganic substances such as iron and calcium; and phytochemicals like alkaloids, steroids, flavonoids and tannins. There are several outputs that were realized out of the study, which includes a monograph of the *Amorphophallus* species in Palawan, Philippines, and a laboratory manual on phytochemical screening of plants.

Key words: *Amorphophallus*, balbag, ethnobotanical uses, phytochemicals, saponin, alkaloids, steroids, flavonoids, tannins, iron, calcium



INDIGENOUS FARMING FAMILIES: PARTNERS IN SAFEGUARDING THE SUSTAINABLE USE OF NATURAL RESOURCES

Sherry B. Marasigan¹ and Joane V. Serrano²

¹Agricultural Systems Cluster, College of Agriculture, UP Los Banos, Los, Banos, Laguna, Philippines; ²Faculty of Management and Development Studies, UP Open University

ABSTRACT

The year 2014 has been declared as the International Year of Family Farming. This is a very timely event since it is an opportunity to recognize the important tasks of family farming in “eradicating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment, and achieving sustainable development, in particular in rural areas” (FAO, 2014). In the Philippines, especially in indigenous communities, farming is indeed a family activity. However, it has been observed that many children coming from families whose main livelihood is farming no longer participate and involve themselves in farming activities. A number of family members migrate to urban places and those who have been educated totally abandon their farming duties and roles. This study aims to determine the involvement of families in farming particularly in areas which farming has been the primary source of income. This study will explore how farming families can contribute to safeguarding the sustainable use of natural resources. This study interviewed indigenous farming families from Ifugao on how they deal with this particular challenge. Indigenous families and communities have been stewards of the Earth’s natural resources for thousands of years, hence it is important to preserve and conserve the traditions of farming families.

Key words: farming families, natural resources, indigenous people

UNDERSTANDING SOCIO-CULTURAL ENVIRONMENT THROUGH ARCHIVING LAGAYLAY, AN ORAL TRADITION IN CANAMAN, CAMARINES SUR

Jiye A. Margate

Department of Physical Education, College of Arts and Sciences, Central Bicol State, University of Agriculture, San Jose, Pili, Camarines Sur, Email: pink_pearl1080@yahoo.com

ABSTRACT

Oral traditions are precious data but very volatile because of the continuous threat of its extinction. There is therefore the need to conduct the study regarding *Lagaylay*, a two-hour song and dance performance in honor of the Holy Cross in the town of Canaman, Camarines Sur, Philippines. A description of the ritual and factors affecting its practice are determined and evaluated. Specifically, the study focuses on dance documentation highlighting its distinguishing movements and styles. Interviews with key informants are conducted in order to classify the implements, costumes, accessories and musical instruments used in the traditional ritual. Digitization of the “*duyag*” part of the entire *Lagaylay* is done in order to enhance precise archiving of this threatened oral tradition for the present and future generation’s understanding and appreciation. Writing of the dance notation following the Reyes-Aquino format is prepared in order to document in print this perishable art form. In order to understand the socio-cultural environment of the people, exploring the existing oral tradition can be of great help.

Key words: dance, digitization, intangible cultural heritage, oral tradition

DEFINING STAKEHOLDERS' PARTICIPATION IN BUENLAG-SABANGAN RIVER'S CONSERVATION AND MANAGEMENT: A MULTIDISCIPLINARY APPROACH

Shella C. Parreño¹ and Romeo A. Gomez²

¹Pangasinan State University, Binmaley, Pangasinan; ²Benguet State University, La Trinidad Benguet

ABSTRACT

This study was conducted to define the participation of the stakeholders in the conservation and management of Buenlag-Sabangan River. To achieve the purpose, river assessment using quantitative bio-physical and social-political data gathering instruments was conducted. At the end of the assessment, a river plan was formulated identifying the potential roles of various stakeholders in the conservation and management of the river.

Results of the study revealed that the river has low macrofloral diversity ($H=1.31$) with *Rhizophora apiculata* dominating the 23 species of macroflora. The aquatic fauna which is composed of 20 species of fish, 11 species of crustaceans and 6 species of mollusks also has generally low diversity ($H=1.71$). The aquatic faunal community structure is characterized by the high density and abundance of a non-edible species of mollusks (*Modiolus philippinarum*) and high frequency of occurrence and abundance of less economically important of fish species (*Gerres erythrouros*, *Tetraodon fluviatilis*). The water quality of the river is generally within the standard for set by authorities for Class C water.

Buenlag-Sabangan River and its resources were moderately utilized for fishpond habitation, protection against storm surge and strong wind, and as sources of food and livelihood. Likewise, strategies employed by LGUs in resource conservation and management were moderately implemented. On problems encountered, low catch was considered as more serious and reduction on the number of fishing apparatus (FAs) ranked first among the proposed solutions to increase catch per unit effort.

Based on the results of the assessment, a concerted effort of various stakeholders is necessary in: resource governance, resource rehabilitation and protection, community welfare development and information, education and communication for sustainable utilization and management of the river.

Key word: multi-disciplinary approach



GENETIC CHARACTERIZATION OF TREES FOR BETTER MANAGEMENT OF PLANTED FOREST IN SOUTHERN PHILIPPINES

Albert A. Piñon¹, Wilfredo M. Carandang², Edina S. Fernando², Cesar C. Nuevo³, Manuel L. Castillo², Marco A. Galang² and Marilyn O. Quimado²

¹Ecosystems Research and Development Bureau, Department of Environment and Natural Resources, Los Baños, College, Laguna, Philippines. Corresponding author: Email address - alpinon@yahoo.com; ²CFNR, University of the Philippines Los Baños, Laguna, Philippines; ³Forestry Consultant, Cagayan de Oro City, Philippines; ⁴Ecosystems Research and Development Bureau, Department of Environment and Natural Resources, Los Baños, College, Laguna, Philippines

ABSTRACT

Appropriate utilization and management of planted trees are realized when seedlings used are properly characterized. This study used the Random Amplified Polymorphic DNA Analysis (RAPD) to genetically characterized trees in the context of forest genetic improvement. Using three F1 mother trees and seventy-four F2 progenies of *E. deglupta* x *E. pellita* hybrids, genetic variants such as the number of detected bands (B), percent polymorphic loci (L), percent polymorphism (P), dendrogram and genetic diversity index (H') were identified. Maternal, non-maternal and pure-maternal bands were also determined. Outcome of the RAPD analysis revealed that F1 hybrids were relatives and Inbreeding Depression (ID) reduced the performance of the F2 generation. Among the F1 hybrid parents, EDP3_{F1} undergone selfing as it recorded with the most number of pure-maternal bands. Constructed dendrograms proved the occurrence of ID due to narrowed genetic distance between the F1 and F2 generations. Characterization between the F2 generations showed the superiority of the EDP2_{F1} hybrid parent. Results suggest that best-performing tree plantation may be established when planting materials to be used are collected from the EDP2 population.

Key words: genetic characterization, RAPD analysis, inbreeding depression, *E. deglupta*



CROP DIVERSITY OF UPLAND FARMS IN APAYAO, NORTHERN PHILIPPINES

David A. Rodolfo

Apayao State College, San Isidro Sur, Luna, Apayao

ABSTRACT

This study was conducted to determine the socio-economic characteristics of the upland farmers, document their existing farming systems and practices and assess the crop diversity of their upland farms in Apayao Province in Northern Philippines. A structured interview schedule was designed to generate data for the socio-economic profile of the farmer respondents and actual field observation, documentation and validation is undertaken for their farming systems, practices and crop diversity. The results showed that the respondents were mostly in the working age group, majority are males, with elementary graduate as their average level of education. Majority of them are Isnags, although just a percent higher than that of Ilocanos. The agroforestry farming system of the area can be generalized as: a) improved fallow, b) multistorey cropping system, c) rice terracing with woodlot, d) Taungya, e) alley cropping and f) boundary planting. On the other hand, the soil and water conservation practices were fallowing, multiple cropping, mulching, contour farming, crop rotation, terracing, woodlot establishment and protection, small pond establishment and hedgerows or belting for soil and water conservation. The species crop diversity index (H') of the upland farms using the Shannon-Weiner diversity index formula has a mean of 1.0002 (range: 0.0046-2.3877).

Key words: biodiversity, crop, upland, agroforestry



REDISCOVERING ALMACIGA (*Agathis philippinensis*): MOTHER TREE DOCUMENTATION AND SELECTION IN LUNA, APAYAO

David A. Rodolfo

Apayao State College, San Isidro Sur, Luna, Apayao

ABSTRACT

This study was conducted to document the presence of Almaciga (*Agathis philippinensis*) mother trees in the Province especially in the municipality of Luna. Specifically, the study was conducted to assess and describe the present condition of the potential Almaciga mother trees/ plus trees in accordance to the accepted or standard criteria present in Luna, Apayao, map the Almaciga mother trees in Luna for fruit and seed collections and other related purposes and identify potential livelihood project/s in relation to the documentation and mapping of the Almaciga stands. A standard criteria and indicators in selecting mother/ plus trees were employed. Phenotypic characters like, diameter at breast height, stem straightness, Axis persistence/forking, branch angle, branching habit, branch persistence/ pruning ability, branch thickness and tree health are the criteria considered in the diagnosis. In the mapping, GPS receiver (Garmin 500) was used in data gathering and Arc GIS 3.2 software plotting the data gathered. Thirty eight mother or plus trees were documented and according to the diagnosis undertaken they are considered to be potential excellent mother trees for fruits/seeds and wildling collection purposes for any type of reforestation and re-greening program by both government and non-government agencies and or individuals. There were three (3) of the identified mother tree bear fruits in the last fruiting season.

Eleven (11) of the identified and evaluated mother trees are fruiting at present, which means they are potential seed source and wildling collection for the harvesting season this year in August and September. Three (3) of the identified and evaluated mother trees have a diameter of more than 100 centimeters that be considered as very large mother trees. All the mother trees are considered to be a distant to each other, which facilitates easier collection of fruits and seeds during harvesting period. Almaciga tree is associated to some Dipterocarp species including other premium species.

Key words: mother/plus tree, indigenous tree, tree health



KNOWLEDGE, ATTITUDE AND PRACTICES OF RICE AND CORN FARMERS ON THE UTILIZATION OF BIOMASS FOR RENEWABLE ENERGY IN SCIENCE CITY OF MUNOZ, NUEVA ECIJA

Ma. Theresa R. Sawit

College of Public Affairs and Development, University of the Philippines Los Banos

ABSTRACT

Philippines as an agricultural country has ample supply of agricultural wastes produced in the farm. The government sees the importance of developing renewable energy source because of the increasing price of non-renewable energy source and the benefit it can provide by mitigating the effects of climate change. However, large portions of biomass are underutilized and are just burned in the field.

This study aims to determine the knowledge, attitude and practices of rice and corn farmers on biomass utilization for renewable energy. Interviews are conducted with 15 farmers from the Science City of Munoz using convenience sampling method. Results show that all respondents have knowledge and positive attitude towards the use of biomass for renewable energy. However, many of them still practice burning of farm wastes in open field. It is interesting to note that all of the respondents would rather choose to benefit from the use of biomass than to burn or dispose it once they learn how to properly utilize the biomass and if they have the necessary equipments to easily collect and store these resources. It is found out that no significant relationship exists between farmers' socio-demographic and economic characteristics and their practice of biomass utilization.

Key words: biomass utilization, renewable energy, farmers' knowledge, farmers' attitude, farmers' practices



MANAGEMENT OF CABBAGE PESTS IN AN ORGANIC FARM

L.M. Villanueva, J.C. Perez, J. Ibis

Benguet State University, La Trinidad, Benguet, Philippines

ABSTRACT

Cabbage is regarded as an important crop in the Cordilleras making the region as the top producer nationwide. Organic production of this crop also boosted farmer income due to high demand of organic products. Like other crops, maximum production is not realized due to factors affecting the crop's growth and development. Major culprit in yield loss is associated with pests and diseases which affects plant processes and damages the over-all appearance of the crop. Major pest identified for this crop is diamond-back moth (*Plutella xylostella*) while major diseases are black rot (*Xanthomonas campestris*) and Alternaria leaf spot (*Alternaria brassicae*). A necessary task in organic vegetable production is controlling these highly destructive pests and diseases using bio-pesticides.

To minimize the fungicide inputs yet sustain the productivity of the crop, the potential of plant extracts namely garlic (*Allium sativum*), "gawed" (*Piper betle*), pepper (*Capsicum sp.*), "dengaw" (*Acorus calamus*), ginger (*Zingiber officinale*), basil (*Ocimum basilum*), sunflower (*Helianthus annuus*), oregano (*Origanum vulgare*), yellow ginger (*Curcuma longa*), and pandan (*Pandanus sp.*) were evaluated in vitro, under the greenhouse, in field trials and ultimately with a farmer cooperator. An area in the farmer-cooperator's farm at Tulodan, Atok, Benguet measuring approximately 100 square meters was divided into two to compare two production systems in managing cabbage pests and diseases: farmer's practice and developed product and system. It was observed that the developed product significantly reduced disease progress both for Alternaria leaf spot and black rot by more than 50% as reflected by the area under disease progress curve (AUDPC). Insect damage was also reduced. Plants treated with developed products also produced significantly higher yield than plants treated with farmers' practice. The potential of developed product for the management of cabbage pests and diseases has been shown in the present investigation. A confirmatory test is recommended to validate results.



ASSESSMENT OF AQUATIC FAUNA IN THE RIVER SYSTEM OF DAGUPAN CITY

Marjorie A. Villanueva¹ and Sotero M. Aban²

¹City Agriculture Office, City of Dagupan and ²Pangasinan State University, Binmaley Campus, Binmaley,
Pangasinan

ABSTRACT

This study was conducted to assess the aquatic fauna in the river system of Dagupan City. Specifically, the study aimed to identify the different species of finfish, crustaceans and mollusk which can be found in the river system of Dagupan City; determine the abundance and diversity of the aquatic fauna; to determine the cost and return analysis of the different fishing gears used in catching aquatic fauna; to get the water parameters of the river system and to know what are management program of the city to sustain the fishery resources.

Results of the study showed that there are twenty five (25) species of fin fishes, nine (9) species of crustaceans and five species of mollusk identified in the river system of Dagupan City. In general, fish species, crustaceans and mollusk are almost the same in all stations though in terms of abundance are different from all sampling areas. In all stations the most abundant species of fish is *bugsang bakes* (*Agpogon spp.*), for crustaceans' hipong maskal (*Metapenae usensis*) is the most abundant. Based on the results on the cost and return analysis the most expensive gear is batikwas (modified lift net) with a total of P 40, 533.33 cost of materials and installation but the most cheaper is the gillnet (tabal) which the expenses is amounting to P 1, 290.00 the cost of materials. The management program of the city includes the strict implementation of the CFO # 1768 s. of 2003; mangrove rehabilitation and river clean-up/ demolition of the illegal structures along the river system.

Key words: aquatic fauna, diversity, assessment



GREEN MUSSEL AS A NEW EMERGING MOLLUSK SPECIES IN THE COASTAL WATERS OF BOLINAO, PANGASINAN

Sotero M. Aban, Richmel Mercado, Michael M. Ferrer and Joemark C. Oclima

*Department of Fisheries Science Pangasinan State University,
Binmaley Pangasinan, Philippines email: sotero_620@yahoo.com*

ABSTRACT

Green mussel (*Perna viridis*) has emerged as a new bivalve mollusc species that can now be found in the coastal waters of Pangasinan. It is now being cultured in Bolinao Bay. Thus, this study was conducted to describe the status of gathering and culture of green mussel in Bolinao Bay in western Pangasinan. Fifty two green mussel gatherers/operators were surveyed to gather information on their socio-demographic and socio-economic profile and their knowledge about the emergence of green mussel in Bolinao Bay. Of the 52 respondents, 76.92% of them are males, 94.23% are married, 69.23% has an age of more than 40 years, 57.69% are high school graduates, 92.31% are members of the Roman Catholic Church and 73.08% of them are engaged in fishing as their main source of income. Most of the respondents (84.61%) revealed that green mussels emerged in the coastal waters of Bolinao as an effect of intensive feeding of milkfish in cages while 15.39% believed that green mussels were carried by the fishing vessels docking into the Bay and 5.77% said that some researchers introduced some mollusc seeds in Bolinao in the 1980s but did not grow. They only emerged when the water conditions in Bolinao are already suitable for their growth and reproduction. Majority (55.77%) of them observed the growth of green mussel from 1990 to 1995 while 36.54% observed green mussel growing in plastic drums used as floaters in Norwegian sea cages from 1996 to 1999. Only 5.77% of them said that they first observed the growth of green mussel from 1988 to 1989 and only 1.92% who observed the growth of green mussel in 2003 just after the massive fish kill of milkfish cultured in Norwegian sea cages.

About 82.69% of them reported a volume of harvest of 20 sacks per month while others had 21 to 40 sacks per month (15.38%) and 1.92% had more than 40 sacks. The harvested green mussels were sold to direct buyers with prices ranging from ₱300.00 to ₱500.00 per sack. All of the respondents agreed that culture and gathering of green mussels in Bolinao Bay is a good source of income and alternative livelihood for their families. All of them also agreed that the presence of green mussel indicates pollution and deterioration of the quality of water in Bolinao Bay due to unregulated intensive feeding of milkfish grown in Norwegian sea cages.

Key words: Green mussel, Bolinao bay, bivalve molluscs

MUSTARD (*Brassica juncea*) PRODUCTION GUIDE USING AMINO ACID-BASED NITROGEN UNDER DROUGHT CONDITION

Roger Rico Alferez

Luray II National (Night) High School, Luray II, West District, Toledo City Division

ABSTRACT

The study was conducted to investigate the effects of the different levels of amino acid-based nitrogen on the performance of mustard (*Brassica juncea*) exposed to the different drought condition. The treatments were To (control-complete fertilizer at 20 grams per plant as basal and urea applied as side dressing two weeks before the termination of the study), T1 (2 ml of amino acid based nitrogen per liter of water at 10 ml per plant per week), T2 (4 ml of amino acid based nitrogen per liter of water at 10 ml per plant per week), and T3 (8 ml of amino acid based nitrogen per liter of water at 10 ml per plant per week). The treatments were applied to mustard exposed to normal, dry and dry plus soil moisture condition as measured by 4 in 1 soil moisture meter instrument KC 300. Dry and dry plus conditions were imposed to plants once per week. During the first week until the termination of the study, no significant differences were observed among treatments on all parameters except on root length of mustard under dry condition where application of amino acid-based nitrogen resulted to longer roots of 18.14 cm. Though not the objective of the study, it is also very evident that there was a drastic reduction in the performance of mustard from normal to dry and to dry plus condition, thus it can be said that mustards are sensitive to drought. Using amino acid based nitrogen can improve root development under drought condition (dry) which may result to tolerance in other crops but not to mustard.

Key words: agriculture, *Brassica juncea*, drought condition, amino acid-based nitrogen

Carissa carandas FRUIT EXTRACT AS A NATURAL FABRIC DYE

Mary Felma A. Aliño

*University of San Carlos – Talamban Campus
College of Architecture and Fine Arts, Cebu*

ABSTRACT

This study aimed to produce a natural fabric dye from canberry (*Carissa carandas*) extract that can create an intermediate color. The natural dye was generated by mixing water and fruits and heated to simmer. To be able to test for the type of fiber which best absorbs the dye, 3 different fabrics were used – Swiss cotton, greige, and silk cocoon fabric. The silk cocoon fabric, found to be most viable for natural dyeing, was used in testing for the effect of the fruit's ripeness to the color it produces. Three different sets of the fruit were used – fully-ripe violet cranberries, ripe red-violet ones, and slightly-ripe red cranberries. It was found out that the colors produced ranged from red-violet to blue-violet. The fabric dyed using the ripe cranberries produced the most highly-intense color among the 3 sets of tests. It can be concluded that the extract was able to produce a natural fabric dye of intermediate colors and that the ripeness of the fruit affects the value and intensity of the fabric dye's color. The experiment may later on be improved and tested for the best number of hours it would take soaking the fabric to produce a darker color value



SCREENING AND DISTRIBUTION OF POTENTIAL NICKEL HYPERACCUMULATOR PLANT SPECIES IN SELECTED MINING AREAS IN CLAVER, SURIGAO DEL NORTE

¹A. A. Along, ²M. T. Demetillo and ³K. L. Ciudad

¹ Undergraduate student, ²Faculty of Biology, ³Faculty of Chemistry, College of Arts and Sciences, Caraga State University, Ampayon, Butuan City

ABSTRACT

Hyperaccumulators are plant species that can accumulate extraordinarily high foliar concentrations (>1000 µg/g dry weight) of certain metals and metalloids. The study aimed to screen potential nickel hyperaccumulator plant species in Urbiztondo, Claver, Surigao del Norte. Opportunistic and systematic sampling methods were applied in collecting data such as abundance and distribution of potential nickel hyperaccumulator plant species in the mining area. Plant samples were screened for nickel hyperaccumulation by reacting leaf extracts with filter paper impregnated with 1% dimethylglyoxime (1g in 70% ethanol) and further analyzed by atomic absorption spectrometer. Among the 114 plant species recorded in the area, 108 species were identified belonging to 61 families and 88 genera. Moreover, only 11 species, mostly rare and with limited distribution throughout the area were potential nickel hyperaccumulators. *Phyllanthus* sp. and *Begonia bolsteri* were noted as species with the most intense rose-pink color reaction with dimethylglyoxime. However, six of the potential hyperaccumulator plants that were quantitatively analyzed, including *B. bolsteri* (18 ppm), did not qualify for nickel hyperaccumulation. Based on IUCN, *B. bolsteri* and *Xanthostemon verdugonianus* were considered as rare, endemic and threatened species. This study serves as preliminary assessment for the potential nickel hyperaccumulator plant species in the area.

Key words: Opportunistic and Systematic sampling, Potential Nickel Hyperaccumulator Species, Surigao del Norte

PLANTING SYSTEM AND RATES OF VERMICOMPOST ON RAINFED LOWLAND RICE

Cherubin M. Alonzo and Jesusa D. Ortuoste

Sultan Kudarat State University, Access, EJC Montilla, Tacurong City

ABSTRACT

The study was conducted to determine the planting system and different rates of vermicompost on rainfed lowland rice. This study was conducted from July 01 to November 31, 2013 at Barangay New Cebu, Lambayong Sultan Kudarat. A 4m x 6m split plot RCBD Factorial was used in the study where Factor A, was the Planting system and Factor B, were the different rates of Vermicompost. The lay-out was 20cm x 20cm and transplant at 2-3 seedlings per hill. Re-planting for transplanted was within 5-7 days. For DSR, 192 gms per plot was broadcasted. Re-planting for DSR is within 7-10 DAS. The agronomic and yield characteristics of NSIC 2011 Rc286 as influence by planting system showed a significant effects in terms of plant height, number of productive tillers, panicle length, number of filled grains, meanwhile different levels of vermicomposts showed significant effects in terms of plant height, number of productive tillers number of unproductive tillers, panicle length, number of unfilled grains, moisture content weight of 1000 grains and occurrence of pest and diseases. On the other hand, grain yield of rice plant did not affected by different planting system and levels of vermicomposts, However in terms of cost and return analysis, direct seeded rice applied with inorganic fertilizer got the highest net income and transplanted rice applied with inorganic fertilizer got the highest return of investment.

POST HARVEST LOSS ASSESSMENT OF COFFEE IN SENATOR NINOY AQUINO

Leah Astrologo and Romualdo M. Ortuoste¹

¹MAST Graduate student and faculty/adviser of SKSU-College of Graduate Studies, Sultan Kudarat State University

ABSTRACT

The study was conducted to make an assessment of the post-harvest losses in coffee. It is also aimed to identify the qualitative and quantitative losses in every post-harvest operation, to identify the different factors affecting post-harvest losses and to determine the economic value of post-harvest losses in coffee. This was conducted from September 2013 to January 2014 at Senator

Ninoy Aquino, Sultan Kudarat. The study was conducted using a Benchmark Survey. Five Barangay were selected with a total of 100 respondents. Five coffee traders were also interviewed to obtain desired information. Based on the result of the study, a total of 10.59% quantitative losses and 18.4% qualitative losses were incurred on the different post-harvest operation. Factors affecting post harvest losses were observed. Economic factors include high interest rates of financial support from the lending institution to farmers, high cost of production and unawareness of farmers on the post-harvest losses. Technical factors include lack of appropriate technologies in post-harvest activities and lack of technical assistance by the research institution. Social factors include lack of skilled manpower, lack of proper educational training for farmers and lack of discipline among laborers. Result of the study revealed the high percentage of post-harvest losses. Furthermore, it is recommended to have immediate dissemination of post-harvest losses for farmers awareness, conducting of training on post-harvest and sustained monitoring of the farmers' cooperative and rapid implementation of post-harvest technologies in the municipality.

OPTIMIZATION OF THE GROWTH CONDITION FOR RAPID MICROPROPAGATION OF LILIUM PHILIPPINENSE USING PLANT GROWTH FACTORS

Jo-Ann Licay, Jace Maica Palpallatoc and Karen Ballada

University of the Philippines Baguio, Baguio City bEmail: ka_ballada@yahoo.com

ABSTRACT

Lilium philippinense, commonly known as Benguet lily, is a wild *Lilium* species endemic to the Cordillera Region. This flora is at high risk of extinction as a consequence of habitat destruction and exploitation. The aim of the current study is to establish an efficient protocol for the micropropagation of this flora as a conservation strategy to respond to its declining population. Regeneration capacities and efficiencies of the basal leaf segments, nodal segments and bulb scales were assessed in different media formulations. Bulb scales were found to be the most efficient source of explants (50%-100%) generating bulblets directly without callus formation as an intermediate step. The number of regenerated bulblets was found to be highest (100%) in MS medium supplemented with 3mg/L BAP in combination with 0.5mg/L NAA. Generated bulblets subsequently formed shoots and roots to form a whole plantlet within a culturing period of two months. Rooted and non-rooted in vitro-generated plantlets were able to acclimatize after two weeks of transfer into organic soil. Transferred plantlets showed a survival rate of 83% under greenhouse conditions which is indicative of the efficiency of the protocol employed in this study.

Key words: *Lilium philippinense*, micropropagation, optimization, plant growth factors



DUCK EMBRYONIC DEVELOPMENT UNDER A SIMULATED POWER SHORTAGES IN MINDANAO, PHILIPPINES

¹*Ma. Abegail Bastigu, and *Henry I. Rivero*

¹*Department of Biological Sciences, College of Science and Mathematics, Mindanao State University*

**Paper presenter, +Corresponding author: abegailbastigue@gmail.com*

ABSTRACT

Mindanao is one most seriously affected by the power outages in the Philippines directly affecting the small- and medium-scale “balutan”. This study gained new insights on the intermittent power shortage in the region with implications on the duck embryonic development as the main commodity of balut makers using improvised incubator with semi-automatic setting (with thermostat only). Ninety day-old duck eggs were purchased and set to incubator after weighing and candling to temperature settings of 32°C and 34°C, simulating power shortage, and the standard 37.5oC. The embryonic development at 32°C and 34°C stopped just within the first week indicating that slightest differences in incubation temperature can highly affect the success of duck embryonic development, while those at 37.5oC settings allowed the embryos to reach the hatching age. This intervention on temperature settings of a crude-type incubator can directly affect the economics of small scale balut makers in Mindanao, wherein, the duck eggs can still reach the *penoy* stage, which calls for lower price reflected in the economics of balut in Mindanao. The 78% hatchability rate and the 80% survivability rate of the 2-week old hatchlings would suggest power supply for balutan and hatchery facilities is necessary and continuing power shortage can greatly harm the Philippine economy.

Key words: balut production, business sector, ducks, power outages, egg viability

ORGANIC FARMING STRATEGIES FOR SUSTAINABLE LOWLAND RICE SEED PRODUCTION

Analie B. Castillo and Jesusa D. Ortuoste

Sultan Kudarat State University ACCESS, ECJ Montilla, Tacurong City.

ABSTRACT

The study aimed to identify organic farming strategies for sustainable lowland seed production. The materials needed in this study were the following: registered seed (NSIC Rc 222), plywood for placards, bamboo slots for placard posts, bamboo stick (for sticking), wooden meter stick, record book, ballpen, weighing scale (Digital), zip lock cellophane, sprayer. A 2x5 RCBD Factorial was used in the study where Factor A is the organic fertilizers used as basal and Factor B is the different organic foliar fertilizers. This were replicated three (3) times and the following treatments were as follows: Factor A: Organic Fertilizers for basal application such as Farmer's Practice and A2- Vermicompost; Factor B: Organic Foliar Fertilizers such as B1- Amway, B2- Rovy, B3- RestoMax Forte, B4- Kaiser. Data gathered was analyzed using the analysis of variance (ANOVA) for factorial experiment in randomized complete block design. The LSD Test was employed to compare the significant differences between treatment mean values. Fertilizers are indispensable for the crop production systems of modern agriculture and inorganic fertilizers today hold the key to the success of the crop production systems,. The combined use of organic and inorganic fertilizers might be helpful for sustainable crop production and maintenance of soil fertility. But, it is also true that maintaining the sustainable crop production is difficult by using chemical fertilizers alone and similarly it is not possible to get higher crop yield by using organic manure only. Organic fertilizer and organic foliar fertilizer such as vermicomposts and Roby is one of the promising alternatives for basal and foliar application.

INFLUENCE OF FREEZING OF COCONUT MEAT ON THE QUALITY OF VIRGIN COCONUT OIL

Jelly Mae Colipano and Jason Hermosilla

Cebu Technological University, Sabang, Danao City

ABSTRACT

Virgin coconut oil depends on the freshness of coconut meat prior to extraction. This study determined the influence of freezing the coconut meat on the production and quality of virgin coconut oil. Using 0 day freezing or control sample, after 2 days of freezing, 4 days of freezing and 6 days of freezing the coconut meat prior to virgin coconut oil extraction were investigated to determine its yield of production and the quality of virgin coconut oil based on sensory evaluation by the students of the Bachelor of Science in Hospitality Management at Cebu Technological university, Danao City Campus. Based on the Analysis of Variance, all attributes of virgin coconut oil extracted from coconut meat with and without freezing insignificantly differs as well as its yield of production. Thus, coconut meat could be subjected to freezing prior to the extraction process of virgin coconut oil. The freezing of coconut meat prior to virgin coconut oil extraction is recommended.

Key words: freezing, coconut meat, virgin coconut oil

ENHANCING UPLAND RICE PRODUCTION IN VARIOUS AGRO-ECOSYSTEMS IN ARAKAN VALLEY COMPLEX

Onofre S. Corpuz, Samson L. Molao, Zainudin M. Adam, Pendatun E. Dalam, Abddul S. Sangcupan

ABSTRACT

The study aimed to determine the potentials of various agro-ecosystem in producing favorable growth and yield of upland rice including biomass production and carbon storage. Results of the study revealed that hinumay and dinorado were performed significantly better in plant height, yield, biomass and carbon content as compared to other varieties. However, in terms of panicle length and number of tillers, it was found out that kawilan variety perform better but it is not significantly different with hinumay and dinorado. With the current findings, hinumay and dinorado were the best upland rice varieties to be cultivated under oil palm, coconut and rubber tree but not to banana agro-ecosystem. On the other side, for early flowering and maturity, it was found out that the 90 days variety significantly bear flower and matured earlier as compared with the other upland rice varieties.

Key words: Agro-ecosystem, coconut, rubber, oil palm, banana, upland rice



GROWTH AND YIELD RESPONSE OF ADLAI (*Coix Lacryma – jobi L.*) ON VERMICOMPOST AND VARIOUS LIQUID ORGANIC EXTRACTS

Paz A. Cutamora and Junito P. Marcelino

College of Graduate Studies
Sultan Kudarat State University

ABSTRACT

This field experiment was conducted from May to November 2013 at the General Santos City Demonstration Farm to evaluate the growth and yield response of Adlai (*Coix Lacryma – jobi L.*) on vermicompost and various liquid organic extracts. It was laid out in Randomized Complete Block Design with eleven treatments replicated three times. The parameters observed were on growth (plant height, number of days to 50 % flowering, number of days to maturity) and yield parameters (number of tillers, number of grains per panicle, number of filled grains, weight of biomass, weight of 100 grains and total yield). The soil from experimental was sandy loam with a pH of 5.8, 1.5 % organic matter, 1.35 % organic carbon, 29% and 385 % P and K, respectively. Vermicompost contained 0.20 % N, 1.66 % P, 0.33 % K, 0.99 % other macro and micronutrients that exceeded vermitea and IMO except for % N, % K and sulfur contents in IMO with 0.78 %, 1.26 % and 1,833.33 ppm, respectively.

No significant difference was noticed in plant height and biomass weight among treatments. However, tiller count was significantly the highest in plots fertilized with 75% VC+ 25 % Inorganic fertilizer +VT (13.51) followed by full recommendation of inorganic fertilizer (12.89). Treatment 3 (25% VC+ 75 % Inorganic fertilizer +VT) flowered and matured at 111.07 and 157.73 days, significantly earlier compared to Control with 118.10 and 166.43 mean days. Similarly, plants fertilized with 75% VC+ 25 % Inorganic fertilizer +VT (T5) obtained maximum number of filled grains (1976.88), weight of 100 grains (7.34 g) and grain yield (2.52 t/ha) except on grains per panicle, plants applied with full recommendation of inorganic fertilizer (3.37) was slightly higher than in plots with 75% VC+ 25 % Inorganic fertilizer +VT (3.27). Comparable results were obtained among treatment combinations but significantly higher than the Control. Pests and diseases occurrences were observed that caused minimal damage to plants. Vermicompost and liquid extracts of vermitea and indigenous microorganism IMO enhanced the growth and yield of adlai which proved their potential as alternative to sustainable organic adlai production.

APPLICATION OF VERMICOMPOST DERIVED FROM BANANA PSEUDOSTEM WITH ANIMAL MANURE IN TOMATO (*Lycopersicon esculentum L.*)

Sansaluna Punto Dalanda and Jesusa D. Ortuoste

Sultan Kudarat State University, Acces, EJC Montilla, Tacurong City

This study was conducted to determine the macro and micronutrient elements present in vermicompost derived from banana pseudostem parts with different animal manure, determine the effect vermicompost derived from banana pseudostem parts with different animal manure on the growth and yield of tomato, as well as cost and return analysis of using it in tomato grown on Digal clay loam soil. Results of the study I showed that vermicompost derived from whole banana pseudostem with goat manure had a macronutrients of N, P₂O₅, K₂O with an analysis of 1.23%, 0.98% and 0.91%, respectively. While its micronutrient analysis are: Manganese, copper, iron, and zinc with 813.51, 61.75, 4332.83 and 248.61 ppm, respectively. These nutrients significantly affected the growth and development of tomato plants. Moreover, results of Study II showed that application of 1kg/plant of vermicompost derived from whole banana pseudostem with goat manure basally applied in the soil during transplanting significantly increased plant height, yield per plant, marketable yield per plot, and weight of 50 fruits. On the other hand, significantly increase in plant height to tomato in banana pseudostem with goat manure. On the economic analysis, it was further found out that application of the said product obtained a net income of 10,065 Php with a return of investment (ROI) of 609.4%.

CACAO AND TABLEA TSOKOLATE: SPANISH CONTRIBUTION TO PANGASINAN AGROFORESTRY, CULINARY, AND ECONOMY

Irene A. De Vera

Pangasinan State University; elijerenai@yahoo.com; Mobile: 09321819489

ABSTRACT

Cacao (*Theobroma cacao*) is a tropical plant of the Family Sterculiaceae. It has many uses and by-products from husk, shell, pulp, and beans. Its beans are known to have the highest antioxidant value of all the natural foods in the world. In areas in the Philippines including Pangasinan where cacao is grown, it is not uncommon to see tableatsokolate a home-made chocolate from the beans of cacao. In Pangasinan, tableatsokolate is usually partnered with the native puto of Calasiao, or suman and mango for breakfast or snacks. Because of the plant's growth habit and characteristics, cacao is one among the agroforest species being promoted by the Department of Environment and Natural Resources to maximize land productivity, enhance ecological stability and improve socio-economic condition of the farmers. This paper traced the Spanish contribution to the introduction and development of cacao and tableatsokolate in Pangasinan that impacted the agroforestry, culinary and economy of the province.

PEST AND DISEASE SEVERITY INCIDENCE OF OPV WHITE MAIZE (*Zea mays*) AS INFLUENCE BY ORGANIC FERTICIDES

Lodifel c. Deypalan, and Junito p. Marcelino¹

¹MAST Graduate student and faculty/adviser of SKSU-College of Graduate Studies

ABSTRACT

The study was conducted at Barangay Mamali, Lambayong, Sultan Kudarat on December 2012 to March 2013 with the following objectives: 1) to determine the severity incidence of pest and diseases in open pollinated white maize using organic ferticides, 2) to determine the effect of organic fertilizer and pesticides on its growth and yield using the following indicators: plant height, ear height, ear length, shelling percentage, insect pest and disease rating and grain yield; 3) to evaluate which organic ferticides can significantly reduce the incidence of pest and diseases. The levels of organic ferticides used were: vermi cast + FFJ +FPJ + FAA and OHN (A1), vermin cast supplemented with vermi tea, FFJ +FPJ +FAA and OHN (A2), vermi cast with vermi tea + OHN (A3), without application (control) and recommended rate of inorganic fertilizer and pesticides (A5) as factor A white corn varieties planted were USMARC Var 10 (B1) and USMARC Var 6 (B2) as factor B laid out in Randomized Complete Block Design replicated 3 times. OPV white maize applied with recommended rate of inorganic fertilizer exhibit a significant difference in terms of plant height, ear height, ear length, shelling percentage and grain yield. Likewise , significant difference was observed on pest and diseases in terms of damage rate and infection percentage. Moreover, corn yield and profit were significantly influenced by corn varieties and rates of organic ferticides. Highest yield of 4.39 tons/ha was obtained from USMARC Var 10 using the recommended rate of inorganic fertilizer and pesticides (A5) and highest net income of P 36,590/ hectare with 212% ROI. The lowest yield of 3.07 ton/ha with the net income of P 25,130 was observed in USMARC Var 6. Interaction effects among fertilizer and pesticides rates and corn varieties on plant height, shelling percentage, grain yield, pest and disease incidence were found to be significant. However, organic fertilizer and pesticides rate and corn varieties did not affect the ear height of the corn plant. Based on the results of the study, USMARC Var 10 applied with recommended rate of fertilizer and pesticides were significantly influenced the plant height, ear height, ear length, shelling percentage and grain yield of OPV corn varieties. In terms of organic ferticides application, it was found out that effective rate of treatment was the combination of vermi cast + vermi tea + OHN showed significant difference and economical among treatments used.

Key words: vermin cast, organic ferticides



POTENTIALS OF VERMICAST AS FEED SUPPLEMENT FOR A THREE-WAY CROSSED CHICKEN (PARAOAKAN X KABIR X SASSO/COBB) RAISED UNDER MODIFIED FREE-RANGE SYSTEM

Julie Dizon And Ne B. Velasco ¹

¹ MAST Graduate student and faculty/adviser of SKSU-College of Graduate Studies

ABSTRACT

The study aimed to assess the potentials of vermicast as food supplement for a three-way crossed chicken raised under modified free-range system. It also aimed to determine the levels of vermicast that enhanced the performance of free-range chicken; evaluate the productive performance of a three-way crossed chicken supplemented with varying levels of vermicast; determine the amount of feed consumed after the duration of the study and feed conversion ratio (FCR); and evaluate the cost and return analysis. This was carried out in a 2x 4 factorial in a Completely Randomized Design (CRD Factorial) replicated three (3) times with Factor A as represented by three-way crossed chicken and Factor B - varying levels of vermicast in feeds. Results of the study revealed that the three-way crossed chicken had significantly influenced its feed consumption. The varying levels of vermicast also significantly affected the final weight, average daily gain and feed consumption of the chicken. On the other hand, the three-way crossed chicken had no significant effect on the initial weight, final weight, average daily gain and feed conversion ratio. Also, the use of varying levels of vermicast in the feeds of chicken had no significant effect on the initial weight and feed conversion ratio of the chicken. Results also showed that the three-way crossed chicken Paraoakan x Kabir x Sasso (Pakasa) fed with 90% home mix feeds + 10% vermicast gave heavier final weight and average daily gain weight with minimal feed consumption.

EFFICACY OF ORGANIC FERMENTED MATERIALS FOR DESHOOTED TOMATO (*Lycopersicon esculentum*)

Nessie F. Fordan and Jesusa d. Ortuoste

Sultan Kudarat State University, SUNAS campus. Dajay, Surallah, South Cotabato

ABSTRACT

A study to evaluate the "Efficacy of Organic Fermented Materials for deshooted Tomato (*Lycopersicon esculentum*)" was conducted to determine the effectiveness of every treatment in the growth and yield of tomato. Organic Fermented Materials such as T₁ (2 tbsp Indigenous Microorganism + 1 Liter of water), T₂ (2 tbsp Fermented Fruit Juice + 1 Liter of water) and T₃ (2 tbsp Fermented Plant Juice + 1 Liter of water) were applied per plot of tomato plants. It is also aimed to determine if there were significant differences in the efficacy of Organic Fermented Materials on the given parameter in a Randomized Complete Block Design (RCBD) with four (4) treatments replicated three (3) times with 8 samples in every treatment, the study was conducted to determine the effect of Organic Fermented Materials. The application of 2 tbsp of Fermented Fruit Juice + 1 Liter of water enhances the growth of tomato plant in terms of plant height, number of harvested fruits and number of marketable fruits due to the presence of enzymes and natural resources of potassium and phosphorus in Fermented Fruit Juice which help in the progress of different stages of plant's growth.



RESOURCE ASSESSMENT OF TAMBAC BAY IN WESTERN PANGASINAN

Sotero M. Aban, Armando C. Garcia, Richmel A. Mercado and Michael M. Ferrer

*Department of Fisheries Science, Pangasinan State University, Binmaley Campus
Binmaley, Pangasinan Email: sotero_620@yahoo.com*

ABSTRACT

Tambac Bay is a rich fishing ground for fisherfolks living along the three coastal waters of Alaminos City, Bani and Anda, Pangasinan. Its coastal and fishery resources need to be conserved and managed for sustainable fishing activities of the fisherfolks. Hence, this study was conducted to assess the status of the coastal and fisheries resources of Bolinao Bay. A total of 507 fisherfolks from Alaminos City, Bani and Anda were surveyed to gather information on their socio-demographic and socio-economic profile, the type of fishing gears used and the species of fish caught. Result reveals that most of the fisherfolks of Tambac are males (98.42%), married (90.73%), with an average number of household members of 4, having an age bracket ranging from 31 to 50 years of age (64.3%) and are members of the Roman Catholic Church (86.79%). Majority of the fisherfolks are high school graduates. About 52% of them have a mean monthly household income ranging from ₱5,000.00 to ₱10,000.00 while 48% of them have a monthly household income of less than ₱5,000.00. About 72% of them had fishing experience ranged from 11 to 30 years while 23% had 1 to 10 years experience and 5% had more than 30 years of fishing experience. Of the 507 fisherfolks, 65.68% of them had motorized boats while 34.32% had non-motorized boats for fishing. Gill net (46.35%) is the most commonly used fishing gear by the fisherfolks. Others used fish corral, scissors net, fish trap, fyke net, stationary lift net, and "pasabing". The most commonly caught fish was rabbitfish (70.41%). Other species caught include spadefish, hairtails, caranx, gobies, parrotfish, tilapia, mullet, grouper, and crustaceans such as shrimps, crabs, lobsters.

Key words: Tambac Bay, fishing gears, marine fishes, fisheries resources



THE RETURN OF ORGANIC AGRICULTURE IN BENGUET: A CHRONICLE OF THE FARMERS' JOURNEY IN ORGANIC AGRICULTURE

Michelle B. Gatab-Laruan

Department of Development Communication, Benguet State University, La Trinidad, Benguet

ABSTRACT

The study documented the history of Organic Agriculture (OA) in Benguet, determined the smallholder groups that promote OA in Benguet and the challenges encountered in the promotion of OA. Due to the increase in demand for vegetables in the country, farmers had to resort to the usage of chemical inputs. This was influenced by the Green Revolution Project. Health and environmental issues are surfacing towards this farming practice. Terminal diseases are associated with too much use of pesticides which gradually move the consumers to look for chemical-free vegetables. This consciousness affected the farming practices of concerned institutions and organizations to implement interventions to reinforce OA. OA was institutionalized in the region when Benguet State University declared itself as Pro-Organic University and the launching of the 10 point agenda. This was further enhanced with the support from the Department of Agriculture and other line agencies as well as Peoples Organization and Non-Government Organizations upon the declaration of the Organic Agriculture Act of 2010 (Republic Act 10068). Moreover, it was the individual farmers who had to initiative to start OA in Benguet. Later on, eleven smallholder groups were organized in Benguet from 2005 to 2012. These organizations were formed to promote OA and its products. The challenges mentioned in the promotion were inadequate funding and policy support from the government and lack of consumer awareness.

SEED TREATMENTS ON THE GERMINATION AND GROWTH OF RUBBER (*Hevea brasiliensis*) WITH DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA

Olive G. Gomez and Romualdo M. Ortuoste

ABSTRACT

The study generally aimed to determine the influence of different seed treatments on the germination and growth of Rubber (*Hevea brasiliensis*) with different levels of Vermicompost as potting media. Specifically, the study aimed to (1) determine seed treatments that promote maximum germination; (2) identify suitable potting media for quality seedling production; and (3) identify the survival rate of rubber seeds subjected to different seed treatments. The study was carried out in Complete Randomized Design (CRD) in a 2 x 4 Factorial replicated 3 times. The different treatments were composed of the following: Factor A- Seed Treatments and Factor B- Levels of Vermicompost. Results revealed that in terms of germination percentage, scarified seeds showed to have a maximum germination rate. A potting media of equal proportion of ordinary garden soil and vermicompost was suitable for quality seedling production. In terms of survival rate, scarified seeds and seeds with no treatment (control) showed comparable results. Thus, scarified seeds are recommended to promote maximum germination percentage of rubber seeds. Furthermore, an equal proportion of ordinary garden soil and vermicompost is highly recommended to increase the height of rubber seedlings and a ratio of 75% ordinary garden soil + 25% vermicompost is recommended for a wider circumference of rubber plants.

RAPID MULTIPLICATION TECHNIQUES OF WHITE POTATOES (*Solanum tuberosum* Linn.) AS INFLUENCED BY DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA

Josalyn Jomoad and Jesusa D. Ortuoste

Sultan Kudarat State University, Access, Ejc Montilla, Tacurong City

ABSTRACT

The study aimed to evaluate the performance of three (3) varieties of white potato in the production of stem cuttings using rapid multiplication techniques as influenced by different levels of vermicompost. **This** study was laid out in a 3 x 5 factorial in Completely Randomized Design with different white potato varieties as Factor A and different levels of vermicomposts as Factor B replicated three (3) times. And Granola varieties Results showed that Ganza varieties of white potatoes planted in 50% ordinary garden soil and 50% vermicomposts as potting media were earliest to emerged, with wider stem girth, more vigorous cuttings using rapid multiplication techniques. Moreover, the cost and return analysis showed that this varieties planted in 1:1 ratio of ordinary garden soil and vermicomposts got a net income of 62,721.00 Php, with an ROI of 138.52%.

INFLUENCE OF TEMPERATURE ON THE QUALITY OF QUESEO

Michelle G. Capuyan, Maria Luisa T. Jopia and Corazon P. Macachor

Cebu Technological University, Danao Campus, Danao City, 09166205031/cora_macachor@yahoo.com

ABSTRACT

Queseo or cheese is a result of processing carabao milk, where many families in Compostela Cebu derive their daily earnings from the business of preparing the queseo and utilized salt as preservative in few days prior to delivery. The study aimed to determine the influence of temperature on the quality of queseo. This utilized the experimental method of research by exposing the queseo at 25 degrees Celcius (room temperature), 5 degrees Celcius (chilling temperature) and 0 degree Celcius (freezing point) for three days, and subjected to analyses based on chemical analysis based on peroxide value level in meq per gram; microbial analysis specifically bacterial count in cfu/g and sensory evaluation particularly taste and texture. Based on laboratory analyses, the peroxide value of the products exposed in 3 varying temperature had 0 meq/g with a bacterial count of 2.30×10^1 cfu/gram sample for the queseo sample which was exposed at room temperature. The taste and texture of queseo exposed at room temperature was slightly sour and quite watery, respectively. The queseo product exposed at chilling and freezing conditions had similar quality as to its 0 day of storage. Hence, queseo should be kept at low temperature prior to its delivery.

Key words: processed carabao's milk, quality, low temperature



EFFICACY OF ORGANIC BASED-TEAS FOR THE CONTROL OF BACTERIAL LEAF BLIGHT DISEASE OF SALINAS RICE CAUSING *Xanthomonas oryzae* pv. *oryzae* IN INTERMITTENTLY FLOODED AREAS OF COTABATO CITY

Zainodin M. Kusin

College of Agriculture, Cotabato City State Polytechnic College, Cotabato City, E-mail: Kusin_z@yahoo.com

ABSTRACT

Organic teas are proven as environmentally friendly, less cost and readily available when compared to synthetic chemical pesticides. Application of organic tea enhances soil fertility, sustains productivity and provides efficient control of plant pathogens. Using Randomized Complete Block Design (RCBD) with five treatments replicated four times, this study was conducted to effectively manage the bacterial leaf blight (BLB) of rice through an in vivo test in intermittently flooded areas of Cotabato City from August to November 2012. Of the organic pesticides tested against BLB of rice causing *Xanthomonas oryzae* pv. *oryzae*, Vermi Tea was found effective (E) and was comparable to Antica (commercial check) while Kamantigue (*Impatiens balsamina* Linn) Plant Juice (KPJ) and Effective Microorganism (EM) were moderately effective (ME). Plants applied with Antica (commercial check) had the highest yield of 5.3 t ha⁻¹ but comparable to plants applied with Vermi Tea (5.2 t ha⁻¹). Plants applied with EM and KPJ had comparable yield of 4.8 and 4.7 t ha⁻¹, respectively. Cost-efficacy of treatments usage for a hectare of rice gave a high return of investment (ROI%) in VT (118.4%), EM (113.9%), KPJ (109.5%), and Antica (11.5%). The low cost and significant effect action provided by the different biopesticides employed increased the ROI of rice production per hectare under intermittently flooded areas of Cotabato City.

Key words: Bacterial leaf blight, organic based-teas

PROPAGATION OF *Vitex parviflora* Juss. IN NON-MIST TECHNIQUE TREATED WITH IBA CONCENTRATION

Allihasgar M. Limanay and Farida K. Dimalen

ABSTRACT

The researcher aims to know the number of rooting developed and survived cuttings on the propagation of *Vitex parviflora* Juss. in non-mist technique with IBA concentration. This research was limited only on propagation of *Vitex parviflora* Juss. in non-mist technique treated with Indole-3 Butyric acid concentration. The study was conducted at the College of Forestry experimental area at Cotabato City State Polytechnic College, Cotabato City for a period of eighty (80) days. The designed used was Complete Randomized Design (CRD) with four treatments and four replications where in treatment one (T₁) 100ppm, treatment two (T₂) 400ppm, treatment three (T₃) with 700ppm and treatment four (T₄) with 1000ppm. Analysis of variance was used in analyzing the experimental data, F-test at 1% and 5% level of significance. In terms of roots developed treatment two (T₂) gave the highest number with the mean of 6.25 and treatment three (T₃) gave the lowest number with a mean of 5.75. The ANOVA result was not significantly different. For survived cuttings of *Vitex parviflora* Juss., treatment three (T₃) gave the lowest number with a mean of 1.75 and the ANOVA result was not significant. Therefore, both roots developed and survived cuttings have no significant difference results.

Key words: non-mist technique, *Vitex parviflora*, Indole-3 Butyric Acid (IBA)

DETECTION OF *Staphylococcus aureus* FROM PACKED DRIED SIGANIDS

Jean F. Nebrea¹, Corazon P. Macachor² and Cecilio S. Baga²

¹CTU Carmen Campus, Poblacion, Carmen, Cebu

²CTU Main Campus, Cebu City / cora_macachor@yahoo.com

ABSTRACT

Taboan Market in Cebu City, Philippines is the most famous source of dried *danggit*, *pusit* and *mangsi* which served as *pasalubong* for local and foreign tourists in Cebu City. The study aimed to determine the appropriate packaging material of dried siganids to reduce its microbial density. Samples of dried siganids were packed using polyethylene plastic bags, buri bags and carton and analyzed as to bacterial and fungal total plate count with the detection of *Staphylococcus aureus*, in colony forming unit, using 3M-Petrifilm and pour plate method. The pH and water activity levels of the products were determined. The dried *danggit* packed in buri bags had longer shelf life with lower microbial count. The *Staphylococcus aureus* count of 30 cfu/g sample for packed dried siganids using buri bags were within the acceptable standards of Bureau of Food and Drug Administration. The pH level of dried fish samples was within 6.1 to 6.5, while the water activity of the dried products is 0.98 based on Lupin's water activity (Aw) mathematical calculation. Buri bag as packaging material for dried siganids ensure microbial reduction.

Key words: packaging, dried siganids, buri bag, fish microbiology

INFLUENCE OF CARRAGEENAN FROM *Kappaphycus cottonii* ON THE FLAVOR OF DRIED TILAPIA *Oreochromis spp*

Corazon P. Macachor¹ and Benjie Oncienes²

¹Cebu Technological University, Main Campus, Cebu City

²Cebu Technological University, Carmen Campus, Carmen, Cebu
email: cora_macachor@yahoo.com

ABSTRACT

Carrageenan from *Kappaphycus* species and calamansi extract enhances the flavor of dried tilapia. This is an experimental study using the randomized complete block design using four variables, i.e. R₀ - 4% carrageenan with 0% calamansi; R₁-3 % carrageenan with 10% calamansi; R₂ - 2% carrageenan with 20% calamansi; R₃-1% carrageenan with 30% calamansi and R₄ - 0% carrageenan with 40% calamansi concentrations which was added to the splitted tilapia to determine the effects of additives on the quality of dried tilapia. Out of the four varying concentrations of carrageenan and calamansi, treatment with 3% carrageenan and 10% calamansi obtained the highest sensory rating scores in all sensory attributes undertaken. The product had a brown color, slightly fishy flavor and odor and moderately firm texture with an acceptability rating of "like very much". The most preferred dried hybrid tilapia is composed of carrageenan with 10% calamansi concentrations composed of 22.20% moisture, 65.73% protein, 10.90% fat and 1.17% ash contents. After a series of analyses of the acceptability and proximate composition of the most preferred dried hybrid tilapia, 0.3 % carrageenan with 10% calamansi concentration is appropriate to be added to the splitted hybrid tilapia.

Key words: hybrid tilapia, carrageenan, postharvest, *kappaphycus*



MILK YIELD OF DAIRY COW FED WITH VARYING LEVELS OF CORN HUSK SILAGE AND MORINGA LEAF MEAL

Aileen Malasador and Ne Velasco

College of Graduate Studies, Sultan Kudarat State University

ABSTRACT

The study aimed to identify the levels of corn husk silage and moringa leaf meal that influenced the cow's milk yield and quality; determine the interaction effects on the different levels of corn husk silage and moringa leaf meal on cow milk yield and determine the economics of using different levels of corn husk silage and moringa leaf meal. The experiment was carried out in a 3x3 factorial Completely Randomized Design (CRD) with 18 heads pure breed Holstein Friesian dairy cow assigned into three treatments replicated twice having 2 sample animal per treatment. The mean separation was subjected for Least Significant Difference (LSD) test. Treatments consisted of the following: Factor A (Corn Husk Silage) ; A1- without corn husk silage; A2- 15% corn husk silage; A3- 30% corn husk silage and Factor B (moringa leaf meal); B1- without moringa leaf meal; B2-5 grams moringa; B3- 10 grams moringa. Results revealed that the corn husk silage significantly influenced the average weight gained and average milk yield of dairy cow. On the other hand, moringa leaf meal significantly influenced the final weight and average milk yield of dairy cow. The 30% corn husk silage and 10 grams moringa leaf meal and 30% corn husk silage and 5 grams moringa leaf meal are appropriate combinations of corn husk silage and moringa leaf meal which highly influenced the milk yield of dairy cow.

SPECIES COMPOSITION AND VOLUME OF FISH CAUGHT IN *PAYAOS* INSTALLED IN THE WEST PHILIPPINE SEA

Dante M. Mendoza, Gerondina R. Casaclang, John Rey R. Flores,
Jocelyn B. Camero and Sotero M. Aban

Pangasinan State University – Binamaley Campus, Binmaley, Pangasinan

ABSTRACT

The study was conducted to assess the finfish resources attracted by *payaos* in the commercial area of the West Philippine Sea from September to November, 2013. Specifically, the study sought to describe and compare finfishes caught in two *payao* groups in the West Philippine Sea in terms of species composition, relative abundance by family, occurrence of finfish species and catch biomass. Furthermore, the study aimed also to determine the species richness, diversity, evenness of finfishes in *payao* groups, and the length frequency distribution and analyze the growth of the first five abundant species and the problems encountered by the *payao* users with their suggested solutions. Results of the study showed that there were 14 species of finfish caught in *payaos* installed in the West Philippine Sea where 12 species were caught in RV *payaos* while 11 were caught in HJ *payaos*. In terms of relative abundance by family, it was noted that Family Scombridae dominated the catch in RV and HJ *payaos*. Five species of finfish were occurred regularly in the catch in both *payao* groups namely *K. pelamis*, *T. albacares*, *D. macrosoma*, *A. thazard* and *E. bipinnulata* while other species occurred once or twice during the duration of the study. The catch biomass in HJ *payaos* was higher in September fishing operation while in October and November it was higher in RV *payaos* but test on mean catch biomass failed to show any significant difference. A total of 65, 372 individuals were caught in RV and HJ *payaos* during the study period. It was noted that the values of H' in the two groups of *payaos* were ranging from 1.17 to 1.30 and shows moderate evenness of distribution (0.49 – 0.65). The results suggest that the pelagic species did not strongly vary monthly in the study zone. Using the length frequency histogram, the sizes of the top five species were presented and it was also observed that their sizes were generally falls below their common sizes. In terms of the growth, the top five finfish species were growing allometrically. *K. pelamis*, *T. albacares* (caught in RV *payaos* only) and *D. macrosoma* were growing in positive allometric pattern which implies that the growth of these species favors its weight than its length. *T. albacares* (caught in HJ *payaos* only), *A. thazard* and *E. bipinnulata* were showing a negative allometric growth meaning that its length is growing faster than its weight. There were 7 problems stated by the respondents regarding *payao* utilization and disconnection of floating device from the mainline during typhoons was the number one problem encountered.

Key words: *payao*, species composition, catch biomass, species diversity, length-weight relationship



IMPLEMENTING BIOGAS TECHNOLOGY PROJECT: THE MALVAR EXPERIENCE

J.G. Mojares

Batangas State University-Malvar mojuvs@gmail.com

ABSTRACT

Worldwide many efforts have been made into renewable energies to compensate the energy demand increase and to decrease the harmful effects of burning fossil fuels (Koh, et al., 2010). That is why, municipal solid waste management becomes a global issue (Ghani & Idris, 2009). Thus, the "Waste- to- Energy (WTE)" concept is gaining more interest in exploring this alternative renewable energy resource.

This study sought to determine the environment and social impacts of the biogas technology project of the municipal government of Malvar through the Municipal Environment and Natural Resources Office. Secondary data and interview were employed in this study. Results showed that heat and electricity generation from biogas decreased dependency on electricity and fuel oil. In terms of social impacts, the biogas technology contributed to socio-economic improvement of the barangay in the form of job creation, technological and skills transfer through training in biogas production, contribution to continuous pursuing of energy neutrality and encouraged sustainability development at the community level. Aside from these, the technology was a source of organic fertilizer for the farming community of Malvar. Last year 600 farmers were provided with organic fertilizer, but with more production of organic fertilizer more farmers would also benefit.

Key words: biogas technology, solid waste management, organic fertilizer

DEVELOPMENT OF PRINTER INK FROM CEPHALOPODS

**Romeo P. Montecillo, Cecilio S. Baga, Joseph C. Pepito,
Pedro P. Cuizon and Corazon P. Macachor**

Cebu Technological University (CTU), Cebu City, csbaga@yahoo.com

ABSTRACT

The production of the squid ink developed by the Cebu Technological (CTU), Main Campus-Technology Research Center (TRC) researchers, promote the utilization of ink from sac of Cephalopods particularly Squid, Diamondback Squid and cuttlefish that may influence the decrease in the actual cost of commercial ink. The squid ink using different species of cephalopods is superimposed with water, acid, glycerin, thinner and varnish. This is a liquid containing black pigment used for coloring a surface to render an image or text, drawing or writing with a pen. The developed drawing ink from *Thysanoteuthis rhombus*, cuttlefish and squid were enhanced with virgin coconut oil and resulted to light black color, moderately desirable solvent-like odor, sharp regular line, thin and dry ink consistency as perceived by the Bachelor of Science in Industrial Technology (BSIT) students major in Drafting Technology. All attributes significantly differ among ink sac from different species of Cephalopods based on Analysis of Variance and Duncan Multiple Range Tests at 5% level of significance. The drawing ink from squid had a density (0.98 g/ml) closer to commercial ink and is safe for use, since the lead content was less than 3.00 ppm. The squid ink were tested as printer ink and found comparable with commercialized printer ink using different mode of printing. The researchers are on their way to refining the ink density towards wider application of the newly formulated ink from a natural source.

Key words: ink sac, sepia, cephalopods, printer ink

SENSORY QUALITIES OF BANANA *Musa balbisiana* COOKIES

Corazon P. Macachor, Cecilio S. Baga, Angelica A. Villazorda and Jean F. Nebrea

Cebu Technological University, Cebu City email: cora_macachor@yahoo.com

ABSTRACT

Banana cultivar is widely used for food as raw and cooked food items. The study aimed to determine the acceptability of *cardaba* banana, *Musa acuminata* x *balbisiana* cookies as a basis for techno-guide. This utilized the experimental method of research employing the procedure on banana cookies to determine its acceptability using different banana cultivars, like *lakatan*, *bungan*, *cardaba* or *saba* and *tondan*, based on sensory qualities. Based on the Analysis of Variance at 5% level of significance, all attributes of banana cookies significantly differs. Banana cookies with *lakatan*, *bungan* and *cardaba*, insignificantly differs in all attributes except *latundan* cultivar. *Bungan*, *Cardaba* and *Lakatan* cookies had general acceptability rating of "like very much" with weighted mean scores of 7.65, 7.58 and 7.54, respectively while *Latundan* cookies had general acceptability rating of "like slightly" with weighted mean score of 6.44. Hence, *cardaba*, *Musa balbisiana* x *Musa acuminata* cultivar can be utilized as ingredient for cookies preparation which is comparable with *bungan* cultivar, the usual ingredient for bakery products. Adoption of proposed techno guide on *cardaba* cookies is recommended.

SUBMERGENCE – TOLERANT RICE VARIETIES AS INFLUENCED BY PLANT SPACING

Norodin G. Palti and Romualdo M. Ortuoste ¹

¹MAST Graduate student and faculty/adviser of SKSU-College of Graduate Studies
Sultan Kudarat State University

ABSTRACT

This study aimed to determine the adaptability of submergence-tolerant rice varieties as influenced by plant spacing under Lambayong, Sultan Kudarat condition. The experiment was done in factorial format based on randomized complete block design in three replications. Factors of the experiment consisted of four levels of plant spacing and ten submergence-tolerant rice varieties. This study was conducted on October 29, 2012 to February 28, 2013 at Barangay Tambak, Lambayong, Sultan Kudarat . Results showed that, wider plant spacing (25 x 25 cm, 30 x 30 cm) is more suitable, since it gives the highest grain yield, cost and return analysis, weight of 1,000 grains, number of days to maturity, number of tillers, number of productive tillers, panicle length, panicle count, and number of filled grains. Of the submergence-tolerant rice varieties, Br11-Sub1 (V₄) was found more suitable in terms of tillers, number of productive tillers and number of filled grains, PSB Rc68 (V₁) was good in terms of plant height, panicle length and weight of 1,000 grains and PSB Rc82 (V₉) had good grain yield, highest return of investment (ROI) and cost and return analysis.

As to reaction to insect pests and diseases, PSB Rc68 (V₁), Swarna-Sub1 (V₃), Br11-Sub1 (V₄) and PSB Rc82 (V₉) are the varieties which are more resistant to some insect pests and diseases. On the other hand, Ciherang Sub-1 (V₅) and Raeline 10 (V₆) are susceptible to bacterial leaf blight while IVC 109 (V₁₀) is susceptible to stem borer. NSIC Rc194-Sub1 (V₂) is susceptible to both bacterial leaf blight and to stem borer.



FLOWERING AND YIELD OF TWO TOMATO VARIETIES TO VARYING WATERING SCHEDULES AND FERTILIZERS

Pet Roey L. Pascual and Jingjing P. Cabahug

Cebu Technological University – Barili Campus, Barili, Cebu

ABSTRACT

The growing concerns on global water scarcity require water resources to be used more efficiently. Native tomato varieties are said to be adapted to minimal water and fertilizer input. Thus, a 2x3x3 factorial study was conducted to determine the response of native tomato to varying watering schedules (daily, two days interval and three days interval) and fertilization (inorganic fertilizer, 10t/ha compost fertilizer, 20t/ha compost fertilizer) against a commercial variety in terms of number of days to flowering and yield (t/ha). Treatment means were compared using Duncan's Multiple Range Test (DMRT). Earliest flowering were observed on commercial variety watered at three days interval and fertilized with 20 t/ha compost (28 days). This is not significantly different from those fertilized with the same amount of compost and watered at two days interval (31 days) and those with inorganic fertilizer and watered daily (31 days). This is also comparable to native tomato variety fertilized with 20 t/ha (29.67 days) and 10 t/ha (30.67 days) compost and watered daily. Overall, native tomato variety flowered earlier (38.11 days) than commercial variety (40.67 days). On the other hand, highest yield was obtained on commercial tomato variety applied with 20t/ha compost and watered daily (10.54 t/ha). Significantly higher yield was also observed on commercial variety (3.99 t/ha) than the native tomato variety (0.52 t/ha). It is however noteworthy that no significant reduction, contrary to the significant reduction in yield with water deficit and increased yield with increased fertilization for commercial variety, was observed on native tomato variety when interval of watering was extended from daily to two, then to three days. Thus in terms of yield, native tomatoes are less sensitive to reduced water supply. However, they are also less responsive to increased fertilization and therefore could not provide substantial yield compared to commercial tomato variety.

Key words: days to flowering, yield, tomato varieties, watering, fertilizer

VARYING WATERING SCHEDULES AT DIFFERENT FERTILIZER SCHEMES: IMPLICATION OF TOMATOES' RESPONSE TO WATER SHORTAGE

Pet Roey L. Pascual and Jingjing P. Cabahug

Cebu Technological University – Barili Campus, Cebu Email: j2pcabahug.agri@gmail.com

ABSTRACT

Aimed to investigate the growth and yield responses of tomato to water stress in varied fertilization scheme, a 3x3 factorial experiment involving three fertilizer management practices (use of recommended inorganic fertilizer, organic fertilization at 10 T/ha and 20 T/ha) and three watering schedules (daily, two days interval, and three days interval) was done. Analysis of the plant height showed that at increased level of organic fertilizer, plants were taller even up to three days watering interval. Reducing the compost to 10 T/ha and watering at three days interval and pure inorganic fertilization significantly reduced the plants' height. On the other hand, prolonging the interval of watering up to three days on compost-fertilized tomatoes allowed them to initiate flowering earlier. This was not significantly different with tomatoes applied with pure inorganic fertilizer but watered daily. Finally, examination of the analysis on the cumulative yield shows that the highest yields, 10.54 and 8.96 MT/ha, were obtained on tomatoes applied with 20 T/ha compost while watered daily and at two days interval, respectively. Significant reduction in yield was exhibited by tomatoes applied with inorganic fertilizer only and watered daily, more so, when watering is at two and three days interval. A conclusion is drawn that application of compost reduces the negative effects of water shortage to flower initiation and plant height even up to three days watering interval and up to two days interval to yield.

RHIZOSPHERE BACTERIAL SPECIES DIVERSITY IN TWO RICE CROPPING SYSTEMS UNDER THREE DIFFERENT NUTRIENT MANAGEMENT SCHEMES

CAG Perez and CGB Banaay

*Environmental Biology Division, Institute of Biological Sciences, College of Arts and Science
University of the Philippines Los Banos*

ABSTRACT

The effect of the two factors, the different cropping systems (paddy rice-Aerobic rice and paddy rice-maize cropping systems), and crop nutrient management (Conventional, Zero Nitrogen and Site Specific Nutrient Management Schemes) to the dynamics of the rhizosphere bacterial community was examined using culture-independent methods. DNA was extracted from the rhizosphere soil samples of the rice and maize plants harvested at different stages of development. Nested PCR was used to amplify the 16S ribosomal RNA gene and the products were subjected to Denaturing Gradient Gel Electrophoresis (DGGE). Results showed that in all treatments, there is high diversity of rhizosphere bacterial species, ranging from 2.31 to 3.58. There were rise and decline of diversity in each treatment throughout every sampling season showing fluctuations in evenness of different species. Differences on the trends is probably the result of the different maturation stages specific to each treatment which may have influenced the different types and amounts of root exudates specifically during Booting and Milking Stages. But generally, the differences in the diversity, evenness and banding patterns among different nutrient management schemes are minimal. The patterns were relatively stable suggesting that plant root only caused subtle changes instead of complete shifts in the community structure and that it is not the amount of nutrient that primarily determines the assemblage of rhizosphere microorganisms or that the differences may not be only apparent yet after only two seasons of cropping.



REARING OF PUPAL PARASITOID (*Tetrastichus brontispae*) USING DIFFERENT LEVELS OF HONEY CONCENTRATION

Ryan P. Plenciano and Dr. Jesusa D. Ortuoste

Sultan Kudarat State University, SUNAS Campus. Dajay, Surallah, South Cotabato

ABSTRACT

A study to evaluate the effects of different levels of honey concentration in rearing pupal parasitoid (*Tetrastichusbrontispae*) was conducted to determine the effectiveness of every treatment that is good to be used in rearing pupal parasitoid. Different levels of honey concentration like T2 (2.5 ml honey + 7.5 ml water), T3 (5 ml honey + 5 ml water) and T4 (7.5 ml honey + 2.5 ml water) were tested in parasitoid. It also aimed to determine if there were significant differences in the effect of honey concentration on the given parameter. Complete Randomized design (CRD) with (4) treatments, replicated (3) times was used in the study in rearing pupal parasitoid (*Tetrastichusbrontispae*) using different levels of honey concentration. The result implies that parasitoid longevity, its fecundity, its developmental time and reproduction were significantly affected by the application of 7.5 ml honey + 2.5 ml water.

EFFECT OF LIQUID ORGANIC FERTILIZER OBTAIN FROM FISH WASTE TO GROWTH PERFORMANCE OF PECHAY IN SANDY SOIL OF PSU-BINMALEY CAMPUS BINMALEY, PANGASINAN

Rey S. Raguindin

Pangasinan State University - Binmaley Campus Binmaley, Pangasinan

ABSTRACT

This study was conducted at Pangasinan State University-Binmaley Campus, Binmaley Pangasinan to verify the effect of fermented fish waste as organic liquid fertilizer to growth performance of pechay grown to sandy soil inside the campus of Pangasinan State University, Binmaley Campus from December 2, 2013 to January 6, 2014. This is to find out which were considered best concentration to be utilize in the growth performance of pechay up to the marketable stage. Five treatments were undertaken with fifteen plants for each r treatment. Treatment 1 will be watered once a week using 1% solution of the fish waste liquid fertilizer, T2 with 2% solution, T3 with 3% solution and T4 with 4% solution. T5 were serves as the control and watered with 2% of Urea, a commercial fertilizer. The seedling planted, Pavo variety, were 16 days old at the time of transplanting with an average leaf length of 4 to 5 centimeters and with of about 2 centimeters . Growth performance of pechay plant were verified on the second week after transplanting, on the third week for second sampling, fourth week for the third sampling and the last sampling incurred during the 35th day after transplanting obtaining the final length of leaves, width of the leaves and its canopy. The length of roots and weight of individual plant is also obtained to be the bases of taking their growth performance. Among the five treatments, T2 obtain the average best performance in terms of weight having 143.03 grams, followed by T3 with an average of 131.2 grams, followed by T4 with an average weight of 114.80 grams. T1 gave the lowest average among the treated treatments with a weight of 107.60 grams. The control be the fourth to which it is little bit higher than that of treatment 1 having an average weight of 21.16 grams. The results shows also similar to average leaf length and width. For leaf Length, T2 has the longest with 44.450 cms followed by T4 having 25.50, T1 having 23.50, Treatment 3 having 23.20. The Control treatment found to be the shortest of about 18.23cms. The width of leaves, T1 had the highest average width of 12.10 cms, followed by T2 with 11.60, followed by T4 with an average width of 11.40 and the control treatment having 8.97 cms. It is also noted that when the area becoming dry and heated up during noon time, the pechay plants under the control seems it became difficult to grow and it slows down in attaining leaf length and width.

Key words: commercial fertilizer, fish waste, organic liquid fertilizer, pavo variety, solution

INFLUENCE OF SCENT CONCENTRATION ON *Citrus microcarpa* PEEL EXTRACT-BASED- HAND WASH

Chrisnan Darenn A Ramos

S.U.R.E. Learning Center, Inc. Sabang, Danao City

Liquid hand wash contains *Citrus microcarpa* (calamansi) juice and virgin coconut oil as active reagents added to SLES, CDEA, Dehyton AB 30, propylene glycol, salt, preservatives and water. The scent attribute of a calamansi peel extract-based hand wash formulated by the Cebu Technological University, Technology Research Center need to be enhanced. This study determined the influence of lemon scent on the acceptability of calamansi peel extract-based liquid hand wash to improve the scent of the product. Using 0.1 g, 0.2 and 0.3 gram of lemon scent concentration added to the calamansi peel extract-based hand wash and subjected to sensory evaluation by the students of S.U.R.E Learning Center, Inc. and found out that scented calamansi peel extract-based hand wash with 0.2 g of lemon scent was the most preferred concentration with “like very much” to all attributes. The product was effective based on total plate count in cfu/20²cm using swab test. The 0.2 g lemon scent added to calamansi peel extract-based hand wash is recommended.

Key words: *Citrus microcarpa*, peel extract, hand wash, lemon scent

PHYTOHORMONE APPLICATION AND MYCORRHIZAL INOCULANT ON ROOTING OF DIMORPHIC ROBUSTA CUTTINGS

Ray A. Rodriguez and JESUSA D. Ortouste

Sultan Kudarat State University, ACCESS, EJC, Montilla, Tacurong City

ABSTRACT

The study aimed to identify locally sourced substances as alternatives to synthetic rooting hormones, determine the interaction effect of phytohormone and mycorrhizal inoculant in rooting of dimorphic robusta cuttings and provide a cost effective technology that can be use for commercial production of coffee seedlings through nodal cuttings. The experiment was carried out on a 4X4 Factorial in Split-Split Plot Design . Treatments consisted of the following: Factor A consisted of (Dimorphic robusta cuttings); D₁- Orthotrophic, D₂- Plagiotrophic ; Factor B (Different Phytohormone); PH₁- Control (water only), PH₂- ANAA (100ppm), PH₃- 5% Rice straw ash, PH₄- 5% Coconut water P₅- SA (3tab/16L H₂O) and Factor C (Mykovam (VAM); V₁- With VAM, V₂- Without VAM. Results revealed that the phytohormone and VAM inoculants significantly influenced the root index, percentage of survival and plant vigor of coffee cuttings. On the other hand, the use of orthotrophic cuttings + phytohormones like 100ppm ANAA (PH₂), 5% rice straw ash (PH₃), 5% coco water (PH₄) and 1ppm salicylic acid (PH₅) contributes to higher number of root index and percentage of survival. The use of dimorphic cuttings as planting materials regardless of branch origin can be used, provided it will be supplied with phytohormone to achieve higher percentage of survival rate for coffee nodal cuttings.



VARIETAL TRIAL OF UPLAND RICE CULTIVARS IN SURALLAH, SOUTH COTABATO

Jean S. Salazar and Carlos E. Lacamento

SKSU-SUNAS Campus, Surallah, South Cotabato

ABSTRACT

A study entitled "Varietal trial of upland rice cultivars in Surallah, South Cotabato" was conducted from September 2013 to February 2014 at Lopez's Farm in Purok Maligaya, Dajay, Surallah, South Cotabato. The study aimed to determine the yield of upland rice cultivars under Surallah condition, to determine the effect of fertilizer to upland rice cultivars; and to select and promote productive rice varieties that can fit into low-input and the condition existing under Surallah. The parameters gathered were the panicle length, plant height, number of panicles, number of tillers, days to flowering, days to maturity, dry weight (g) of clean palay, grain yield per plot (grams) and grain yield (kg/ha). The study was laid out in a Randomized Complete Design with 5 varieties and replicated 3 times.

Based on the study, findings show that Hinomay and Pinopoy performed well as compared to other varieties in terms of days to flowering, number of filled grains per panicle, number of days to maturity, dry weight of clean palay, grain yield per plot, grain yield per hectare. This variety was high yielding and has a potential and the ability to maintain diversity, natural resistance to pest and diseases, tolerance to drought, usefulness in low-input sustainable agriculture, nutritional value and greater adaptation to a wider range of climatic condition and diverse ecosystem.

Key words: rice cultivars, Surallah, South Cotabato

EFFECT OF VERNIMAL MANURE ON THE GROWTH AND YIELD OF SWEET CORN (*Zea mays* var. *Saccharata*)

Roy A. Signacion, Aizel Y. Celeste, and Carlos E. Lacamento

Sultan Kudarat State University, College of Agriculture, SUNAS, Surallah, South Cotabato

ABSTRACT

A study entitled "EFFECT OF VERNIMAL MANURE ON THE GROWTH AND YIELD OF SWEET CORN (*Zea mays* var. *Saccharata*)" was conducted from November 2013 to February 2014 at DEMO-Farm, Dajay, Surallah, South Cotabato. Materials such as seeds of sweet corn, vermicompost, different animal manures, meter stick, tape measure, bolo, record book, pen, weighing scale, and other necessary materials were used in the study. Randomized Complete Block Design (RCBD) was used in the study with five (5) treatments, ten (10) samples per treatment and replicated three (3) times to test and determine the effect of vernimal manure on the growth and yield of sweet corn. The study was conducted to give practical information and technology to lessen the farmer's fertilizer expenses.

Based on the findings of the study, vermicompost + decomposed goat manure obtained the highest treatment mean among all treatments and revealed highly significant differences in terms of ear length, weight of marketable ears, number of marketable ears, total yield and total yield in hectare of sweet corn. The plant height of sweet corn was significantly affected by vermicompost + decomposed goat manure. Control got the highest treatment mean among all treatments in terms of weight of non-marketable ears and number of non-marketable ears. The reaction to pest and diseases were not significantly affected by vernimal manure.

Key words: vermicompost, manure, sweet corn

HATCHERY PERFORMANCE OF F1 AND F2 GIANT FRESHWATER PRAWN (*Macrobrachium Dacqueti* SUNIER, 1925) BREEDERS IN CONCRETE TANKS

Roy C. Villanueva¹ and Sotero M. Aban²:

¹DMMMSU-Institute of Fisheries, Sto. Tomas, La Union, and ²Pangasinan State University, Binmaley Campus, Binmaley, Pangasinan

ABSTRACT

This study was conducted to evaluate the hatchery production performance of the first generation (F1) and second generation (F2) breeders of the giant freshwater prawn, *Macrobrachium dacqueti*. Specifically, the following questions were answered: 1) What is the hatchery performance of F1 and F2 *Macrobrachium dacqueti* breeders in terms of quantity of larvae, weight of newly hatched F1 and F2 larvae, number of post-larvae harvested and survival rate of F1 and F2 post-larvae of *Macrobrachium dacqueti*? 2) What are the levels of pH, ammonia, dissolved oxygen, salinity and temperature of the water during the study period? The study made use of the experimental method of research to evaluate the hatchery performance of F1 and F2 giant freshwater prawn *Macrobrachium dacqueti* breeders in terms of quantity of larvae produced, weight of newly hatched larvae, number of post larvae harvested and survival rate of post larvae under hatchery condition. Water quality parameters such as pH, ammonia, dissolved oxygen, salinity and temperature were monitored. Differences and relationship of the observed variables were subjected for analysis

Result showed that F1 breeder produced more larvae than F2 breeders and are comparable on weight of newly hatched larvae, in terms of the number of post larvae harvested, F1 breeders is higher compared to F2 breeders but not statistically different from each other and in terms of survival rate of post larvae harvested F2 breeder is slightly higher than F1 breeder but not statistically different from each other. Water quality parameters were within the desirable range for *Macrobrachium dacqueti* hatchery production. Since F2 *Macrobrachium dacqueti* breeders is comparable with F1 *Macrobrachium dacqueti* breeders, F2 breeders can be recommended for hatchery use and seed production. Important water quality parameters such as dissolved oxygen, temperature, salinity, ammonia and pH should be given attention in the production process to improve the hatchability and survival rate of larvae to post larvae. The hatchery management protocols for the production of F1 and F2 *Macrobrachium dacqueti* breeders must be disseminated to the potential prawn hatchery operators and must be strictly implemented. Proper training on successful hatcheries is also recommended to implement good hatchery management.

Key words: macrobrachium, giant freshwater prawn, hatchery, ulang



IMPROVING STUDENTS PERFORMANCE IN ECOLOGY THROUGH CULTURE-BASED SCIENCE PEDAGOGY

Harold O. Buenvenida

College of Education-Graduate School, West Visayas State University, Iloilo City

ABSTRACT

This study aims to determine the effectiveness of utilizing an innovative approach in teaching Ecology in the first year high school students. This research was conducted in a small scale, a non-probability sampling was used to compare the effects of the intervention in two particular groups. The pre-test-post-test matching group was utilized. The whole first year population comprising of two sections were utilized. A section was taught using the traditional method while the other was taught using the culture-based approach. The group who were taught utilizing the culture-based science pedagogy approach obtained an average performance after the intervention. There was a significant difference between the pre-intervention and post intervention performances of the students. There was also a significant difference that existed in both the traditional and culture-based science approach with respect to their pre and post intervention performances. Notwithstanding the results of the culture-based science group which performed better compared to the traditional in the post-intervention performance with a mean difference of 0.38, the difference is not statistically significant. The culture-based science pedagogy technique allows students to articulate their ideas through mother-tongue language thus increase their active participation and diminishes anxiety and timidity.

Key words: ecology, performance, culture-based science, pedagogy



REVEALING PRE-SERVICE TEACHERS' PERFORMANCE IN THE CLIMATE CHANGE CONCEPT INVENTORY (CCCI): THE CASE OF TWO UNIVERSITIES IN EASTERN VISAYAS

Minerva E. Sañosa¹; Ian Phil M. Canlas*; Elfred E. Olaer¹

¹Naval State University, Naval, Biliran Province; *Leyte Normal University, Tacloban City, Philippine
Address correspondence to: Ian Phil M. Canlas lordphil2003@gmail.com

ABSTRACT

The issues and concerns on climate change have greatly increased towards the end of the 20th century and has continued now in the 21st century. The increasing numbers of extreme events occurring in the Philippines and worldwide like the recent super typhoon Haiyan (Yolanda) which hit the Visayas region, extreme heat in Australia and polar vortex in North America and so on has caught the attention not only of climate scientists but as well as masses. An increasing number of literatures agreed that knowledge the science of climate change is very vital towards successful mitigation and adaptation strategies. The foregoing study examined the performance of 400 first year pre-service teachers enrolled during the second semester of school year 2013-2014 in two of the universities in the Visayas. It made use of the Climate Change Concept Inventory (Jarret, 2011). Quantitative data analysis includes frequency counts and mean percentages. Meanwhile, qualitative data gathered from individual and group interviews were treated as well. Themes and patterns from the responses in the interviews were sought and were also reported in this study. Results revealed a significant gap in the understanding of university students on climate change concepts which could be detrimental in achieving a successful climate mitigation and adaptation programs and projects. It is then recommended that a more serious effort and concrete steps be done should we want to address this gap on students' understanding on the basics of climate science.

Key words: students' understanding, pre-service teachers, climate change, climate change concept inventory

ASSESSING THE PATTERNS, MOTIVATIONS AND BARRIERS IN THE TEACHING OF CLIMATE CHANGE AMONG ELEMENTARY CLASSROOMS

Ian Phil Canlas

Leyte Normal University, Tacloban City, Philippines

ABSTRACT

The recent decade is characterized by an increased concern on the effect of climate change. This is due to an increasing number of extreme events occurring not only in the country but worldwide. The foregoing study randomly surveyed about 200 intermediate public school teachers on the patterns, motivations and barriers in the teaching of climate change. Result showed that a greater majority of the respondents agrees that the basics of climate science must be included in their teaching; however most of them discuss climate change only informally. Other important findings revealed in this study is the existence of knowledge gap on climate change held by the respondents. As a whole, the result documented in this study strongly suggest that a professional development that highlights climate science, best practices in climate teaching and climate communication would be very beneficial to all intermediate public school teachers.

Key words: climate change, patterns, motivations, elementary classrooms



ENVIRONMENTAL EDUCATION: IT'S ROLE FOR SUSTAINABLE DEVELOPMENT

Leah V. Carballo

Central Bicol State University of Agriculture, Pili, Camarines Sur

ABSTRACT

Environmental Education developed from the concern that human development was having profoundly damaging effects on the natural environment and its primary aim is the protection and conservation of the environment including natural habitats and ecosystems. Environmental education's primary concern is the reduction of poverty, the promotion of social justice and the improvement of quality of life for people. It addresses basic human needs and links local and global actions. Environmental education focuses on interdependence and interconnectedness between people on both a global and local perspective but does not traditionally extend this to ecosystem interdependence or specific environmental concerns. It also primarily focuses on social issues of human rights, social injustice, human poverty and world citizenship. It is concerned with the building of knowledge, understanding, skills, attitudes, values and behaviours necessary to enable people to critically examine the world, its development and to act to make it a more just and equitable place. It has much in common with other forms of social and political education (DCI, 2003). Human rights education, peace education, multicultural education, education on race and race issues, environmental education and ultimately citizenship education all have overlapping features and concerns with development education, although each has its own distinct character and focus.

Education for sustainable development's primary concern is the improvement of the quality of life for people without damaging the environment. Therefore although all three 'educations' have much in common they differ in their primary goal. The relationship between Education and Sustainable Development and other educational sectors is the subject of ongoing debate with the latter often as being 'part of' their education. Moreover, what many regard as the closest sector to Education for Sustainable Development is Environmental Education. Many believe that Education for Sustainable Development should embrace all these educational sectors to a certain level and, with sustainable development assuming increasing importance in policy and educational contexts, there will be a need for each of these sectors and their practitioners to explore more closely the commonalities between them. Education for sustainable development expands upon the social and human rights dimension in Environmental Education and other educational sectors to include a strong environmental focus. It also shares many similarities with Environmental Education and addresses issues such as climate change, oil shortages, water pollution, the need to maintain biodiversity as well as poverty alleviation and human rights. They also employ similar methodologies including: critical thinking and problem solving, experiential learning, role play, guided interpretation, debate, futures thinking and participatory decision making. Education for Sustainable Development also helps to develop links between the lives of people locally and in the developing world and encourages us to link our actions at a local level to the needs and management of the planet and its population.

Key words: Environmental Education, students, schools and colleges, sustainable development, pedagogical strategies, responsible environmental behavior, ethics, morality



AN ASSESSMENT ON THE ENVIRONMENTAL AWARENESS AND ENVIRONMENTAL EDUCATION OF COLLEGE STUDENTS IN DE LA SALLE ARANETA UNIVERSITY

Roland S. Cartagena

College of Arts, Sciences and Technology, De La Salle Araneta University

ABSTRACT

The extent of teaching nature and the environment in higher education has a strong influence in the students' awareness and behavior that could shape the way how they deal with environmental issues, problems and concerns. This study attempted to assess in what academic areas the students were taught about nature and the environment and what they learned about them. A total of 214 randomly chosen college student respondents participated in the study by answering a pre-tested self-administered questionnaire created by the researcher.

Findings showed that a big majority of the respondents was taught about nature and the environment in their Biological Sciences and NSTP subjects only. A wide array of topics about ecology, environmental pollution, waste disposal and segregation; global warming and climate change; environmental risks, health and hazards; environmental issues problems and concerns; natural calamities and disasters was taught to them. Furthermore, only less than half of the respondents have learned about the various environmental topics taught to them. Well environmentally-educated students are the key to producing environmentally responsible citizens. Thus, there is a need to revise the curriculum to widen the scope of environmental education in higher education.

Key words: Nature, environment, environmental education, environmental awareness



BLENDED LEARNING CONTEXT: A MEDIATED DELIVERY IN THE NEXT GENERATION WASTE-FREE CLASSROOM

**Daniel D. Dasig, Jr.¹, Paulino H. Gatpandan², Arlene Mae C. Valderama¹, Mengvi P. Gatpandan¹,
Mary Ann Bernadette Taduyo¹, Roel Trabajo**

¹College of Computer Studies and Engineering, Jose Rizal University, Philippines roel.trabajo@jru.edu

²College of Sciences, De La Salle University, Dasmarias, Cavite, Philippines phgatpandan@dlsud.edu.ph

ABSTRACT

In the landscape of computing technology and engineering education, emerging technologies and evolution of teaching approaches in higher education has provided rewarding opportunities to faculty and students'. Using a blended learning, student control over time, path, place and pace while participating to an online content delivery and instruction, and attends to a "bricks and mortar" with computer mediated activities. This study aims to identify waste in traditional classrooms, waste eliminated using blended learning, present arguments to why blended learning will help eliminate wastes, describe student perception, and analyze lived experiences in the context and eventually provide measures to countervail wastes.

Qualitative methodology, participant observation and secondary data analysis had been employed by the researchers. A homogenous sampling used to identify the participants in a permissive Focus Group Discussion (FGD). Participants were given privileged to articulate, elicit and elaborate experiences in the context by providing open-ended question in a semi-structured interview. Seven deadly wastes have been identified in the traditional classroom. On the positive note, wastes such as Overproduction, Waiting, Transportation, Motion, Over processing and Inventory have been eliminated in blended learning context. Despite the positive perceived significance and implications, more research on the empirical world of this context is suggested.

Key words: waste elimination, mediated instruction, mediated activities, student perception, waste



A STUDY ON THE ADAPTATION OF PROJECT-BASED LEARNING IN THE DEVELOPMENT OF RENEWABLE ENERGY PROJECTS AND SUSTAINABLE ENGINEERING SOLUTIONS

Daniel D. Dasig, Jr.¹, Arlene Mae C. Valderama¹, Mengvi P. Gatpandan¹, Mary Ann Bernadette Tadyo¹, Liza Reyes¹ and Paulino H. Gatpandan²

¹College of Computer Studies and Engineering, Jose Rizal University, Philippines Paulino H. Gatpandan malicdan²College of Sciences, De La Salle University, Dasmarias, Cavite, Philippines

ABSTRACT

Creative Education provides successful advocacy campaign and engagement of students in school and community projects to serve as catalyst. Creative educators impart academic core to students', invigorate skills and competence to become a workforce ready, developed 21st century skills, stimulate life skills for a life- long stewards. The context of the study is a computer engineering curriculum mediated with a Project-based learning attuned to authentic products themed as renewable energy and sustainable engineering designs to prevent or eradicate global environmental issues.

The study explores and describes student perceptions and adaptation techniques, examines the evolution of green projects and purchasing techniques, identify methodologies used in the development of their scientific discoveries and engineering designs. Qualitative methodology, secondary data analysis and participant observation and triangulation were used. Based on the results, students perceived PBL as best learning strategy since they become directors and managers of learning. Projects evolved in the areas of renewable energy, waste collection and management, reduction of disaster ill-effects, assistive and adaptive technologies. Design components were carefully studied with appropriateness of mechanics of materials. With this contention, students' share the same social and nature awareness and responsibility. PBL provides compelling context to an environmentally aware next generation of engineers.

Key words: environment, renewable energy, sustainable projects, waste management, disaster



GENOTOXIC EFFECTS OF *Jatropha curcas* Linn. SEED EXTRACT ON THE MERISTEMATIC ROOT CELLS OF *Allium cepa*

Pedro M. Gutierrez, Jr.¹, Franco G. Teves², Ruben F. Amparado^{3a},
Roberto M. Malaluan^{3b}, Ma. Luisa S. Orbita^{3a}

¹Department of Biology, School of the Sciences, College of Arts and Sciences Cebu Normal University, Osmeña Boulevard, Cebu City, ²Department of Biological Sciences, College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines, ^{3a}Department of Biological Sciences, College of Science and Mathematics, MSU-Iligan Institute of Technology, Iligan City, Philippines, ^{3b}Department of Chemical Engineering Technology, MSU-Iligan Institute of Technology, Iligan City, Philippines
Email: gutierrezpedrojr@yahoo.com

ABSTRACT

The genotoxic effects of *Jatropha curcas* seed extracts were evaluated using standard *Allium cepa* root assay. *J. curcas* seeds were macerated and extracted using Supercritical Fluid Extractor (Akico brand) at 200 atm and 300 atm. pressure. Ten (10) onion bulbs were then grown in various treatment concentrations of 10^{-2} M, 10^{-3} M, 10^{-4} M and 10^{-5} M of *J. curcas* seed extract for 72 hours. The mitotic indices and chromosomal aberrations were used as parameters to evaluate the genotoxic effects of the seed extracts. It was found that there was a statistically significant inhibition of mitotic activity which was manifested by the decreased mitotic index depending on concentration by the extracts when compared with that of the control groups. Chromosomal aberrations such as lagging chromosomes, bridges, stickiness, c-anaphase, multipolarity, fragments and irregular metaphase were also observed. The said aberrations significantly increased at various treatment concentrations except at the 10^{-5} M concentration of the extract compared to those of the control group. Moreover, the number of aberrations also increased with the increasing concentration of the *J. curcas* seed extracts. The decrease in the values of the mitotic index of the root cells and the presence of chromosomal aberrations in the dividing cells revealed cytotoxic and genotoxic effects of *J. curcas* seed extracts.

Key words: *Allium cepa* test, genotoxic effect, mitotic index, chromosome aberrations, *Jatropha curcas*



COMPARISON BETWEEN KNOWLEDGE AND PRACTICE OF RURAL WOMEN IN NUTRITION EDUCATION AT TNAOT CHUM COMMUNE, KROKOR DISTRICT, PURSAT PROVINCE, CAMBODIA

¹Mourng Kagna and ²Josefina T. Dizon

¹Graduate School and ²College of Public Affairs and Development, University of the Philippines Los Banos, email: mourngkagna@gmail.com

ABSTRACT

Poverty in Cambodia is closely associated with lack of food security and nutrition. Food insecurity and nutrition remains a serious problem at the community and household levels. High rates of food insecurity, malnutrition and poor health status remain endemic in many areas of the country (HKI Cambodia, 2011).

The study attempts to compare the nutrition education on rural women's knowledge, attitude, and practices in Tnaot Chum Commune, Krokro District, Pursat Province, Cambodia. Specifically, the objectives of the study are: (1) to describe socio-demographic and economic characteristics of rural women participants and non-participants of the HARVEST program; (2) to compare nutrition knowledge, attitude and practices of rural women participants and non-participants of the HARVEST program. A quantitative study using survey questionnaire is done through a face to face interview with 81 women respondents, 38 participants and 43 non-participants of HARVEST program in seven villages of Tnaot Chum. Descriptive and inferential statistics including frequency distribution, percentages, means, range and standard deviations, independent T-test for Two Populations are applied in the analyses.

Most of the respondents of this study are married (71%) while 16% are single. Related to education, only 3% reached high school, 61% are in primary school (1-6), 24% are secondary high school (7-9). The mean and standard deviation analysis of the results revealed that the mean knowledge of the respondents on nutrition was 19 with a standard deviation of 1.93 with the participants of the project while non-participants' score is 16.72 with a standard deviation of 2.14. Concerning the practices, it showed the mean of 16.58 and a standard deviation of 2.46 for participants. Non-participants, the mean score were 15.58 with standard deviation 1.87.

Key words: nutrition education, nutrition, rural women, nutrition knowledge, and nutrition practice



BIOPESTICIDAL EFFECT OF KANTUTAY (*Lantana camara*) LEAF EXTRACT ON COCONUT LEAF BEETLE (*Brontispa longissima*)

Eulenia C. Pizaña

College of Agriculture, Forestry and Environmental Sciences, Western Philippines University, Aborlan, Palawan

ABSTRACT

The damage of *Brontispa longissima* on coconut production and eventually copra industry motivated farmers to look for possible plant materials found in the locality that could address the problem without resorting to insecticide. Hence a study was conducted to test the effectivity of kantutay (*Lantana camara*), an endemic shrub in Palawan as biopesticide for coconut leaf beetle (*Brontispa longissima*).

Treatments used were pure kantutay extract and kantutay extract with alcohol. There were four treatments and three replications. These are Treatment 1 (pure kantutay extract), Treatment 2 (90% kantutay extract + 10% ethyl alcohol), Treatment 3 (80% kantutay extract + 20% ethyl alcohol, and Treatment 4 (70% kantutay extract + 30% ethyl alcohol).

Mortality rate and behaviour of coconut leaf beetle (*Brontispa longissima*), was observed 10 minutes, 15 minutes, 30 minutes and 45 minutes after subjected to biopesticide treatment. Statistical analysis showed no significant differences among treatments means. The result of this research suggests that kantutay leaf extract with or without ethyl alcohol is an effective and eco-friendly biopesticide that can kill coconut weevil.

Key words: *Brontispa longissima*, Kantutay (*Lantana camara*), biopesticide



FOOD SAFETY PRACTICES AMONG NATIVE DELICACY PRODUCERS AND VENDORS IN THE PUBLIC MARKET OF BAYAMBANG, PANGASINAN

Catalina C. Platon and Raquel C. Pambid

Pangasinan State University, Bayambang, Pangasinan Email: catalinaplanton@yahoo.com

ABSTRACT

Unsafe food causes many acute and life-long diseases, ranging from diarrheal diseases to various forms of cancer. This study determined the food safety practices and measures among native cake vendors and producers. It also described the profile of the native cake vendors and producers in the public markets and enumerated the common native delicacies sold in the market and its economic viability. Particularly, this study described the safety food practices and measures of the producers and vendors in terms of: 1. cleaning the materials and the workplace, 2. formulation, 3. cooking, 4. food handling, 5. packaging, 6. labeling, 7. storage, 8. vending and finally identified the factors for non-compliance of the safety food practices and measures adopted from Hazard Analysis Critical Control Points (HACCP). The researchers utilized the descriptive method of research and made use of interview guide, checklist questionnaire and direct observation rating scale adopted from (HACCP) during and after the processing/selling of native delicacies. The results were comprehensive presentation and interpretation of statistical tabulation of data yielded from a survey. This study determined the food safety practices and measures among native cake (kakanin) vendors and producers. Using the HACCP standards and control of rating, kakanin vendors/producers have major deficiencies in food safety measures and practices in packaging, post-product handling/vending, health and hygiene, and in the market place however, they have minor deficiency in the work place. This study recommends that dissemination of these findings be given to proper authorities to remedy the poor condition of food safety. The Institute of nursing should also conduct trainings on food safety and proper handling among the kakanin vendors. Municipal authorities on health and customers should be vigilant in the observance of food safety.

Key words: Food safety practices, native delicacies, food contamination, food handling



MOTHER EARTH: THROUGH THE UPOU EARTH AMBASSADOR'S EYES

Joane V. Serrano, Larry N. Cruz, Jeniffer F. De Pasion, and Ma. Joanna G. Vinas

Faculty of Management and Development Studies, UP Open University Los Banos, Laguna, Philippines

ABSTRACT

Children are affected by environmental problems as well, but they are rarely given a voice in environmental advocacy. As a result of this lack of participation and involvement, children grow up with a distorted view of how the environment should be taken care of. This research aimed to draw out the environmental worldview of the UPOU Earth Ambassadors from four schools through illustrations and imaginations. This research illustrates the value of involving children and empowering them to be actively part of taking care of mother earth. Through the children's drawings, poems, songs and presentations they were able to share their experiences and how they understand the environmental issues that they face in their own families, school and community. This research made use of participatory approach wherein the UPOU Earth Ambassadors conducted workshops in their own individual schools. They were asked to draw or illustrate how they see Mother Earth's current situation or condition and how they see their roles as earth ambassadors in saving or caring for Mother Earth. They presented and shared what they have collected or gathered in a forum. During the forum they crafted three actions which they brought home to their respective families, schools and communities. Qualitative comparative analysis was used to analyze the drawings, poems and presentations of the students. Results showed that they see themselves as catalysts for caring for Mother Earth and as advocates for Mother Earth.

Key words: environmental worldview, earth ambassadors, environmental advocacy

ENVIRONMENTAL AWARENESS AND ENVIRONMENT-RELATED BEHAVIOR OF STUDENTS IN SELECTED PRIMARY SCHOOLS IN BOGOR, WEST JAVA, INDONESIA

Imelda Siregar and Maria Ana T. Quimbo

College of Public Affairs and Development, University of the Philippines Los Banos, College, Laguna

ABSTRACT

Environmental problems have progressively affected people's lives because of lack of understanding and awareness. One way to address this concern is through environmental education that should start at an early age. There have been efforts to increase childrens' environmental awareness such as the integration of environmental education into primary level school curricula. The analysis of students from Grades 5 and 6 in two primary schools showed that type of school influenced students' environmental awareness and environment-related behavior. Specifically, students in the Nature school, which integrates environment education in their daily activities, learning process and practice, and offers more environmental friendly surroundings and facilities, had higher environmental awareness and more positive environment-related behavior than the Regular school. The study also disclosed that parent's education had a significant influence on the level of student's environmental awareness. This is in line with the finding that the parents as well as school teachers and family members are important source of information and knowledge for the students. The study concluded that children learn better about the environment if they have direct experience and more familiar with what they see around them. Learning through activities will bring the children closer to and engage with the environment.

Key words: environmental awareness, environment-related behavior, environmental education curriculum integration, experiential learning



ENVIRONMENTAL ADVOCACY: AN EXPERIENCE FROM THE PROPOSED COAL-FIRED POWER PLANT IN ABORLAN, PALAWAN

Glenn O. Sopsop¹ and ²Lita B. Sopsop

¹College of Agriculture, Forestry and Environmental Sciences, ²College of Arts and Sciences
Western Philippines University, Aborlan, Palawan

ABSTRACT

The proposed coal-fired power plant (CFPP) which was unaccepted in Narra Municipality was transferred in Barangay San Juan, Aborlan, Palawan, the location of Western Philippines University (WPU). Unaware of environmental risks, project endorsements were railroaded by the barangay, municipal and provincial officials.

Using available and widely accepted scientific facts about the impacts of CFPP on human health and environment, massive education and information campaign was done to different sectors (education, local government unit, indigenous people, civic and religious organizations) in Aborlan. People awareness has resulted to: (1) creation of environmentally-concerned multisectoral organization called "Save Aborlan From Evils" (SAFE), (2) voluminous signatures expressing opposition on the project, (3) WPU's firm opposition on the project, (4) good participation of Aborlan residents to different rallies, (5) nullification of favorable endorsement made by previous barangay officials by the current ones, (6) barangay ordinance to ban coal power plant in Barangay San Juan, and (7) filing a case (petition) and court issuance of Temporary Environmental Protection Order.

Our experience proved that educating people is the best weapon to protect nature. The fight is not over yet but it is worth the risk rather than being passive and allow our children and grandchildren to suffer because of our nonchalance.

Key words: coal-fired power plant, information and education campaign, Palawan

QUALITY OF WATER SUPPLY FROM DEEP WELLS OF PUBLIC ELEMENTARY SCHOOLS IN PANGASINAN

Wilma M. De Vera and Racquel C. Pambid

Pangasinan State University-Bayambang Campus, Bayambang, Pangasinan
nrdevera2@yahoo.com and rcpambid@yahoo.com

ABSTRACT

The study determined the quality of water supply from deep wells of selected public elementary schools of the third congressional district of Pangasinan¹. The descriptive research design was used and employed the use of Standard Laboratory Procedures to determine the microbiological and physicochemical qualities of the deep well water. Statistical tools used are frequency counts, percentages, Kruskal Wallis, Mann Whitney U test, t-test and Pearson correlation. Findings reveal that total bacterial counts is significantly higher during dry season than wet season but E. coli is not detected. Water samples with high color, odor and taste has a higher pH. During wet season, there is a significant relationship between physical characteristics and salinity of deep well water samples at 0.05 level. Water samples with high or intense color, odor and taste have high salinity. Another output of the study is a proposed training program on sustaining groundwater/deep well water potability.

Key words: water quality, deep well, microbiological, physico-chemical analyses.



MATERNAL HEALTH CARE SERVICES IN SELECTED MUNICIPALITIES OF PANGASINAN

Maria Rhodora E. Malicdem

*Pangasinan State University-Lingayen Campus, Lingayen, Pangasinan
Email: rhodora_rem@yahoo.com*

ABSTRACT

This study assessed the impact of the delivery of maternal health care programs in selected municipalities in the province of Pangasinan. This study used the descriptive research design supplemented by documentary analysis and interviews and survey method. Statistical tools used were frequency counts, average weighted mean and Spearman Rho correlation. Findings reveal that the capacity of the municipality and the impact of the maternal health care services in selected municipalities in Pangasinan showed no relationship. There is no relationship between the impact of the maternal health care services and the hindering factors in birth delivery services and post natal services. There exist an indirect relationship between the impact of the maternal health care services and hindering factors in pre natal services, child care services and reproductive health services. Another output of the study are policy recommendations that may be adopted by LGUs for a better delivery of their maternal health care services.

Key words: Maternal health, Local health care services

DISASTER PREPAREDNESS OF SELECTED ELEMENTARY SCHOOLS IN THE COASTAL MUNICIPALITY OF GENERAL NAKAR, QUEZON

Rowena Yap-Bernal and Maria Ana T. Quimbo

Institute for Governance and Rural Development, College of Public Affairs and Development, University of the Philippine Los Banos

ABSTRACT

This paper explored the disaster preparedness of three elementary schools in General Nakar, Quezon province, a coastal and mountainous municipality identified as flood and landslide vulnerable community by a government agency. The study employed a descriptive research design utilizing interviews, focus group discussions and survey. Results showed that the municipal local government unit has taken steps towards disaster risk reduction and plans to cascade down its support to the barangays and schools in 2014. The barangay captains agreed that support must be provided to schools and that their lines of communication are open. The study also showed that no readings or reference materials on disaster and disaster preparedness are available in the district office or in the schools. There were no drills conducted for flood, landslide and typhoon although students are aware of the hazards that they face. There were discussions of disasters and disaster preparedness in class although these are limited. The principals, students and most teachers have not attended any training in disaster preparedness. Students and teachers believe that drills, lessons, trainings and the availability of reading materials on disasters and disaster prevention would help them. Schools look forward to receiving guidance in developing a disaster preparedness plan.

Key words: environmental awareness, disaster preparedness, environmental education curriculum integration, disaster preparedness plan

THE DYNAMICS OF NETWORKING IN A COASTAL COMMUNITY: BASECO AS CONTEXT

**Ms. Ma. Cherina S.B. Dionisio; Ms. Ma Jovi P. Jore; Ms.
Hannah Julia Padolina and Arlen A. Ancheta**

Faculty of Arts and Letters, University of Santo tomas

ABSTRACT

The study analyzes the working relationship of the interest groups in Baseco, a coastal barangay in Manila. The objective of these groups (The Urban Poor Associates, the Kabalikat sa Pag-unlad ng Baseco, Inc., and the Barangay Baseco) is to reduce social vulnerability of the community members amidst its geographical location along the Pasig river and Manila bay. Using the network governance theory, the study analyzes the collaborative network among the interest groups. This is a case study utilizing interviews, fieldwork observations and review of documents together with matrices and triangulation as analysis of data. Results show that the strong collaborative network governance of the interest groups facilitated the reduction of social vulnerability of Baseco. In conclusion, common advocacies, goals and strategies among the agencies facilitated the strong collaborative network.

Key words: coastal, network governance, collaborative network, Baseco, social vulnerability

PROSPECTS AND CHALLENGES OF PUBLIC-PRIVATE PARTNERSHIP FOR SUSTAINABLE FOREST MANAGEMENT IN THE PHILIPPINES: CASE OF THE DBP- FOREST PROGRAM

**Leila D. Landicho, Lutgarda L. Tolentino, Rowena D. Cabahug, Roselyn F. Paelmo and Catherine
C. de Luna**

*Institute of Agroforestry, College of Forestry and Natural Resources
University of the Philippines Los Banos, College, Laguna*

ABSTRACT

This paper argues that the continued depletion of the natural resources in the Philippines brought about by the human activities and natural phenomena has prompted not only the agriculture, forestry and environment sectors that are mandated to conserve and protect the natural resources, but also the economic sector, particularly the corporates, which are one of the primary consumers of these natural resources, to rehabilitate the degraded environment.

This paper highlights the findings of the participatory assessment of the Development Bank of the Philippines (DBP) –Forest Program being implemented in the 23 project sites in the Philippines. The DBP-*Forest* Program is an environmental advocacy program which aims to reduce poverty and improve the environmental services through the reforestation of open and denuded upland and coastal areas in the Philippines. This program harnesses the collaboration of local government units, people's organizations, non-government organizations, and academic institutions.

The DBP-Forest Projects have employed practical and innovative strategies such as promoting synergy and partnership among the local organizations; harnessing the active participation of upland dwellers; encouraging the planting of high value fruit trees which could be a long-term livelihood activity of the farming communities. There are mechanisms in these partnerships, however, that have constrained the effective and efficient program implementation.

This paper concludes that effective mechanisms of public-private partnerships should be in place to be able to achieve the goal of sustainable forest management.

Key words: participatory, natural resources, sustainable forest management, partnership



WILLINGNESS TO PAY (WTP) AMONG THE CITIZENS OF VILLASIS, PANGASINAN FOR THE ESTABLISHMENT OF A SANITARY LANDFILL

Jan Ramel A. Tumbaga

*Panpacific University North Philippines, Urdaneta City, Pangasinan,
,E-mail: jrt015@gmail.com*

ABSTRACT

This study determined the willingness-to-pay (WTP) of the citizens of Villasias, Pangasinan for the establishment of a sanitary landfill associating it to their socioeconomic status and KAP (Knowledge, Attitude and Practice). The method that was employed to gather necessary data was the household drop-off survey method, utilizing a structured questionnaire. The overall level of KAP among the three comparative groups: rural, sub-urban, and urban, were interpreted as moderate: significant differences were observed on the different sections. The frequencies of respondents (212/365) who are willing to pay for the establishment of a sanitary landfill are relatively higher as compared to the respondents who are not willing to pay. The total mean cost that respondents are willing to pay before the establishment of a sanitary was P89.56, while the total mean cost that respondents are willing to pay after the establishment of a sanitary landfill was P27.18. The most common reason why respondents do not want to pay is that, they believe that it is a government responsibility. The study can be used by the municipality for future reference on the benchmarking of value to be mandated for community support for the establishment of a sanitary landfill.

Key words: Willingness-to-pay, Sanitary landfill, SWM, Contingent Valuation, KAP

ANALYSIS/SYNTHESIS OF RAINFALL TIME SERIES USING THE BOX-JENKINS METHODOLOGY

J. E. Acosta¹, V.B. Ella², D. T. Franco³

¹ Mathematics, Physics and Computer Science Department, College of Science and Mathematics, University of the Philippines Mindanao, email: jacosta_96140@yahoo.com; ² Land and Water Resources Division, Institute of Agricultural Engineering, CEAT, University of the Philippines Los Baños, College, Laguna, ³ Land and Water Resources Division, Institute of Agricultural Engineering, CEAT, University of the Philippines Los Baños, College, Laguna

ABSTRACT

Long and reliable hydrometeorologic records are important requirements in water resources planning. Unfortunately, these resources are scarce in locations where data monitoring is a low priority activity in the hierarchy of public services. Mathematical models on the other hand require long, continuous records if they are to be useful in data augmentation and event forecasting.

The replicatable Box-Jenkins methodology was applied to the analysis of the properties of the monthly rainfall records of the National Agrometeorological Station at the University of the Philippines Los Baños. The ARIMA (0, 1, 1) model was determined to be the best model for the de-seasonalized, first-differenced and standardized 52-year, monthly rainfall series. Residual analysis showed independent (uncorrelated) and normally distributed residual variates. The comparison of the synthesized 50-year monthly rainfall with the historical series indicate insignificant differences in monthly means and standard deviations. Furthermore, statistical tests and graphical comparison of the autocorrelation and partial autocorrelation functions showed that seasonality and persistence have been reproduced in the synthetic series.

MOLECULAR AND BIOCHEMICAL CHARACTERIZATION OF A NOVEL ACTIN BUNDLING PROTEIN IN *ACANTHAMOEBA*

Joanna I. Alafag¹, Hyun-Hee Kong²

Benguet State University^a, Kyungbook National University^b

ABSTRACT

Actin binding proteins play key roles in cell structure and movement particularly as regulators of the assembly, stability and localization of actin filaments in the cytoplasm. In the present study, a cDNA clone encoding an actin bundling protein named as AhABP was isolated from *Acanthamoeba healyi*, a causative agent of granulomatous amebic encephalitis. This clone exhibited high similarity with genes of *Physarum polycephalum* and *Dictyostelium discoideum*, which encode actin bundling proteins. Transfected amoeba cells demonstrated that AhABP is primarily localized in phagocytic cups, peripheral edges, pseudopods, and in cortical cytoplasm where actins are most abundant. Moreover, AhABP after the deletion of essential regions formed ellipsoidal inclusions within transfected cells. Under the electron microscope, thick parallel bundles were formed by full length AhABP, in contrast to the thin actin bundles formed by constructs with deletion sites. In the light of these results, we conclude that AhABP is a novel actin bundling protein that is physiologically important component of the cytoplasmic network. AhABP may also contribute to the pathogenicity of the organism since it is critically required for the progression and completion of phagocytosis, growth, and host-parasite interactions.

Key words: actin-binding protein, cDNA, AhABP



BIODIVERSITY OF MACRO- INVERTEBRATES IN BALAY SA AGTA CAVE, SOUTHERN CEBU, PHILIPPINES

¹Steve Michael T. Alcazar, ²Adela C. Duran, ³Rosalyn P. Alburo,
and ⁴Hemres M. Alburo

¹Cebu Technological University-Argao Campus, Email: stv_michael@yahoo.com; ²Cebu Technological University-Argao Campus; ³Cebu Technological University-Argao Campus; ⁴Cebu Technological University-Argao Campus

ABSTRACT

A paper is presented of the cave fauna assessment in Argao, Cebu Philippines. Argao has many caves. One of which is the Balay sa Agta cave which holds high diversity of macroinvertebrates. Results of the study are integrated into the CHED- Cave Biodiversity Database - one of the major objectives of the study. Taxonomic composition of species recorded varied with two species of shrimps; namely *Antecaridina lauensis* and *Macrobrachium mamillodactylus* belonging to the family Atyidae and Alpheidae respectively. We collected three species of crabs. They are as follows: *Sundathelphusa cavernicola*, *Sundathelphusa sp.(non-cavernicolous)*, and *Cardisoma cf. guanhumi*. Macroinvertebrates represented by arachnids and crustaceans were the dominant taxa but the lack of taxonomic knowledge resulted in family or genus identification and leaving some macroinvertebrates unidentified. The study reports new probable distributional records for hypogean shrimp (*Macrobrachium mamillodactylus*). A crab species, *Sundathelphusa cavernicola* may be also a new distributional record for the locality. The study employed cruising transect walk, quadrat sampling method, hand-grabbing, trapping and scoop netting. Biophysical variables which include humidity, temperature, and light availability that influence the cave ecosystem are also recorded.

The cave related data and its species taxonomy detail in a database is unique, making it the only cave fauna database of its kind in Balay sa Agta cave.

Key words: Balay sa Agta, macroinvertebrates, Argao, Cebu

HEALTH EXPOSURE OF LABORATORY STAFF IN SELECTED CHEMICAL FACILITIES

Kristeen Y. Alday, Aldin E. Cailing, Sheleen P. Ebueza, Jinebeth M. Pacaña, Karen B. Pantallano, Alden Ray C. Pingol, Quizalaine Mae L. Samarista and Van Ryan Kristopher R. Galarpe

^aMindanao University of Science and Technology, Contact details: vanryangalarpe@gmail.com

ABSTRACT

This study assessed the health hazard exposure among laboratory staff in selected chemical laboratories in universities, government departments, and industries in Misamis Oriental, Philippines. Data collections were achieved using modified survey questionnaires covering hematological, respiratory, excretory, gastrointestinal, acute and chronic fatigue and aching, ophthalmic and neurological categories. Result showed prevalence of gastrointestinal (1.59%) and respiratory symptoms (1.19%) in government department laboratories exhibiting highest degree of exposure to chemicals with toluene being commonly used. Relatively lower exposure were found in universities and industries owing to comprehensive laboratory management plan.

URBAN AGRICULTURAL LANDSCAPE DYNAMICS AND ITS IMPLICATIONS IN LOCAL COMMUNITY FOOD SECURITY: A GIS-BASED ANALYSIS

Ricardo T. Bagarinao

Faculty of Education, University of the Philippines Open University, Los Baños, Laguna, Philippines, Email: ricardo.bagarinao@upou.edu.ph

ABSTRACT

Community food security, which is a relatively new concept, has become a global concern as climate change had affected several communities throughout the globe. Urban communities in the Philippines, like Calamba City in Laguna province, are not exempted from the impacts of climate change. The current study looked at the changes in its agricultural landscapes since they play an important role in establishing local community food security. The analysis was done through the use of patch analyst extension of a geographic information system (GIS) software. Land use-land cover maps for 2003 and 2010 were obtained from NAMRIA, and used in computing two landscape metrics, namely, mean patch size (MPS) and mean shape index (MSI).

Two types of agricultural patches were identified in the study site, namely: annual cropland, which contains rice, vegetables, ornamental plants, and other high valued crops and perennial cropland, which contains coconut. The annual cropland dominated the landscape in 2003 with computed MPS value of 1,088.15 has. This value however was significantly reduced to 274.55 has in 2010. Patches of perennial crops had also been established in 2010 with computed MPS value of 160.80 has. Computed MSI values for both patch types indicate complexity in shape, which is irregular for man-made structures. These changes indicate high dependence from external sources for rice and other crops, and may affect food security of the City.

Key words: community food security, geographic information system, mean patch size, mean shape index, landscape



MORPHOLOGICAL ANALYSIS OF *Keratella cochlearis* AND *Lecane bulla* (ROTIFERA) FROM LAKE LANAO, MINDANAO, PHILIPPINES

Sittie Aisah U. Balt and Ephrime B. Metillo

Department of Biological Sciences, College of Science and Mathematics, Mindanao State University-Iligan Institute of Technology, Iligan City, Philippines)

ABSTRACT

Rotifers are important soft-bodied invertebrate metazoans having a very short life cycle among the plankton. Rotifers serve as a food source for larger organisms including newly hatched fish larvae and other predatory zooplankton. This study analyzed four morphometric parameters in two dominant rotifer species *Keratella cochlearis* (Gosse, 1851) and *Lecane bulla* (Gosse, 1851) from seven sampling sites in Lake Lanao. Lorica length without considering the anterior and posterior spine, lorica width, lorica length plus longest spine and the lorica area without considering anterior and posterior spines were measured in loricas of *K. cochlearis*. Three morphometric parameters were considered in *L. bulla*: lorica width, lorica length and lorica area. The ImageJ software was used in taking the measurements of the four parameters, and all data were analyzed using the SPSS software. Among the seven transects established in the first sampling (May 2014) transects 3, 4 and 7 have highly significant variations among stations in the four morphological parameters (lorica length without considering the anterior spine, lorica width, lorica length plus spine and the lorica area without considering anterior spines) of *K. cochlearis*. In *L. bulla*, Transect 4 have the high significant in area while transect 5, 6 and 7 have the high significant in length for the first sampling. The morphological variations in *K. cochlearis* (Gosse) seem associated with different environmental conditions, in particular, the presence and size of the posterior spine, and lorica length and width were related to temperature and also the presence of the predator *Bosmina fatalis*. Morphological measurements of lorica width, lorica length and lorica area in the *L. bulla* can be explained by the availability of the food with more bacterial food available in all stations at the Marawi site and in inshore stations of Bayang site. This study demonstrates the plasticity of rotifer body morphology which seem to be influenced by water quality parameters in Lake Lanao.

Key words: Morphometrics, *Keratella cochlearis*, *Lecane bulla*, Lake Lanao, freshwater ecology

THE PHYSICAL CHARACTERISTICS OF UPPER SALTAN RIVER, BALBALASANG, BALBALAN, KALINGA

Tules P. Banwa, Angelle Mae L. Allao, Marjonnete N. Dunol & Gilma Marcos

Institute of Teacher Education, Kalinga Apayao State College, Tabuk City, Kalinga, Philippines

ABSTRACT

Saltan River of Balbalsang, Balbalan, Kalinga was once awarded the cleanest river in the province. The river is part of the ecotourism site, the Balbalasang National Park. This study determined the physical characteristics of Upper Saltan River. Three sample stations were established along the river. The pH and temperature were measured in each station. The pH and temperature of the sampling stations were compared using the analysis of variance. The sampling station located in the upper stream of the community showed a significantly lower pH compared to the sampling stations at the downstream, but no significant difference to that of the potable piped water within the village. The upper stream part of the river and the potable water for the community seemed to have a common water source, as showed by the mean pH that did not differ significantly. The significantly higher pH of the downstream sampling stations could be attributed to anthropogenic factors. Ocular observations showed that drainage canals from the community were all directed downward to the river. In terms of water temperature, the sampling stations showed no significant difference indicating a uniform temperature prevailing in the area. The water appeared clear despite the frequent rains that time.

Key words: Saltan River, cleanest river, physical characteristics river pH, ecotourism

PROSPECTS OF MAINTAINING VERMIVOROUS CONE SNAIL, *Conus ebraeus*, IN THE LABORATORY

Zenaida G. Baoanan, Zarah A. Alaska, Lulubelle B. Flojo and Rose Anne S. Galapia

*Department of Biology, College of Science
University of the Philippines Baguio, zbaoanan@yahoo.com*

ABSTRACT

Biosustainable methods of acquiring the pharmacologically important *Conus* peptides, such as venom milking, are currently being explored. Venom milking is a procedure that prevents the sacrificing of the organisms but requires them to be in captivity. In this study, maintenance of the vermivorous cone snail, *Conus ebraeus*, in the laboratory was conducted and feasibility of milking them with the piscivorous milking method was determined. Maintenance was minimal since physical parameters measured were largely within the range in the natural habitat. Milking, however, was deemed unsuccessful due to difficulty in manipulating the milking set-up. Still, rate of feeding of each sample was computed. Results have shown that bigger *C. ebraeus* can consume polychaetes at a greater rate. *C. ebraeus* was observed to feed on two different species of polychaetes under the genus *Perinereis*.

Key words: *Conus ebraeus*, biosustainability, venom milking, aquaculture, *Perinereis*



RELATIVE DENSITY AND DIVERSITY OF MEIOFAUNA FROM RIVER SEDIMENTS OF DIFFERENT DETRITAL SOURCES IN BINMALEY, PANGASINAN

Lemark M. Bautista, Maricel S. Ferrer, Jomari O. Soriano, and Sotero M. Aban

Pangasinan State University, Binmaley Campus, Binmaley, Pangasinan

ABSTRACT

This study was conducted to determine the relative density and diversity of Meiofauna from river sediments of different detrital sources (Mangrove area in Buenlag River, Aquaculture Area in Manat River, and Residential Area in Poblacion River) in Binmaley, Pangasinan which were selected based on the sources of detritus for their bottom soil sediments.

Soil sediments were collected from the designated sampling river stations by the used of an Ekman Dredge or grab. These sediments were placed in pre-labeled containers and kept for meiofauna and soil sediment analysis. Meiofauna samples were brought to PSU - laboratory for identification. Density was determined by counting the number of individuals per square meters. Shannon-Weiner diversity index (DI) was used in this study. Sediments samples were brought to the Limnological Laboratory of the NIFTDCBFAR in Bonuan Binloc, Dagupan City for organic and inorganic matter content analysis.

Results showed that four meiofaunal groups (copepods, nematodes, polychaetes, molluscs) were found in the study sites. Copepods and nematodes were seen in all sites. This indicates the broad spatial distribution of these organisms and their resilience to any type of environment. Highest density and diversity of meiofauna were observed in the aquaculture area. The aquaculture area in Manat river had the highest DI of 1.86. the mangroves of Buenlag river and the residential area of Poblacion river have DI of 1.60 and 1.45, respectively. The high diversity and density of meiofauna in aquaculture area may due to its low accumulation of organic and inorganic pollutants which were significantly lower among others.

Soil sediments in all three rivers had black color and fouling odor indicating the decomposition of organic matter. Measurements of soil pH were close to pH neutrality. Grain size analysis showed that the sediments of Buenlag river and Manat river are classified as sandy – muddy while muddy for the sediments of Poblacion river. The water qualities of the three rivers in Binmaley are in good condition since they are within the water quality standard of DENR for Class C type of water.

Key words: Meiofauna, sediments, detrital sources, relative density and diversity.

Ni ACCUMULATION IN PLANTS GROWING IN SOILS DERIVED FROM SERPENTINITE IN TANAUAN, LEYTE, PHILIPPINES

Pearl Aphrodite Bobon-Carnice

*Natural Science Department, Eastern Visayas State University
penncarnice@gmail.com*

ABSTRACT

Serpentine belongs to the ultramafic clan of rocks which contains naturally occurring heavy metals such as nickel (Ni). This study is based on the hypothesis that Ni is present in high amounts in the soil and it could be taken up by the plants including food crops. The study aims to evaluate the Ni content of the soil, native crops and agricultural crops growing in the hill of Brgy. Pago, Tanauan, Leyte where Serpentine are found. Composite soil samples from the surface soil (0-20 cm depth) and plant tissues (roots and leaf samples) were collected and determined their pH and Ni content using atomic absorption spectrophotometer. Results revealed that levels of extractable Ni in the soil are low due to its lithogenic origin and plants accumulation is moderately low. Additionally, the soil is alkaline which affects the retention of Ni in soils and its dissolution into extractable or available forms. Results also showed that Ni is present in soils and plants indicating that it enters the food chain and may lead to its bioaccumulation of the people living near the Pago Hill. However, no plants sampled quantified as hyperaccumulator.

Key words: Serpentine, Nickel, hyperaccumulator, Ultramafic rocks, Tanauan, Leyte

FRACTIONS AND SORPTION OF CADMIUM IN SOILS DERIVED FROM LIMESTONE

Ariel B. Bolledo¹ and Beatriz C. Jadina²

¹Agriculture Department, Capiz State University-Pontevedra, Pontevedra, Capiz, Philippines

²Department of Agronomy and Soil Science, Visayas State University, Baybay City, Leyte, Philippines

ABSTRACT

Soil accumulation of heavy metals coming from industrial and municipal wastes poses contamination risk to groundwater resources. A leaching experiment was conducted to determine the fractions and sorption of cadmium in soils derived from limestone. Cadmium (Cd) at five different Cd concentrations (0, 50, 150, 250, 350 mg l⁻¹) was used in the conduct of the leaching experiment. Solution containing Cd(NO₃)₂·4H₂O was used as source for Cd. The experiment was conducted for 60 hours. Results showed that the electrical conductivity (EC) and pH of the leachates were high at the first 12-h of leaching which decreased as the leaching process was continued. The different concentrations of Cd did not significantly affect the EC and pH of the leachates. Most of the recovered concentrations of Cd in the leachates from all the treated soil columns were below the detection limit. The concentrations recovered from Cd was very low (0.0035 – 1.77 mg l⁻¹) which implies high sorption of the heavy metal. Hence, mobility of Cd was not evident in soils derived from limestone. Fractionation analysis of Cd in soil revealed the dominance of carbonate-bound fractions which supports the observation of heavy metal immobility. High cation exchange capacity and high calcium carbonate content were the soil properties related to sorption of the heavy metal cadmium.

Key words: cadmium, fractionation, leaching, limestone, sorption



ORGANIC MANAGEMENT OF TOMATO DISEASES GROWN UNDER PROTECTIVE AND OPEN FIELD CULTIVATION

¹Lucia M. Borines, ¹Rezel M. Sagarino, ³Othello B. Capuno, ²Zenaida C. Gonzaga, ¹Reny G. Gerona, ⁴Gordon Rogers, ⁵Sandra McDougall and ⁵Len Tesoriero.

¹ Department of Pest Management, ²Department of Horticulture, ³Office of the Vice President for Research and Extension, Visayas State University, Visca, Baybay City, Leyte, Philippine; ⁴ Applied Horticultural Research (AHR), Eveleigh New South Wales, Australia; ⁵ New South Wales Department of Primary Industries Yanco Agricultural Institute, PMB, Yanco, NSW Australia

ABSTRACT

Soil amendments with certain plant species were reported to suppress certain diseases. Based on this premise, a trial was conducted to determine the effect of cabbage residues, *Chromolaena odorata* and forest litter amendments on disease incidence and yield of tomato grown under protective and open field cultivation. The amendments were applied at 15 kg/10 m² plots three weeks before transplanting. The treatments were arranged in 2 factor factorial in RCBD with three replications. Data gathered include disease ratings, yield and yield components of tomato. All amendments had reduced bacterial wilt and nematode ratings regardless of type of cultivation, with cabbage as the most effective. The amendments had no effect on the incidence of leaf mold. Plants amended with *Chromoalena odorata* and forest leaf litter had significantly reduced bacterial spot. Cabbage produced the highest marketable yield and number of fruits. Bacterial wilt, bacterial spot and nematode ratings were higher in the open field while leaf mold was higher under protective cultivation. Plants under structure had significantly higher marketable yields. Organic amendments, particularly cabbage has a potential in the control of major diseases affecting tomato while protective cultivation can effectively reduce bacterial diseases and increase the yield of tomato.

Key words: Cabbage Chromoalaena forest litter amendment disease incidence yield

FLORAL MORPHOLOGY AND SOME ASPECTS OF FLORAL PHENOLOGY OF *Hoya cumingiana* Decne. (Apocynaceae)

¹Rachel Anna T. Bustos, ²Faith S. Maranan and ³Jennelyn M. Carandang

^{1,2}Environmental Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Banos, College, Laguna 4031; ³ Institute of Plant Breeding, Crop Science Cluster, College of Agriculture, University of the Philippines Los Banos, College, Laguna

ABSTRACT

The Philippines has a high diversity of Hoyas. These are epiphytes that are gaining popularity as more enthusiasts are becoming interested to collect, to market and to study these plants. However, a number of *Hoya* species are already reported to be vulnerable to extinction. Thus, knowledge about Hoyas may provide a clearer understanding of their role in the ecosystem and may help find ways to promote their conservation and protection. This preliminary study investigated some aspects of the floral biology of *H. cumingiana* specifically to provide baseline information on its floral morphology, some aspects of its floral phenology as well as visitors. Unlike many of the hoyas, this species is remarkable for its ability to emit odor all throughout the day. Observation for the phenology of the flowers began as each individual flower started to bloom and continued until its senescence. Results showed that floral development of *H. cumingiana* can be characterized into six (6) stages. Morphological variations among the samples were reported. Variation in corolla color, peduncle length, and number of florets per umbel were identified. Likewise, anthesis initiation varies among the flowers. *Hoya cumingiana* bloomed for 10-15 days. The flower life span of *H. cumingiana* is relatively longer compared to other *Hoya* species. Floral visitors such as *Thomisus* sp. and ants were also reported.

THE FLORAL COVER OF SANTA VICTORIA CAVES ILAGAN SANCTUARY: BASELINE DATA FOR CONSERVATION OF PRIORITY SPECIES OF INDIGENOUS TREES

Marie Grace S. Cabansag, Candida U. Magbaleta, Gisel R. Santiago, Jerry B. Tolentino, Roldan S. Cardona, Edilberto M. Andres, Jr., Clemente M. Aguinaldo, Jr., and Jesus D. Gonzales

Philippine Normal University

ABSTRACT

The research generated knowledge on the native and indigenous species of trees in the ecotourism sites of Ilagan Sanctuary for biodiversity conservation and sustainability. The inventory of the tree species utilized the transect method of ecological sampling. The Simpson's indices of diversity in the two study sites indicate an overall positive condition of the sanctuary. The results also revealed a higher Simpson's index of diversity along limestone rich areas (site 1) compared to areas of higher concentration of soil (site 2) indicating that there is a higher variety of plant species found in site 1 than in site 2. The receding number of native and indigenous trees in comparison with the expanding density of exotic plant species calls for actions and participation of different agencies for the establishment of more assertive program on biodiversity conservation to ensure sustainability of the natural resources present in the area.

Key words: floral cover, indigenous trees, biodiversity, conservation



RESPIRATORY HEALTH ASSESSMENT OF SELECTED HOUSEHOLDS IN MAJOR STREETS AND ACCESS ROADS IN CAGAYAN DE ORO, PHILIPPINES

April Rose T. Cahucom, Melvin L. Canoy, DJ Casiño, Ellen Kieth S. Dapin, Vanessa Lacre, Queenie Jyne R. Lucagbo, Sheena Jane S. Sabejon, and Van Ryan Kristopher R. Galarpe

Mindanao University of Science and Technology, Cagayan de Oro, Philippines
Email address: vanryangalarpe@gmail.com

ABSTRACT

This study aimed to determine the respiratory health risks and profile of selected households residing in major streets in Cagayan de Oro City, Philippines through modified survey instrument. The respondents were situated adjacent to the highways and access roads of Cagayan de Oro City namely: Bugo, Bulua, Carmen, Corrales St., Julio Pacana St., and Agora-Osmeña. Overall, respondents from Corrales St showed higher symptoms of upper respiratory illnesses (23%) evidenced by chest pain and persistent cough. The highest exposure may likely be associated to vehicular soot other than pre-existing health condition. It is recommended that further evaluation be carried to evaluate environmental quality and public health.

DISTRIBUTION OF CHIROPTERA SPECIES AT MALAGOS WATERSHED, DAVAO CITY

Patrisha Marie E. Carilhay, Einan G. Chavez, Giovanna G. Viti and Geonyzl Alviola

Davao Doctors College

ABSTRACT

The distributions of Chiroptera species worldwide are mostly from clumped to random. This was due to hunting and change of habitat quality. This study aimed to identify the species of bats and determine its distribution within the Malagos watershed. Mist nets were randomly distributed and established at the middle canopy of the fragmented forest. A total of five species were collected namely: Golden crown fruit bat (*Acerodon jubatus*), Philippine Pygmy fruit bat (*Haplonycteris fischeri*), Common short nose fruit bat (*Cynopterus brachyotis*), Dagger-toothed Long-nosed fruit bat (*Macroglossus minimus*), and Mindanao fruit bat (*Megaerops wetmorei*). All accounted bats belong to family Pteropodidae that were mostly found in disturbed areas. Most of these species were distributed randomly within the protected area except for the *M. minimus* because it had a clumped distribution in site two. Second site was composed of old growth flowering and fruiting trees. Among all fruit bats recorded *M. minimus* fed on nectar and pollen. Most of the observed Chiroptera species were least concern except for *A. jubatus* and *M. wetmorei* were considered vulnerable or threatened within their habitat. The distribution of most bat species depend on the structure of the habitat that sustained their life processes even though there is an overlapping of territories among other species in a fragmented forest. To protect the vulnerable species, proper education of the community surrounding the protected area must be conducted and strict implementation for conservation of the area must be observed.

Key words: Environment, Chiroptera Distribution, Descriptive, Malagos Watershed Davao City

SIXTEENTH CENTURY PHYSICAL ENVIRONMENT OF THE PHILIPPINES ACCORDING TO THE CHRONICLES OF PIGAFETTA, DE SANDE, AND DE MORGÀ

April Hope T. Castro

Division of History, Department of Social Sciences, University of the Philippines Los Baños

ABSTRACT

The 1500s was a century of many firsts in the history of Philippine-Spanish relations. This was the first time that the Europeans saw the Philippines - its inhabitants and its physical environment. One particular trend that is gaining ground in historical studies today deals with the study of the environment. Thus, this paper aimed to explore the physical environment of the Philippines when the colonizers first saw the archipelago. The chronicles written during the *conquista* were consulted, particularly that of Antonio Pigafetta, Francisco de Sande and Antonio de Morga, to relate the climatic conditions of the Philippines and its land and water resources. There were four important products that were mentioned by all three chroniclers - these were rice, coconut, gold, and pearls. All of which were of utmost importance that they were offered as gifts to the foreigners. Not only that they were mentioned but the uses, as well as the processing of these products were vividly described in the chronicles. In fact, these documents were used by the ilustrados, especially Jose Rizal, to stress on the idea that the Philippines had a glorious past prior to the arrival of the Spaniards.

Key words: 16th century Philippines, physical environment, history

ISOLATION AND IDENTIFICATION OF *Bacillus licheniformis* ISOLATED FROM A GROW-OUT POND IN STA. LUCIA, MAGALANG, PAMPANGA AND ITS DENITRIFYING POTENTIAL

Rose Anne C. Bognot and Monaliza M. Cayanan

Department of Natural Sciences, Institute of Arts and Sciences, Pampanga Agricultural College, Magalang, Pampanga, Philippines

ABSTRACT

In view of the importance of nitrates in the environment and in the human health, this study was aimed to isolate *Bacillus spp.* from a grow-out pond located at Sta. Lucia, Magalang, Pampanga and to identify this microorganisms morphologically and biochemically. After isolation of the *Bacillus spp.* from the pond water sample, an investigation was taken up to find out the denitrifying potential of the most dominant *Bacillus spp.* regarding the reduction of 5 mg/L and 10 mg/L nitrate under laboratory conditions. The isolation and identification showed that *Bacillus licheniformis* was the most dominant bacteria in the pond water. The results showed that *B. licheniformis* exhibited 95.29% nitrate reduction on 5 mg/L NO₃⁻ concentration and 88.31% nitrate reduction on 10 mg/L NO₃⁻ concentration. Based on the findings, the following conclusions were drawn: 1) The *Bacillus sp.* isolated and identified as *Bacillus licheniformis* is characterized as medium-sized, opaque, having dry surface, circular in form, having convex elevation and with entire margin; 2) *Bacillus licheniformis* reacts to different biochemical tests. It is β-hemolytic, produce no growth on MacConkey agar, gram-positive, rod-shaped, Catalase positive, Oxidase positive, motile, Urease positive, Indole and Simon's Citrate tests negative; 3) There is a significant nitrate reduction on the two concentrations (5mg/L NO₃⁻ and 10mg/L NO₃⁻) as affected by *Bacillus licheniformis*. It showed high percent reduction of nitrates in 5mg/L and 10mg/L concentration, thus it have a good denitrifying potential; 4) There is no significant difference on the nitrate reduction of the two concentrations (5mg/L NO₃⁻ and 10mg/L NO₃⁻) as affected by the isolated *Bacillus licheniformis*; and 5) There is weak correlation between nitrate concentration on the treatments and factors such as ambient water temperature and water pH.

Key words: nitrates, nitrate reduction, denitrifying potential, *Bacillus licheniformis*



PHYTOCHEMICAL SCREENING, RADICAL SCAVENGING ACTIVITY, TOTAL PHENOLICS, AND BIOACTIVITY ASSAY OF *Jacquemontia paniculata* (Burm. f.) Hall f. (Convolvulaceae) EXTRACTS

Julien Joy Clemeña, Paul Venson C. Rara, *Van Ryan Kristopher R. Galarpe, Ronnie L. Besagas

Chemistry Department, Mindanao University of Science and Technology, Cagayan de Oro, Philippine

*Corresponding author: vanryangalarpe@gmail.com

ABSTRACT

The bark and leaf extracts of *Jacquemontia paniculata* (himag) were evaluated for its pharmacological capacity. Analysis included determination of secondary metabolites qualitatively, total flavonoids, radical scavenging, total phenolics, and biological activity (antibacterial and toxicity). Overall, secondary metabolites present in leaf and bark extracts were alkaloids, flavonoids, saponins, tannins, anthraquinone, and steroids. Further quantification of total flavonoid was found higher ($p = 0.017$; $F = 4.413$) in bark extracts (12.87 ± 0.26 to 15.51 ± 1.26 mg/g). Determined radical scavenging activity was similarly pronounced in bark extracts (IC_{50} 0.211-0.264 mg/mL) compared to the leaf extracts. The total phenolics were found higher in bark extracts (3.66-4.34%). The antibacterial capacity were observed dominant in bark and leaf aqueous extracts (inhibition 64.3%) against *E.coli* and bark and leaf ethanolic extracts (inhibition 47.1%) against *S. aureus*. Toxicity against brine shrimp also exhibited higher mortality in bark extracts. While results of the study showed potential pharmacological application it however recommended to carry further studies elucidating specific compounds.

DIVERSITY ASSESSMENT OF FLORAL TREES AND SHRUBS: ITS IMPACT ON RESOURCE MANAGEMENT

Onofre S. Corpuz¹, Samson L. Molao¹, For. Merly C. Remollo², Carlou E. Terado³

¹CFCST Arakan, Cotabato, ²C.A Forestry Department-CFCST Arakan, Cotabato, ³C.A Forestry Department-CFCST Arakan, Cotabato

ABSTRACT

The study was conducted to establish a benchmark data on the various flowering trees and shrubs now existing in the Ecological Garden of the Cotabato Foundation College of Science and Technology (CFCST) which is then grassland in 1980's. The implication of these diverse flowering plants to resource management and climate change were also considered.

A 5% sampling inventory in a 10 has. Ecological Garden found out a 105 plant species belonging to 36 families and 79 genera. Family Moraceae found to be dominating species with 16 representative taxa.

Kamiring of the Anacardiaceae family had the most number of 565 individuals with relative density of 20.5, relative frequency (20.4), importance value (20.45), species richness (163.93) and diversity values of 70.81.

These findings revealed that CFCST Ecological Garden is now diverse with various floral species essential to support life. Climatic condition had been enhanced by the presence of this diverse community of floral species in the area.

Key words: Floral diversity, Assessment, Classification, Ecological garden, Philippines

ETHNOBOTANY OF COMMONLY USED BAMBOO VARIETIES AND THEIR UTILIZATION IN REGION XII

Anabelle Lorente Dagon and Jesusa D. Ortuoste

Sultan Kudarat State University, ACCESS, EJC. Montilla, Tacurong City

ABSTRACT

A study on ethnobotany of commonly used bamboo varieties and their utilization aimed to determine the morpho-taxonomic characteristics of commonly used bamboo varieties, identify the existing utilization practices and indigenous knowledge, determine the extent of utilization of commonly used bamboo varieties, identify issues and concerns on the utilization of commonly used bamboo and describe the socio-economic profile of respondents in Region XII. A descriptive survey design was used in this study using investigatory and descriptive approach to analyze the different characteristics of commonly used bamboo varieties in Region XII.

A purposive sampling technique was employed using questionnaires in gathering data. Frequency counts, percentile and mean were used in treating the data. Result of the study showed that ix (6) commonly used bamboo varieties has its own characteristics in Region XII. Bamboo is not a priority plant but it highly utilized by the farmers as well as some industries in the region because of its common uses such as housing materials, fences, rudimentary furniture and household utensils, agricultural implements (use in tying and harvesting of crops, transport material, etc), handicraft, livestock implements, fish cages, and as footbridges along creeks and rivers. Bamboo is not an integral part of the economy, but it plays a very important role socially, economically and ecologically.

As to the extent of utilization of bamboo, it was found out that bamboo is highly utilized because of its importance. Moreover, the top five (5) most pressing issues and concerns identified by the respondent in Region XII were: a) there is a need for an intensive information campaign to encourage farmers to plant more bamboos, b) lack of knowledge and understanding on the economic importance of bamboo , c) no concrete plan for bamboo production, marketing and industry promotion, d) lack of commitment of some Municipal Local Government Unit (MLGU) / Barangay Local Government Units (BLGU) on environmental concerns e) lack of technology training and support from the government.

According to bamboo craft makers, the top five (5) pressing issues and concerns were: a) lack of industrial technology training and support from the government, b) low price of finished product, c) high price of raw material for bamboo craft, d) lack of access to financing institutions and most furniture makers are use simple technologies and machineries, and e) have no knowledge on bamboo preservation. Furthermore, on socio-demographic profile of respondents, majority were ages 51-55 years old, dominated by male respondents, majority were married and of Roman Catholic. Most of the respondents were Ilonggo and majority was elementary graduate. Bamboo growers and bamboo craft makers have other sources of income to sustain their way of living with an annual income above poverty line.



WATER QUALITY CHARACTERISTICS OF BOLINAO BAY IN WESTERN PANGASINAN

Sotero M. Aban, Rene B. De Vera, Cornelia E. Ibarra,
Francis Albert T. Argente and Armando C. Garcia

Department of Fisheries Science, Pangasinan State University, Binmaley Campus
Binmaley, Pangasinan, Philippines, Email: sotero_620@yahoo.com

ABSTRACT

Bolinao Bay is a coastal body of water located along the barangays of Pilar, Luciente I, Luciente II, Salud and Luna of the coastal municipality of Bolinao in Western Pangasinan. This bay is designated as the mariculture zone for the culture of milkfish (*Chanos chanos*) using Norwegian Sea Cages and at the same time the location for the gathering and culture of green mussel (*Perna viridis*) by the fisherfolks. The intensive culture of milkfish in cages contributes to the deterioration of water quality in the mariculture zone of Bolinao Bay. However, with the emergence of green mussel in the Bay may contribute in the improvement of water quality conditions of the Bay. Hence, this study was conducted to describe the water quality conditions of Bolinao Bay.

An on-site water quality analyses of water depth, water turbidity, water pH, water temperature, Dissolved Oxygen, and the collection of water samples for BOD/COD analysis and plankton samples for qualitative and quantitative analyses were done in seven sampling stations which covered the Milkfish Cage Culture Area and the Green Mussel Culture Area.

Result shows that Bolinao Bay had a water temperature ranging from 29.4 to 29.5°C, water salinity ranging from 33 to 35 ppt, and water pH ranging from 7.85 to 8.46. For water depth, milkfish cage culture areas had water depths ranging from 10.6m and 9.8m while the green mussel culture areas had water depths ranging from 3.4m to 5.8m. Milkfish cage culture areas had higher water turbidity readings ranging from 2 to 3.4m than the green mussel culture area with 0.8 to 2.2m water turbidity. Dissolved oxygen levels in the milkfish culture area ranged from 3.38 to 4.15 mg/L. Total suspended solids in milkfish cage culture area ranged from 115 to 265 mg/L while from 127 to 278 mg/L in the green mussel culture area. Chlorophyll a levels in the milkfish culture area ranged from 59 to 89 mg/L while 52 to 159 mg/L in the green mussel area.

Plankton analysis shows that most of the natural food present in Bolinao Bay during the study were composed of zooplankton. Phytoplankton like *Navicula* was very rare. The major groups of zooplankton include those under **Order Copepoda** of the Phylum Arthropoda which include the most abundant groups of zooplankton namely the calanoids, cyclopoids and herpacticoids copepods. Order Decapoda and Order Cirripedia which includes the mysids, nauplii of cirripeds, copepods and decapods were also present but a lower density.

Other groups zooplankton include the larvae of mollusks under **Order Gastropoda** of Phylum Mollusca, larvae of appendicularians of **Class appendicularia** under Phylum Prochordata, organisms like the polychaetes under Phylum Annelida. The presence of organisms under the Protist kingdom like the **ciliophorans and foraminiferans** were also observed.

Key words: Bolinao Bay, water quality, mariculture zone, green mussel

SPECIES COMPOSITION OF SEAGRASSES ALONG ALBAY GULF, ALBAY, PHILIPPINES

Ann Retuerma-Dioneda and Ida F. H. Revale

Bicol University College of Science, Legazpi City
Email: idafhrev@yahoo.com

ABSTRACT

Out of the 13 species found in the Philippines, there were eight (8) identified seagrass species found in Albay Gulf, namely *Cymodocea rotundata*, *Cymodocea serrulata*, *Enhalus acoroides*, *Halodule pinifolia*, *Halodule uninervis*, *Halophila ovalis*, *Syringodium isoetifolium*, and *Thalassia hemprichii*. These represent 62% of the total reported seagrass' species nationwide.

The water quality in some areas of Albay Gulf is conducive for the growth of marine aquatic organisms, however, in some areas, like Sto. Domingo, the water temperature is quite high, particularly to favor the growth of aquatic plants like the seagrasses. Normal growth of aquatic biosystems may be supported by the water quality, however, this marine habitat is so fragile that any alterations to this aquatic environment including the observed optimum condition of such environment will render them unfavorable for both aquatic organisms.

Key words: seagrass, species composition of seagrasses; seagrass in Albay Gulf Philippines

BALILI RIVER'S PHYSICO-CHEMICAL CHARACTERISTICS: THE EFFECT ON THE RIVER'S BIOLOGICAL CHARACTERISTIC

Bretel B. Dolipas, Jovalson Abiasen, Joel V. Lubrica, Jennifer Lyn S. Ramos

Benguet State University, La Trinidad, Benguet

ABSTRACT

The study determined the interrelated physico-chemical characteristics of the Balili river water system and the regression correlation of the Dissolved Oxygen DO and Biological Oxygen Demand with the derived interrelated physico-chemical factors of the Balili river water system. Secondary data regularly measured by the Environmental Management Bureau EMB of the Department of Environment and Natural Resources DENR, Cordillera Administrative Region CAR was used in the study. Factor and Regression analysis were the statistical tools used in the study.

There were four derived interrelated physico-chemical factors of the Balii river water and these are as follows: F_1 :Physico-Chemical Factor; F_2 :pH-Conductivity-Cadmium-Phosphate Factor; F_3 :Temp-Coliform Factor; and F_4 :Lead-TSS Factor. The Dissolved Oxygen DO of the Balili river water system was correlated to the four factors derived as shown by the equation: $DO = 8.242 - 0.267F_1 + 0.187F_2 + 0.084F_3 - 0.069F_4$, but not significantly correlated. The regression correlation of the Biological Oxygen Demand BOD with the four derived factors is shown by the equation: $BOD = 51.643 + 0.747F_1 - 0.122F_2 + 0.143F_3 + 0.16F_4$ with the first factor significantly interrelated while the other three were not. It is recommended that water treatment procedures should be undertaken to improve the Dissolved Oxygen and Biological Oxygen Demand of the Balili River water system.

Key words: Dissolved Oxygen DO, Biological Oxygen Demand BOD, Balili River Water System, Physico-Chemical Characteristics



HORSETAIL STALK (*Equisetum arvense* Linn.) AS AN ANTI-OXIDANT

Dunamis Ruth A. Dumlao

ABSTRACT

The study was conducted to determine the efficacy of horsetail (*Equisetum arvense*) extract as anti-oxidant specifically, it seeks to answer the following questions; a.) what are the active chemical component of horsetail (*Equisetum arvense* Linn.) extract that make it effective as anti-oxidant; b.) what is the best dilution or effective concentration of horsetail (*Equisetum arvense* Linn.) extract that is most effective as anti-oxidant in terms of change in color of peeled potato, absorbance reading of DPPH solution, percentage of scavenging activity or % free radical inhibition; and c.) is there a significant difference between the different concentrations of horsetail (*Equisetum arvense* Linn.) extract and commercial as anti-oxidant?

The researcher used six (600) hundred grams horsetail stalk in testing its antioxidant property in terms of change in color of peeled potato. One hundred (100 %), 50% and 25 % concentrations of horsetail were prepared. It was applied to the peeled potato then change of color of peeled potato was observed and recorded after 24 hours.

The DPPH Assay was also conducted following the proper protocol in conducting DPPH assay using 20 mcg/ml, 50 mcg/ml, 80 mcg/ml and 120 mcg/ml horsetail extract to determine its efficacy as antioxidant in terms of absorbance reading at 517 nm wavelength and % scavenging activity. Twenty five (25) µg/ml, 50 µg/ml, 100 µg/ml, 150 µg/ml, 200 µg/ml horsetail extract was again used to determine its efficacy as anti oxidant.

Based on the data gathered, the following conclusions were drawn: a.) there is a significant difference among the different horsetail extracts and control since the computed F-value (64.500) is greater than the critical F-value (5.994366) at alpha 0.01% level of significance in terms of change of color of peeled potato; b.) there is a significant difference among the different concentration or dilution of horsetail extracts and control since the computed F-value (140.15) is greater than the critical F-value (3.705424) at alpha 0.01% level of significance in terms of absorbance reading at 517 nm wavelength; c.) the horsetail extracts with higher concentration has higher percentage of scavenging activity 120 mcg/mL extract and 80 mcg/mL extract with 80.707 and 80.136 respectively; and d.) the horsetail extracts with higher concentration has higher percentage of free radical inhibition. Thus, the higher the concentration of the horsetail extracts, the higher its efficacy as anti-oxidant. Finally, the most Effective Concentration (EC) or dilution of horsetail extracts as anti-oxidant that scavenges or inhibits 50% of free radical, DPPH is 145.401 µg/ml.



ECTOPARASITES OF COMMENSAL RODENTS FROM BACKYARD FARMLANDS IN BAGUIO CITY

Imee Rose B. Estrada, John Edward L. Felipe, and Aris A. Reginaldo

College of Science, University of the Philippines Baguio, Gov. Pack Rd., Baguio City
email: joedfelipe@yahoo.com

ABSTRACT

Ectoparasites that infest rodents are known agents of vector-borne diseases to humans. Studies on ectoparasites are important in the prevention and control of zoonotic diseases. This study was conducted to determine the assemblage and occurrence of ectoparasites in pest rodents that inhabit backyard farmlands in Baguio City. Hosts were trapped from three different locations in the City, from January to March 2014 and all ectoparasites were collected and identified. A total of 1,658 ectoparasites were recovered from four species of rodents, namely *Rattus tanezumi*, *Rattus exulans*, *Suncus murinus* and *Mus musculus*. At least eleven species of ectoparasites were identified, including *Laelaps nuttalli*, *Laelaps echidninus*, *Ornithonyssus bacoti*, *Polyplax serrata*, *Polyplax spinulosa*, *Hoplopleura pacifica*, *Ixodes granulatus* and *Xenopsylla cheopis*. Among these, *X. cheopis*, *O. bacoti* and *H. pacifica*, *P. spinulosa* and *P. serrata* are notable rodent ectoparasites known to be responsible for diseases such as bubonic plague, dermatitis, and murine typhus. *R. tanezumi* harbored all the ectoparasite species. Only *H. pacifica*, *L. nuttalli* and *L. echidninus* was found in *R. exulans*. *Suncus murinus* also harbored several species while none was found in *M. musculus*. The diversity, number and occurrence of ectoparasites in various host species and the widespread distribution of the hosts suggests that ectoparasites are common, increasing the possibility of zoonosis. Information such as these is important in environmental campaigns that promote proper management of the environment in relation to sanitation and disease.

Key words: ectoparasites, zoonosis, environmental program and disease

CHEMICAL WASTE OF SELECTED UNIVERSITIES IN THE PHILIPPINES

Van Ryan Kristopher R. Galarpe

Department of Chemistry and Environmental Science & Technology Department, Mindanao University of Science and Technology and Biology Department, Xavier University-Ateneo de Cagayan, Cagayan de Oro, Philippines
Email address: vanryangalarpe@gmail.com

ABSTRACT

The study evaluated the chemical waste management of selected universities in Regions 10 and 7. This included University of San Carlos (USC), Cebu Doctors' University (CDU), Cebu Technological University (CTU), Southwestern University (SWU), Mindanao University of Science and Technology (MUST), and Xavier University-Ateneo de Cagayan (XU). Overall, chemical waste segregation was implemented as per DENR mandate for hazardous wastes. Waste chemicals were contained in glass receptacles often classified according to the type of chemical or by the experiment conducted. However, selected gaps were identified per institution which included: i) lack of waste chemical collection and transport scheme to a treatment facility; ii) absence of economically accessible treatment facility; iii) absence or poorly managed water treatment facility; iv) lack of technical personnel (e.g. pollution control officer/technicians); and iv) lack of chemical waste management training in all faculty and staff involved in chemical waste generation. Further evaluation through student's perception analysis is underway.



FROM OLD TO NEW, HARNESSING GENES FROM HISTORICAL SAMPLES

Juan Carlos T. Gonzalez

Animal Biology Division, Institute of Biological Sciences and UPLB Museum of Natural History, University of the Philippines Los Baños, College, Laguna
E-mail: jctgonzalez@uplb.edu.ph; jctgonzalez@gmail.com

ABSTRACT

Museum specimens are an invaluable resource and embody the historical record of the earth's biological diversity. These specimens represent important taxonomic types and some of these species may now be extinct or extremely rare. Milestones in molecular genetics have allowed us to extract and sequence genes from various sources, both contemporary and historical. In order to complete a comprehensive study of the phylogeography of Afro-Asian Bucerotidae, the mtDNA Cytochrome *b* gene was extracted and amplified from various taxa of hornbills. These samples represented specimens collected by D.S. Rabor, C. Hose and A.R. Wallace from different museums worldwide, which include the extinct Ticao Tairctic Hornbill and the critically endangered Sulu Hornbill. A modified protocol for DNA extraction from feathers and toe-pad tissues of bird skins were used, and specific primers were developed to amplify and sequence fragments of the Cyt *b* gene. Historical DNA derived from samples kept in tropical museums was more degraded than from samples stored in museums from temperate countries. Subsequent applications of this modified method were done on African Barbets and currently proposed for other Philippine birds with taxonomic uncertainties.

Key words: museum bird skins, historical DNA, hornbills, toe-pad sampling

RADIATION CYTOGENETIC STUDIES ON PHILIPPINE ASHITABA (*Gynura nepalensis* DC)

D.E. Gracilla and J.V. Bagunu

Department of Natural Science, Institute of Arts and Science
Pampanga State Agricultural University, jackbagunu@gmail.com

ABSTRACT

Philippine Ashitaba (*Gynura nepalensis* DC.) at 100% and 50% leaf extract concentrations when administered to white mice (*Mus musculus*) before radiation treatment were found to reduce the incidence of chromosomal aberration (dicentrics, rings, breaks, gaps, fused, desperalized, chains, complex sticky and fragments) when compared with the somatic cells of white mice in the positive control, T+ (mice exposed to 2Gy at an exposure rate of 150 cGY per minute for 2.5 minutes). Hence, the *Gynura* leaf extract induced to mice before radiation exposure possesses the potential to act as radioprotective agent.

Gynura leaf extract introduced to mice for 15 days after irradiation with the same exposure treatment did lower the occurrence of chromosomal aberrations as compared with the T+ (sacrificed 24 hours after irradiation) but there is a non-significant difference among the means of total chromosomal aberrations in T++ (irradiated and sacrificed after 15 days), T1 (100% *Gynura* leaf extract treatment for 15 days after irradiation), T2 (50% *Gynura* leaf extract treatment for 15 days after irradiation) and T0 (no irradiation), hence, it is not conclusive at this point that *Gynura* leaf extract possess potential against radiation's adverse effects. The reduction of chromosomal aberrations observed after irradiation may not be due solely to the effect of the leaf extract but may also possibly be due to the body's defense mechanisms in the mice that counteracted the negative effects of radiation.

Key words: Radioprotective, chromosome repair damage potential, chromosomal aberration

LARVICIDAL ACTIVITY OF SELECTED PLANT EXTRACTS AGAINST THE DENGUE VECTOR *Aedes aegypti* MOSQUITO

Pedro M. Gutierrez, Jr.¹, Aubrey N. Antepuesto², Bryle Adrian L. Eugenio³,
Maria Fleurrelei L. Santos³

¹Department of Biology, School of the Sciences, College of Arts and Sciences
Cebu Normal University, Osmeña Boulevard, Cebu City, Philippines

^{2,3}Misamis Occidental National High School, Oroquieta City, Philippines

ABSTRACT

The larvicidal activity of leaf and stem/bark extracts of *Jatropha curcas*, *Citrus grandis* and *Tinospora rumphii* were tested on the larvae of the dengue-vector, *Aedes aegypti*. Phytochemical analysis of the extracts was performed to determine the active toxic compounds. Various concentrations (20 mg/mL, 40 mg/mL and 60 mg/mL) of the plant extracts were tested against third instar larvae of *A. aegypti*.

Phytochemical screening revealed the presence of alkaloids, flavonoids and steroids in the leaf and bark extracts of *Jatropha curcas* while the leaf and bark/stem extracts of *Citrus grandis* and *Tinospora rumphii* are rich in alkaloids, saponins, tannins, flavonoids and steroids. These compounds are known to possess insecticidal and larvicidal properties causing the mortality of insects and other pests. All plant extracts showed significant larvicidal activity against *A. aegypti* mosquito larvae at 0.05 level of significance. *Tinospora rumphii* leaf extract is the most effective mosquito larvicide which is manifested by the highest percentage mortality on the larvae of 90% and 93% after 24 and 48 hours respectively; with an LC₅₀ and LC₉₀ values of 10 mg/mL and 46 mg/mL respectively after 48 hours of exposure. *Citrus grandis* bark and *Tinospora rumphii* stem extracts showed a significant difference on the increased of the mortality of mosquito larvae with increasing concentrations of the plant extracts at 0.05 level of significance.

The high larvicidal activity of *Tinospora rumphii* leaf is supported by the abundance of phytochemicals which show synergistic effects in terms of larvicidal action to mosquito larvae. The larvicidal activities of the three plants vary according to the plant species and part used which is supported by the presence of several bioactive chemicals.

Key words: Larvicidal activity, *Jatropha curcas*, *Citrus grandis* and *Tinospora rumphii*, *Aedes aegypti*



PRODUCTIVITY AND LIVELIHOOD ANALYSIS OF SELECTED AREAS OF LIBON, ALBAY

Hanilyn A. Hidalgo, Charlie P. Nacario, Emma G. Jarcia

Central Bicol State University of Agriculture

ABSTRACT

The study on Productivity and Livelihood Analysis of Selected Areas of Libon, Albay was undertaken to assess the productive capacity of the proposed Organic Agriculture-Based Social Enterprise (OABSE) program areas and generate livelihood management options thereof. It specifically deemed to 1.) Describe and understand the productive capital of each OABSE project area as a socio-ecological system, 2.) Assess the livelihood assets and capacities in terms of productive resource base, resource use and livelihood patterns, including vulnerabilities in the OABSE sites, 3.) Provide management and planning guidelines in the transition of farms from traditional to sustainable agriculture following organic agriculture technologies, 4.) Identify innovation entry points and research and extension needs of the community for building sustainable livelihoods and resilient communities. The methodological approach used was Participatory Rural/Rapid Appraisal. The respondent for this study is the Libon Cluster, specifically the barangays of Ponso, Sagrada Familia, Villa Petrona, Nogpo and Libtong.

The Libon cluster showed that the community is generally a rice farming community. The social access seemed to be advantageous but also a manifestation of low job opportunities and poor economic activities. Majority of the constituents were characterized as poor who cannot access financial capital support resulting to low human and physical capital. The results also showed that the individual physical capital was inaccessible due to the underutilized natural capital. In terms of Sustainability the results revealed that among the five barangays, Ponso demonstrated the highest sustainability rating due to a relatively higher level of productivity and social enterprise support from its local community. The other four barangays were found to demonstrate a fair sustainability rating. Except Libtong, which is an economically depressed community with lowest sustainability rating, the other barangays were well supported with common livelihood facilities, transportation and communication services. Generally, the study revealed that amidst climate change, Productivity and Profitability were the primary issues; and development options must be established which will reinforce the cluster's weak assets, specifically, the financial and human capitals.

Key words: productivity, livelihood analysis, sustainability



SPECIES OF BIVALVES AND GASTROPODS IN DASOL BAY

**Sotero M. Aban, Armando C. Garcia, Cornelia E. Ibarra, Rey S. Raguindin,
Rene B. De Vera and Dante M. Mendoza**

Pangasinan State University, Binmaley Campus, Binmaley, Pangasinan, Philippines
Email: **sotero_620@yahoo.com**

ABSTRACT

The municipality of Dasol borders Dasol Bay in the west of the province of Pangasinan which is surrounded by the eight coastal barangays. Because of its topography, the municipality of Dasol is known for its white sandy beaches. Residents of the coastal barangays depend mainly on the living marine resources of the Bay which include finfishes, crustaceans, molluscs, echinoderms, corals, seaweeds and seagrasses. Some of the most important resources found in the Bay are marine mollusc particularly the bivalves and gastropods. A survey was then conducted to determine the species of bivalves and gastropods of economic importance.

Result showed that there are 17 species of bivalves belonging to 11 families, and 26 species of gastropods from 16 families. It was observed that gastropods are more diverse in Dasol Bay than bivalves in terms of the number of family and species.

Result revealed that 35.3% of the total bivalve molluscs species identified were used as solely as human food while the other 64.7% were utilized both as human food and as raw materials for the shellcraft industry. For gastropod mollusks, only one species (3.85%) is being used as human food while 11 species (42.31%) are not edible but used as raw materials for the shellcraft industry alone, and 15 species 957.69% are utilized both as human food and raw materials for the shellcraft industry. The economic value of the combined number of bivalves and gastropods identified in the area shows that 7 species are utilized as human food only, 11 species are used in shellcraft industry and 26 species are utilized both in shellcraft industry and as food.

Key words: bivalves, gastropods, seashells, economic value



DIVERSITY AND DISTRIBUTION OF BATS DURING WET SEASON WITHIN THE SMALL-SCALE GOLD MINING AREA OF MASABONG, ROSARIO, AGUSAN DEL SUR, PHILIPPINES

Marian G. Ibarra, Rosalinda L. Olor, Gloria R. Valeroso, Sherryl L. Paz

Caraga State University, Ampayon, Butuan City

ABSTRACT

Caraga is one of the richest regions in Mindanao in terms of mineral deposits where mining operations proliferate. Although mining is known to be economically rewarding, it is also thought to be destructive to biodiversity in the region where wildlife studies are scarce. This research employed mist netting to determine the richness, diversity, trophic guilds, conservation status and geospatial distribution of bats across different habitat types (cultivated, agroforest and early secondary forest) within the small-scale gold mine site in Masabong, Barangay Bayugan 3, Rosario, Agusan del Sur. Ten Megachiropteran bat species were found in the area with a diversity of $H' = 1.55$. Early secondary forest had the highest richness (9) and diversity (1.79). Bat community structure was represented by 70% frugivores and 30% nectarivores. The low relative abundance of the vulnerable *Megaerops wetmorei* (0.02) and the near-threatened *Eonycteris robusta* (0.19) and the presence of six endemic species *Eonycteris robusta*, *Eonycteris spelea*, *Haplonycteris fischeri*, *Harpyionecterus whiteheadi*, *Ptenochirus jagori* and *Ptenochirus minor* implied conservation value of the area. The results suggest that such small-scale gold mine area needs conservation attention to mitigate further destruction of potential habitats for bats especially for the endemics and threatened species caused by mining, logging, land-use change and bat hunting. A thorough ecological study on bats and habitat relationships will yield more information and insights about the possible effects of mining on bat community dynamics and thus a scientific basis for the formulation of ordinances and policies that would mitigate the adverse impacts of mining on biodiversity.

Key words: Conservation, Diversity, Endemics, habitats



ASSESSMENT AND CHARACTERIZATION OF A LANDSCAPE IN RELATION TO ENVIRONMENTAL DEGRADATION IN SOUTHERN LEYTE, PHILIPPINES

Beatriz Cuevas Jadina

Visayas State University, Visca, Baybay City, Leyte

Email: bettyjadina@yahoo.com

ABSTRACT

Southern Leyte (SL) is one of the provinces of the Philippines which had its share of environmental disasters like the occurrence of massive erosion, earthquake, landslides and flooding. This study was conducted to assess and characterize the landscape in relation to environmental degradation in the area. Collection of secondary data and a field survey were done to document current environmental conditions and soil samples were collected and analyze following standard procedures.

Results showed a change in vegetation cover in the hills and mountains of the area which are current sites of landslides from 53 % forest cover in 1953 to 14 % in year 2010. Rainfall amount was noted to be abnormally high during disaster occurrences. Moreover, slope of the study site was steep (30 – 50°) to very steep (> 50°) and the soil series was generally classified as rough mountainous land and rough stony land. Analysis revealed that the soils in Southern Leyte were generally clayey to clay loam and acidic in pH.

Furthermore, human activities such as small scale mining, road construction and quarrying contributed to the occurrence of massive erosion and landslides in the area. These human activities aggravated the natural vulnerability of the province. Addressing environmental and land degradation is a challenge that needs to be addressed at the national level and which should trickle down to the local government units.

Key words: environmental degradation, land use, forest cover, landslides, soil properties



GAUGE ANALYSIS OF FORMALDEHYDE IN AIR IN SELECTED HOSPITAL-HISTOPATHOLOGY LABORATORIES, CAGAYAN DE ORO, PHILIPPINES

Jenny G. Jerusalem and Van Ryan Kristopher R. Galarpe

*Chemistry Department, Mindanao University of Science and Technology, Cagayan de Oro, Philippines
Email address: vanryangalarpe@gmail.com and jerusalem_jenny@yahoo.com*

ABSTRACT

The study focused on the occupational exposure of gaseous formaldehyde (HCHO) in selected hospital-histopathology laboratories in Cagayan de Oro. This was carried to gauge the potential levels of HCHO during gross-cutting period. Modified passive sample set-ups of 2,4-dinitrophenylhydrazine (DNPH) and DNPH-coated silica were used for air sample collection between 1h and 3h intervals and were analyzed spectrometrically. Infrared (IR) analysis for DNPH-coated silica sample showed relevant peaks of the known IR spectra of formaldehyde hydrazone: $1600-1636\text{ cm}^{-1}$ (C=N); $1000-1350\text{ cm}^{-1}$ (C-N); $2945-2900\text{ cm}^{-1}$ (aliphatic stretch); $3218-3080\text{ cm}^{-1}$ (NH-N); and $880-900\text{ cm}^{-1}$ (meta disubstituted aromatic). Generally, gaseous HCHO concentrations in three histopathology laboratories during its gross-cutting period exceeded the recommended exposure ceiling limits of USA-ACGIH and TWA of USA-OSHA (0.3-0.75 ppm). Absorbing efficiency of DNPH set-up was statistically different from that of DNPH-coated silica set-up. Increased concentration was observed for the 3h interval using DNPH-coated (0.933 ± 0.320 ppm (Hospital A), 0.802 ± 0.590 ppm (Hospital B), and 1.03 ± 0.360 ppm (Hospital C)). Thus, the installation of exhausts ventilation system was seen necessary to minimize occupational exposure.

CORRELATION STUDY OF FERTILIZER APPLICATION PRACTICES ON SOIL QUALITY AND YIELD OF POTATO IN THE TWO FARMERS' FIELD IN PAOAY, ATOK, BENGUET

Addisson Kyle B. La-ao

Benguet State University

ABSTRACT

This study was intended to identify the different fertilizer application practices implemented on the two farmers' field; determine the effect of the different fertilizer application on some physical and chemical soil properties; and determine correlation among the yield of potatoes, fertilizer application practices, and some soil properties in the two selected potato farms at barangay Paoay, Atok, Benguet.

Results indicate that the farmer at Farm 1 applied fertilizer at 210-210-210 kg NPK/ha in the form of 14-14-14, while the respondent at Farm 2 applied 190-190-190 kg NPK/ha in the form of 16-16-16. Both respondents applied 50 kg of manure in every 3 plots. The recommended treatment was applied with 140-140-140kgs of NPK/ha and 5 tonnes per hectare chicken dung. The highest Net Income was calculated from those applied with recommended fertilizers. There were no significant differences between the different fertilizer applications on the bulk density of the soil. However, the soil pH, organic matter, and nitrogen content increased using the farmers' practices and recommended rate of fertilizers in both farms. There were significant relationships between the soil bulk density, pH, organic matter, nitrogen, phosphorus, and the amount of fertilizers applied on the yield of potato. However, correlations between the amount of fertilizers applied and sub-surface N showed no significant relationship.

EVALUATION OF MANGROVE DAMAGE DUE TO SUPER TYPHOON YOLANDA (HAIYAN) IN THE LEYTE GULF AND EASTERN SAMAR, PHILIPPINES

Facundo Rey M. Ladio^{1,2}, and Geraldine O. Macawile²

¹Leyte Normal University; ²Leyte Samar Comprehensive Development Initiative, Inc. (LSCDI)
email: reyladio@gmail.com and macawilegeraldine@yahoo.com

ABSTRACT

Mangrove forests are one of the most threatened ecosystems in the Philippines due to land use conversion of naturally occurring mangrove areas for different anthropogenic activities. Yet mangroves also sustain damage from natural causes. A most notable natural cause of destruction to mangroves and other natural habitats is the series of typhoons that annually passes through the Philippines. But Typhoon Yolanda (Haiyan) late last year seems to be too much not just for humans but for the mangroves of Eastern Visayas, as well. There are at least two categories of damage that mangroves sustained. One is from the wind that resulted in defoliated and broken branches of mangroves that led to around 10% mortality in areas where storm surge did not inundate the mangrove areas. The second is the storm surge that has defoliated, broken branches and uprooted many mangrove species in areas where it flooded. The second category actually has the combined effect of both the storm surge and wind in many mangrove areas in Leyte Gulf and Eastern Samar that led to almost 50% mortality for many species.

Key words: Mangrove damage, mortality, Typhoon Yolanda (Haiyan), Leyte gulf, Southern Samar

PHILIPPINE-ENDEMIC AND MINDANAO-ENDEMIC BIRD COMMUNITY WITHIN AND THE SURROUNDING ENVIRONS OF A SMALL-SCALE GOLD MINING SITE OF MASABONG, BAYUGAN 3, ROSARIO, AGUSAN DEL SUR, PHILIPPINES

Sherryl Lipio-Paz¹, Fe Colas² and Aiza Calub²

*Division of Environmental Science, Department of Natural Sciences¹; Department of Biology², College of Arts and Sciences, Caraga State University, Ampayon Butuan City
Email ad: sheter29@yahoo.com*

ABSTRACT

There is paucity of studies on endemic birds and habitat associations on Mindanao specifically in Caraga region where mining operations proliferate. It is indeed necessary to study on how endemics are affected by vegetation and land use changes to determine appropriate conservation measures. Hence, in this research, the Philippine-endemic and Mindanao-endemic bird community was investigated in the first ever legalized small-scale gold mine site in Masabong, Rosario, Agusan del Sur and its surrounding areas using eight-minute fixed radius point counts. Habitat variables like vegetation structure, elevation, distance to disturbance and water systems were included. Endemic bird community ordination using Canonical Correspondence analysis was used to determine the influence of the selected habitat variables on the endemic bird community. A total of 44 Philippine-endemic (4 threatened) and 9 Mindanao-endemic birds (4 threatened) were observed in the area with an overall diversity of $H' = 1.62$. Bird community ordination shows that most of the endemics especially the threatened ones prefer to be in more mature forests which are distant from anthropogenic disturbances. The study suggests that the area needs conservation attention. Proper regulation of mining activities, human encroachment and agricultural expansion must be prioritized to conserve the preferred habitats of the threatened endemics.

Key words : birds, threatened, ordination, mining



IDENTIFICATION OF *ASPERGILLUS* SECTION *FLAVI* IN PHILIPPINE PEANUTS THROUGH MORPHOLOGICAL CHARACTERIZATION AND REP-PCR DNA FINGERPRINTING

J. S. Luis¹, Jm S. Luis², A.E. Glenn³ and R.C. Kemerait, Jr.⁴

¹Benguet State University, La Trinidad, Benguet, Philippines; ²University of Georgia, Georgia, USA; ³R. B. Russell Research Center, United States Department of Agriculture, Athens, Georgia, USA

ABSTRACT

The genus *Aspergillus* section *Flavi* is very important in agriculture due to the ability of its species to produce aflatoxin in both pre-harvest and post-harvest of susceptible crops. The pre-harvest aflatoxin has been proven to be managed with the use of naturally soil-inhabiting non-aflatoxigenic strains that compete with aflatoxigenic strains as in the cases of Aflaguard in the USA and Aflasafe in Africa. With the goal of searching for non-aflatoxigenic strains, this study aimed to characterize 16 isolates in stored peanuts from Isabela, 4 isolates from Mountain Province, and 2 isolates through morphological characterization and rep-PCR DNA fingerprinting. Morphological characterization showed observable differences of isolates in colony surface and reverse colors and color of sclerotia and but no obvious differences in conidial wall texture and growth diameter when grown in Czapek Yeast Agar (CYA) in 7 days at 34°C. All isolates conformed to the morphological characterization of *A. flavus* which coincided with the results of rep-PCR DNA fingerprinting using the Diversilab system.

Key words: *Aspergillus flavus*, aflatoxin, Aflaguard, Aflasafe, CYA, sclerotia, conidia, rep-PCR

LAND USE PATTERN ANALYSIS IN ARGAO RIVER WATERSHED RESERVE (ARWR)

Archiebald Baltazar B. Malaki

Faculty, College of Forestry; Cebu Technological University
Argao Campus, Cebu, Philippines

ABSTRACT

ArcInfo was used to generate the land use map of ARWR. Two landscape indices were used in quantifying the existing land uses including the number of forest patches and patch shape irregularity. Three land uses were generated namely: cultivated, forest and built-up areas. Cultivated areas cover 45.4%, followed by forests at 40.16% and finally built-up areas covering 14.4% of the watershed. For the landscape index calculation, forests got the highest patch number at 19,992, followed by cultivated areas at 18,089 and built-up areas at 9,249. Finally, the shape index for the cultivated areas is 1.53, followed by forest and built-up areas at 1.39. These values suggest that ARWR is a fragmented watershed with patch shape that is considered irregular.



SPACE OBSERVATION OF CARBON DIOXIDE CONCENTRATIONS (XCO₂) OVER THE PHILIPPINES: SETTING STRATEGIES FOR CLIMATE CHANGE MITIGATION/ADAPTATION

Ryan Padilla Manuel

*College of Forestry, Nueva Vizcaya State University, Bayombong, Philippines
nayrleunam@yahoo.com*

ABSTRACT

In 2002, the remote sensing instrument Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) was launched into space via the European Space Agency Environmental Satellite (ESA-ENVISAT). SCIAMACHY is currently the only remote sensing instrument capable of measuring XCO₂. XCO₂ refers to the column-averaged mole fraction of CO₂, derived by dividing the number of CO₂ molecules by the number of oxygen molecules as proxy for air.

This study pioneers observation of Philippines' local, air-column CO₂. It employs SCIAMACHY level III dataset covering years 2003 to 2005. The dataset used in this study has a spatial and temporal resolution of 0.5° X 0.5° (gridded) and one month. Mapping of XCO₂ annual concentrations was performed to visualize and interpret data. Four key areas were pinpointed to further describe XCO₂ in the country: Manila, Davao, Bayombong (Nueva Vizcaya) and Catarman (Samar). Further, the author used time series (36-point) to determine seasonality in XCO₂ for said period. The SCIAMACHY dataset was further analyzed and compared with CO₂*in-situ* data of NOAA's Mauna Loa (Hawaii) Observatory.

Despite the strict requirements of SCIAMACHY filtering algorithms, substantial data were obtained for use in the study. Mean XCO₂ for Philippines is 376.62ppm. High concentrations of CO₂ (385 – 395 ppm) were seen consistently throughout the months in urbanized areas such as Manila and Davao. Meanwhile, moderate to above-moderate concentrations (365-375-385 ppm) were observed for rural areas and the rest of the country. From 2003 to 2005, CO₂ concentrations rose by 2.025%, with the highest record in November 2005 at 395.26 ppm. Maps and time series graph showed fluctuated XCO₂ levels at various parts of the country and at certain months, but without distinct seasonality, but found at par with the rising CO₂ trend of Mauna Loa's dataset. Various anthropogenic factors were put forward as contributory to natural sources of carbon dioxide. On the national scale, environmental managers can pinpoint priority areas for reducing or sequestering carbon emissions. This can be further supplemented of local government by instituting case-appropriate policies and strategies for adaptation and mitigation.

Key words: Carbon Dioxide, SCIAMACHY, Philippines



AQUATIC MACROINVERTEBRATES AS INDICATORS OF POLLUTION IN BAROBBOB AND NAGSABARAN STREAMS OF NUEVA VIZCAYA USING THE HILSENHOFF FAMILY BIOTIC INDEX

Ryan Padilla Manuel

Nueva Vizcaya State University

ABSTRACT

Aquatic macroinvertebrates are considered ideal bioindicators of stream conditions because of their feeding roles and life requirements in freshwater ecosystems. Hilsenhoff Family-level Biotic Index (FBI) is a stream bioindicators assessment method that assigns pollution tolerance values to various taxonomic macroinvertebrate families. Two human-affected streams in Nueva Vizcaya, namely Barobbob and Nagsabaran were studied using FBI. The number of benthic organisms collected at Barobbob and Nagsabaran were 106 and 114 (Table 2). The total collection for both streams registered 14 different taxa in 12 families and 2 orders. Most abundant was Heptageniidae (Scrapers; Order Ephemeroptera), with 44 individuals for Barobbob and 63 in Nagsabaran. Shredders constitute 10.38% and 12.28% of total samples for Barobbob and Nagsabaran. FBI for Barobbob registered at 3.31, indicating that organic pollution is unlikely, while FBI for Nagsabaran, 3.86 suggesting possible slight organic pollution. Ocular characterization of the areas' vegetation and geomorphology can be related to the presence/absence of the bioindicators. Because of the simplicity of the method for FBI, community people who are not well-versed in ecology and related sciences, can be engaged, and by combining FBI with other physico-chemical analyses, macroinvertebrate-based assessment and monitoring can raise deeper insights about the health of stream ecosystems.

Key words: Watershed, Stream Ecology, Macroinvertebrates, Benthic, Hilsenhoff, FBI, Barobbob, Nagsabaran, Nueva Vizcaya

CHARACTERIZATION OF FISH AND MACRO INVERTEBRATES SPECIES POPULATION IN SIBONGA AND CARCAR, CEBU, CENTRAL PHILIPPINES

Mario S. Marababol¹ and Ferdinand T. Abocejo²

¹*Ocean Care Advocates, Inc. and Department of Tourism, Cebu City*

²*Center for Research and Development, Cebu Normal University, Cebu City*

ABSTRACT

This study assessed the fish and macro invertebrate's compositions of the reef in Sibonga, Cebu, Philippines. It determined the status of coastal resources on fishes and macro invertebrates and identified various anthropogenic impacts on the reef following the Reef Check Protocol. Biophysical characterizations were also done during the study. A total of thirty (30) fish families were observed and recorded in all 3 survey sites at 2 different depths. A total of 454 species were recorded in all 3 sites with a total of 3,500 counted individuals. Damsel fishes (*Pomacentridae*) registered the highest number of 170 species. Topographically, shallow areas are mostly covered with sea grasses, silt and other non-living substrate due to the construction of illegal and unregulated structures which reveal the remnants of destructive and other illegal fishing activities in the area. The study concludes that limited number of fish species and macro invertebrates is brought about by overfishing and lack of enforcement of fishery laws. There is a need to intensify and enforce fishery laws together with active participation of the community. Identification, delineating and designing areas for seaweed farming, marine protected area establishment, fishing area and eco-tourism activities.

Key words: Macro invertebrates, overfishing, seaweed farming, Reef Check Protocol, anthropogenic impact, siltation

INFLUENCE OF NUTRIENT LOAD ON THE AQUATIC LEAF LITTER DECOMPOSER COMMUNITY

RM Mendoza, DEM Husana and CGB Banaay

Environmental Biology Division, Institute of Biological Sciences, CAS, University of the Philippines Los Banos

ABSTRACT

The use of macroinvertebrates as indicators of the degree of pollution in the two segments of Molawin Creek: along the Makiling Botanical Garden (BG) and along the Student Union Building (SU) was tested. The calculated biotic index of the macroinvertebrates collected using leaf litter baiting showed that the water quality of the BG segment is fair and the degree of organic pollution is fairly significant. On the other hand, the SU segment was found to have fairly poor to poor water quality and the degree of organic pollution was very significant. These findings were supported by other parameters, namely – nutrient concentrations of the stream water, most probable number (MPN) of coliforms and biological oxygen demand (BOD). The nutrient concentrations showed that the SU segment of Molawin Creek is eutrophic with 0.226 mg L⁻¹ total phosphorus and 0.848 mg L⁻¹ nitrogen nitrates while BG has only 0.08 mg L⁻¹ total phosphorus and nitrogen nitrates was not detected. Water samples from SU segment had 9400 MPN mL⁻¹ coliforms while BG had 35 MPN mL⁻¹ coliforms indicating the greater fecal contamination in SU than in BG. Lastly, the BOD was significantly higher ($p < 0.05$) in SU than in BG. All the parameters are consistent with the biotic index indicating that SU has greater degree of organic pollution than BG. The effect of organic pollution to leaf litter decomposition was also determined. The ratio of exponential decay rate of SU to BG shows that there is already an indication of at least a moderate impairment of function in the SU segment which is probably due to the high levels of organic pollution as indicated by the macroinvertebrate biotic index. These results showed that macroinvertebrates are useful indicators of organic pollution in streams and that leaf litter decomposition parameters may complement the data obtained from the more established structural metric of macroinvertebrate diversity.



MICROHABITAT AND DIVERSITY OF REPTILIAN SPECIES IN AGUSAN MARSH BUNAWAN, AGUSAN DEL SUR, MINDANAO, PHILIPPINES

Meconcepcion M. Ngilangil and Lilia Z. Boyles

Graduate School, Caraga State University, Ampayon, Butuan City, Mindanao, Philippines

ABSTRACT

The study *Diversity and Microhabitat of Reptilian Species in Agusan Marsh, Bunawan, Agusan Del Sur, Philippines* was concerned about biodiversity threats among reptiles which are becoming endangered or worst extinct. This study was the first systematic investigation of reptile species on the marsh. This study aimed to conduct a systematic study on reptiles in Sago swamp and Terminalia forest, Agusan Marsh. The methods used were a combination of quadrat method, pitfall trap and opportunistic during September to December 2013. The study found out that eleven (11) species belonging to seven (7) families, with a total of two hundred thirty seven (237) individuals were documented in both sampling sites. Five species were recorded as Philippine endemic namely; *Hydrosaurus pustulatus*, *Naja philippinensis*, *Draco quadrasi*, *Tropidophorus davaoensis* and *Tropidophorus misaminius*. Among the five endemic species, *Tropidophorus davaoensis* and *Tropidophorus misaminius* were Mindanao endemic. The species most commonly encountered in the study was *Hemidactylus frenatus* followed by *Tropidophorus davaoensis*. Both sampling sites documented high diversity and more or less even distribution. The most common microhabitat of reptiles were human-made objects or houses, tree trunk, and under rotting logs followed by agricultural areas or clearings, moist soil and small streams. Despite the exceedingly small land coverage, the Sago swamp and Terminalia forest were confronting threats due to unprecedented human activities such as land conversion to agricultural land, deforestation, *kaingin* and hunting of wildlife vertebrates for food consumption and pet trade. Thus, conservation action is essential to protect and preserve biodiversity in the entire Agusan Marsh.

Key words: Reptilian species, biodiversity, microhabitat

THE EFFECTS OF EFFECTIVE MICROORGANISMS ON SOIL PHYSICAL AND CHEMICAL PROPERTIES

Leonora E. Ngilangil and Desiree A. Vilar

Faculty Members, Institute of Environmental Studies, Don Mariano Marcos Memorial State University, Bacnotan, La Union

ABSTRACT

The use of effective microorganisms (EM) technology is rapidly gaining popularity not only in agricultural development but also in environmental management. In this study, formulated EM from fish amino acid and lactic acid bacterial serum were used as drenched water to a marginalized soil. With the objectives of determining the change in the physical and chemical properties. Results revealed that there is a significant change on the physical and chemical properties of the soil as reflected in the soil analysis before and after the treatment.

It is recommended that identification of specific microorganisms or group of microorganisms, including their numbers/populations should be done.

Key words: effective microorganisms, drench, fish amino acid, lactic acid bacterial serum, soil

ISOLATION AND CHARACTERIZATION OF ARBUSCULAR MYCORRHIZAL FUNGI (AMF) ASSOCIATED WITH WILD LEGUMES AND COGON GRASS

PRECELITA L. OSILLOS¹ and ASUNCION L. NAGPALA²

¹College of Arts and Sciences, Don Mariano Marcos Memorial State University, South La Union Campus, Agoo, La Union Email: precy_osillos@yahoo.com; ²Department of Plant Pathology, College of Agriculture, Benguet State University, La Trinidad, Benguet

ABSTRACT

This study was conducted to isolate and characterize the AMF associated with the wild legumes and cogon grass found in the soils of DMMMSU-SLUC, Agoo, La Union. AMF present in the rhizosphere soil and roots of wild legumes and cogon grasses were trapped in corn then isolated through wet sieving and manual picking. Using the INVAM spore data and the taxonomic key as references, identity of the AMF isolates were ascertained morphologically based on spore shape, size, color, complexity of spore wall, and shape of vesicles. Roots were stained to assess colonization while physical and chemical properties of the soil were evaluated through soil analysis. Results showed that AMF associated with wild legumes and cogon grass belong to the family Acaulosporaceae, Gigasporaceae and Glomaceae. The identified AMF resembled *A. morrowiae*, *A. laevis*, *A. mellea*, *A. scrobiculata*, *Gi. margarita* and one unidentified species under family Glomaceae. *A. laevis* together with *A. morrowiae* were abundant in the trap soil. The AMF associated with *C. pubescens* Benth. had the highest colonization rate. Soil analysis showed that these fungi thrived in a slightly acidic Sandy Clay Loam soil with low moisture content, moderate amounts of Organic Matter, Phosphorus and Potassium.

Key words: AMF, wet sieving, Acaulosporaceae

COPPER CONCENTRATION IN MOLAWIN CREEK, U.P. LOS BAÑOS: DETERMINATION BY ATOMIC ABSORPTION SPECTROSCOPY AND VISUALIZATION OF THE DYNAMICS OF CONCENTRATION AS WATER FLOWS

¹Elmer A. Polintan, ^{1,2}Jose Rene L. Micor, ^{1,3}Arian J. Jacildo, and ³Jaderick P. Pabico

¹UPLB Bee Program, ²Institute of Chemistry, and ³Institute of Computer Science
College of Arts and Sciences, University of the Philippines-Los Baños, Laguna

ABSTRACT

Copper concentrations in water samples taken from eighteen strategic spots of Molawin Creek, Los Baños, Laguna were determined using replicated atomic absorption spectrophotometry. The eighteen spots were spatially distributed from upstream to downstream of the creek, but within the administrative management of UP Los Baños. Relatively high copper concentration was measured at midstream (spot 11) and downstream (spot 18) compared to the other 16 spots, which could be attributed to the observed effluent of two untreated sewer-flood drain combinations located upstream of these two spots. Copper concentration has a peak of 4.0761 mg/L and averaged 0.5610 mg/L along the creek within the 18 spots. This average is higher than the maximum allowable copper concentration in fresh water set by the Department of Environment and Natural Resources. Using the measurements from the 18 spots as basis data coupled with the profile and elevation of the creek, the temporal and spatial dynamics of the copper concentration as the water flows from upstream to downstream was visualized using a multi-agent based visualization and modeling framework. The visualization helps locate where copper tend to concentrate and diffuse along the creek, as well as identifies the effect of the presence and absence of untreated sewer-flood drains.

Key words: Copper concentration, Molawin Creek, atomic absorption spectroscopy, concentration dynamics visualization, multi-agent modeling



ECOTOXICITY EVALUATION OF LAKE BUHI, CAMARINES SUR USING PROLONGED ZEBRAFISH (*Danio rerio*) EMBRYO ASSAY

Joseph Martin Q. Paet

Biology Department, College of Science, Bicol University, Albay, Philippines,
E-mail: j0martin_animeir@yahoo.com

ABSTRACT

Lake Buhi is an indispensable freshwater resource which plays major roles in the economy of the locality (e.g. aquaculture production) and as an ecosystem to myriad of its valuable denizens (e.g. *sinarapan*). Concomitant to its continued utilization, several reports have showed that its water quality has been deteriorating yet routine monitoring reveals that parameters are still within normal range. Disputatively, a more substantial approach for its appraisal is possible through the use of sensitive biomarkers such as zebrafish (*Danio rerio*) in a prolonged embryotoxicity assay. There from, collection of water samples from five randomly established sites was conducted (September 2013) and tested upon. Lethality test showed promising results, suggestive of the appropriate Class C status given to the lake. However, major developmental defects including induced eye growth were eventually observed. Highly significant developmental malformation indices per treatment and zonation were observed reflective of the presence of teratogens that is normally below detection level. Furthermore, significant retardation on the rate of embryogenesis per zonation was also observed. Significant findings are consistent with the histological sections of the juvenile fish's eyes which showed induced growth of tissue layers. Thus, results alarmingly demonstrate the presence of toxics that may go undetected.

Key words: Lake Buhi, zebrafish, prolonged embryotoxicity assay, ecotoxicology, congenital malformations

WATER QUALITY EVALUATION OF NAM XONG RIVER IN VANGVIENG DISTRICT, VIENTIANNE PROVINCE, LAO PEOPLE'S DEMOCRATIC REPUBLIC

Keosangkhom Phommaseng¹ and Carmelita M. Rebancos²

¹Pollution Control Division, Ministry of Natural Resources and Environment, Lao People's Democratic Republic;

²School of Environmental Science and Management, UPLB, College, Laguna

ABSTRACT

The study was conducted to evaluate the water quality of Nam Xong River in Vientianne province. Three sampling sites were established: upstream, mid stream and down stream. The parameters analyzed were water temperature, pH, electrical conductivity, turbidity, dissolved oxygen, biochemical oxygen demand, total nitrogen, total phosphorous and fecal coliform. The results of the analysis of the water quality shows that all nine water quality parameters are within the water quality established by NES-Lao Environmental Quality and Current Major Issues in Lao PDR that Concluded that "Water quality throughout the country as well as the Mekong River generally varies between very good and good quality. The probability of identifying and implementing a Sustainable Management Strategy for Nam Xong River will be high.

Key words: Nam Xong River, water quality

ROLE OF LIGHT SPECTRUM IN INDUCING PHENOTYPIC PLASTICITY IN *Hoya albida* KLOPPENBURG, SIAR, CAJANO AND CARANDANG 2012

¹Rubyann Robelle L. Polido, ²Faith S. Maranan and ³Jennelyn M. Carandang

^{1,2}Environmental Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Banos, College, Laguna, ³ Institute of Plant Breeding, Crop Science Cluster, College of Agriculture, University of the Philippines Los Banos, College, Laguna

ABSTRACT

The ability of *Hoya albida* to express plasticity in its vegetative traits was investigated in this paper. In order to determine this, nine samples (P1 to P9) of the plant were exposed to different light spectra (white, red and blue) for seven weeks at 12-hour day-night photoperiod. Possible morphological and anatomical changes in the plant were recorded. These include floral morphology, shoot length, and leaf parameters such as number, color, thickness and anatomy. Data on floral morphology only presents a summary of measurements of six flowering periods since the flowers did not initiate once they were in the treatment. Likewise, application of flower inducer resulted to production of leaves instead of flowers. Increases in both shoot length and leaf number was both evident in pots exposed to white light. This could have been the result because of the collective action of red and blue light contained on the broad spectrum of white light. However, changes in leaf color were not that apparent. There was no significant difference in leaf thickness among treatments but a significant difference seen in P8 exposed to white light. Data on the leaf thickness and mesophyll thickness of the plant showed a relatively thick palisade mesophyll layer (142.60-229.91 μm), undifferentiated palisade and spongy tissues and reduced intercellular air space.

LEVEL OF NITROGEN IN WATER HYACINTH (*Eichhornia crassipes* [Mart.] Solms) IN SELECTED LAKESHORES OF LAKE MAINIT

Ivy Mae Batoon, Laverne Lyn Odchigue, Jessa Salvador, and Chime Mora-Garcia

Department of Natural Science, Caraga State University, Butuan City, Philippines

ABSTRACT

Water hyacinth (*Eichhornia crassipes* [Mart.] Solms) has been widely deemed as a vexatious hydrophyte plant. In Lake Mainit, the proliferation of this plant was very evident especially in lakeshores near to rice fields. Field measurements were done to determine and compare the level of total nitrogen accumulated by the water hyacinth in areas with and without rice fields. Some physico-chemical properties of the water in the lake were also measured to correlate with the total nitrogen level of the water hyacinth in the different sampling sites. Three sampling sites were selected from the lakeshores of Lake Mainit to compare the results of the measurements. The sample analyses showed that there is no significant difference ($p>0.05$) between the concentration level of the total nitrogen accumulated by the water hyacinth samples in areas with and without rice fields. However, the level of total nitrogen in water hyacinth in areas with rice field is higher (1.176%) compared to area with no rice field (1.163 %). Nitrogen level in water hyacinth in the different sampling sites have very low correlation with pH (0.295), total dissolved solids (0.168), and conductivity (0.166) and have no correlation with temperature (-0.069), dissolved oxygen (-0.056), and resistivity (-0.025).

Key words: water hyacinth, water quality, nitrogen, rice field, and lake



LINE LOSS REDUCTION IN ELECTRICITY DISTRIBUTION USING BINARY INTEGER LINEAR PROGRAMMING

Ma. Leah Zilpah M. Jacela¹, Julius H. Sayseng², and Prof. Rey Bryan M. Cubero³

¹UPLB Mathematical Student Society; ²UP CABALLEROS; ³U.P. Los Banos

ABSTRACT

For years, massive increase in electricity consumption and demand occurs in the Philippines. According to a recent study, electricity demand is projected to have an annual increase of 5.1 %. However, electricity supply is projected to increase for just about 1.18% every year. The higher percentage of demand over supply will lead to shortage.

System loss is one of the factors that are involved in electricity shortage. It is the amount of electricity loss during the transmission and distribution of electricity. It is classified into technical and non-technical losses. In technical losses, line loss, electricity loss in the cables during the distribution process, shares the biggest part. With this, this study addresses the problem of electric distributors especially electric cooperatives in minimizing line loss. With the use of Binary Integer Linear Programming the most appropriate wire to be used in a certain area with respect to the budget constraint is selected to minimize line loss. The findings indicate that using the formulated Binary Integer Linear Programming model as the new lining system, line loss is minimized while budget constraint has met and electricity has been conserved.

Key words: Electricity Distribution, System Loss Minimization, Line Loss Minimization, Energy Conservation

VISUALIZATION OF THE UPTAKE OF PESTICIDES IN COMBINATION WITH ADJUVANTS THROUGH CONFOCAL LASER MICROSCOPY

Pieter Spanoghe¹ and Chime Mora-Garcia²

¹Department of Crop Protection, Faculty of Bioscience Engineering, Universiteit Gent

² Department of Natural Science, Caraga State University, Butuan City

ABSTRACT

Efficiency of the pesticides in combination with adjuvants can be determined through its uptake in the plant leaves or roots using confocal laser scanning microscopy which can provide evidence of the presence of pesticides in the plants. Oregon Green which has similar properties with some pesticides serves as the substitute since only fluorescent compounds can be visualized under the scanning microscope. Different types of adjuvants including bond, ethomeen T/25, silwet L-77, and softanol 70 were used in this study. The images obtained were observed and compared using the Image J image analysis software. Images obtained from the confocal laser scanning microscope showed that silwet L-77 in combination with Oregon Green was significantly different from the control. This may indicate that penetration rate using silwet L-77 is faster allowing lower peaks during observation since most of the fluorescent dyes may have already diffused into the lower part of the leaf. Adjuvants bond, ethomeen T/25, and softanol 70 were not significantly different from the control. This suggests that combination of adjuvants and pesticides will most likely cause an increase in uptake of pesticide into the leaf if the pesticide used is water soluble mixed with a hydrophilic adjuvant.

Key words: leaf uptake, adjuvants, Oregon Green, confocal laser scanning microscopy



SPECIES DISTRIBUTION AND ABUNDANCE OF AMPHIBIANS USING GEOGRAPHIC INFORMATION SYSTEM MAP IN AGUSAN MARSH

Rainer P. Sularte and Lilia Z. Boyles

Graduate School, Caraga State University, Ampayon, Butuan City, Mindanao, Philippines

ABSTRACT

Agusan Marsh is the 1009th RAMSAR site, a wildlife sanctuary which harbour unique and pristine faunal species, and considered one of the most ecologically significant wetland ecosystems in the Philippines. This study assessed species distribution and abundance using Geographic Information System in Agusan Marsh between *Sago Palm* and *Terminalia* Forest. Results showed a total of three hundred twenty two (322) individuals, 11 species and six (6) families of amphibians documented. Of the 11 species of amphibians documented in *Sago Palm* and *Terminalia* Forest, six species were Philippine endemics, three amphibian species were categorized as non-endemics and 2 species of amphibians were Invasive species in the area. *P. leucomystax* was commonly found in arboreal microhabitat type (*Tree Ferns*, *Trunks of the tree* and *Dead woods*) and *O. annulata* inhabit mostly under the leaves of *Pandanus spp.* and *Araceae* family while other amphibians were considered as substrate-dweller. *H. rugulosus* and *R. marina* were found both in *Sago Palm* and *Terminalia* Forest categorized as invasive species in the area. *Terminalia* forest had the highest number of individuals documented during the conduct of the study. *Sago Palm* and *Terminalia*. Forest have almost the same type of vegetation where amphibian species thrive most. Furthermore, ecological and environmental threats (conversion of *Terminalia* forest to agricultural land, run-off of environmental pollutants and *Kaingin*) being identified in the two habitat types must be given urgent attention. Finally, this is very clear that Agusan Marsh particularly *Sago Palm* and *Terminalia* Forest still harbour unique features of endemic amphibian species.

Key words: Amphibians, *Sago Palm*, *Terminalia* Forest, Agusan Marsh



PRELIMINARY STUDY ON BIODIVERSITY LOSS ASSESSMENT, UTILIZATION AND CONSERVATION OF INDIGENOUS FOOD CROPS IN THE CORDILLERA ADMINISTRATIVE REGION (CAR)

Belinda A. Tad-awan, Esther Josephine D. Sagalla, Ritcher B. Batalao

*Higher Education Regional Research Center
Benguet State University, La Trinidad, Benguet*

ABSTRACT

Continuous conservation of indigenous food crops and their landraces needs to be done to prevent biodiversity loss, maintain a gene pool, and mitigate climate change. With the objective of assessing diversity loss of indigenous food crops (IFCs) and conserving these in gene banks, the study was conducted in the six provinces of CAR.

The study started with a survey using a structured questionnaire consisting of potential indicators for biodiversity loss. Prior to the collection trips, verbal and written permissions were given to the researchers by the local government units. A total of 221 respondents were interviewed and invited for focus group discussions.

The key informants reported that cultivation and utilization of IFCs were an integral part of their daily living passed on from generation to generation. Most of the informants strongly agreed that IFCs could be sources of income, provide more food and have cultural significance used in rituals.

Most of the key informants perceived that loss of IFCs is caused by the introduction of new varieties. There were 274 indigenous crop varieties lost in CAR. A high percentage of loss was reported among the traditional varieties of rice (168), sweet potato (57), and legumes (21).

A total of 524 IFCs were collected. Most of the crops were grain crops (e.g. rice and legumes). Existing traditional storage practices documented are the use of 'sooan', plastic bags, small baskets, bottles and cans. For the rice varieties, 'sooan' is mostly used. 'Sooan' is a place where harvested rice is dried beneath the traditional kitchen.

Key words: indigenous food crops; biodiversity loss; conservation; Cordillera

ORGANIC FERTILIZER ON PECHAY HOMEGARDEN

Mosib M. Tagotong, Onofre S. Corpuz and Pendatun E. Dalam

ABSTRACT

This study aimed to determine the kinds and level of organic fertilizer gave favorable growth and yield on pechay planted at Katipunan, Arakan, Cotabato. The Organic fertilizers used were manure (Carabao and Goat) and Fermented Plant Juice (FPJ) and Fermented Fruits Juice (FFJ). Result of the study revealed that among the animal manure used, goat manure was found better on the three parameters tested such as height, number and weight of leaves. In the case of fermented plant application it was observed that (FPJ) excelled only on the plant height while FFJ found to have better effect on the number of leaves and weight of pechay. Having all the kinds and levels of organic fertilizers used it was noticed that Fermented Fruit Juice at the rate of 6tbsp/lit. of water was known to be excellent in all parameters tested.

Key words: Organic fertilizer, animal manure, fermented plant juice, fermented fruit juice

PLANT DIVERSITY AND CARBON STOCKS ASSESSMENT OF BENGUET PINE (*Pinus kesiya*) IN BUSOL WATERSHED AND FOREST RESERVE

Christopher J. Tapnio

University of Baguio, General Luna Rd., Baguio City

ABSTRACT

Busol watershed and forest reserve in the province of Benguet is the second largest water source for Baguio City and is listed as number four in the List of Protected Areas in the Philippines. Since forest ecosystems play crucial roles in mitigating climate change impacts as carbon sinks, the study measured the abundance of *Pinus kesiya* (Benguet Pine), quantified its potential carbon stocks, and assessed phytodiversity in its understorey vegetation. Standard field measurements were used to measure its abundance. Carbon stocks were measured based on the nested sampling plot developed by Hairiah *et al.* (2001) and was computed from its biomass using allometric equations. Results showed that *P. kesiya* with dbh=30 cm. is still abundant within the watershed with 65 trees per hectare. Biomass density of *P. kesiya* was measured at 139.54 Mg/ha. Total carbon stocks is pegged at 77.58 MgC/ha, which includes aboveground biomass of *P. kesiya* (62.80 MgC/ha) and the understorey vegetation (2.48 MgC/ha), and belowground biomass (12.26 MgC/ha, excluding soil carbon). Diversity was very low ($H' = 1.270$) with a total of 8 species recorded mostly coming from the *Poaceae* or the true grasses family. Regardless of this, Busol watershed and forest reservation shows great potential to sequester atmospheric carbon and contribute to mitigation measures against climate change. It is recommended that a concerted effort from all sectors of the society must be done to ensure protection and preservation of the watershed.

Key words: *Pinus kesiya*, carbon sequestration, carbon sink, climate change, diversity



PREVALENCE OF *Enterobius vermicularis* IN THE PROVINCE OF ALBAY, PHILIPPINES

**Jeffrey A. Toledo¹, Ma.Carmela L. Loares¹, Ma.DonnaZaira M. Acebar¹,
Mark R. Villanueva¹, Nikko B. Ciruelos¹, Valerie Mae M. Marbella¹,
Richelle M. Moral¹, Rhomeneo L. Verzosa¹, Salvacion B. Rafanan²,
Mae Ai P. Sauro², John Alfred N. Llano²
and Ma. Teresa A. Mirandilla,¹**

¹Biology Department, College of Science Bicol University, Albay, Philippines

²College of Nursing Bicol University, Albay, Philippines

.ABSTRACT

The study was conducted to investigate the prevalence of *Enterobius vermicularis* or pinworm infestation among children ages 3 to 10 years old in the rural and urban areas in the Province of Albay and correlate the infestation in terms of socio demographic characteristics, knowledge of parents, hygiene practices and symptoms of the infection.

Ten (10) percent of the total barangays in each municipality were considered as sampling areas, that both equally represented the urban and rural areas, with 10% of the total population in each sampling areas. Cellulose tape method was employed in the study in collecting samples early in the morning before the children take a bath and defecates. Survey was also conducted for the socio demographic factors in the infestation of pinworm. A total of 2202 children ages 3- 10 years old were examined and 676 or 30.7% were found to be infected with pinworm. Chi-square analysis revealed that the area where the children reside in terms of district ($P=0.081$), the age ($P=0.000$), the educational status of the father ($P=0.028$) and the number of children in the family ($P=0.000$) were found significantly related to pinworm infection in the Province of Albay. Other socio demographic factors and hygienic practices of the respondents were not significantly related with the infestation of pinworm.

The total prevalence rate of pinworm infection in the Province of Albay is 30.7% with a 676 positive cases out of the 2202 respondents. District, age, educational status of father and the number of children in the family were found significantly related in pinworm infection in the Province of Albay. Other socio-demographic factors and hygienic activity of respondents were found not to be significantly related to pinworm infection to the children ages 3-10 years old in the sampling area.

Key words: *Enterobiusvermicularis*, prevalence, infection, Socio-demographic factors

TEMPORAL POPULATION ANALYSIS OF LEPIDOPTERANS (BUTTERFLIES SPECIES) IN THE NORTHWESTERN SLOPE OF MT. ARAYAT

Evelyn V. Totaan^{1*}, Ma. Margarita Hayna N., Caballero¹, Jacqueline V. Bagunu¹
and Darwin E. Totaan²

¹Department of Natural Sciences, Institute of Arts and Sciences, and ²Department of Agroforestry and Forestry, Institute of Agriculture Systems and Technology, Pampanga Agricultural College, Magalang, Pampanga

ABSTRACT

The study was conducted to find out if there are fluctuations in the number and kind of butterflies through time as affected by different environmental factors. Specifically it aimed to determine the significant differences of the diversity indices of the identified species of butterflies from 2001-2011.

Among the diversity indices, the numbers of individual, density, dominance, and relative frequency have shown significant differences through time. There were more species and individuals of butterflies collected from 2001 than from 2010 and 2011. *Leptosia nina* was the densest per unit area and the most dominant in 2001 while *Nacaduba subperusa* was the densest and *Hypolimnys bolina bolina* was the most dominant in 2010 and 2011. The species having the highest relative frequency were *Papilio rumanzovia* (2001), *Gandaca harina* (2010) and *Melanitis leda leda* (2011). The distribution/occurrence of the butterflies can be highly associated with altitude, humidity, temperature and human-induced activities in time and space.

Key words: temporal population analysis, lepidopterans, diversity indices



AUSTRALIAN PEANUT (*Arachis pinto* L.): ITS EFFECT ON THE PHYSICO-CHEMICAL PROPERTIES OF SOIL

E.D Tumindog, E. L Abas, and J.C Bangi, O.S Corpuz

College of Agriculture, Cotabato Foundation College of Science and Technology, Doroluman, Arakan, Cotabato

ABSTRACT

The study aims to determine the positive influence of Australian peanut (*Arachis pinto*) in controlling soil erosion, and evaluate its contribution to soil physical (e.g.: MC, Bulk density, and Porsity) and chemical (e.g, pH, NPK) properties.

Four months after planting, leaf and stolon length increase significantly from 1.81 cm-4 cm; and 1.29 cm-4 cm .respectively. While little increased was observed in some measured characteristic such as; height (4.76-4.86); vegetative coverage (31.83 cm.-32.86 cm) ; and number of flowers/ plant (18.50-21.62). It was found out that *A. pinto* completely covered 1 square foot soil surface in 30-33 DAP, and bear flowers from 31.83 and 32.86 days from the date of planting. The sharp increased of leaf and stolon length indicates that the species is very much potential for higher production of organic matter while assuring the soil protection from degradation.

Key Words: Australian peanut, living mulch, and soil erosion.



POSTER PRESENTATION ABSTRACTS

PROPERTY RIGHT SYSTEM OF MARICULTURE OPERATIONS IN LINGAYEN GULF: ITS EFFECTS ON THE NATURAL FISH STOCKS AND SOCIAL WELFARE OF THE COASTAL COMMUNITY

¹Rosie S. Abalos and Shella C. Parreño

Pangasinan State University, Binmaley Campus, Binmaley, Pangasinan

¹rosie_abalos@yahoo.com

ABSTRACT

This study was conducted to document and evaluate the Property Right System (PRS) of mariculture operations in Lingayen Gulf, determine the effects on natural fish stocks and evaluate its impact on the social welfare of the community. This study employs the descriptive (survey and economic valuation) method of research. Fisherfolks, mariculture operators, representative/s from local government units (LGUs), and other stakeholders were interviewed.

The study revealed that there is already an established property right system in the areas covered by mariculture operation in the Municipality of Sual, Pangasinan. The operation did not greatly affect the fishing activity of the fishers as evidenced by comparable catch and similar species observed without and with the presence of mariculture structures and smaller area covered for fishing activities. Legal Bases of the PR System and mandates in revenue sharing by the local government with community/fisherfolks are bounded by the Local Government Code, Municipal Ordinance, Public hearing to Municipal Ordinance and Barangay Ordinance. About 10-30% of the PRS goes back to the community for the implementation of projects and activities. Most of the projects are geared towards the social welfare on the community such as health and nutritional needs, electrification, water system, education of children and improvement of roads.

With this initial findings, there is a need to validate the result of the interview on the spatial and distribution of fish species caught by actual participation of a fishing activity. There is also a need to validate the bottom substrate/structure of the mariculture area. This study also suggests that LGU impose corresponding tax to feed companies/manufacturers who are considered possible contributor in the degradation of the environment. While it is true that about 30% of taxes paid to the government goes back to the community, what part of the PRS is used for the rehabilitation of the water body.

Key words: Property Right System, Mariculture, Social Welfare



ASEPTIC CULTIVATION OF *Coprinus comatus* (O.F. MÜLL.) PERS. USING *PLEUROTUS* MUSHROOM SPENT

Wesley S. Gagarin¹, Rich Milton R. Dulay^{1,2}, Evaristo A. Abella¹,
Sofronio P. Kalaw^{1,2}, and Renato G. Reyes^{1,2}

¹Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija.

²Center for Tropical Mushroom Research and Development, Central Luzon State University, Science City of Muñoz, Nueva Ecija.

ABSTRACT

Mushroom spent, sometimes called mushroom compost, is a soil like waste material produced after the utilization of the substrate in mushroom cultivation. Previously, our team successfully demonstrated the utilization of the spent of leaf litter decomposing mushroom, *Volvariella volvacea* for the cultivation of wood-rotting basidiomycetes such as *Ganoderma lucidum*, *Auricularia polytricha*, and *Pleurotus* species. However, these wood-rotters again produce spent after their cultivation. Herein, this study evaluated the different *Pleurotus* mushroom spent (basal media) enriched with indigenous nutritious sources (rice bran, corn grit, and rice grit) for *C. comatus* aseptic cultivation. The nitrogen and carbon content of the spent were analyzed prior to aseptic cultivation. The periods for mycelial running, primordial initiation, fruiting body development, and the yield and bioefficiency of *C. comatus* were evaluated.

Result of the analysis showed that *P. florida* spent had the highest amount of carbon (15.38%) and nitrogen (0.99%) while *P. ostreatus* and *P. sajor-caju* spent had carbon contents of 12.95% and 12.83% and nitrogen contents of 0.76% and 0.94%, respectively. *P. sajor-caju* spent enriched with 10% rice grit recorded the fastest mycelial colonization with a mean of 7.50 days. However, *P. sajor-caju* enriched with 10% corn grit had the shortest period of primordial initiation (9.38 days) and fruiting body development (11 days), highest yield of fruiting bodies (4.42 g) and biological efficiency (11.06%). Among the different mushroom spent types, *P. sajor-caju* and *P. ostreatus* significantly obtained the shorter periods of cultivation phases and higher yield and bioefficiency when compared to *P. florida*. Regardless of the spent types, corn grit significantly recorded the shortest periods of cultivation phases (except mycelial colonization), and highest yield and bioefficiency. Generally, we have successfully demonstrated the cultivation of *C. comatus* on *Pleurotus* mushroom spent enriched with nutritious sources particularly on *P. sajor-caju* with 10% corn grit which provided the most efficient growth of *C. comatus*.

Key words: *Pleurotus* mushroom spent, *Coprinus comatus*, mycelia growth, biological efficiency, corn grit



TEXTUAL ANALYSIS OF GRADE VI ENGLISH TEXTBOOKS

Ramlah A. Ampatuan

Cotabato Foundation College of Science and Technology
ramz_0982@yahoo.com.ph

ABSTRACT

This study was conducted to analyze the readability level of Grade VI English textbooks used in DepEd Schools. Specifically, it endeavored to: 1) determine the readability level of Grade VI English textbooks using the “Flesch-Kincaid Grade Level Readability Formula”; 2) identify the genres of the textbooks; 3) analyze the stereotype roles of male and female characters in the dialogues and stories in the textbooks; and 4) determine the values infused in the stories. Qualitative research design was used in textual analysis. Flesch-Kincaid Grade Level Readability Formula online calculation was employed to determine the readability level of the two textbooks. The grade level score of the Language textbook (Textbook 1) was 6.4 while the Reading textbook (Textbook 2) was 5.7. The readability level of the Language textbook was found appropriate to its assigned grade level of the pupils, while the Reading textbook was lower in level which made it more understandable by average 6th grade pupils.

Genres found in the Language textbook were 15 dialogues, 12 poems, 6 short narrative non-fiction, 5 essays, 3 letters, and 1 tongue twister. The Reading textbook consisted of 16 stories, 10 poems, 3 essays, 1 fable and 1 dialogue.

Result indicates that gender stereotype roles portrayed by male and female characters were evident in the dialogues and stories, as president, chairman, great performer, great singer, good singer, talented artist, school paper editor, talented artist, versatile singer, popular folk singer, UN Secretary General, office employee, engineers, farmers, bread winners, driver, innkeeper, stranger, ferryman, lords, barons, emperor, famous artist, expert artist, father's farm helper, postmaster, employee, champion, coach, scholars, professional and boss for males and as teacher/adviser, secretary, best music teacher, teacher-librarian, grandmother's helper, full time vendor, household keeper, server, lover, storage cleaner, nurse, and fashion model for females.

Universal values of being appreciative of arts & nature, love, trustworthy, friendliness, hopefulness, care, compassion, helpfulness and generosity were infused in the stories found in the reading textbooks. Filipino cultural values were evident also like *palabra de honor*, *utang-na-loob*, family support, patriotism, strong family ties, and superstitious belief.

Key words: Textual analysis, dialogues, poems, short narrative non-fiction, essays, letters, tongue twister



IMPORTANT TRAITS OF THE INDIGENOUS CHICKEN OF MINDANAO: THE BASILAN CHICKEN

**J.D. Anunciado, M.G.L. Asuncion, D.L.J.M. Baay, I.N.A. Bulay-og, D.M.A. Cabrera, N.M.P. Castro,
J.I.C. Dedel, J.E. Ederango, F.P. Macalabo, A.C.L. Opada, I.C.J. Perez, N.G. Samsodin, L.J.P.
Sancebutche, R.V.C. Suazo, M.G.A. Tambis, and H.I. Rivero¹**

*Department of Biological Sciences, College of Science and Mathematics
MSU-Iligan Institute of Technology,
¹henrivero68@gmail.com*

ABSTRACT

Mindanao is home to a unique breed of chicken with characteristics shared in common with other breeds of chickens of the Philippines. This poster paper introduces the Basilan chicken, an ecotype of the Asil of Pakistan and India and has been recorded to be widely distributed throughout Southeast Asia. The relatedness of the different groups of this native chicken from four geographically distant provenances was examined for comparison of the external, internal organs, and hematologic traits.

Key words: animal biology, cladistics, hematologic profiles, livestock, native chicken

JOB MOTIVATION AND MANAGERIAL PRACTICES IN STATE HIGHER INSTITUTIONS

Jesica B. Arenga and Ali K. Dilangalen

jesica.arenga@gmail.com

ABSTRACT

This study aimed to determine the job motivation and managerial practices, and their influence on State Higher Institutions faculty performance in Region X11.

It determined the level of job motivation of the administrators; the degree of managerial practices; and the level of faculty performance. Likewise, determined the significant influence of job motivation on faculty performance; managerial practices of administrators on faculty performance; and job motivation on the managerial practices of the administrators.

Respondents were 77 administrators and 243 permanent faculty. Mean was used to determine the level of job motivation, managerial practices, and faculty performance; while multiple regression analysis to test the hypotheses of the study.

Job motivation significantly influenced the faculty performance in instruction and extension. Intrinsic motivation was the best predictor for instruction and research; whereas, extrinsic motivation was on production.

Job motivation significantly influenced the managerial practices of the administrators particularly planning. Intrinsic motivation is the significant predictor in planning and controlling; whereas, extrinsic motivation on planning and organizing.

Managerial practices significantly influenced the faculty performance particularly instruction. Planning practices was the most significant predictor on the faculty performance in instruction; while; organizing was the most significant predictor on the faculty performance in research, extension and production.

Key words: Job Motivation, Managerial Practices and Faculty Performance.

SOME ASPECTS OF POPULATION BIOLOGY OF THE MANGROVE CLAM, *Polymesoda expansa* (MOUSSON 1849) (BIVALVIA; CORBICULIDAE) IN LOAY-LOBOC RIVER, BOHOL, CENTRAL PHILIPPINES

Francis Albert T. Argente^{*,1,2} and Anthony S. Ilano¹

¹*Department of Biology, University of San Carlos – Talamban Campus, Cebu City, Cebu, Philippines*

²*Department of Fisheries Science, Pangasinan State University – Binmaley Campus, Binmaley, Pangasinan, Philippines*

**faargente@gmail.com*

ABSTRACT

The status of the mangrove clam, *Polymesoda expansa*, an important species in the artisanal river fisheries, was assessed using monthly shell length frequency data (October 2012 to March 2014) to estimate growth, mortality and recruitment parameters. The growth parameters derived using ELEFAN I were $L_8 = 91.53$ mm and $K = 0.51$ year⁻¹. The mean growth rate estimated using Bhattacharya method was $0.100 (\pm 0.091$ SD) mm day⁻¹. The length-weight relationship of the clam showed a positive allometric growth ($r^2 = 0.925$). Total mortality ($Z = 0.90$ yr⁻¹) was estimated based on a length-converted catch curve analysis. Natural (M) and fishing (F) mortalities estimates were 0.78 yr⁻¹ and 0.12 yr⁻¹, respectively. There was low exploitation rate ($E = 0.13$ yr⁻¹) on the *P. expansa* population in the river. Two recruitment pulses were derived with unequal strengths and duration. The monthly condition index (CI) suggested that spawning took place during wet season (July to November 2013). It appeared that the CI is fairly associated ($r = 0.500$) with salinity. Based from these results, *P. expansa* population is not yet prone to overexploitation. However, regulation of the fishery is being recommended to maintain the sustainability of the resource.

Key words: population dynamics, VBGF, FiSAT, *Nypa* zone, river fisheries

TRICHANTERA AND AMARANTHUS AS FEED SUPPLEMENTS FOR PATEROS DUCKS AND BASILAN CHICKEN: THE MINDANAO EXPERIENCE

C.D.Arquion, A.V.R. Clerigo, P.K.A.S. Osing, R.S. Pagarigan, N.D.T. Revelo, and ¹H.I. Rivero

*Department of Biological Sciences, College of Science and Mathematics
MSU-Iligan Institute of Technology*

¹henrivero68@gmail.com

ABSTRACT

The potential and promises of these two cultivated plants are highlighted in this paper by looking into the morphology, anatomy, and histochemistry of the few ergastic components of the leaves of the animal fodders namely; *Trichantera gigantea* and *Amaranthus* spp. The prominent features of the leaf samples were documented for future use in the biological and chemical studies of these plants with implication to animal health and feed resources as supplements. The leaf meal of these animal fodders have been tested for native chickens and ducks and were found to be effective supplements for growing livestock animals such as poultry as attributable to their cellular components.

Key words: backyard farming, cultivation, ergastic substances, fodder, histochemical tests



PERFORMANCE OF ADMINISTRATORS ON SCHOOL IMPROVEMENT

Bainena B. Sampulna and Zainudin A. Adam

ABSTRACT

This study aimed to determine the management performance of school administrators in the school improvement plan.

Complete enumeration sampling technique was employed and important information were obtained through questionnaire. The data were analyzed through frequency, and mean. Pearson Regression-Correlation Analysis to test the hypotheses.

Results revealed that the school administrators of Antipas districts always performed their management functions in terms of; planning, organizing, implementing and controlling.

It is concluded that Antipas district Administrators always referred their school improvement plan in the Implementation of School Improvement such as; staff development, community building, resource management, learning environment, and curriculum development.

Planning, Organizing, Implementing and Controlling were highly associated to the implementation of School Improvement Plan. While organizing and controlling were the significant predictors influencing the implementation of school improvement plan. Furthermore, a high significant relationship between the management functions and implementation of school improvement plan is found.

The school administrators may consider the performance of teachers from in strategic planning based from their SWOT Analysis in order to be guided accordingly.

Key words: Management function, planning, organizing, controlling

MULTI-CRITERIA APPROACH FOR THE ASSESSMENT OF THE QUALITY OF THE SOCIAL WELFARE AND DEVELOPMENT SERVICES OF THE MUNICIPALITY OF INDANG, CAVITE

Mark Lexter D. De Lara¹ and Diana Paula S. Beaño^{1,2}

¹*Institute of Mathematical Sciences and Physics, College of Arts and Sciences, University of the Philippines Los Baños (mrklxtrdlr@yahoo.com).*, ²*Social Welfare and Development of Indang, Cavite.*

ABSTRACT

In this study, Analytical Hierarchy Process (AHP) was used to determine the preferred government services to the indigent families in the municipality. Five criteria were taken into consideration: process of implementation, benefits, beneficiaries, duration of implementation and requirements/conditions of the programs. Nine programs offered by the Municipal Social Welfare and Development Office of Indang were compared in pair wise manner in a survey conducted among randomly selected indigents of the town. Relative weights of each criterion and each program were computed. Composite weights of each program based on each criterion were also obtained. Pantawid Pamilyang Pilipino Program received the highest composite weight which implies that indigents of the municipality preferred the program over the others. On the other hand, Health and Nutrition program received the lowest composite weight, making it the program least preferred by the respondents. Also, the strengths and weaknesses of the nine programs were determined.

Key words: analytical hierarchy process, multi-criteria approach



DISEASES COMMONLY AFFECTING VEGETABLES IN LEYTE: THEIR INCIDENCE UNDER PROTECTIVE STRUCTURE AND OPEN FIELD

¹L.M. Borines, ¹Z.C Gonzaga, ¹O.B. Capuno ¹R.G, Gerona, ¹D.C. Iusanta, ¹H.B. Dimabuyo, ¹ M.L.P. Vega, and ² G. Rogers

¹Visayas State University, Visca, Baybay City, Leyte, ² Applied Horticultural Research, Eveleigh, NSW 2015 Australia

ABSTRACT

Year-round production of vegetables in Eastern Visayas is quite difficult due to high rainfall. Gonzaga et al. (2013) confirmed the feasibility of profitably producing vegetables under low-cost protected structures. One major reason for this is the difference in the occurrence and incidence of diseases between these two conditions. This study was conducted to monitor disease occurrence and incidence of vegetable under open field and protective cultivation in selected areas in Leyte. The kinds of diseases, incidence and disease severity were documented. The most commonly recorded diseases were bacterial wilt caused by *Ralstonia solanacearum* affecting solanaceous and bitter gourd; downy mildew caused by *Pseudoperonospora cubensis* affecting bitter gourd, cucumber and squash; *Cercospora* diseases affecting tomato, sweet pepper, bitter gourd, and snap beans; and bacterial spots caused by *Xanthomonas vesicatoria* affecting tomato and pepper. The incidence of fungal and bacterial diseases was generally higher under structure than in the open field. Bacterial spot usually occurred only in the open field and sooty mold occurred only under protective structure. The occurrence and incidence of virus diseases had no pattern. This benchmark data could be used as a guide for farmers who would want to avoid the occurrence of certain diseases in their farms.

Key words: Protected cropping Vegetables Diseases Incidence Leyte



THE BEACH FOREST OF PAN-AY: FLORAL DIVERSITY AND ITS IMPORTANCE TO THE COASTAL COMMUNITY

Harold O. Buenvenida

(Pawa National High School, DepEd Capiz Division, Roxas City, Capiz, Philippines, 7
harold_ob@yahoo.com,

ABSTRACT

This research project was initiated to describe the floral diversity and structure of beach forest community in the three coastal barangays (Buntod, Navitas and Lat-asan) in the municipality of Panay. Specifically this study revealed the different plant species that was found growing in the beach forest of each barangay. It showed a picture of the plant community thriving in the beach forests according to the following parameters: species composition species diversity and distribution, basal area, relative frequency, relative dominance. The levels of intrusion (anthropogenic and natural) in the beach forest areas were also determined. Circular plot method was used.

Measurements of tree diameter at breast height and frequency count for individual species were done. Species were identified onsite and plant samples were collected for further taxonomic identification. Results of the study discovered thirty nine 39 different species of plants. Buntod is the most diverse area having 26 species , followed by Navitas with 22 species, and lastly Lat-asan with only 10 species.

Terminalia cattapa has the highest basal area in sampling sites which indicates the growth of mature trees. Single monospecific stand of *Casuarina equisetifolia* was found in Navitas, a relict of previous succession.. Buntod has 4 *Pandanacea* species, while Lat-asan had a high intrusion impact of the high impact were accounted for cutting of trees and clearing for fishponds and human settlement. The result of this study initiated to establish local initiatives such as forest recovery, protection, conservation and species propagation. Pawa National High School have played a major role in the conservation , protection and reforestation efforts in the coastal areas in the municipality of Pan-ay. It has forged a strong relationship with the Zoological Society of London in the heir Community-based Mangrove Rehabilitation Project in the municipality. Since 2010, the school has established a well-stocked nursery of mangroves species and beach forest species which is used by ZSL in their reforestation efforts. Until the very recent destruction brought by typhoon Yolanda, the schools beach forest and mangrove nursery have grown species like *Casuarina equisetifolia*, *Camptostemon philippinense*, *Cerbera odolam*, *Barringtonia asiatica*, *Rhizophora spp.*, *Xylocarpus granatum* , *Terminalia cattapa*, *H. littoralis* and several others.

Key words: Beach forest, forest, mangroves, plant, ecology, coastal ecology, education, school, nursery, local initiatives



BULLYING AMONG TRIBAL LEARNERS IN SECONDARY SCHOOLS

Gerardo A. Campo and Lumina D. Cabilo

ABSTRACT

The study aimed to determine the effects of bullying among tribal learners in secondary schools of Matalam, Cotabato.

Purposive sampling was employed in taking the samples of the study. There are 30 males and 66 female tribal learners who were officially enrolled in three (3) selected high schools in Matalam, Cotabato.

Forty-two students are age within the bracket of 15-16. Female has greater in number compared to their male counterpart, farming was the occupation of the most respondents parent, majority were Ilyanen and their monthly income below 1,000 respectively.

Once in a while the respondents experience verbal, non-verbal, and physical bullying. Bullying has an effect to students school performance as it lower their grades.

Furthermore, bullying experiences of students significantly relates to school performance.

The researcher concluded that bullying is evident in Matalam Cotabato but not that high. It has an effect to students academic performance relationship between these bullying experiences and academic performance is significant.

DepEd schools may infuse values education to classes to prevent the act of bullying most particularly on verbal, non-verbal, and physical bullying.

Key words: Bullying, verbal, non verbal, physical, Tribal learners



PERCEPTION AND READINESS OF PRE-SERVICE TEACHERS TOWARDS CLIMATE CHANGE

Ian Phil M. Canlas

*Leyte Normal University, Philippines
lordphil2003@gmail.com*

ABSTRACT

The recent deluge brought by super typhoon Yolanda (Haiyan) that hit central Philippines has caught the attention of the entire humanity and has further increased the urgent call for climate mitigation and adaptation. However, mitigating and adapting with climate change requires collective effort that is not limited to the scientific community or government leaders only, but also the people across ages regardless of race and culture. The effective and maximum participation of the community can only be achieved if they do completely understand the context of climate change, its causes and effects. The foregoing study attempted to examine the perception and readiness of pre-service teachers towards climate change. Two hundred (200) first year students enrolled in a course on physical sciences during the second semester of school year 2013-2014 were asked to answer a content-validated open-ended researcher-developed questionnaire. Individual and group interviews were likewise conducted to check, verify and confirm their responses in the questionnaire. Themes, trends and patterns were sought from the responses and were reported in this study. Results show that majority of the respondents possesses variety of perceptions along climate change, its causes, effects, prevention and proper emergency response. This implies that while other countries are already on its battle against climate change through different mitigation and adaptation strategies, the Philippines, also known as the disaster capital of the world, is left with unprepared and knowledge-insufficient people as manifested by the result of this study.

Key words: climate change, perception, readiness, pre-service teachers



INSPECTION CHART MAPPING OF THE REFORESTATION AND AGROFORESTRY PROJECTS OF NPC-PANTABANGAN- CARRANGLAN WATERSHED AREA TEAM (PCWAT)

Jayson Q. Caranza¹ Elmer T. Castañeto¹ Arvin P. Vallesteros¹ and Ador R. Mallare²

¹ Nueva Vizcaya State University, Center for Environmental Resources Management and Sustainable Development, Bayombong, Nueva Vizcaya 3700

² National Power Corporation, Pantabangan-Carranglan Watershed Area Team, Conversion, Pantabangan, Nueva Ecija

ABSTRACT

An Inspection Chart Mapping (ICM) of the Reforestation and Agroforestry Projects of the National Power Corporation (NPC)- Pantabangan-Carranglan Watershed Area Team in Brgy. Conversion, Pantabangan, Nueva Ecija has been done by the Nueva Vizcaya State University- Center for Environmental Resources Management and Sustainable Development (CERMSD). CERMSD has introduced changes in the usual ICM methodology especially in rugged terrains of the area utilizing spatial information technology.

As a result, a total of 25,048 planted trees and their regenerations were recorded. In addition, a total of 2,754 naturally growing trees were also counted over approximately 88 ha of plantable areas. Interestingly, the predominant *Gmelina* stands have an average of around 17 cm dbh and maximum of about 41 cm dbh based on monitoring plots. Crowns of *Gmelina* trees with dbh of more than 15 cm, positioned side by side, are going to touch each other at 5m x 5m spacing which generally indicated the projects are adequately stocked. The most dominant species, in terms of number and distribution, is *Gmelina* (*Gmelina arborea*) while the highest number of regenerations was observed for *Acacia* (*Acacia auriculiformis*). On the other hand, the abundance of *Palosapis* (*Anisoptera thurifera*) regenerations along patches of native forest is encouraging because of its potential benefits in rehabilitation effort of NPC. An assisted natural regeneration technique would ensure survival and development of wildlings of naturally growing trees.

Key words: inspection chart mapping, reforestation, forest inventory



GROWTH RESPONSE AND MYCOREMEDIATION ACTIVITY OF *PLEUROTUS FLORIDA* ON LEAD-CONTAMINATED MEDIA

Rich Milton R. Dulay^{1,2,*}, Mary Lyssa O. Isip³, Rhodel D. Constante³, Reyna C. Tiniola³,
Ma. Angelyka Romano⁴, Sofronio P. Kalaw^{1,2}, Renato G. Reyes^{1,2}

¹Center for Tropical Mushroom Research and Development, Central Luzon State University, Science City of Munoz, Nueva Ecija

²Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija

³Dr. Ramon De Santos National High School, San Antonio, Cuyapo, Nueva Ecija

⁴University Science High School, Central Luzon State University, Science City of Munoz, Nueva Ecija
*richmiltondulay@yahoo.com

ABSTRACT

Heavy metal contamination is one of the most serious environmental threats around the world. One of the recent techniques to eliminate various hazardous and toxic metallic compounds in the soil is through mycoremediation, which the role of fungi as decontaminant is a focus. In connection, this study was conducted to determine the secondary mycelial growth response and the ability of *Pleurotus florida* to uptake lead (Pb). Daily mycelia growth of *P. florida* was evaluated on potato dextrose agar with different concentration (in ppm) of lead. The Pb-myco-uptake ability of mycelia and basidiocarp of *P. florida* was evaluated on coconut water media in lawn culture and rice straw-sawdust based substrate formulation in artificial logs, respectively. Harvested mycelia and basidiocarp were subjected to lead detection analysis.

Results revealed that no significant difference was found on the daily mycelial growth of *P. florida* grown on the varying concentrations of lead. The mycelia of *P. florida* contained 29.94 ppm of lead from the 100 ppm lawn culture while the coconut water spent had 47.53 ppm. On the other hand, mycelia from the 10 ppm of lead culture had 2.52 ppm and the lead was not detected in the spent. In the artificial log, lead was not detected in the first flushing of basidiocarp while the second and third flushing respectively contained 2.08 and 2.24 ppm of lead. Taken the data together, *P. florida* has the ability to grow and accumulate heavy metal like lead.

Key words: *Pleurotus florida*, mycoremediation, lead, flushing, heavy metals.

OBSERVATION ON THE HATCHABILITY OF THE GIANT FRESHWATER PRAWN *Macrobrachium rosenbergii* (de Man) IN AQUARIA

¹Jennie B. Fernandez, Armando C. Garcia and Raul V. Dela Peña

Pangasinan University, Binmaley Campus, Binmaley, Pangasinan

¹jbfernandez20@yahoo.com

ABSTRACT

Macrobrachium rosenbergii (de Man) is a freshwater species cultured in ponds, tanks and cages. This species lives in an environment influenced by nearby brackishwater areas. Gravid females migrate downstream into estuaries, where eggs hatch as free-swimming larvae in brackishwater.

A study was conducted to observe the hatchability of this species in captivity. Four gravid females were acclimatized in aquaria and were let to produce larvae. Brackishwater was prepared with a salinity of 8ppt. Based on the observation, larvae were produced after two days.

Keywords: *Macrobrachium rosenbergii*, prawn, hatchability



EFFICACY OF GU-ON-MA-GI-PAPA (*Psidium guajava*), (*Allium porrum*), (*Moringa oleifera*), (*Zingiber officinale*) and (*Peperomia pellucida*) EXTRACTS IN INHIBITING THE GROWTH OF ANTHRACNOSE (*Colletotrichum gloeosporioides*) IN MANGOES (*Mangifera indica*)

Joy M. Ferrer, Leia Angelu G. Gerardinoand and Antonette I. Ong

Baguio City National High School

ABSTRACT

The study was conducted to determine the efficacy of the different plant extracts as an alternative treatment for anthracnose on mango. Specifically, it aims determine the efficacy of the different plant extracts against the mango fungus *C. gloeosporioides* in terms of mean zone of inhibition through *in-vitro* test; in terms of number of infections, severity of infection and days to symptoms appearance through *in vivo*-test; and lastly to compare the efficacy of the plant extracts as antifungal with the control.

In Vitro test was conducted. The collection, preparation and obtaining of the different plant extracts were done same with the obtaining, preparation of culture medium and isolation of *C.gloeosporioides*. After which, Bioassay test was conducted and then data was gathered after 72 hours by the measuring the DZI. *In Vivo* test was done by the collecting and obtaining of crude extracts from the different plants extracts same with the obtaining of healthy mangoes. After that was the application of the crude plant extracts and spraying of the *C.gloeosporioides* were done. The mangoes were observed after 144 hours.

Results showed that pansit-pansitan and onion are very effective while guava and ginger are effective in inhibiting the growth of *C.gloeosporioides* through *in -vitro* test. Malunggay extract is moderately effective in inhibiting *C.gloeosporioides* causing anthracnose on mango in terms of DZI. Through *in-vivo*, pansit-pansitan is the most effective in terms of number of infections, severity of infection and days to symptoms appearance. Ginger, malunggay, and pansit-pansitan are very effective in terms of number of infections. Lastly, there is significant difference among the different crude extracts in inhibiting *Colletotrichum gloeosporioides* in terms of: a.) DZI; b.) number of infections; c.) severity of infection; and d.) days to symptoms appearance.



LOW-COST RAIN SHELTER FOR INCREASED AND SUSTAINABLE VEGETABLE PRODUCTION: A FARMER'S EXPERIENCE

RG Gerona¹, ZC Gonzaga¹, OB Capuno¹, PT Armenia¹, MB Loreto¹, LB Nunez¹, AB Tulin¹, LM Borines¹, JS Mangmang¹, ER Tauza¹, DC Lusanta¹, LP Vega¹, KM Menz¹, LR Gerona², and GS Rogers^{3,4}

¹Visayas State University (VSU) Visca, Baybay City, Leyte, Philippines, ²Bontoc, Southern Leyte, Philippines,

³University of Sydney, New South Wales, Australia, ⁴Applied Horticultural Research, Australia

ABSTRACT

For years, Boie (Lucio R. Gerona) had been working hard to become a progressive vegetable farmer. Countless attempts in farming were made in his self-acquired land in Bontoc, Southern, Leyte but often failed and/or non-profitable. Among the many constraints, he found continuous heavy rains as the most difficult and almost impossible to manage.

With the introduction of the low-cost structures as rain shelters by the ACIAR-VSU Vegetable Project coupled with the technical assistance of the research team, year-round production of vegetables was made possible. Yields of lettuce, ampalaya and sweet pepper were consistently higher with gross margins of up to three folds than those in the open field. Moreover, the reproductive periods of fruit vegetables especially sweet pepper were prolonged to almost two folds than in the open-field.

To Boie, the outcomes are very rewarding: Increased and sustained productivity/profitability enabling him to put up other farm improvements (improved irrigation system, additional enclosed structure for leafy vegetables, vermiculture shed and mini-piggery); capacity building (as farmer representative of Southern Leyte for organic farming, resource person/farmer trainor), and continued linkage with ACIAR-VSU Vegetable Project showcasing the technology. With all of these, he was awarded the 2012 Most Outstanding Vegetable Farmer given by VSU.

Key words: vegetables, low-cost rain shelter, increased and sustainable productivity.



INSECTS ASSOCIATED WITH JACKFRUIT (*Artocarpus heterophyllus* Lam) AS SILENT CARRIERS OF *Phytophthora palmivora* BUTLER CAUSING DECLINE DISEASE

R.G¹. Gerona, L.R². Gerona, V.G¹. Palermo, G¹. Guadelquiver, R³. Daniel, D³. Guest and L.M¹. Borines

¹Dept. of Pest Management, VSU, Visca, Baybay City, Leyte, Philippines, ²Bontoc, Southern Leyte, Philippines and

³University of Sydney, New Southwales, Australia

ABSTRACT

A participatory action research (PAR) was conducted in the laboratory and nursery of a farmer stakeholder in Bontoc, Southern Leyte to determine the role of insects commonly associated with jackfruit on the dissemination of *Phytophthora palmivora* Butler. This fungus causes jackfruit decline disease which greatly affected the massive plantings of jackfruit in Region 8 as its banner commodity.

Results from the tissue baiting revealed the presence of *Phytophthora* in the field-collected insects associated with jackfruit that include two ant species (Myrmecinae and Ponerina), chrysomelid beetle, crambid fruit borer, two species of tree hoppers (Cicadellidae and Dictyopharidae), mealybugs and curculionid beetle. Inoculating the fungus to jackfruit seedlings using laboratory-reared insects (Myrmecinae and Ponerinae ants, chrysomelid and curculionid beetles) sprayed with *Phytophthora* spore suspension resulted in 50-100% seedling infection. On the other hand, 50-83.3% of the seedlings were infected when the test insects were simply allowed to crawl on *Phytophthora*-infected jackfruit fruits to acquire the fungus. Microscopic examinations from the baited infected leaf samples of test seedlings revealed the presence of *Phytophthora* propagules which indicated that the insects used were effective carriers of the fungus. These findings imply that proper insect management must be considered by growers to effectively manage jackfruit decline.

Keywords; jackfruit, insects, jackfruit decline, *Phytophthora palmivora*



INVENTORY OF ARTHROPOD PESTS AND BENEFICIALS ASSOCIATED WITH SELECTED VEGETABLES IN LEYTE ISLAND

¹R.G. Gerona, ¹B.I. Lauro, ¹O.B. Capuno, ²S. McDougall

¹Dept. of Pest Management, VSU, Visca, Baybay City, Leyte, Philippines, ²University of Sydney, New Southwales, Australia

ABSTRACT

Field visits were conducted in different vegetable growing areas in Leyte and Southern Leyte to document the common arthropod pests (insects and mites) and beneficials associated with tomato, sweet pepper, ampalaya and eggplant. Based on the initial surveys conducted, a number of major arthropod species commonly associated with the selected vegetables were identified although some minor species were also documented.

Major species observed included the following: fruitworm (*Helicoverpa armigera* Hubner), fruit fly {*Bactrocera cucurbitae* (Coq.)} and 12-spotted beetle (*Epilachna* sp.) in tomato; broad mite (*Polyphagotarsonemus latus* Banks), cluster caterpillar (*Spodoptera litura* F.), fruit fly {*Bactrocera cucurbitae* (Coq.)} and aphid (*Aphis gossypii*) in sweet pepper; fruit fly {*Bactrocera cucurbitae* (Coq.)}, cucumber moth (*Diaphania indica* Saunders) and aphid (*Myzus persicae* Glover) in ampalaya; eggplant fruit and shoot borer (*Leucinodes orbonalis* Guene'e), leafhopper (*Empoasca* sp.) and mirid bug (*Helopeltis collaris* Stal.) in eggplant. The beneficial species included the following: a) parasitoids like *Cotesia* sp. on green looper larva, *Apanteles* sp. on cucumber moth and fruitworm larvae, *Microplitis* sp. on *Spodoptera* sp. and fruitworm larvae, *Copidosomopsis truncatella* on green looper larva; b) predators e.g. 2 species of ladybird beetles (*Micraspis crosea* F. and *Chilomenes sexmaculatus* (F.)).

Key words: inventory, arthropod pests, beneficials, vegetables, Leyte Island.

MULCHING AS A MEANS OF INCREASING YIELDS OF MALABAR SPINACH (*Basella alba* L. and *Basella rubra* L.) GROWN IN MARGINAL UPLAND AREA OF INOPACAN, LEYTE

Zenaida C. Gonzaga, Hubert B. Dimabuyu, Richiella R. Sumalinog and Othello B. Capuno

Visayas State University, Visca, Baybay City, Leyte

ABSTRACT

Basella or malabar spinach, locally known as alugbati is a tropical leafy green indigeous vegetable commonly grown for its succulent, nutritious greens, and tender stems. It has two chief cultivars, Basella alba, which features green-stems and deep-green leaves, and Basella rubra with purplish-stem and deep-green leaves with pink veins.

The study was conducted to evaluate the effect of different mulching materials on the growth and yield of two Basella species (*Basella alba* L. and *Basella rubra* L.) grown in a relatively dry, rolling soil in the marginal upland condition in Inopacan, Leyte. The cultivars served as factor A while the different mulching materials as factor B and were as follows: T0- control, T1--ricehull, T2- rice straw and T3- plastic mulch. The green-stemmed alugbati had greater number of shoots and heavier shoots per plant than the red-stemmed. Leaf spot disease caused by *Colletotrichum* sp. was more evident in B.rubra. On the other hand, yield from plants mulched with plastic was significantly higher than the other mulching materials. Control plants or those without mulch had the least yield.

Key words: alugbati, Basella alba, Basella rubra, plastic mulch, rice straw, rice hull



INCREASING YIELDS OF UPLAND KANGKONG (*Ipomoea reptans* Poir) GROWN IN THE MARGINAL UPLAND AREA OF INOPACAN, LEYTE THROUGH ORGANIC AND INORGANIC FERTILIZATION

Zenaida C. Gonzaga, Hubert B. Dimabuyu, Richiella R. Sumalinog and Othello B. Capuno

Visayas State University, Visca, Baybay City, Leyte

ABSTRACT

Kangkong is a commonly grown for its young tops which are cooked or lightly fried in oil and eaten in various dishes. Less attention however is given to kangkong being an indigenous vegetables.

The study was conducted to determine the effect of organic, inorganic fertilizer and their combination on the growth and yield of upland kangkong grown in a relatively dry, rolling soil in the marginal upland condition in Inopacan, Leyte. The following treatments were used: T₀- control, T₁- inorganic (10 grams complete fertilizer), T₂- organic (300 grams Chicken dung) and T₃- inorganic + organic (5 grams complete + 150grams chicken dung). Kangkong applied with chicken dung had greener leaves and were vigorously growing. Weekly plant height up to the first month from sowing, number and weight of shoots per hill were significantly increased in plants incorporated with fertilizers regardless of the type. Plants supplied with the combination of organic and inorganic fertilizer were the tallest with widest stem and had the most number and heaviest marketable shoots.

The control plants or those without fertilizers applied had poor growth as manifested by fewer number of yellowish, very thin, short and severely damaged shoots produced.

Key words: upland kangkong, organic fertilizer, inorganic fertilizer, combination of organic and inorganic

THE POTENTIAL OF GROWING ZUCCHINI (*Cucurbita pepo* L.) UNDER TUNNEL-TYPE STRUCTURE AT VSU, LEYTE, PHILIPPINES

Zenaida C. Gonzaga¹, Dhenber C. Lusanta and Hubert B. Dimabuyu

Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte

¹zcgonzaga@yahoo.com

ABSTRACT

Zucchini is a member of the Cucurbitaceae family and a relative of ampalaya, muskmelon, watermelon and cucumber. While the mentioned cucurbits are widely grown in the Philippines, zucchini is not. The potential of growing Zucchini was undertaken under Visayas State University (VSU) condition for the first time. The study was conducted to study the morphology of the plant and to evaluate its growth and yield performance under tunnel-type structures roofed with UV - treated net and plastic and in the open-field.

As a Cucurbit, it exhibited the monoecious flowering habit but unlike the common ones which are viny, the Zucchini plant appeared bushy due to rosette growth habit brought about by the very short or reduced internodes. Female and male flower attributes were not affected by the type of roofing, however, vegetative growth measured in terms of plant height, number of leaves, and leaf blade length were significantly improved under tunnel covered with net. The condition under the net produced vigorous plants with one hundred percent survival which resulted to a significant increase in yield. Plants under tunnel covered with net yielded 2.15kg of marketable fruits per plant compared to 0.95kg and 0.57kg in open field and tunnel plastic, respectively.

Key words: zucchini, cucurbits, tunnel-type structures, UV - treated net, UV - treated plastic



INDIGENOUS VEGETABLES: THE FORGOTTEN VEGGIES – ARE THEY WORTH REMEMBERING?

Zenaida C. Gonzaga*, Hubert B. Dimabuyu, and Othello B. Capuno

Visayas State University, Visca, Baybay City, Leyte

**e-mail: zcgonzaga@yahoo.com*

ABSTRACT

Indigenous vegetables (IVs) are vegetable species native to or originating from a particular region or environment. IVs are rich sources of vitamins, minerals, and other health promoting factors such as high antioxidant activity. They also have the genes for resistance to insect pest and diseases, hence used as parents in breeding work. The new generations, however, are no longer aware of its existence as farmers' fields and markets now are flooded with hybrid vegetables which require high inputs. Considering the benefits they offer, it is deemed necessary to remember and cultivate them.

An attempt to gather different IVs was initiated to conserve its germplasm and to promote awareness among the local people particularly the young generation of its existence thus, enhance its utilization. A number of IVs had been collected and are now propagated in the germplasm collection area of the Department of Horticulture, VSU, Baybay City, Leyte. These include: winged bean, patani, katuray, kadios, native onion, roselle, agitway, ridged gourd, patani, pako, malunggay, lubi-lubi, libas, kulis, talong, alugbati, okra, tomato, talinum, kangkong, bago and kulitis. They served as source of propagules for planting in the marginal upland areas in Leyte.

Keywords: Indigenous vegetables, forgotten veggies, rich source of nutrients, germplasm collection



OPTIMIZATION OF CULTURE CONDITIONS FOR MYCELIAL GROWTH OF *Coriolus versicolor*

Sarah Joy Nilo, Sofronio P. Kalaw, Rich Milton R. Dulay and Renato G. Reyes

Center for Tropical Mushroom Research and Development, Department of Biological Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija

ABSTRACT

Coriolus versicolor is a wild macrofungus that commonly grow on decomposing wood. This mushroom has been reported to contain anti-tumor, anti-viral, immunomodulators anti-cancer and antioxidant properties. In this study the influence of different indigenous culture media, physical factors and spawning materials were evaluated.

The mycelia of *C. versicolor* were cultured on rice bran decoction agar, potato sucrose gulaman, coconut water gulaman and corn grit decoction gulaman. After optimizing the nutritional requirement for mycelia growth, the influence of physical factors such as pH (6.0, 6.5, 7.0, 7.5 and 8), temperature (room temperature, air condition and refrigerated), aeration (sealed and unsealed) and illumination (dark and light) conditions. Different granulated materials namely: sorghum, palay and corn grit were evaluated as spawning material. Daily mycelia growth and mycelia density were used as parameters in evaluating the optimal growth conditions.

Rice bran decoction sucrose gulaman with pH 7.5, incubated in sealed plates in dark condition at room temperature (32°C) were the most suitable condition for efficient mycelial growth of *C. versicolor*. Moreover, sorghum seeds produced very luxuriant mycelial growth and the shortest incubation period of 8 days.

Key words: *Coriolus versicolor*, indigenous media, physical factors



INFLUENCE OF HARVESTING INTERVAL ON THE GROWTH AND YIELD OF UPLAND KANGKONG (*Ipomoea reptans* Poir.)

Leonardo E. Lacostales*, Getulio A. Barcenas, Jr., Mariedith F. Itang, Dhenber C. Lusanta, Sarah M. Ravelo, Jennibeth J. Villaflores and Zenaida C. Gonzaga

*Department of Horticulture, College of Agriculture and Food Science, Visayas State University,
Visca, Baybay City, Leyte
e-mail: lacostalesnardz@yahoo.com

ABSTRACT

Kangkong is a commonly used leafy vegetables in the Philippines. The young tops are cooked as “sinigang” or just stir-fried with garlic. Multiple harvesting can be done on this vegetable, however, the frequency or interval of harvest for maximum yield has not been establish yet.

The influence of harvesting interval on the stimulation of the regrowth of kangkong shoots and consequently on the yield was investigated. The study was set-up in a randomized complete block design (RCBD) with the following interval of harvesting which served as the treatment. : T1 (15 days), T2 (20 days), T3 (25 days) and T4 (30 days).

Increasing the harvesting interval from 15-30 days, resulted to a corresponding increase of the different horticultural characteristics monitored such as plant height, and leaf size. Highest yield however, was obtained from 25 days with the least at 15 days interval of harvesting.

Key words: Upland kangkong, harvesting interval, 25 days interval, regrowth



INVENTORY AND MAPPING OF *ACACIA MANGIUM* USED FOR RESTORATION IN POBLACION, LINGAYEN, PANGASINAN

C. G. B. Lagunzad¹, J. A. B. Almazar², E. G. Amurao³, E. A. C. Malong⁴, I. G. G. Quiambao⁴,
and R. C. Quilla⁵

¹. Ateneo de Manila University, Loyola, Quezon City². Dr. Gloria D. Lacson Foundation Colleges, Castellano, San Leonardo, Nueva Ecija³. Benigno S. Aquino National High School, Concepcion, Tarlac⁴. Angeles University Foundation, Angeles City⁵. Angeles City Science High School, Angeles City

ABSTRACT

A floristic survey was conducted on the 7.5 sq km area of Barangay Poblacion, Lingayen, Pangasinan in December 2012 to May 2013. Forty six different species were documented and described., *Acacia mangium* was identified, counted, mapped and their individual diameter at breast height (dbh) was measured. The trees were categorized based on dbh as small (<5cm), medium (5.1-30cm) and large (>30 cm).

A total of 1,214 individuals of *Acacia mangium* were surveyed along the coastal area of Poblacion, Lingayen, Pangasinan.

The study aimed to provide a database on the location of nurseries, an inventory of coastal vegetation and a description of the distribution and growth status of individuals for each plant species. The data generated were used in the preparation of a brochure of beach flora that may serve as baseline data for future researches and for policy recommendations for coastal ecosystem management and also for climate change mitigation.



HUMAN IMPACTS TO THE BIODIVERSITY OF MT. LANTOY, ARGAO, CEBU, PHILIPPINES

Edgardo P. Lillo, Steve Michael T. Alcazar

*College of Forestry
Cebu Technological University-Argao Campus*

ABSTRACT

The impact of the surrounding local communities on the diversity of Mt. Lantoy, Argao, Philippines was studied from June 1 to July of 2012, to obtain information which can help formulate policies and programs for effective environmental protection and biodiversity conservation. A total of 45 household respondents were interviewed using a structured survey questionnaire.

Results revealed the following information; Household size ranged from 1-4 members who had been staying in the vicinity of Mt. Lantoy for 30 years and above. Most were farmers with monthly income of Php 1,000.00-5,000.00 who tilled their farms for 20 years and more. Crops grown included corn, vegetables, banana and coconut. They practiced crop rotation, intercropping and contour farming as well as livestock raising to augment their income. Water was provided from springs of Mt. Lantoy for their domestic use. Similarly, firewood was derived from wood products taken from Mt. Lantoy.

Mt. Lantoy was the habitat of some indigenous animals like birds, bats, snakes, lizard, monkey and wild cat. Hunting of these wildlife species and other destructive activities were prevalent despite of municipal and barangay ordinances. Birds and bats were the most the hunted species. Hunters came from other municipalities. Respondents believed that wildlife species specifically bats and birds are ecologically important species because of their contribution to the ecosystem which included forest regeneration, pest control, seed dispersal, and as source of fertilizer (guano). Because of this belief they practiced forest protection activities such as tree planting and proper solid waste management. Implementation of conservation measures and coordination among the concerned agencies in the municipality of Argao, Cebu was seen as an important measure to protect and conserve the biodiversity of Mt. Lantoy.

Key words: Mt. Lantoy, human impact, biodiversity, local communities, resources utilization



PHYTOCHEMICAL ANALYSIS OF SOME MEDICINAL PLANTS UTILIZED BY THE TAGBANUAS OF PALAWAN, PHILIPPINES

Eva Niña B. Lopez

*College of Arts and Sciences, Western Philippines University, Aborlan, Palawan,
evaninalopez@gmail.com*

ABSTRACT

Plants are the basic source of food, building materials, clothing and medicines. All plants have primary and secondary constituents which contain proteins, chlorophyll and amino acids, flavonoids, alkaloids and other phytochemical substances that is responsible for therapeutic and industrial uses.

Tagbanua is one of the indigenous people that can be found in Palawan, and one of the indigenous group that were educationally and economically improve but their beliefs and practices were practiced by some of the younger generations. These people were also performing their rituals and beliefs particularly in healing practices, they also believe in using plants in treating their common illnesses.

Descriptive method using survey questionnaire with Tagbanua language was used to determine the indigenous plants used by the Tagbanuas. Also, actual collection, extraction and phytochemical analysis were conducted to validate the therapeutic and industrial value of some plant species used by the Tagbanua, particularly the presence or absence of flavonoid which have the ability as antibacterial, antimicrobial or antidiarrheal.

Based from the results of the study, papaya, kamantigue and calamansi were commonly used by the Tagbanuas. Results of the phytochemical analysis particularly flavonoid test confirmed the therapeutic value of those plants species. Each plant parts have different level of flavonoid.

Key words: Tagbanua, flavonoid, Willstatter cyanidin test, therapeutic value, industrial value



MORPHOLOGICAL STUDY OF TWO *AMORPHOPHALLUS* SPECIES (BALBAG) IN PUERTO PRINCESA CITY, PALAWAN, PHILIPPINES

¹Josephine M. Magay-Salmo and ²Mildred Palatino-Palon

¹ College of Education, Western Philippines University, Puerto Princesa Campus

²Palawan Ethnobotanical Research Center Holy Trinity University, Puerto Princesa City, Palawan,
phinesmagaysalmo@gmail.com, mppalon@yahoo.com

ABSTRACT

The study dealt on the morphological characteristics of two *Amorphophallus* species found in Puerto Princesa City, Palawan, Philippines. Descriptive method of research was employed which includes actual collection of the *Amorphophallus* species by the researchers. Standard tests for inorganic substances and organic phytochemicals were done to account the presence of those substances.

Results revealed that there are distinctive similarities and differences on the botanical characteristics of *Amorphophallus* species in Puerto Princesa City, Palawan. *Amorphophallus* species 2 has more present organic substances particularly the phytochemicals saponin than the other species. Both *Amorphophallus* species contains inorganic substances such as iron and calcium.

A monograph of the two *Amorphophallus* species describing the plant, its habitat and plant parts; was realized as an output of the study.

Key words: *Amorphophallus*, morphological, phytochemicals, saponin.

EFFECTS OF UTILIZING SWEET SORGHUM AS SUBSTITUTE FOR CORN ON THE GROWTH PERFORMANCE OF BROILER CHICKENS

¹Nestor B. Malong and ²Lane M. Pineda

¹Municipal Agriculture Office - Municipality of Arayat. ²Pampanga Agricultural College

ABSTRACT

The general objective of the study was to investigate the effects of utilizing sweet sorghum as substitute for corn on the growth performance of broiler chickens. Completely Randomized Design (CRD) was adopted with three treatments namely: Treatment 1 (50% corn), Treatment 2 (50% sweet sorghum) and Treatment 3 (25% corn and 25% sweet sorghum). The growth and economic performance of birds fed diets containing up to 50% sweet sorghum were equivalent with those fed typical corn-soybean diets. The results clearly indicate that sweet sorghum could be a successful alternative grain for poultry production. Thus, sweet sorghum can be successfully cultivated in regions where corn production is marginal, this grain may prove to be economically beneficial to the grain and poultry producers.

DIVERSITY, PRODUCTIVITY AND USES OF GRASSLAND PLANTS IN PLAGIOCLIMAX COMMUNITIES OF BANGAN HILL, NUEVA VIZCAYA

Ryan Padilla Manuel

*Department of Environmental Science and Ecotourism
College of Forestry, Nueva Vizcaya State University
nayrleunam@yahoo.com*

ABSTRACT

This paper is an initial assessment of the ecological functions of plagioclimax grassland areas of Bangan Hill, a very important area with multiple uses in the town of Bayombong, Nueva Vizcaya. The author observed the diversity and productivity as well as the uses of plants thriving in the two distinct types of grassland therein: the larger *Themedia triandra-Imperata cylindrical* (Kangaroo Grass-Cogon) area and the scattered grassland patches within the hill's open forest. Observations of the communities involved GIS and species sampling, alpha diversity analyses (Shannon-Weiner, Evenness, and Simpson's Indices), carbon storage potential using relevant model, and compilation of ethnobotanical knowledge about the species' varied uses.

Based on GIS data, these communities account for 41.12 ha and 2.23 ha respectively. For the Kangaroo Grass/Cogon-dominated area, its carbon storage capacity was computed using the model developed by Lales, *et.al.*(2001) through a study at a *cogonal* in Leyte Province, Southern Philippines. On the other hand, sampling and diversity analysis of the more diverse grassland patches involved two strategically placed 16m x 16m quadrats therein.

By extrapolating the coverage area of the *Themedia triandra-Imperata cylindrical* at Bangan Hill to Lales' carbon model (that *Imperata cylindrical* can store 13.1 tons /ha of carbon), said grassland area is estimated to store more than 538.67 tons of carbon in the plant community's biomass.

On the other hand, sampling of the patches yielded 1614 species. These areas are dominated by *Paspalum conjugatum*, *Ageratum conyzoides*, *Coffea arabica*, *Elephantopus tomentosus* and one particular unknown species. In terms of abundance and dominance in the area, palatable and miscellaneous species outnumber the inedible ones, with 1217 and 295 versus 122 individuals. These edibles are mostly members of Poaceae, Fabaceae and Asteraceae. Shannon, Evenness and Simpson's Indices were computed at 2.38, 0.32 and 0.18, respectively. Community density is 3.19 plants per hectare. Many of these species have been reported to have medicinal properties.

As regard the ecological functions of the ecosystems, harvestable phytomass in the cogonal can serve as feed for livestock, material for vermicomposting, and for possible cottage products. Also, like other Poaceae species, the cogon can be seen as a very good cover plant against erosion. Its form factor can also arrest the impact of rainfall. In consideration of ecosystem services and potential uses, managers can optimize socioeconomic and ecological productivity of Bangan Hill by incorporating relevant land uses. Physical features of the patch like slope, density of trees, proximity of water and roads/trails, the census of plants therein implies that the patches can be useful for small scale ("backyard") grazing.

Observations of the diversity and productivity of such ecosystems open new opportunities for more in-depth research in the future.

Key words: Alpha diversity, Grassland, Plagioclimax, Ecosystem, Ethnobotany, Bangan Hill, Range management, Multiple land-use



CARBON DIOXIDE CONCENTRATIONS (XCO₂) OVER THE PHILIPPINES USING SCIAMACHY LEVEL III DATA

Ryan Padilla Manuel

*College of Forestry, Nueva Vizcaya State University, Bayombong, Philippines
nayrleunam@yahoo.com*

In 2002, the remote sensing instrument Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) was launched into space via the European Space Agency Environmental Satellite (ESA-ENVISAT). SCIAMACHY is currently the only remote sensing instrument capable of measuring XCO₂. XCO₂ refers to the column-averaged mole fraction of CO₂, derived by dividing the number of CO₂ molecules by the number of oxygen molecules as proxy for air.

This study pioneers observation of Philippines' local, air-column CO₂. It employs SCIAMACHY level III dataset covering years 2003 to 2005. The dataset used in this study has a spatial and temporal resolution of 0.5° X 0.5° (gridded) and one month. Mapping of XCO₂ annual concentrations was performed to visualize and interpret data. Four key areas were pinpointed to further describe XCO₂ in the country: Manila, Davao, Bayombong (Nueva Vizcaya) and Catarman (Samar). Further, the author used time series (36-point) to determine seasonality in XCO₂ for said period. The SCIAMACHY dataset was further analyzed and compared with CO₂ *in-situ* data of NOAA's Mauna Loa (Hawaii) Observatory.

Despite the strict requirements of SCIAMACHY filtering algorithms, substantial data were obtained for use in the study. High concentrations of CO₂ (385 – 395 ppm) were seen consistently throughout the months in urbanized areas such as Manila and Davao. Meanwhile, moderate to above-moderate concentrations (365-375-385 ppm) were observed for rural areas and the rest of the country. From 2003 to 2005, CO₂ concentrations rose by 2.025%, with the highest record in November 2005 at 395.26 ppm. Maps and time series graph showed fluctuated XCO₂ levels at various parts of the country and at certain months, but without distinct seasonality, but found at par with the rising CO₂ trend of Mauna Loa's dataset.

Various anthropogenic factors were put forward as contributory to natural sources of carbon dioxide.

THE DIET OF RICE EEL (*Monopterus albus*)

Christian Oliver P. Marzo, Roana Lee Caban, Federico Furuc De Jesus, Randolph Rivera, Kimberly Maguad, Sadiri Laborte Iii, Joanna De Fiesta, Angelique Antonio And Rene Argie Tudino

Philippine Normal University North Luzon

ABSTRACT

The Asian swamp eel (*Monopterus albus*) locally known as “rice eel” or “kiwit” is described as non-specialist consumer. Currently, there are no predators of this species except human; no specific measures in controlling its rapid increase and now considered as pest in rice fields so the study sought to identify the various foods eaten by the “rice eel” to serve as basis in possible controlling measures. Thirty six (36) specimen eels classified into big and small sizes were dissected and examined and two pairs of small and big eels were kept in aquariums for observation of their eating behaviors. The stomach contents found were algae, caterpillar, decaying wood, fish, insect, insect cover, plant component, sand particle, seed, shell, snail, snail cover, soil, wood debris and worm. The diet of the two groups of Asian swamp eels is comparable in the number of variety; and that laboratory observations showed their diet depends on the available food in their habitat.

Key words: Rice eel, Asian swamp eel, diet of *Monopterus albus*, agricultural pest



SI MALVAR AT ANG KAPALIGIRAN: UNVEILING THE KAPALIGIRAN AGENDA PROGRAM

Juvy G. Mojares

*Batangas State University – Malvar
mojuvs@gmail.com*

ABSTRACT

Malvar, as a second class municipality located between the cities of Lipa and Tanauan in Batangas, has five major thrusts under the 5K Agenda program. One of these is Kapaligiran aiming to promote green economy and to protect Malvar's three river systems, namely: Balete River, Alulod River and San Juan River.

This paper was conducted to explore and divulge the various sustainable environmental development programs of the municipality, despite limited resources, which could be emulated as best practices by neighboring towns and cities in the province.

Results showed that strong political will had strengthened the Kapaligiran agenda program. First, the intensified waste management had given birth to numerous successful environmental initiatives such as a) improved Material Recovery Facility (MRF) which established a controlled compost pit for diapers to become fertilizer; b) vermin-composting beds expected to produce organic fertilizer in the future that would replace the inorganic fertilizer subsidy of the government; c) biogas facility for backyard hog raisers that produced methane gas for cooking; d) Malvar Seedling Bank with seedlings of forest trees, ornamental trees and forage; e) pilot organic gardens in 15 public schools; and f) agro-silvo- pasture technology for MRF through planting long term and cash crops and raising livestock. Second is the protection of water bodies through a) Malvar Green Park to protect a river tributary, b) river bank rehabilitation, and c) barangay tree planting along Balete and Alulod Rivers. Lastly, the municipal government had stiffer requirements in securing business permits for commercial farms, poultries and junk shops.

Key words: institutions, leadership, green economy



ALTERNATIVE LEARNING SYSTEM STRATEGIES AND THEIR IMPACT TO LITERACY

Elvin P. Monsales and Rene A. Galladora

ABSTRACT

This study was conducted to determine the impact of different Alternative Learning Strategies to literacy. There were 19 Districts ALS Coordinators; eleven were graduates of BS Degree, four have earned units in MA and four have finished a Masters' Degree. In terms of relevant trainings, three (3) have attended regional level; 15 on a national level; and one (1) on an international training. On the length of service, almost all were in the service 5-10 years. They have a monthly income of 20,000 and above, and majority were female.

There were 57 ALS clientele who were passers of Accreditation and Equivalency. The instrument used in the study was the structured questionnaire. Random sampling was employed. Percentage and means were used to determine the ALS Strategies and their impact to literacy to the implementers and clientele.

The clientele's characteristics significantly influenced the impact of ALS Strategies in terms of attitude, but do not significantly influenced in terms of knowledge and skill of ALS clientele. In addition, the implements characteristics significantly influenced the impact of ALS strategies to literacy. While the program strategies significantly influenced the knowledge and attitudes but did not significantly influence in terms of skills of the clientele.

In the light of the findings, it could be concluded that the implementation of ALS program strategies were very effective. The characteristics of ALS implementers contributed to the impact of strategies and programs they delivered and these program strategies have improved the knowledge and skills of the clientele.

As recommendation, a similar research study should be conducted with larger scope to determine the impact of ALS Strategies as basis of determining the funding support from the DepED National Office.

Key words: Alternative learning system, attitude, knowledge, skills



THE IMPLEMENTATION OF ON-THE-JOB TRAINING PROGRAM AMONG STATE UNIVERSITIES AND COLLEGES IN REGION I

Gilbert Pastrana Moralista

Pangasinan State University

ABSTRACT

This study dealt on the extent of implementation of on-the-job training (OJT) program among State Universities and Colleges (SUCs) in Region I. It also looked into the problems encountered as perceived and the compliance to the requirements. The study likewise determined the extent of adequacy and condition of required facilities of the Host Training Establishment (HTEs).

The descriptive correlation method was used in this study. Samples were taken using stratified random sampling. Two sets of questionnaires were given to the fifteen OJT Advisers/Coordinators and 290 OJT students which were formulated based from the CHED Memorandum Order (CMO No. 23, Series of 2009) known as Guidelines for Student Internship Program in the Philippines (SIPP) for All Programs with Practicum Subject, and also books and manuals.

The salient findings revealed that, from the fifteen (15) OJT Advisers/Coordinators, there are six (6) belonged to 31 – 40 age group while only four are within the age group of 51 – 60 years old. Nine (9) out of fifteen OJT Advisers are graduates of BS Business Administration/Management, two (3) are graduates of BS Information Technology and three (3) are graduates of BS Computer Science, while out of 290 OJT students, the most number of respondents (84) are enrolled in BS in Information Technology and (65) are enrolled in BSBA major in Financial Management and the BS Information System (11) has the least number of population. The relationship between the sex of the OJT Advisers/ Coordinators and SUCs' compliance of the requirements during on-site deployment showed the lowest r-value or very negligible relationship with the r-value of 0.016, and showed no significant relationship ($\text{sig.} = .956$).

Based on the salient findings of the study, the researcher concluded that the profile the of the OJT Advisers/Coordinators, OJT students, SUCs in Region I, and HTEs vary in terms of variables included in this study. The extent of implementation of on-the-job training conforms to the different area-components included and used in this study and SUCs, HTEs and OJT students have not experienced serious problems in the implementation of OJT. The academic degree earned by the OJT Advisers/Coordinators is the only one among the profile variables that influenced in the preparation of the set requirements during post deployment of the OJT students. The OJT Advisers/ Coordinators perceived that the adequacy and condition of the required facilities of HTEs are not influenced by the extent of compliance of the requirements for OJT and the effectiveness of provisions of the required competencies, while the OJT Students apparently believed that the extent of adequacy and condition of the required HTEs' facilities significantly affect the effectiveness of provisions of the required competencies during on-the-job training.



LEADERSHIP STYLES OF SCHOOL ADMINISTRATORS; ITS RELATION TO THE TEACHER'S BEHAVIOR

Shefraida Manampan Moreno, Adam M. Zainudin , Onofre S. Corpuz, and Lumina D. Cabilo

ABSTRACT

This study was conducted to determine the leadership styles of the school administrations and its effect to the teacher's behavior. Specifically, it determined the socio-demographic characteristic of the school administrators; the extent of leadership styles of the school administrators in Pikit East District; identified the levels of the teacher's behaviors, evaluated the significant influence of the socio-demographic characteristics of the school administrators to the teacher's behavior; evaluated the significant influence of the leadership styles of administrators to the teacher's behavior; and determine the significant relationship between leadership styles of administrators and the teacher's behaviors.

Findings of the study revealed that the socio-demographic characteristics did not significantly influence the teacher's behavior. It was also found out that leadership style of the school administrators did not significantly influence the teacher's behavior therefore the influence is very negligible. Data also showed that leadership styles had a negative but significant relationship to the teacher's behaviors except Bureaucratic Leadership style. The socio-demographic characteristics were highly significantly associated to the teacher's behavior.

Key words: Leadership style, autocratic, democratic, teacher behavior

DETERMINING THE OPTIMAL ROUTE OF VEHICLES DELIVERING RELIEF GOODS TO THE CALAMITY-PRONE AREAS IN REGION IV-A

Allen L. Nazareno¹, Vanessa Joy B. Burgos², Ann Margaret M. Silva²
and Mark Lexter D. De Lara¹

¹*Institute of Mathematical Sciences and Physics, College of Arts and Sciences,
University of the Philippines Los Baños,* ²*Canon Information Technologies Philippines, Inc.*

ABSTRACT

This paper implements an integer linear programming model that determines the optimal route of vehicles delivering relief goods to the calamity-prone areas in Region IV-A. This optimization problem is categorized as a capacitated vehicle routing problem. Data for typhoon Gener from the Department of Social Welfare and Development (DSWD) were considered in this study. Clarke-Wright's Savings Algorithm was used to generate the specific routes of each vehicle from the warehouses to the affected areas. The algorithm gave the minimum number of vehicles to be used and the minimum total travel time to be taken by the delivery vehicles. The solution to this problem can be used by DSWD in efficiently distributing the relief goods to different areas in Region IV-A and consequently optimizing the use of government's resources.

Key words: integer linear programming, vehicle routing problem



LAPAT SYSTEM, INDIGENOUS KNOWLEDGE, SYSTEMS, AND PRACTICES (IKSP) OF MAENG TRIBE-TUBO: A CLIMATE CHANGE ADAPTATION STRATEGY IN FISHERIES RESOURCE MANAGEMENT

Paul Joseph A. Nuval and Lita .M. Colting

Open University, Benguet State University, La Trinidad, Benguet

ABSTRACT

The study determined effective governing practices of the Lapat system; determined how these practices adapt to climate change; and determined the perceived challenges in the promotion and implementation of Lapat system.

Based on the findings, the characteristics of Lapat that can be an adaptation strategy for climate change relates the regulation and prohibition the harvesting of forest and water by-products and maintain its biodiversity.

Further, the study underscored that the Lapat system encapsulates three concepts: IP rights over land and resources; protection of biodiversity; and the ecosystem-based approach. These three concepts converged and were pointed out as potential climate change adaptation measure.

The perceived effects of climate change to fisheries according to the fisherfolk respondents were traced to rainfall, river levels and flows, temperature structure, and water parameters. The impacts of these climatic changes were determined in the bio-physiological, migration pattern, reproduction, and metabolism of the fish species.

In adapting climate change in fisheries resource management, the study revealed that the Lapat system affects and impacts production, ecosystems, farming systems, communities, and wider society and economy.



THE DIVERSITY OF INTERTIDAL MOLLUSCS ASSOCIATED WITH THE MANGROVE FOREST OF MAUBAN, QUEZON PROVINCE, PHILIPPINES

Joana Krisha E. Hirang, Kreenzel Joy D. Pagaduan, Clarivelle M. Razon, Brylle Christian A. Suilan and Steve P. Obanan

Department of Biological Sciences, College of Arts and Sciences, University of the East, Sampaloc, Manila

ABSTRACT

Mauban, Quezon Province is situated in the southeast coast of the Philippines with mangrove forests found in the three sampling sites namely, Cagsiay, Pilaway and San Lorenzo. The diversity of intertidal molluscs associated in these mangrove forests of Mauban, Quezon Province was explored. Physico-chemical parameters affecting the molluscan diversity were measured including water temperature, pH, salinity, conductivity, dissolved oxygen and soil Calcium content. A total of 38 taxa of molluscs were identified comprising 33 species of gastropods and 5 species of bivalves. *Clypeomorus moniliferus* was found to be the most abundant species. Family Neritidae is the most common out of the 15 families that were surveyed. The mangrove forests of Mauban Quezon comprising of *Rhizophora apiculata*, *R. mucronata*, *Avicennia officinalis*, *A. marina* and *Sonneratia alba* tree species were found to harbor high species diversity of intertidal molluscs based from the Shannon index of diversity, $H' = 3.028$. Molluscan diversity associated with mangrove forests are bio indicators of the ecological status of mangrove ecosystem.

Key words: Mauban, Quezon, mollusc diversity, mangrove

GROWTH PERFORMANCE AND NUTRIENT UPTAKE OF TOMATO (*Lycopersicon esculentum* Mill.) GROWN WITH SELECTED ARBUSCULAR MYCORRHIZAL FUNGI

Ma. Luisa D. Ombao and Adviser: Prof. Jonathan Jaime G. Guerrero

Bicol University

ABSTRACT

Physico-chemical properties of soil media and plant tissue were subjected to analysis before and after experiment. It was found out that among soil properties, only pH differed significantly and appears to have a positive relationship to number of AM propagules in the soil. Result implies that the more AM fungi present in the soil the higher the pH and vice versa. On the other hand, plant tissue analysis revealed that only potassium was found to be significantly different. Except for Nitrogen, it was found out that AM colonization has a negative relationship to phosphorous and potassium.

Overall growth performance of plants revealed a high significant difference in the height among the different treatments. On the other hand, no significant difference was observed on other growth parameters. Among AM fungi *Gl. intraradices* is considered to be the best since it has the ability to naturally increase nutrient uptake and increased plant growth and yield. Though successful colonization was observed on the three selected AM fungi, it was perceived that only *Glomus* sp. was able to give beneficial effect to the plant. AM fungi *G. margarita* and *A. spinosa* were adapted to the plants root system but it was observed that these AM fungi did not give a synergistic effect to the plant. Use of different species of *Glomus* sp., lengthening the period of experiment as well as used of other crops to be tested is recommended by the researcher.

Key words: AM fungi, root colonization, synergistic effect, correlation, propagules



STUDENTS' PREFERENCES AND SCHOOLS' PREPAREDNESS ON TECHNOLOGY AND LIVELIHOOD EDUCATION

Joven N. Ondovilla and Harris M. Sinolinding

ABSTRACT

The study aimed to determine the students' preferences and schools' preparedness on technology and livelihood education.

Proportionate sampling by equal allocation was used to obtain the samples of the respondents. Slovin Formula was used to select the obtained five percent margin of error used in collecting the data information gathered in the survey questionnaires were tallied and encoded by the used of SPSS.

There were 224 students and 140 teachers served as respondents. Teachers age mostly 32-above and for students 16-below; female were dominated by males, Bachelor of Arts / Bachelor of Science (AB/BS) were the degree and grade 8 for students, and with a family income below two thousand.

On schools' preparedness of teachers and facilities they were moderately available, on HSOII they were more preferred, Technical vocational livelihood track and industrial arts were more preferred. It is concluded that the influence of demographic profiles on HSOII and technical vocational livelihood track, schools preparedness on TLE of teachers and facilities and students' preferences on HSOII, demographic in terms of teachers and facilities with students' preferences in technical vocational livelihood track were highly significant influence.

Furthermore, demographic profile with HSOII and on schools' preparedness and Students' preferences has a highly significant relationship.

Key words: Preferences, preparedness, technical vocational livelihood.



ISOLATION AND CHARACTERIZATION OF HEAVY METAL RESISTANT BACTERIA FROM MARILAO RIVER, BULACAN

Cielo Emar M. Paraoan¹, Maevel Romero¹, Pierangeli Vital¹, Windell Rivera^{1,2}

¹Institute of Biology, College of Science, University of the Philippines Diliman, ² Natural Science Research Institute, University of the Philippines Diliman, Quezon City, Philippines

ABSTRACT

Heavy metal pollution has caused environmental degradation and numerous public health problems. Metals play a vital role in biological systems, as a living cell cannot exist without metal ions. In order to survive in the wild, bacteria need to develop different mechanisms to confer resistances to these heavy metals. This study deals with isolation and characterization of heavy metal (cadmium chloride, potassium dichromate, sodium thiosulfate, and lead nitrate) resistant bacteria isolated from water collected in Marilao River, Bulacan. On the basis of morphological analysis, all isolates appeared to be rod-shaped and Gram-negative bacteria. All the river isolates were resistant to CdCl_2 (0.25M), $\text{K}_2\text{Cr}_2\text{O}_7$ (0.25M), $\text{Na}_2\text{S}_2\text{O}_3$ (1M) and $\text{Pb}(\text{NO}_3)_2$ (1M). Biochemical tests showed that isolates from CdCl_2 , $\text{Na}_2\text{S}_2\text{O}_3$ and $\text{K}_2\text{Cr}_2\text{O}_7$ were positive in MacConkey agar but $\text{Pb}(\text{NO}_3)_2$ isolates showed less growth or no growth at all. For Eosin Methylene Blue agar, all were negative for *E. coli* but all showed growth except $\text{Pb}(\text{NO}_3)_2$ isolates. All showed positive results in Simmons Citrate agar and Catalase test. Negative results were noted in Starch hydrolysis and Indole tests. Using Triple Sugar Iron slants, some isolates exhibited characteristics for *Salmonella* and *Shigella*. Isolates were subjected to antibiotic susceptibility and showed sensitivity to kanamycin, ceftazidime, and penicillin while showed minimal resistance to penicillin-streptomycin. Based on the results, the tentative isolates were assumed to be either *Salmonella* or *Shigella* species.

HATCHING PERCENTAGE OF RELOCATED OLIVE RIDLEY SEA TURTLE (*Lepidochelys olivacea* Eschscholtz) EGGS IN BRGY. SAN ROQUE, SARIAYA, QUEZON, PHILIPPINES

Emmanuel S. Querubin

Southern Luzon State University, Lucban, Quezon

ABSTRACT

A study on hatching percentage of relocated olive ridley sea turtle (*Lepidochelys olivacea* Eschscholtz) eggs in Brgy. San Roque, Sariaya, Quezon was conducted from October 2012 to December 2012. The study aimed to determine hatching percentage, duration of incubation period, as well as temperature and moisture regimes. It was determined that relocated *L. olivacea* eggs have high hatching efficiency with an average of 94.87% considering the average hatching percentage of 91.91% and average incubation period efficiency of 97.83%. Increasing sand temperature and moisture content were found out to have negative effects and impacts on hatching efficiency. Furthermore, nest dimensions should not be too deep or too narrow, and must be able to accommodate the number of eggs. It was also noted that anthropogenic intervention can have positive influence on hatchling production since humans can protect the nests as well as recover hatchlings buried by cave-ins.

Key words: hatching efficiency, olive ridley, relocated, Sariaya, sea turtle



FULLY EXPANDED PILEUS OF *Volvariella volvacea* EXHIBITS TERATOGENICITY ON ZEBRA FISH AS MODEL

Dean Barry L. Tan, Rich Milton R. Dulay, Sofronio P. Kalaw and Renato G. Reyes

Center for Tropical Mushroom Research and Development, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija

ABSTRACT

Volvariella volvacea which is commonly known in the Philippines as *kabuteng dayami* or *kabuteng saging* is the most popular due to its exotic taste and aroma. The fruiting body of this edible mushroom has 4 distinct stages namely pin head, button, egg, partially opened and the fully expanded/opened pileus or umbrella. Consumers often prefer the button, egg and partially opened pileus due to their meaty-like texture. Though edible, the fully expanded pileus is oftentimes not preferred due to its unfavorable texture and very short shelf-life while in storage. However, our previous investigation confirmed that the fully expanded pileus is also nutraceutical. With its nutraceutical attributes, our team investigated its teratogenicity and cytotoxicity. The combined methanolic and hot water extracts of the CLSU strain of *V. volvacea* was evaluated using embryo of zebra fish as animal model. Different concentrations (0.0005, 0.005, 0.05 and 0.5 %) of the combined extracts of the fully opened pileus of *V. volvacea* were prepared using embryo water as diluent. To determine the effects of the different concentrations of the extract, embryo water without extract was used. The teratogenic and cytotoxic effects of the different extracts on the developing embryo were evaluated 12, 24 and 48 hours after treatment.

Results revealed that extracts of *V. volvacea* exhibited teratogenicity starting from very low concentration of 0.0005 up to 0.005 % respectively. Growth retardation of the embryo as a form of teratogenicity was evident. Higher concentration beyond 0.005 % resulted in the coagulation of the embryo. Heart beat of the embryos was generally lower compared to the control.

Key words: *Volvariella volvacea*, teratogen, cytotoxicity, zebrafish embryo.



BEST PRACTICES IN THE MITIGATION AND MANAGEMENT OF DISASTER OCCURRENCES IN SOUTHERN LEYTE, PHILIPPINES

Meriza M. Saga* and Beatriz C. Jadina

Department of Agronomy and Soil Science Visayas State University, Visca, Baybay City, Leyte

*agas_azirem87@yahoo.com

ABSTRACT

Disaster occurrences such as landslides, earthquakes and flooding have become frequent in Southern Leyte, Philippines. International attention was captured when catastrophic landslides devastated the entire Barangay of Guinsaugon, Saint Bernard last February 17, 2006. This study was conducted to identify and document some mitigation and management practices to minimize the impact of disaster occurrences in the area. An interview with the head of Municipal Disaster Risk Reduction and Management Office (MDRRMO) was conducted. A seminar on disaster preparedness and a survey of the flood and landslide susceptible areas were also done.

Results of the study showed that MDRRMO strictly implemented the following best practices to mitigate and manage disaster occurrences in Saint Bernard, Southern Leyte. Intensive effort of the LGU's to acquire, install, manage and maintain important pieces of equipment for monitoring and early warning system for flooding and landslides; regular conduct of seminars and community drills in preparation of the occurrences of earthquake, flooding and landslides; constant monitoring of activities (signing in logbook of residents who are going to hazardous areas); provision of livelihood support to residents; Installation of gabions along the river banks to minimize river widening during flooding; and force evacuation of residents immediately prior to disaster occurrences. All of these were personally supervised by the MDRRMO and the municipal mayor which ensures effective implementation of these practices.

Key words: Disaster preparedness, flood and landslide early warning system, MDRRMO

COMPARATIVE STUDY OF HYPOGLYCEMIC AND HISTOPATHOLOGICAL EFFECTS OF COMMERCIAL FOOD SUPPLEMENTS OF *Moringa oleifera*, *Blumea balsamifera*, and *Garcinia mangostana* ON ALLOXAN-INDUCED DIABETES IN MICE

Christelle Faye I. Sison and Pia Angela R. Lejano, Adviser: Ms. Thucydides L. Salunga

Miriam College

ABSTRACT

Diabetes is a metabolic syndrome that is caused by either a malfunction in insulin secretion or resistance. Studies show that *Moringa oleifera* Lam. (malunggay), *Blumea balsamifera* (L.) DC. (sambong), and *Garcinia mangostana* Linn. (mangosteen) are used to treat diseases including hyperglycemia. The study aims to compare the hypoglycemic effects of malunggay, sambong, and mangosteen supplements on the blood glucose level (BGL) of diabetic and non-diabetic mice and analyze their histopathological effect on their pancreas and liver. Thirty ICR male mice were grouped into diabetic and non-diabetic. Alloxan was injected at 200 mg/kg body weight to induce diabetes. After 3.5 weeks, they were all hyperglycemic with an average BGL of 424 mg/dL. Both groups were then treated every other day with malunggay, sambong, mangosteen, and metformin except for the positive and negative controls. The results showed that there is a decrease in BGL in all of the treatments, with sambong and malunggay having the highest hypoglycemic activity. Histopathological analysis of the pancreas showed that morphologically, the islets of Langerhans of non-diabetic mice were more clear and defined than diabetic mice indicating damaged cells in the islets of diabetic mice. No effect on the liver was observed in this study.

Key words: Diabetes, Hyperglycemia, Hypoglycemia, Histopathology



BIOLOGICAL AND CHEMICAL CHARACTERISTICS OF GROUNDWATER IN BARANGAY BADAS, MATI, DAVAO ORIENTAL

Janeth C. Tayone* and Mark Gomez

*Mathematics and Natural Sciences Department
Davao Oriental State College of Science Technology, City of Mati, Davao Oriental
njtayone2005@yahoo.com

ABSTRACT

The study was conducted to assess the quality of groundwater in Barangay Badas, Mati, Davao Oriental. Specifically, this included the biological characteristics – Most Probable Number (MPN) of coliforms per 100 mL sample, chemical characteristics - pH, total dissolved solids, total hardness, chloride, nitrates, sodium, magnesium, and calcium.

The Philippine National Standards (PNS) for drinking water was used for water quality assessment. The t-Test was used for data analyses in comparing the experimental mean with the standard value.

The results for Most Probable Number of coliforms per 100 mL sample and sodium were above the maximum level. The pH levels were within the safe limits for drinking water. The results for total dissolved solids, total hardness, chlorides, nitrates varied from one station to another ranging from below to above the standard values. There were no PNS for magnesium and calcium for reference. These results serve as baseline data for the local government units in formulating policies for sustainable management of the groundwater resources.

DNA BARCODING OF PTERIDOPHYTES IN MINALUNGAO NATIONAL PARK AT GENERAL TINIO, NUEVA ECIJA, PHILIPPINES

Eleonor D. Alfonso¹, Kristina J. Cruz^{1,2}, Jerwin R. Undan^{1,2} and Eden S. David¹

¹ Department of Biological Sciences, ² Molecular Laboratory and Biotechnology, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines

ABSTRACT

DNA barcoding is proven to be essential in molecular identification of ferns since it generally lack the morphological complexity for morphology-based identification. DNA barcoding, therefore for identification of species were most appreciated especially in ecological studies. In this study, four species of Pteridophytes collected in Minalungao National Park in General Tinio, Nueva Ecija were subjected for DNA barcoding, using the *rbcl* gene region. Basic Local Alignment Search Tool and Phylogenetic analysis on the species sequences revealed that one species collected was closely identical to *Adiantum caudatum*, one was identical to *Pteris ensiformis*, the other species was closely identical to *Pityrogramma austroamericana*, while the last species was closely identical to *Adiantum Philippense* with 99% sequence identity respectively. Based on the results of the study, the ferns species were identified properly using molecular approach and indicated that *rbcl* gene can be useful for DNA barcoding for ferns.

Keywords: DNA barcoding, *rbcl* gene, Phylogenetic analysis



PHYTOCHEMICAL SCREENING OF SELECTED MEDICINAL AND TOXIC ETHNOBOTANICALS FROM THE IGOROT AND DUMAGAT TRIBE IN LUZON

Jerwin R. Undan^{1,2}, Emmanuel E. Gandalaria¹, Hector M. Espiritu², Ma. Shaimaine Bugarin² and Renato G. Reyes^{2,3}

¹ Molecular Biology and Biotechnology Laboratory, ² Department of Biological Sciences,

³ Mycology and Taxonomy Laboratory, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines

ABSTRACT

Screening of phytochemical constituents was carried out for the detection of the presence or absence of plant secondary metabolites found among the tribes of Igorot and Dumagat in two areas in Luzon. A total of seven ethnobotanicals, three of which were identified by the Igorots as toxic, two as medicinal and another two medicinal plants by the Dumagats were studied. Analyses of phytochemicals were done using the point scale system: (+) for positive and (-) for negative. Ethanol extract and powdered samples were used to detect the phytochemical constituents. Results showed that tannins, alkaloids, terpenoids and saponins were present on the three toxic plants (*Pittosporum pentandrum*, *Derris elliptica*, *Cestrum nocturnum*) but saponin was not present in *D. elliptica* and terpenoid was not present in *C. nocturnum*. Phytochemical analyses on the medicinal plants obtained positive results for terpenoids, cardiac glycosides, and alkaloids. The presence of these plant secondary metabolites can affect different biological activities like antibacterial, antifungal, cytotoxic and antitumor to name a few.



PHYSICAL FITNESS PRACTICES AND STATUS OF FRESHMEN STUDENTS IN HEIs

Mariano L Vicente, and Marieta D. Cayabas

ABSTRACT

This study was conducted to determine the physical fitness practices and status of freshmen students in State HEIs.

An aggregate of 170 freshmen students served as respondents to this study obtained through purposive sampling based on their age. Most (97) were within 17-18 years old; 56 were within 19 and above, and 17 were within 15-16 years old.

The physical fitness practices of the respondents were rated good; likewise with the level of physical fitness status that includes health-related and skill-related were generally good.

Per result of Chi-square test, personal information showed no significant relationship with physical fitness status in terms of health-related; however, BMI had significant relationship with health-related particularly muscular strength, muscular endurance, cardio-respiratory endurance, and flexibility.

On the other hand, physical fitness practices such as exercise, diet, sleep, recreation, and discipline showed significant relationship with physical fitness status in terms of skill-related particularly on speed, power, agility, balance, and coordination as result of chi-square test. Particularly, recreation turned out best predictor on flexibility.

Freshmen students in the state HEIs in North Cotabato have enough and good physical fitness practices with suitable body mass index that contributed to a considerable level of physical fitness status on health and skill-related indicators. This implies that substantial amount of exercise, good diet, enough sleep and rest, commendable recreation, and discipline make a person to become physically fit.

Key words: Physical fitness, health related, physical related, BMI, HEIs



GUIDELINES

BEST PAPER COMPETITION

Authors of competing oral papers should send a copy of the manuscript, typed in double space as word document (v.97-2003) to secretariat@pssnonline.org not later than April 2, 2014. Use "competing paper" as the subject of the email.

There will be 5 categories for the Best Oral paper Award: Biological Sciences, Physical Sciences, Social Sciences, Integrative Studies, and Best Undergraduate Thesis. Best Paper award and cash prize will be awarded to the winners. All finalists will be awarded with a Certificate of Recognition. Finalists will be announced on April 30, 2014.

1. Only oral papers submitted by bonafide members of PSSN with a corresponding payment of the processing fee of PhP1000 shall be considered. This fee is non-refundable but will be deducted from the registration fee if the author will attend in the conference.
2. Submitted entries shall be pre-screened or pre-evaluated by the Best Paper Award Committee. Only 3 papers per category will be selected by the Committee as finalists. The finalists will have to present the papers at the designated Best Oral Paper Session of the Annual Scientific Convention for final judging. Non-finalist papers will be presented in a separate schedule as assigned by the convention secretariat in-charge of the oral papers.
3. The title of all the papers competing for Best Oral Paper shall be found in the official list certified by the convention secretariat. Only one entry should be submitted by an author. In case where an author has more than one paper/entry, the committee reserves the right to choose only one of his/her papers for inclusion in the competition.
4. The criteria for the selection of the finalists for the Best Oral Paper shall be as follows:
 - Contribution to the body of knowledge - 50%
 - Relevance to the Theme - 25%
 - Organization - 25%
5. Members of the Best Paper Award Committee shall not join the competition or shall not be advisers of students competing for the Best Undergraduate Thesis. Also, authors and co-authors who were winners during the last 3 years are not qualified to compete.
6. The paper must be presented orally (in person), otherwise, it is disqualified. Fifteen minutes will be allotted for the oral presentation. For the final judging, the criteria for selection of the Best Oral Paper shall be as follows:
 - Delivery/Presentation - 30%
 - Content - 30%
 - Ability to answer questions - 30%
 - Time - 10%
7. The decision of the committee is final and shall be respected. The committee shall not entertain questions regarding the selection of the winners.

POSTER PAPER PREPARATION

The Poster Paper must at least possess the following components: Title, Authors, Author Affiliation, Abstract, Introduction, Materials and Methods, Results and Discussion, Conclusions, Literature Cited, and Acknowledgement.

Size of poster. The whole poster should fit into a 30" by 40" (76 cm x 102 cm) sheet or board, laid in portrait.

Title of poster. All caps and centered, except for scientific names that should be written in italics. Use letters equivalent to 72 points (about 2 cm) for the main title and 40 points (less than 1 cm) for the



subtitle. On the main title a footnote must indicate that the poster is competing during a particular PSSN Conference, venue, date and the category chosen. For example "Poster presented during the 8th PSSN Scientific Conference held at MMSU, Batac, Ilocos Norte on May 5-10, 2007; Social Science; Graduate level". The size of the footnote should be legible within 1 meter distance.

Author's or authors' name/s. Should be in full, all caps and centered. Use 40 points. Affiliation/address should be written in caps and lower case, italics and centered.

Text. Use type letters that are legible within two-meter distance. Use simple typeface. Use upper and lower case standard letters. Use no more than 2 colors. Good color combinations are black on white, black on yellow, black on pink, dark red on white, dark blue on white, and dark blue on yellow. The best is a dark type on a light background because it is easiest to read.

Illustrations, Tables, Graphs, & Photographs. Should be 5" x 7" (12.5 cm x 18 cm). Labels and captions on illustrations should be readable within two meters.

BEST HIGH SCHOOL PROJECT COMPETITION

Authors of competing papers should send a copy of the manuscript, typed in double space as word document (v.97-2003) to secretariat@pssnonline.org not later than April 20, 2014. Use "Competing Project_High School Category" as the subject of the email.

Certificate and cash prize will be awarded to the BEST PROJECT. All finalists will be awarded with a Certificate of Recognition. Finalists will be announced on April 30, 2014.

1. Only competing papers with a corresponding payment of the processing fee of Php500.00 shall be considered. This fee is non-refundable but will be deducted from the registration fee if the author will attend the conference. The co-author/s and the accompanying judges/chaperones will have to pay the same amount (Php 1,000.00 early bird and Php 1,600.00 onsite).
2. Submitted entries shall be pre-screened or pre-evaluated by the Best Paper Award Committee. ONLY three finalists will have to present the papers during the Best Project Competition on May 21, 2014. Non-finalist papers will be presented in a separate schedule as assigned by the convention secretariat in-charge of the oral papers.
3. The title of all the papers competing for Best Project shall be found in the official list certified by the convention secretariat. Only one entry should be submitted by an author. In case where an author has more than one paper/entry, the committee reserves the right to choose only one of his/her papers for inclusion in the competition.
4. The criteria for the selection of the finalists for the Best Project shall be as follows:
 - Contribution to the body of knowledge - 50%
 - Relevance to the Theme - 25%
 - Organization - 25%
5. Members of the Best Paper Award Committee shall not join the competition or shall not be advisers of competing students.
6. The paper must be presented orally (in person), otherwise, it is disqualified. Fifteen minutes will be allotted for the oral presentation. For the final judging, the criteria for selection of the Best Project shall be as follows:

• Delivery/Presentation - 30%	Content - 30%
• Ability to answer questions - 30%	Time - 10%
7. The decision of the committee is final and shall be respected. The committee shall not entertain questions regarding the selection of the winners.



Philippine Society for the Study of Nature, Inc. | PSSN

TIN 005-866-117-000 SEC Reg. No. B200000647

University of the Philippines - Baguio

Baguio City, Benguet, Philippines

<http://www.pssnonline.org>

PSSN BOARD OF TRUSTEES

CY: 2013-2014

Romeo A Gomez Jr.

President

Benguet State University

Irene de Vera

Vice President

Pangasinan State University

Zenaida G. Baoanan

Secretary

University of the Philippines Baguio

Merites M. Buot

Treasurer

University of the Philippines Los Baños

Sotero M. Aban

Auditor

Pangasinan State University

Ricardo T. Bagarinao

PIO

UP Open University

Arlen Ancheta

Member

University of Santo Tomas

Corazon Macachor

Member

Cebu Technological University

Jesusa D. Ortuoste

Member

Sultan Kudarat State University

Nilda Roma Burgos

Member

University of Arkansas, USA

Cecilio S. Baga

Ex-Officio

Cebu Technological University

PSSN 14th National Scientific Conference

ORGANIZING COMMITTEES National Organizing Committee

Chairman: Incumbent President, Dr. Romeo Gomez Jr., BSU

Members: current BOT members

Local Organizing Committee

Steering Committee

Chairman : Dr. Ben D. Ladilad, President, BSU

Co-Chair : Dr. Perciveranda A. Lubrica, BSU

Members : Dr. Romeo Gomez, Jr. BSU, PSSN



WORKING COMMITTEES

Conference Coordinators (Program and invitation)

Chair : Dr. Jesusa Ortuoste, SKSU
Co-Chair : Dr. Zenaida Baoanan, UPB
Members : Dr. Elvie Diaz, SKSU

Secretariat & Registration

Chair : Prof. Merites Buot, UPLB
Co-Chair : Dr. Zenaida Baoanan, UPB
Members : Dr. Romeo Dizon, UPB; Ms. Karen Ballada, UPB, Lina Cancino, PSU

Proceedings, Documentation & Evaluation

Chair : Dr. Arlen Ancheta, UST
Co-Chair : Dr. Yolina Castaneto, NVSU
Members : Mr. Cristopher Cocal, PSU; Mr. Thom Christian Tabisola, PSU;
Mr. Jayson Caranza, NVSU, representative from BSU

Awards Committee

Over-All Chair : Dr. Irene de Vera
Co-Chair : Dr. Jacqueline Lampac, BCNHS
Member : Dr. Lorna Urbiztondo, PSU; Dr. Rodolfo Moreno, ISPSC,
Dr. Zenaida Baoanan, UPB

Best Poster

Chair : Dr. Honorio M. Soriano Jr., PSAU
Co-Chair : Dr. Sotero Aban, PSU
Members : Prof. Elnora Dudang, PSU, Dr. Lita M. Colting, BSU,
Dr. Leonora Ngilangil, DMMSU

Best Paper (Pre-screening Committee)

Chair : Dr. Rachel C. Sotto, UPLB
Members : Dr. Carmelita M. Rebancos, UPLB
: Dr. Aimee Lynn B. Dupo, UPLB

Oral Presentation

Chair : Dr. Percyveranda A. Lubrica, BSU
Members : Dr. Juan Carlos T. Gonzales, UPLB
: Dr. Maria L. Teresa Samonte, CFCST
: Prof. April Hope Castro, UPLB

Exhibits Committee

Chair : Dr. Lorenza Lirio, BSU
Co-Chair : Dr. Jose Balaoing, BSU
Members : Ms. Joyce N. Paing, BSU

Ways and Means Committee

Chair : Dr. Cecilio Baga, CTU
Co-Chair : Dr. Corazon Macachor, CTU
Members : Prof. Elnora Dudang, PSU, BSU, Dr. Sotero Aban, PSU,
Dr. Irene de Vera, PSU, Ms. Elizabeth Dom-oguen, BSU

Committee on Food, Socialization and Tour

Chair : Prof. Merites Buot
Co-Chair : Ms. Zeverine Banganan
Members : Mr. Jimmy Wakat, BSU; Dr. Bretel B. Dolipas, BSU, Mr. Buenaventura Caluscasin, DMMSU, Dr. Romeo Dizon, UPB (for the pre-conference)



Advocacy & Promotion Committee

Chair : Dr. Ricardo Bagarinao, PSSN Website Master, UPOU
 Co-Chair : Mr. Paul Joseph Nuval, BSU
 Members : Dr. Imelda Parcasio, BSU

Membership and Election Committee

Chair : Dr. Romeo Dizon
 Co-Chair : Mr. Rene de Vera
 Members : Dr. Sherlyn Tipayno, BSU; Mr. Rey Raguindin, PSU

Certificate Committee

Chair : Dr. Zenaida Baoanan, UPB and Dr. Ricardo Bagarinao, UP OU
 Co-Chairs : Ms. Karen Ballada, UPB and Mr. Rene de Vera, PSU
 Members : Elizabeth Dom-ogen, BSU; Maricel Guron, BSU;
 Abner Lawangen, LGU-Tublay, Benguet

Technical Sessions Committee

Chair : Prof. Valentino Macanes
 Co-Chair : Dr. Kenneth Laruan
 Members : Dr. Ramon Docto

Souvenir Program

Chair : Dr. Romeo A. Gomez Jr, BSU
 Co-Chair : Ms. Maricel A. Guron, BSU
 Members : Ms. Elizabeth Dom-oguen, BSU
 Ms. Emily A. Diw-ayan, BSU
 Rene Vincent Tad-o, BSU GS Student
 Xelamae Habon, BSU GS Student
 Almark M. Bisaya, BSU GS Student

Committee on Hall Preparation/Stage Decoration

Chair : Mr. Armando Cabanas, Jr., BSU
 Co-chair : Nelson Dacawe, BSU
 Members : Joanna Alafag, BSU
 Melchor Catones (BSES IV volunteer)
 Wellhymn Marcos (BSES IV volunteer)
 Selected BSES Student-Volunteers

Welcoming Committee

Chair : Dr. Gilda B. Jacalan, BSU
 Members : Dr. Grace Bengwayan, BSU
 Ms. Elizabeth Dom-oguen, BSU

Committee on IT Equipment Set-up

Chair : Mr. Paul Garcia, Jr., BSU
 Members : ICT Staff, BSU, Selected GS Student-Volunteers



Republic of the Philippines
BENGUET STATE UNIVERSITY
La Trinidad, Benguet



GREETINGS TO THE PHILIPPINE SOCIETY FOR THE STUDY OF NATURE, INC.

From: BSU Management, Faculty, Staff and students

COURSE OFFERINGS:

MAIN CAMPUS
La Trinidad, Benguet

Courses offered:

GRADUATE PROGRAMS

DOCTOR OF PHILOSOPHY (PhD)

Agricultural Education
Agronomy
Educational Management
Horticulture
Language Education
Rural Development
Science Education: Biology

MASTER of SCIENCE (MSc)

Agricultural Economics
Agricultural Education
Agronomy
Animal Science
Biology
Entomology
Forestry
Horticulture
Mountain Engineering (BSU-SLU-UC Consortium)
Plant Pathology
Rural Development
Soil Science

MASTER OF ARTS IN EDUCATION (MAED)

Educational Administration and Supervision
Elementary Education

MASTER OF ARTS (MA)

Applied Statistics
Chemistry
English as a Second Language
Filipino
General Science
Home Economics
Mathematics
Physical Education
Physics
Technology and Home Economics
Social Studies
Guidance

MASTER OF RESOURCE SYSTEM MANAGEMENT-Agribusiness

MASTER IN PUBLIC ADMINISTRATION

MASTER IN LIBRARY AND INFORMATION SCIENCE

UNDERGRADUATE PROGRAMS

COLLEGE OF TEACHER EDUCATION

Bachelor in Secondary Education
Bachelor in Elementary Education
Bachelor in Library and Information Science

COLLEGE OF ARTS AND SCIENCES

Bachelor of Science in Applied Statistics
Bachelor of Science in Environmental Science
Bachelor of Science in Information Technology

COLLEGE OF HOME ECONOMICS AND TECHNOLOGY

Bachelor of Science in Home Economics
Bachelor of Science in Nutrition and Dietetics
Bachelor of Science in Entrepreneurial Tech. (ladderized)
Bachelor of Science in Hotel and Restaurant Management
Associate in Entrepreneurial Technology

COLLEGE OF NURSING

Bachelor of Science in Nursing

COLLEGE OF AGRICULTURE

Bachelor of Science in Agriculture (ladderized)
New major field: Organic Agriculture
Bachelor of Science in Agribusiness
Bachelor of Science in Dev. Communication
Diploma in Agroforestry
Certificate in Agricultural Science

COLLEGE OF FORESTRY

Bachelor of Science in Forestry

COLLEGE OF ENGINEERING AND APPLIED TECHNOLOGY

Bachelor Science in Agricultural Engineering

Certificate in Basic Automotive Technology

Certificate in Advance Automotive Technology

COLLEGE OF VETERINARY MEDICINE

Doctor of Veterinary Medicine

INSTITUTE OF HUMAN KINETICS

Bachelor of Physical Education
Diploma in Physical Education

INSTITUTE OF PUBLIC ADMINISTRATION

Bachelor of Arts in Public Administration
Diploma in Public Administration

OPEN UNIVERSITY

Master in Community Development
Master in Development Communication
Master in Coop Management
Master in Human Resource Development
Master in Urban Management
Master in Non- formal Education
Master in Community Health Development
Diploma in Training Management
Diploma in Urban Management
Certificate in Organic Agriculture

BSU-BOKOD CAMPUS
Daclan, Bokod, Benguet

Courses offered:

Bachelor of Science in Industrial Education
Bachelor of Science in Industrial Technology
Bachelor of Science in Elementary Education

BSU-BUGUIAS CAMPUS
Loo, Buguias, Benguet

Courses offered:

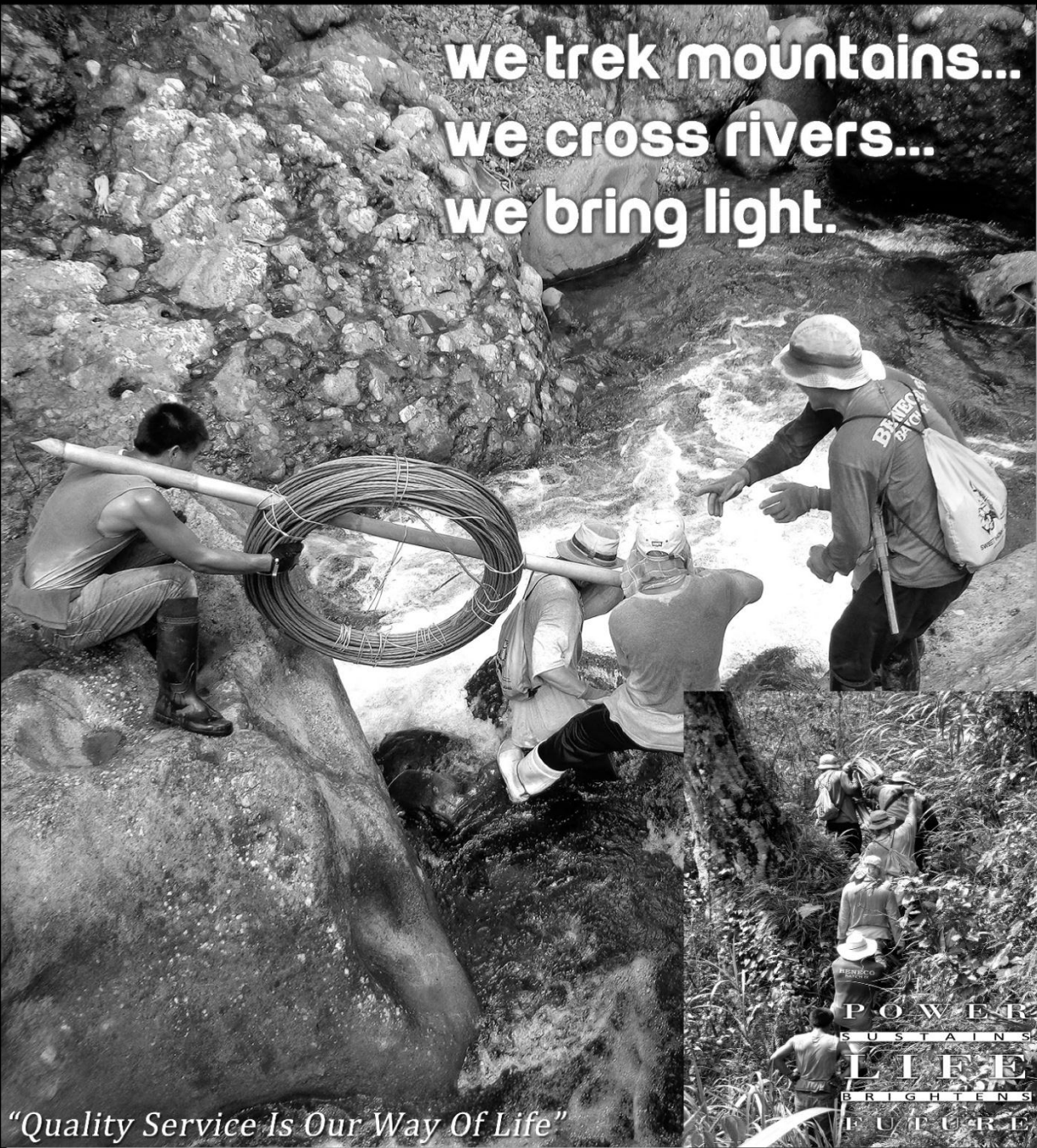
Bachelor in Elementary Education
Bachelor in Secondary Education
Bachelor of Science in Agricultural Education
Bachelor of Science in Industrial Technology
Bachelor in Agricultural Technology

Tel.No. (63) (74) 422-2401; Fax.No. (63) (74) 422-2261 ; Website: www.bsu.edu.ph



*The Benguet Electric Cooperative, Inc. (BENECO)
welcomes
the delegates of the 14th National Scientific
Conference*

**we trek mountains...
we cross rivers...
we bring light.**



"Quality Service Is Our Way Of Life"

**POWER
SUSTAINS
LIFE
BRIGHTENS
FUTURE**



**Congratulations to
PSSN on its 14th
National Scientific
Conference**



The Philippine Society for the Study of Nature-Northern Luzon Chapter

*Congratulates PSSN on its 14th
National Scientific Conference*

Join the Chapter's 8th Annual Scientific
Conference in November 2014.

Updates shall be posted on PSSN Official Website
soon!



Compliments of:



Dr. Joel V. Lubrica, Dean
Dr. Dominga S. Tomas, Associate Dean
Dr. Leoncia L. Tandang, Dean-CA
Dr. Aurea Marie M. Sandoval, Dean-CAS
Dr. Pelin B. Belino, Dean-CHET
Dr. Vicente T. Wacangan, Dean-COF
Dr. Ester T. Fianza, Dean-CTE
Dr. Eduardo P. Laconsay, Director-IHK

Compliments of:

**Dr. and Mrs.
Christopher A. Ramos**

Compliments of:

**Mr. & Mrs.
Efren M. Macachor
and Family**

Greetings to the Philippine Society for the
Study of Nature (PSSN), Inc. on its
14th Annual National Scientific Conference!
Wishing the success of all the activities
pertinent to creating possibilities for a
responsible resource use. Hand and hand
we go together to achieve such goals.

Greetings from:
Board Member Robert M.
Namoro & Family | District II-
Benguet Province



WE MATCH YOUR DREAMS WITH YOUR FINANCES.

"BASTA'T MAY PLANO, KAYA MO 'YAN! USAP TAYO"

FINANCIAL ADVISOR

ADDISON KYLE B. LA-AO

Email: jhasm2000@yahoo.com
Address: MA-081, Puguís, L.T.B.
CP #: 0999-824-0381
Office #: 422-7138

You can personally visit me at:
Dongla Unit, Hora Agency, PhilAm
Life, Session Rd., Baguio City
PhilamLife Km.4, L.T.B. on
Saturdays

Compliments:

**TRIMATRIX
ELECTRICAL SUPPLY**

**TA-3 SUNNY SIDE,
T. ALONZO STREET
BAGUIO CITY**

Tel No. 074-3043967



Republic of the Philippines
PROVINCE OF BENGUET
La Trinidad
OFFICE OF THE GOVERNOR

On the occasion of the 14th National Scientific Conference of PSSN on May 20-24, 2014 at the Benguet State University, we extend our warmest greetings to the participants, the planners and the organizers of the event.

We are happy that PSSN's enthusiasm in conducting this yearly affair is unflinching and we hope that it will continue to do so, it being a very relevant activity especially at this time when there is a need to care for our environment.



Nestor B. Fongwan
GOVERNOR

Greetings to:

Philippine Society of the Study of Nature, Inc. (PSSN)



Benguet State University-CCA Performing Arts Group together with the Senior Citizens of Caliking Atok, Benguet.



from:

Norma S. Mayos
Louisa P. Pladio
Janet B. Mede

Penelope F. Tica-a
Elizabeth T. Dom-ogen
Joyce N. Paing

Irene de Vera Rene de Vera Sotero Aban
Cornelia Ibarra Armando Garcia Shella Parreno
Emmanuel Federico Capinpin Jr. Jennie Fernandez
Rosie Abalos – Executive Director, Binmaley Campus
Dante Mendoza Francis Albert Argente
All from PSU Binmaley Campus
Rhodora Malicdem- ***PSU Lingayen Campus***
Catalina Platon Gudelia Samson
Wilma de Vera Raquel Pambid
All from PSU Bayambang Campus

Congratulations to
PSSN for its
14th Annual National
Scientific Conference
From:
Biology Department-CAS
Benguet State University

Notes

[illegible]

Index

ENVIRONMENTAL GOVERNANCE AND PEOPLE'S PARTICIPATION		
AUTHOR/S	TITLE	PAGE
BaiSaguira M. Abdulah, et al.	HOUSEHOLD SOLID WASTE MANAGEMENT IN RELATION TO HEALTH STATUS	36
Helen Alojado Puno	CHILD LABOR CONTRIBUTIONS TO THE HOUSEHOLD PRODUCTIVITY AND INCOME OF RUBBER FARMERS IN THE ARAKAN VALLEY COMPLEX, PROVINCE OF COTABATO	37
Pasigan U. Buisan	EVALUATION OF THE DEVOLVED AGRICULTURAL SERVICES ON THE JOB PERFORMANCE OF EXTENSION WORKERS	38
Christine Laurie L. Canuto, et al.	PETROLEUM PRODUCT CONSUMPTION AMONG RESIDENTS OF RURAL AND URBAN COMMUNITIES OF LA TRINIDAD, BENGUET	38
Ana Rosa Carmona, et al.	HUMAN-ENVIRONMENT INTERACTION IN THE RIPARIAN BUFFER ZONE IN BARANGAY BAMBANG, LOS BAÑOS, LAGUNA	39
Aiko F. Claudio, et al.	USE OF PLASTIC AND ALTERNATIVE BAGS: THE CASE OF CONSUMERS AND BUSINESS ESTABLISHMENTS	39
Jose Edwin C. Cubelo and Teodora A. Cubelo	PESTICIDE RESIDUES IN VEGETABLES, SOIL, AND WATER SAMPLES FROM FOUR VEGETABLE-PRODUCING AREAS OF NEGROS ORIENTAL, PHILIPPINES	40
Jose Edwin C. Cubelo	FACTORS ASSOCIATED WITH PESTICIDE USE AMONG VEGETABLE FARMERS IN NEGROS ORIENTAL, PHILIPPINES	41
Dwight Antero Daodao	THE SOLID WASTE MANAGEMENT PRACTICES OF URBAN BARANGAYS IN LA TRINIDAD, BENGUET	42
Narses S. Detera	AGRICULTURAL WASTE MANAGEMENT OF RICE FARMERS IN CAMARINES SUR, PHILIPPINES	43
Corazon P. Macachor, et.al.	ENVIRONMENTAL PROTECTION PRACTICES OF DANAO CITY BEACH RESORTS	43
Eddie G. Fetalvero	TIGER GRASS PLANTATIONS: IMPLICATIONS FOR CALSANAG WATERSHED FOREST RESERVE MANAGEMENT	44
Hans Gerth V. Garcia, et al.	PHILIPPINE FLOOD INSURANCE NOTES: PRICING BASED ON MONTE CARLO SIMULATION	44
Celia R. Ignacio, et al.	COMMUNITY AWARENESS ON RASA ISLAND PROTECTION PROGRAM	45
Ben D. Ladilad, et al.	COMMUNITY-LEVEL CLIMATE CHANGE VULNERABILITY AND ADAPTIVE CAPACITY ASSESSMENT OF VEGETABLE AGROECOSYSTEMS IN BENGUET	46
Jehan K. Laoyan, et al.	ELECTRIC CONSUMPTION AND CONSERVATION PRACTICES AMONG BAGUIO – BENGUET RESIDENTS	46
Corazon P. Macachor, et al.	HOUSEHOLD PARTICIPATION OF LUYANG, CARMEN CEBU RIVER CLEAN UP	47



Edgardo P. Lillo, et al.	BIODIVERSITY CONSERVATION AND TOURISM DEVELOPMENT IN BARANGAY TALOOT, ARGAO, CEBU	48
Rhodora Lynn C. Lintag, et al.	WOMEN'S PARTICIPATION AS SOCIAL VULNERABILITY INDICATOR IN COASTAL WATER MANAGEMENT	49
Josephine M. Magay-Salmo and Mildred Palatino-Palon	ETHNOBOTANICAL USES AND PHYTOCHEMICAL ANALYSIS OF TWO <i>Amorphophallus</i> SPECIES (BALBAG) IN PALAWAN, PHILIPPINES	50
Sherry B. Marasigan and Joane V. Serrano	INDIGENOUS FARMING FAMILIES: PARTNERS IN SAFEGUARDING THE SUSTAINABLE USE OF NATURAL RESOURCES	51
Jiye A. Margate	UNDERSTANDING SOCIO-CULTURAL ENVIRONMENT THROUGH ARCHIVING LAGAYLAY, AN ORAL TRADITION IN CANAMAN, CAMARINES SUR	51
Shella C. Parreño and Romeo A. Gomez	DEFINING STAKEHOLDERS' PARTICIPATION IN BUENLAG-SABANGAN RIVER'S CONSERVATION AND MANAGEMENT: A MULTIDISCIPLINARY APPROACH	52
Albert A. Piñon, et al.	GENETIC CHARACTERIZATION OF TREES FOR BETTER MANAGEMENT OF PLANTED FOREST IN SOUTHERN PHILIPPINES	53
David A. Rodolfo	CROP DIVERSITY OF UPLAND FARMS IN APAYAO, NORTHERN PHILIPPINES	54
David A. Rodolfo	REDISCOVERING ALMACIGA (<i>Agathis philippinensis</i>): MOTHER TREE DOCUMENTATION AND SELECTION IN LUNA, APAYAO	55
Ma. Theresa R. Sawit	KNOWLEDGE, ATTITUDE AND PRACTICES OF RICE AND CORN FARMERS ON THE UTILIZATION OF BIOMASS FOR RENEWABLE ENERGY IN SCIENCE CITY OF MUNOZ, NUEVA ECIJA	56
L.M. Villanueva, et al.	MANAGEMENT OF CABBAGE PESTS IN AN ORGANIC FARM	57
Marjorie A. Villanueva and Sotero M. Aban	ASSESSMENT OF AQUATIC FAUNA IN THE RIVER SYSTEM OF DAGUPAN CITY	58

GREEN TECHNOLOGY AND ECONOMY		
AUTHOR/S	TITLE	PAGE
Sotero M. Aban, et al.	GREEN MUSSEL AS A NEW EMERGING MOLLUSK SPECIES IN THE COASTAL WATERS OF BOLINAU, PANGASINAN	59
Roger Rico Alferez	MUSTARD (<i>Brassica juncea</i>) PRODUCTION GUIDE USING AMINO ACID-BASED NITROGEN UNDER DROUGHT CONDITION	60
Mary Felma A. Aliño	<i>Carissa carandas</i> FRUIT EXTRACT AS A NATURAL FABRIC DYE	60

A. A. Along, et al.	SCREENING AND DISTRIBUTION OF POTENTIAL NICKEL HYPERACCUMULATOR PLANT SPECIES IN SELECTED MINING AREAS IN CLAVER, SURIGAO DEL NORTE	61
Cherubin M. Alonzo and Jesusa D. Ortuoste	PLANTING SYSTEM AND RATES OF VERMICOMPOST ON RAINFED LOWLAND RICE	61
Leah Astrologo and Romualdo M. Ortuoste	POST HARVEST LOSS ASSESSMENT OF COFFEE IN SENATOR NINOY AQUINO	62
Jo-Ann Licay, et al.	OPTIMIZATION OF THE GROWTH CONDITION FOR RAPID MICROPROPAGATION OF LILIUM PHILIPPINENSE USING PLANT GROWTH FACTORS	62
Ma. Abegail Bastigu, and Henry I. Rivero	DUCK EMBRYONIC DEVELOPMENT UNDER A SIMULATED POWER SHORTAGES IN MINDANAO, PHILIPPINES	63
Analie B. Castillo and Jesusa D. Ortuoste	ORGANIC FARMING STRATEGIES FOR SUSTAINABLE LOWLAND RICE SEED PRODUCTION	63
Jelly Mae Colipano and Jason Hermosilla	INFLUENCE OF FREEZING OF COCONUT MEAT ON THE QUALITY OF VIRGIN COCONUT OIL	64
Onofre S. Corpuz, et.al.	ENHANCING UPLAND RICE PRODUCTION IN VARIOUS AGRO-ECOSYSTEMS IN ARAKAN VALLEY COMPLEX	64
Paz A. Cutamora and Junito P. Marcelino	GROWTH AND YIELD RESPONSE OF ADLAI (<i>Coix lacryma – jobi</i> L.) ON VERMICOMPOST AND VARIOUS LIQUID ORGANIC EXTRACTS	65
Sansaluna Punto Dalanda and Jesusa D. Ortuoste	APPLICATION OF VERMICOMPOST DERIVED FROM BANANA PSEUDOSTEM WITH ANIMAL MANURE IN TOMATO (<i>Lycopersicon esculentum</i> L.)	65
Irene A. De Vera	CACAO AND TABLEA TSOKOLATE: SPANISH CONTRIBUTION TO PANGASINAN AGROFORESTRY, CULINARY, AND ECONOMY	66
Lodifel C. Deypalan and Junito P. Marcelino	PEST AND DISEASE SEVERITY INCIDENCE OF OPV WHITE MAIZE (<i>Zea mays</i>) AS INFLUENCE BY ORGANIC FERTICIDES	66
Julie Dizon and Ne B. Velasco	POTENTIALS OF VERMICAST AS FEED SUPPLEMENT FOR A THREE-WAY CROSSED CHICKEN (PARAOAKAN X KABIR X SASSO/COBB) RAISED UNDER MODIFIED FREE-RANGE SYSTEM	67
Nessie F. Fordan and Jesusa D. Ortuoste	EFFICACY OF ORGANIC FERMENTED MATERIALS FOR DESHOOTED TOMATO (<i>Lycopersicon esculentum</i>)	67
Sotero M. Aban, et al.	RESOURCE ASSESSMENT OF TAMBAC BAY IN WESTERN PANGASINAN	68
Michelle B. Gatab-Laruan	THE RETURN OF ORGANIC AGRICULTURE IN BENGUET: A CHRONICLE OF THE FARMERS' JOURNEY IN ORGANIC AGRICULTURE	69
Olive G. Gomez and Romualdo M. Ortuoste	SEED TREATMENTS ON THE GERMINATION AND GROWTH OF RUBBER (<i>Hevea brasiliensis</i>) WITH DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA	69



Josalyn Jomud and Jesusa D. Ortuoste	RAPID MULTIPLICATION TECHNIQUES OF WHITE POTATOES (<i>Solanum tuberosum</i> Linn.) AS INFLUENCED BY DIFFERENT LEVELS OF VERMICOMPOST AS POTTING MEDIA	70
Michelle G. Capuyan, et al.	INFLUENCE OF TEMPERATURE ON THE QUALITY OF QUESEO	70
Zainodin M. Kusin	EFFICACY OF ORGANIC BASED-TEAS FOR THE CONTROL OF BACTERIAL LEAF BLIGHT DISEASE OF SALINAS RICE CAUSING <i>Xanthomonas oryzae pv. oryzae</i> IN INTERMITTENTLY FLOODED AREAS OF COTABATO CITY	71
Allihasgar M. Limanay and Farida K. Dimalen	PROPAGATION OF <i>Vitex parviflora</i> Juss. IN NON-MIST TECHNIQUE TREATED WITH IBA CONCENTRATION	71
Jean F. Nebrea, et al.	DETECTION OF <i>Staphylococcus aureus</i> FROM PACKED DRIED SIGANIDS	72
Corazon P. Macachor and Benjie Oncienes	INFLUENCE OF CARRAGEENAN FROM <i>Kappaphycus cottonii</i> ON THE FLAVOR OF DRIED TILAPIA <i>Oreochromis</i> spp	72
Aileen Malasador and Ne Velasco	MILK YIELD OF DAIRY COW FED WITH VARYING LEVELS OF CORN HUSK SILAGE AND MORINGA LEAF MEAL	73
Dante M. Mendoza, et al.	SPECIES COMPOSITION AND VOLUME OF FISH CAUGHT IN PAYAOS INSTALLED IN THE WEST PHILIPPINE SEA	74
J.G. Mojares	IMPLEMENTING BIOGAS TECHNOLOGY PROJECT: THE MALVAR EXPERIENCE	75
Romeo P. Montecillo, et al.	DEVELOPMENT OF PRINTER INK FROM CEPHALOPODS	75
Corazon P. Macachor, et al.	SENSORY QUALITIES OF BANANA <i>Musa balbisiana</i> COOKIES	76
Norodin G. Palti and Romualdo M. Ortuoste	SUBMERGENCE – TOLERANT RICE VARIETIES AS INFLUENCED BY PLANT SPACING	76
Pet Roey L. Pascual and Jingjing P. Cabahug	FLOWERING AND YIELD OF TWO TOMATO VARIETIES TO VARYING WATERING SCHEDULES AND FERTILIZERS	77
Pet Roey L. Pascual and Jingjing P. Cabahug	VARYING WATERING SCHEDULES AT DIFFERENT FERTILIZER SCHEMES: IMPLICATION OF TOMATOES' RESPONSE TO WATER SHORTAGE	78
CAG Perez and CGB Banaay	RHIZOSPHERE BACTERIAL SPECIES DIVERSITY IN TWO RICE CROPPING SYSTEMS UNDER THREE DIFFERENT NUTRIENT MANAGEMENT SCHEMES	78
Ryan P. Plenciano and Dr. Jesusa D. Ortuoste	REARING OF PUPAL PARASITOID (<i>Tetrastichus brontispae</i>) USING DIFFERENT LEVELS OF HONEY CONCENTRATION	79
Rey S. Raguindin	EFFECT OF LIQUID ORGANIC FERTILIZER OBTAIN FROM FISH WASTE TO GROWTH PERFORMANCE OF PECHAY IN SANDY SOIL OF PSU-BINAMLEY CAMPUS BINMALEY, PANGASINAN	79
Chrisnan Darenn A Ramos	INFLUENCE OF SCENT CONCENTRATION ON Citrus microcarpa PEEL EXTRACT-BASED- HAND WASH	80

Ray A. Rodriguez and Jesusa D. Ortouste	PHYTOHORMONE APPLICATION AND MYCORRHIZAL INOCULANT ON ROOTING OF DIMORPHIC ROBUSTA CUTTINGS	80
Jean S. Salazar and Carlos E. Lacamento	VARIETAL TRIAL OF UPLAND RICE CULTIVARS IN SURALLAH, SOUTH COTABATO	81
Roy A. Signacion, et.al.	EFFECT OF VERNIMAL MANURE ON THE GROWTH AND YIELD OF SWEET CORN (<i>Zea mays</i> var. <i>Saccharata</i>)	81
Roy C. Villanueva and Sotero M. Aban	HATCHERY PERFORMANCE OF F1 AND F2 GIANT FRESHWATER PRAWN (<i>Macrobrachium Dacqueti</i> SUNIER, 1925) BREEDERS IN CONCRETE TANKS	82

ENVIRONMENTAL EDUCATION AND ADVOCACY		
AUTHOR/S	TITLE	PAGE
Harold O. Buenvenida	IMPROVING STUDENTS PERFORMANCE IN ECOLOGY THROUGH CULTURE-BASED SCIENCE PEDAGOGY	83
Minerva E. Sañoso, et al.	REVEALING PRE-SERVICE TEACHERS' PERFORMANCE IN THE CLIMATE CHANGE CONCEPT INVENTORY (CCCI): THE CASE OF TWO UNIVERSITIES IN EASTERN VISAYAS	84
Ian Phil Canlas	ASSESSING THE PATTERNS, MOTIVATIONS AND BARRIERS IN THE TEACHING OF CLIMATE CHANGE AMONG ELEMENTARY CLASSROOMS	84
Leah V. Carballo, PhD	ENVIRONMENTAL EDUCATION: IT'S ROLE FOR SUSTAINABLE DEVELOPMENT	85
Roland S. Cartagena	AN ASSESSMENT ON THE ENVIRONMENTAL AWARENESS AND ENVIRONMENTAL EDUCATION OF COLLEGE STUDENTS IN DE LA SALLE ARANETA UNIVERSITY	86
Daniel D. Dasig Jr. et al.	BLENDED LEARNING CONTEXT: A MEDIATED DELIVERY IN THE NEXT GENERATION WASTE-FREE CLASSROOM	87
Daniel D. Dasig Jr., et al.	A STUDY ON THE ADAPTATION OF PROJECT-BASED LEARNING IN THE DEVELOPMENT OF RENEWABLE ENERGY PROJECTS AND SUSTAINABLE ENGINEERING SOLUTIONS	88
Pedro M. Gutierrez Jr., et al.	GENOTOXIC EFFECTS OF <i>Jatropha curcas</i> Linn. SEED EXTRACT ON THE MERISTEMATIC ROOT CELLS OF <i>Allium cepa</i>	89
Mourng Kagna and Josefina T. Dizon, PhD.	COMPARISON BETWEEN KNOWLEDGE AND PRACTICE OF RURAL WOMEN IN NUTRITION EDUCATION AT TNAOT CHUM COMMUNE, KROKOR DISTRICT, PURSAT PROVINCE, CAMBODIA	90
Eulenia C. Pizaña	BIOPESTICIDAL EFFECT OF KANTUTAY (<i>Lantana camara</i>) LEAF EXTRACT ON COCONUT LEAF BEATLE (<i>Brontispa longissima</i>)	91
Catalina C. Platon and Raquel C. Pambid	FOOD SAFETY PRACTICES AMONG NATIVE DELICACY PRODUCERS AND VENDORS IN THE PUBLIC MARKET OF BAYAMBANG, PANGASINAN	92
Joane V. Serrano, et al.	MOTHER EARTH: THROUGH THE UPOU EARTH AMBASSADOR'S EYES	93
Imelda Siregar and Maria Ana T. Quimbo	ENVIRONMENTAL AWARENESS AND ENVIRONMENT-RELATED BEHAVIOR OF STUDENTS IN SELECTED PRIMARY SCHOOLS IN BOGOR, WEST JAVA, INDONESIA	93



Glenn O. Sopsop and Lita B. Sopsop	ENVIRONMENTAL ADVOCACY: AN EXPERIENCE FROM THE PROPOSED COAL-FIRED POWER PLANT IN ABORLAN, PALAWAN	94
Wilma M. de Vera, et al.	QUALITY OF WATER SUPPLY FROM DEEP WELLS OF PUBLIC ELEMENTARY SCHOOLS IN PANGASINAN	94
Maria Rhodora E. Malicdem, et al.	MATERNAL HEALTH CARE SERVICES IN SELECTED MUNICIPALITIES OF PANGASINAN	95
Rowena Yap-Bernal and Maria Ana T. Quimbo	DISASTER PREPAREDNESS OF SELECTED ELEMENTARY SCHOOLS IN THE COASTAL MUNICIPALITY OF GENERAL NAKAR, QUEZON	95

PARTNERSHIPS FOR THE ENVIRONMENT		
AUTHOR/S	TITLE	PAGE
Ms. Ma. Cherina S.B. Dionisio, et al.	THE DYNAMICS OF NETWORKING IN A COASTAL COMMUNITY: BASECO AS CONTEXT	96
Leila D. Landicho, et al.	PROSPECTS AND CHALLENGES OF PUBLIC-PRIVATE PARTNERSHIP FOR SUSTAINABLE FOREST MANAGEMENT IN THE PHILIPPINES: CASE OF THE DBP-FOREST PROGRAM	96
Jan Ramel A. Tumbaga	WILLINGNESS TO PAY (WTP) AMONG THE CITIZENS OF VILLASIS, PANGASINAN FOR THE ESTABLISHMENT OF A SANITARY LANDFILL	97

ENVIRONMENTAL RESEARCH AND METHODS		
AUTHORS	TITLE	PAGE
J. E. Acosta, et al.	ANALYSIS/SYNTHESIS OF RAINFALL TIME SERIES USING THE BOX-JENKINS METHODOLOGY	98
Joanna I. Alafag, and Hyun-Hee Kong	MOLECULAR AND BIOCHEMICAL CHARACTERIZATION OF A NOVEL ACTIN BUNDLING PROTEIN IN <i>ACANTHAMOEBA</i>	98
Steve Michael T. Alcazar, et al.	BIODIVERSITY OF MACRO- INVERTEBRATES IN BALAY SA AGTA CAVE, SOUTHERN CEBU, PHILIPPINES	99
Kristeen Y. Alday, et al.	HEALTH EXPOSURE OF LABORATORY STAFF IN SELECTED CHEMICAL FACILITIES	100
Ricardo T. Bagarinao	URBAN AGRICULTURAL LANDSCAPE DYNAMICS AND ITS IMPLICATIONS IN LOCAL COMMUNITY FOOD SECURITY: A GIS-BASED ANALYSIS	100
Sittie Aisah U. Balt Ephrime B. Metillo	MORPHOLOGICAL ANALYSIS OF <i>Keratella cochlearis</i> AND <i>Lecane bulla</i> (ROTIFERA) FROM LAKE LANAOK, MINDANAO, PHILIPPINES	101
Tules P. Banwa, et al.	THE PHYSICAL CHARACTERISTICS OF UPPER SALTAN RIVER, BALBALASANG, BALBALAN, KALINGA	102
Zenaida G. Baoanan, et al.	PROSPECTS OF MAINTAINING VERMIVOROUS CONE SNAIL, <i>Conus ebraeus</i> , IN THE LABORATORY	103
Lemark M. Bautista, et al.	RELATIVE DENSITY AND DIVERSITY OF MEIOFAUNA FROM RIVER SEDIMENTS OF DIFFERENT DETRITAL SOURCES IN BINMALEY, PANGASINAN	103

Pearl Aphrodite Bobon-Carnice	NICKEL ACCUMULATION IN PLANTS GROWING IN SOILS DERIVED FROM SERPENTINITE IN TANAUAN, LEYTE, PHILIPPINES	104
Ariel B. Bolledo and Beatriz C. Jadina	FRACTIONS AND SORPTION OF CADMIUM IN SOILS DERIVED FROM LIMESTONE	104
Lucia M. Borines, et al.	ORGANIC MANAGEMENT OF TOMATO DISEASES GROWN UNDER PROTECTIVE AND OPEN FIELD CULTIVATION	105
Rachel Anna T. Bustos, et al.	FLORAL MORPHOLOGY AND SOME ASPECTS OF FLORAL PHENOLOGY OF <i>Hoya cumingiana</i> Decne. (Apocynaceae)	106
Marie Grace S. Cabansag, et al	THE FLORAL COVER OF SANTA VICTORIA CAVES ILAGAN SANCTUARY: BASELINE DATA FOR CONSERVATION OF PRIORITY SPECIES OF INDIGENOUS TREES	106
April Rose T. Cahucom, et al.	RESPIRATORY HEALTH ASSESSMENT OF SELECTED HOUSEHOLDS IN MAJOR STREETS AND ACCESS ROADS IN CAGAYAN DE ORO, PHILIPPINES	107
Patrisha Marie E. Carilhay, et al.	DISTRIBUTION OF CHIROPTERA SPECIES AT MALAGOS WATERSHED, DAVAO CITY	107
April Hope T. Castro	SIXTEENTH CENTURY PHYSICAL ENVIRONMENT OF THE PHILIPPINES ACCORDING TO THE CHRONICLES OF PIGAFETTA, DE SANDE, AND DE MORGÁ	108
Rose Anne C. Bognot and Monaliza M. Cayanan	ISOLATION AND IDENTIFICATION OF <i>Bacillus licheniformis</i> ISOLATED FROM A GROW-OUT POND IN STA. LUCIA, MAGALANG, PAMPANGA AND ITS DENITRIFYING POTENTIAL	108
Julien Joy Clemeña, et al.	PHYTOCHEMICAL SCREENING, RADICAL SCAVENGING ACTIVITY, TOTAL PHENOLICS, AND BIOACTIVITY ASSAY OF <i>Jacquemontia paniculata</i> (Burm. f.) Hall f. (Convolvulaceae) EXTRACTS	109
Onofre S. Corpuz, et al.	DIVERSITY ASSESSMENT OF FLORAL TREES AND SHRUBS: ITS IMPACT ON RESOURCE MANAGEMENT	109
Anacell Lorente Dagon, et al.	ETHNOBOTANY OF COMMONLY USED BAMBOO VARIETIES AND THEIR UTILIZATION IN REGION XII	110
Sotero M. Aban, et al.	WATER QUALITY CHARACTERISTICS OF BOLINAO BAY IN WESTERN PANGASINAN	111
Ann Retuerma-Dioneda and Ida F. H. Revale	SPECIES COMPOSITION OF SEAGRASSES ALONG ALBAY GULF, ALBAY, PHILIPPINES	112
Bretel B. Dolipas, et al.	BALILI RIVER'S PHYSICO-CHEMICAL CHARACTERISTICS: THE EFFECT ON THE RIVER'S BIOLOGICAL CHARACTERISTIC	112
Dunamis Ruth A. Dumlao	HORSETAIL STALK (<i>Equisetum Arverse</i> Linn.) AS AN ANTI-OXIDANT	113
Imee Rose B. Estrada, et al.	ECTOPARASITES OF COMMENSAL RODENTS FROM BACKYARD FARMLANDS IN BAGUIO CITY	114
Van Ryan Kristopher R. Galarpe	CHEMICAL WASTE OF SELECTED UNIVERSITIES IN THE PHILIPPINES	114



Juan Carlos T. Gonzalez	FROM OLD TO NEW, HARNESSING GENES FROM HISTORICAL SAMPLES	115
Gracilla D.E. and Bagunu J.V.	RADIATION CYTOGENETIC STUDIES ON PHILIPPINE ASHITABA (<i>Gynura nepalensis</i> DC)	115
Pedro M. Gutierrez, Jr., et al.	LARVICIDAL ACTIVITY OF SELECTED PLANT EXTRACTS AGAINST THE DENGUE VECTOR <i>Aedes aegypti</i> MOSQUITO	116
Hanilyn A. Hidalgo, et al.	PRODUCTIVITY AND LIVELIHOOD ANALYSIS OF SELECTED AREAS OF LIBON, ALBAY	117
Sotero M. Aban, et al.	SPECIES OF BIVALVES AND GASTROPODS IN DASOL BAY	118
Marian G. Ibarra, et al.	DIVERSITY AND DISTRIBUTION OF BATS DURING WET SEASON WITHIN THE SMALL-SCALE GOLD MINING AREA OF MASABONG, ROSARIO, AGUSAN DEL SUR, PHILIPPINES	119
Beatriz Cuevas Jadina	ASSESSMENT AND CHARACTERIZATION OF A LANDSCAPE IN RELATION TO ENVIRONMENTAL DEGRADATION IN SOUTHERN LEYTE, PHILIPPINES	120
Jenny G. Jerusalem and Van Ryan Kristopher R. Galarpe	GAUGE ANALYSIS OF FORMALDEHYDE IN AIR IN SELECTED HOSPITAL-HISTOPATHOLOGY LABORATORIES, CAGAYAN DE ORO, PHILIPPINES	121
Addisson Kyle B. La-ao	CORRELATION STUDY OF FERTILIZER APPLICATION PRACTICES ON SOIL QUALITY AND YIELD OF POTATO IN THE TWO FARMERS' FIELD IN PAOAY, ATOK, BENGUET	121
Facundo Rey M. Ladio, and Geraldine O. Macawile	EVALUATION OF MANGROVE DAMAGE DUE TO SUPER TYPHOON YOLANDA (HIYAN) IN THE LEYTE GULF AND EASTERN SAMAR, PHILIPPINES	122
Sherry I Lipio-Paz, Fe Colas and Aiza Calub	PHILIPPINE-ENDEMIC AND MINDANAO-ENDEMIC BIRD COMMUNITY WITHIN AND THE SURROUNDING ENVIRONS OF A SMALL-SCALE GOLD MINING SITE OF MASABONG, BAYUGAN 3, ROSARIO, AGUSAN DEL SUR, PHILIPPINES	122
J. S. Luis, Jm S. Luis, et al.	IDENTIFICATION OF ASPERGILLUS SECTION FLAVI IN PHILIPPINE PEANUTS THROUGH MORPHOLOGICAL CHARACTERIZATION AND REP-PCR DNA FINGERPRINTING	123
Archiebald Baltazar B. Malaki	LAND USE PATTERN ANALYSIS IN ARGAO RIVER WATERSHED RESERVE (ARWR)	123
Ryan Padilla Manuel	SPACE OBSERVATION OF CARBON DIOXIDE CONCENTRATIONS (XCO ₂) OVER THE PHILIPPINES: SETTING STRATEGIES FOR CLIMATE CHANGE MITIGATION/ADAPTATION	124
Ryan Padilla Manuel	AQUATIC MACROINVERTEBRATES AS INDICATORS OF POLLUTION IN BAROBBOB AND NAGSABARAN STREAMS OF NUEVA VIZCAYA USING THE HILSENHOFF FAMILY BIOTIC INDEX	125
Mario S. Marababol and Ferdinand T. Abocejo	CHARACTERIZATION OF FISH AND MACRO INVERTEBRATES SPECIES POPULATION IN SIBONGA AND CARCAR, CEBU, CENTRAL PHILIPPINES	126

RM Mendoza, et al.	INFLUENCE OF NUTRIENT LOAD ON THE AQUATIC LEAF LITTER DECOMPOSER COMMUNITY	126
Meconcepcion M. Ngilangil and Lilia Z. Boyles	MICROHABITAT AND DIVERSITY OF REPTILIAN SPECIES IN AGUSAN MARSH BUNAWAN, AGUSAN DEL SUR, MINDANAO, PHILIPPINES	127
Leonora E. Ngilangil and Desiree A. Vilar	THE EFFECTS OF EFFECTIVE MICROORGANISMS ON SOIL PHYSICAL AND CHEMICAL PROPERTIES	127
Precelita I. Osillos and asuncion I. Nagpala	ISOLATION AND CHARACTERIZATION OF ARBUSCULARMYCORRHIZAL FUNGI (AMF) ASSOCIATED WITH WILD LEGUMES AND COGON GRASS	128
Elmer A. Polintan, et.al.	COPPER CONCENTRATION IN MOLAWIN CREEK, U.P. LOS BAÑOS: DETERMINATION BY ATOMIC ABSORPTION SPECTROSCOPY AND VISUALIZATION OF THE DYNAMICS OF CONCENTRATION AS WATER FLOWS	128
Joseph Martin Q. Paet	ECOTOXICITY EVALUATION OF LAKE BUHI, CAMARINES SUR USING PROLONGED ZEBRAFISH (<i>Danio rerio</i>) EMBRYO ASSAY	129
Keosangkhom Phommaseng and Carmelita M. Rebancos	WATER QUALITY EVALUATION OF NAM XONG RIVER IN VANGVIENG DISTRICT, VIENTIANNE PROVINCE, LAO PEOPLE'S DEMOCRATIC REPUBLIC	129
Rubyann Robelle L. Polido, et al.	ROLE OF LIGHT SPECTRUM IN INDUCING PHENOTYPIC PLASTICITY IN <i>Hoya albida</i> KLOPPENBURG, SIAR, CAJANO AND CARANDANG 2012	130
Ivy Mae Batoon, et al.	LEVEL OF NITROGEN IN WATER HYACINTH (<i>Eichhornia crassipes</i> [Mart.] Solms) IN SELECTED LAKESHORES OF LAKE MAINIT	130
Ma. Leah Zilpah M. Jacela, et al.	LINE LOSS REDUCTION IN ELECTRICITY DISTRIBUTION USING BINARY INTEGER LINEAR PROGRAMMING	131
Pieter Spanoghe and Chime Mora-Garcia	VISUALIZATION OF THE UPTAKE OF PESTICIDES IN COMBINATION WITH ADJUVANTS THROUGH CONFOCAL LASER MICROSCOPY	132
Rainer P. Sularte and Lilia Z. Boyles	SPECIES DISTRIBUTION AND ABUNDANCE OF AMPHIBIANS USING GEOGRAPHIC INFORMATION SYSTEM MAP IN AGUSAN MARSH	133
Belinda A. Tad-awan, et al.	PRELIMINARY STUDY ON BIODIVERSITY LOSS ASSESSMENT, UTILIZATION AND CONSERVATION OF INDIGENOUS FOOD CROPS IN THE CORDILLERA ADMINISTRATIVE REGION (CAR)	134
Mosib M. Tagotong, et al.	ORGANIC FERTILIZER ON PECHAY HOMEGARDEN	134
Christopher J. Tapnio	PLANT DIVERSITY AND CARBON STOCKS ASSESSMENT OF BENGUET PINE (<i>Pinus kesiya</i>) IN BUSOL WATERSHED AND FOREST RESERVE	134
Jeffrey A. Toledo, et al.	PREVALENCE OF <i>Enterobius vermicularis</i> IN THE PROVINCE OF ALBAY, PHILIPPINES	135
Evelyn V. Totaan, et al.	TEMPORAL POPULATION ANALYSIS OF LEPIDOPTERANS (BUTTERFLIES SPECIES) IN THE NORTHWESTERN SLOPE OF MT. ARAYAT	136
E.D Tumindog, et al.	AUSTRALIAN PEANUT (<i>Arachis pintoi</i> L.): ITS EFFECT ON THE PHYSICO-CHEMICAL PROPERTIES OF SOIL	137



Republic of the Philippines
Province of Benguet
MUNICIPALITY OF LA TRINIDAD



**MABUHAY and Warmest Greetings to the
organizers, speakers, participants and guests of
the Philippine Society for the Study of Nature's**

14th Annual Scientific Meeting and Conference

**Theme - Public Private Partnerships: Creating
Possibilities for Responsible Resource Use**

From:

EDNA C. TABANDA
Municipal Mayor

**THE PEOPLE, EMPLOYEES AND THE OFFICIALDOM OF THE MUNICIPALITY
OF LA TRINIDAD**



Republic of the Philippines

Pampanga Agricultural College

Magalang, Pampanga

soon to be

Pampanga State Agricultural University
by virtue of RA 10605**CURRICULAR OFFERINGS****GRADUATE PROGRAMS****AACCUP Accreditation
Status***Doctor of Philosophy in Agricultural Sciences*

Level III

Doctor of Philosophy in Management

candidate for Level I

Doctor of Education

Level II

Master in Business Management

candidate for Level I

Master in Public Administration

candidate for Level I

Master of Science in Agriculture

Level III

Master of Arts in Education

Level II

*Master of Science in Biology***BACCALAUREATE PROGRAMS***Doctor of Veterinary Medicine*

candidate for Level I

Bachelor of Science in Agriculture

Level III (candidate for Level IV)

Bachelor of Science in Forestry

candidate for Level I

Bachelor of Science in Agroforestry

candidate for Level I

*Bachelor of Science in Fisheries**Bachelor of Elementary Education*

(major in Pre-School Education, Generalist, and TLE)

Level III

Bachelor of Secondary Education

(major in English, Mathematics, General Science, MAPEH and TLE)

Level III

Bachelor of Science in Agricultural Engineering

Level III

*Bachelor of Science in Geodetic Engineering**Bachelor of Science in Information Technology*

candidate for Level I

Bachelor of Science in Agricultural Economics

Level III

Bachelor of Science in Agricultural Business

Level III

Bachelor of Science in Entrepreneurship

candidate for Level I

Bachelor of Science in Hotel and Restaurant Management

candidate for Level I

Bachelor of Arts in English

Level III

Bachelor of Science in Mathematics

Level III

Bachelor of Science in Biology

Level III

Bachelor of Science in Development Communication

candidate for Level I

TWO-YEAR COURSES*Diploma in Computer Programming**Diploma in Computer Secretarial**Associate in Agricultural Technology*