



Theme: "Nature, People and Development:
Making Connection Matters"

19th
PSSN
ANNUAL
SCIENTIFIC
CONFERENCE

International Conference on Nature Studies and Innovation for the Environment (ICoNSIE) 2019

2-6 July 2019 ● Palawan State University ● Puerto Princesa City, Palawan

In partnership with:



**MANILA
BULLETIN**
THE PHILIPPINES' LEADING NATIONAL NEWSPAPER

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Philippine Society for the Study of Nature (PSSN), Inc.

TIN 005-866-117-000 SEC Reg. No. B200000647

Mailing Address: P.O box 1036, Baguio City, Benguet, Philippines

Website: <http://www.pssnonline.org>

Philippine Society for the Study of Nature, Inc.

BPI checking account no. 000911-0146-45

Los Baños Branch

PSSN stands for the Philippine Society for the Study of Nature, Inc. It was organized in a national conference on networking for the wise and sustainable use of nature at the University of the Philippines College Baguio (now University of the Philippines Baguio) in April 2000. The participants saw the need for a network to address nature and nature-related problems on the country. Thus, the society was established in order to provide a venue for the development of strategies for the unscrupulous utilization of nature and its amenities. On September 16, 2000, the society was registered with the Securities and Exchange Commission (SEC) as a non-profit, non-stock, non-partisan organization of Professionals, researchers, administration policymakers, practitioners, students, and organizations involved in nature studies and its related activities.

The society's primary objectives are to provide and develop strategies towards wise and sustainable use of nature and to ensure a faithful representation of responsible thinking and sentiment regarding issues about nature. It also seeks to established partnership and/or collaboration with local government units and other institutions that are involved in the development, conservation, and management of nature resources. Its various activities serve as a channel for the exchange of information, sharing of professionals expertise, networking, and strengthening of camaraderie and cooperation among members and partner's institutions.

Objectives

PSSN was established to:

1. Provide and develop strategies towards wise and sustainable use of nature;
2. Ensure a faithful representation of responsible thinking and sentiment regarding issues about nature;
3. Establish partnership/collaboration with LGU and NGO;
4. Establish local institutional chapters;
5. Strengthen camaraderie and cooperation among members



International Conference on Nature Studies and Innovations for the Environment 2019 and PSSN's 19th Annual Scientific Conference

The Conference

PSSN's annual conference in nature studies has been successfully conducted for the last 18 years. With the first conference held in Los Baños in 2001, the conference has been collaborated with various institutions in different areas in the country, since then, in Baguio (2002) with UP Baguio; Cebu (2003) with UP Cebu College; Bohol (2004); Pampanga (2005) with then Pampanga Agricultural College; Davao del Norte (2006) with University of Southern Mindanao and Local Government of Kapalong; Palawan (2007) with Palawan State University; Ilocos Norte (2008) with Mariano Marcos State University; Iligan City (2009) with Mindanao State University-Iligan Institute of Technology; Baguio City (2010) with UP Baguio; Los Baños (2011) with University of the Philippines Open University and University of the Philippines Los Baños; General Santos City (2012) with Sultan Kudarat State University; Cebu City (2013) with Cebu Technological University; Benguet Province (2014) with Benguet State University; Clark (2015) with Pangasinan State University and Pampanga State Agricultural University; Dumaguete City (2016) with Silliman University; Los Baños with Palawan State University (2017); and University of Santo Tomas (2018). These conferences provided an important venue that attracts researchers, engineers, scientists, students, environmental advocates, and other professionals from many parts in the country.

ICoNSIE 2019 (International Conference on Nature Studies and Innovation for the Environment. With a theme, **"Nature, People, and Development: Making Connection Matters"** the conference envisions to create a discursive environment for the global scientific communities and environmental management and development practitioners to exchange information and collaborate for the deeper understanding of the connection between nature, people, and development. Thus, ICoNSIE 2019 aims to: (a) bring together scientists, researchers, practitioners, and other stakeholders to discuss the interconnectivity of the environment, humanity, and development; (b) provide opportunities for the collaboration of participants; and (c) strengthen the camaraderie of the Society's members.

This year's theme focuses on the role of nature studies in building knowledge base for nature, people, and development. It was developed around the following sub-themes: (a) Green technology and sustainable designs; (b) Education for sustainable development; (c) Environmental management, protection and conservation; (d) Gender and the environment; (e) Sustainable and inclusive tourism; (f) Indigenous knowledge and communities; (g) Complex systems, modeling, and nature-society interactions.

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

PSSN OFFICERS AND BOARD OF TRUSTEES FY2018-2019



DR. ARLEN ANCHETA
PSSN President
University of Santo Tomas



DR. LITA SOPSOP
PSSN Vice-President
Western Philippine University



DR. ZENAIDA G. BAOANAN
PSSN Corporate Secretary
University of the Philippines
Baguio



PROF. STEVE OBANAN
PSSN Treasurer
University of the East



DR. MARIA ANA T. QUIMBO
PSSN Auditor
University of the Philippines
Los Banos



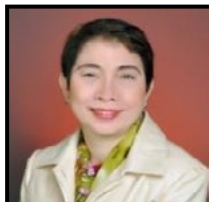
DR. RICARDO T. BAGARINAO
PSSN Public Information Officer
University of the Philippines
Open University



PROF. HERMENEGILDO P. DELA PENA
PSSN Business Manager
Palawan State University



DR. GLENN SOPSOP
PSSN Member
Board of Trustees
Western Philippine University



DR. IRENE DE VERA
PSSN BOT Member
Pangasinan State University



DR. JOSEPH EDWIN CUBELO
PSSN BOT Member
Silliman University



DR. RAMON M. DOCTO
PSSN Ex-Officio
Palawan State University



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Message of the PSSN President



Congratulations to the 19th Philippine Society for the Study of Nature Conference and International Conference on Nature Studies and Innovation for the Environment (ICONISIE) in Palawan State University (PSU), Puerto Princesa, Palawan.

This year's theme on "Nature, People and Development: Making Connection Matters" illustrates the interconnectivity of resources from nature as the source of development, people as users who can protect or destroy nature and process of utilizing resources in the name of development. Connection matters because sustainable development is dependent on people, as the

link between nature and development.

PSSN as a platform of knowledge generation, is a conduit of promoting research, based on grounded data to enhance the capability and capacity of faculty and researchers in conducting research, to publish and more importantly bring empirical studies inside the classroom to improve student's life.

And true to our commitment, PSSN serves as a breeding ground of opportunities for faculty, graduate students and researchers to be heard in the field of research through oral and poster presentations, and publication.

To our guest lecturers who are experts in their own field, thank you very much for gracing our conference. Your scholarly papers will provide new insights to our participants.

Our unending thank you for all the support provided by Palawan State University, through Dr. Ramon Docto. We are grateful that PSU is the site of our conference as participants would experience attending an academic discourse in a natural setting, the city within the forest.

To our participants, thank you for believing in PSSN as a vehicle in promoting sustainable development.

Arlen A. Ancheta

DR. ARLEN ANCHETA

President, PSSN 2017-2019



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Message of the PSU President



Republic of the Philippines
PALAWAN STATE UNIVERSITY
Puerto Princesa City



MESSAGE

"Everything is connected to everything", as Norwegian Prime Minister and Sustainable Development champion Gro Harlem Brundtland aptly puts it.

Human activities affect the environment, and vice-versa. While technological advancement enhances communication and saves lives, global tourism growth improves the quality of life and fuels local and international industries. This, however, does not come without creating undesirable impact to the natural environment which in a number of cases left damage lowering sustainable rate of growth.

This annual conference aims to provide a platform to create a balance between economic growth and environmental conservation and to form strategies for sustainable development. Collective awareness and responsibility are indispensable to achieve that balance.

The guiding principle for economic growth and environmental protection is to secure a future where the next generations are sustainably enjoying a quality life with due regard to the natural environment.

Welcome to PSSN's 19th Annual Scientific Conference!


RAMON M. DOCTO, Ph.D.
University President



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Message of the Mayor



Republic of the Philippines
OFFICE OF THE CITY MAYOR
City of Puerto Princesa



MESSAGE


Welcome to Puerto Princesa City—where nature begins and never ends!

It is an honor for Puerto Princesa to be the venue of International Conference on Nature Studies and Innovations for the Environment (ICoNSIE) 2019 which is the 19th Annual Scientific Conference on the Philippine Society for the Study of Nature, Inc. With the theme “Nature, People, and Development: Making Connections Matter”, the conference is hosted by Palawan State University at the Performing Arts Center in Tiniguiban Heights on July 2-6, 2019.

Puerto Princesans are sincerely hoping that our City will provide an inspiring environment for around 130 participants including scientists, researchers, practitioners and other stakeholders from 28 academic institutions nationwide as they: (1) discuss the interconnectivity of the environment, humanity, and development; (2) provide opportunities for collaboration; and (3) strengthen camaraderie of the Society's members.

To the Philippine Society for the Study of Nature and local host Palawan State University which collaborated in organizing this event, we wish you a very successful conference.

Dayon camo!


LUCILO R. BAYRON
City Mayor *ar*



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Message from CENRO



MESSAGE



My utmost felicitations to the organizers, promoters, participants and sponsors of the International Conference on Nature Studies and Innovations for the Environment (**ICoNSIE**) for choosing Puerto Princesa City to be the venue of the 19th Annual Scientific Conference on the Philippine Society for the Study of Nature, Inc., with its appropriately dubbed theme of "Nature, People and Development: Making Connection Matters" this coming July 2-6 at the PSU Performing Arts Center.

Lately, Puerto Princesa City Government thru the leadership of **Hon. Lucilo R. Bayron**, our City Mayor, inspiringly stirred the Local Government towards investing in on environmental infrastructure projects and programs with integrated environmental issues. Empirical assessment showed that by increasing budgetary or financial allocations to these environmental projects and programs greatly influenced performance of our decision makers to increasingly integrate more critical environmental issues in its strategic planning process. Our leaders are preparing the Highly Urbanized City of Puerto Princesa to attain zero-waste status by adapting Waste-to-Energy Program. Septage and Waste Water Treatment facility likewise are to commence this year to address the issue of cleaning our bodies of water. The Continuous Air Monitoring Systems (CAMS) are just awaiting procurement to observe and possibly improve air quality for a healthy environment for the community.

The **CommuniAct Program** of the City Environment and Natural Resources Office was necessarily conceptualized to connect the City's constituents to the environment by sharing with them the responsibility of conserving our nature. Under **CommuniAct Program**, we inculcate to our people the sense of shared responsibility to protect the environment by making them stewards of our forests, wildlife areas and other important conservation sites with inclusive economic growth and opportunities for livelihood. We strive to make the connection of our people with the environment more meaningful and relevant thru adaption of nature-based economic program.

We are optimistic that this forthcoming International Conference will benefit the country and this City of its output and will be able to share it to provide us with more learnings and nature-based practices leading towards an environmentally viable and sustainable approach. Once again, welcome to the City of Puerto Princesa, the environmental core of Palawan.

Atty. Carlo B. Gomez
City Environment and Natural Resources Officer
Puerto Princesa City



Message from PENRO



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
**PROVINCIAL ENVIRONMENT AND NATURAL
RESOURCES OFFICE**
PROVINCE OF PALAWAN



MESSAGE

Magandang buhay! A good life to all of us! It is with great honor to welcome you in the Province of Palawan, a role model for sustainable development under the blanket of Republic Act 7611 or the Strategic Environmental Plan (SEP) for Palawan. Indeed, our province fits well with PSSN's raison d'être and the objectives of the ICoNSIE 2019.

The human population, the main driver of development, is pegged to rise to 9 billion by 2050. We should be proactive in our means to sustainable development; if not, we may need to revise our definitions of development to accommodate the security of the planet and its people. As a member state of the United Nations, we placed our hands in the adoption of the 2030 Agenda for Sustainable Development or commonly known as the Sustainable Development Goals. We got a long way ahead of us, there is no need to mention horrifying stats and figures on how nature has declined over decades to prove that.

Sustainable development is a serious issue facing great challenges between the use of natural resources and people. There will always be a razor-sharp balance that we have to tiptoe when choosing between a farm-to-market road and a century-old tree, an economic center and a natural waterway, or cheap energy and climate change mitigation. This is where stakeholders, scientists, researchers, and practitioners in this conference come into light, "to exchange information and collaborate for the deeper understanding of the connection between nature, people, and development."

Rest assured that the Department of Environment and Natural Resources, under the leadership of Sec. Roy A. Cimatu, will remain faithful to its mandate for the welfare of the present and future generations of Filipinos. Let us work side by side towards sustainable development. Thank you so much and enjoy your stay in Palawan, the country's Last Ecological Frontier.



ERIBERTO B. SANTOS

OIC Provincial Environment and Natural Resources Officer
DENR Palawan

Message from PCSD



Malipayeng pag-abot sa Palawan (Welcome to Palawan)!

I commend the Philippine Society for the Study of Nature (PSSN) for holding this activity in Palawan underscoring the benefits of nature-based solutions for both the environment and society. You are very welcome in this province, a living laboratory, where different models of sustainable development practices are being tested. Palawan is a globally recognized biosphere reserve under the UNESCO Man and the Biosphere (MAB) Program, home to two natural World Heritage Sites, and a stronghold of a large number of unique flora and fauna species. The careful development of Palawan is anchored on the principles of sustainable development as enshrined in the Strategic Environmental Plan (SEP) for Palawan Act, a national landmark law developed specifically for Palawan to ensure the continuity of life-support systems derived from nature.

I challenge all participants to the PSSN Conference to draw inter-relations among nature, people, and economic development. Such holistic perspective will enhance our capability to address the persistent challenges we encounter: climate change, extreme weather events, and rapid urbanization.

We hope that every participant in this conference will, in his or her own way, be able to synthesize or put together the correlations among the research findings presented and will be able to translate these findings into useful policies and decisions. We also want to discover how these researches can be communicated to local communities who need, now more than ever, to be engaged in environmental conservation.

It is by working together, collectively, that we will be strong to be nature's stewards. It is only by working within the limits of nature that we can ensure the perpetual delivery of ecosystem goods and services. We aim to create in Palawan a cluster of thriving and sustainable communities that respect nature and put the environment front and center in the agenda of sustainable development.

Putting people and the environment first and foremost is our way of life in Palawan. In the words of former Palawan Governor Salvador P. Socrates, "As far as the protection of Palawan's environment is concerned, it is absolute. There is no compromise. It is non-negotiable."

Thank you and congratulations!

(SGD) NELSON P. DEVANADERA
Executive Director
Palawan Council for Sustainable Development



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Message of the Governor



Republic of the Philippines Provincial
Government of Palawan
OFFICE OF THE GOVERNOR
Capitol Complex, Puerto Princesa City



Message

On behalf of the Provincial Government of Palawan, I extend my warmest greetings to the organizers, guests and participants of the International Conference on Nature Studies and Innovations for the Environment 2019 Annual Scientific Conference!

The conference is a great opportunity for scientists, researchers, members of the academe, and other stakeholders to discuss with one another their knowledge and best practices on the protection of the environment, and together come up with efficient solutions to the environmental concerns of our modern society. They may collaborate and help each other solve their respective problems. I am delighted that knowledgeable, competent and compassionate individuals are working together for the benefit of our environment!

I hope that you will have a productive and successful conference!

Mabuhay!


JOSE CH. ALVAREZ



Schedule of Activities

Opening Program

02 July 2019

(Tuesday)

Time	Activity
1.0-5.0	Pre-conference Lecture demo on "Inclusive Growth and Sustainable Rural Development" Resource speaker: Dr. Renato G. Reyes Director, International Affairs Office Central Luzon State University Nueva Ecija, Philippines Palawan State University Performing Arts Center

03 July 2019

(Wednesday)

Time	Activity
Morning	
7.0-8.30	Registration
8.30-8.45	Processional of PSSN Officers and BOT Members Plenary Speakers Keynote Speaker Opening Prayer National Anthem
8.45-9.0	Welcome Message Dr. Ramon M. Docto President Palawan State University



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Time	Activity
9.0-9.15	Opening Remarks Dr. Arlen Ancheta (University of Sto. Tomas) President, PSSN 2017-2019
9.15-9.50	Recognition of Participants Mr. Steve Obanan (University of the East) Treasurer, PSSN 2017-2019 Conference Overview Dr. Ricardo Bagarinao (UP Open University) Chair, Conference Secretariat Intermission "PSU Sining Palawan Dance Troupe"
9.50-10.0	Introduction of the Keynote Speaker Prof. Hermenegildo Dela Pena (Palawan State University) BOT, PSSN 2017-2019
10.0-11.0	Keynote Speech Peter Jürgen Widmann Director, Conservation Programs Katala Foundation, Inc., Philippines Awarding of Plaque of Appreciation and Token Dr. Arlen Ancheta President, PSSN 2017-2019 Dr. Zenaida Baoanan (UP Baguio) Secretary, PSSN 2017-2019



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Time	Activity
11.0-11.10	Awarding of PSSN Achievement Award to Dr. Ramon Docto President, Palawan State University Dr. Arlen Ancheta and Dr. Zenaida Baoanan
11.10-11.15	Introduction of the First Plenary Speaker Dr. Ricardo Bagarinao (University of the Philippines Open University)
11.15-11.45	First Plenary Speech Dr. Lin Mei- Hua Associate Professor Department of Psychology School of Science and Technology Sunway University, Bandar Sunway
11.45-12.0	Open Forum
12.0-1.0	Lunch Break
Afternoon	
1.0-1.05	Introduction of the Second Plenary Speaker Dr. Ma. Ana Quimbo (UP Los Banos) Auditor, PSSN 2017-2019
1.05-1.35	Second Plenary Speech Dr. Rico Ancog Assistant Professor 5 University of the Philippines Los Baños Los Baños, Laguna, Philippines
1.35-1.45	Open Forum
1.45-4.30	Best Paper Competition



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Time	Activity
4.30-4.45	Preparation for the Poster Presentation
4.45-5.45	Opening of Poster Exhibit and Evaluation of Poster Papers
5.45-6.0	Break
6.0-7.0	PSSN 19 th General Assembly Meeting and Report of the President
7.0-9.0	Welcome Dinner and Socialization

**4 July 2019
(Thursday)**

Time	Plenary Hall
8.0-8.15	Introduction of the third plenary speaker Dr. Edwin Cubelo (Silliman University) PSSN BOT, 2017-2019
8.15-8.45	Third Plenary Speech Dr. Quyen Dinh Ha Deputy Head of Rural Development Department Faculty of Economics and Rural Development Vietnam National University of Agriculture Trau Quy Town, Gia Lam District, Hanoi, Vietnam
8.45-9.0	Open Forum



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Concurrent/Parallel Paper Presentations

Time	Session Room 1 (Moderator: Mary Ann V. Bukanadi)	Session Room 2 (Moderator: Elmira Trina C. Pelayo)	Session Room 3 (Moderator: Alain Jomarie G. Sanatos)
9.0-9.15	Preparation for the Concurrent Sessions		
9.15-9.30	Disaster Preparedness Concepts, Frameworks, and Guidelines: The Philippine Case <i>Ricardo T. Bagarinao</i>	Influence of Organic - Inorganic Fertilizer on Postharvest Quality of Jackfruit (<i>Artocarpus heterophyllus</i>) Eviarc Sweet <i>Rosalia L. Briones and Dario P. Lina</i>	Groundwater Potential Mapping in Cebu Island Using Remote Sensing and Weighted Overlay Analysis <i>Florwilyn C. Cayson, Chito L. Patiño and Mary Joyce L. Flores</i>
9.30-9.45	Facilitators and Barriers of Incident Command System Implementation for Disaster Response: The Case of Caraga Region, Philippines <i>Erma R. Suyo and Ricardo T. Bagarinao</i>	Modelling a Growing-Degree-Day (GDD) European Put Option for Rice Crops in Laguna <i>Justine L. Angcao, Patricia Ann P. Poral and Diane Carmeliza N. Cuaresma</i>	Biological Assessment of LGU Managed Urban Parks in Iloilo, Philippines <i>Lynlei L. Pintor and Wencelito P. Hintural</i>



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

9.45-10.0	Drivers and Barriers to Effectives Disaster Risk Reduction and Management Implementation: Cases in the Calabarzon Region, Philippines Enrilito Bernardo, Jr and Ricardo T. Bagarinao	Use of Metaheuristics in Solving Land Use Assignment Problem Involving Neighborhood Constraints Jonah Terese D. Arellano, Prof. Mark Lexter D. De Lara and Prof. Desteny S. Lutero	Efficiency of Mobile Apps in Citizen Scientist Participation in Biodiversity Conservation IP Quijano and MJ Flores
10.0-10.15	Disaster Preparedness of Two Landslide-Vulnerable Communities in Benguet, Philippines Rameliren Borja and Ricardo T. Bagarinao	Innovative Integration of Lettuce (<i>Lactuca sativa</i> L.) Production and Tilapia (<i>Oreochromis niloticus</i> L.) in Modified Floating Raft Aquaponics System Getulio A. Barcenas Jr. and Rosario A. Salas	Bird Diversity and Abundance in Three Sites in Nug-as Forest Reserve, Alcoy, Philippines Jireh Jasmin Yang and Mary Joyce Flores
10.15-10.30	Early Warning System (EWS) for Disaster Preparedness: A Community Perceptual Case	Viability of Rice Crop Insurance in Los Baños, Laguna Under Changing Temperatures	Assessment of Waste Management Program in the Town of



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Study of the Tullahan River Basin, Philippines Rosalie Pagulayan and Ricardo T. Bagarinao	Alyssah M. Arugay, Patricia Anne V. Quilitis and Diane Carmeliza N. Cuaresma	Concepcion, Iloilo, Philippines Richard D. Jardenil and Bernardita C. Lauron
10.30-10.45	Open Forum	Open Forum	Open Forum
10.45-11.0	Loss Modelling of Bank Loans with Livestock as Collaterals Considering the Personal Property Security Act Rayon Vincent Sioson	Habitat Quality Monitoring and Macrobenthos Diversity: Integrated Assessment Framework for the San Pablo Seven Lakes Ecosystem Maria Claret L. Tsuchiya, Sedney S. Mendoza and Emmanuel Ryan De Chavez	Adaptive Practices of Farmers in Coping Climate Change in Zamboanga City, Philippines Fredelino M. San Juan, Ardel S. Barre and Cecille C. Diamante
11.0-11.15	Forest Conservation and Management of Mount: The Kapampangans's Way	Responses of Macro Propagated <i>Ficus ulmifolia</i> Lam. to Nutrient Supply and Drought Stress: Potential Basis for	Evaluation of Different Cropping Systems for Marginal Uplands in Barangay Caticugan, Sta.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Reynante G. Bustillos, John Crisver M. Viesca, Jericho F. Miranda and Jomell Santiago	Karst Reforestation Program Maria Luisa N. Cabrera and Nelson M. Pampolina	Rita, Samar, Philippines Ulysses A. Cagasan, Ed Allan L. Alcober, Mark Gil B. Gerona and Gretchen Mae M. Prado
11.15-11.30	Development of Division Contextualized Curriculum Matrix (DCCM) and Division Contextualized Learning Resources (DCLR) for Batak Tribe Learners in Schools Division of Puerto Princesa City Ronald S. Brillantes, Cyril C. Serador and Redempto A. Cervantes	Disaster Risk Reduction and the Science Curriculum of the Philippine Basic Education Program Ian Phil Canlas and Mageswary Karpudewan	Nutrient Analysis of Wild Edible Plants as Food Alternatives in the Municipality of Daanbantayan, Considered as a Disaster-Prone Area in the Province of Cebu, Philippines Patricia Anne G. Nazareno, Ricardo T. Bagarinao, Inocencio E. Buot Jr. and Patrick John Lim
11.30-11.45	A Methodology for Developing a Weather Index-based Insurance	Alleviation of Waterlogging Stress in Onion (<i>Allium cepa</i>) By	Gonadal development of the flatribbed scallop



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Using Game Theory Diane Carmeliza N. Cuaresma and Mark Ryan N. Zamora	Exogenous Application of Fish Amino Acid Fertilizer, Acetylsalicylic Acid and Potassium Silicate Arnel B. Celestino and Rachel C. Sotto	<i>Decatopecten radula radula</i> (Linnaeus 1758) Joezen D. Corrales and Anthony S. Ilano
11.45-12.0	Open Forum	Open Forum	Open Forum
12.0-1.00	Lunch/ Elections		
	(Moderator from PSU)	(Moderator from PSU)	(Moderator from PSU)
1.0-1.15	Use of Choice Modelling in Establishing Payments for the Recreational Ecosystem Service of Mount Macolod in Batangas, Philippines Christian B. Cuevas and Rico C. Ancog	Identification and Quantification of Microplastics in Philippine Cupped Oyster (<i>Crassostrea iredalei</i> , Faustino 1932) From Cañacao Bay, Cavite City Elselear L. De Leon, Gabriel R. Salva, Danica Kayla T. Santos, Daniel E. Segovia, Raynar Joseph Uybarreta and Steve P. Obanan	Increasing Community Awareness and Resilience Enhancement (ICARE): An Empowering Tool for Enhancing Resiliency Among Lakeshore Fishing Communities Miriam R. Nguyen, Samantha Geraldine G. De los Santos, Maria Francesca O. Tan,



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

			Francisca O. Tan and Roxanne A. Banalo
1.15- 1.30	<i>In Vitro</i> Induction and Maintenance of Callus from Different Types of Explants of Cacao (<i>Theobroma cacao</i> L.) Ramonita C. Verano, and Catherine C. Arradaza	SEAMEO INNOTECH: Gearing Up Responsible Teachers of 21 st Century Husna T. Lumapenet and Hyriah G. Sanusi	Assessment on the Performance of Different Varities of Pole Sitao Under Regional Field Trial Reyna Mae Caintic and Rosario A. Salas
1.30- 1.45	Diversity, Microhabitat Preferences and Socio-economic Importance of Reptilian Fauna in Andanan Watershed Forest Reserve, Caraga Region, Philippines Jerry T. Cuadrado and Eve Fernandez- Gamalinda	Demographic Factors, Knowledge, Attitude, and Behavior of Filipino Senior High School Students Towards Agriculture J.P. Echavez, A. Bulfa and JE. Cubelo	Toxicity Effect of Toad's (<i>Bufo marinus</i>) Parotoid Gland Secretion on the Frog's Heart Rate Jose Noel V. Fabia, Aris A. Lapada, Elisa C. Noguera and Noel F. Alfonso
1.45- 2.0	Growth and Yield of Upland Kangkong (<i>Ipomoea aquatica</i>	Taxonomic Assessment, Economic Importance and Ecological Status of	Antioxidant and Growth Comparison of Inorganic and



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Forsskal) as Influenced by Mounding and Different Planting Densities Ana Linda G. Gorme, Zenaida C. Gonzaga, Kevin M. Godoy, Warren L. Obeda, Jessie C. Rom and Othello B. Capuno	Vegetation in Roxas Range: Basis for Preservation and Conservation Aisha Barrios Grafil and Elvie V. Diaz	Organically Grown Lettuce (<i>Lactuca sativa</i> L.) in Urban Community Luisa Marie V. Iglesias and Getulio A. Barcenas Jr.
2.0-2.15	Antibiotic-driven Escape of host in Lotka-Volterra Red Queen Dynamics Aynanie S. Kiram and Jomar F. Rabajante	Quantification of Soil Organic Carbon within Soil Aggregates Using ¹³ C Techniques as Influenced by Land Use Change Suzette B. Lina, Ian Naverrete, Marife Corre and Victor B. Asio	Entomotoxic Potential of Cane Toad (<i>Rhinella marina</i>) Parotid Extract Against Red Flour Beetle (<i>Tribolium castaneum</i> Herbst) Christopher A. Malay
2.15-2.30	Open Forum	Open Forum	Open Forum
2.30-2.45	Curating a Sustainable Adaptive Reuse of Bahay Nakpil Bautista Heritage House in Quiapo: Basis for	Influence of Wood Vinegar on the Growth and Yield of Leaf-Type Lettuce (<i>Lactuca sativa</i> L.) var. Eton Under SNAP Hydroponics System	Use of Metaheuristics in Validating Land Use Assignment Model Involving Neighborhood Constraints in



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Developing Indices for Historic Spaces in the Philippines Mary Ann Venturina Bulanadi and Arlen Ancheta	Aldwin Paul M. Parac, Warren L. Obeda, Raffy R. Danggoy, Eric Kent Z. Mapili, Blanche Franchette D. Llera, Jannu Geuseppe Clemeña and Zenaida C. Gonzaga	Barangay Laiya-Aplaya, San Juan, Batangas Shaira Perez
2.45-3.0	Strengthening Women Fisherfolk Empowerment Toward Social Inclusion in Coastal Environment of Malolos, Bulacan, Philippines Elmira Thina C. Pelayo	Evaluation of Acetylcholinesterase Activity (AChE) and Melanomacrophage Centers (MMCs) Formation of Nile Tilapia (<i>Oreochromis niloticus</i> Linn.) from Pesticide-Exposed Waters in Agricultural Lands Ris Menoel R. Modina	Artificial Neural Network and Genetic Algorithm Hybrid Approach in the Optimization of Energy Efficiency of Residential Buildings Margareth C. Navia, Carl Anthony E. Casal and Allen L. Nazareno
3.0-3.15	An Economic Resiliency Model of Floating Communities: Disaster Mitigation in the Philippines Alain Jomarie G. Santos and	Proposed Risk Management Program in Quezon Panitian National High School, Quezon, Palawan James C. Recente and Lerna L. Ayco	Environmental Knowledge, Attitudes, and Practices of Physics Teachers Cherry Wanya



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Arlen A. Ancheta		
3.15-3.30	From Instability to Flexibility: The Social Ecological Resiliency of the Island Barangays of Babatnin, Calero, Caliligawan, Masile, Namayan and Pamarawan John Christian C. Valeroso,	Connecting the Dots: Protein-Protein Interaction Network and Pathway Analysis of Cane Toad Responses to Environmental Toxicants Jashin J. Rosal, Maria Claret L. Tsuchiya and Hisato Iwata	Influence of Grafting and Pruning on the Growth, Yield and Chemical Characteristics of Sweet Bell Pepper (<i>Capsicum annuum</i> L.) Under Highland Conditions Rosario A. Salas, Helen Mae Mejia and Othello B. Capuno
3.30-3.45	PILDS Model: A Collective View of Filipino Educators on localization of Education for Sustainable Development Carmina S. Vicente and Arlen A. Ancheta	Effectiveness of Different Mulching Materials in Improving the Growth and Yield of Eggplant (<i>Solanum melongena</i> L.) Grieza J. Apao, Warren L. Obeda, Zenaida C. Gonzaga and Othello B. Capuno	Gibberellin Application Influence on Growth, Flowering and Steviol Glycoside Accumulation of Tissue Culture-Derived Natural Sweetener (<i>Stevia rebaudiana</i> Bertoni) Catherine C. Arradaza,



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

			Rocelie R. Zara, Constancio C. de Guzman, Lourdes B. Cardenas, Evalour T. Aspuria and Ma. Lourdes O. Cedo
3.45- 4.0	Open Forum	Open Forum	Open Forum
4.0- 4.15	Do Clearing and Selective Cutting in Simulated Plant Communities Follow the Intermediate Disturbance Hypothesis (IDH)? Jerrold M. Tubay, Monica C. Torres, Gimelle B. Gamilla and Destiny SM. Luter	Stochastic Lotka- Volterra Model of Host and Parasite Interaction with Red Queen Dynamics Allyzssa Eunice O. Avila and Jomar F. Rabajante	Multi-objective Optimization Model for Crop Cotation Problem Considering Spatiotemporal Climate Indices and Crop Adjacency Emerson R. Rico, Destiny S. Lutero, Allen L. Nazareno and Arnold Salvacion
4.15- 4.30	Science Instruction in DMMMSU-NLUC College of Education: Perceptions on the Competence of Science Teachers along Instruction	Suitability Analysis for Sanitary Landfill Site in Province of Ifugao, Philippines Mark Joseph J. Buncag and Lea Mari Santos	Growth and Yield Response of Cabbage (<i>Brassica oleracea</i> var. <i>capitata</i> L.) Grown with Different Soil Amendments



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Jomar L. Aban, Joan S. Valdez and Anny Ross A. Bayan		Merlyn Guzman- Buscato
4.30- 4.45	Broccoli (<i>Brassica oleraceae</i> L. var. <i>italica</i> Plenck) Production as Influenced by the Application of Different Organic and Inorganic Nutrient Solution Formulations using Aggregate Hydroponic System Darlyn B. Posas and Rosario Salas	Assessing the Household's Willingness to Pay for the Conservation of Agusan Marsh Wildlife Sanctuary, Philippines Angel Mae V. Macadingding, Aprilyn Joy H. Brangca, Meycel C. Amarille, Richie P. Lador and Chime M. Garcia	An Integrated Recursive Feature Elimination and Artificial Neural Network Approach to Healthcare Data Classification Problems Crystal Jean T. Natividad, Destiny S. Lutero and Allen L. Nazareno
4.45- 5.0	Open Forum		



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

**05 July 2019
(Friday)**

Time	Session Hall 1 (Moderator: John Christan Valereso)	Session Hall 2 (Moderator: Carmina S. Vicente)	Session Hall 3 (Moderator: Mary Ann V. Bulanadi)
8.0-8.15	Sustainability of Bangsamoro Development Agency Program, Pikit, Cotabato <i>Mahirah B. Salik</i>	Alleviation of Drought Stress in Papaya (<i>Carica papaya</i> L.) Seedlings by Exogenous Application of Acetic Acid, Potassium Silicate and Salicylic Acid <i>Nonnatus S. Bautista, Lailani A. Masungsong, Jose Angel Jude B. Telan, Franz Allen C. Estrella and Rachel C. Sotto</i>	Socio-Economic Status and Conservation Practices of the Cagayan River Bivalve Gatherers <i>Cherry S. Wanya, Robert G. Carbonell, Mia Q. Columbano, Bernie N. Waña, Mary Jane J. Bulusan, and Nenette T. Columna</i>
8.15-8.30	Valuation of the Rice Field Crop Damaged by Wildlife in Selected Barangays in Narra, Palawan, Philippines	Salient Features of Tourism Landscapes Discourses of Palawan's Prime Tourist Destinations	Inventory of Oil Producing Herbs in Camotes Islands, Cebu, Philippines <i>Ian Paul C. Bayon,</i>



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Gerlie J. Boni, Darwin O. Aniar, Maybelle V. Dela Pena and Kimberly S. Arbelo	Janet B. Oab	Chembelyn G. Bayon, Martha Joyce G. Garciano, Israeli S. Caminos and Jonita V. Literatus
8.30-8.45	Factors that Affect Employees' Productivity: Basis for Productivity Improvement Dante V. Ariñez	Gaps in Core Competencies for Effective Extension Service on Sustainable Agriculture Among Public Extension Workers in Two Selected Provinces: Basis for In Service Training Programs Jose Edwin C. Cubelo	Length Frequency Distribution of Razor Clam (<i>Pharus</i> sp.) in a Silty Loam Abandoned Fishponds of Candijay, Bohol, Philippines: A Key for Resource Conservation Winfild E. Buscato
8.45-9.0	Willingness to Pay of Select Barangays in Brooke's Point, Palawan: Basis for Improved Solid Waste Management Services Angelo M. Amistad	Environmental Health Safety Awareness and Practices of Small and Medium Enterprises in the Tourism Industry in Puerto Princesa City	Tourists' Experiences on Green Tourism Practices Towards Sustainability Roadmap for the Community-Based Tourism Projects in Palawan Henrietta M. Roque



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

		Hathwell C. Capistrano and Ramon M. Docto	
9.0-9.15	Acceptability of Adlai as Coffee and Tea Beverages in Banaue, Ifugao Joan N. Batton and Marissa P. Bulong	Integrating Climate Change in the Bachelor of Science in Agriculture Curriculum: The Case of UP Los Baños Imelda Grace Siregar and Maria Ana T. Quimbo	Evaluation of Different Plant Extracts against Stripe Flea Beetle of Pechay Grown under Field Condition Daisy S. Capon and Marilyn G. Patricio
9.15-9.30	Open Forum	Open Forum	Open Forum
9.30-9.45	Effects of Non-Formal Education and Ecotourism Practices to the Customs and Traditions of the Bataks Nenelia Aguirre, Ramon M. Docto, Vincent B. Esguerra and Amparo Leonila F. Esguerra	Changes in catch of yellowfin tuna <i>Thunnus albacares</i> with sea surface temperature in Palawan, Philippines Hermenegildo P. Dela Peña and Benjamin J. Gonzales	Think Green: Perspective of School Administrators of Mangaldan National High School towards Solid Waste Management Analyn I. Diola, Jeffrey O. Ballesteros, Flordiliza B. Dalumay and Ian Jones Dela Cruz



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

9.45-10.0	<p>Recreational and Existence Value of Maoyon River Cruise for Policy Support and Decision Making</p> <p>Tutu Almonte, Claudette Basaya, Alejandro Bernardo, Amparo Leonila F. Esguerra, Emi Marjorie Gabinete, Eireka O. Merigillano, Archelm Joseph S. Sadang, Ma. Teresita F. Jardinico and Ma. Chona Rizada</p>	<p>Social and Economic Benefits of Solid Waste Handling: A Case Study of City of San Fernando, Pampanga, Philippines</p> <p>Arlen A. Ancheta, Belinda de Castro, Moises Norman Garcia, Ma. Rosario Virginia Garcia and Ronald Castillo</p>	<p>Growth, Yield and Physico-Chemical Properties of Lettuce (<i>Lactuca sativa</i> L.) var. Carlo Rossa Under SNAP Hydroponics System as Influenced by Wood Vinegar Application</p> <p>Warren L. Obeda and Zenaida C. Gonzaga</p>
10.0-10.15	<p>Payment for Ecosystem Services for the Conservation of Agusan Marsh Wildlife Sanctuary in Caraga Region, Philippines</p>	<p>Recursive Feature Elimination Approach Improves Support Vector Machine-Based Classification Models</p> <p>Crystal Anne M. Perez,</p>	<p>Fractal Analysis of Philippine River Networks</p> <p>Marisol P. Martinez and Ranzivelle Marianne L. Roxas-Villanueva</p>



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Chime Mora-Garcia, Roberto G. Campos Jr. and Romell A. Seronay	Destiny S. Lutero and Allen L. Nazareno	
10.15-10.30	Efficiency of Hepato-Modulator Supplement to Broilers Banisa S. Jumawan and Alan E. Faburada	Impact Assessment of Community-Based Sustainable Tourism – Maoyon River Cruise Project Claudette M. Basaya, Vincent B. Esguerra and Amparo Leonila F. Esguerra	Effect of Decrease in Rainfall in Los Banos, Laguna to Rice Production and Crop Insurance Viability Patricia Anne V. Quilitis, Alyssah M. Arugay and Diane Carmeliza Cuaresma
10.30-10.45	Open Forum	Open Forum	Open Forum
10.45-11.0	Spatial Patterns of Urban Heat Island using Landsat and Sentinel Data in Puerto Princesa City, Philippines Reagan M. Venturillo	PUJ Drivers' Compliance to Anti-Smoking Ordinance in Zamboanga City Philippines: A Cross Sectional Study Dolores O. San Juan	Soil Fertility, Rice (<i>Oryza sativa</i> L.) Productivity and Profitability Under Organic and Inorganic Input R.J.C. Rollon, A. S. Polinar, M. Troza and A. J. Sutacio

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

11.0-11.15	Yield Increase of Sweet Pepper (<i>Capsicum annuum</i> L.) through Interspecific Grafting Malvin B. Datan and Zenaida C. Gonzaga	Diversity of Trees in Nueva Ecija University of Science and Technology Gabaldon Campus, Gabaldon, Nueva Ecija Jomell M. Santiago, Reynante G. Bustillos and Maricar H. Sison	Willingness to Pay towards the Conservation of Ecotourism Resources at Agusan Marsh Wildlife Sanctuary, Agusan del Sur, Philippines Julie Rose D. Apdohan, Romell A. Seronay and Sarajane O. Lopez
11.15-11.30	GIS-Assisted Carbon Stock Assessment of Loboc-Bilar Mahogany Plantation, Bohol, Philippines Tomas D. Reyes, Jr.	Relationship Between Demographic Factors, Knowledge, Attitude, and Behavior of Filipino Senior High School Students Towards the Agriculture Profession J.P. Echavez, A. Bulfa and JE. Cubelo	Influence of Different Organic Mulches on the Growth and Yield of Bitter Gourd (<i>Momordica charantia</i> L.) Under Two Types of Cultivation System Whilma O. Tuyan and Zenaida C. Gonzaga
11.30-11.45	Changes in Phytoplankton Composition and Diversity in Lake	The Level of Tourists' Awareness on Anti-Littering and	Open Forum



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

	Danao, Ormoc City, Leyte: A Re-Sampling Study after 12 Years Eunice Kenée L. Serião and Krizel Ann G. Galangue	Anti-Smoking Ordinances in Puerto Princes City, Philippines Judy Ann V. Sarail, Judith M. Pasion and Ramon M. Docto	
11.45-12.0	Open Forum	Open Forum	
12.00-1.0	Lunch		

Closing Ceremony

Time	Plenary Hall
1.00-1.15	Oath-Taking of New Set of Officers and New Members Dr. Arlen Ancheta
1.15-1.30	Message of the Newly Elected President
1.15-1.30	Awarding of Winners of the Best Paper Competition Chair of the Best Paper Competition Committee
1.30-1.45	Closing Remarks/Message of the Outgoing President

Invited Speakers

Keynote Speaker



Peter Jürgen Widmann
Conservation Programs Director
Katala Foundation, Inc.,
Puerto Princesa City
Palawan, Philippines

About the Speaker

Peter Jürgen Widmann is a founding member of the Katala Foundation Inc. (KFI), a nongovernmental organisation based in Palawan, Philippines. As a biologist by background, Mr. Widmann is highly engaged in conservation programs, mostly in the tropical Asia such as the Philippines, Indonesia, Nepal, and China. As a program leader in an Asian-based non-government organization, he has spearheaded and been greatly involved in the conservation of threatened species programs such as the Philippine Cockatoo, Palawan Hornbill, Calamian Deer, Balabac Mousedeer where he employed both ecosystemic and participatory approaches. He is also engaged in the restoration of tropical forest and freshwater ecosystems and in establishing an institute for biodiversity research, conservation and education with living plant and animal collection. As such, he has been an advisor for curriculum development and research on conservation biology for academic institutions.

Mr. Widmann is a graduate of Biology at the University of Hohenheim, Germany.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Plenary Speakers



Dr. Quyen Ding Ha

Deputy Head of Rural Development Department
Faculty of Economics and Rural Development
Vietnam National University of Agriculture
Trau Quy Town, Gia Lam District, Hanoi, Vietnam

About the Speaker

Dr. Quyen Ding Ha is a lecturer and the deputy head of the Rural Development Department, Vietnam National University, where he is highly engaged in research and teaching undergraduate, masteral, and doctoral courses in development, economics, and management. His research is focused on agricultural economics and rural development and risk management in agriculture. He has been involved as an expert in the Ministry of Agriculture and Development Vietnam National Vegetable, Fruit and Agricultural Product Corporation (VEGETEXCO) and in the Ministry of Agriculture and Rural Development Vietnam National Agricultural pProducts and Manufactured Food Import-Export Corporation (VINAFIMEX).

Dr. Ha was born on October 29, 1979 in Yen Bai Province, Vietnam and received his doctorate degree in Community Development from the University of the Philippines Los Baños, Philippines.

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*



Dr. Lin Mei-Hua

Associate Professor
Sunway University, Petaling Jaya,
Malaysia

About the Speaker

Dr. Lin Mei-Hua is an associate professor in Sunway University, teaching undergraduate and postgraduate courses in Psychology. She manages research projects related to cognitive psychology or cognitive science.

Among the works she has done include affective technology acceptance, causal explanations of complex events, influence of social and cultural cognition and personality on trust, and the like. She has been greatly involved in mentoring research assistants who are doing studies on psychology-related research works. She has also been involved in developing undergraduate and postgraduate curricula in the University.

Dr. Lin graduated with a PhD in Industrial and Organisational Psychology/Human Factors Psychology degree from Wright State University, USA.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*



Dr. Rico Ancog

Assistant Professor and UP Scientist III
School of Environmental Science and Management
(SESAM)
University of the Philippines Los Banos (UPLB).

About the Speaker

Dr. Rico Ancog serves as the Head of the Ecosystem Services and Environmental Policy (ESEP) Research Laboratory of SESAM, while also working as the Managing Editor of the *Journal of Environmental Science and Management (JESAM)*, an ISI-indexed journal based in UPLB. He likewise sits as the Board Secretary of the Philippine Network of Environmental Educators (PNEE) and as District Chair of the Environment Protection Committee of Rotary District 3820. With specialization in environmental science and environmental economics, his research projects are focused on systematic understanding of socio-ecological systems for efficient resource conservation and resilience. He has served as a consultant of National Economic Development Authority (NEDA) and the Philippine Statistics Authority (PSA) in the initial development of the *Philippine Mangrove Systems Account* under the program, *Wealth Accounting and Valuation of Ecosystem Services (WAVES)*. Currently, he handles two on-going projects in NEDA. One, focuses on the development of a Supplemental Manual on the integration of DRRM/CCA in the project evaluation system of NEDA Board's Investment Coordination Committee (ICC), while the other project looks into the efficiency, financing gap, and potential funding sources of the the Coastal Resources Management (CRM) programs of selected 24 local government units (LGUs) around the country.

He finished his PhD in 2011 in UPLB complemented with a sandwich program in Nagoya University. He was awarded the *Dr. Elvira O. Tan Award for Best Published Paper (2017)* and the *Asian Young Professional on Water Research (2009)*.

Pre-Conference Speaker



Dr. Renato G. Reyes

Director, International Affairs Office
Central Luzon State University
Nueva Ecija, Philippines

About the Speaker

Dr. Renato Reyes has been highly engaged in teaching and research in microbiology, botany, and mycology. He has supervised research studies in mushroom science and biotechnology in Central Luzon State University. His works in mushroom research has been recognized by several scientific and research-based

institutions. Among the awards he received for these works are: 2006 CHED HEI Best Research Program; Best Paper Award in Development Category (Mushroom Farming of Local and Imported Strains of Medicinal Mushrooms); Best Paper in Crops Category (A Pioneering Cultivation Technology and Nutritive Value of *Schizophyllum commune*, a newly cultivated culinary and medical mushroom in the Philippines); and Best Oral Paper Award (Morphogenesis of *Kudat*). His recent research works are focused on nutraceuticals, fungal ecology and taxonomy, and fungal plant pathogens.

Dr. Reyes is a graduate of Ph.D. in Forest Science from the Tokyo University of Agriculture. He has also received two post-doctoral fellowships: the Japan Society for the Promotion of Science at Tokyo University of Agriculture and InWent Training Fellowship on Modern Industrial Biotechnology at University of Braunschweig, Germany.



Invited Speeches

Flagship species conservation programs of Katala Foundation in Palawan, Philippines

Peter Widmann

Conservation Programs Director, Katala Foundation, Inc.,
Puerto Princesa City, Palawan, Philippines

Abstract

Islands are home to a disproportionate number of highly threatened species. Long periods of isolation not only led to unique life-forms, but in some cases also to naïve biological traits, making these species particularly vulnerable to outside threats. Consequently, historically and up until now, islands had significantly higher extinction rates compared to mainland areas. Conservation of critically endangered island species therefore often requires comprehensive approaches, which integrate species-specific research and interventions, ecosystem conservation and restoration, community involvement through conservation education, capacity building, and advocacy, among others. Such programs then in turn can have positive effects on other species or biological assemblages, as well as local human communities in a variety of ways. Examples of Katala Foundation's species conservation programs, particularly for the Philippine Cockatoo, are presented. Not only did the approach result in marked recovery of the global population of this species, but also benefited small island and lowland forest ecosystems and human populations within its present range.



Psychology and Environmental Sustainability

Mei-Hua Lin, Ph.D.

Sunway University

Malaysia

Abstract

As human behaviour is the primary cause of ecological damage, human behaviour experts can contribute to sustainable solutions. Psychology can contribute in several ways to understanding and changing behaviours that negatively impact nature. First, is to understand the human-nature relationship – individuals place in nature. Second, is to transform current destructive patterns of human behaviour into sustainable ones by leveraging on the understanding of cognition, emotion, and behaviour of individuals as well as social influence. Lastly, through education, we can integrate environmental issue in psychology curricula and vice-versa psychology in environmental curricula. Through a multidisciplinary approach, future stakeholders are better educated about human behaviour, cognition, and affect; and thus, benefit the earth and all of its inhabitants. In conclusion, psychology has a critical role to play in creating a sustainable society.

Indigenous Knowledge on Climate Change Adaptation in Vietnam

Quyen Dinh Ha, PhD.

Department of Rural Development

Faculty of Economics and Rural Development,

Vietnam National University of Agriculture (VNUA)

E-mail: quyendinhhab@vnua.edu.vn

Abstract

With the onset of climate change, it is necessary to assess how human populations have adapted in the past and present times to develop strategies for the future. Climate change adaptation's implicit and explicit link with the country's development processes and trajectories took the attention of the scientific and policymaking communities. Developing countries like Vietnam are disproportionately vulnerable to climate change and lack adaptive capacity. With this, various adaptation measures and practices had



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

been designed in order to respond to the impacts of climate change which include adaptation planning, disaster preparedness, and risk assessment.

Another key to successful climate change adaptation is Indigenous knowledge (IK). Recent researches discovered the important role of IK for the effective undertaking of climate change adaptation. Even UNESCO recognized the potential of its inclusion in the development process since it has a broad perspective of the ecosystems and of sustainable ways of using natural resources. Besides, IK has been constantly developed by the Indigenous People based on their geographical origin and experiences over time. Hence, it will definitely provide valuable insights for development. It would then be necessary to conduct further scientific exploration on the indigenous knowledge of a particular area.

One of the growing interests is the incorporation of Indigenous Knowledge on weather and climate forecast. Climate forecasting for adaptation was promoted to the IK holders in order to provide them with informed decision on the best time to plant; how to develop rainfall records using rain gauges; reduce the drying up and subsequent collapse of rice terraces through water storage and infiltration facilities; collect and store run-off water during the rainy season through the use of qochas, the rectangular excavations with two side channels; improve food security by burying grain in the sand or constructing granary rooms in houses; and other appropriate communications for climate resilience.

Initiatives in adopting a national approach to include IK in the improvement of climate change adaptation are now executed in different countries. The programs include series of dialogues and exchanges between indigenous and scientific knowledge holders, with the support of indigenous knowledge experts. In the case of a study in Vietnam, extra effort has to be exerted in order to unite coastal communities in mitigating the effects of climate change through solid waste management, planting and protection of mangroves, prohibition of destructive fishing activities, building a management model and to practice the rational use of natural resources, and promoting a close link among the farmers, scientists, enterprises, and the government.

To further facilitate adaptive skills and develop resiliency to climate change among the coastal communities, the following needs are raised: (1) proposal for the government to invest in early warning system in coastal communities; (2) a request for budget allocation for infrastructure facilities like evacuation centers during typhoon and flood to be prioritized; (3) provision for food and clean water to the evacuees in these centers; (4) availability of infrastructures for the water system in the community; and (5) decentralization in the management of mangrove resources.

Sustainability Considerations in Accelerating Economic Development: Making the Connections Work by Enhancing the Transdisciplinary Approach

Rico Ancog

Ecosystem Services and Environmental Policy (ESEP) Laboratory
School of Environmental Science and Management
University of the Philippines Los Baños

Abstract

The Southeast Asian countries are projected to grow economically competitive in terms of medium-growth rates. Strong investment to infrastructure development is viewed as one of the factors that may drive this anticipated event. Recent history of infrastructure development, however, describes an unsustainable growth that often emphasizes capital investments to financial and physical structures. The principles of sustainable development— of which many of the national policy frameworks are now grounded on— indicate that infrastructure development needs to fully account social, economic, and environmental considerations. Aside from the commonly perceived environmental and socioeconomic impacts, contemporary developmental challenges necessitate an integrated framework to infrastructure development. In order to truly operationalize an integrative analysis, the concepts, principles, and methods from the natural, social, and physical sciences must be maximized in addressing the inherent complexity and uncertainty of development issues---an approach that transcends disciplinary boundaries is conceptualized. This methodology referred to as a transdisciplinary approach seeks to understand complexity and diversity of the system to provide pragmatic and reflexive solutions to societal problems. Achieving transdisciplinarity is difficult but the challenge may be aided by establishing a relationship based on mutual communication of ideas, observations, and innovations among and between bodies of knowledge including the academe, government, non-government organizations, community, and end-users.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Best Paper Competition Abstract of Entries

Isolation, Molecular Identification, Phylogenetic Analysis and Biodiversity of Root Symbiotic Fungi (RSF) from *Drynaria quercifolia* L.

Jomar L. Aban

Don Mariano Marcos Memorial State University-
North La Union Campus
Philippines

Abstract

Fern epiphytes exposed to light- and water-deprived environments are common. *Drynaria* is an epiphytic fern found in such habitats. One of its unique ecophysiological adaptation is their association with fungi. This research is one of the few studies that explored the phylogenetic relationship, colonization, occurrence and diversity of symbiotic fungi found in *D. quercifolia*. Genomic DNA of the RSF was extracted, and the ITS (internal transcribed spacer) region of the 18S ribosomal DNA (rDNA) were sequenced. Five isolates were recorded. All the isolates were identified up to the species level using the Basic Local Alignment Search Tool program to their closest type available on NCBI databank. These five isolates are under two genera: *Trichoderma* and *Aspergillus*. Their phylogenetic relationship was determined using Molecular Evolutionary Genetics Analysis (MEGA6) and two distinct monophyletic groups were formed: Sordariomycetes and Eurotiomycetes. The computed colonization rate (100%) implies their abundance in the roots of *D. quercifolia* where species of the genus *Trichoderma* and *Aspergillus* were found to occur very frequently. Understanding the diversity of root fungal symbionts and the presence of dominating species are necessary to determine their impact on ecosystem functioning. These factors lead to RSF's potential in organic agriculture and green biotechnology.

Keywords: taxonomy, biodiversity and phylogeny, molecular identification, Philippines

Physiological and Morphological Responses of Corn (*Zea Mays* L.) to Corn Cob and Corn Husk Biochar Applications as Soil Amendment and Carbon Capture

A. Bulfa¹ and G. Pangga²

¹College of Agriculture, Silliman University, Dumaguete City 6200, Philippines

²Agricultural Systems Institute, College of Agriculture and Food Sciences,
University of the Philippines Los Baños, College, Laguna, 4031, Philippines



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Email: gvpangga@up.edu.ph; arseniodbulfa@su.edu.ph

Abstract

Biochar is a carbon rich material obtained by heat treatment in a limited oxygen environment. More research findings indicated that properties of biochar improve soil health and enhances plant growth. An experiment laid out in Split Plot in Completely Randomized Design was conducted to investigate the physiological and morphological responses of corn to corn cob and corn husk biochars application. The fertilizer recommendation was 120N-60 P₂O₅-60 K₂O /ha), organic fertilizer (10 t/ha), corn cob biochar (15 t/ha) and corn husk biochar (15t/ha) with 3 replicates. Application of corn cob and corn husk biochars significantly increased soil pH, improved cation exchange capacity (CEC) and significantly affected soil electrical conductivity (EC). Corn cob biochar and inorganic fertilizer mixture significantly increased soil organic carbon (OC). A significant difference in total phosphorus of corn cob and corn husk biochars mixed with inorganic fertilizers was observed. Significant increases of root weight, plant biomass and chlorophyll concentration in the leaves were discovered in both corn con and corn husk biochars mixed with inorganic and organic fertilizers. More root hairs were also produced in biochar-treated soil. Environmental benefits of these biochars include soil health improvement, water treatment and carbon dioxide sequestration. This inexpensive technology will help rehabilitate the degraded soils in the Philippines such as soil acidity, salinity and heavy metal contamination that will help our farmers in the long run.

Keywords: corn cob biochar, corn husk biochar, soil amendment, carbon capture, plant growth

Phosphorus Fractions of Highly Weathered Soils Derived from Various Parent Rocks

Gerry May C. Añonuevo^{1*} and Victor B. Asio²

¹Department of Agricultural Sciences, University of Eastern Philippines, Catarman, Northern Samar and ²Department of Soil Science, Visayas State University, Baybay City, Leyte, Philippines

E-mail: gerrymay_anonuevo@yahoo.com

Abstract

Phosphorus is the most limiting macronutrient in the soil due to its source and availability. The inorganic (available) and organic P (reserve) forms are influenced by anthropogenic, biotic and abiotic processes. This study was conducted to determine the P fractions of highly weathered soils using P sequential extraction by Hedley et al (1982). Soil sampling of 17 highly weathered soil profiles (ultisols and oxisols) was done in Samar, Leyte and Biliran islands. Correlation between clay, soil pH and SOM to each soil P fractions were also determined. The result showed that the P fractions had similar trend in all soil profiles across the three islands. The P fraction distributions were moderately-available P_i > easily-available P_i > non-available P fractions, which means that P are coming from the chemically more stable P forms. The clay and SOM were correlated with P fractions. The non-available P forms stays at the clay surfaces and SOM stored moderately available P forms. Hence, application of organic source of fertilizer and agroforestry system are recommended as it can enhance P acquisition by plants. Further studies on P fractions are also encouraged especially in Biliran island to better understand the P fractions distribution of Eastern Visayas.

Keywords: Hedley P fractionation, inorganic P, organic P, soil organic matter

Growth Performance and Profitability of Broilers with Vermi Meal on Fermented Ration Under Two Management Systems

Marcos E. Bollido

Northwest Samar State University

Barangay Erenas, San Jorge, Samar

Email: markbollido@yahoo.com

+63 999 583 6494

Abstract

The study was conducted to evaluate the effects of the different levels of vermi (*Eisenia fetida*) meal on fermented ration in broilers growth and profitability under two management systems. 120-day old chicks were tested in CRD with 4 treatments: commercial feeds, 2% vermi meal (vm)+local ingredients(li), 3% vm+li, 5% vm+li in three replications. Result revealed that total confinement (TC) had higher body weight (bw) and weight gain (wg) with a difference of 35.60 grams and 36.90 grams respectively compared to that of free-range (FR) that had lesser feed consumption (fc) with difference of 81.10 grams and high in net income and ROI. In feed ration, fc increased when given higher



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

percentage of vm and it was significantly different from the commercial feeds (cf). In 3 different levels of vm, though they didn't have significant difference to each other, the 2% level of vm was comparable to cf and showed difference in terms of bw 296.70 grams in TC; 326.00 grams in FR. In wg 296.67 grams in TC and 370.97 grams in FR in both management. Consequently, 2% level vm had an optimum result in final body weight, wg and high in feed conversion.

Keywords: vermi, free range, total confinement, profitability, fermented ration

**Productivity and Fruit Quality of Eggplant (*Solanum melongena* L.)
Cultivated with Different Nutrient Management Strategies**

Felix M. Salas^{1*}, Rosario A. Salas¹, Stephen Harper² and Victor B. Asio¹

^{1*}Visayas State University, Baybay City, Leyte (fmsalas_dopac@yahoo.com);

²Queensland Department of Agriculture and Forestry, Australia.

Abstract

This study was conducted at Farmville Experimental Station located at the Visayas State University in Baybay City, Leyte to evaluate the effects of the different nutrient management strategies on the productivity and fruit quality of eggplant. The field experiment was laid-out in a randomized complete block design with five treatments which were replicated thrice using Fortuner variety of eggplant. The different nutrient management strategies were as follows: T1 (no fertilizer added or control), T2 (150-100-160 kg N-P₂O₅-K₂O/ha or RRIF), T3 (T2 + 400g chicken manure per plant), T4 (400g chicken manure per plant or RROF), and T5 (T2 + micronutrients: B, Cu, Mo & Zn)). Eggplant applied with fertilizers flowered earlier than the control. The plants cultivated with the recommended rate of inorganic fertilizer (RRIF) alone or with added micronutrients were significantly tallest in height. The combined application of RRIF and chicken manure exhibited the longest fruit length of eggplant. Eggplants applied with 150-100-160 kg N-P₂O₅-K₂O/ha (RRIF), RRIF plus 400g chicken manure per plant, and RRIF plus micronutrients produced the highest number of marketable fruits, heaviest marketable fruits, and consequently gave the highest yield. Lowest yield was observed on control plants, which received no fertilizer application. Highest chlorophyll and carotenoid contents were shown by eggplants cultivated with 400g chicken manure per plant (RROF), however, electrical conductivity and total dissolved solids of harvested eggplant were found significantly highest when cultivated with RRIF alone or in combination with RROF. Meanwhile, the addition of micronutrients with RRIF somehow lowered the redox

potential of the harvested eggplant to improve potential shelf-life and storability of the fruit. The overall result of the study simply implied that the combined application of recommended rate of inorganic fertilizer and chicken manure as organic fertilizer is worth recommending for optimum productivity and fruit quality of eggplant under Visca agro-climatic condition.

Keywords: eggplant, electrical conductivity, redox potential, total dissolved solids, yield

Investigation of Oil Palm (*Elaeis Guineensis*) Trunk Lumber

Engr. Rodolfo B. Solomon¹ and Maher A. Mangakop²

Sultan Kudarat State University

EJC Montilla, Tacurong City

Email: rudybsolomon@yahoo.com

Abstract

The physical and mechanical properties of the oil palm trunk based on its wood zoning were studied. The trunk was cut into three (3) parts: top, middle and the bottom, and each cut was dried through a mechanical process using kiln-dryer and later investigated for their physical and mechanical properties. Testing was conducted according to the standards of ASTM C293. The result on the physical and mechanical properties showed that the moisture content decreased along the trunk depth from inner zone (IZ) to peripheral zone (PZ) of the trunk. The peripheral zone (PZ) of the trunk had the higher weight density and thickness swelling percentage. The peripheral zone (PZ) of the trunk had the lowest shrinkage percentage. The peripheral zone (PZ) of the Oil Palm trunk had a higher flexural strength compared to the inner zone (IZ) and central zone (CZ) of the trunk. The result showed that flexural strength of the oil palm trunk was lower than the minimum flexural strength for wood, however, oil palm trunk is recommended for non-load bearing structures of the building like wood panels, interior and exterior walls, ceilings, ventilation slots, frames, handicrafts, and materials for light bearing fixtures.

Keywords: inner zone, peripheral zone, central zone, weight density, flexural strength



Facilitators and Barriers of Incident Command System Implementation for Disaster Response: The Case of Caraga Region, Philippines

Erma R. Suyo¹ and Ricardo T. Bagarinao²

¹Head, Provincial Planning and Development Office, Province of Agusan del Norte

²Professor, Faculty of Education, University of the Philippines Open University, Los
Baños, Laguna, Philippines

Abstract

The Philippines is highly vulnerable to disasters, and thereby, need a strong disaster response system. The Incident Command System (or ICS) was seen to address this need. But there is limited information on ICS practice in the country and the factors that influence its implementation as a disaster response tool. Using three data collection approaches, i.e. focused group discussions, key informant interview, and document analysis, the study determined the facilitators and barriers of ICS implementation in the context of natural disaster in Caraga region. Although ICS implementation in the study site had been affected by the lack of appropriate training among responders and coordination among sending agencies, it helps stabilize incidents and optimizes the use of resources. It strengthens interoperability of agencies involved in a disaster response. Enhanced community-disaster responders' partnership, integration of financial and accounting personnel into the incident management team, and regular training of local chief executives enhanced ICS capacity as a disaster response system. Although ICS did not ensure reduced number of casualties and property damages during a disaster, it is recommended that it should be evaluated regularly to address the factors that compromise its implementation.

Keywords: incident command system, disaster response, focus group discussion, key informant interview, Caraga

Phosphorus fluxes in Hyperdystric Folic Cambisol assessed by ³³P labeling technique

Deejay Maranguit-Lumanao^{1, 2*} and YakovYakow Kuzyakov^{2,3}

¹Department of Soil Science, Visayas State University, Baybay, 6521-A Leyte, Philippines

²Department of Soil Science of Temperate Ecosystems, University of Goettingen,
Büsgenweg 2, 37077 Goettingen, Germany

³ Institute of Environmental Sciences, Kazan Federal University, 420049 Kazan, Russia

*Corresponding author: D. Maranguit, tel. +49-162-8296906
Email: maranguitdeejay@gmail.com

Abstract

^{33}P labeling has high sensitivity to trace the fate of added P fertilizers across various P pools. Nonetheless, only a few studies used this approach. This study investigates the effects of biological and physicochemical processes on P availability in P-limited soil. We followed the incorporation of ^{33}P -labeled KH_2PO_4 in available P (P_{AEM}), microbial biomass P (P_{mic}) and Fe/Al-bound P (P_{NaOH}) pools as influenced by the presence of C and N sources. Not all applied P fertilizer is available for plant uptake; instead, it was distributed to poorly-available pools. Fast, almost instantaneous P fixation by the Fe and Al oxides and immobilization by microbial uptake were recorded. Glucose boosts microbial growth and demand for P, resulting in increased ^{33}P recovery and P content in P_{mic} . The negative relationship between P_{mic} and P_{AEM} ($R^2 = 0.46$) emphasizes that P availability is influenced by microbial uptake. The high ^{33}P recovery in P_{NaOH} and the strong negative relationship ($R^2 = 90-96$) between P_{NaOH} and P_{AEM} show the dominance of P adsorption by Fe and Al oxides on the fate of P. These processes – biotic (microbial P immobilization) and abiotic (adsorption) – sustain long-term P fertility after the turnover of microbial biomass and desorption of fixed P, respectively.

Keywords: ^{33}P isotopic labeling; Phosphorus dynamics; Phosphorus fractions; Microbial biomass P; Sorption-desorption

Attitude of Selected Senior High School Students Towards Traditional Medicine

Jasper Milo Dela Cruz, Anjelamari Dela Rea, Caryl Anne Magalong, Kristine Ann Poyaoan, Christian Michael Velarde and Christopher A. Malay

Senior High School, International School, Lyceum of the Philippines University-Cavite

Abstract

Attitude of Selected Senior High School Students Towards Traditional Medicine
Traditional medicine, though proven to be effective and beneficial, has been perceived differently by people from varying demographics. This study aimed to explore the attitude of the population of G12 STEM (Science, Technology, Engineering and Mathematic) students towards traditional medicine (TM) and to evaluate the impact of demographic



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

indicators such as age and gender. A sample size of 239 respondents obtained through uncontrolled data sampling technique was used in the study. Data was collected through self-administered survey form comprising of questions assessing the respondent's attitude towards TM in three parameters namely: attitude towards practice, efficacy, and advantage and disadvantage of traditional medicine. Data analysis involved descriptive statistics; Chi-square test coupled with Cramer's V to measure its degree of association with level of significance set at $p > 0.05$. Results show that 44.4% have a moderate utilization, 45% have a positive attitude towards efficacy of TM and 75.7% have neutral attitude towards the pros and cons of traditional medicine. Chi square tests for association revealed no statistically significant difference between gender and the three attitudinal parameters. This is similar between age variable and attitude towards practice and attitude towards the pros and cons of traditional medicine. However, test between age and attitude towards efficacy suggests that there is a statistical relationship between the two variables. Based on the results, the senior high school students are aware of the effectiveness of traditional medicine and the benefits it offers. The relationship between age and attitude towards efficacy of TM suggests that this awareness may be brought through acquired knowledge through time. However, this awareness may be insignificant for them to resort to constant practice of and positive outlook on TM. These findings will prove useful for academe, government officials and parents for them to take actions to help people obtain a favorable attitude towards traditional medicine given the benefits they offer. Further analysis on wider demographics as well using different parameters may be done to further improve this research.

Keywords: traditional medicine, attitude, parameters, age, gender, demographics



Net Revenue Insurance for Beef in Region IV-A (Calabarzon)

Eduard Joseph C. Senson and Azra May B. Kabiri

Mathematics Division, Institute of Mathematical Science and Physics,
College of Arts and Sciences, University of the Philippines Los Baños,
College, Los Baños, Laguna 4031

Abstract

The cattle industry was identified to be one of the least developed industry in the country due to numerous risks that greatly affect the cattle farmers' income, including market risks such as sudden movements in livestock and feed prices. Hence, this study considers the revenue as the primary factor in designing an option using Principle of Net Revenue Insurance. We consider a Net Revenue Insurance which is a path dependent option in which the payoff depends, not on the values of livestock and feed prices on a given day, but on the path that prices take over the life of the option or insurance product. An Asian Option was designed to insure the expected average revenue of cattle farmers. Monte Carlo simulation was used to price the option. Prices of the resulting Asian Option were calculated using different time intervals, risk-neutral interest rates and initial prices.

Keywords: asian option, livestock insurance, revenue insurance



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Oral Paper Abstracts

Science Instruction in DMMMSU-NLUC College of Education: Perceptions on the Competence of Science Teachers along Instruction

Jomar L. Aban

Don Mariano Marcos Memorial State University-
North La Union Campus
Philippines

Abstract

The competence of a science teacher is affected by both his/her personal traits and professional achievements. In turn, his/her competence may lead to quality student learning and academic achievement. The perceptions of students, teachers and supervisors were evaluated to determine the competence of science teacher in DMMMSU-NLUC College of Education along instruction. This research utilized a combined descriptive-quantitative method of investigation. Using a structured survey questionnaire, the demographic profile and competence of the science teachers were measured. It was found that science teachers with less than ten training points significantly reduced their competence in terms of their personal character ($3.15 \pm .32$), teaching efficiency (self: $3.06 \pm .58$; student: $2.97 \pm .54$), general class atmosphere (self: $2.31 \pm .55$; student: $2.22 \pm .55$; supervisor: $2.62 \pm .53$), substantiality of teaching (self: $2.86 \pm .55$; student: $2.77 \pm .53$; supervisor: $3.17 \pm .43$) and evaluation skills (self: $2.69 \pm .55$; student: $2.60 \pm .54$; supervisor: $3.00 \pm .36$). Other personal and professional demographic profiles were also found to have an influence on the competence of science teachers along instruction. These include the number of children, sex, educational attainment, length of service and workload preparation. It was also deduced in this study that all the five parameters of teacher competence (personal character, teaching efficiency, class atmosphere, substantiality in teaching and evaluation skills) can be considered as predictors of students' academic performance because there is a positive relationship between and among these teacher competence parameters to the grades and academic performance of the science students. This study was used as basis in crafting an action plan to improve science instruction in the College of Education.

Keywords: science instruction, teachers' competence, students' performance, dmmmsu, descriptive-quantitative design, Philippines



Effects of Non-Formal Education and Ecotourism Practices to the Customs and Traditions of the Bataks

**Nenelia Aguirre¹, Ramon M. Docto², Vincent B. Esguerra^{2*}, and
Amparo Leonila F. Esguerra²**

¹ Puerto Princesa City Tourism Office

² Palawan State University

Email: vincesguerra@gmail.com

Abstract

This study aimed at evaluating the effects of Non-Formal Education (NFE) and the current ecotourism practices to the customs and traditions of the Batak tribe. Twenty older Bataks were purposively selected as respondents. These individuals were the recipient of the non-formal education classes conducted by Heaven's Eyes Tribal Mission Academy as sponsored by the Pilipinas Shell Foundation and the Department of Education. The findings showed that the subject areas offered are Math, Reading, and Writing. Customs and traditions still practiced are *Lambay*, *Bandi*, *Rangkapan*, and prayer rituals invoking nature spirits. The ecotourism activities such as trekking, mountaineering, camping, handicraft making, and cultural integration served as an alternative source of livelihood for the Bataks. Data showed that none of the respondents agree that the introduction of non-formal education had affected their customs and traditions. However, the Bataks considered the importance and benefits derived from non-formal education as they hone their basic skills in their everyday living and enhance their ecotourism practices. The rich cultural heritage of the Bataks is a treasure worth preserving and must be protected. The absence of tribal management of the village is of utmost concern for their full protection and to prevent the disintegration of their tribal customs and traditions.

Keywords: indigenous people, cultural heritage, community-based tourism

Recreational and Existence Value of Maoyon River Cruise for Policy Support and Decision Making

**Tutu Almonte¹, Claudette Basaya², Alejandro Bernardo³, Amparo Leonila F. Esguerra²,
Emi Marjorie Gabinete^{2*}, Eireka O. Merigillano², Archelm Joseph S. Sadang²,
Ma. Teresita F. Jardinico², and Ma. Chona Rizada²**

¹Department of Environment and Natural Resources – Puerto Princesa City

²Palawan State University

³Western Philippines University

Email: emingabinete@gmail.com

Abstract

Economic valuation of the Maoyon River in terms of the use and non-use values have not been done in the past. The purpose of this study was to determine the recreational value of the Maoyon River using the travel cost method (TCM) and its existence value based on the perception of the community regarding its conservation program. To value the recreational benefits and the existence of the study site, travel cost and contingent valuation methods (CVM) were used incorporating both the quantitative and qualitative measures. To obtain the recreation value estimates for Maoyon River Cruise only, the researchers used the total expenses incurred for multiple-destination multiplied by the computed mean satisfaction rate of 75.5%. The TCM resulted an estimated recreational value of the site at Php3,149 per person per day and the estimated existence value of the Maoyon River Cruise according to the community's perception on the conservation program was Php463,722 per annum. The calculated high values using the TCM and the CVM led the researchers to conclude that the recreational services of the Maoyon River Cruise will significantly contribute to the progress and development of the community as well as the improvement of the lives of the local residents.

Keywords: valuation, travel cost, community-based tourism



Assessing the Household's Willingness to Pay for the Conservation of Agusan Marsh Wildlife Sanctuary, Philippines

¹ Angel Mae V. Macadingding, ² Aprilyn Joy H. Brangca, ³ Meycel C. Amarille, ⁴ Richie P. Lador, and ⁵ Chime M. Garcia

^{1,2} Environmental Science Department, College of Forestry and Environmental Science
Caraga State University

^{3,4} Instructor 1, Environmental Science Department, College of Forestry and
Environmental Science
Caraga State University

⁵ Assistant Professor 1, Environmental Science Department, College of Forestry and
Environmental Science Caraga State University
Email: mcamarille@carsu.edu.ph

Abstract

Wetlands played a vital role in the environment. The basic role of wetlands is to conserve and offer water, constituting economic, scientific, cultural and recreational value for the community. Loss and encroachment on wetlands will cause severe environmental destruction to the ecosystem, hence rehabilitation and restoration should be done (Alexander & Mcinnes, 2012). Agusan Marsh Wildlife Sanctuary (AMWS) was one of the identified "Wetland as International Importance" by Ramsar Convention. It is one of the most important wetlands in the Philippines that contains almost 15% of freshwater resources. Due to the complexity and huge area of the AMWS, the marsh undergo to several threats and degradation. The benefits and usage of the community might influence their willingness to conserve the AMWS. This study assessed the locale communities willingness to pay (WTP) for the conservation of AMWS through payment card Contingent valuation method (CVM). It is a stated preference method that enables the researches to directly estimate the monetary value of a non-market goods and services of the ecosystem. A total of 556 respondents were interviewed face-to-face to collect the data. The factors affecting WTP was also analysed. The study revealed that 95.9% of the respondents were willing to conserve the AMWS however, only 94.6% of the respondents were willing to pay for the conservation of AMWS. The 1.3% of the respondents were willing to conserve but were not willing to pay for the reasons that it is an obligation of the government to make funds for the maintenance needed by the resources and the community could not afford to pay due to seasonal source of income. The economic benefit of the conservation of AMWS was measured using the households' WTP monthly. Multiple linear regression model was employed to determine the households' willingness to pay. The study revealed that income and their help to conserve the AMWS were the significant factors influencing households' WTP. The monthly estimated community's willingness to pay for the conservation of the AMWS is PhP

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

157.47. The estimated economic value of AMWS for the locale residents is amounting to PHP 993,950.64 annually. The result of the study would play a significant contribution in the formulation of conservation and management plan strategies for the Agusan Marsh Wildlife Sanctuary.

Keywords: wetland, Agusan marsh, contingent valuation, payment card, willingness to pay

Willingness to Pay of Selected Barangays in Brooke's Point, Palawan: Basis for Improved Solid Waste Management Services

Engr. Angelo M. Amistad

Department of Chemical Engineering, College of Engineering, University of San Carlos-
Technological Center

Master of Science in Environmental Management Program, Graduate School, Palawan
State University- Main Campus

Email: angelo092083@yahoo.com

Abstract

Day- to- day convenience depends on common utilities and services paid for by households or individuals at par with food and other basic needs. One inevitable product at the expense of convenience which comes from materials consumption is solid wastes. Solid Waste Management (SWM) has remained a persistent issue hounding concerned Philippine government agencies and Local Government Units (LGUs). A sectoral waste generation analysis in the country's urban and rural areas revealed that households consistently contribute largely to solid waste generation, but LGUs only run after commercial establishments and obligate them to pay for SWM services or environmental fees. The famous environmental adage "*polluter-must-pay*" principle was used as one of the bases leading to the conduct of Willingness to Pay (WTP) of households for improvement of SWM services in the Municipality of Brooke's Point in Palawan. More than just plain WTP study on SWM, households' take on incremental tariff per solid waste volume generation was also focused and studied. The study interviewed 357 respondents based on 95% confidence level and 5% margin of error from four (4) select barangays in the municipality. Survey results revealed 62% of total respondents favored WTP and only 42% showed WTP for incremental tariff charging. The computed WTP_{MEAN} is equivalent to PHP 86.76. Statistical test of significance used was either Chi- Square Test of Independence or Spearman's Correlation. The study found out that household income (HHI) has the most recurring significance. However, it also revealed that HHI is outweighed by significance of other predictors as effected by situations.



Keywords: chi-square test, solid wastes, spearman's correlation, tariff, willingness to pay.

Modelling a Growing-Degree-Day (GDD) European Put Option for Rice Crops in Laguna

Justine L. Angcao, Patricia Ann P. Poral, Diane Carmeliza N. Cuaresma

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

Abstract

Climatic conditions are primary influencer on the rice production: causing unpredictable yield. Any unexpected variations and irregularities in the weather, such as in temperature, may contribute to the negative impacts on production. This have greatly affected the livelihood of the farmers. Weather derivatives are alternative financial instruments that can be used to protect production risks related to weather variability. Thus, the objective of this study is to price a European put option, a type of weather derivative in Laguna, with temperature, specifically a growing degree day (GDD), as the underlying index. Daily temperatures recorded from the UPLB Agrometeorological Weather Station from year 1960 to 2018 are collected. Temperature is modelled in and it is found that the average temperature in Laguna is 26.88 °C, and varies by 1.42 °C. It is also found that temperature is expected to increase by 1 °C in 2500 years. Using this information, the GDD option is priced. It is found that by paying Php 3, the farmer can gain Php 5577 if he exercises the option. The results of this study will help insurance providers and the government to design products that can help the farmers. This product is relatively cheaper than other financial contracts hedging against adverse weather conditions.

Keywords: european option, weather risk, weather derivative



Effectiveness of Different Mulching Materials in Improving the Growth and Yield of Eggplant (*Solanum melongena* L.)

Grieza J. Apao¹, Warren L. Obeda¹, Zenaida C. Gonzaga¹, Dr. Othello B. Capuno²

Department of Horticulture, College of Agriculture and Food Science ¹

Office of the Vice-President for Research and Extension²

Visayas State University

Visca, Baybay City, Leyte 6521-A

Abstract

Eggplant (*Solanum melongena* L.) which belong to the Solanaceae family or nightshade is commonly grown as fresh market vegetable in all region. One of the horticultural practices which improve yield of vegetable like eggplant and is proven to increase the yield of other vegetables including fruit trees is mulching. This involves covering of the topsoil with some materials to enhance the activity of soil microorganisms, modifies the temperature and retains the moisture content of the soil most especially during drought condition and regulates water during excess water situation. Hence, this study was conducted to evaluate the effect of mulching on the survival, growth, yield and yield attributes of eggplants and to determine the best mulching materials to be used in eggplant production that will result to significant increase in growth and yield. There were six treatments in the experiment that was laid out in Randomized Complete Block Design and was replicated three times. The different treatments used were as follows: T₀ – Control (Bare soil), T₁ – Corn stalk, T₂ – Rice hull, T₃ – Rice straw, T₄ – Scratch paper and T₅ – Plastic mulch. Results showed that different mulching materials did not significantly affect the growth of eggplant. However, mulching significantly influenced the reproductive activities of the plants, significantly reduced the weeds associated with the plant, percent plant survival, number and weight of marketable and non-marketable fruits produced. Plastic mulched eggplant significantly produced the highest yield and of best horticultural and reproductive characteristics.

Keywords: plastic mulch, corn stover, Solanum melongena l., paper mulch



Willingness to Pay towards the Conservation of Ecotourism Resources at Agusan Marsh Wildlife Sanctuary, Agusan del Sur, Philippines

Julie Rose D. Apdohan, Romell A. Seronay and Sarajane O. Lopez

Department of Environmental Science,
College of Forestry and Environmental Science,
Caraga State University
Ampayon, Butuan City, Philippines
Email: juliedegamo@gmail.com

Abstract

This study aimed to determine the willingness-to-pay (WTP) of local residents and tourist for the conservation of ecotourism resources at Sitio Panlabuhan Floating Village part of Agusan Marsh Wildlife Sanctuary (AMWS) in order to establish basis for collecting a conservation fee. The study uses the open-ended contingent valuation method and analyzed using Multiple Linear Regression to reveal WTP. Results revealed WTP of Php. 81.54 and Php. 208.00 for local residents and tourists, respectively. The study suggests collection increase of entrance or conservation fee as much as Php. 208.00 from Php. 100.00 to increase the integrated protected area fund (IPAF) for the protection and conservation management of AMWS.

Keywords: ecotourism, willingness-to-pay, contingent valuation method, conservation

Use of Metaheuristics in Solving Land Use Assignment Problem Involving Neighborhood Constraints

Jonah Terese D. Arellano, Prof. Mark Lexter D. De Lara, and Prof. Destiny S. Lutero

BS Applied Mathematics
Institute of Mathematical Sciences and Physics
College of Arts and Science
University of the Philippines Los Baños

Abstract

Land serves several purposes for human betterment. It can be utilized for industrial, residential, agricultural or commercial purposes, depending on the need. Since decision makers may have contrasting needs in their land, the suitability of land uses to neighboring areas is a key factor as well. This serves as a motivation for the land use

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

assignment problem. In this study, a linear integer programming model involving neighborhood constraints was developed. The model aims to solve for the optimal assignment of land uses with weights associated in each use. These problems are large-sized, so various land use classifications and land sizes were used in the study. Metaheuristic techniques were used to find the nearest optimal solution. The techniques are modified versions of Simulated Annealing and a hybrid of Variable Neighborhood Search. The study compared the algorithms based on their efficiency in terms of running time and effectiveness in terms of objective function value and visual output. Specific sites in Cavite, Philippines were used as the parcels of land to test the model and algorithms.

Factors that Affect Employees' Productivity: Basis for Productivity Improvement

By:

Dante V. Ariñez, MBA

Palawan State University, Narra Campus

Narra, Palawan, 5303

Email: arinezd@yahoo.com

Cellphone No.: 0905-3764-297

Abstract

This study aimed to determine the factors that affect the employees' productivity in the Local Government Unit of Brooke's Point. Descriptive-correlational research method was used in this study to determine the relationship between the two variables, productivity and the factors considered in this study. This study utilized all of the one hundred and two (102) employees of the different departments in the Local Government Unit (LGU) of Brooke's Point. The data revealed that almost half of the employees of the Local Government Unit of Brooke's Point turn out to produce a good volume or able to reach at least 120% of their commitments but short of 125% performance, which means that they are productive enough in their own work. All the factors such as training and development, workplace environment, technology advancement and skills, motivation attitude towards work and job satisfaction; have no significant relationship with productivity of the employees when tested at $\alpha = 0.05$ (two-tailed). Therefore, there are sufficient evidence to "accept" the null hypothesis stating that there is no significant relationship between the factors presented and the productivity of the employees. It



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

implies that when the data will be treated individually and not by group, the factors do not affect the productivity of the employees.

Keywords: productivity, training and development, workplace environment, technology advancement and skills, motivation, attitude towards work, and job satisfaction

Gibberellin Application Influence on Growth, Flowering and Steviol Glycoside Accumulation of Tissue Culture-Derived Natural Sweetener (*Stevia rebaudiana* Bertoni)

Catherine C. Arradaza¹, Rocelie R. Zara², Constancio C. de Guzman, Lourdes B. Cardenas, Evalour T. Aspuria and Ma. Lourdes O. Cedo²,

¹Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Visca, Baybay City, Leyte, 6521, Philippines

²Crop Physiology Division, Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna 4031, Philippines
Email: catherine_arradaza@yahoo.com

Abstract

Stevia rebaudiana Bertoni is a good sugar alternative that produces sweet-tasting leaves owing to their steviol glycoside (SG) content, which are about 300 times sweeter than sucrose at their concentration of 4% (w/v). Growth of stevia plants and their SGs production are known to be influenced by external and internal factors. In this study, the effect of exogenous GA₃ application on the growth, flowering and steviol glycoside (stevioside and rebaudioside A) accumulation of tissue culture-derived stevia under Philippine condition was determined. A previously established tissue culture-derived plant was used as mother plants and categorized into two groups: (1) non-flowering (NF) and (2) flowering (F). Stevia stem cuttings were sprayed with GA₃ solutions of various concentrations: 0, 50, 100 and 200 mg L⁻¹ at 1-week interval for 5 weeks. NF plants sprayed with GA₃ showed significant difference in shoot length, number of shoot tips, length of longest primary branches compared to the control. NF plants produced more leaves than F at any GA level but without significant difference. The application of gibberellic acid (GA₃) neither delayed nor inhibits flowering of tissue culture-derived stevia but significantly reduced the flowering intensity of the plant. Exogenously applied GA₃ also did not affect the SG accumulation in the leaves and flowers.

Keywords: tissue culture, Stevia, gibberellin, Steviol glycosides

Viability of Rice Crop Insurance in Los Baños, Laguna Under Changing Temperatures

Alyssah M. Arugay, Patricia Anne V. Quilitis, Diane Carmeliza N. Cuaresma

Institute of Mathematical Sciences and Physics,
College of Arts and Sciences, University of the Philippines Los Baños

Abstract

Rice production is highly sensitive to changes in weather, threatening not only food security in the country but also the livelihood of Filipino farmers. One of the protections against losses brought by weather conditions is by purchasing crop insurance. However, due to increasing risk of rice production, insurance companies may hold back on offering such crop insurance. Hence, this study assessed the viability of offering crop insurance. Daily weather data (rainfall, maximum & minimum temperature, and solar radiation) from 1960 to 2018 was collected from the UPLB National Agrometeorological Station. The collected data was used to forecast rainfall and temperature for the coming years. It was found that there would be no statistically significant increase in temperature in the area. Rice yield was simulated using the forecasted data. Furthermore, rice yield was also simulated given a significant increase in temperature. Using DSSAT v4.7 (Decision Support System Agrotechnology Transfer), it was found that rice yield is expected to decrease by as much as 8.28%. This study can be used by the crop insurance industry to aid in designing insurance so that both parties, the farmers and the insurer, would profit from their business.

Keywords: climate change, temperature, crop insurance, DSSAT

Stochastic Lotka-Volterra Model of Host and Parasite Interaction with Red Queen Dynamics

Allyzsa Eunice O. Avila¹ and Jomar F. Rabajante¹

¹Institute of Mathematical Sciences and Physics, University of the Philippines Los,
Laguna, Philippines
Email: jfrabajante@up.edu.ph

Abstract

Red Queen Dynamics refers to the coevolutionary “arms race” between host and parasite system showing antagonistic relationship (Van Valen, 1973).



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Winnerless coevolution of hosts and parasites characterize by cyclic switching of host phenotypes driven by parasite phenotypes could result to the persistence of Red Queen Dynamics (Anzia & Rabajante, 2018). Due to the nature of the host-parasite system, there are probabilistic factors that needed to be considered in order to come up with a realistic model. The deterministic Lotka-Volterra model is used to come up with three stochastic models. These three models are: (1) Model that deals with the stochasticity of the initial condition of the second host and parasite type (2) Stochastic model with demographic noise and (3) Stochastic model with environmental noise. The results in the first model show that the clone of the host establish faster than the clone of the parasite. The stochastic model with demographic noise shows the extinction of the parasite and host types despite the strength of the stochastic noise (σ_d). The persistence of Red Queen Dynamics is still observed in the stochastic model with environmental noise on the carrying capacity (K) and the basal growth rate of the host (r). While the environmental noise on the death rate of the parasite (d) and the combined three parameters (K, r, d) show that the higher environmental noise (σ_e) can lead to the extinction of the parasites types and the equilibrium number of hosts types is reached by the hosts.

Keywords: red queen dynamics, red queen hypothesis, stochastic model, lotka-volterra model, demographic noise, environmental noise, coevolution, antagonistic host-parasite system.

Innovative Integration of Lettuce (*Lactuca sativa* L.) Production and Tilapia (*Oreochromis niloticus* L.) in Modified Floating Raft Aquaponics System

Barcenas, Getulio Jr. A¹ and Salas, Rosario A.²

¹Instructor, Northwest Samar State University, San Jorge Campus, Samar, Philippines, ²

Associate Professor, Department Head, Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte, Philippines

Abstract

The integrated production of lettuce and tilapia in an aerated and non-aerated modified floating raft aquaponics system applied with formulated foliar supplements were assessed on the morphological characteristics, phytochemical properties of lettuce, growth and yield of the two species. Separate studies that represent the pond with aeration and non-aerated pond were conducted simultaneously. It was set-up in a randomized complete block design with the following supplements as treatments:

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

fermented banana peel, fermented Malunggay and Kangkong leaves, commercial organic fertilizer (Algafer) and fish effluents alone as control. Results showed that provision of aeration and application of formulated foliar supplements improved most of the morphological characteristics (plant height, leaf length, and leaf area), yield (increased fresh weight) and phytochemical properties (chlorophyll *a* and total soluble solids) of lettuce compared to non-aerated pond and fish effluents alone. The growth and yield of tilapia were also enhanced with the provision of aeration (205 g/fish) compared to non-aerated pond (180 g/fish). Results suggest that the provision of aeration and supplementation had significant effects on morphological characteristics, phytochemical properties of lettuce, growth and yield between the two species produced in the integrated production system.

Keywords: aquaponics, innovation, lettuce, morphology, biochemical, fermented foliar fertilizer.

Impact Assessment of Community-Based Sustainable Tourism – Maoyon River Cruise Project

Claudette M. Basaya, Vincent B. Esguerra, and Amparo Leonila F. Esguerra*

Palawan State University

Email: ampyesguerra@gmail.com

Abstract

Community-based sustainable tourism (CBST) was introduced by the City Government of Puerto Princesa in 2012. One of the CBST projects implemented by the City Government is the Maoyon River Cruise Project (MRCP) in barangay Maoyon. This study was conducted to assess the environmental impact and socioeconomic benefits of the MRCP to the local community. Participatory rapid assessment involving focus group discussion and key informant interviews were conducted particularly in determining the Strengths, Weaknesses, Opportunities, and Threats of the project. Secondary data were also used to establish baseline information as well as to determine the gaps. Findings indicated that the CBST-MRCP, which is operated and managed by the local community, has become a major source of employment for its 32 members. As both ecotourism operators and workers, they protect their environment effectively and sustainably. In support to the MRCP, the Sangguniang Barangay of Maoyon issued a resolution banning the activities of slash-and-burn farming in the upstream areas of the river. This project has also raised the environmental awareness among the local residents.

Keywords: community participation, environmental awareness, employment



Alleviation of Drought Stress in Papaya (*Carica papaya* L.) Seedlings by Exogenous Application of Acetic Acid, Potassium Silicate and Salicylic Acid

Nonnatus S. Bautista¹, Lailani A. Masungsong¹, Jose Angel Jude B. Telan², Franz Allen C. Estrella² and Rachel C. Sotto¹

¹ Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, College, Laguna 4030 Philippines

² Graduate School, University of the Philippines Los Baños, College, Laguna 4030 Philippines

Abstract

Drought as an environmental stress can occur at any developmental stage of a crop. This triggers a wide range of metabolic and physiological responses thereby affecting the growth and development in crops that belong to the same or different species. In fruit crops such as papaya, water availability is vital during its early seedling growth because it has not yet established an extensive root system making it susceptible to water deficit. This study was, therefore, carried out to assess the effectiveness of exogenous application of acetic acid, potassium silicate and salicylic acid in alleviating the adverse effects of drought on the early seedling growth stage of papaya. The study was done under greenhouse conditions. Twelve-week-old papaya seedlings were subjected to drought for 17 days. Prior to drought imposition, the plants were pre-treated with different levels of acetic acid (40 mM, 50 mM), potassium silicate (2 ppm) and salicylic acid (0.5 mM, 1.0 mM). The study revealed that in comparison to the non-treated papaya seedlings, the drought-stressed plants supplemented with acetic acid, potassium silicate and salicylic acid showed an improvement in growth and photosynthetic pigments, thus mitigating the inhibitory effects of drought stress.

Keywords: Carica papaya, drought stress, salicylic acid, acetic acid, potassium silicate

Inventory of Oil Producing Herbs in Camotes Islands, Cebu, Philippines

Ian Paul C. Bayon, Chembelyn G. Bayon, Martha Joyce G. Garciano, Israeli S. Caminos, Jonita V. Literatus

Cebu Technological University- San Francisco Campus

Email: ian.bayon@gmail.com

Mobile #:09157392885

Abstract

Plants have a long and rich history of medicinal use and, even in the era of modern medicine, their medicinal properties are still sought after. One example of these plants are the herbs. A lot of people turning to herbs as an alternative way of healing and herbal medicine has been around for centuries. One component of herbs with medical benefits is its oil though not all has this composition. The inventory of herbs in the entire Camotes Islands are classified as endemic or introduced. The abundance was computed, and the local names and local medicinal uses were documented. From the identified herbs, it was found out that 78% has its natural oil. Though the locality does not have the necessary extraction methods but they practiced decoction and infusion in preparing herbal medicines. Some also practiced pressing method in extracting oils from herbs and directly applied to the affected area of the body or take it internally. It was also found out that the locales adapted these techniques of extractions and uses from their experiences and/or ancestral knowledge passed down through generations. Moreover, though the local government units of Camotes Islands are open and supportive to the idea of using oils from herbs for medicinal treatment, none of them did an initiative to scientifically test its efficacy.

Key words: herbs, oil, endemic, introduced, abundance, local uses, local name

Valuation of the Rice Field Crop Damaged by Wildlife in Selected Barangays in Narra, Palawan, Philippines

Gerlie J. Boni, Ed.D¹, Darwin O. Aniar, MAEd², Maybelle V. Dela Pena³, and Kimberly S. Arbelo⁴

Palawan State University Narra Campus

1 Chair of Instruction for Social, Physical and Applied Sciences

2 Chair of Instruction for Business Programs

3 4 BA Political Science Students

Abstract

The study utilized the descriptive method of research at casting light on current issues through a process of data collection that enabled to describe the situation more completely. The study focused on determining the damaged caused by wildlife to rice field crops. Five hundred twelve (512) randomly selected farmers were the respondents of the study which was conducted in four barangays of Narra, Palawan namely Poblacion,



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Panacan 1, Panacan 2 and Malinao. Data were processed using frequency, percentage and mean. The study revealed that the average age of the respondents is 43.43; majority are male; most are married who have finished high school. Most of them are farming for less than 25 the field they own. The average size of the farm is 3.86 hectares. It was identified that generally chestnut munia was identified by 64.45% of the farmers while rodent rat caused damaged the crops according to 31.64%. The study had also found out that black bug caused damaged to the crops. These wildlife attack the crops mainly during the first quarter. It was found out that P16, 560,120 worth of crops were damaged by wildlife during the period of the study. Wildlife affect the rice field crops and it is recommended that a more intensified training on pest control by the local agriculture department in partnership with farmers association.

Keywords: rice crop fields, wildlife, narra. damage

**Development of Division Contextualized Curriculum Matrix (DCCM)
and Division Contextualized Learning Resources (DCLR) for Batak Tribe
Learners in Schools Division of Puerto Princesa City**

Ronald S. Brillantes, MAED, Cyril C. Serador, Ph.D, Redempto A. Cervantes, Ph.D
Deped School Division of Puerto Princesa City

Abstract

Congruity of the curriculum is considered as one of the most vital concerns in the basic education today, and through contextualization it allows schools to localize, indigenize and enhance the curriculum based on their respective educational and social context. This qualitative study is focused on the development of Division Contextualized Curriculum Matrix (DCCM) and Division Contextualized Learning Resources (DCLR) for Batak learners. Ethnographic approach was used to describe Batak's cultural belief system, customs, and practices through structured interview, observation, focused group discussion, cultural mapping template, and localization and indigenization matrix. Results showed that the Batak tribe has a unique and rich in cultural beliefs, customs, and traditions. These were classified and introduced in the localization and indigenization matrix as bases for developing contextualized curriculum and learning resources. Five (5) Division Contextualized Curriculum Matrix (DCCM) and five (5) Division Contextualized Learning Resources (DCLRs) were made. Further, it was revealed that Batak tribe *Surugiden*/chieftains and parents believed that their culture can still be preserved from culture disintegration. These are encapsulated under the following themes: integrate

through teaching using their dialect or mother tongue, incorporate to the lessons, and teach learners to love their culture with the help of the parents. Thus, the development of the Division Contextualized Curriculum Matrix (DCCM) and Division Contextualized Learning Resources (DCLR) will be of great help and excellent avenue to introduce to learners' local culture and traditions of the community where they belong. In this way, this would help them preserve their disintegrating culture.

Influence of Organic - Inorganic Fertilizer on Postharvest Quality of Jackfruit (*Artocarpus heterophyllus*) Eviarc Sweet

Rosalia L. Briones¹ and Dario P. Lina

¹Department of Agriculture and Related Programs
Northwest Samar State University, San Jorge Campus

Brgy. Erenas, San Jorge, Samar

²Departmento of Horticulture

Visayas State University

Visca, Baybay City, Leyte

Email: rosaliabriones@yahoo.com

Mobile #:09051960750

Abstract

The study was conducted to determine the effects of inorganic and organic fertilizer application on the physico-chemical and sensory acceptability of jackfruit and to identify which nutrient management scheme will give the best postharvest quality. One hundred forty-day old fruits were harvested from Fran Farm in Brgy. Casilda, Merida, Leyte and allowed to ripen at ambient condition for 5 days. Application of organic and inorganic fertilizer significantly influenced the pulp width, pulp circumference and core width of jackfruit. Inorganic fertilizer (T1) gave bigger pulp circumference (11.38 cm), longest pulp length (7.13 cm) and highest number of pulp per fruit (138.75). The color a (redness/blueness) and b (yellowness) values, pH, total soluble solids (TSS), percent Titratable acidity (%TA), vitamin C and juice yield were significantly affected by the application of organic and inorganic fertilizer. The b* values indicate the yellowness of the fresh-cut jackfruit pulp. It was observed that T1 and T2 have observable lower +b* than those without fertilizer application as indicated by lower intensity of yellow color. Sensorial analyses on color, aroma, sweetness, firmness, flavor and juiciness were not significantly influenced by fertilizer application. The two nutrient management schemes revealed a comparable general acceptability of jackfruit.

Keywords: jackfruit, organic, inorganic, TSS, pH



Curating a sustainable adaptive reuse of Bahay Nakpil Bautista heritage house in Quiapo: Basis for developing indices for historic spaces in the Philippines

Mary Ann Venturina Bulanadi, Arlen Ancheta, PhD
Graduate School, University of Santo Tomas

Abstract

The rising number of heritage houses being transformed with a new function require the services of interior designers. The adaptive reuse of the interiors of heritage houses require broader knowledge, standardized processes, and proper cultural heritage training in order to develop a holistic design and heritage plan. This can be achieved through an ethnographic study that explores the curation of historic interior spaces through adaptive reuse. These will be developed into sustainable socio-cultural indices that will aid designers in the development of their design. The study utilizes a case study of Bahay Nakpil-Bautista in Quiapo as a framework for determining the historical transect and analyzing the socio-cultural sustainability of adaptive re-use within the local sustainability. On the primary level, this involved a thorough review of literature juxtaposed against fieldwork, observation, and secondary data analysis. This data was then supplemented by interviews and focus group discussion. The resulting analysis and results informed the development of indices for the systematic and holistic design of historic interior design spaces.

Keywords: historic interior spaces, sustainability, interior design, curation

Acceptability of Adlaia as Coffee and Tea Beverages in Banaue, Ifugao

¹Joan N. Batton, ²Marissa P. Bulong, Ph.D.

¹, ISMTP trainee from Banaue, Ifugao, Philippines, ²Faculty member at Ifugao State University, Nayan, Lamut, Ifugao, Philippines

Abstract

Humans depend on a healthy natural environment for their wealth and wellbeing. Nature delivers various valuable goods that would benefit man like the wild Adlai (*Coix lacryma – jobi* L.) which has many uses. This Ifugao Satoyama Meister Training Program

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

study aimed to explore the possibility of developing coffee and tea beverages out of wild Adlai and to determine the acceptability of Adlai coffee and Adlai tea. The Adlai beans were utilized for coffee beverage while the Adlai husks were processed into Adlai tea beverage. One tablespoon processed Adlai coffee was steeped with 250 ml of water (175⁰ C water temperature). Likewise, one tablespoon processed Adlai tea was steeped with 250 ml of water (175⁰ C water temperature). The two beverages were subjected to sensory evaluation by experts, where the following parameters were evaluated: color, aroma, taste and general acceptability. Complete Randomized Design with three replications was used in the study which revealed that color and taste have significant differences. Adlai coffee has a brown color while Adlai tea is light brown in color. In terms of taste, Adlai coffee is more stimulating. It is highly recommended that both products be tested for their nutrient contents and be properly packaged.

Keywords: Adlai beans, Adlai husks, sensory evaluation, color, taste.

Suitability Analysis for Sanitary Landfill Site in Province of Ifugao, Philippines

Joseph J. Buncag, MSc^{1,2} and Lea Mari Santos²

¹Faculty, Palawan State University San Vicente Campus

²Ph.D in Environmental Science Student, SESAM, University of the Philippines Los Baños (UPLB)

Abstract

Solid wastes generation is an alarming contemporary environmental issue. As part of national strategies in solid wastes management as stipulated in RA 9003 otherwise known as the Ecological Solid Wastes Management Act of 2001 is the establishment of sanitary landfills by the local government units. This study aims to assess and identify key suitable sites in the province of Ifugao in accordance with the sanitary landfill siting area requirement and generate sanitary landfill suitability map. This study utilized weighted overlay analysis of required maps based on landfill siting area requirement using ArcMap GIS software licensed to UPLB. Based from the generated sanitary landfill suitability map, there are areas fall on restricted, low, moderate, high and very high suitability for sanitary landfill site in which large areas of Ifugao province fall on restricted zone. Only three municipalities have land areas that fall under the category of very high suitability, namely Alfonso Lista (1,287 ha), Aguinaldo (9 ha), and Hungduan (2 ha). Municipality of Alfonso



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Lista has the largest area fall on high suitability. Also, the top three municipalities in terms of land area under high suitability are Alfonso Lista (14, 232 ha), Aguinaldo (11, 907 ha), and Lagawe (5, 817 ha).

Keywords: sanitary landfill suitability map and sanitary landfill siting area requirement

Growth and Yield Response of Cabbage (*Brassica oleracea* var. *capitata* L.) Grown with Different Soil Amendments

Merlyn Guzman-Buscato

Silliman University College of Agriculture
Dumaguete City

Abstract

Soil amendments utilized any materials that could improved the condition of the soil which supports plant growth indirectly. Thus, the growth performance of cabbage, *Brassica oleracea* var. *capitata* L., was tested using different soil amendments as treatments with garden soil as control. Each were distributed following the Completely Randomized Design (CRD) in 4 replicates. Each treatment was composed of 16 plants in a potted experiment. The effect of the different soil amendments was measured in terms of plant height, leaves produce, leaf area, stem circumference, root length and width, root weight, head circumference, and head weight. Result showed that cabbage plants grown with eggshell as soil amendment manifested the highest means specifically on the leaf area (389.63 cm²), root weight (191.99 g), total herbage yield (762.69 g), and head weight (221.10 g) of cabbage plants. Henceforth, the use of eggshell as soil amendment is ideal for plant growth.

Keywords: soil amendments, yield, growth, cabbage, and brassica oleracea

Forest Conservation and Management of Mount: The Kapampangans's Way

Reynante G. Bustillos¹, John Crisver M. Viesca¹ and Jericho F. Miranda¹

¹Nueva Ecija University of Science and Technology

Abstract

Mount Arayat is an inactive stratovolcano located in the plains of Central Luzon, Philippines. It stands firmly with a height of 1,026 meters (3,366 ft). The mountain is one of the most popular hiking sites in Luzon and its forest has been known for having rich biodiversity. The study sought to determine the different flora and fauna species that can be found in the area including the impacts of human activities in the degradation of the forest ecosystem of Mt. Arayat. It also seeks to determine the conservation and management efforts being implemented through the involvement of local people together with the Local Government Units (LGUs), Non-Government Organizations (NGOs) and Indigenous People (Aetas). Various interviews and gathering of information within those who are involved in the conservation and management were made in order to identify the different activities and practices intended for the conservation of forest. Checklists were also used to identify the level of impacts of the different sources of environmental degradation in Mt. Arayat. Results revealed that Mt. Arayat hosted more than 160 species of plants and animals. Moreover, the obtained results exposed the different human activities such as illegal logging and quarrying which has the greatest impacts in terms of degradation of forest ecosystem. Thus, the Department of Environment and Natural Resources together with different LGU's, NGO's, local community and Indigenous people (Aetas), work simultaneously in the conservation of the Mt. Arayat forest ecosystem.

Keywords: Mt. Arayat, forest conservation, flora, fauna

Responses of macro propagated *Ficus ulmifolia* Lam. to nutrient supply and drought stress: potential basis for Karst reforestation program

^{1,2}Maria Luisa N. Cabrera, ²Nelson M. Pampolina

Science Department, College of Natural Sciences and Mathematics

Mindanao State University, General Santos City

Department of Forest Biological Sciences, College of Forestry and Natural Resources,
University of the Philippines Los Baños, College, Laguna



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Abstract

Identifying site-specific species for a successful reforestation program requires an understanding of the physiological and morpho-anatomical responses of plants. In order to examine the suitability of *Ficus ulmifolia* to a karst environment, cuttings were grown using hydroponic technique exposed to varying nutrient availability (10, 50 and 100 % of Hoagland's solution), and water availability (drought stressed and regularly watered conditions) for 95 days. Total leaf area is higher on N100>N50>N10 with a trend showing a linear increase over time in all nutrient concentration. Ficus have shown high NPK content on its early development. N and P uptake is higher in N100 and N10 while P uptake is higher in N50. Responses of ficus to nutrient availability shows them to be plastic and adapted to these varying condition. However, water condition was a limiting factor for its survival.

Keywords: leaf biomass, ecophysiology, karst, plant responses, reforestation

**Evaluation of Different Cropping Systems for Marginal Uplands in
Barangay Caticugan, Sta. Rita, Samar, Philippines**

**Ulysses A. Cagasan, Ed Allan L. Alcober, Mark Gil B. Gerona and
Gretchen Mae M. Prado**

Department of Agronomy, Visayas State University, Visca, Baybay City, Leyte

Abstract

To help improve the lives of upland farmers in Barangay Caticugan, Sta. Rita, Samar, there is a need to find ways to increase crop production and income. This study aimed to determine cropping systems that improve crop productivity, increase income and promote cropping systems technology to upland farmers in Barangay Caticugan, Sta Rita, Samar. The experimental units were arranged in Randomized Complete Block Design with three replications. The cropping systems tested were monocropping on corn, peanut and mungbean and intercropping corn + peanut and corn + mungbean. The growth and yield characteristics of all crops under study were not significantly ($p < 0.05$) affected by the cropping systems. Fresh herbage yield (tha^{-1}) and total yield (tha^{-1}) in all crops (corn, peanut and mungbean) and harvest index of peanut were significantly affected by the treatments. On the other hand, corn + mungbean gave a land equivalent ratio (LER) of 1.16, which means that such practice is more productive than growing corn or mungbean as monocrop. Likewise, corn + peanut have an LER value of 1.20 which means corn +

peanut intercropping system is more advantageous over monocropping.

Keywords: Cropping systems, growth and yield, land equivalent ratio (LER), productivity

Assessment on the Performance of Different Varieties of Pole Sitao Under Regional Field Trial

Reyna Mae Caintic¹, Rosario A. Salas²

¹Research Assistant, Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Baybay City, Leyte ²Associate Professor, Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Baybay City, Leyte

Emails: rasalas_horti@yahoo.com; reynamaecaintic@yahoo.com

Abstract

This study was conducted to assess the performance of nine pole sitao lines with NSIC PS 4 (check var), in terms of horticultural characteristics, yield, insect pest and disease resistance for two dry and wet seasons from cropping year 2017-2018. The experiment was laid out in randomized complete block design with ten treatments replicated three times. The different lines had generally better performance during the dry season as manifested by the shorter days to first harvest and longer days to last harvest, longer pods, greater and heavier weight of marketable pods and total yield. Line CPS sel # 2 out yielded the check entries both for dry and wet season, Moreover CPS Sel. #1 has comparable effect with the check entry in terms of weight of pods kg/plot and total yields tons/ha during wet season but higher yield during dry season. There was only a mild infestation of aphids and pod borer and no infection of fusarium and mosaic virus for all the entries.

Keywords: vegetable, yield, insect resistance, disease resistance, shelf life



Disaster Risk Reduction and the Science Curriculum of the Philippine Basic Education Program

Ian Phil Canlas^{ab}; Mageswary Karpudewan^a

^a School of Arts and Sciences, University of Central Asia – Naryn Campus, Kyrgyz Republic

^b School of Educational Studies, Universiti Sains Malaysia, Penang Island, Malaysia

Abstract

Functional level of scientific literacy maybe an indicator of a successful disaster risk reduction and a successful disaster risk reduction maybe an indicator of a successful science education. This study explored the link between disaster risk reduction and science education. Using the document analysis design and having the guidelines of integrating disaster risk reduction into school curricula from UNESCO and UNICEF, it attempted to determine the disaster risk reduction-related content standards and learning competencies from the science curriculum of the Philippine basic education programme of the Department of Education. Building from the findings obtained through content and thematic analysis of relevant documents reviewed, generic science education disaster risk reduction learning outcomes was proposed. All of which were reported in this study.

Keywords: disaster risk reduction; science curriculum; scientific literacy; Department of Education; UNESCO; UNICEF

Environmental Health Safety Awareness and Practices of Small and Medium Enterprises in the Tourism Industry in Puerto Princesa City

Harthwell C. Capistrano,

Master of Science in Environmental Management,

Palawan State University, April 2019

Corresponding Author: Dr. Ramon M. Docto

Abstract

The study intended to identify the level of awareness and practices of small medium enterprises (SMEs) in the tourism industry in Puerto Princesa City. Respondents of the study were all the 17 managers of hotels duly accredited by the Department of Tourism Region IV- B Office. Participants answered a survey form containing statements

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

that determined their level of awareness and practices on environmental health and safety requirements. It was determined that SMEs in the tourism industry in Puerto Princesa City have high level of awareness and practices based on selected environmental health and safety. Furthermore, based on the results of the Chi Square tests between the respondents' awareness and level of practice of environmental health and safety, it was observed that significant relationships exist. An exception to this observation was reflected in the awareness and level of practice of environmental and occupational safety training. In particular, research findings indicated that the practice of tourism SME managers of most environmental health and safety areas was significantly dependent on their awareness levels of standards. Results of the study also showed that age and educational level of the respondents do not have a significant relationship with their awareness of environmental health and safety. Gender proved to be influential to the awareness of the respondents. Those with membership on environmental health and safety organizations proved also to be more aware on Chemical Handling, PPE & Industrial Hygiene. Moreover, exposure to relevant trainings was also associated to higher awareness on Chemical Handling, PPE & Industrial Hygiene as well as environmental health hazards and control. Business establishments must ensure that they fully comply with the laws, regulations and programs required of them by the government agencies to avoid accidents and incidents in their respective workplaces, promoting health and safety of the workers.

Groundwater Potential Mapping in Cebu Island Using Remote Sensing and Weighted Overlay Analysis

Florwilyn C. Cayson¹, Chito L. Patiño¹, and Mary Joyce L. Flores²

¹ University of the Philippines Cebu Center for Environmental Informatics, Lahug, Cebu City, 6000, Philippines,

² University of the Philippines Cebu, Lahug, Cebu City, 6000, Philippines
Email: fccayson@up.edu.ph

Abstract

The increasing demand for freshwater over time and the emergence of drought in the province of Cebu call for the need to immediately locate possible areas with groundwater. The study aims to delineate the groundwater potential zones of Cebu island with the use of Remote Sensing and Geographic Information System (GIS). Various thematic maps such as geomorphology, geology, soil, rainfall, land use, lineament density, and drainage density were collected and prepared along with their assigned weights for the derivation of the groundwater potential zones. The thematic maps were integrated



using weighted overlay analysis. The groundwater potential zones derived from the analysis were classified into very high, high, moderate, and low potential. The map was validated by overlaying the locations of wells. It was observed that 44% of the existing wells were located in the very high potential zones, 36% were on the high potential, 15% were on the moderate potential, and 5 percent were on the low potential zones. The integration of subsurface information for the mapping of groundwater potential zones can help the future development of groundwater utilization processes in a time and cost-effective way for the freshwater needs of Cebu island.

Keywords: groundwater potential, GIS, remote sensing

Alleviation of Waterlogging Stress in Onion (*Allium cepa*) By Exogenous Application of Fish Amino Acid Fertilizer, Acetylsalicylic Acid and Potassium Silicate

Arnel B. Celestino¹ and Rachel C. Sotto²

¹Graduate School, University of the Philippines Los Baños, College, Laguna, Philippines

²Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Banos, College, Laguna, Philippines

Abstract

Onion is one of the high valued but seasonal vegetable crops in the Philippines. Due to climate change, flooding as a consequence of typhoons during the planting season is a major constraint in onion production. This study was, therefore, conducted to determine the effects of waterlogging on the morphological and physiological characters at three growth stages of red onion and to recommend potential treatments to alleviate the adverse effects of waterlogging. Among the treatments, application of Fish Amino Acid fertilizer (FAA) attained the highest chlorophyll content, fresh weight and shoot length. Pretreatment of Acetylsalicylic Acid (ASA) and Potassium Silicate (KSIO) also showed significantly higher chlorophyll content, fresh weight, shoot length and reduction in membrane leakage than the waterlogged control. Moreover, the bulb swelling stage was considered the most waterlogging tolerant growth stage while the late vegetative stage and bulb initiation stage were susceptible to waterlogging. The results of this study suggest that exogenous application of fish amino acid fertilizer, acetylsalicylic acid and potassium silicate were effective in mitigating the negative effects of flood stress in onion.

Keywords: Allium cepa; waterlogging; fish amino acid fertilizer; salicylic acid; potassium silicate

Evaluation of Different Plant Extracts against Stripe Flea Beetle of Pechay Grown Under Field Condition

Daisy S. Capon and Dr. Marilyn G. Patricio

Visayas State University-Villaba, Leyte, Philippines and Central Luzon State University,
Science City of Muñoz, Nueva Ecija, Philippines

Abstract

Now a days crop production will not sustained without continuous application of synthetic pesticides. However, frequent and mistake use of this pesticides can result to changes of insects pest behavior, dispersal, development, fecundity which indicating resurgence and replacement. Farmers and growers are switching to a pesticide that is safer to the natural enemies or switching to a pesticide with different mode of action. They commonly integrate the new control techniques into their operations like using of plant organic compounds in controlling population of insect pests. The use of botanical pesticide is currently gaining an interest as a cheap and safe alternative to conventional pesticide. This study aimed to assess the percent incidence and damage severity of stripe flea beetle and to determine the yield of pechay in response to different formulated plant extracts. Different formulated plant extracts were sprayed to pechay at weekly interval until harvest. The data gathered were the population of the stripe flea beetle, severity of damage and yield of pechay. The different plant extracts had a significant effect on the population of the stripe flea beetle and percent damage. However, it was found out that pechay sprayed with turmeric extract has the lowest population of stripe flea beetle and lowest percentage of leaf damage compared to other plant extracts followed by organic herbal nutrient (OHN). Highest number and weight of marketable plants were harvested from plants sprayed with turmeric extract and synthetic pesticides. Results of this study indicate that turmeric extract and OHN were effective in controlling stripe flea beetle and could be useful as an alternative to synthetic pesticides.

Keywords: plant extract, pechay, stripe flea beetle, synthetic pesticides



Gonadal development of the flatribbed scallop *Decatopecten radula radula* (Linnaeus 1758)

Joezen D. Corrales¹ and Anthony S. Ilano²

1 Cebu Normal University and 2 University of San Carlos

Abstract

The gonad development of the flat-ribbed scallop *Decatopecten radula radula* (Linnaeus, 1758) in Calituban Island, Talibon, Central Philippines was investigated on a one-year period to determine the species spawning season for proper management of its fishery. Monthly samples were collected from catches of fisherfolks and the gonadal development stages were determined to gain understanding on its spawning pattern and reproductive strategies. Results revealed that *D. radula radula* is a dioecious species but with some cases of hermaphroditism with the female gametes dominant over male gametes. There were five gonadal stages identified and the species had a protracted reproductive strategy. Peak spawning months were May to August with a minor peak in October. Regulation on its fishery should be implemented during these spawning months in May, August and October for proper stock management and conservation of the species.

Keywords: Decatopecten radula radula, flat-ribbed scallops, gonad development

Diversity, Microhabitat Preferences and Socio-economic Importance of Reptilian Fauna in Andanan Watershed Forest Reserve, Caraga Region, Philippines

Jerry T. Cuadrado^{1*} and Eve Fernandez-Gamalinda²

¹Bayugan National Comprehensive High School-Science, Technology, Engineering and Mathematics, Bayugan City, 8502 Caraga, Philippines

²Biology Department, Caraga State University, Ampayon Butuan City, 8600 Caraga, Philippines

Email: jerry_cuadrado@ymail.com

Abstract

This study was carried out to assess the diversity and microhabitat preferences of reptilian fauna in Andanan Watershed Forest Reserve, Caraga, Philippines employing the

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

transect walk and extensive opportunistic sampling method. Environmental variables were gathered, and the association of reptiles between these variables was performed using Canonical Correspondence Analysis. The socio-economic importance of reptiles was also assessed through key informant interviews. A total of 216 individuals of reptiles belonging to nine families, 23 genera and 27 species were recorded, of which 77.77% are considered least concern species. Eighteen significant record of Philippine and Mindanao endemics were also accounted in the area. Species richness was highest in Brgy. San Juan ($S=19$), and high species abundance was recorded in Brgy. Calaitan ($N=73$). Moreover, nine environmental variables were strongly associated with the abundance of reptiles. The reptilian fauna utilized aquatic, arboreal, and terrestrial microhabitat types and highly preferred forest habitats. However, reptiles are threatened not only because they are consumed, sold and used in traditional medicine, the destruction and degradation of the habitats in the area also elevated the threats to reptilian faunal diversity. Monitoring, as well as protection and conservation of the forests of the Andanan Watershed are essential to safeguard the reptiles and other biodiversity of the watershed.

Keywords: microhabitat, Philippine endemic, threats

A Methodology for Developing a Weather Index-Based Insurance Using Game Theory

Diane Carmeliza N. Cuaresma, Mark Ryan N. Zamora

Institute of Mathematical Sciences and Physics,
College of Arts and Sciences, University of the Philippines Los Baños

Abstract

Weather index-based crop insurance (WIBI) has recently caught the interest of policymakers and insurers as a mean to safeguard the livelihood of the farmers. However, as this product is relatively new to the country, premium rate determination and threshold level setting is still underway. Thus, this study aimed to give a methodology on how to develop a low rainfall index-based insurance for rice using Game Theory. Expected utilities, which are assumed to follow a logarithmic function for the farmers and a linear function for insurer, of purchasing a WIBI under a specified premium and threshold level were used as the pay-offs. The model was illustrated for the province of Laguna. It was found that there was no pure strategy equilibrium and the mixed strategy equilibrium yields a range of premium. This study further assessed the viability of the WIBI with regard to its threshold level. Because of climate change, threshold levels cannot be constant.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Rainfall data from year 1960 to 2017 were obtained from UPLB National Agrometeorological Station and rice yield was simulated under different rainfall conditions for Los Baños, Laguna. Results showed that increasing or decreasing rainfall affects rice yield and would therefore affect the viability of WIBI.

Keywords: weather index-based insurance, crop insurance, climate change, game theory

Use of Choice Modelling in Establishing Payments for the Recreational Ecosystem Service of Mount Macolod in Batangas, Philippines

Christian B. Cuevas¹, Rico C. Ancog¹

¹School of Environmental Science and Management, University of the Philippines Los Baños

Abstract

Mount Macolod in the town of Cuenca, Batangas is a mountain ecosystem that benefits tourists through its recreational ecosystem service – a non-market good. It is usually embodied in the sceneries, challenging trails, and the natural environment. In 2017, it was visited by 29,619 individuals for its scenic views at its famed Rockies, Summit, and Grotto. This study measured the benefits from the recreational ecosystem service of Mount Macolod using Choice Experiments (CE) with trail condition, guide to tourist ratio, camping regulation, and cleanliness and orderliness. With the increasing demand especially from weekend and summer season tourists from nearby towns and Metro Manila area, the need for a concrete policy balancing environmental and economic priorities in the area is warranted to ensure its sustainability. Hence, ecotourism management was identified as an intervention that connects the goal of conserving the natural environment and promoting local livelihood opportunities. This study further confirms that the respondents' valuation for Mount Macolod is positive when ecotourism management is implemented and the establishment of a payment for ecosystem service (PES) in the form of an Environmental User's Fee was recommended to regulate tourists' access and as a funding source for the ecotourism management for the mountain ecosystem.

Keywords: choice experiments, non-market good, mountain ecosystem, ecotourism, payment for ecosystem service

Yield Increase of Sweet Pepper (*Capsicum annuum* L.) Through Interspecific Grafting

Malvin B. Datan and Zenaida C. Gonzaga

Department of Horticulture
College of Agriculture and Food Science
Visayas State University
ViSCA, Baybay City, Leyte, 6521-A

Abstract

Sweet pepper (*Capsicum annuum* L.) is one of the highly remunerative vegetable crops in the Philippines. However, its production is hindered by insect pests and diseases, particularly bacterial wilt, which can impede the plant in attaining normal growth and development. This study was conducted to evaluate the effect of grafting on the growth and yield of sweet pepper, compare the bacterial wilt incidence between grafted and non-grafted plants, and to perform a cost and return analysis on the production of grafted and non-grafted sweet peppers. It was conducted in a single factor experiment arranged in randomized complete block design with six (6) treatments namely: control (non-grafted Emperor), grafted Emperor, Red Crest, Kayem, Green hornet, and Sultan. Grafted plants were observed to have enhanced flowering and yield than the non-grafted. Survival rate and bacterial wilt incidence of the control and grafted treatments are similar except the Red Crest due to incompatibility. Additionally, both the weight and number of marketable fruits and total yield were enhanced by grafting wherein overall yield was three times greater compared to control. On the other hand, even though grafting incurred higher production costs, it showed higher net return compared to the non-grafted treatment.

Keywords: Ralstonia solanacearum, scion, grafting clips, cleft grafting, grafting chamber, BPI-HP-001

Identification and Quantification of Microplastics in Philippine Cupped Oyster

(*Crassostrea Iredalei*, Faustino 1932) From Cañacao Bay, Cavite City

**Elselear L. De Leon¹, Gabriel R. Salva¹, Danica Kayla T. Santos¹, Daniel E. Segovia¹,
Raynar Joseph Uybarreta² and Steve P. Obanan^{1,3}**

¹Department of Natural Sciences, College of Arts and Sciences,
University of the East, CM. Recto Ave., Manila

²Senior High School Department, University of the East, C.M. Recto Ave., Manila



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

³School of Environmental Science and Management, University of the Philippines,
Los Baños, College, Laguna

Abstract

Microplastics are plastic particles that measure less than 5mm and pollute the marine environment and aquaculture areas. Microplastics pose risk on human health due to their capacity to adsorb heavy metals and retention in various trophic levels. This research aims to identify and quantify the microplastics present in Philippine cupped oyster (*Crassostrea iredalei*) in Cañacao Bay, Cavite City, Southern Luzon, Philippines. The oyster shell lengths and widths were measured using Vernier caliper. The total shell and meat weights were also measured using an analytical balance. The extracted soft tissues of the samples were digested using 10% Potassium Hydroxide (KOH) for 24 hours at 60°C. The solutions were filtered using Whatman Grade 1 Quantitative Filter Paper (pore size: 11 micron). Microplastics were photographed, identified, and characterized using a stereomicroscope. Eight hundred twenty-seven (827) microplastics were collected and identified; 817 were classified as microfibers and 10 were fragments. Microbeads and microfoams were not found in the collected samples. Sources of the microplastics may be from the domestic sewage and fishing activities of the community near the sampling area. No significant relationship between the shell length, width and weights with the number of microplastic present ($p>0.05$). Results indicate that microplastics can be assimilated by the oyster regardless of their sizes and weights. This study confirmed the presence of microplastics in Philippine oysters and important management strategies are recommended to reduce or prevent the microplastic inputs in the marine ecosystem and trophic levels.

Keywords: microplastics, Crassostrea iredalei, oyster

**Increasing Community Awareness and Resilience Enhancement (ICARE):
An Empowering Tool for Enhancing Resiliency Among Lakeshore Fishing
Communities**

**Miriam R. Nguyen, Samantha Geraldine G. De los Santos,
Maria Francesca O. Tan, Francisca O. Tan, and Roxanne A. Banalo**
College of Public Affairs and Development,
University of the Philippines Los Baños
Email: sgdelossantos@up.edu.ph

Abstract

Small scale fishers in the Philippines have become increasingly marginalized. Their sector is burdened by depletion of resources, population pressure, pollution among others, coupled with the challenge of climate change. Through participatory action research, the Increasing Community Awareness and Resilience Enhancement (ICARE) tool was developed to capacitate fisherfolks as well as enable them to collaborate on strategies to improve community resilience. ICARE is a mix of activities involving four steps: (1) Awareness Raising of Communities (ARCs) on Climate Change Effects and Adaptation and Resilience Practices and Strategies (ARPS); (2) Participatory Community Resilience Action Planning (PCRAP) training-workshop for Climate Change Effects; (3) Advocacy and Communication Activities Towards Climate Change Resilience (ACT-CCR); and (4) Stakeholders' Forum on Lakeshore Fishing Communities and Climate Change. These chosen activities were carried out at the barangay, municipal and provincial levels in five major lakes in Luzon. Pre- and post-training assessments were undertaken to determine the change in knowledge levels of participants and effectiveness of each activity. ICARE resulted in collaboration of fishing communities, local governments and other agencies in creating action plans and strategies. ICARE can be used to enhance campaigns on climate change in achieving climate action goals towards sustainable development.

Keywords: resilience, climate change, fisherfolks, lakeshore, development

Think Green: Perspective of School Administrators of Mangaldan National High School towards Solid Waste Management

Analyn I. Diola, Jeffrey O. Ballesteros, Flordiliza B. Dalumay, Ian Jones Dela Cruz

Mangaldan National High School School Division of Pangasinan II,

Don Eufemio F. Eriguel Memorial National High School

School Division of La Union,

Don Mariano Marcos Memorial State University

South La Union Campus

Abstract

This is a Narrative Research on the perspective of the principal and department heads of the largest school in Region 1- Mangaldan National High School. The purpose of this study is the describe and understand their perception in terms of amount of waste generated; reduction of solid waste generation; solid waste management practices



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

(segregation, collection and disposal); their experiences; programs and statuses of each; responsibility of managing solid waste and future collaborations with the LGU. Interviews were conducted among the school administrators (Principal and 10 Department Heads). Verbatim transcriptions and narrative description was used to analyze the results of the study. Based on the results of the study, the following are implied: 1) the school administrators are aware of the huge amount of solid waste generated in the school; 2) the Principal wish to comply with the existing laws and policies; 3) waste reduction is being taught but not observed; 4) The current solid waste management includes designated waste bins for recyclables, biodegradable and non-biodegradable but not used properly, the trash were collected by janitors and they separate the plastic bottles to be sold, and residuals are dump at the open pit at the back of the school; 5) there are existing programs and policies in the school but most of them are not sustained and implemented for short period only. Further, there must be a change in attitude and mindset towards solid waste management. Thus, solid waste is everybody's responsibility. There is a need for students' values transformation and discipline. Political will among school administrators, since they have the "call" to sustain or abolish solid waste policies and programs. Also shared responsibility among students, teachers, non-teaching staff, department heads and principal must be realized. Likewise, the school Administrators has the desire to improve the solid waste management practices. There are plans to construct and operate a Material Recovery Facility (MRF), composting facility, organic garden and renew linkages with the local government unit.

Keywords: solid waste management, school administrators perspective on solid waste, solid waste management practices

PUJ Drivers' Compliance to Anti-Smoking Ordinance in Zamboanga City Philippines: A Cross Sectional Study

Dolores O. San Juan

Zamboanga City State Polytechnic College

Email:dolly_olaso@yahoo.com

Abstract

The City Ordinance 469 or also known as Ordinance Regulating Smoking in the City of Zamboanga has been promulgated on January 2018. This ordinance prohibits smoking in all enclosed places that are open to the general public and in public conveyances such as the public utility jeepneys. However, current observation on the compliance of jeepney

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

drivers with the anti-smoking ordinance is lax. Hence, study intends to determine the status of compliance to the anti-smoking ordinance among public utility jeepney drivers in the districts of Zamboanga City. A cross-sectional survey was conducted using questionnaire and observation methods of collecting data. Observation was done during the peak hour's operation of the public utility jeepneys to identify potential and/or actual violations as per the compliance guide. The study revealed that none of the drivers did ever receive a penalty for noncompliance. Heavy smoking, allowing passengers to smoke and deviating from prescribed size of signage predicted noncompliance. Strengthening policies and their implementation are highly encouraged. This study clearly demonstrates that a poorly-enforced anti-smoking ordinance is vulnerable to breaches, and highlights the need for clear and strong policies.

Keywords: anti-smoking ordinance, compliance, enforcement, cigarette, e-cigarette, and jeepney.

Relationship Between Demographic Factors, Knowledge, Attitude, and Behavior of Filipino Senior High School Students Towards the Agriculture Profession

J.P. Echavez¹, A. Bulfa², and JE. Cubelo³

¹BSA student, College of Agriculture, Silliman University, Dumaguete City 6200, Philippines

^{2,3} Faculty Members, College of Agriculture, Silliman University, Dumaguete City 6200, Philippines

Email: paolo.echavez@gmail.com

Abstract

A downtrend in the number of enrollees in the Agriculture, Forestry and Natural Resources (AFNR) courses has been observed. This raises concern as the average age of the Filipino farmer is 57. The industry will be experiencing a significant lack in manpower due to retiring farmers. Perhaps the youth have misconceptions regarding agriculture which lead to a negative perception towards the industry. These may be brought about by a student's income level and his/her own exposure to agriculture which in turn affects his/her knowledge, attitude and behavior towards agriculture. This study aims to determine the interrelationships of these different factors. A shareable online survey was created to accomplish the objective. The survey contains four sections: demographics, knowledge, attitude, and behavior. The data from the survey was consolidated and treated with a chi-square test for independence, and linear regression analysis.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Knowledge and attitude towards agriculture are the only two variables that were found to be significantly related. According to the regression analyses: income did not significantly affect other variables. On the other hand, a higher level of exposure to agriculture correlated with more knowledge, better attitude and behavior; and a higher level of knowledge correlated with better attitude and behavior towards agriculture.

Keywords: knowledge, attitude, behavior towards agriculture

Payment for Ecosystem Services for the Conservation of Agusan Marsh Wildlife Sanctuary in Caraga Region, Philippines

Chime Mora-Garcia^{1,2}, Roberto G. Campos Jr.², and Romell A. Seronay^{1,2}

¹College of Forestry and Environmental Science, Caraga State University, Ampayon,
Butuan City

²Center for Research in Environmental Management and Eco-Governance
Caraga State University, Ampayon, Butuan City

Abstract

The Payment for Ecosystem Services (PES) involves a series of payments to land or other natural resource owners in return for a guaranteed flow of ecosystem services or certain action like enhance their provision over and above what would otherwise be provided in the absence of payment. In Agusan Marsh Wildlife Sanctuary (AMWS), threats including conversion of land and unsustainable land use practices affect the watershed area and might result to degradation. This study was conducted to introduce PES as way of reducing land degradation and conversion. Contingent valuation method (CVM) was used to determine the minimum willingness to accept (WTA) compensation per month of land managers should they agree to conserve part of the AMWS. Provisioning services such as food and water resources were seen as the benefits provided by the marsh to the community living within the marsh but regulating services were more important for people living in the downstream. Flood control services is the regulatory service that has an impact towards to the lower stretches of Agusan river and too much financial effort has been given to flood control projects in low lying areas. The minimum WTA of farmers and fishermen for any land conservation agreement were Php2,144.32 and Php3,442.0, respectively. This amount can be the basis of the decision makers and stakeholders if sustainable financing scheme on ecosystem services management program will be implemented in AMWS.

Keywords: ecosystem services, payment scheme, wetland, willingness to accept, willingness to pay



Growth and Yield of Upland Kangkong (*Ipomoea aquatica* forsskal) as Influenced by Mounding and Different Planting Densities

Ana Linda G. Gorme¹, Zenaida C. Gonzaga¹, Kevin M. Godoy¹, Warren L. Obeda¹, Jessie C. Rom¹ and Othello B. Capuno²,

Department of Horticulture, College of Agriculture and Food Science¹, Office of the Vice-President for Research and Extension², Visayas State University, Visca, Baybay City, Leyte 6521-A

Abstract

Upland kangkong (*Ipomoea aquatica* Forsskal.) is an important vegetable in many Asian countries. It has many health benefits, medicinal and nutritional values, hence a need to increase its production. This study was conducted to determine the growth, yield and profitability of upland kangkong as influenced by mounding and different planting densities. A split plot experiment arranged in Randomized Complete Block Design (RCBD) with three replications was used. The cultivation technique either mounded or non-mounded served as main plot and different planting densities of 1, 2 and 3 seeds per hill as the sub-plot factor. Result showed that all horticultural characteristic and yield and yield components of upland kangkong were not significantly affected by the cultivation technique regardless of the planting density. The same results were obtained on the effect of planting density on the horticultural parameters considered. However, planting densities of 2 and 3 seeds per hill were comparable and consistently showed significant increases in all yield and yield components. Kangkong therefore, must be left non-mounded after harvesting and 2 and 3 seeds per hill is recommended for better yield and high net return.

Keywords: swamp cabbage, water convolvulus, water spinach, mounded



Taxonomic Assessment, Economic Importance and Ecological Status of Vegetation in Roxas Range: Basis for Preservation and Conservation

¹ Aisha Barrios Grafil and ² Elvie V. Diaz

¹ Department of Education, Apolinario S. Bernardo National High school
Baras, Tacurong City

² Sultan Kudarat State University College of Graduate Studies,
ACCESS Campus, Tacurong City

Email: aisha.grafil@deped.gov.ph; bingdiaz2005@yahoo.com

Abstract

This study focused on the taxonomic assessment, economic importance and ecological status of vegetation in Roxas Range as basis for preservation and conservation. The study was carried out by establishing transect lines and quadrats in the identified three (3) stations. The inventory of plants was conducted to determine the taxonomic classification of the vegetation, the diversity indices, the taxonomic and morphological characteristics of each species. Its economic importance was determined through the use of questionnaire. The results on the taxonomic classification of vegetation in Roxas Range revealed that there are one hundred thirty-six (136) species in fifty-three (53) families as found in the study site. It was observed that family Fabaceae and Poaceae have the most number of species with fourteen (14) different taxa. Results on the diversity indices of vegetation showed that trees got the highest diversity index with a relative value of "moderate" whereas shrubs had the lowest diversity index with the relative value of "very low". The taxonomic and morphological characteristics of vegetation in the area varies depending on the types of the area where it thrives. The results of economic importance of the vegetation showed that "Butong" (*Dendrocalamus asper* (Schult.) Backer) had the highest percentage of economic value described as with the "moderate economic importance" as perceived by the community. The ecological status of vegetation in the area revealed that most of the species thriving in the area are native with forty (40) species and one (1) species was found out as endemic to Mindanao. As shown on the results and findings of the study, therefore, it is recommended that the study be replicated in other mountain ranges of the province of Sultan Kudarat so that findings will help understand the bigger and more complicated issues of natural resources and their importance to human life in general.

Keywords- ecological status, economic importance, taxonomic assessment

Antioxidant and Growth Comparison of Inorganic and Organically Grown Lettuce (*Lactuca sativa* L.) in Urban Community

Luisa Marie V. Iglesias¹ and Getulio A. Barcenas Jr.²

¹Secondary School Teacher III, Science Dept.,
Leyte National High School Tacloban City, Philippines

²Instructor, Northwest Samar State University, San Jorge Campus, Samar, Philippines

Abstract

The application of organic and inorganic fertilizer is considered as a good agricultural practice to improve soil fertility and crop production but assertion relating to the effects on the nutritive property is inadequate. This study aims to compare the antioxidant capacity and growth characteristics among lettuce grown in urban community of Tacloban City applied with inorganic and organic fertilizer. Lettuce were applied with commercialized complete fertilizer + Urea as inorganic treatment, vermicast as organic amendment and garden soil as control. Free Radical Scavenging Activity (FRSA) was assessed along with chlorophyll *a* and *b* content. Morphological characteristics of the harvested lettuce were also assessed like, plant height, root length, fresh and dry weight. Results revealed that FRSA were higher in organic leaf samples with mean value of 616.49 $\mu\text{molTE}/100\text{g}$ compare to the values of (564.19 $\mu\text{molTE}/100\text{g}$) inorganic and (559.66 $\mu\text{molTE}/100\text{g}$) garden soil. The leaf samples of organically grown plants also had higher chlorophyll *a* and *b* content. Comparable effects on the morphological characteristics was observed between organic and inorganic fertilizer except for root length (33.21cm and 17.10cm) respectively. The experimental results of this study have showed that organic fertilizer produced higher antioxidant content than inorganic fertilizer.

Keywords: antioxidant, organic production, vermicast



Assessment of Waste Management Program in the Town of Concepcion, Iloilo, Philippines

Author: Richard D. Jardenil

Co-Author: Bernardita C. Lauron

Abstract

In recent years, the town of Concepcion, Iloilo was experiencing many environmental problems specifically, pollution. Pollution is caused by the dumping of garbage everywhere; thus, resulted to damages in life of humans, animals and plants. This problem is associated with the upbringing of the people in the locality; however, the Local Government Unit (LGU) of Concepcion has initiated to have its own solid waste management. It started with an identified dumpsite with an area of 10,000 square meters. The residents were instructed to segregate their garbage prior to the scheduled collection and it implemented the safe closure and rehabilitation of dumpsite. It also established a Material Recovery Facility (MRF) which is also a functional Eco-Solid Waste Management Park. Through the initiative of the LGU-Concepcion, the wastes were classified, characterized and segregated. It has also provided information, education and campaign programs. Along with the waste management programs is the planting and replanting of mangroves in the seashore. Through these initiatives of the LGU-Concepcion, this town will be eventually one of the cleanest among coastal municipalities in the Philippines. The town will attract **tourists** both local and foreign that could boost employment and income to the natives of this municipality.

Efficiency of Hepato-Modulator Supplement to Broilers

Banisa S. Jumawan and Alan E. Faburada

Negros Oriental State University (NORSU), Poblacion, Pamplona, Negros Oriental

Abstract

A study involving plant-based extract and ninety Cobb broiler bird samples was conducted to evaluate the efficiency of *Cynara scolymus* in the production performance traits of poultry as potential alternative supplement source to multivitamins. The study was done for thirty-five days of rearing. Experimental chickens were randomly assigned into nine cage pens. Broilers' initial weights were gathered and recorded prior to giving of the experimental treatment. Inclusion of the experimental extract was mixed to the drinking water of the broilers with a minimum range of 4 liters given twice daily with 10

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

grams of multivitamins (T0), 1 ml *Cynara scolymus* extract (T1) and 2 ml *Cynara scolymus* extract (T2) respectively. The growth production performance was assessed for final weight, feed conversion efficiency, weight gain, mortality rate, feed consumption and carcass recovery. Analysis of Variance was used to determine the difference among the three treatment means. Results showed that there were no significant differences observed among the three treatments. In totality, the inclusion of *Cynara scolymus* extract in the broilers water had insignificant influence on the overall performance of the poultry.

Keywords: Cymara scolymus, broiler, feed conversion, carcass recovery

Antibiotic-driven Escape of host in Lotka-Volterra Red Queen Dynamics

Aynanie S. Kiram¹ and Jomar F. Rabajante^{1,*}

¹Institute of Mathematical Sciences and Physics, University of the Philippines Los Baños,
Laguna, Philippines

Email: jfrabajante@up.edu.ph

Abstract

Antagonistic Host-Parasite interaction often exhibits a perpetual cycle of alternating dominance caused by negative frequency-dependent selection, called Red Queen dynamics. In this study, we desire the host population to escape the Red Queen cycle by suppressing the numerical response in the parasite population. We investigate this using the antibiotic-induced Lotka-Volterra-based host-parasite coevolution model and showed the levels of antibiotic effectiveness as well as the different modes of antibiotic application that would result in a surviving stable host population. Our simulations show that the uninterrupted application of adequate antibiotic effectiveness is needed to escape the Red Queen dynamics. This study shows consistent results with previous studies regarding antibiotic-induced host-parasite interaction. This also can serve as an aid for scientists and provide new insight into the fields of evolutionary biology, parasite ecology, and epidemiology.

Keywords: Red Queen dynamics, Red Queen hypothesis, coevolution, Lotka-Volterra population model, antibiotic effectiveness, antibiotic resistance, evolutionary parasitology



Quantification of soil organic carbon within soil aggregates using ^{13}C techniques as influenced by land use change

Suzette B. Lina^{a*}, Ian Naverrete^b, Marife Corre^c and Victor B. Asio^a

^aVisayas State University, Visca, Baybay City, Leyte

^bDepartment of Environmental Science, School of Engineering, Ateneo de Manila University, Philippines

^cSoil Science of Tropical and Subtropical Ecosystems, Busgenweg 2, 37077 Goettingen, Germany

Email: sblina@vsu.edu.ph

Abstract

The rate of deforestation was still alarmingly high but it was slowing down (FAO, 2011). Philippines is one of the Southeast Asian countries with high potential to minimize global warming, specifically carbon emissions. Leyte in particular is a site to the Philippines' few remaining patches of forest cover with large soil organic carbon storage potential. However, some of the secondary forest were converted to other land uses such as grassland. We used a space-for-time substitution approach with paired-sites experimental design (e.g. Veldkamp *et al.*, 2003; de Koning *et al.*, 2003) in this study. We measured soil C concentrations and stocks within soil aggregate level in the paired forest and grassland sites together with other chemical (pH, extractable P, effective CEC, total N and pedogenetic oxides) and physical properties of the soil (bulk density and soil texture). Results indicate that conversion of secondary forest to grassland did not significantly decrease the SOC stocks in Southern Leyte using ^{13}C . Preservation of SOC in Silago soils was due to strong interaction between SOC and aluminum/iron oxides and not with clay. The accumulation of the above-ground biomass of grasses was very slow thus, contributing to a low amount of soil organic carbon in grassland.

Keywords: SOC, land use, secondary forest, grassland, preservation

SEAMEO INNOTECH: Gearing Up Responsible Teachers of 21st Century

Husna T. Lumapenet, EdD¹ & Hyriah G. Sanusi ²

¹Assistant Professor IV, Cotabato Foundation College of Science and Technology, Droluman, Arakan, Cotabato, Philippines

²Teacher, Department of Education, Cotabato Division, Philippines

Abstract

Teachers need to improve competencies to enhance, improve and explore their teaching practices. Many of the studies on competencies of teachers focus on the teaching role of teachers in the classroom rather than teachers' competencies. Thus, this study aimed to find out teacher's competency and their educational leadership skills prior and after completing the the SEAMEO INNOTECH GURO21 course. Results of the study indicated that teacher's competency was found to be moderately high before enrolling to the course. However, after completing the SEAMEO INNOTECH Guro21, the teacher's competency had been high. Moreover, teacher's competency was moderately high prior to their enrolment with the course and had improved into high after completing the course. Further, it was found out that completion of the course will eventually increase the competencies of the teachers. In addition, there is significant relationship between SEAMEO INNOTECH Guro21 and teacher's educational leadership skills. Meanwhile, SEAMEO INNOTECH Guro21 significantly influences teacher's educational leadership skills. Thus, there is really a need to advise/grant all teachers in the DepEd to undergo training specially the SEAMEO INNOTECH Guro21 course.

Keywords: SEAMEO INNOTECHGURO21, educational leadership skills, teacher's competency.

Entomotoxic Potential of Cane Toad (*Rhinella marina*) Parotid Extract Against Red Flour Beetle (*Tribolium castaneum* herbst)

Christopher A. Malay

Senior High School Department, International School,
Lyceum of the Philippines University-Cavite

Abstract

The study investigated the entomotoxic potential of cane toad (*Rhinella marina*) parotid extract on *Tribolium castaneum* Herbst or the red flour beetles. Cane toads, being an invasive species, have been explored as source of novel biological compounds especially in the study of tumor cells. However, groundwork studies on its entomotoxic potential has not been established yet. Exploring the possible entomotoxic potential of cane toad parotid gland extract on economically important pest is the reason why the study was conceived. Different volumes of 50% (w/v) cane toad parotid extract was added to rice grains as modified feed for the insect. Same concentration and volumes were also



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

added to filter papers as a contact residue. Results of the study showed that mortality rate on modified rice grains were volume and length of exposure dependent. After 48 hours of feeding, red flour beetles' mortality rate using 5 ml of parotid extract was statistically comparable to commercial insecticide- Malathion. However, results from contact residual method showed significantly lower mortality among red flour beetles compared to commercial insecticide. The result of the study suggests that cane toad parotid extract have a promising entomotoxic potential against red flour beetles if used as toxic baits rather than contact solutions. Further analysis and elucidation of bioactive compounds of cane toad parotid extract as well as field studies on other stored grain pests can be done to improve this research.

Keywords: parotid extract, cane toad, red flour beetle

Fractal Analysis of Philippine River Networks

Marisol P. Martinez and Ranzivelle Marianne L. Roxas-Villanueva

Institute of Mathematical Sciences and Physics, College of Arts of Sciences,
University of the Philippines Los Baños

Abstract

River basins exhibit fractal geometry. Their fractal geometry can be used to analyze their topographical structure. Characterizing a river's geometry can be significant since most geomorphological, biological, and hydrological processes are sensitive to topographic characteristics. In this study, the fractal nature of Philippine's river basins was characterized using their fractal dimensions. Fractal dimensions were obtained using an image processing software. The software uses a box-counting algorithm in order to obtain the fractal dimension for each river basin. Fractal dimension of major river basins ranges from 1.22 to 1.54 with a mean value of 1.34 while fractal dimension of minor river basins ranges from 1.01 to 1.31 with a mean value of 1.19. These values can be analyzed in order to see possible relation to the river's topographic properties or in order to cluster river networks into various categories. The correlation between the fractal dimension and other known characteristics of each river basin such as their mainstream length and basin area were also determined. Results showed that there is a positive linear relationship between the major river's basin area and fractal dimension. Same trend was observed between fractal dimension and length. Moreover, the average fractal dimension of the major river basins is significantly different to the average fractal dimension of the minor river basins.

Keywords: fractal analysis, river networks, fractal dimension



**Evaluation of Acetylcholinesterase Activity (AChE) and
Melanomacrophage Centers (MMCs) Formation of Nile Tilapia
(*Oreochromis niloticus* Linn.) from Pesticide-Exposed Waters in
Agricultural Lands**

Ris Menoel R. Modina

Department of Biological Sciences, College of Arts and Sciences,
Visayas State University, Baybay City, Leyte

Abstract

Aquatic animals near rice fields are continually exposed to pesticides, particularly organophosphate and carbamates, where fishes appear to be sensitive to their toxic effects. These effects might be detected in some physiological parameters such as Acetylcholinesterase (AChE) activity, and melanomacrophage centers (MMCs) proliferation. The aim of this study was to evaluate the sensitivity of these parameters on Nile tilapia, *Oreochromis niloticus*, as a possible bioindicator of pesticide exposure in the field. The test sites were located in paddy fields planted with vegetables in Calauan, Laguna, which was constantly sprayed with organophosphate insecticide, mainly profenofos. Fishes were placed in a 1m x 1m net cage. The test groups included are: Group 1- fish placed in irrigation canals within paddy fields, Group 2- fish placed in the drainage outlet of the irrigation canal originating from Group 1 and Group 3- fish from waters upstream about 600 meters away from the location of Group 1, and Control- fish that were depurated in the laboratory for fourteen days prior to evaluation. The field exposure showed significant influence on brain and muscle AChE activity, and splenic MMC proliferation in Group 1 fish. These changes were also detected among fish under Group 2 but to a lesser degree. AChE and MMCs proliferation of those under Group 3 and control group were comparable. The present study confirmed that AChE and MMCs in Nile fish is sensitive enough to the exposure of field sprayed insecticides to be used as a bioindicator of pesticide loading in waters near agricultural lands.

Keywords: bioindicator, fishes, pesticides



An Integrated Recursive Feature Elimination and Artificial Neural Network Approach to Healthcare Data Classification Problems

Crystal Jean T. Natividad, Destiny S. Lutero, Allen L. Nazareno

Institute of Mathematical Sciences and Physics

College of Arts and Sciences

University of the Philippines - Los Baños

Abstract

In the recent years, AI-based algorithms have been applied in healthcare. These applications include disease diagnosis, drug discovery, and early detection of illness, to name a few. AI-based models recognize patterns and trends in a given data to generate insights that can be useful in decision-making. In this study, an integrated recursive feature elimination and artificial neural network (RFE+ANN) classification model was developed for the seven health-related datasets obtained from a public repository database. The datasets include breast cancer, cryotherapy, fertility, lymphography, Parkinson's disease, heart disease and thoracic surgery data. ANN is a model inspired by the structure and functions of biological neural networks that can be used for high-dimensional data. RFE is a feature selection technique that ranks features of a given dataset to eliminate the undesirable attributes. RFE was applied to select top attributes before the implementation of ANN as a classifier for the seven datasets. Results showed that the incorporation of RFE improved the accuracy of ANN-based classification models. Notably an increase of approximately 6% was observed in the classification of a lymph (whether it is normal find, metastases, malign lymph, or fibrosis). Moreover, based on the analyses of the datasets, including the top four features as predictors of the model can already give a reasonable accuracy.

Keywords: machine learning, recursive feature elimination, artificial neural network, classification

Artificial Neural Network and Genetic Algorithm Hybrid Approach in the Optimization of Energy Efficiency of Residential Buildings

Margareth C. Navia, Carl Anthony E. Casal, and Allen L. Nazareno

Institute of Mathematical Sciences and Physics, College of Arts and Sciences,

University of the Philippines Los Baños

Abstract

Increasing energy consumption is a common issue among countries worldwide. Buildings account for the least amount of share in energy consumption but they are a major contributor to its growth. The electricity use in the residential sector is increasing fast and projected to comprise almost half of total energy consumption. Creating energy efficient residential buildings can help alleviate this problem. In this study, we developed a hybridized optimization model for energy efficiency in residential buildings using Artificial Neural Network (ANN) and Genetic Algorithm (GA). The heating load and cooling load were used as measures of the energy efficiency. These measures were calculated using a building's measurements such as relative compactness, surface area, wall area, roof area, overall height, orientation, glazing area, and glazing area distributions. Given these building measurements, we constructed two artificial neural networks with heating load and cooling load as outputs. We used simulated measurements of residential buildings as data to train the network models. Moreover, optimal hyperparameters were obtained using grid search with cross-validation. Utilizing the optimal structure of the ANN and integrating the ANN model with GA, the suitable building measurement values with maximum energy efficiency were determined.

Keywords: ANN-GA hybrid, artificial neural network, energy efficiency, genetic algorithm, residential buildings

Nutrient Analysis of Wild Edible Plants as Food Alternatives in the Municipality of Daanbantayan, Considered as a Disaster-Prone Area in the Province of Cebu, Philippines

**Patricia Anne G. Nazareno, Ricardo T. Bagarinao, Inocencio E. Buot Jr.,
and Patrick John Lim**

Department of Biology and Environmental Science, College of Science University
of the Philippines Cebu

Lahug, Cebu City, Philippines

Faculty of Education, University of the Philippines Open University

Los Baños, Laguna, Philippines

Institute of Biological Sciences, University of the Philippines Los Baños

Los Baños, Laguna, Philippines

Department of Chemistry, University of San Carlos

Talamban, Cebu City, Philippines

Email: pgnazareno@up.edu.ph



Abstract

The Philippines is prone to natural calamities because of its geographic location. After a disaster, affected communities depend largely on external assistance for their food. Wild edible plants (WEP) that have been identified to have rich nutritional value, can serve as an alternative source of nutrients needed by the people in food insecure regions in disaster prone areas of the Central and Eastern Visayas Regions in the Philippines. An objective of this study was to assess the phytochemical, nutritional, and mineral composition of wild edible plants collected in Daanbatayan, Cebu which was hit by Typhoon Haiyan in 2013.

Keywords: alternative food, wild edible plant, natural disaster, proximate analysis

Coconut Water-Treated Fishery Products

Jean F. Nebrea* and Corazon P. Macachor**

*Bohol Island State University, Tagbilaran City, Bohol

**Poblacion, Carmen, Cebu

Email:cora_macachor@yahoo.com

Mobile #:09166837096

Abstract

Low cost tropical species of fish due to its taste which can be enhanced through pickling process. The study aimed to determine the sensory qualities of coconut water treated-mullet chunks. This utilized the experimental method of research determining the volume of coconut water per cultivar and employing the three treatment formulations; that is: Treatment 1, marinated solution containing 100% vinegar with seasonings; Treatment 2, marinated solution containing 50% vinegar and 50% coconut water with seasonings; and Treatment 3, marinated solution containing 100% coconut water with seasonings, based on sensory evaluation using descriptive and preference testing on color, taste and texture. Based on the Analysis of Variance at 5% level of significance, all attributes of marinated mullet chunks and bottled sardines significantly differs. Marinated mullet chunks and sardines with 50% coconut water had general acceptability rating of "like very much" with weighted mean score of 8.48 with flesh-like appearance, very tasty and firm in texture for mullet chunks, while glossy grayish appearance, very tasty and firm in texture for bottled sardines. The most preferred products of bottled sardines were subjected to nutritional facts, patented and technology licensed by 5 adopters. Technology adoption is realized in collaboration with the Department of

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Science and Technology (DOST) 7, Department of Trade and Industry, Cebu Province, Philippine Coconut Authority, Region 7, and Philippine Carabao Center, Region 7. The technology of coconut water-treated bottled sardines is also one of the resource income generations of the university.

Keywords: coconut water, mullet, sardines, bottled product

Salient Features of Tourism Landscapes Discourses of Palawan's Prime Tourist Destinations

Janet B. Oab

Palawan State University

Email: oabjanz@gmail.com

Abstract

This paper investigated discourses of tourism landscapes in Palawan. Data were from interviews, observations, and photos of signages. This was anchored on Pennycook's (2007) *language as a local practice*. It highlighted the relationship between language, locality and practice and how the three are mutually and performatively constituted: how the practice of language informs locality, how locality informs language practices and how local practices inform language. Discourses were found aesthetically presented and linguistically operative thus established Palawan's authentic and non-hegemonic identity.

Keywords: discourse semiotics, authenticity, mobility, and environmental preservation

Growth, Yield and Physico-Chemical Properties of Lettuce (*Lactuca sativa* L.) var. Carlo Rossa Under SNAP Hydroponics System as Influenced by Wood Vinegar Application

Warren L. Obeda, Zenaida C. Gonzaga

Visayas State University

Visca, Baybay City, Leyte



Abstract

In temperate areas, lettuce is one of the leading commercial vegetables whereas in the tropics like the Philippines, it is a secondary vegetable of small but increasing commercial importance. The hazards to health and environment from the use of inorganic synthetic fertilizer must be minimized and needs to be reduced without compromising the growth of lettuce and its volume of production. This study was conducted to evaluate the growth and yield of lettuce as affected by different concentrations of wood vinegar either applied singly or in combination with VSU Liquid Nutrient Fertilizer and to determine the concentrations of wood vinegar that will enhance the growth, yield and physico-chemical attributes of lettuce. This study was laid out in RCBD with three replications. Single and different combination percentage of wood vinegar and VSU-LNF were designated as treatments. Results showed that application of wood vinegar has positive effect in the horticultural, yield and yield components and improves some of the chemical attributes of lettuce. Combined application of 25% diluted wood vinegar and 75% VSU-LNF (T2) and 50% wood vinegar and VSU-LNF (T3) had comparable effect with commercial VSU-LNF alone. Moreover, addition of diluted wood vinegar enhanced some chemical attributes of leaf type lettuce under SNAP hydroponics system.

Keywords: VSU-LNF, Pyroligneous acid, Methanol, Acetic acid, TSS, TA, UV vis Spectrophotometer

Influenced of Wood Vinegar on the Growth and Yield of Leaf-Type Lettuce (*Lactuca sativa* L.) var. Eton Under SNAP Hydroponics System

**Aldwin Paul M. Parac, Warren L. Obeda, Raffy R. Danggoy, Eric Kent Z. Mapili,
Blanche Franchette D. Llera, Jannu Geuseppe Clemeña, Zenaida C. Gonzaga**

Visayas State University
Visca, Baybay City, Leyte

Abstract

In temperate areas, lettuce is one of the leading commercial vegetables whereas in the tropics like the Philippines, it is a secondary vegetable of small but increasing commercial importance. The hazards to health and environment from the use of inorganic synthetic fertilizer must be minimized and needs to be reduced without compromising the growth of lettuce and its volume of production. This study was conducted to evaluate the growth and yield of lettuce as affected by different concentrations of wood vinegar either applied singly or in combination with VSU Liquid Nutrient Fertilizer and to

determine the level that will enhance the growth and yield of lettuce. The study was laid out in Randomized Complete Block Design with three replications. Single and combined application of bamboo wood vinegar and VSU-LNF were designated as treatments. Results showed that application of diluted wood vinegar at 25% and 75% VSU-LNF (T2) and 50% wood vinegar and VSU-LNF (T3) (v/v) significantly improved the horticultural and yield attributes of lettuce compared to 75% WV and 25% VSU LNF (T4) and wood vinegar alone (T5) under SNAP hydroponics system. Reducing the amount of VSU LNF at 25%-50% (volume) and replacing this with diluted wood vinegar enhanced the growth of lettuce. At 25% WV and 75%VSU LNF (v/v ratio), growth and yield parameters were greatly enhanced and even much higher than with pure VSU LNF alone. Therefore, diluted WV could be a better alternative or substitute to minimize the use of inorganic nutrient solution in lettuce production but up to a certain volume.

Keywords: VSU-LNF, Pyroligneous acid, Methanol, Acetic acid, Eton

Strengthening Women Fisherfolk Empowerment Toward Social Inclusion in Coastal Environment of Malolos, Bulacan, Philippines

Elmira Thina C. Pelayo
University of Sto Tomas

Abstract

Concerns pertaining to the plight of women fisherfolk in the fisheries are needed to be addressed and should be taken intensively in most coastal communities. Therefore, the study is conducted to discover the challenges in strengthening women empowerment in the coastal communities of Malolos, Bulacan. Two hundred seventy-five adult women who were involved in different fishing activities for at least 3 years formed the sample of the study. The researcher used ethnography as the design. A semi-structured interview schedule was used to collect the information through personal interview. The interviews were transcribed and translated into English and the statements were coded and presented in matrix form through thematic presentation. Participant observation was also facilitated to gather more reliable evidence to be utilized in the discussions. The findings showed that the role of the women fisherfolk is not directly connected with fish catching but rather they are part of fish production and marketing. The challenges that hinder the strengthening of their empowerment are poverty, violence and lack of education. The different ways to strengthen women empowerment are through creation the of the conditional cash transfers (CCTs), the introduction of microfinance schemes, addressing the issues on violence against women and children, the improvement of the



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

program and increased funding of the government in the fields of education and health. The study concludes that there is a need to empower the women because it helps in building of human capabilities and that empowered women play a crucial role of sustaining their family and community livelihoods.

Recursive Feature Elimination Approach Improves Support Vector Machine-Based Classification Models

Crystal Anne M. Perez, Destiny S. Lutero, Allen L. Nazareno

Institute of Mathematical Sciences and Physics

College of Arts and Sciences

University of the Philippines Los Baños

Abstract

Machine learning has been used over the past decades on various areas of research such as natural language processing, financial services, and healthcare, among others. It is widely used to discover trends and patterns on a certain data and process these insights for predicting and, clustering, and classifying information. In this study, an integrated recursive feature elimination and support vector machine (RFE+SVM) classification model was developed for the five datasets (including breast cancer and autistic spectrum disorder data) obtained from a public repository database. SVM is a classifier that can deal with high-dimensional data whereas RFE is a commonly used feature selection method which eliminate undesirable features which may cause a significant effect to the improvement of accuracy of a model. RFE was applied to select top features before implementing SVM to do to classification task in five datasets. Results showed that the incorporation of RFE can improve the accuracy of SVM classification models. In the breast cancer dataset, there was a notable increase, approximately 10%, in the model accuracy. Additionally, the results of the analyses of the five datasets suggest that choosing the top 5 features may already provide a reasonable accuracy rate.

Keywords: machine learning, recursive feature elimination, support vector machine, classification

Use of Metaheuristics in Validating Land Use Assignment Model Involving Neighborhood Constraints in Barangay Laiya-Aplaya, San Juan, Batangas

Shaira Perez

BS Applied Mathematics
Institute of Mathematical Sciences and Physics
College of Arts and Sciences
University of the Philippines Los Baños

Abstract

A good land use plan is one with land parcels assigned for uses suitable to it. One way to model land assignment problems is by assigning land uses to grids with high suitability scores. An integer linear programming (ILP) model for a land use assignment problem with neighborhood constraints was used to address this problem. Costs associated with the assignment of a land use to a grid that is affected by the weights associated to the object placed adjacent to it. To solve this land use assignment problem with neighborhood constraints, different metaheuristics like hill climbing algorithm, simulated annealing with learning, and genetic algorithm were developed as well as for the cells restricted to contain particular land use. Model was validated using data of Barangay Laiya-Aplaya, San Juan, Batangas with objective of promoting tourism in the area.

Biological Assessment of LGU Managed Urban Parks in Iloilo, Philippines

Lynlei L. Pintor and Wencelito P. Hintural

Email: lynlei14@gmail.com

Abstract

Urban park assessment emphasizes biodiversity-based strategy for its management. The study focused on the biophysical assessment of urban parks managed by the local government in Iloilo such as Plaza Libertad, Plaza Molo, Plaza Jaro, Plaza Mandurriao, Plaza La Paz, Bo. Obrero Park, and Plaza Arevalo. Research methods include 100% inventory of trees with at least 10 cm dbh and bird counting and identification traversing two-kilometer transect with 16.67 meters per minute. A continuous observation through a paced walk was done to avoid double count of individuals. Analysis



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

was based on species composition in terms of species richness, similarity index, distribution and conservation status, and diversity indices.

Result revealed that Plaza La Paz exhibited the most number of species while parks in Molo, Mandurriao and Bo. Obrero have the least species. All tree species among seven parks showed that trees in Plaza Jaro showed the highest average height measuring 10.49 m while the highest average dbh was found in Plaza Libertad with 53.66 cm in diameter. A total of 394 (43.39%) individuals are indigenous and 514 (56.61%) individuals are exotic species out of the 908 trees. Species diversity indices of flora revealed that the parks have very low to moderate diversity ranging from 1.11-2.36 value. Three endemic species were observed in the area such as Philippine Bulbul (*Hypsipetes philippinus*), Greater Coucal (*Centropus cinensis*), and Yellow-vented Bulbul (*Pycnonotus goiavier*). No species are found to be threatened as these avifauna are mostly urban species that have high tolerance to any human intervention. Based on the biodiversity indices used for birds, Shannon Diversity Index (H') indicates that the level of diversity is very low in Iloilo City. The Evenness Index suggests that the area exhibited a very high species evenness or high level of species distribution.

Keywords: urban parks, biological assessment, avifauna

**Broccoli (*Brassica oleraceae* L. var. Italica Plenck) Production as
Influenced by the Application of Different Organic and Inorganic Nutrient
Solution Formulations Using Aggregate Hydroponic System**

Darlyn B. Posas¹ and Rosario Salas²

¹ Negros Oriental State University, Poblacion, Pamplona, Negros Oriental

² Visayas State University, Visca, Baybay City, Leyte, Philippines

Email: darlynposas@yahoo.com and rasalas_horti@yahoo.com

Abstract

Broccoli is one of the most expensive vegetables in the Philippines requiring alternative sources of nutrient fertilizer for better yield and quality. Inorganic nutrient solution is now widely used around the globe to enhance vegetable production but can be very detrimental for the environment and human health. This study aimed to determine the growth and yield performance of broccoli as affected by the length of storage of the fermented malunggay, kudzu and ramie. This was undertaken following a Split-Plot Randomized Complete Block Design with seven different nutrient solutions as the main plots and four storage periods of ferments as subplots. Broccoli plants applied

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

with VSU-Liquid Nutrient Formulation (LNF) had the tallest plant height, earliest to form curd and highest yield. Among the three ferments, the malunggay extract stored for three months was found efficient in enhancing plant growth and curd formation. Despite the low level of nitrogen content, malunggay extract stored for 3 months was found to be more efficient source of organic nutrient solution. The combination of VSU-LNF and organic nutrient solution looked promising as source of nutrient solution in hydroponic system as it enhanced broccoli production.

Keywords: hydroponics, broccoli, malunggay, ramie, kudzu, ferments

Efficiency of Mobile Apps in Citizen Scientist Participation in Biodiversity Conservation

IP Quijano¹ and MJ Flores^{1, 2}

¹Center for Environmental Informatics, University of the Philippines Cebu

²Department of Biology and Environmental Science, College of Science, University of the
Philippines Cebu

Email: ilquijano@up.edu.ph; mlflores2@up.edu.ph

Abstract

The application of technology and smart phones can be a powerful tool for biodiversity conservation, linking different stakeholders and encouraging citizen scientists to actively participate in the conservation process. Recognizing the efficiency of using technology to collect, analyse, and interpret voluminous data and more importantly, in optimizing various work processes, this paper highlights the use of ICT in biodiversity conservation through the development of a mobile application. A species count app, with the intent to improve data standardization and work flow, and reduce data entry errors during on-site fieldwork for species occurrence mapping was created as a field survey application for Android devices. The application was tested in a recent synchronized Black Shama count in Cebu province confirming its positive utilization in involving the participation of citizen scientists to species mapping, a significant step if biodiversity conservation efforts are to be successful. The app effectively decreased the time in converting raw data output to finalized datasets for analysis.

Keywords: Mobile App, Biodiversity Conservation, Citizen Scientist, ICT, Environmental Informatics



Effect of Decrease in Rainfall in Los Banos, Laguna to Rice Production and Crop Insurance Viability

Patricia Anne V. Quilitis, Alyssah M. Arugay, Diane Carmeliza Cuaresma

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

Abstract

Climate change is a threat in rice production: threatening the food security in the country and the livelihood of many Filipino farmers. One of the ways to protect these farmers against the losses brought by changing weather conditions is by purchasing crop insurance. However, due to the increasing risk of producing rice, insurance companies are reconsidering the continuation of their business. This study assessed the viability of offering crop insurance under changes in rainfall. Weather data from 1960 to 2018 was collected from the UPLB National Agrometeorological Station. Rainfall, using ARIMA, and temperature, using Ornstein-Uhlenbeck process, was forecasted. It was found that there would be no statistically significant increase in temperature in the area, and that rainfall would decrease by as much as 20% during wet season. Rice yield was simulated using the forecasted rainfall data. Furthermore, rice yield was also simulated if there was significant changes due to changes in rainfall. Using Decision Support System Agrotechnology Transfer (DSSAT), it was found that rice yield is expected to decrease by as much as 4.20%. This study can be used to support crop insurance companies in designing crop insurance, so that both the farmers and the insurers would benefit from it.

Keywords: climate change, rainfall, crop insurance, DSSAT

Development of Calcium-Enriched Gluten-Free Flour Blends Products

**Renissa S. Quiñones, Corazon P. Macachor, Rosein A. Ancheta, Jr.,
and Hubert G. Quinones**

Cebu Technological University Main Campus

R. Palma Street, Cebu City

Email address: renissasario@gamil.com

Mobile No. 09065767822

Abstract

Gluten is one of the identified allergens for celiac disease (CD) patients. However, observance of a gluten-free diet is an effective treatment for gluten sensitive patients. This program innovates calcium-enriched gluten-free flour blends and its applications to reduce allergens. The program aimed to innovate food products and transfer to interested beneficiaries through the university-industry-government partnership and generate income. This utilized the research innovation, protection through patenting and copyrighting, publication, exhibits, extension training with licensing, and commercialization of calcium-enriched gluten-free flour blends research outputs. The program on calcium-enriched gluten-free flour blends and its applications has generated 14 patents, trained trainers out of 325 beneficiaries, established university-industry-government or triple helix partnership and increased resource generation of the university and industry partners. The continuing partnership of HEI with other government agencies, industries and local government units for technology transfer of the research-based outputs is recommended.

Keywords: calcium-enriched, gluten-free, food processing

Proposed Risk Management Program in Quezon Panitian National High School, Quezon, Palawan

Recente, James C

Co-Author: Dr. Lerna L. Ayco

Master of Education, Major in School Leadership and Instruction,
Palawan State University, March 2019.

Abstract

This study aimed to assess and enhance the disaster risk reduction awareness of the Quezon Panitian National High Schools students. It was conducted to the 86 senior high school students of Grades 11 and 12 in: Bread and Pastry, Agriculture and General Academic strands. Descriptive–correlational design was employed in the study wherein Pearson Correlation was used in the analysis of data together with descriptives in the distribution of respondents by their demographic profile and perceptions on readiness and commitment to disaster risk reduction management. Significance was tested at alpha (α) .05. It was found out that despite the awareness of the QPNHS students of the Disaster and Risk Reduction and Management Plan in general, the school readiness to DRRM is not



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

evident due to basic documents, signage, trainings and programs not existing in the school. Disaster risk reduction related activities appear to be embraced by the students that a proposed Disaster Risk Reduction Management Program for QPNHS is in order. The respondents' demographic profile significantly relate with their readiness to disaster risk reduction management. It appears that the younger the respondent, the more aware or ready is he/she as far as DRRM is considered. Most likely a respondent who is older, female, with a father who has an agriculture related occupation, a mother who is a teacher, and whose location of residence is within the school area are inclined to be more committed to participate in disaster risk reduction related activities since all perception statements were rated strongly agree or described as very much committed. Strong recommendation is offered that the propose Disaster Risk Reduction Management Program be implemented in the Quezon Panitian National High School, Quezon Palawan.

GIS-Assisted Carbon Stock Assessment of Loboc-Bilar Mahogany Plantation, Bohol, Philippines

Tomas D. Reyes, Jr.

Bohol Island State University, Bilar Campus, Zamora, Bilar 6317, Bohol

Abstract

The study determined the carbon budget of the Loboc-Bilar Mahogany (*Swieteniamacrophylla* King.) Plantation in the province of Bohol, Philippines within the months of June to October 2018. The plantation straddles two municipalities, Loboc and Bilar. It is a popular destination for local and international tourists due to its compelling tunnel-like vegetative scenery. Delineation of the plantation boundary was fine-tuned using both image digitization and ground survey. A random sampling method was applied in conjunction with Geographic Information System (GIS) software to spatially distribute sampling plots in the research area. Several carbon pools were assessed, namely: aboveground biomass, necromass or ground biomass, and belowground biomass. Allometric and other mathematical equations were used in the calculation of biomass density, stored carbon and carbon dioxide equivalents. Results reveal that the plantation had 29,428.03 Mg of stored carbon in the biomass distributed over a total land area of 115.21 hectares, yielding an estimated stored carbon density of 255.43 Mg ha⁻¹. The monetized value of stored carbon in the whole plantation amounted to US\$486,003.96.

Keywords: allometric equation, carbon budget, carbon stock, mahogany plantation

Multi-objective optimization model for crop rotation problem considering spatiotemporal climate indices and crop adjacency

Emerson R. Rico^a, Prof. Destiny S. Lutero^b, Prof. Allen L. Nazareno^c, Prof. Arnold Salvacion^d

^a Undergraduate student, Institute of Mathematical Sciences and Physics, College of Arts and Sciences, University of the Philippines Los Baños

^b Assistant professor, Institute of Mathematical Sciences and Physics, College of Arts and Sciences, University of the Philippines Los Baños

^c Assistant professor Institute of Mathematical Sciences and Physics, College of Arts and Sciences, University of the Philippines Los Baños

^d Assistant professor, Department of Community and Environmental Resource Planning, College of Human Ecology, University of the Philippines Los Baños

Abstract

A mixed-integer goal-programming model was formulated to serve as a tool in generating optimal cyclic crop rotation plan with respect to multiple crop planning factors. The crop planning factors considered are i.) spatiotemporal climate indices such as rainfall and temperature, and ii.) crop spatial adjacency. To assess the validity of the model, it was employed to generate a crop rotation plan for agriculturally suitable areas of Marinduque, Philippines. The model was tested to multiple scenarios, varied by i.) the distribution of priority to crop planning factors, and ii.) number of type of crops considered. The problem was solved using an optimization solver, Gurobi. The result shows that the model is applicable even with large problems. Finally, the versatility of the model allows the inclusion of additional crop planning factors, which can help farmers in finding compromise solution between multiple objectives.

Keywords: Crop rotation, Mixed-integer programming, goal-programming, Multiple-criteria, climate indices, crop adjacency

Soil Fertility, Rice (*Oryza sativa* L.) Productivity and Profitability Under Organic and Inorganic Inputs

R.J.C. Rollon¹, A. S. Polinar², M. Troza³ and A. J. Sutacio⁴

¹ Department of Agricultural Science, College of Agriculture and Agri-Industries, Caraga State University, Butuan City 8600, PHILIPPINES, rollonreubenjames@gmail.com



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

- ² Department of Agricultural Science, College of Agriculture and Agri-Industries, Caraga State University, Butuan City 8600, PHILIPPINES, polinarcaraga@gmail.com
³ Department of Agricultural Science, College of Agriculture and Agri-Industries, Caraga State University, Butuan City 8600, PHILIPPINES, michaeltroza@gmail.com
⁴ Department of Agricultural Science, College of Agriculture and Agri-Industries, Caraga State University, Butuan City 8600, PHILIPPINES
Email: mhayang7euv@gmail.com

Abstract

A field experiment was conducted to determine the effects of organic and inorganic fertilizer application on rice productivity and profitability. There were five treatment combinations with 4 replications laid out in RCBD. The treatments were: control; farmer's best practice (FBP); soil-based recommended rate (SBRR); 10t ha⁻¹ organic fertilizer or OF, and combined fertilizer or CF (5t ha⁻¹ OF + ½ SBRR). Sole OF and CF application significantly increased soil fertility after harvest. The N and K uptake of rice was also increased under FBP and SBRR treatments. All yield components were increased with FBP, SBRR and CF treatments with consistently highest increased in the FBP treatment. Highest grain yield was obtained in the FBP (6.68t ha⁻¹) followed by SBRR (6.28t ha⁻¹), CF (6.12t ha⁻¹) and OF (5.25t ha⁻¹) while the lowest yield was recorded in the control treatment (4.67t ha⁻¹). Interestingly, the yield obtained in our study was higher compared to the average yield of 3.21t ha⁻¹ reported in the region. Net income increased by 30% in FBP, 28% in SBRR and 25% in CF over the control treatment. Maximum rice productivity and profitability were obtained under FBP. However, a similar yield and profit increase could also be obtained under SBRR and CF treatment. The result also highlighted the importance of combining organic and chemical fertilizer in reducing the cost of fertilizer inputs, increasing soil fertility, improving rice yield and maximizing profitability in rice production.

Key words: Soil fertility, organic fertilizer, chemical fertilizer, rice productivity

Tourists' Experiences on Green Tourism Practices Towards Sustainability Roadmap for the Community-Based Tourism Projects In Palawan

Author: **Prof. Henrietta M. Roque**
Palawan State University

Abstract

This study highlighted the CBST drawing on the Tourists' Experiences on Green Tourism Practices at Ugong Rock Spelunking and Sabang Mangrove Tour, Sabang, Puerto Princesa City. Green Tourism practices were unusual hobbies or activities experienced by few people, have spending power and seeking holiday experiences. The Tourists' Experiences at the Community-Based Sustainable Tourism projects had drawn towards developing Green Tourism Practices Sustainability Roadmap for the CBST projects in Palawan. The study bridged literature gap of Green Tourism Practices on visitor experience study. The paper consists of Part 1- Profile; Part II - CBST attributes on 5 A's of tourism: *Accessibility, Amenities, Activities and Activities*; Part III- Environmental integrity, preservation of local culture, economic sustainability and community participation. The assumption that tourist experiences on Green Tourism Practices can contribute to the realization for Community-Based Tourism projects sustainability was accepted. Results showed positive experiences met and highly recommended. The Sustainability roadmap shall translate into changes on responsible behavior and attitudes while inside CBST Projects.

Keywords: stakeholders, green tourism practices experience, community-based sustainable tourism projects, sustainability roadmap

Influence of Grafting and Pruning on the Growth, Yield and Chemical Characteristics of Sweet Bell Pepper (*Capsicum annuum* L.) Under Highland Conditions

Rosario A. Salas^{1*}, Helen Mae Mejia² and Othello B. Capuno³

¹Associate Professor, Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Baybay City, Leyte; ²Research Assistant, Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Baybay City, Leyte; ³Professor, Office of the Vice President for Research and Extension, Visayas State University, Baybay City, Leyte

Email: rasalas_horti@yahoo.com



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Abstract

This study was conducted to evaluate the influence of grafting and pruning on the growth, yield performance and chemical characteristics of Sweet Bell Pepper. This experiment was conducted in the highlands of Cabintan, Ormoc City following a randomized complete block design with four treatments replicated three times as follows: T1-Ungrafted/Unpruned Sweet Bell Pepper, T2-Ungrafted/Pruned Sweet Bell Pepper, T3-Grafted/Unpruned Sweet Bell Pepper, and T4-Grafted/Pruned Sweet Bell Pepper. Result showed 100% survival rate of grafted sweet bell pepper plants four months after transplanting. Except for fruit length, all growth and yield parameters such as plant height (101.2-102.6 cm), total number of fruits (615-617), fruit diameter (8.81-8.92 mm), weight of fruits and total yield (123.0-123.4 kg) were significantly highest for grafted bell pepper regardless of whether the plants were pruned or not. Grafted sweet bell pepper yielded 117.8% higher than ungrafted Sweet Bell Pepper. Similar trend was also observed with respect to *chlorophyll a* (2.87-2.98 ppm) and total carotenoid (1.95-1.96 ppm) composition of the harvested fruit. Ungrafted and pruned Sweet Bell Pepper exhibited significantly highest electrical conductivity (1874 μ S) with the least redox potential (0.2 mV) to indicate better mineral nutrition, shelf-life and storability. Moreover, both pruned and unpruned grafted Sweet Bell Pepper showed significantly highest free radical scavenging activity (35.16-35.38%) and total dissolved solids (675-678 ppm). The overall result of the study clearly pointed out the supremacy of grafted technology for sweet bell pepper production in highland conditions particularly when soil borne pathogens exist.

Keywords: Electrical conductivity, Free radical scavenging activity, Pigment composition, Redox potential, Sweet bell pepper, Total dissolved solids

**Sustainability of Bangsamoro Development Agency Program,
Pikit, Cotabato**

Mahirah B. Salik, EdD

Instructor, Cotabato Foundation College of Science and Technology, Doroluman, Arakan,
Cotabato, Philippines.

Abstract

The study study on sustainability of Bangsamoro Development Agency Program was conducted at the selected municipalities of the Province of North Cotabato particularly in the Municipality of Kabacan, Pikit, and Aleosan to 155 beneficiaries taken as respondents. Study aimed to determined the profile of the respondents in terms of

age, gender, educational attainment (English/Arabic), occupation, family size; determine the provision of the Bangsamoro Development Agency (BDA) on the needs of the beneficiaries such as values transformation, community organizing, rehabilitation projects, and medical mission; sustainability of the BDA program in terms of economic viability, ecological friendliness, technological soundness and cultural acceptability; influence of the socio-demographic profile on the sustainability levels; and influence of the BDA programs to the sustainability levels. Socio-demographic profile of the respondents was analyzed using frequency and percentage; degree of BDA programs and its and its level of sustainability were analyzed using weighted mean; and hypothesis was tested using linear regression techniques. There were 155 respondents of the study answered the questionnaires provided with three parts. The finding gleamed that most of the beneficiaries were in the young age, female, high school level in both English and Arabic, barangay officials, and household size were under the bracket of 0-5 members of the family. For BDA, it was revealed that based on the assessment, the beneficiaries strongly agreed that values transformation contributed to their daily life; however, they agree that the program extended rehabilitation projects and medical mission. For the level of sustainability, beneficiaries of the programs responded that the program highly sustained on the cultural aspect of the beneficiaries; moderately sustained on the ecological friendliness; and fairly sustained on economic viability and technological soundness. As to the influence of the socio-demographic profiles of the respondents significantly influence the economic viability, ecological friendliness, and technological soundness where age, occupation, family size and English and Arabic Education as significant predictors. However, socio-demographic profiles of the beneficiaries do not significantly influence the cultural acceptability but beneficiaries' gender was considered significant predictor. On the influence of the BDA programs, it is noted that the different programs significantly influenced particularly on the economic viability, ecological friendliness, technological soundness and cultural acceptability and the best predictors where rehabilitation programs, values transformation and community organizing.

Persistence of Red Queen Dynamics in Stochastic Epigenetics-based Host-parasite Coevolution Model

Nathaniel C. San Jose¹, And Jomar F. Rabajante, Phd.¹

¹Institute Of Mathematical Sciences And Physics, University Of The Philippines Los
Baños, Laguna, Philippines



Abstract

Red Queen dynamics is often exhibited by winnerless coevolution of antagonistic interacting species, it is manifested by oscillation of population densities with perpetual alternating dominance among host (parasite) types in a system with antagonistic interacting species such as hosts and parasites. We hypothesize that incorporating stochasticity in the deterministic population density model will alter the population dynamics therefore escaping the Red Queen dynamics. In this study we modify a deterministic epigenetics-based host-parasite coevolution model by including stochastic factors such as: (i) stochasticity on the initial conditions, (ii) demographic noise and (iii) environmental noise. The models are simulated mathematically to test our hypothesis. Our simulations reveal that the Red Queen dynamics persists while we incorporate varying magnitudes of stochasticity on the initial conditions, we are also able to identify the parameters that affect the clone-establishing time of the mutant host and parasite. Moreover, we discover that the Red Queen fails to persist even with small magnitude demographic noise ($\sigma_d < 0.1$). Lastly, we observe the effect of environmental noise on the resulting population dynamics when applied to the parameter

r (host basal growth rate), ρ (host death rate), ξ (parasite growth rate), and d (parasite death rate). We also consider an addition case in which we applied environmental noise simultaneously on the aforementioned parameters. We conclude that only the environmental noise on r and ρ preserves the Red Queen dynamics.

Keywords: red queen hypothesis, red queen dynamics, coevolution, stochastic population modelling, demographic noise, environmental noise

Adaptive Practices of Farmers in Coping Climate Change in Zamboanga City, Philippines

Fredelino M. San Juan¹, Ardel S. Barre² and Cecille C. Diamante³

Faculty Members, College of Forestry and Environmental Studies

Western Mindanao State University

Zamboanga City, Philippines

Abstract

Climate change is a stern issue that threatens not only the environment but also the livelihood, food security and health of the large percentage of the country's population. This study determined the farmers awareness on climate change, adaptation strategies and as well as issues and problems. A total of 43 farmers were taken as respondents. The respondents were selected randomly from the list of active members of farmers association provided by the Office of the City Agriculturist of Zamboanga City. A structured questionnaire and focus group discussion were conducted to determine their awareness on climate change, adaptive practices and as well issues and problems. The farmer respondents in the city are aware on climate change concepts. They agree that extreme weather events could affect their production. In terms of adaptation strategies the top 3 strategies are: rainwater harvesting, use suitable crops during extreme weather condition and adjust timing of planting activities. For the issues and problems encountered that affect the adaptation strategies, they said; increase of pests and diseases, decreased yield of crops and delayed fruiting of crops. There is a need to for Local Government Units and national government agencies to provide the necessary infrastructures and other assistance to help the farmers in dealing with the changes in climate.

Keywords: climate change, adaptation strategies, coping, level of awareness

Diversity of Trees in Nueva Ecija University of Science and Technology Gabaldon Campus, Gabaldon, Nueva Ecija

Jomell M. Santiago¹, Reynante G. Bustillos¹ and Maricar H. Sison¹

¹ College of Education, Nueva Ecija University of Science and Technology, San Isidro
Campus, San Isidro Nueva Ecija

Abstract

The study was conducted to determine the diversity of trees in Nueva Ecija University of Science and Technology Gabaldon Campus, Gabaldon, Nueva Ecija. They were described, identified and classified. Species richness, abundance, dominance and occurrence of trees were noted. NEUST Gabaldon Campus area was divided into 3 stations and each station consists of 3 quadrats randomly distributed. Data were gathered using quadrat method. A total of 24 species were recorded. They were further grouped under



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

single division, 1 class, 11 orders, 15 families and 24 genera. The most abundant species of trees belonged to family Arecaceae with 2 species under 2 genera followed by family Annonaceae and Meliaceae with 2 species under 2 genera. The species of trees that gained the least number of individuals came from the family Burseraceae, Moraceae, Fabaceae and Sapindaceae with only one species. In terms of species occurrence, *Swietenia macrophylla*. Thrived in 8 out of 9 quadrats. This was followed by *Polyalthia longifolia* and *Mangifera indica* which was observed in 7 out of 9 quadrats, respectively. In terms of species richness, Station 1 exhibited the highest number of species with a total of 16 species followed by station 3 with a total of 15 species of trees. Station that show the lowest number of species were station 2 with only 13 species. Quadrat 3 in Station 1 exhibited the highest number of species with a total of 14 species followed by quadrat 1 in Station 1 with a total of 11 species. The station that exhibited the lowest number of species is quadrat 2 in station 1 with the total of 6 species only. *Cocos nucifera* had the most number of individual, highest dominance and species important value of 42.85. The species with the least value in all indices and with species important value of 1.78 were *Tamarindus indicus*, *Ficus septica*, *Canarium ovatum* and *Litchi chinensis*. The identified species exhibited a diversity of 0.08 (Simpson's index) which indicates that trees in NEUST Gabaldon Campus is diverse.

Keywords: diversity, quadrat, species occurrence, species dominance, Simpson index

An Economic Resiliency Model Floating Communities: Disaster Mitigation in the Philippines

Alain Jomarie G. Santos^{1,2} and Dr. Arlen A. Ancheta^{1,2}

The Graduate School, University of Santo Tomas¹; UST Faculty of Arts and Letters²

Abstract

This research explored the variables that can potentially lessen the disaster-related problems in the Philippines. Tapping the islands in Malolos, Bulacan, Philippines as a case in point, the researcher attempted to determine the variables that can help alleviate problems in times of disaster. Using one of the variables used by Orencio & Fuji (2013), adapted from the model of Twigg (2007), this research determined the variables that strengthen floating community resiliency. The study used mixed methods in ascertaining resilience and economic sustainability of the communities. For its quantitative design, factors considered for the Logistic model's independent variables are: Environmental and Natural Resource Management; Human Health and Well Being;

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Sustainable Livelihood; Social Protection; Financial Instrument; Physical Protection, Structural and Technical Measures; Planning Regimes; and Socio-economic Profile. The research used direct observation, and focused group discussion as a qualitative tool, to further substantiate the facts derived from the initial quantitative analysis. Research tools include transcriptions, field notes, observations and questionnaires. The locals living with water all their lives are sensitive to the needs of the island environment and are complacent on the nature of disaster. As daily wage earners dependent on nature, they resort to loans in case of financial handicap. As an isolated community, disaster information is inadequate. Mobility is limited and accessibility to the mainland is slow-on set. Initial findings showed that the island ecosystem is able to withstand perturbation due to micro-governance and strong social capital. It is recommended that the community engaged resilience should be strengthened among the locals where they have access to proper education with microfinance support, implementation of community-based water disposal management, space as buffer between the sea and community and responsible collaboration among the local government, residents and partner communities.

Keywords: community resiliency, disaster prone areas, floating community, Malolos City Islands, economic model

Changes in Phytoplankton Composition and Diversity in Lake Danao, Ormoc City, Leyte: A Re-Sampling Study after 12 Years

Eunice Kenée L. Serião and Krizel Ann G. Galangue

Department of Biological Sciences, Visayas State University,
Visca, Baybay City, Leyte

Abstract

The study was conducted in Lake Danao, Ormoc City to assess the composition and diversity of phytoplankton genera inside the tourism area, and to compare present data to a study conducted in 2007. Collection of phytoplankton samples was done once a month using a plankton net (80µm mesh size) for three months. Diversity, taxa richness, evenness and dominance were determined using standard indices to describe the phytoplankton community in the area. In terms of composition, higher number of genera (31) was encountered in the present study compared to the previous one (24). Division Bacillariophyta (diatoms) was found to be the most represented group in both studies (15 and 13 genera, respectively), which highlights their reproductive success in the lake.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

However, in the present study, Division Chlorophyta (green algae) was the most abundant group based on relative density as represented by *Staurostrum* (51%), followed by *Microcystis* (37%) under Division Cyanophyta (cyanobacteria) which is known to cause harmful blooms. In the previous study, diatoms were the most abundant group in the lake as represented by *Synedra* (56%), followed by the green alga, *Arthrodesmus* (9%). Based on diversity, lower index value (0.94) was observed in the present study compared to previous (1.70), which could be due to the presence of dominant algal genera in the site. The study shows that Lake Danao hosts a diverse phytoplankton community, which can be used as basis for conservation measures to protect the lake's water quality if monitored regularly.

Keywords: diversity, freshwater algae, lake ecosystem, plankton

Loss Modelling of Bank Loans with Livestock as Collaterals in Light of the Personal Property Security Act

Rayon Vincent Sioson
Adviser: Eleanor Gemida

Abstract

Micro, small, and medium enterprises play a huge role in the Philippine economy, however, most of them do not have access to finance for their businesses. To improve access to credit of MSMEs, the *Personal Property Security Act* or Republic Act No. 11057 was signed in 2018. This law states that banks can now accept non-traditional collaterals such as livestock. This is beneficial to MSMEs. However, it is risky for the part of the banks since livestock are exposed to more risks such as death, sickness, etc. relative to immovable collaterals. The researchers aimed to model the expected loss of the banks considering livestock as collaterals. Moreover, the researchers identified the minimum loan interest rate such that the expected loss is in the threshold of the bank and the maximum interest rate that the debtor can bare. Results via numerical simulations show that banks incur a greater loss with higher debtor age, greater loan amount, etc. Moreover, the maximum and minimum interest rates observed sometimes do not coincide with each other, thus, extending the term or increasing the collateral value are possible alternatives.

Keywords: loan, loss model, RA 11057, loan collateral



Habitat Quality Monitoring and Macrobenthos Diversity: Integrated Assessment Framework for the San Pablo Seven Lakes Ecosystem

Maria Claret L. Tsuchiya, Sedney S. Mendoza and Emmanuel Ryan De Chavez

Animal Biology Division, Institute of Biological Sciences, College of Arts and Sciences,
University of the Philippines Los Baños, 4031, Laguna, Philippines

Abstract

Macrobenthic invertebrates are integral part of a lake ecosystem. They are vital in nutrient cycling and important components of the food web. Macrobenthos diversity and community assemblage are influenced by their habitat quality. However, optimal assessment and methods to determine their temporal and spatial dynamics in relation to habitat perturbations are still understudied. Identification of local macrobenthic indicator species of ecological stress also needs to be evaluated. Here, we present an integrated ecosystem assessment framework involving comprehensive monitoring of macrobenthos and their habitat characteristics in the seven lakes of San Pablo City. Specifically, the current condition of the lakes will be examined by determining water quality, nutrients loads, and pesticide levels affecting macrobenthos diversity and community dynamics. The data generated from this research will be utilized for the lake ecosystem science-based management which are relevant for human survival and sustainable development.

Keywords: lake ecosystem, macrobenthos, assessment framework, sustainable management

Connecting the Dots: Protein-Protein Interaction Network and Pathway Analysis of Cane Toad Responses to Environmental Toxicants

Jashin J. Rosal^{1,2*}, Maria Claret L. Tsuchiya^{1*}, and Hisato Iwata³

¹University of the Philippines Los Baños, Laguna, Philippines

²Caraga State University, Butuan City, Philippines

³Center for Marine Environmental Studies (CMES), Ehime University, Matsuyama, Japan



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Abstract

Biological processes are tightly maintained and regulated by an interconnected system of molecules such as proteins. Network analysis deciphers the functional organization of proteome, thus provide insights on the pathways affected by environmental contaminants in organisms like cane toads. We previously reported the presence of persistent organic pollutants in the liver of organisms from Laguna Lake. In this study, proteins of cane toads from the riparian zone of Laguna Lake were analyzed to understand the responses and adaptations of animals from environmental stressors. 1,833 proteins were identified using iTRAQ-based nano-LC-MS/MS proteomic approach. Gene ontology biological process annotation of differentially expressed proteins revealed relevant molecular functions involved in metabolic processes and ribosomal assembly. Protein-protein networks analyzed using STRING plug-in of Cytoscape3.0 showed involvement in chromatin organization, transcription, translation, and metabolism. Enriched biological pathways identified from the KEGG and REACTOME databases suggest that pollutants have direct effects in the level of gene expression and other important cellular processes. Hub proteins from these networks were SMARCA2, PPP2CA, GLDC, TRRAP, and some histone and ribosomal proteins. These hub proteins and its associated pathways are important biological processes involved in metabolism of toxicants. The current findings contribute to the knowledge on the response of cane toads from environmental toxicants.

Keywords: cane toad, liver, protein-protein interaction network, pathway analysis, hub proteins

**Do clearing and selective cutting in simulated plant communities follow
the Intermediate Disturbance Hypothesis (IDH)?**

Jerrold M. Tubay^{1*}, Monica C. Torres¹, Gimelle B. Gamilla¹, Destiny SM. Lutero¹

¹Mathematics Division, Institute of Mathematical Sciences and Physics
College of Arts and Sciences, University of the Philippines Los Baños

Abstract

Plant communities such as forests and grasslands are usually diverse with many coexisting plant species [1,2]. Through the years, though there is a significant reduction in plant diversity, even in the presence of human disturbance such as logging, species coexistence is still maintained. Here, we investigate the effect of human disturbance (i.e., clearing and selective cutting) to the coexistence of plant species in a simulated plant

community. Using the lattice Lotka-Volterra competition model, we will determine whether the said human interventions follow the Intermediate Disturbance Hypothesis (IDH). This hypothesis is an idea in ecology that states that species coexistence can be maximized if the disturbance is maintained at an intermediate level, meaning, it is not too rare nor too frequent [3]. In the model, we will include the idea of microhabitat locality, which has been shown to promote species coexistence [4, 5]. Here, we use and investigate two models: (1) microhabitat locality affecting seed establishment, and (2) microhabitat locality affecting species mortality.

Keywords: lattice simulation model, clearing, selective cutting, intermediate disturbance hypothesis

Influence of Different Organic Mulches on the Growth and Yield of Bitter Gourd (*Momordica charantia* L.) Under Two Types of Cultivation System

Whilma O. Tuyan and Zenaida C. Gonzaga

Department of Horticulture, College of Agriculture and Food Sciences
Visayas State University, Visca, Baybay City, Leyte 6521-A,

Abstract

Bitter gourd, *Momordica charantia* L., is one of the most important fruit-vegetable grown in tropical countries like the Philippines because of its enormous range of health benefits. However, its production is beset by problems on insect pests and diseases particularly the problems on the soil borne diseases causing wilting commonly caused by *Ralstonia solanacearum*. Aiming to offer an additional intervention to be used to increased crop productivity, this study has been conducted on bitter gourd to investigate the influence of different organic mulches on its growth, yield, insect pest and diseases under two types of cultivation system. Bitter gourd plant were grown in different organic mulching materials which are rice straw, rice hull, *Chromolaena odorata* leaves as (kakawate) and *Gliricidia sepium* leaves (hagonoy) under protective structure and open field cultivation system. Results have shown that organic mulching did not affect the growth and yield of bitter gourd in open field cultivation system while under protective structure, number and weight of marketable fruits was significantly increased by hagonoy mulch. Organic mulching also reduced the bacterial wilt infection particularly under rice straw, kakawate and hagonoy mulch compared to control in the open field condition. Only hagonoy mulch however, had reduced infection under in protective structure. The damage and population of insect pests were least under organic mulches in both cultivation systems. Moreover, all organic mulches greatly reduced weed growth grown



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

with bitter gourd plant causing lesser competition for nutrition from the soil. Organic mulching particularly hagonoy mulch together with protected cultivation had lowered bacterial wilt incidence and yield of bitter gourd.

Keywords: bitter gourd, organic mulches, cultivation system, bacterial wilt

**From Instability to Flexibility: The Social Ecological Resiliency of the island
barangays of Babatnin, Calero, Caliligawan, Masile, Namayan and
Pamarawan.**

Valeroso, John Christian C.
University of Santo Tomas

Abstract

This research investigates the social resiliency of island ecosystems off the coast of Malolos. As a qualitative study, it anchors on the Social-Ecological Resiliency framework creating an adaptive system in the context of the island barangays namely Babatnin, Calero, Caliligawan, Masile, Namayan and Pamarawan. Using the case study design, this research sheds light on the struggles of the locals and how they become resilient, as they live side by side with water. Methods used are in depth interviews using purposive sampling. Field texts are subjected through vertical and horizontal analyses identifying recurring themes and patterns that would frame the module in context of the local experiences. The study will eiditically surfaced ecological knowledge and understanding that could facilitate how people navigate island management practices, institutions, organizations and social networks. Initial findings of the research yield local-based concepts on social ecological resiliency serving as valuable inputs in identifying and framing an adaptive system for sound policy measures.

Keywords: Social-Ecological resiliency, adaptive system, instability, flexibility.

**Spatial Patterns of Urban Heat Island using Landsat and Sentinel Data in
Puerto Princesa City, Philippines**

Reagan M. Venturillo

Department of Forestry and Environmental Science, College of Agriculture,
Forestry and Environmental Science, Western Philippines University, Aborlan,
Palawan.

Email: reaganventurillo@gmail.com

Abstract

An urban heat island (UHI) is a phenomenon where higher atmospheric and surface temperatures occurring in the urban areas compared to the surrounding rural areas due to anthropogenic activities. Assessing the spatio-temporal characteristics of UHI is essential for understanding the urban thermal environment and development management. The urban areas of Puerto Princesa City has increased rapidly in the past decade due to growing population and economic activities. This study used Landsat and Sentinel images to study the urban heat island effects by mapping and detecting changes in land use and land cover using land surface temperature (LST) and normalized difference vegetation index (NDVI) and normalized difference build-up index (NDBI). Results show the positive correlation between LST and NDBI means that build-up areas increase the surface temperature, while there is negative correlation between LST and NDVI indicating that green spaces or urban vegetation weaken the effect of urban heat island in the study site.

Keywords: Urban Heat Island, LST, NDVI, NDBI, Puerto Princesa City

***In Vitro* Induction and Maintenance of Callus from Different Types of Explants of Cacao (*Theobroma cacao* L.)**

¹Ramonita C. Verano and ²Catherine C. Arradaza

¹Graduate Student, Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte

²Faculty, Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte

Abstract

The effect of plant growth regulators on callus induction in cacao (*Theobroma cacao* L.) using different types of explants was studied. The study was taken at the Plant Tissue Culture Laboratory (PTCL) of the Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte from September 25, 2018 to January 25, 2019 with four treatments which replicated thrice and was evaluated and assessed visually using callus growth scoring value. Flower bud, petiole, and leaf explants were used and cultured on the Murashige and Skoog (MS) medium with the following treatments: control (MS alone), TDZ (0.1 mg/L), 2, 4-D (1.0 mg/L) and TDZ + 2, 4-D (0.1 mg/L + 1.0 mg/L). The present investigation revealed that different kinds of explants showed significant impacts on callus induction of *T. cacao*. The potential of different PGRs in the induction of callus has been well documented in different plants in which generally, it was essential for the



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

initiation of callus *in vitro*. The highest callus induction rate was obtained in leaf explants and with the application of TDZ (0.1 mg/L) alone. After the culture establishment, callus induction of leaf explants was observed in TDZ, 2, 4-D and TDZ + 2, 4-D within twenty-five, thirty and thirty-one days, respectively. Whereas, leaf explants that cultured on the PGR-free medium (control) did not produce any callus. Callus tissue is good source of genetic variability and adventitious shoot formation. In the present study, supplementation of TDZ exhibited better callus morphogenesis.

Keywords: In vitro, callus, explants, Theobroma cacao L.

PILDS model: A collective view of Filipino Educators on localization of Education for Sustainable Development

Carmina S. Vicente^{1*,2} and Arlen A. Ancheta^{1,3,4}

¹The Graduate School, University of Santo Tomas, España, Manila

² College of Education, University of Santo Tomas, España, Manila

³ Faculty of Arts and Letters, University of Santo Tomas, España, Manila

⁴ Research Center for Social Sciences Education,
University of Santo Tomas, España, Manila

Email: amyvicente@yahoo.com; csvicente@ust.edu.ph

Abstract

This study explores the views of Filipino elementary teachers and administrators regarding localization of ESD being change agents towards sustainability. Anchored on the General Systems Theory which underscores systems thinking through which one can perceive sustainability, this qualitative study following a case study design investigated 41 purposively selected public school administrators and teachers in the four schools from the flood prone cities of Caloocan, Malabon, Navotas and Valenzuela in Metro Manila, Philippines. Data gathered through the “5-Words that come into your mind” activity and semi-structured interview were analyzed using a repertory grid and thematic coding revealing five main themes in the newly developed PILDS (Purpose, Institutional arrangements, Linkages of power, Delivery and Synergy) model depicting a multi-dimensional and interrelated concept with the human person at the heart of the process. This study allowed the unraveling of the multi-level perspectives of localization of ESD that emphasize the individuality of the person; paving the way to a deeper understanding of the process thereby, the advancement of sustainability in the local setting through the newly framed PILDS model that can serve as a guide for educational planners and

administrators in understanding the views of educators in localizing ESD in the grassroots level.

Keywords: localization, Education for Sustainable Development, Filipino educators, perception

Socio-Economic Status and Conservation Practices of the Cagayan River Bivalve Gatherers

**Cherry S. Wanya, Ph.D., Robert G. Carbonell, Ph.D., Mia Q. Columbano, DME, Bernie
N. Waña, MA, Mary Jane J. Bulusan, MS, Nenette T. Columna,
MS* Cagayan State University- Lallo, Lallo, Cagayan, Philippines**

Abstract

With the rising pressure of urbanization to biodiversity, this study aimed to obtain baseline information on the socio-economic profile of the Cagayan Bivalve gatherers, their fishing practices, conservational practices and awareness of environmental protection ordinances. Descriptive-survey method of research was employed in this study. Findings showed that the bivalves gatherers were in their middle adulthood, high school graduates, compose of 4-6 members in every household, with the father as prime gatherer; mother as the seller. Most of the bivalve gatherers earn an income of Php 4,501 – Php 6,500 monthly with an average harvest of 3-5 sacks per harvest per group using their own harvesting equipment or tool. Furthermore, most of the bivalve gatherers live in a rough finish bungalow with farming as their other source of income. Moreover, the most abundant species collected in the Cagayan River is bennek or tulya with the use of improvised catching nets. The peak of harvest is from the months of March to May. Almost everybody gathers daily in their own and neighbouring towns. Some of the bivalve gatherers take a bath daily and sometimes wash clothes and only a few throw their garbage in the river. Although most of them bury dead animals, some still construct piggery and/or near the riverbank and connect their drainage to the river. The harvest of the gatherers is sold either wholesale and retail mode in the market, neighbourhood and to other buyers who sell to other towns during market days, while small ones are being made into vinutong or in the form of “narnar” (unshelled). The bivalve gatherers are aware that not all existing municipal ordinances are implemented. The study presents policy recommendations for sustainable supply of bivalves in Cagayan River.

Keywords: conservation practices, environmental sustainability, bivalves gatherers



Environmental Knowledge, Attitudes, and Practices of Physics Teachers

Cherry Wanya, Ph.D.

Cagayan State University- Lallo Campus, Lallo, Cagayan, Philippines

Abstract

This study purposively determined the relationship between physics teachers' environmental knowledge and environmental attitude. The study employed a descriptive correlational research design. Questionnaires were administered to the sample respondents of physics high school teachers. The study used descriptive and inferential statistics. Results of the study revealed that the physics teachers have the high level of environmental knowledge implying that they manifest understanding and mastery of articulating environmental concepts in teaching physics. It was also revealed that they have favorable attitude and concern towards environmental issues around them. Their difficulties in integrating environmental education are generally low. Indicating that most of them infused the concept of environmental education in their teaching. The test of difference showed no significant difference between male and female physics teachers in their level of environmental knowledge, environmental attitude, and difficulties encountered in integrating environmental concepts. Further, level of educational attainment showed the significant difference in the level of environmental knowledge of the respondents. Consequently, the highest educational attainment showed no significant difference in terms of the environmental attitude and difficulties encountered by the physics teachers in integrating environmental education. In furtherance, there is a significant relationship between physics teachers' environmental knowledge and level of environmental attitude. The findings imply that the physics teachers need more relevant training to further strengthen their environmental competency.

Keywords: environmental education, environmental awareness, environmental attitude, physics teaching

Length Frequency Distribution of Razor Clam (*Pharus* sp.) in a Silty Loam Abandoned Fishponds of Candijay, Bohol, Philippines: A Key for Resource Conservation

Winfield E. Buscato

Bohol Island State University

Marine Biology Department, College of Fisheries and Marine Sciences

Candijay Campus, Cogtong, Candijay, Bohol 6312 Philippines

Abstract

Razor clam (*Pharus sp.*) is a Solenidae marine bivalve being gleaned for family consumption and as source of livelihood in coastal communities of Bohol, Philippines. The unregulated fishery and haphazard collection of any resources for a long - term period could lessen the population of good genotypic and phenotypic qualities of certain strains of biological resource through natural selection. The study aims to determine the length frequency distribution of razor clam and their population density in relation to sediment texture composition in two abandoned fishponds of Candijay, Bohol, Philippines. Gleaning of *Pharus sp.* were employed in triplicate 2x50 m² belt transect method at 10 m apart. Shell length of collected clams were measured to the nearest millimeter using a Vernier caliper. Results of frequency distribution for shell lengths of razor clams is linked to the amount of silt present in sediment, the more siltier the sediment, the higher population density of razor clam can be collected, and the frequently shell length collected in sampling sites ranges from 60 mm to 80 mm. Shell length larger than 80 mm were rarely found. Therefore, a policy is needed for allowable shell size to be gleaned for the sustainability of a resource.

Keywords: length frequency, sediment texture, population, razor clam, and Pharus sp.

Bird Diversity and Abundance in Three Sites in Nug-As Forest Reserve, Alcoy, Philippines

Jireh Jasmin Yang¹ and Mary Joyce Flores, PhD¹

1 Center for Environmental Informatics, University of the Philippines Cebu

2 Department of Biology and Environmental Science, College of Science,
University of the Philippines Cebu

Email:jirehjasminyang@gmail.com; mlflores2@up.edu.ph

Abstract

Cebu is one of the Philippine islands with the richest biodiversity. However, industrialization and pollution have lead to rapid deforestation, in turn leading to the endangerment and extinction of birds, which are important bioindicators of a healthy forest ecosystem. The main objective of this study was to determine the diversity and abundance of birds in Nug-as Forest Reserve in Cebu province. The data collection was carried out in the fragmented forest during the province-wide synchronized Black Shama count in March 30, 2019. The activity started at 6:00 AM with three transect lines of two (2) kilometers each plotted in different areas of the Forest Reserve, with one trail leading



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

uphill, one along the road, and another trail in the natural secondary forest. The distance from each point in the transect was 250 meters to avoid double-counting of birds. The Shannon-Wiener diversity index, Evenness index, Richness index, and Sorensen's coefficient were used to determine the species richness, diversity and similarity of the sites while One Way ANOVA was used to determine the significant difference of species richness and abundance. Further explanation on the studies methodology as well as its results and conclusions will be discussed in this paper.

Keywords: birds, biodiversity, abundance, Cebu, environmental informatics

**Social and Economic Benefits of Solid Waste Handling: A Case Study of
City of San Fernando, Pampanga, Philippines**

Arlen A. Ancheta; Belinda de Castro; Moises Norman Garcia;

Ma. Rosario Virginia Garcia; Ronald Castillo

University of Santo Tomas

Email: aaancheta@ust.edu.ph; arlen_ancheta@yahoo.co.uk

Abstract

This case study illustrates the economic and social benefits from handling solid waste, focusing on recovery practices through a decentralized approach. The objective of the study is to illustrate how a bustling city like the City of San Fernando, Pampanga, localized zero waste practices as an environmental policy to reduce solid waste. The study is anchored on the framework of zero waste city of Zaman and Lehman (2012). The study used mixed methods of survey, interview and observations. Results show that localization begins with creating CENRO, crafting local ordinances as legal framework, collaboration with NGO, cooperation from the local agencies, decentralized collection strategy, and intervention of the Materials Recovery Facility (MRF). Waste handling benefits provided livelihood, increased income, strong sense of community, awards and rewards. The Materials Recovery Facility as an intervention in the waste stream is a community asset. In conclusion, an emerging model of decentralized solid waste handling was crafted to frame the CSFP model showcasing the dynamics of social waste actors, behavioral shift and zero waste practices.



Gaps in Core Competencies for Effective Extension Service on Sustainable Agriculture Among Public Extension Workers in Two Selected Provinces: Basis for In Service Training Programs

Jose Edwin C. Cubelo

Associate Professor, Silliman University College of Agriculture,
Dumaguete City

Email: joseccubelo@su.edu.ph

Abstract

The Philippine government uses agricultural extension as its primary policy instrument to help improve the productivity and efficiency of farmers and fisher-folks. This study sought to determine the core competencies for effective agricultural extension service and ascertain the level of competence of agricultural extension workers (AEWs) in these areas as bases for determining in service training programs. Data were collected from 210 AEWs from the provinces of Siquijor and Negros Oriental, Philippines using cluster sampling strategies. To assess gaps in core competencies, the study adapted Borich (1980) Needs Assessment Model which determined the mean weighted discrepancy score (MWDS) between the AEWs' perceived level of importance and perceived level of competence regarding 40 extension-related professional competencies. Results show that the AEW rated all 40 competencies to be "important to very important" for effective extension service but indicated gaps in their perceived level of competencies for each of the items in the list. Using the MWDS, the top five areas in terms of competency gaps are the following: identifying and acquiring resources for programs; planning and designing appropriate programs; using quantitative and qualitative tools for data analysis; development of monitoring and evaluation tools; and using ICTs to source relevant information on improved and sustainable agricultural technologies. The study recommends the implementation of advanced in service training programs for EWs on the aforementioned competency areas to enhance the quality and effectiveness of their extension services.

Key words: agricultural extension, core competencies, in service training



Changes in Catch of Yellowfin Tuna *Thunnus albacares* with Sea Surface Temperature in Palawan, Philippines

Hermenegildo P Dela Peña^{1,3*} and Benjamin J Gonzales²

¹ College of Fisheries and Aquatic Sciences, Western Philippines University
Puerto Princesa Campus

² Research and Development/Extension Department, Western Philippines University
Aborlan, Palawan

³ Palawan State University, Puerto Princesa City

Email: hdelapena@psu.palawan.edu.ph

Abstract

Direct and indirect impacts of climate change in fisheries have been reported worldwide. This paper examines the relationship in catch of yellowfin tuna and sea surface temperature (SST) from 2002 to 2017 in Palawan. Commercial and municipal catch data from the Philippine Statistics Authority OpenSTAT and the National Oceanic and Atmospheric Administration SST data were analyzed using linear regression at 95% confidence interval and a p -value ≤ 0.05 . Results indicated that commercial fishing peak seasons were March-April-May (MAM) and June-July-August (JJA) while municipal fishing was during MAM only, the lowest catch was during December-January-February (DJF). About 162,120 metric tons (MT) of yellowfin tuna were harvested, of which 75% was contributed by municipal fisheries. The highest catch of 19,409 MT was recorded in 2006 while the lowest was 2,851 MT in 2017. The lowest seasonal mean SST of 27.17°C was recorded in DJF of 2002 at Tubbataha Reefs, while the highest of 30.93°C in JJA of 2010 at El Nido. The total catch and annual mean SSTs for Tubbataha Reefs and El Nido showed significant relationships at $p = 0.012$ and $p = 0.024$, respectively. In terms of seasonality, only MAM at El Nido presented a significant relationship at $p = 0.018$. Similar studies should be conducted in other fishing grounds of the country to provide additional information for sustainable management of tuna fisheries.

Keywords: fisheries, fishing season, climate change impact

Integrating Climate Change in the Bachelor of Science in Agriculture Curriculum: The Case of UP Los Baños

Imelda Grace Siregar and Maria Ana T. Quimbo

Abstract

Higher education plays a vital role in preparing graduates with sufficient understanding and knowledge to meet the challenges of climate change. This study was conducted to analyze the integration of climate change topics into the Bachelor of Science in Agriculture Curriculum with crop-based major curricula in UP Los Baños. Specifically, the study was conducted to: 1) discuss the process of integration of climate change in the curriculum and 2) construct an Index of Integration of Climate Change (iIOCC) into the BSA curriculum. Results revealed that UPLB does not have a course or subject about climate change although some topics related to climate change are embedded in some subjects. Using the Principal Component Analysis, the study found three dimensions that influence the iIOCC. These include Program and Curriculum Dimension, Organizational Dimension, and Academic Staff Dimension. It revealed that the Program and Curriculum Dimension is the most sensitive to iIOCC. The iIOCC for UPLB was 63 percent indicating that it can still improve its integration of climate change in its BSA curriculum. Recommendations are forwarded as to actions that UPLB can take to integrate climate change in the BSA curriculum.

Keywords: integrating climate change, curriculum development, index of integration of climate change

Disaster Preparedness Concepts, Frameworks, and Guidelines: the Philippine Case

Ricardo T. Bagarinao
(UP Open University), Philippines

Abstract

Disaster preparedness is imperative for households, businesses, and communities, but many remain unprepared. The increasing number of disaster-related mortalities in recent years highlights the need for individual responsibility, local and national coordination, and formulation of plans that ensure the ability of the local communities



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

and government units to respond to and recover from major events. More so, it requires widening the reach of information about the concepts, frameworks, and guidelines on disaster risk reduction and management. A strong knowledge-based on disaster preparedness will lead to its effective practice. This paper aims to discuss disaster preparedness concept, frameworks, and guidelines as adopted by different agencies engaged in disaster preparedness, and as adopted by the Philippine government. It also contrasts preparedness with mitigation and presents the guidelines and frameworks in the Philippine disaster risk reduction and management law.

Keywords: disaster preparedness, disaster preparedness framework, Philippines

**Drivers and Barriers to Effectives Disaster Risk Reduction and
Management Implementation: Cases in the Calabarzon Region,
Philippines**

Enrilito Bernardo, Jr., and Ricardo T. Bagarinao

(Philippine Public Safety College, Manila and Rizal Provincial Government, Rizal),
Philippines (UP Open University), Philippines

Abstract

The research attempts to discover what factors help some local government units (LGUs) perform better and what factors prevent them from achieving their goals of disaster risk reduction in compliance to their mandates provided in the eight (8) year old Republic Act 10121 or the Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010. Using a self-administered online survey, the 38 local disaster risk reduction and management officers (LDRRMOs) of the CALABARZON Region (IV-A), were asked questions regarding various factors affecting implementation including their office, council, risk awareness and perception, funding and resource allocation. Respondents were asked to enumerate top drivers and barriers to effective implementation where the verbatim answers were then encoded and categorized into themes. The top five drivers (political leader's support, community risk knowledge, national support, training and funds) and top five barriers (lack of sufficient funds, lack of personnel, poor community risk knowledge, high risk vulnerability and administrative issues) were further analyzed through one-way analysis of variance (ANOVA) in terms of province, LGU income classification, LGU type, SGLG and GK award status. Based on the results of the study, it has been confirmed twice (through qualitative and quantitative approaches), that the LDRRMO-identified drivers and barriers significantly affect effective PDRRM Law

implementation in the CALABARZON Region. The support of the political leaders and funding of an LGU play a critical role in increasing effectiveness. While lack of funds and lack of DRRM personnel negatively affects effective implementation.

Keywords: local disaster risk reduction, local disaster risk governance, drivers and barriers to effective disaster risk reduction

Disaster Preparedness of Two Landslide-Vulnerable Communities in Benguet, Philippines

Rameliren Borja and Ricardo T. Bagarinao

(Philippine Public Safety College, Manila and Bureau of Fire Protection, Benguet),
Philippines (UP Open University), Philippines

Abstract

The study assessed the perception, level of awareness and practice of disaster preparedness among the landslide-vulnerable communities in Barangay Ucab, Itogon, Benguet. The study employed a purposive research method where data were collected through a 4-point Likert-scale instrument where 4 is highest and 1 is lowest. About 100 respondents were selected purposively from the community residents, barangay officials and staff, uniformed personnel participated in the survey. Results indicate a moderate level of respondents' disaster preparedness. There were however differences being noted on respondents' perception on disaster preparedness while the extent of practice of disaster preparedness in the community is moderate. Given the vulnerability of the area to landslide and the moderate level of disaster preparedness and practice of the communities, it is recommended that the government should relocate the residents to some other safer places in the barangay.

Keywords: disaster preparedness, landslide, vulnerability, quantitative research, Ucab, Benguet



Early Warning System (EWS) for Disaster Preparedness: A Community Perceptual Case Study of the Tullahan River Basin, Philippines

Rosalie Pagulayan and Ricardo T. Bagarinao

(Philippine Public Safety College, Manila and PAGASA, Manila), Philippines

(UP Open University), Philippines

Abstract

The Philippines has been subjected to various hazards of hydro-meteorological origin. With an average of 19-20 tropical cyclones per year entering the Philippine Area of Responsibility (PAR), 7 to 9 of these weather disturbance are making landfall that creates serious impacts on various sectors, notable of these are the human society, agriculture and infrastructure. There are other weather systems that also influence the hydro-meteorological hazards, which at time are also causing invaluable negative impacts. Owing to this scenario, various international and local instrumentalities have highlighted the need for a people centered, end-to-end Early Warning System (EWS) as an important tool for national and local disaster risk reduction and management plan, particularly addressing the need to monitor the precursors or triggers that form the basis for warning and disaster preparedness activities and eventually minimizing the negative impacts of a disaster. The EWS should address not just the monitoring and warning component but also other key elements that are of equal importance: risk knowledge, information dissemination and communication and response capability. An important consideration that form the foundation for the establishment of an early warning system is the people's perception on the risk they face that motivate them to accept the need and include a functional early warning system in their disaster risk reduction and management plans. The study focused on the Tullahan River, evaluating how the barangays or communities with an established early warning system benefitted from it. As the EWS will cover other elements, the study presented the actions, activities and other platforms in the study area that are contributory to the successful implementations of the DRRM plans and actions. The study further aimed to provide guidance for PAGASA's programs and initiatives on EWS, giving due considerations on the perceived risk of the communities, engaging them in the design and implementation process.

Keywords: early warning system, disaster preparedness tool, Tullahan River

Facilitators and Barriers of Incident Command System Implementation for Disaster Response: The Case of Caraga Region, Philippines

Erma R. Suyo¹ and Ricardo T. Bagarinao²

¹Head, Provincial Planning and Development Office, Province of Agusan del Norte

²Professor, Faculty of Education, University of the Philippines Open University, Los
Baños, Laguna, Philippines

Abstract

The Philippines is highly vulnerable to disasters, and thereby, need a strong disaster response system. The Incident Command System (or ICS) was seen to address this need. But there is limited information on ICS practice in the country and the factors that influence its implementation as a disaster response tool. Using three data collection approaches, i.e. focused group discussions, key informant interview, and document analysis, the study determined the facilitators and barriers of ICS implementation in the context of natural disaster in Caraga region. Although ICS implementation in the study site had been affected by the lack of appropriate training among responders and coordination among sending agencies, it helps stabilize incidents and optimizes the use of resources. It strengthens interoperability of agencies involved in a disaster response. Enhanced community-disaster responders' partnership, integration of financial and accounting personnel into the incident management team, and regular training of local chief executives enhanced ICS capacity as a disaster response system. Although ICS did not ensure reduced number of casualties and property damages during a disaster, it is recommended that it should be evaluated regularly to address the factors that compromise its implementation.

Keywords: incident command system, disaster response, focus group discussion, key informant interview, Caraga

Toxicity Effect of Toad's (*Bufo marinus*) Parotoid Gland Secretion on the Frog's Heart Rate

Jose Noel V. Fabia^{1,4}, Aris A. Lapada^{2,4}, Elisa C. Noguera^{3,4}, & Noel F. Alfonso⁴

¹Department of Education, Division of San Jose del Monte City, Bulacan

²Eastern Samar State University, Main Campus

³Department of Education, Division of Manila

⁴De La Salle University, Manila



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Abstract

Study conducted to find out if there is a significant effect of toad's paratoid gland secretion to frogs' heart. The main instrument used in this study is the PowerLab/4ST ML760. There were four treatments of paratoid gland secretion used in this study: 2.5g, 0.5g and 1.0g. The venom was extracted through manual extraction of toad's paratoid glands. Ten (10) toads regardless of the size, sex, and weight were used in the experimental process. Based on the results of the study, there was an inconsistency of the heart rate of the ten frogs being studied. The rate goes faster as the heart to the concentration. The One-way ANOVA revealed that different means of the groups were not equal and to determine which of the concentration has the greatest difference among all means, the Scheffes post-hoc analysis was also conducted. It was revealed that 0.0 g concentration of paratoid secretion is significantly different from the other concentrations of the paratoid secretion and chemicals such as the epinephrine but not with Atropine and Pilocarpine. The concentration of 0.25g and 0.50g paratoid secretion is significantly different with 0.00g of concentration of paratoid secretion and Pilocarpine. While 1.0 g of concentration of paratoid concentration is only significantly different from the 0.00g concentration of paratoid concentration. The mean of the Atropine was not significantly different to any means. In addition, Epinephrine is only significant with the 0.00g concentration of paratoid secretion and Pilocarpine. Lastly, Pilocarpine is only significantly different from the concentrations of paratoid secretion in 0.25 and 0.50 g, and with Epinephrine. All means were significant at the 0.05 level. It can be concluded that in this study, as the frog's heart is exposed to the paratoid gland its heart rate.

Keywords: paratoid gland secretion, toxicity effect, frog, Bufo marinus, heart rate.

The Level of Tourists' Awareness on Anti-Littering and Anti-Smoking Ordinances In Puerto Princes City, Philippines"

Judy Ann V. Sarail, Ph.D-IHM, Judith M. Pasion, MBA, Ramon M. Docto, Ph.D.

Palawan State University

Email: judyann.valinosarail@gmail.com, judith.pasion@yahoo.com,

rdocto@psu.palawan.edu.ph

Abstract

The purpose of this study is to determine the level of tourists' awareness on Anti-Littering and Anti-Smoking Ordinances in the City of Puerto Princesa with its corresponding penalties, designated areas, and also the participation of tourism

*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

frontliners on information dissemination. This study also includes the comments and suggestions of tourists with their observation the two ordinances enactment of the implementing agencies: Oplan Linis for the Anti-Littering Ordinance and City ENRO for Anti-Smoking Ordinance. Descriptive statistics were utilized to analyze the data gathered through survey questionnaire and focus group discussion from 400 tourists. After interpreting the data, researchers found out that tourists are somewhat aware of both Anti-Littering and Anti-Smoking Ordinances in the City of Puerto Princesa. Based on the findings, the following are hereby recommended: the City government may seek support from all commercial airlines and sea vessels to take part in information dissemination; increase in number of signages to be installed in strategic places especially in various tourist attractions and entry point with corresponding penalties indicated; For strict implementation, Oplan Linis and City ENRO may consider continuous collaboration with various associations under the City Tourism Council, deputize residents in barangay level, and authors of ordinances may consider amendments for stiffer penalties to violators. With these, the local government may help the city to sustain its cleanliness, orderliness, and healthier environment.

Keyword: Puerto Princesa City, anti-littering ordinance, anti-smoking ordinance, oplan linis, tourist, healthier environment



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Poster Paper Abstracts



Ecological Diversity of Pteridophytes Across Land Use Types in Mt. Makiling, Philippines

Marjorie D. Delos Angeles^{1*}, Ailene A. Alcala² and Inocencio E. Buot, Jr.¹

¹Faculty, Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, Laguna

²University Research Associate II, Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, Laguna

Email: mddelosangeles1@up.edu.ph

Abstract

This study identified fern species and described its distribution pattern in reference to ecological parameters obtained from various land use types across the northeastern slope of Mt. Makiling Forest Reserve, Los Baños, Philippines. The plot technique was employed using a 20x20 meter quadrat. Three (3) 5x2 subquadrats were randomly distributed within the established quadrat. Cluster and ordination analysis was employed and edaphic factors were analyzed. Fern specimens were identified (sensu PPG) and measured. Samples were collected for herbarium voucher deposited in the PBDH. A total of 27 fern species from 13 families were recorded across the different land use types. Cluster analysis revealed six land use types: buffer, agroforest, agri-farm, roadside, mahogany, and forest. Among the land use, the Agila forest had the most number of fern species (9) and the agri-farm and mahogany had the least number of fern species (6). Analysis showed that pH and soil moisture were significant explanatory drivers of fern distribution. Understanding the relationships of ferns and edaphic factors in the Mt. Makiling would aid in the creation of a forest management and conservation plan.

Keywords: edaphic factors, ferns, Mt. Makiling Forest Reserve



Nurturing Nature, a Two-Way Street: The Mangrove Conservation and the Ecotourism in Brgy. Silonay, Calapan City

Wylene Mari B. Agua, Leann A. Cruz, and Maria Patricia Adrianna V. Olagat

Abstract

Mangrove Forests are wetlands that are found in coastal areas that serve as sanctuaries for aquatic creatures and natural barriers against natural calamities. These forests have also been proven to provide livelihood for its surrounding community and natural resources like fishes, and shells for fishermen, and poles and other building materials for construction. Despite the benefits, there is a vast depletion of Mangrove forests. Considered as one of the most neglected plantations in the tropical and subtropical regions, the continuous decrease is a result of degradation of these lands as they are converted to commercial areas, human settlements, or aquaculture farms. Philippines is among the Southeast Asian countries whose Mangrove Forests face the same threats. As Mangrove Forest conservation is heavily motivated by its environmental and economic benefits, ecotourism is used to promote the protection and rehabilitation of these forests. Ecotourism has been a trend of nature-based tourism and has increased its impact on promoting conservation. As such, the researchers of this study focused on both conservation and ecotourism of these Mangrove forests. This research is a qualitative case study that used the Theory of Environmentally Responsible Behavior of Hines, Hungford, and Tomera (1987), to identify and analyze the mangrove conservation and ecotourism in Brgy. Silonay, Calapan City, Oriental Mindoro. The researchers interviewed the local community, local government, and NGO's involved in the conservation of mangroves in Silonay and used thematic analysis to study the data gathered. The results project the importance of mangrove conservation and indicate the features of a sustainable ecotourism through the model created by the researchers, KEECS Development Model.

Keywords: mangrove forests, conservation, ecotourism, environment, sustainable

Ecological Diversity of Pteridophytes Across Land Use Types in Mt. Makiling, Philippines

Marjorie D. Delos Angeles^{1*}, Ailene A. Alcala² and Inocencio E. Buot, Jr.¹

¹Faculty, Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, Laguna

²University Research Associate II, Plant Biology Division, Institute of Biological Sciences,
College of Arts and Sciences, University of the Philippines Los Baños, Laguna
Email: mddelosangeles1@up.edu.ph

Abstract

This study identified fern species and described its distribution pattern in reference to ecological parameters obtained from various land use types across the northeastern slope of Mt. Makiling Forest Reserve, Los Baños, Philippines. The plot technique was employed using a 20x20 meter quadrat. Three (3) 5x2 subquadrats were randomly distributed within the established quadrat. Cluster and ordination analysis was employed and edaphic factors were analyzed. Fern specimens were identified (sensu PPG) and measured. Samples were collected for herbarium voucher deposited in the PBDH. A total of 27 fern species from 13 families were recorded across the different land use types. Cluster analysis revealed six land use types: buffer, agroforest, agri-farm, roadside, mahogany, and forest. Among the land use, the Agila forest had the most number of fern species (9) and the agri-farm and mahogany had the least number of fern species (6). Analysis showed that pH and soil moisture were significant explanatory drivers of fern distribution. Understanding the relationships of ferns and edaphic factors in the Mt. Makiling would aid in the creation of a forest management and conservation plan.

Keywords: edaphic factors, ferns, Mt. Makiling Forest Reserve

Mammalian Fauna in Agricultural and Agroforest Landscapes in the Philippines

**Ace Kevin S. Amarga^{1,2}, Roman N. Fornesa⁴, Dwight Mitchell S. Dandoy³, Desamarie
Antonette P. Fernandez³**

¹Department of Biological Sciences, College of Arts and Sciences, Cavite State University-
Don Severino delas Alas Campus

²School of Environmental Science and Management, University of the Philippines Los
Baños

³Animal Biology Division, Institute of Biological Sciences, College of Arts and Sciences,
University of the Philippines Los Baños



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

⁴Adaptive Agronomy and Pest Ecology Cluster, International Rice Research Institute, Los
Baños, Laguna, Philippines
Email: ace_amarga061@yahoo.com

Abstract

The Philippine archipelago is home to more than 200 species of mammals belonging to 12 orders and more than half of the recorded species are known to be endemic. Mammals can be found in almost all forms of terrestrial setting in the Philippines ranging from tropical forests to agroecosystems. These agroecosystems serve as foraging and feeding grounds to a variety of mammals ranging from rats and mice (Order Rodentia) to civets and leopard cats (Order Carnivora). Presence of mammals in agricultural and agroforest landscapes have a great impact on vegetation structure, crop yield, and floral species dispersal. However, some of these mammalian species can serve as pest and in certain cases, as vectors of diseases. Using metanalyses, we present an update on the diversity, ecology, and impact of mammals vis-à-vis agricultural and agroforest landscapes. Furthermore, we examined the role of agroforest landscapes as wildlife corridors in relation to mammalian conservation in the Philippine setting.

Keywords: agroecosystem, agroforest, conservation, diversity, Mammalia.

**Women and Flood Disaster Management: Barangay 820 Paco, Manila in
context**

Apelit, Althea Mae C.^{1,2}; Arroyo, Alea Kim B.^{1,2}

Faculty of Arts and Letters, University of Santo Tomas

Abstract

This paper illustrates women's view on flooding as a disaster in Barangay 820, Paco, Manila. Using Moser framework (1980) by Caroline Moser, the objective of the paper is to understand the role of women in flood disaster and analyze the functions and the roles of women in disaster management. This is a qualitative study that analyzes the narratives of women in their experience during the flooding events in the Barangay 820 Paco, Manila. The methods used were interview and field observation aided by transcription, field notes, and secondary data. The results show that the women's first priority is the family or their reproductive roles focusing in the safety of their family members and the security of their properties. Second is their involvement in disaster risk

management as the women consider men to be the main actor in disaster management. Men have the strength and capabilities of assisting vulnerable sectors whereas women choose to perform their household roles. The women do not have initiatives in disaster risk management activities, because they are dependent on government intervention. In conclusion, women in disaster risk management are mainly focused on volunteerism, second to their reproductive roles.

Keywords: women, disaster management, flooding, roles, disaster, safety, security.

Flowering and Steviol Glycoside Accumulation in Stevia: Photoperiod and Nitrogen Manipulation *In Vitro* And *Ex Vitro*

Catherine C. Arradaza¹, Evalour T. Aspuria², Constancio C. De Guzman², Lourdes B. Cardenas², Rocelie R. Zara² and Ma. Lourdes O. Cedo²,

¹Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Visca, Baybay City, Leyte, 6521, Philippines

²Crop Physiology Division, Institute of Crop Science, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna 4031, Philippines

Email: catherine_arradaza@yahoo.com

Abstract

Flowering and steviol glycoside (SG) accumulation of *Stevia rebaudiana* Bertoni under Philippine condition can be purposely manipulated by controlling photoperiod and nitrogen levels. In the present study, the most appropriate photoperiod and nitrogen level for flowering and steviol glycoside (SG) accumulation of stevia grown *in vitro* and *ex vitro* under local condition was investigated. In stevia, flowering is an important phenological stage since SG content in the leaves is reported to decrease prior to flowering. Under *in vitro* condition, flowering was inhibited when exposed to natural condition, 13-hour and 15-hour photoperiod except in 11-h but of low flower bud formation (2%). When tissue culture-derived stevia was allowed to develop *ex vitro*, flowering was effectively inhibited at 15-h photoperiod. SG analysis showed that *in vitro*-grown stevia had lower stevioside and rebaudioside A than tissue culture-derived stevia. Increasing the amounts of source of N (2x=32.0g and 3x=48.0g NH₄NO₃) in the Murashige and Skoog (MS) medium than the normal (16.0g NH₄NO₃), did not induce flowering of *in vitro* plantlets but increased SG accumulation. Tissue culture-derived stevia applied with nitrogen fertilizer (5, 10 and 15 g urea) did not alter their flowering response to the natural short photoperiod. A high SG content was observed in the highest N level, but increasing N level did not reach the level



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

of SG production by the tissue culture-derived plants. Significantly higher total SG accumulation (% of dry weight) per plant in the fertilized plants was recorded, particularly at the stage just before or at the start of flowering.

Keywords: photoperiod, nitrogen, flowering, steviol glycosides, tissue culture

Institutional Arrangements in Managing Transboundary Subwatershed: A Case Study of Silang-Sta. Rosa River

Besinio, Maria Francine Therese S.^{1,2}; Urmatan, Camille Joyce C.^{1,2}; Ancheta, Arlen ^{1,2}
Faculty of Arts and Letters¹, University of Santo Tomas²

Abstract

This study aims to assess the institutional arrangements in managing the Silang-Sta. Rosa River and the effect of the implemented projects in mitigating river pollution. Anchored on the framework of the Integrated River Basin Management (IRBM) governance, the Silang-Sta. Rosa River is a transboundary subwatershed that has emerging problems of environmental degradation. The management of the river is spearheaded by the Laguna Lake Development Authority (LLDA) with four different local government units namely Sta. Rosa, Silang, Cabuyao, and Biñan as the subwatershed pass through different political borders. As a qualitative study, methods used were interviews and observations. Results of the study showed that the arrangement in managing the Silang-Sta. Rosa subwatershed uses a top-down approach, from the Policy Level to the Implementation Level, up to the Operational Level. Ensuring a collaborative management of the Operational Level, the local governments used the ridge-to-reef approach, that views the river as a system from the upland down to the Laguna lake. In conclusion, rivers as transboundary resource needs collaborative management with multi sectoral actors.

Key words: Silang-Sta. Rosa subwatershed, transboundary river, Integrated River Basin Management, institutional arrangements



Understanding Economic Vulnerability of Small-Scale Fisherfolks along the Lakeshore of Laguna De Bay

Botardo, Ma. Ann Dominique M.^{1,2} and Cabujat, Dyann Queenzelle C.^{1,2}

Faculty of Arts and Letters, University of Santo Tomas

Abstract

The paper examines how the lakeshore fisherfolks of San Pedro, Laguna able to overcome economic difficulties due to ecological problems arising in the lakeshore of Laguna de Bay. The methods used are semi-structured interview and non-participant observations. The use of field observation, field notes and transcripts were also utilized. This paper illustrates how the fisherfolks reliant on the marine resources of the lake frame vulnerability and fishing experiences from barangays Landayan and San Roque, Laguna. Results show that small scale fisherfolks in San Pedro, Laguna are economically vulnerable due to the decreasing number of fish catch, pollution, presence of invasive species that greatly affect their livelihood. In conclusion, Laguna Lake Development Authority (LLDA) regulates and assists the fisherfolks to provide livelihood action plans and the government occasionally provides these fisherfolks gears that could help them improve their catch. Furthermore, the local government alongside with LLDA should give priority in responding to the needs and problems of these fisherfolks and to the betterment of the lake as well.

Keywords: Vulnerability, Fisherfolks, San Pedro, Laguna, Laguna de Bay, Laguna Lake Development Authority (LLDA)

Impact of Varying Concentrations of Liquid Fertilizer on the Yield Components of Cabbage (*Brassica oleracea* var. *capitata* L.) Under Screenhouse Condition

Merlyn Guzman-Buscato

Silliman University, College of Agriculture
Dumaguete City 6200 Philippines



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Abstract

A pot experiment was conducted to evaluate the effect of four different concentrations (i.e. 0%, 25%, 50%, 75%, and 100%) of liquid fertilizer on the yield components of cabbage. The set-up was laid out in a Completely Randomized Design (CRD) with the different concentrations of liquid fertilizer as treatments. Each treatment was replicated three times containing five plants per replicate. The application of liquid fertilizer was done twice a month prior to head formation of the crop and harvesting was conducted upon reaching the marketable heads. The effect of liquid fertilizer is determined by measuring the vegetative parts (i.e. plant height, number of leaves, leaf area, length and weight of roots, and total herbage yield), and reproductive part (i.e. diameter and weight of cabbage heads). The application of various concentrations of liquid fertilizer showed no significant differences except at the 25% liquid fertilizer concentration that is manifested on the enhanced length and weight of roots and the diameter and weight of cabbage heads. Thus, the 25% concentration is the ideal liquid fertilizer concentration for better root performance leading to improved cabbage head production.

Keywords: fertilizer, cabbage, yield, concentration, and Brassica oleracea

**Factors Associated with the Adoption of Organic Farming Practices in Fruit
Tree Nursery Farms in Davao City, Philippines**

Adrian Dee A. Bustaleño¹ and Jose Edwin C. Cubelo²

BSAB IV student¹ and Associate Professor², College of Agriculture, Silliman University,
Dumaguete City.

Email: adrian.dee.bustaleno@gmail.com

Abstract

This study aimed to determine the relationship between the socio-economic characteristics of nursery farm owners and their level of knowledge on and adoption of organic farming practices. A total of thirty (30) fruit tree nursery farm owners in Davao City were included in the study. A structured interview schedule was utilized to obtain data from the respondents in a face to face interview. Data were described using frequency counts and percentages, and the relationships between the variables were determined using Chi-square test of independence. Results show that majority of the respondents were females, middle aged, possessed high school level of education, and

operated medium-sized nursery farms raising mainly cacao seedlings. Majority were found to have low to moderate levels of knowledge on organic farming practices. None of the respondents adopted a completely organic system of farming, with the majority opting to have a mix of organic and conventional agricultural practices. The educational attainment of the nursery farm owners was found to be significantly associated with their level of knowledge on organic farming practices. Similarly, educational attainment and size of the nursery farm were also found to be significantly related to the level of adoption of organic farming practices. However, the study presented no significant relationship between level of knowledge on organic farming practices and their level of adoption suggesting the influence of other factors.

Keywords: organic farming, adoption, nursery farms

Teachers' Perception and Readiness of the Spiral Progression in the Science Curriculum of the K to 12 Programme

Rosario M. Canlas^A and Ian Phil M. Canlas^{BC}

^A Division of Biliran, Department of Education, Naval, Biliran Province

^B School of Arts and Sciences, University of Central Asia, Naryn, Kyrgyz Republic

^C School of Educational Studies, University Sains Malaysia, Penang Island, Malaysia

Abstract

The concept of spiral progression in a curriculum may not be totally new. With the most recent changes in the basic education programme of the Philippines, the principles of spiral progression have taken significant contribution in the development of the framework for the science curriculum of the K to 12 programme. It is hypothesized that significant level of perception and readiness of the former may be necessary for the successful implementation of the later. Having the K to 12 programme in place for about nine years now, the present study attempted to explore the perception and readiness of science teachers on the spiral progression of the science curriculum in the hope of being able to identify and address existing gaps and challenges. Using the mixed-method design and having surveyed and interviewed 50 science teachers of the Department of Education in the Division of Biliran Province, results revealed gaps and challenges that may be detrimental in the successful implementation of the science curriculum across levels. Hence, it may be necessary to develop and implement a professional development program for science teachers that is context and issue-specific.

Keywords: spiral progression, science curriculum, K to 12 programme



Anti-Microbial Activities of the Soft Tissues of Asian Clam (*Corbicula fluminea*) OF Muller 1774 (Bivalvia Corbiculidae)

De Guzman, Marco F¹. And Argente, Francis Albert T.²

Aurora State College of Technology Casiguran Campus¹ Pangasinan State University
Binmaley Campus²

Abstract

Antimicrobial activity of various concentrations of the ethanolic crude extract (ECE) of *Corbicula fluminea* was tested against bacteria and fungi using standard discs diffusion technique. There were three bacteria used on the antibacterial assay namely the *Escherichia coli* (gram-negative), *Pseudomonas aeruginosa* (gram-negative bacteria), *Staphylococcus aureus* (gram-positive) and for antifungal assay the fungi, *Candida albicans*, and *Aspergillus niger* were used. The ethanolic crude extract (ECE) showed 12.67-h activity on *E. coli* with inhibition zone (IZ) range of 10-12.8 mm. Similar IZ range (10.6-12.4 mm) was observed in *P. aeruginosa* and with efficacy time of 14 h. *S. aureus* test cultures showed also activity of ECE with IZ range of 0.00 to 17 mm and efficacy time of 15 h. Both of the two fungal strains tested showed activity of ECE, IZ range of 8.3-10.5 mm was observed in *A. niger* with efficacy time of 19 h while *C. albicans* showed activity with IZ range of 9.6-12.8 mm with efficacy time of 21.33 h. The study showed that *C. fluminea* is a potential source of antimicrobial compounds. Identification, extraction, and purification of such compounds are recommended for future studies.

Keywords: Corbicula fluminea, antimicrobial activities, inhibition zone, efficacy time

Ethnomycological Survey and Species Listing of Macrofungi Utilized by Bago Tribe in Alilem, Ilocos Sur

Dana Theresa C. De Leon¹, Rence Marrion M. Pineda¹, Benjie L. Garcia¹, Shiena Marie C. Fermin⁴, Mark Adrian G. Del Rosario¹, Eduardo J. Damaso Jr.¹, Joshua C. Ramos¹, Sofronio P. Kalaw^{1, 2, 3}, Rich Milton R. Dulay^{1, 2, 3}, Angeles M. De Leon^{1, 3}, Jerwin R. Undan^{1, 3, 4} and Renato G. Reyes^{1, 2, 3}

¹Tuklas Lunas Center, Central Luzon State University, Science City of Munoz, Nueva Ecija

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

³Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija

⁴Biotechnology and Analytical Laboratory, Central Luzon State University, Science City of
Munoz, Nueva Ecija

Abstract

The indigenous knowledge and utilization of macrofungi by the Bago tribe in Ilocos Sur was documented in this study. An ethnomycological survey of macrofungi was performed by gathering information through survey questionnaires and interview with the chieftains and members of the Bago tribe on how they utilized, collect and cultivate mushrooms. Mushroom collection was done during the rainy season with the assistance from the chieftain of the tribe. The macrofungi was collected and initially identified morphologically during their fruiting body stage and were photographed *in situ*. Results showed that most of the respondents knew about mushrooms and commonly call it “uong” or “kuwat” and utilized as food. Based on the questionnaires, the community utilizes 15 species of mushroom for consumption and medicine and 9 species were molecularly identified using Internal Transcribed Spacer (ITS) gene primers. PCR products were sequenced through Sanger sequencing and used for molecular identification and phylogenetic analysis. Sequences were assessed, searched and queried in Genbank using NCBI-BLAST which led to the following identities *Coriolopsis caperata* (98.35%, KU535647), *Polyporus philippinensis* (92.80%, MG273731), *Ganoderma gibbosum* (99.49%, KY203856), *Trametes elegans* (100%, JN164936), *Lentinus squarrosulus* (100%, MH172168), *Trametes elegans* (100%, LC176779), *Pleurotus djamor* (100%, MH862831), *Marasmius palmivorus* (99.56%, MF100964), *Daedalea flavida* (99.33%, MH855616). There are no previous articles regarding species listing of wild mushrooms in Ilocos, making this the first record of these species present in the area.

Keywords: Ethnomycology, macrofungi, Bago tribe

Mycochemical Screening, Anti-Oxidant Activity and Cytotoxic Property of *Phellinus robiniae* Collected from Mt. Pulag, Kabayan, Benguet

Evangelista, Thomas Rupert L.¹ Kalaw, Sofronio P.¹ & De Leon, Angeles M.¹

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

Abstract

Mushrooms have long been used as food, medicine and other purposes. Their relevance in modern day pharmaceuticals and nutraceuticals is a product of human research over time. Several studies have been conducted on various macrofungi, however little is known about the *P. robiniae*. *P. robiniae*, of the family Hymenochaetaceae is a woody bracket macrofungus which almost exclusively grow on locust tree, decaying wood and logs. In order to establish the nutraceutical potentialities of *P. robiniae*, the mycochemical composition, anti-oxidant activity and cytotoxic property of the fruiting bodies were evaluated. In this study, the fruiting bodies generally contain eleven bio-active secondary metabolites such as essential oils, phenols, sugars, triterpenes, coumarines, anthraquinones, anthrones, tannins, alkaloids, flavonoids and steroids. Essentially, this study also revealed that *P. robiniae* exhibited anti-oxidant activity with a DPPH radical scavenging activity of 34.59% and a total phenolic content of 49.42 mg GAE/g of sample. Moreover, the ethanolic extract of *P. robiniae* showed an LC₅₀ of 328.05 ppm which is considered as moderately toxic.

Keywords: cytotoxic, macrofungi, mycochemical, Phellinus robiniae, antioxidant

Enhanced Growth Performance of Molecularly Identified Wild Polyporous Mushroom Collected in Lupao, Nueva Ecija, Philippines

Benjie L. Garcia¹, Gervin S. Tandingan⁵, Princess Hershey V. Campos⁵, John Aerielle P. Cruz⁵, Veronica I. Matic⁵, Rence Marrion M. Pineda¹, Dana Theresa C. De Leon¹, Joselito DG. Dar⁶, Rich Milton R. Dulay^{1,2,3}, Sofronio P. Kalaw^{1,2,3}, Jerwin R. Undan^{1,2,4} and Renato G. Reyes^{1,2,3}

¹Tuklas Lunas Center, 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

³Center for Tropical Mushroom Research and Development, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija

⁴Biotechnology and Analytical Laboratory, Central Luzon State University, Science City of Munoz, Nueva Ecija

⁵Laboratory High School, Nueva Ecija University of Science and Technology-General Tinio Campus, Cabanatuan City, Nueva Ecija

⁶JDGD Agri-Tech Enterprises, Lupao, Nueva Ecija

Abstract

Cultivated and wild mushrooms contain reasonable amounts of proteins, carbohydrates, minerals, fibers and vitamins and available literature reviews indicate that mushrooms have mycochemical compounds of strong functional activities. This study aimed to identify and enhance the performance on *in vitro* laboratory condition of a wild mushroom rescued from a private farm located in Lupao, Nueva Ecija. The mushroom was rescued initially in a water agar media. The successfully grown mycelia were inoculated in different indigenous media; Rice Bran Decoction broth, Taro-Sucrose broth, Coconut-Sucrose broth and Potato-Sucrose broth. Other physico-chemical conditions of the broth such as pH, temperature, aeration and illumination were adjusted to optimize mycelial growth. DNA was extracted from the mycelia using cetyltrimethyl ammonium bromide (CTAB) method and the internal transcribed spacer (ITS) gene polymerase chain reaction (PCR). The products were sequenced using Sanger Sequencing and queried using NCBI-BLAST in the GenBank Database. The wild mushroom was identified as *Trametes sanguinea* ([KP012989.1](#), 99.42% identity) with optimum growth in Coconut-Sucrose broth with pH 5.5 at room temperature (24°C to 28°C) aeration in a bottle plugged with cotton and with proper illumination.

Keyword: Trametes sanguinea, enhanced performance, polymerase chain reaction

Scientific Attitude and Behavior and Learning Strategies in Biological Sciences

Martha Joyce G. Garciano

Cebu Technological University San Francisco Campus, San Francisco, Cebu

Email: joycegarciano@yahoo.com.ph

Abstract

Biology, an integrative science, required the application of scientific processes. Hands-on activities involving inquiry and discovery were designed and planned. Students acquired appropriate science attitude and behavior while taking part actively in learning tasks. This study, anchored on Experiential Learning Theory, determined the manifestation of scientific attitude, behavior and extent of use of science learning strategies as perceived by students and teachers, and their relationships. Descriptive method was used and data were gathered using Rating Scales for Scientific Attitude and Behavior, and Self- evaluation checklist for the science learning strategies, and treated



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

using Weighted Mean, Pearson Product Correlation of Coefficient, and t-test. Results revealed that scientific attitude and behavior were often but not always manifested by the students; specifically, creativity and wellness in manipulating laboratory equipment and materials were seldom manifested. The extent of use of science learning strategies was often and always manifested by the teachers. The relationship of Scientific Attitude and Behavior and the extent of use of Science Learning strategies revealed a computed r value of .62 and a computed t value of 7.77 at 0.05 with a df of 98, thus, significant. Therefore, scientific attitude and behavior were often manifested by the students, except creativity and wellness in manipulating laboratory equipment and materials. The use of science learning strategies affected the scientific attitude and behavior of the students during Biological science classes. Enhanced learning activities which promoted scientific attitude and behavior, developed independence in the students, and enhanced the communication skills are recommended.

Keywords: scientific processes, learning-by-doing, laboratory, enhanced learning activities

A Network Approach to Analyzing the Structure of Junior High School Mathematics Curriculum

Geleena A. Gestuada¹, Marisol P. Martinez¹, Marie Joy F. Lopez², Mark Lexter D. De Lara¹, Allen L. Nazareno¹, and Ranzivelle Marianne L. Roxas-Villanueva¹

¹Institute of Mathematical Sciences and Physics, College of Arts of Sciences,
University of the Philippines Los Baños

²Institute of Statistics, College of Arts of Sciences, University of the Philippines Los Baños

Abstract

K to 12 Mathematics Curriculum is designed to progress spirally to encourage students in using their previous learning experiences to new lessons. Thus, mastery of common pre-requisite competencies across year levels and domains in the junior high school mathematics curriculum is essential to achieve this goal efficiently. In this study, the structure of the junior high school mathematics curriculum guide was analyzed using complex networks. Network analysis has gained popularity for its vast applications in education research over the years. Valuable insights can be obtained by examining how the units (nodes of the network) are connected to one another. Here, the network was formed by considering the learning competencies as the nodes. Nodes are linked if one is a prerequisite of the other learning competency. Prerequisites to each learning competency were identified using teaching guides provided by the Department of

Education. The network consisting of 215 nodes and 1022 edges was analyzed using Cytoscape. Results showed the most useful learning competencies across domains are: performing fundamental operations on integers and rational numbers (Numbers and Number Sense), approximating the measures of quantities (Measurement), deriving relationships of geometric figures using measurements and by inductive reasoning (Geometry), evaluating algebraic expressions for given values of the variables (Patterns and Algebra), and counting the number of occurrences of an outcome in an experiment (Statistics and Probability). Overall, competencies that need mastery are performing operations on integers, performing operations on rational numbers, and evaluating algebraic expressions for given values of the variables.

Keywords: junior high school, learning competencies, networks, prerequisite competencies, mathematics curriculum

Ampatola: A Strategy of Controlling Bacterial Wilt and Increasing Yields of Ampalaya (*Momordica charantia* L.)

Zenina Joan C. Gonzaga¹, Zenaida C. Gonzaga¹, Ana Linda G. Gorme¹, Ryan D. Quirante¹, Christine Joy Cabahit¹, Warren L. Obeda¹, Griezapa¹, Dhenber C. Lusanta¹, and Othello B. Capuno²

Department of Horticulture, College of Agriculture and Food Science¹, Office of the Vice-President for Research and Extension², Visayas State University, Visca, Baybay City, Leyte 6521-A

Abstract

Grafting of vegetable seedlings is a unique horticultural technology used worldwide to overcome soil-borne diseases, increase plant vigor under various environmental stress conditions and consequently increased yields. Grafted vegetable plants are 'physical hybrids' resulting from combining at least two varieties, a rootstock and at least one scion. *AmPatola* is made by *grafting* Ampalaya as scion to Patola rootstock. Ampalaya is known for its susceptibility to a number of soil-borne diseases, particularly, bacterial wilt while patola for its genes for resistance against a number of soil-borne diseases. This study was conducted to evaluate the growth and yield of grafted and non-grafted ampalaya and compare their resistance to bacterial wilt infection. The experiment was laid out in Split-plot design arranged in RCBD with the type of planting materials whether grafted and non-grafted as the main plot and the three ampalaya varieties, namely Mestisa, Moon beauty and Poseidon as sub-plot factors. Ampatola or the grafted ampalaya had higher percent survival and lower bacterial wilt incidence,



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

longer productive life and higher yield than non-grafted ampalaya. Mestisa and Poseidon were comparable in terms of fruit size and yield and were significantly longer, greater in number and heavier than Moon beauty. Ampatola therefore is a solution to bacterial wilt problem and is recommended for planting in bacterial wilt infected areas.

Keywords: vegetable grafting, stock, scion, grafting chamber, Ralstonia solanacearum

Effectiveness of Different Soil Blankets in Increasing Yields of Cucurbits

**Zenaida C. Gonzaga¹, Warren L. Obeda¹, Ana Linda G. Gorme¹, Jessie C. Rom¹,
Dhenber C. Lusanta¹, and Othello B. Capuno²**

Department of Horticulture, College of Agriculture and Food Science¹

Office of the Vice-President for Research and Extension²

Visayas State University

Visca, Baybay City, Leyte 6521-A

Abstract

The Cucurbitaceae or gourd family has many economically useful species. However, its production faces different problems especially on waters stresses that greatly affected the water and nutrient uptake by the plants which reduced the yield. Likewise, public concerns on health and environmental effects of synthetic pesticides is prompting researchers to look for any alternative, non-chemical pest control measures especially on weed control. Six studies were conducted to evaluate the effects of different mulching materials on the growth and yield of the different cucurbits including bottle gourd, watermelon, honeydew melon, cucumber, muskmelon, and squash. These studies have the following treatments; control (unmulched or bare soil), corn stalk, rice hull, rice straw, scratch paper, and plastic mulch, and were laid out in Randomized Complete Block Design with three replications. Results showed that mulching using plastic and different organic mulching materials showed favorable effects on the vegetative and reproductive performances of the crops showing earliness in flowering, fruiting and harvesting compared to unmulched plants. Most of the cucurbit species showed two to three times significant increase in yield than unmulched plants. Mulching using plastic showed the highest yields and the most effective in suppressing weed growth in all trials conducted.

Key Words: weed incidence, bacterial wilt, plastic mulch, organic mulch

Outcomes-Based Education in Environmental Science: An Alternate Strategy to Directly Involve College Students in Waste Management at the Pampanga State Agricultural University

Maydeen D. Guevarra and Michael Angelo C. Nicdao

College of Arts and Sciences, Pampanga State Agricultural University
Magalang, Pampanga

Abstract

Outcomes-based education is becoming the standard method of teaching in our country. It focuses on student outputs, emanating from the application of the principles of science and the arts. This method of teaching may be used also as a tool to involve college students in addressing community problems such as in waste management. In our class, the students were required to conceptualize a scheme that aimed to raise the awareness of their schoolmates on waste segregation. They were also required to implement the schemes and analyze their effectiveness by determining the types of wastes in the three-colored bins— green for biodegradable, red for non-biodegradable and yellow for recyclable—that were placed around the campus. Analyses were conducted prior to and after the scheme implementation. Results showed improvement in the waste segregation practices among their schoolmates. Our students recommended subsequent strategies to other classes to mold the attitude of their schoolmates towards proper waste management and develop an environment-friendly academic community.

Keywords: outcomes-based education, waste segregation, waste management, student involvement

Exit Sign: Classical Conditioning Applied to the Beed Students of Palawan State University - Narra

Celia R. Ignacio, Uzziel Kate R. Jimenez, and Michelle T. Palaganas

Palawan State University

Email: celiaignacio3m@gmail.com

Abstract

This study observed the use of Pavlov's Classical Conditioning as strategy to solve the unpleasant habit of BEEd students of PSU Narra, tardiness.



International Conference on Nature Studies and Innovations for the Environment 2019 and PSSN's 19th Annual Scientific Conference

An Exit sign was placed on the doorknob of the room of Prof. Celia R. Ignacio. Students were no longer allowed to join the class and enter once they see the sign already placed. The results showed:

- When the rule wasn't imposed yet, the most common reasons of the students' late appearance in class is the distance of their house to the school and the students' sleeping habits.
- After the imposition of the rule, the students said that the rule helped them to be on time, their reason was time management. Most of them said that they're no longer late comers even in their other classes. 100% of the students said the rule helped them to be on time as the imposition of the rule made them realize the essence of time.

Results showed that the behavior of students changed when the Exit Sign policy was applied.

Keywords: tardiness, classical conditioning, strategy, sign, policy. classroom discipline

Assessment of Climate Change Impacts on Soil Properties: Its Implications to Soil Fertility Management

Dr. Beatriz Cuevas Jadina

Professor, Visayas State University (VSU)
Visca, Baybay City, Leyte, Philippines

Abstract

Information on the impacts of climate change on soil fertility remains a challenge. This study aims to determine the rainfall characteristics and the physical and chemical properties of soils grown to upland crops as indicators of soil fertility under VSU conditions. The annual rainfall were obtained from the VSU PAG-ASA station. Moreover, soil samples were collected and analyzed for their physical and chemical properties following standards procedures. The total annual rainfall for a period of about 2 decades (2000-2018) were irregular with the highest (4,878.9 mm) and lowest (1,690.4 mm) amounts were recorded in 2011 and 2010 respectively. The soils have a sandy loam texture with bulk density ranging from 1.32 to 1.62 g/cm³, porosity values of 38.87 to 50.19%, water holding capacity values of 45.57 to 48.98%, field capacity of 20.05 to

28.41%, and aggregate stability of 17 – 28 %. The soil pH was 6.01 and the organic matter content ranged from 1.2 to 2.02%, with cation exchange capacity of 25 cmol/kg soil. The chemical properties indicate low fertility while the physical properties are also unfavorable for crop production. Improved soil management is essential to make the area productive. It is recommended that additional climatic variables (ex. Rainfall intensity & distribution) and soil properties (ex. Soil structure, hydraulic conductivity) be included in future similar studies.

Keywords: climate change, soil physical and chemical properties, soil fertility

Violence Against Women in the Municipality of Estancia

Richard D. Jardenil

Abstract

This research paper attempted to examine VAW (Violence Against Women) cases in the municipality of Estancia, Iloilo and present interventions, based on the data gathered, that will prevent or reduce Violence Against Women. It focused on reported cases in the PNP VAWC Desk and DSWD Women Desk, as such the interventions to be crafted may not be applicable to those unreported VAW cases. Follow up interview with the concern victims were conducted and out of 56 cases recovered in the year 2018, 50 of them were actually met by the researcher, 48 were verbally abused, 42 were sexually abused, 35 were psychologically abused and 50 of them were physically abused. Based on the data gathered the researchers would like to identify the causes and intervention in order to address the problem and prevent or at least reduce Violence Against Women in the municipality.

Marginalized Communities Along the River: Purok 4, San Cristobal, Calamba, Laguna as Context

Jimenez, Tricia Anne I^{1,2}, Toribio, Dawn S.^{1,2}

Faculty of Arts and Letters¹, University of Santo Tomas²

Abstract

This paper examines the riverine communities and identify indicators of marginalization. The locus of study is Purok 4 in San Cristobal, Calamba City, Laguna



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Province. Using culture of poverty as the framework, the study defines marginalization as a social phenomenon experienced by different groups of people who cannot fully participate in the society. Results show that indicators of marginalization are lack of basic services, insufficient social spaces, and difficulties in transportation and accessibility which are results of inadequacy of state intervention and geographic disposition. Using case study design, the methods used are interview, observation, and analysis of secondary data. Community members in Purok 4 do not receive adequate social services from the local government and depend on resources available along the rivers. In conclusion, local government should be vigilant on marginalized communities along the rivers, as these communities suffer most during landslide, flooding and drought. These communities should not be left alone as their location is a disaster waiting to happen.

Keywords: marginalization, vulnerability, culture of poverty

Germplasm Collection, Isolation, Preservation and Molecular Identification of Microalgae in Different Freshwater Bodies

Lilian Joy S. Lacano¹, Louise Kathreen V. Moreno¹, Marisol M. Baltaar¹, Samantha Patricia Esteban¹, Pauline Joy Obligado¹, Larny Martin¹, Dana Theresa C. De Leon², John Dave C. Aquino³, Angeles M. De Leon^{1,2}, Mary Jhane Valentino¹, Eden S. David¹ and Jerwin R. Undan^{1,2,4}

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

² Tuklas Lunas Center, Central Luzon State University, Science City of Munoz, Nueva Ecija

³ Research Office, Central Luzon State University, Science City of Munoz, Nueva Ecija

⁴ Biotechnology and Analytical Laboratory, Central Luzon State University, Science City of Munoz, Nueva Ecija

Abstract

Microalgae or also known as phytoplankton are photosynthetic prokaryotic and eukaryotic microorganisms that grows best in tropical country like the Philippines. Microalgae are untapped resources in the environment and of more than 25,000 species of which only 15 are used in recent years. The biotechnological potential of this untapped resources have been immense for biotechnological research and development. In this study, freshwater microalgae collected from rivers and lake from selected areas have been identified using molecular approach together with its morphological characteristics. The primers belong to RBCL gene was used to amplify the region and employing BLAST analysis after sequencing to query in GenBank for the proper identification of the microalgae. Presently, there are ten microalgae that have been identified from the

collections. There four microalgae collected from Minalungao River in Minalungao National Park, two were identified as *Desertella yichangensis*, while the other was *Chlorophyta* sp. and one was identified as *Chlorellales* sp.. One collected from Nabao Lake in Cabiao, Nueva Ecija was identified also as *Desertella yichangensis*. One species collected from Pantabangan Dam water reservoir was identified as *Cocomyxa* sp.. Microalgae that were collected from Tabiyo Lake in Kabayan, Benguet Province was identified as *Micratinium pusillum* and *Desmodesmus denticulatus* while microalgae collected from the lagoon in Central Luzon State University in Nueva Ecija was identified as *Monoraphidium contortum*. The properly identified microalgae were placed in a 1.5 mL tube with 20% glycerol and were coded and managed using iCollect® v2.2 (2019 TBRC, BIOTEC Thailand) database software and stored in -20°C as collection of microalgae libraries for future use.

Keywords: BLAST, microalgae, RBCL gene

Graft-Take of Jackfruit (*Artocarpus heterophyllus* Lam.) Var. Eviarc Sweet Using Different Grafting Methods

Leonardo E. Lacostales¹ and Dario P. Lina²

¹Cavite State University-Don Severino de las Alas Campus, Indang Cavite

²Visayas State University-Main Campus, Baybay City, Leyte

Abstract

Jackfruit is widely grown in Asian countries because of its high economic value. However, annual yield decreased because typhoons have reduced the populations of productive trees. Propagation of true to type planting materials is the best option to increase its population. One grafting method may have different effects on other fruit species. Hence, this study was conducted to evaluate which grafting method could improve the graft-take of jackfruit. A Randomized Complete Block Design (RCBD) was used in the study with three grafting methods used (side, cleft and saddle) replicated three times with fifteen samples per treatment replicate. Cleft grafted plants had the earliest shoot (17.89 days) and leaf emergence (20.42 days) and also obtained the highest percent graft-take thirty days after grafting (DAG) at 37.78%. However, saddle grafting on jackfruit was a complete failure. Both side and cleft grafted plants have comparable graft-take and percentage of nodes with buds at fifteen and thirty DAG, respectively. Cleft grafted plants obtained the highest percentage nodes with shoots and fully opened leaves, shoots with fully opened leaves, fully opened leaves, leaf to node ratio and number of leaves/shoot. Based on the results, cleft grafting appeared to be the most practical technique for jackfruit.

Keywords: jackfruit, asexual propagation, side grafting, cleft grafting



Resource Capabilities and Disaster Preparedness of Higher Education Institution in Mindanao

¹Ahsan E. Lansao, ²Joyce D. Esrael and ³Bainorie A. Mantawil

1 Faculty, Cotabato Foundation College of Science and Technology, College of Agriculture

2 Faculty, Cotabato Foundation College of Science and Technology, College of
Agriculture

3 Dean, Cotabato Foundation College of Science and Technology, College of Agriculture
College of Education

Abstract

This study examined the resource capabilities and disaster preparedness of Higher Education Institution in Mindanao. This specifically determined the resource capabilities; level of disaster preparedness; and significant influence of the resource capabilities and the disaster preparedness of HEIs. Descriptive correlation design was utilized. The total of 120 respondents was obtained through purposive sampling technique. Data for this research was collected using a survey questionnaire. Frequency, percentage and mean were used to describe the data. Multiple regression analysis was used to test the hypothesis. The study found out that the HEIs are capable in providing resources such as supplies, physical and human resources; and capable in crafting plans and policies and providing competencies. They are also prepared as to planning, process and assessments. Resource capabilities in terms of plans and policies, supplies, physical facilities and human resource capabilities significantly influenced disaster preparedness. Based on the findings, it could be deduced that providing the necessary resources for disaster protection will enhance the disaster preparedness of HEI constituents.

Keywords: disaster, resource capabilities, preparedness

Yogurt Out of Soybean (glycine max) and Eucheuma (solieriaceae)

Author: Prof. Bernardita C. Lauron

Abstract

Powdered Solieriaceal App. (Eucheuma) and Glycine max App (Soybean) were utilized in the preparation of yogurt. The finished product was coopered with commercially available ones (Strawberry flavored, Banana flavored, plain unflavored) in

terms of quality (Viscosity, density, storage stability) and general consumer preference. Data analysis utilized the One-way ANOVA-at 0.05 level of significance which showed that the mean preference scores for the four yogurt were equal. Density measurements among the treatments were also equal using the One –Way ANOVA at 0.05 level of significance, the treatment passed the viscosity test Solieriaceal yogurt was also able to stand a storage period of 14 days without an observable physical and chemical change, provided that it is stored in the refrigerator. This study therefore shows that Solieriaceal yogurt is the same as the commercially available ones. The difference is basically on the use of local materials such as powdered eucheuma and soybean.

Yield and N Uptake of Lettuce (*Lactuca sativa* L.) Grown in Sandy Soil as Influenced by Different Rates of Vermicast

Dhenber C. Lusanta, Zenaida C. Gonzaga

Department of Horticulture, College of Agriculture and Food Sciences, Visca, Baybay City, Leyte

Abstract

Lettuce is one of the most important high value vegetables in the Philippines. Due to its increasing demand, growers tend to source out additional land area. Hence sandy soils can be a good area to venture lettuce production. A pot experiment laid out in Randomized Complete Block Design with 4 replications was conducted to evaluate the effects different rates of vermicast on the yield and N uptake of lettuce, and to determine the best rate of vermicast which enhanced yield and N uptake of lettuce grown in sandy soil. Lettuce grown in sandy soil incorporated with vermicast especially those applied with the highest level which is 7.5 g/kg soil was more vigorous than control which have yellowish leaves. Treatments with lower rates of vermicast (5.0 and 2.5 g/kg soil) as well as the control were not successful in developing head of lettuce while highest rate of vermicast (7.5 g/kg soil) clearly produced head. Incorporating 7.5 g vermicast/kg soil obtained the heaviest fresh weight and total dry matter yield of 88.20 g/plant and 7.86 g/plant respectively due to significant N-uptake upsurge. Moreover, application of vermicast regardless of varying rates evidently improved pH of sandy soil.

Keywords: Lettuce, N-Uptake, Vermicast, Sandy soil



Reflective Thinking Skills of Dmmmsu-MLuc Basic Education Faculty: A Precursor for Incorporating 21st Century Skills

Jayson O. Madayag, PhD

Don Mariano Marcos Memorial State University – Open University System

Email: jaysonmadayag88@gmail.com

Abstract

The research sought to show a link between reflective thinking and its ability to stimulate critical thinking. The respondents of the study are the faculty of the elementary and high school of the DMMMSU-MLUC. The four areas under the level of reflective thinking skills are the ability to self-assess, awareness of how one learns, developing lifelong learning skills, and influence of belief about self and self-efficacy. Statistical tools were frequencies, percentages, weighted mean, average weighted mean and ANOVA. Results showed that respondents were in the middle adulthood, dominantly are females, master's degree holder and attended a 3-day seminar. Analysis of data showed that teachers were overall critically reflective. There is no significant difference between the levels of reflective thinking of the elementary faculty to that of the high school faculty. Each faculty of both departments has different levels of motivation, different attitudes about teaching and learning, and different responses to specific classroom environments and instructional practices.

Keywords: critical thinking, educational challenges, life-long learning, reflective thinking

Supervised Farming Project on Glutinous Corn Production with Ga₃ Application in the City of Batac, Ilocos Norte

John Rick L. Manglal-lan¹ and Eugene D. Ramos¹

¹Department of Agricultural Sciences, College of Agriculture Food and Sustainable Development, Mariano Marcos State University, City of Batac, Ilocos Norte

Abstract

Glutinous (white) corn (*Zea mays* L.) is one of the most important food crops in the Philippines, not only used for human consumption but also as animal feeds. Because of the high demand for this commodity, production technologies have been improved

continuously to increase the yield of corn by introducing the application of plant growth promoters such as Gibberellic Acid (GA₃). The use of GA₃ in this crop production project is hereby envisioned to enhance the yield of glutinous corn. The increase in production of this crop is also in support to the continuous growing “chichacorn” industry of the Ilocos. The project generally aims to provide an avenue for the student to have hands-on-training experience and skills development in managing on-farm business enterprise in glutinous corn production. Specifically it aimed to: determine the growth and yield performance of NSIC Cn308 (MMSU Glutinous 2) using the recommended package of technology applied with GA₃; and determine the profitability of glutinous corn production in Barangay Magnuang, City of Batac, Ilocos Norte. The Supervised Farming Project on white corn production was conducted in a total of at of 961 m² land area at Barangay Magnuang Batac City, Ilocos Norte from December 2018 to April 2019. As part of the training experience, the crop performance, marketing strategy and financial performance of the glutinous corn were done. It was shown that the effective use of the package of technology (PhilRice) followed and application of GA₃ greatly affects the agronomic characteristic of the corn specifically on plant height at 60 DAP, ear length and yield. The actual grain yield of the plants untreated with GA₃ in a 203.50 m² was 44 kg or 2162.16 kg⁻¹ sold at Php 28.50 which result to a total revenue of Php 61621.56. On the other hand, for the plants with GA₃ application had obtained a yield of 242 kg from a 757.65 m² or 3194.09 kg in a hectare. This was also sold at Php 28.50 with a total revenue of Php 91031.48. It can be noted that there is a 47.73% increase in yield and revenue with the application of GA₃. Thus, the production of glutinous corn was effectively profitable in Brgy. Magnuang City of Batac, Ilocos Norte, Moreover, the student was able to develop skills and gained experience on hands-on management of farm business enterprise in corn production.

Keywords: glutinous corn (Zea mays); GA₃; supervised farming

Simulation of Crop Management Options for Usm Var 10 Maize (Zea mays L.) Variety

J. B. Manslao, T. B. Sayco

Abstract

This study was conducted to simulate crop management options for USM Var 10 maize variety using the Decision Support System for Agrotechnology Transfer (DSSAT). Specifically, it aimed to calibrate and validate DSSAT CERES-Maize model for the said variety. An experimental area was prepared and divided into nine plots and assigned into



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

three sowing dates with 10-day interval (SD₁ – August 8, 2017, SD₂ – August 18, 2017 and SD₃ – August 28, 2017) replicated thrice. Data set on SD₂ was used for model calibration and the two remaining SD data set were for validation. The model's performance was measured using Root Mean Square (RMSE), normalized Root Mean Square (nRMSE) and Percentage Deviation (PD). Then, the model was used to simulate different scenarios to formulate crop management options for maize. Based from results, good and acceptable values were obtained as reflected by RMSE and nRMSE which means DSSAT is able to predict with reliable accuracy in response to climate, geographical, soil properties and crop management inputs. Results showed that on rainfed scenario, recommended crop management was for the crop sown on SD₂ with simulated yield 7,619 kg/ha, with 200 kg/ha side dressing and distance of 70 x 25 cm. For rainfed and irrigation at 50% available water scenario, recommended crop management option was for the crop sown as early as June 9, 2017 with simulated yield 9,708 kg/ha, with 200 kg/ha side dressing and distance of 70 x 25 cm.

Keyword: DSSAT-ceres maize model; crop modeling; yield simulation; crop management option; usm var 10

Morpho-anatomical Responses to Drought Stress and Drought Alleviation Strategies During Early Seedling Stage of Mango (*Mangifera indica* L.)

**Lailani A. Masungsong¹, Franz Allen C. Estrella², Jose Angel Jude B. Telan²,
Nonnatus S. Bautista¹, and Rachel C. Sotto¹**

¹Plant Biology Division, Institute of Biological Sciences, College of Arts and Sciences,
University of the Philippine Los Baños, College, Laguna, Philippines

²Graduate School, University of the Philippine Los Baños, College, Laguna, Philippines

Abstract

Drought stress can occur in any developmental stage of a specific crop. However, not much information is available on various crop responses and adaptive strategies of seedlings towards drought. This study was, therefore, conducted to determine the morphological and anatomical responses of mango seedlings to drought and recommend possible measures to alleviate its adverse effects. The experiment was done inside the greenhouse and the responses of potted five-month-old 'Carabao' mango seedlings subjected to 15 days of drought were assessed. Seedlings were pre-treated [40mM Acetic acid (AA), 50mM Acetic acid (AA), 1 mM Hydrogen peroxide (HP), 0.5mM Salicylic acid (SA), 1mM Salicylic acid (SA), Mykovam (MV), MykoVam with Potassium silicate (MVPS)] prior to imposition of drought stress. Morpho-anatomical responses measured were plant

height, stem diameter, number of functional leaves, root and shoot fresh weight, root and shoot dry weight, stomatal density, and total chlorophyll content. Seedlings pretreated with 1mM SA had high increment in plant height 15 days after imposition of drought and 15 days after re-watering. Highest increment in stem diameter and number of functional leaves were also recorded in 1mM SA. Based on the measured morpho-anatomical responses, application of 1mM salicylic acid could effectively alleviate the negative effects of drought on young mango seedlings.

Succession, Abundance, Severity of Damage, and Natural Enemies of Arthropod Pests Associated with Chrysanthemum (*Dendranthema grandiflora* Tzvelev)

Adrian Seño Mausig¹ and Lita Molitas-Colting²

¹Instructor, Marinduque State College

²Former Professor, Benguet State University

Abstract

The study determined the arthropod pests attacking chrysanthemum, *Dendranthema grandiflora*; their sequence of arrival; level of abundance; degree of damage; economic threshold level of major pest(s); and the natural enemies of the identified pests. The pests observed were cotton aphid, *Aphis gossypii* (Glover); chrysanthemum aphid, *Macrosiphoniella sanborni* (Gillette); two-spotted spider mite, *Tetranychus urticae* (Koch); chrysanthemum leafminer, *Liriomyza trifolii* (Burgess); common cutworm, *Spodoptera litura* (Fabricius); cabbage looper, *Trichoplusia ni* (Hübner); and leaf beetles, *Monolepta spp.* There was pest succession and the first to infest the crop were *A. gossypii*, *L. huidobrensis*, *Monolepta spp.*, and *S. litura* during seedling stage; followed by *T. urticae* and *T. ni* in the vegetative stage; and lastly by *M. sanborni* at the onset of bud formation. All of them caused slight damage with population below the ETL except *A. gossypii* with a computed ETL of 114.69 aphids per plant. Aphelinid wasp, *Aphelinus sp.*, parasitized *A. gossypii* while big-eyed bug, *Geocoris sp.* devoured aphids and two-spotted spider mites; hover fly, *Ischiodon scutellaris* attacked aphid colonies and *Opius dissitus* parasitized maggots of *L. trifolii*. Succession of the pests identified and their natural enemies must be considered in planning a pest management strategy on chrysanthemums.

Keywords: *chrysanthemum pests, pest succession, natural enemies, pest abundance, Dendranthema grandiflora*



Size Structure and Reproductive Pattern of the Endemic Fishes, *Mugil cephalus* and *Leiopotherapon plumbeus*, in Pasac River, Sasmuan Pampanga

Dante M. Mendoza

Department of Fisheries Science College of Agriculture Systems and Technology
Pampanga State Agricultural University

Abstract

A study on the size structure and reproductive pattern of two endemic fishes in Pasac River, a brackishwater river in Pampanga was conducted from August 2017 to July 2018. Two species of fish namely, *M. cephalus* and *L. plumbeus* were assessed in a year. The selection of the two species was based in their consistency in the monthly catch of hoop nets installed in area. A total of 431 (40.28%) males and 639 (59.72%) females were identified in the *M. cephalus* samples while 323 males (43.14%) and 518 (56.86%) females were recorded in the *L. plumbeus* samples. The study revealed an overall ratio of 1:1.5 and 1:1.3 between male and female in *M. cephalus* and *L. plumbeus*. The monthly mean GSI of the two species showed that spawning is seasonal. Results revealed that *M. cephalus* exhibited varying gonado-somatic indices with values ranging from 0.38-2.53 in females and 0.11-0.69 in males. Higher mean CF was observed in males in the population of *M. cephalus* (1.91), however, this is in contrast to *L. plumbeus* in which female (2.28) exhibits higher mean CF.

Keywords: sex ratio, size structure, reproductive pattern, growth pattern, condition factor

Alternative Explant Sterilization Method and Shoot Initiation from Nodal Segments of *Dendrocalamus giganteus*

Rafonselle M. Moreno¹ and Catherine C. Arradaza¹¹ Department of Horticulture, College of Agriculture and Food Science, Visayas State University, Visca, Baybay City, Leyte, 6521, Philippines
Email: catherine_arradaza@yahoo.com

Abstract

Bamboos are versatile, strong, renewable and environment-friendly material with considerable economic importance. The increasing realization of its value led to high demand for bamboo planting materials and its production. Plant tissue culture technique offers alternative and rapid methods for the propagation of these plants. In this study, nodal segments of *Dendrocalamus giganteus* were sterilized using less harmful sterilants (i.e sodium hypochlorite and ethyl alcohol) by varying time of exposure and concentration. No significant difference was observed in percentage survival (48% -73%) in all sterilization treatments using a combination of 95% ethyl alcohol and sodium hypochlorite. For multiple shoot proliferation, the clean cultures were transferred in Murashige and Skoog (1992) liquid media supplemented with different cytokinin levels. Highest shoot proliferation (20.0 shoots) was obtained only when cultures were further transferred into culture media containing a combination of 6-Benzylaminopurine (BAP) and Kinetin after 4 months in culture.

Key words: alternative sterilants, Dendrocalamus giganteus, cytokinin

Reaction of Cauliflower (*Brassica oleracea* var. *botrytis* L.) to Two Types of Animal Manures as Organic Fertilizers Grown Under Partially Shaded Condition

Gilyn T. Morente

Silliman University College of Agriculture
Dumaguete City, 6200 Philippines

Abstract

The study was conducted to determine the effects of two animal manures application on the growth and curd yield of cauliflower (*Brassica oleracea* var. *botrytis* L.). Treatments (i.e. Goat and Cow Manures) were distributed in 12 microplots, measuring 1 x 5 m², with four replications following the Randomized Complete Block Design (RCBD). Each treatment was composed of 18 plants at a planting distance of 25 cm x 75 cm between hills and rows, respectively. A 2 m high shed made of coconut fronds was established to partially shade the crop. The vegetative potential of the crop was measured in terms of the plant height, leaf area, and total herbage yield while the reproductive growth potential was determined through its size and weight of curds. Results showed that the plant height, and the size and weight of curds of cauliflower were significantly



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

affected with the application of animal manures. However, the control exhibited the biggest size and heaviest weight of curds over the treatments.

Keywords: Manures, Curd Yield, Microplots, Brassica oleracea var. botrytis L.

Waste is Wealth: Viability of Corn Cob and Saw Dust as Briquette

**Marichu Gaite- Mozo, Macolai D. Edillorana, John Christler T. Betita, Erika C. Legaspin,
and Bea angela R. Uganiza**

¹Faculty, Mathematics Department, Palawan State University, Puerto Princesa City

²Senior High School Student, Palawan State University, Laboratory Senior High School

Abstract

Corn cob burning is widely practiced by small farmers to supplement fuelwood for cooking but direct burning of loose biomass can add problems to air pollution. Others prefer charcoal production as a livelihood support system but production and demands of wood fuel and wood charcoal put the Philippine forest vulnerable to forest degradation. Saw dust, a milling residue is a waste product of woodworking operations can also aggravate water and soil pollution, hence this research investigated the viability of corn cob and saw dust as briquettes, a potential alternative to commercial wood charcoal. The researchers used an experimental research design. Corn cob briquette (Treatment 1), Saw dust briquette (Treatment 2) and Commercial wood charcoal (Control) were tested in terms of combustion time and efficiency time (time in boiling water). From the results of the study, it can be deduced that in terms of combustion time, 150 grams of Treatment 1 burned faster than 150 grams of Treatment 2 and 150 grams of Control while 250 grams of Treatment 2 heated 500 ml water to its boiling point faster than 250 grams of Treatment 1 and 250 grams of Control. The results imply that Corn cob briquette and Saw dust briquette are potentials as domestic energy sources. Significant differences exist among Treatment 1, Treatment 2 and Control in terms of combustion time based on the p-values of 0.00000437, 0.0139 and 0.0080, ($p \leq 0.05$, $df = 18$). The same result was obtained in testing whether significant differences exist among Treatment 1, Treatment 2 and Control in terms of the of time in boiling 500 ml using the same amount of materials based on the p-values of 0.0027, 0.0000000567, and 0.0175, ($p \leq 0.05$, $df = 18$). Since the results revealed that corn cob briquette and saw dust briquette have better performance in terms of combustion time and efficiency time respectively, production of these types of briquette is highly recommended as a potential alternative for commercial wood charcoal.

Keywords: viability, briquettes, efficiency time, combustion time, corn cob, saw dust

Development of a Python-based Program for the Maximization of Energy Efficiency in Residential Buildings

Margareth C. Navia, Carl Anthony E. Casal, and Allen L. Nazareno

Institute of Mathematical Sciences and Physics, College of Arts and Sciences,
University of the Philippines Los Baños

Abstract

Creating energy efficient residential buildings is a good way to lessen the consumption of energy. Reducing energy consumption is beneficial for to the environment. In one study, a hybridized optimization model for energy efficiency in residential buildings using Artificial Neural Network (ANN) and Genetic Algorithm (GA) was developed. Using the model, suitable building measurement values with maximum energy efficiency can be determined. For this study, we developed a program based on Python to implement the ANN-GA framework used to optimize energy efficiency in residential buildings. The program was able to integrate the two methods and automate the process of computation. This can also be utilized and modified easily especially if new modeling assumptions arise.

Keywords: ANN-GA, energy efficiency, optimization, Python, residential buildings,

Determining the Factors Relating to Career Track Choice of Incoming Senior High School Students

**Allen L. Nazareno¹, Marie Joy F. Lopez², Geleena A. Gestida¹, Marisol P. Martinez¹,
Mark Lexter D. De Lara¹, Ranzivelle Marianne L. Roxas-Villanueva¹**

¹Institute of Mathematical Sciences and Physics, College of Arts of Sciences,
University of the Philippines Los Baños

²Institute of Statistics, College of Arts of Sciences, University of the Philippines Los Baños

Abstract

The K to 12 program which was first implemented in the Philippines in 2012 implicated a shift from 10-year basic education to 12 years. This new program includes six years of primary education, four years of Junior High School, and two years of Senior High School (SHS). Before entering SHS, students must choose from four tracks: Academic,



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Technical-Vocational-Livelihood, Sports, and Arts and Design. Identifying the factors that may possibly influence career track choice of incoming SHS students is essential in understanding students' career decision-making process. This information is valuable to teachers since it can serve as a guide in developing pedagogical strategies that can help students perform well in their chosen track. In this study, we analyzed the data obtained from Grade 11 students in various schools in the division of Occidental Mindoro. Results showed that there is a moderate relationship between career track choice and socio-demographic profiles such as sex, age, school type, family monthly income, and birth order. A weak relationship was established between number of siblings and career track choice. In terms of academic profile, a weak relationship was established between career track choice and grades from various subjects. Furthermore, a strong relationship was found between career track choice and college degree to be sought.

Keywords: career track choice, factors, K to 12, senior high school

Growth, Yield and Postharvest Qualities of Sweet Pepper (*Capsicum annuum* L.) as Influenced by Wood Vinegar Application

Warren L. Obeda, Raffy R. Danggo, Aldwin Paul M. Parac, Eric Kent Z. Mapili, Blanche Franchette D. Llera, Jannu Geuseppe Clemeña, Ericjhon P. Hinayon, Zenaida C. Gonzaga

Visayas State University
Visca, Baybay City, Leyte

Abstract

Sweet pepper (*Capsicum annuum* L.) is one of the most important vegetable crops grown extensively throughout the world. The crop is very sensitive to environmental factors (Bhatt et al., 1992). The Department of Agriculture of the Philippines encourages the use of organic fertilizers and botanical pesticides to meet the increasing demand of organically-grown agricultural produce. The hazards to health and environment from the use of pesticides must be minimized and the dependence on chemical control needs to be reduced without compromising the growth of sweet pepper and its volume of production. Hence, this study was conducted to evaluate the effects of the methods of application and the different concentrations of bamboo wood vinegar on the growth, yield and postharvest qualities of sweet pepper under protected structure. The experiment was laid out in split-plot design arranged in RCBD with three replications. The methods of wood vinegar application (M1-drenching and M2-foliar application) served as the main

plot and the different concentrations as the sub-plot which include; C₀-tap water, C₁-750x, C₂-500x and C₃-250 x dilution rate. Results showed that the methods of application and the concentrations of wood vinegar had no significant effect on the growth parameter of sweet pepper but the concentrations significantly affected the yield, yield parameters and enhanced fruit qualities. The higher the concentration of wood vinegar applied, regardless of the methods of application increased fruit production with larger fruits and yield.

Keywords: dilution rate, methanol, phenols, foliar, drenching

Growth, Yield and Essential Oil Content of Spearmint (*Mentha spicata* L.) as Influenced by Different Soil Amendments

Warren L. Obeda

Visayas State University
Visca, Baybay City, Leyte

Abstract

Mint either as herb or its essential oil form is used for flavoring, perfume production and medicinal purposes. Among various factors affecting mint plant, fertilizations, such as nitrogen based, have more pronounced effect on mint plants growth and quantity and quality of oil. With the concern of the negative impact of continuous use of inorganic fertilizer which resulted to adverse effect to the environment. The utilization of organic wastes and products are now rampant due to the demand of organically-grown agricultural product. This study was conducted to evaluate the effect of using different soil amendments to the growth, total yield and the essential oil of spearmint. This study was laid out in Randomized Complete Block Design with three replications. The treatments include T₁ – Garden Soil + Carbonized Rice Hull, T₂ - Garden Soil + Rice Hull + Vermicompost, T₃ - Garden Soil + Carbonized Rice Hull + Coco Coir, T₄ - Garden Soil + Coco coir + Vermicompost, and T₅ - Garden Soil + Carbonized Rice Hull + Rice Hull. Results showed significant improvement in the growth and yield with corresponding increased on the extractable essential oil in plants grown in potting medium composed of the combination of vermicompost, coco coir and garden soil in 1:1:1 v/v (T₄) than plants grown in garden soil, fresh and carbonized rice hull, with their corresponding ratio.

Keywords: hydro-distillation, coco coir, essential oil, Lamiaceae, vermicompost



Identifying Roles of Social Actors in Zero Waste Cities: A Case Study in City of San Fernando, Pampanga, Philippines

Olaje, Jean, Gertie G. Potenciano, Andrea Anne D.S.

Faculty of Arts and Letters

University of Santo Tomas

Abstract

The study aims to verify the significance of the role and responsibilities of the LGUs, NGOs and the community as key social actors in pursuing the sustainability of a Zero Waste City. In pursuit of assessing the Zero Waste Management Program in the City of San Fernando, the study will be identifying the practices of Zero Waste model cities using the Zero Waste model developed by Zaman and Lehmann in 2012. Using a case study design and qualitative methods, the roles of social actors were identified through interview, observations and review of secondary data. The study argues that the success of a city's Zero Waste management program is credited from initiatives undertaken by the effective collaboration of the social actors. As a result, the study concludes that Zero Waste concept is heavily dependent on the social actors. These social actors are vital to the unifying concept of Zero Waste that results to a sustainable practice. The Materials Recovery Facility, as the byproduct of these collaborations, is identified as a community asset that provides livelihood opportunities and increased diversion rate. Therefore, MRF results to sustainability of a Zero Waste practice, through effective collaboration between the social actors. The proponents recommend future researchers to use the study as a guide in developing topics that will be essential in understanding, promoting and implementing a sustainable Zero Waste Concept through the Zero Waste design.

Keywords: zero waste, sustainable development, ecological solid waste management, social actors

Performance of Maize under various Spacing of Yemane Plantation

Onofre S. Corpuz

Prof. VI, CFCST Doroluman Arakan, Cotabato

Email: corpuz.rd@gmail.com

Mobile No. 09653059537

Abstract

Maize was intercropped with 6-month-old *Yemane* plantation in various spacing at Matalam, Cotabato Philippines, arranged in a split-plot design with three replications.

Analysis of data showed significant differences in all agronomic and morphological characters of maize as influence by planting distance. Mono-maize crop were significantly better in all morphological and agronomic characters compared to the maize planted in between rows of the trees. Tree spacing was correlated significantly with corn yield, weight of 500 seeds and biomass. This can be concluded that wider distance of *Yamane* plantation will result to higher yield, weight of seeds and biomass. *Yemane* plantation at earlier stage up to one year can be utilized for maize production as observe in this study.

Keywords: agroforestry, tree spacing, mono-maize crop, Yemane plantation

Genesis and Characteristics of Soils Derived from Ophiolitic Rocks in Babatngon, Leyte, Philippines

Kenneth Oraiz^a and Victor B. Asio^b

^aVisayas State University, Visca, Baybay City, Leyte, Philippines

^bVisayas State University, Visca, Baybay City, Leyte, Philippines

Email: kenneth.oraiz@vsu.edu.ph; vbasio@vsu.edu.ph

Abstract

Inadequate studies have been conducted on the genesis and characteristics of soils derived from ophiolitic rocks in Leyte, Philippines. The Tacloban Ophiolite Complex covers a major part of ophiolite rocks in Leyte. Five soil profiles were selected in Babatngon, Leyte in order to study the genesis, formation and morphological, physical and chemical characteristics of soils derived from ophiolite rocks. Soils derived from ophiolitic rocks in the study area are generally classified as mafic (45 – 52% SiO₂). Results revealed that the soils in the study were generally moderately developed. The dominant vegetation in the site include *Saccharum spontaneum*, *Imperata cylindrica*, *Chromolaena odorata*, *Melastoma malabatricum* and ferns which are indicators of soil degradation. Particle size distribution ranged from clay loam to sandy clay loam. Clay development was observed in profiles 2 and 3. Presence of saprolites from the ophiolite rock were observed in the lower horizons. Results show that bulk density of the soils decreased with depth but increased in porosity. Moreover, the soil pH values ranged from moderately acidic to slightly acidic (5.82-6.12). Generally, exchangeable Mg was higher in the subsoils than on the surface, indicating the ophiolitic property of the parent material. Total N (0.0112-0.1625%), available P (0.596-3.498 mg kg⁻¹), extractable K (0.003-0.010 cmol_c kg⁻¹), soil organic matter (0.140-0.429%) and effective CEC (0.2356-0.5203 cmol_c kg⁻¹) were generally very low in all profiles. With such limiting factors, this study may serve as a



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

profound impact on the vegetation growth and development, biodiversity and productivity of the area for agricultural use.

Keywords: Ophiolite Rocks, Tacloban Ophiolite Complex, ultramafic, Babatngon

**Germplasm Collection and Molecular Identification of Urease Producing
Bacteria Isolated from Soil Samples in Central Luzon State University,
Science City of Muñoz, Nueva Ecija**

Mark Allan A. Perez¹, Khristine Grace D. Waing and Jerwin R. Undan^{1,2,3}

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

² Tuklas Lunas Center, Central Luzon State University, Science City of Munoz, Nueva Ecija

³ Biotechnology and Analytical Laboratory, Central Luzon State University, Science City of Munoz, Nueva Ecija

Abstract

Microbial urease is known for its clinical perspective due to its virulence factor in different microorganisms contributing to urinary stones, pyelonephritis and gastric ulceration. In agriculture, urease plays an essential role in the nitrogen metabolism of terrestrial and aquatic microorganisms. Ureolytic activity minimizes crop damage during urea fertilization of agricultural soil and solves the problem of fixed nitrogen availability. In this study, urease bacteria were isolated from three soil samples with lowest pH level of Central Luzon State University, Science City of Muñoz, Nueva Ecija. Serial dilution were done to minimize and obtain the dominant bacteria from the soil samples, 10^{-5} , and 10^{-7} were used as dilution factor for plating. Bacteria were subjected to urease test by observing the color changes in Urea agar. Ten positive isolates were selected for morphological characterization. Direct colony PCR method was used to amplify 16S rRNA. Through Basic Alignment Search Tool (BLAST), the positive isolates were found to be in the genus *Lysinibacillus* (two *L. sphaericus*), *Bacillus* (one *Bacillus* sp. and *Sporosarcina* (four *S. pasteurii*, one *S. soli*, one *S. ginsengisoli* and one *S. luteola*). The properly identified urease producing bacteria were placed in a 1.5 mL tube with 20% glycerol and were coded and managed using iCollect® v2.2 (2019 TBRC, BIOTEC Thailand) database software and stored in -20°C as collection of bacterial libraries for future use.

Keywords: microbial urease, 16sRNA, colony PCR

Molecular Identification, Phylogenetic Analysis and Germplasm Collection of Wild Mushrooms from Brgy. Bazal, Maria Aurora, Aurora Philippines

Rence Marrion M. Pineda¹, Dana Theresa C. De Leon¹, Benjie L. Garcia¹, Sofronio P. Kalaw^{1, 2, 3}, Rich Milton R. Dulay^{1, 2, 3}, Angeles M. De Leon^{1, 3}, Jerwin R. Undan^{1, 3, 4} and Renato G. Reyes^{1, 2, 3}

¹Tuklas Lunas Center, Central Luzon State University, Science City of Munoz, Nueva Ecija

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

³Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija

⁴Biotechnology and Analytical Laboratory, Central Luzon State University, Science City of Munoz, Nueva Ecija

Abstract

Molecular barcoding is one of the efficient strategies of identifying and conserving rich mycological resources especially when harnessing their medicinal properties. Accuracy in identification is increased especially when morphological identification is assisted with molecular identification. Despite of the numerous reports regarding the functionality of mushrooms, studies on the isolation, purification, elucidation and evaluation of their bioactive compounds are still limited. Hence, this study aimed to identify wild mushrooms collected from Brgy. Bazal, Maria Aurora, Aurora. Genomic DNA was extracted from fruiting bodies using CTAB method and the Internal Transcribed Spacer (ITS) gene was amplified using ITS1 and ITS4 primers and sequenced through Sanger sequencing. Gene sequences were assessed and queried in Genbank using NCBI-BLAST which led to the following identities: *Clavulinopsis miyabeana* (88.76%, AB509796), *Clavulinopsis fusiformis* (84.75%, KM248914), *Clavaria fragilis* (95.37%, KR673556), *Microporus xanthopus* (99.52%, KT273357), *Pleurotus tuberregium* (78.93%, AY450344), *Cheimonophyllum candidissimum* (90.26%, MG712329), *Phillipsia domingensis* (87.55%, AF117380.1). Phylogenetic analysis was carried out using Molecular Evolutionary Genetics Analysis (MEGA 7) Software. Identified samples were stored as germplasm collection to produce a library of mushrooms managed using iCollect® v2.2 software database (2019 TBRC, BIOTEC Thailand) to be available for future use.

Keywords: mushroom, internal transcribed spacer, phylogeny, germplasm



Survey of Macrobenthic Community in Mangrove Stands Adjacent To Abandoned Fishponds in Brgy. Lao and Brgy. San Juan, Ormoc City, Leyte

¹Fretzeljane O. Pogado and ²Julissah C. Evangelio

^{1,2} Department of Biological Sciences, Visayas State University, Baybay City,
Leyte 6521-A

Abstract

The macrobenthic community have been used to assess the impact of some ecological disturbances at present times particularly conversion of lands for economical purposes. This study deals with macrobenthic organisms associated in the mangrove areas of Brgy. Lao and Brgy. San Juan, Ormoc City, Leyte with some parts converted into ponds. A total of 24 species under 18 families were identified in this study. Twenty-one species in San Juan (13 gastropods, 3 bivalves and 5 crustaceans) and twenty-two species in Lao (14 gastropods, 3 bivalves and 5 crustaceans). Generally, the macrobenthic organisms' density, evenness and diversity indices between sites were highest in Brgy. Lao. In terms of distribution per zones (Towards the sea, middle and towards the land), the highest was obtained in the middle zone in Brgy. San Juan and highest towards the land in Brgy. Lao both in mangrove areas away and near fishponds. Pearson-Correlation Analysis showed no correlation for all physico-chemical parameters (pH, salinity, water and soil temperature and percent OM) in the study sites. The conversion of mangroves to ponds may affect the distribution and diversity of macrobenthic organisms in the study area and the amount of organic matter in the soil. The abandonment of fish ponds in the area could have been a start of the recovery of the macrobenthic community thus the findings.

Keywords: macrobenthic organisms, Brgy. San Juan, Brgy. Lao, Ormoc City

Growth and Yield of Tomato (*Solanum lycopersicum*) as Influenced by Pruning and Mulching

**Ryan D. Quirante ¹, Zenaida C. Gonzaga¹, Warren L. Obeda¹, Richiella R. Sumalinog¹
and Othello B. Capuno²**

Department of Horticulture, College of Agriculture and Food Science¹, Office of the Vice-
President for Research and Extension², Visayas State University, Visca, Baybay City,
Leyte 6521-A²

Abstract

Tomato is one of the important vegetables throughout the world. It outranks all other vegetable in total contribution to human nutrition because it is consumed in so many different ways. Its production therefore must be improved. This study was conducted to evaluate the growth, yield and profitability of pruned and intact tomato plants as influenced by mulching. The study was laid out in split-plot arranged in RCBD with 3 replications. The type of seedling wither intact and pruned served as the main plot and the different mulching materials, namely control/bare soil, rice hull, rice straw, scratch paper and plastic mulch as sub-plot factors. Results revealed that flowering, vegetative characteristics and days to harvest were not significantly affected by the type of seedlings and different mulching materials. Plant height however showed that intact plants were consistently taller all throughout the growing period. Significant effects of mulching materials were exhibited only during the third, sixth and seventh week but did not significant differ from all other mulches. On the other hand, yield and yield components were not affected by the type of seedlings used whether pruned or intact. Mulched plants generally showed superiority over unmulched with plastic mulch giving the biggest, most number and heaviest fruits and total yield.

Keywords: organic mulch, lycopene, pruning, mulching

Sustainable Consumption in Univariate Resource Dynamics Models with Subsidy

Dr. Jomar F. Rabajante¹ and Kyrell Vann B. Verano²

¹University of the Philippines Los Baños

²University of the Philippines Los Baños

Abstract

Consumption of renewable resources needs regulation since excessive consumption today may affect future production which can lead to extinction of the resources in the long run. Analysis of simple models of resource dynamics can provide initial insights in formulating comprehensive policies to assure sustainability. Hence, we study univariate resource dynamics through ordinary differential equations which is compartmentalized into production and consumption functions. We assume that the resources are being replenished whenever it reaches a minimum level, thus a production



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

with subsidy. We then propose a production model with subsidy and consider linear (constant and proportional) consumption models. Through quantitative analysis of the models, we determine conditions leading to sustainable consumption. Furthermore, we analyze how delay and stochasticity affect the derived sustainability conditions. Our results can be used as initial input in formulating strategies to properly manage renewable resources, especially in the absence of models requiring extensive data availability.

Keywords: resource management, renewable resource, subsidy, sustainable consumption, differential equations

Effect of Different Probiotic Sources as Growth Promoter on Broiler Performance

Janaura B. Rivera¹ and Merlyn Guzman-Buscato²

¹ Silliman University College of Agriculture, Bantayan, Dumaguete City

² Silliman University College of Agriculture, Bantayan, Dumaguete City

Email: janaurabriviera@su.edu.ph

Abstract

The research experiment was conducted to determine the effect of different probiotic sources as supplementation in relation to broiler performance. The experiment was laid out using the Completely Randomized Design with 90 Cobb 500 broilers chicks that were randomly assigned into 3 treatments with 3 replicates containing 10 birds per cage and maintained in nine slotted broiler cages. Birds in the control group T₁ were given drinking water without probiotic supplementation. On the other hand, birds belonging to T₂ were given drinking water with homemade probiotics using lactic acid bacteria serum (LABS), while T₃ birds were given drinking water supplemented with commercial probiotics at 10ml per 1000ml water on brooding stage until finishing stage. Results have shown relative differences between treatments. Between broilers supplemented with probiotics, birds given with LABS (T₂) showed relatively higher weight compared to birds given with commercial probiotics (T₃).

Keywords: probiotics, broiler, growth, promoter

Gender Sensitivity and Managerial Practices of Bangsamoro School Heads

Salahudin D. Solaiman, EdD

Instructor, Senior High School Department, Cotabato Foundation College of Science and
Technology, Doroluman, Arakan, Cotabato, Philippines

Abstract

The study was conducted to determine the gender sensitivity practices among the Bangsamoro school heads. Specifically, it determined the socio-demographic profile of the respondents, the gender and development programs and the managerial practices of school heads. Descriptive research design utilizing survey questionnaire in gathering data was employed. Frequency, percentage, mean, and multiple linear regression were the statistical tools used in the study. There were 200 school heads randomly selected as respondents of the study. Finding showed the extent of gender sensitivity practices on management operation of Bangsamoro School heads on school vision conveys specific commitment for gender sensitivity and vision statement communicates the commitment to all stakeholders of its intent. Among the practices involved in the study, school vision and support mechanism were found to be the contributory factors to the practices on instructions in terms of curricular approach. This implies that curricular approach are anchored on the designed vision of the school. It further implies that support mechanism of the school played an important role in the practices of the school in instruction particularly in curricular approach.

Keywords: Socio-demographic profile, managerial practices, gender sensitivity.

Slag Fiber-Reinforced Concrete (SFRC)

Engr. Rodolfo B. Solomon, and Dr. Mary Lynn G. Magbanua

Sultan Kudarat State University

EJC Montilla, Tacurong City

Email: rudybsolomon@yahoo.com

Abstract

It is becoming increasingly popular now to reinforce the concrete with small, randomly distributed fibers. The various types of wastes generated from machining operations conducted at machine shops, metal stamping facilities, and other metal



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

working operations called slag are utilized as steel fiber in the fabrication of slag fiber reinforced concrete.

Utilization of slag as fiber in the fabrication of fiber reinforced concrete is one way that the researcher thinks to produce a high strength and low-cost fiber reinforced concrete and help minimize the solid wastes problems. The study assessed the slump and the compressive and flexural strengths of the Slag Fiber Reinforced Concrete (SFRC) and F-test was used to determine the significant differences among the treatments. Further test was employed using Duncan's Multiple Range Test (DMRT). Results showed that the SFRC has low degree of workability. The greatest compressive strength was achieved by the Treatment 3 which has 4% slag fiber and the greatest flexural strength was achieved by treatments 1 and 2 with 2% and 3% slag fibers, respectively. Based on the results, adding slag fibers in plain concrete enhances its strength under compression and flexural. Though the slag fibers reduced the workability of the concrete, it can be minimized by right proportion and proper techniques. This innovative technology is recommended for concrete structures, which would require a higher flexural and compressive strength than the conventional concrete.

Keywords: fiber reinforced concrete, slag fiber, compressive strength, flexural strength

Physical and Mechanical Properties of Selected Lumber Boards

Engr. Rodolfo B. Solomon¹, and Eugenio C. Salon II ²

Sultan Kudarat State University

EJC Montilla, Tacurong City

Email: rudybsolomon@yahoo.com

Abstract

This study was conducted to determine the physical and mechanical properties of Ipil-ipil, Gmelina, Mahogany, and Neem lumber boards. All samples were kiln dried for fifteen (15) days and later investigated for their physical and mechanical properties. Testing was conducted according to the standards of ASTM C293. The result on the physical and mechanical properties showed that the Ipil-ipil lumber had the lowest weight density, thickness swelling, and shrinkage percentage. The Ipil-ipil lumber board had a higher flexural strength compared to the other selected lumber boards. The results obtained in this study has provided information on the mechanical properties of selected wood species which can be used in determining the application of these wood for either

construction or for use as handicrafts, frames, wood board panel and material for light fixtures.

Keywords: lumber boards, weight density, thickness swelling, shrinkage percentage, flexural strength

Settlement Preferences of Green Mussel (*Perna viridis*) in Batad Bay, Batad, Iloilo

Nora O Suerte

Northern Iloilo Polytechnic State College, Estancia, Iloilo

Abstract

Asian green mussel (*Perna viridis*) is an edible bivalve cultured in different areas of Indo – Pacific region to enhance production. It is economically important mussel and popular among customers because of its high nutritional value and easy to culture. Mussel farming does not require highly advanced technologies in making spat collectors, indigenous materials in the locality can be used to collect spats. However, settlement preferences of *Perna viridis* depend on the type of spat collector material. The use of indigenous materials if feasible as spat collectors would help enhance the profitability in the culture of *P. viridis*. The present study was conducted to determine the responses of green mussel spats to different types of indigenous settling materials in the locality. This was carried out in Batad Bay, Batad, Iloilo for 3 months from July to September 2016 using the floating bamboo raft with an area of 25m². Four treatments with five replicates of different indigenous materials were used; polypropylene rope (9m long, 9mm thick), coconut husks (attached to polypropylene rope of the same length and thickness with 30 cm distance between the husks), corn stalks; 9m long, 13mm thick and old nets of the same length and thickness. Monitoring of spat attachment to the different collectors was done every week and daily monitoring for water parameters. Results of the study showed that green mussel spats preferred to attach to coconut husks which comprised 90 individuals/ 9m line and the least preferred was the collector made from corn stalks with attachment of 5 individuals/9m line. Mean salinity, temperature and dissolved oxygen of the water in the study site recorded were 30ppt, 30.7°C and 8.57ppm respectively. Assessment studies on the water quality of Batad Bay should be conducted to determine the impacts of run – offs from corn plantation.

Keywords: spats, spat collector, settlement, preference, Asian green mussel



Influence of Different Organic Mulches on the Growth and Yield of Tomato (*Solanum lycopersicum* L.) Grown in Two Cultivation Systems

Sumalinog RR¹, Gonzaga ZC¹, Ramos AD¹, McDougall S² and Rogers GS³

¹Visayas State University (VSU), Philippines,

²Department of Primary Industries (DPI), Australia,

³Applied Horticultural Research (AHR), Australia

Department of Horticulture, Visayas State University, Visca, Baybay City, Leyte, 6521-A
Philippines

Email: chiel_sumalinog@yahoo.com

Abstract

Tomato is one of the most important vegetable crop in the Philippines. Its production however, is beset by problems on pests and diseases. For this reason, organic mulching and protected cultivation which are two of the known technologies in crop production were evaluated to determine the effects of organic mulches on the growth and yield of tomato, compare performance of tomato under different cultivation systems, and assess the effectiveness of organic mulches in suppressing weeds and controlling pests and diseases. Two studies, one in the open field and the other under protected cultivation were simultaneously set-up in RCBD with the following treatments: control, rice hull, rice straw, *Chromolaena odorata* leaves and *Gliricidia sepium* leaves. Results revealed that flowering and harvesting of tomato grown under protected cultivation were significantly delayed by the application of organic mulches but doubled the number and weight of marketable fruits/plot and total fruit yield compared to open field. Among the treatments applied, *Gliricidia sepium* significantly showed the greatest number and heaviest weight of marketable fruits/plot but was statistically similar to rice hull and rice straw. Furthermore, organic mulches significantly reduced weed population in both cultivation systems and slowed down fusarium wilt incidence in the protected cultivation.

Keywords: UV treated plastic, protective structure, leaf mold, kakawate, hagonoy

Performance of Glutinous Corn (*Zea mays* L.) Applied with Different Kinds and Concentrations of Organic Foliar Supplements in Combination with Inorganic Fertilizer

Sumalinog AR¹, Sumalinog RR² and Ratilla BC¹

¹Department of Agronomy, Visayas State University,

²Department of Horticulture, Visayas State University,

Visca, Baybay City, Leyte, 6521-A Philippines.

Email: asumalinog18@yahoo.com

Abstract

Glutinous corn is popularly grown in the Philippines. However, production is low and failed to supply local demands. This study was conducted to evaluate growth and yield response of glutinous corn to kinds and concentrations of organic foliar supplements in combination with inorganic fertilizer; determine the optimum concentration; and assess its profitability for glutinous corn production. The experiment was laid-out in RCBD with 3 replications and 8 treatments, namely; T₀-0-0-0 (control), T₁-90-60-60 kg ha⁻¹ N,P₂O₅,K₂O, T₂-45-30-30 kg ha⁻¹ N,P₂O₅,K₂O + 10% solution Fermented Plant Juice (FPJ), T₃-45-30-30 kg ha⁻¹ N,P₂O₅,K₂O + 20% solution FPJ, T₄-45-30-30 kg ha⁻¹ N P₂O₅,K₂O + 30% solution FPJ, T₅-45-30-30 kg ha⁻¹ N,P₂O₅,K₂O + 10% solution vermitea, T₆-45-30-30 kg ha⁻¹ N,P₂O₅,K₂O + 20% solution vermitea and T₇-45-30-30 kg ha⁻¹ N,P₂O₅,K₂O + 30% solution vermitea. Results showed that days from sowing to tasseling, silking and boiling stage, plant height, LAI and stover yield were significantly affected by the treatments. Regardless of foliar supplements and concentrations used, taller and bigger LAI were obtained from T₂–T₆ than T₀ but inferior to T₁. Similarly, they produced higher marketable and total ear yield than untreated control. Highest net income (P122,484.00 ha⁻¹) and ROI (317%) were obtained from T₁ followed by T₅ while T₀ got a net loss.

Keywords: fermented plant juice, glutinous corn, inorganic fertilizer, vermitea

Attitude of the Households on Climate Change Adaptation in Real, Quezon

Angelica G. Uy, Jorielle Dominique A. Manzanero, Tish Marthia M. Rebong, and Lynlei L. Pintor

Abstract

The study focused on the attitude of the households toward climate change adaptation in Real, Quezon. The objectives of the study include to categorize the household's climate change adaptation in terms of autonomous adaptation and planned adaptation; and determine the attitude according to components such as affective, cognitive, and behavioral. The data were gathered through survey, key informant interview, review of documents, and observation. Data were analyzed through descriptive statistics. Result revealed that majority of the respondents strongly agree in almost all the statements in autonomous adaptation with a mean of 4.39. The same result was obtained in planned adaptation wherein majority answered strongly agree obtaining a mean of 4.45 and 84% of the respondents are categorized as either autonomous or planned adaptation. For the affective component of attitude, majority worry for their community and family in the occurrence of strong typhoon while for the cognitive component, the respondents strongly agree with a mean of 3.80, and a mean of 4.20 was obtained in the behavioral component which means that they are fully aware on what to do during natural disasters. The socio-demographic and economic characteristics was compared with the type of climate change adaptation of the households. Regardless of age, gender, civil status, educational attainment, household size, income, and length of stay in the area, the households used either planned or autonomous adaptation depending on the situation.

Key words: attitude, climate change adaptation, households

Arthropod Assemblage Across Four Different Habitats in a Fragmented Landscape

Sheryl A. Yap¹, Harold B. Centeno², Ace Kevin S. Amarga^{3,4}

¹Institute of Weed Science, Entomology, and Plant Pathology, College of Agriculture and Food Science, University of the Philippines Los Baños

² Center for Conservation Innovation Philippines, Inc., Alabang, Muntinlupa City

³Department of Biological Sciences, College of Arts and Sciences, Cavite State University-Don Severino delas Alas Campus

⁴School of Environmental Science and Management, University of the Philippines Los Baños

Email: sayap3@up.edu.ph; ace_amarga061@yahoo.com

Tel. #:(049)536-1315

Abstract

Landscape topography alteration as factored by habitat fragmentation and land conversion changes the population of arthropods. Resiliency of arthropods to these changes can be explained by the manner of their adaptability to such changes. To some extent, habitat fragmentation can offer regional coexistence of taxa although its effect may vary depending on the species and its association with other species in the area. Some ecological attributes that affects the species sensitivity to habitat fragmentation include dispersal ecology, habitat specificity, foraging behavior, and ability to compete with other species. Herein we examined the arthropod diversity and assemblage across four different ecosystems: forest fragment, forest edge, agricultural land, and riparian ecosystem. Assessment conducted using pitfall trapping, pan trapping, soil and leaf litter sieving, and portable Burlese extraction in Sitio Malutok, Rizal, Palawan revealed a total of 912 individuals representing 5 classes (Insecta, Arachnida, Chilopoda, Diplopoda, Malacostraca), 12 orders, and 37 families. Majority of the collected specimens belong to herbivorous group primarily folivore guild. Numerous predatory and detritivorous taxa were observed in the area. Based on the total number of species observed in four sampling sites, forest is the most abundant, followed by forest-edge, agroforest, and riparian. This observation can be contributed to the high organic material that each area provides.

Keywords: arthropods, agroforest, forest, landscape, riparian.



*International Conference on Nature Studies and Innovations for the Environment 2019
and PSSN's 19th Annual Scientific Conference*

Sponsors

FACULTY OF EDUCATION
UP OPEN UNIVERSITY
Programs Offered



- Associate in Arts
- Bachelor of Education Studies
- Graduate Certificate in
- Distance Education
- Diploma in Science Teaching
- Diploma in Mathematics Teaching
- Diploma in Social Studies Education
- Diploma in Language and Literacy Education
- Master of Arts in Distance Education
- Master of Arts in Language and Literacy Education
- Master of Arts in Social Studies Education
- Ph.D. in Education (Biology Education, Mathematics Education, Chemistry Education, Physics Education)



Contact: admissions@upou.edu.ph (www.upou.edu.ph)



PHILIPPINE SOCIETY FOR THE STUDY OF NATURE