



**NEW SPECIES AND SUBSPECIES OF *HOYA* (APOCYNACEAE)  
FROM QUEZON PROVINCE, PHILIPPINES**

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**ABSTRACT** – Two new species and a subspecies of *Hoya* from Quezon province, Philippines are described in this paper. The new species are *Hoya polilloensis* Kloppenburg, Guevarra, Mendoza & Ferreras and *Hoya salmonea* Kloppenburg, Guevarra, Mendoza & Ferreras while the subspecies is *Hoya percisina* subspecies *rosea* Kloppenburg, Guevarra, Mendoza & Ferreras.

**Keywords:** *Hoya polilloensis*, *Hoya salmonea*, *Hoya percisina* ssp. *rosea*, Philippine *Hoya*, Quezon Province

## INTRODUCTION

The Philippines, an archipelago consisting of more than 7,100 islands is known worldwide for its rich biodiversity. With an estimated 10,000 native plants, it is considered a mega-diverse country and a global hotspot which needs conservation (Mittermeier, 2011; <http://www.conservation.org>).

The province of Quezon in southern Luzon, Philippines is known to be well represented by the genus *Hoya* and had been a source of additional novelties in the past (Merril, 1918; Kloppenburg, 2002; Kloppenburg and Siar, 2008; Kloppenburg and Siar, 2009). Among the *Hoya* species that were discovered and described from Quezon

province include *Hoya pubicalyx*, *Hoya landgrantensis*, *Hoya siariae*, *Hoya buotii*, *Hoya incrassata*, and *Hoya lazaroi*. Most of the aforementioned species have distributions restricted only to the Philippines.

## METHODOLOGY

Collection of plants was conducted in residual forests in the Provinces of Aurora, Quezon, Laguna, and Bicol in 2010. Judicious collection was employed, live cuttings were propagated in the greenhouse, and necessary cultural management practices were applied. The plant habit, leaf characters, and inflorescence were examined and compared to existing species. New species were evaluated and described using a

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dissecting microscope. Herbarium vouchers were prepared and submitted to the Jose Vera Santos Herbarium (PUH), University of the Philippines, Diliman, Quezon City.

## RESULTS AND DISCUSSION

### Description of New Species

**Hoya polilloensis** Kloppenburg, Guevarra, Mendoza & Ferreras sp. nov.

*Hoya polilloensis* Kloppenburg, Guevarra, Mendoza & Ferreras sp. nova, holotypus 14651 (PUH) hic designatus. Similis *Hoya alwitriana* Kloppenburg et al 2012, sed corolla 1.10 cm diametiente complanatus vs. 1.80cm; corollae lobis 0.37 cm longis et 0.31 cm latis versus 0.40 cm longis et 0.30 cm latis, differt. Sepala triangularis 0.10 cm longis 0.07 cm latis vs. 0.15 cm longis et 0.09 cm latis, ligulatae, differt.

The new species has evenly pubescent dorsal corolla lobes. Its corona has short inner lobes and concave dorsal with a small forward umbo. The outer lobes are raised forming a slightly boat-shaped corona with the apex slightly turned down and sub-acute. Pollinarium has 0.43 mm long and 0.16 mm wide pollinia, the retinaculum is likewise long and wide, and the translator type is d/o. Moreover, the compared species has palmately nerved leaves in contrast to the pty-nerved foliage of this new species. These characters combined make it different from any other present *Hoya* species. Detailed description of the plant in the next pages is supplemented with pictures of live specimen and photomicrographs.

This species was collected from Polillo Island, Quezon Province, Philippines by George Mendoza et al (GM#35), and hence the name. It

was found attached to a tree (*Ficus* sp.) in a gap forest at around 150 m asl.

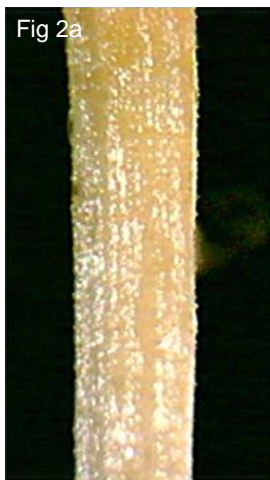


**Fig 1.** *Hoya polilloensis* Kloppenburg et al. a. Leaves; b-c. Inflorescence.

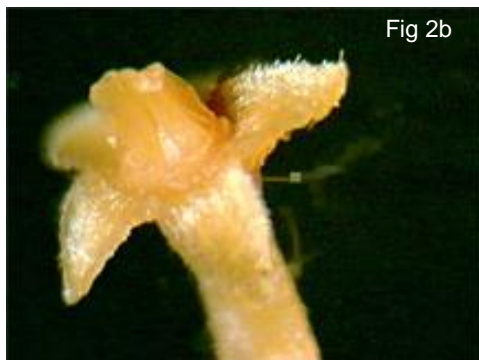
**New *Hoya* Species and Subspecies (Apocynaceae) from Quezon Province, Philippines.**

The leaves are elliptic, opposite, petiolate, and glabrous with some anthocyanin pigmentation usually as blotches on the surface. Leaf base is obtuse, apex is acuminate, and nerve angle to midrib ca. 15°. The inflorescence forms a loose umbel of 14-20 very light pink flowers with pale yellow undertone and light yellow corona.

Ovaries are columnar glabrous, apex with small protrusions, 0.10 cm tall, base pair 0.09 cm wide.



**Fig 2a.** Pedicel section enlarged ca. 55x. Glabrous, finely granulate, terete, strict, 1.8 cm long, and 0.04 cm in diameter.



**Fig 2b.** Calyx enlarged ca. 33x. Sepals are ciliate, granulate outside, inside slick glabrous, 0.10 cm long with obtuse apex, 0.07 cm at the widest, ligules are present.



**Fig 2c.** Corolla ventral surface enlarged ca. 11x. This surface is dull glabrous, center collar protrudes down, lobes cut more than half way.

Sinus – sinus	0.23 cm
Sinus – center	0.18 cm
Sinus – apex	0.40 cm
Apex – center	0.55 cm
Widest	



**Fig 2d.** Corolla dorsal (inner) surface enlarged as above. This surface is shinier and evenly pubescent to finely puberulous all over, center collar is thickened and raised.



**Fig 2e.** Corona ventral view enlarged ca. 13x. The lobes are channelled with sides sulcate, there are thin shelves along the lobe sides extending toward the emarginate sub-acute apex. The central column is thin-walled, 0.04 cm long, surrounded by protrusions toward the channel, also slightly granulate, anther wing apices protrude slightly and are thick-walled with 3 apices.

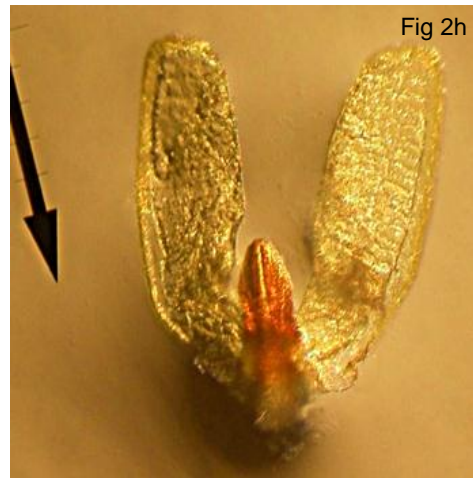


**Fig 2f.** Corona dorsal view enlarged ca. 10x. Inner lobes are short spatulate to terete, touch in the center (on living flower center is open), dorsal is concave and centrally keeled, edges are sharp, outer apex is sub-acute, emarginate from narrow thin side shelves that reach the apex.

Apex – apex	0.28 cm
Widest	0.15 cm
Ret. – ret.	0.05 cm
Ret. – center	0.05 cm
Aw. – aw.	0.13 cm
Aw. – center	0.13 cm



**Fig 2g.** Coronal scale side view enlarged ca. 22x. The outer lobes are raised a little, scale is relatively thin with a very deep scythe shaped anther wing, dorsal is concave with sharp edges.



**Fig 2h.** Pollinarium enlarged ca. 144x (arrowhead=0.1mm).

<b>Pollinium</b>	
length	0.43 mm
widest	0.16 mm
<b>Retinaculum</b>	
length	0.19 mm
shoulder	0.07 mm
waist	0.06 mm
hip	0.07 mm
ext.	0.03 mm
<b>Translator</b>	
length	0.07 mm
depth	0.03 mm
<b>Caudicle</b>	
bulb diam.	0.06 mm
<b>Translator/caudicle type: d/o</b>	

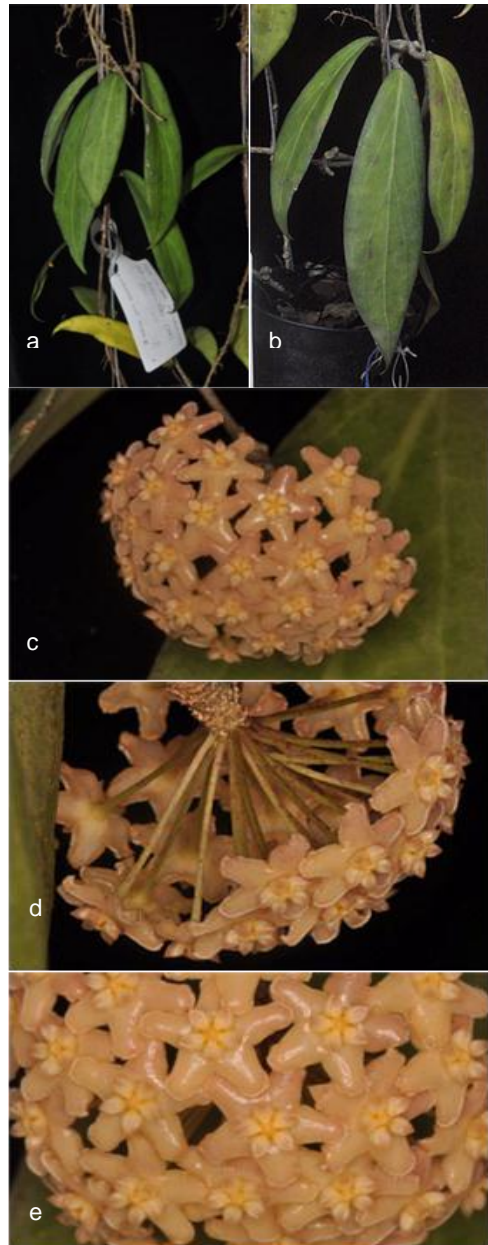
**New *Hoya* Species and Subspecies (Apocynaceae) from Quezon Province, Philippines.**

***Hoya salmonea*** Kloppenburg, Guevarra, Mendoza & Ferreras sp. nov.

*Hoya salmonea* Kloppenburg, Guevarra, Mendoza & Ferreras sp. nov., holotypus 14622 (PUH) hic designatus. Foliis anguste ellipticus, acuminatus, glabris, ply-nervis, nervis internis apicem fere attingentibus, reticulo nervorum distincto, 12.1-16.1 cm longis et 3.2-4.1 cm latis, petiole crnoso brevi 1.3-1.7 cm longo. Cymis umbelliformibus, pedicellis glabris, strictus 2.5 cm longis, teretem; calyces segmentis lanceolata glabris 0.19 cm longis et 0.10 cm latis; corolla rotatam, penta-lobata, usque infra medium, lobis ovato triangularis, 0.90 cm diametro complanatus, extus glabram, intus uniformiter papilosa; coronae lobis anterior spatulate, posterior adsentibus acutus, dorso concavis, pagina subtiliter sulcatis, subtus usque ad basin caniculatis, polliniis parvus, 0.35 mm longis, tranmslatoribus deltatus, retinacula 0.10 mm longis.

This *Hoya* species has opposite leaves, ply-nerved with angle to midrib ca. 25°, anastomosing and lighter than leaf surface. The stems have many adventitious roots. The inflorescence is a globose cluster of around 20-35 flowers with soft pale salmon color. It has rotate corolla with the edges rolled under and cup-shaped corona with the outer lobes above the inner ones (Fig 3).

Collected at General Nakar, Quezon Province by George Mendoza et al (GM#40) and named so due to the color of its corolla. The plant was found dangling from its host tree (*Ficus* sp.), along the stream around 400 m asl.



**Fig 3.** *Hoya salmonea* Kloppenburg et al. a. Plant habit; b. Adaxial side of leaf; c-e. Inflorescence.

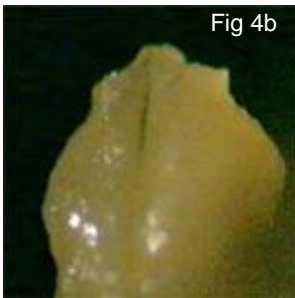
The details of floral parts are shown with appropriate measurements and comments.



**Fig 4a.** Pedicel section enlarged ca. 30x. It is strict, terete, glabrous 2.5 cm long and 0.05 cm in diameter.

Calyx is linear, glabrous, entire, apex sub obtuse, unusually thin, 0.19 cm long, 0.10 cm widest, overlap 0.05 cm.

Ovaries are broad domed, glabrous 0.12 cm tall, base pair 0.05 cm wide.



**Fig 4b.** Ovary apices greatly enlarged to show some modifications from the usual. As shown here the end narrows, then apex has a center knob and side shelves.



**Fig 4c.** Corolla ventral surface enlarged ca. 30x. The surface is glabrous.

Sinus – sinus	0.25 cm
Sinus – center	0.20 cm
Sinus – apex	0.31 cm
Apex – center	0.45 cm
Widest	0.32 cm



**Fig 4d.** Corolla dorsal surface enlarged ca. 12x. This surface is finely pubescent, less so as it approaches the center, that is slightly cupped (concave).

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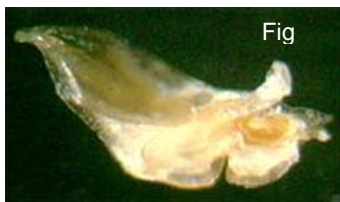


**Fig 4e.** Corona ventral view enlarged ca.14x. The surfaces are glabrous, lobe sides and dorsal are sulcate, lobes are channeled but inner portion (0.08 cm) is folded outward, central column is large 0.09 x 0.07cm in diameter, clean around it. Anther wing apices project a little and are narrow with acute apex. Lobe apices are acute and turn down a little.



**Fig 4f.** Corona dorsal surface enlarged as above. Inner lobes that touch in the center are terete, dorsal is slightly concave with a low central keel, edges are sharp, outer apex acute. Anther wing apices project slightly. Retinacula are visible from above.

Apex – apex	0.21 cm
Widest	0.10 cm
Ret. – ret	0.06 cm
Ret. – center	0.10 cm
Aw. – aw.	0.12 cm
Aw. – center	0.11 cm



**Fig 4g.** Corona scale side view enlarged ca. 30x. Surface is shallowly boat shaped, outer apex turns down slightly, scale shallow in depth.



**Fig 4h.** Corona scale ventral side to show the curved outward edges on the corona central channel. From the left apex to the curl beginning is 0.09 cm and the curl is 0.08 cm its surface is distinctly sulcate. To the right, a part of central column sticks out.



**Fig 4i.** Pollinaria enlarged ca. 75x (arrowhead=0.1mm).

<b>Pollinium:</b>	
length	0.35 mm
widest	0.14 mm
<b>Translator:</b>	
length	0.09 mm
widest	0.04 mm
<b>Retinaculum:</b>	
length	0.10 mm
shoulder	0.10 mm
waist	0.04 mm
hip	0.07 mm
ext.	0.05 mm
<b>Caudicle</b>	
bulb diam.	0.04 mm
<b>Translator/caudicle type:</b>	d/o

**Hoya persicina subsp. rosea** Kloppenburg, Guevarra, Mendoza & Ferreras ssp. nov.

*Hoya persicina* ssp. *rosea* Kloppenburg, Guevarra, Mendoza & Ferreras ssp. nov., holotypus 14623 (PUH) hic designatus. Similis specie sed pedicelis brevior 1.3 x 0.05 cm vs. 1.7 x 0.08 cm et sepalo minus linear et brevior 0.14 vs. 0.26 cm longis, sed corolla diametiente complinatis similes 1.14 cm vs. 1.16 cm sed coronae lobis brevior 0.26 cm vs. 0.33 cm, et pollinaria similes. Corona column cingens non bulbiformis.

This subspecies is similar to the species (Kloppenburger et al, 2012) in that the corolla flattened is nearly the same 1.14 cm versus 1.16 cm and their pollinaria are similar. However some differences were noted as follows: the pedicels are shorter 1.3 cm x 0.05 versus 1.7 x 0.08 cm, the sepals are not as linear and much shorter 0.14 cm versus 0.26 cm, and the lobes of the corona are shorter 0.26 cm versus 0.33 cm. Moreover, the subspecies does not have the bulbous protrusions around the coronal collar. Other small divergences were also observed.

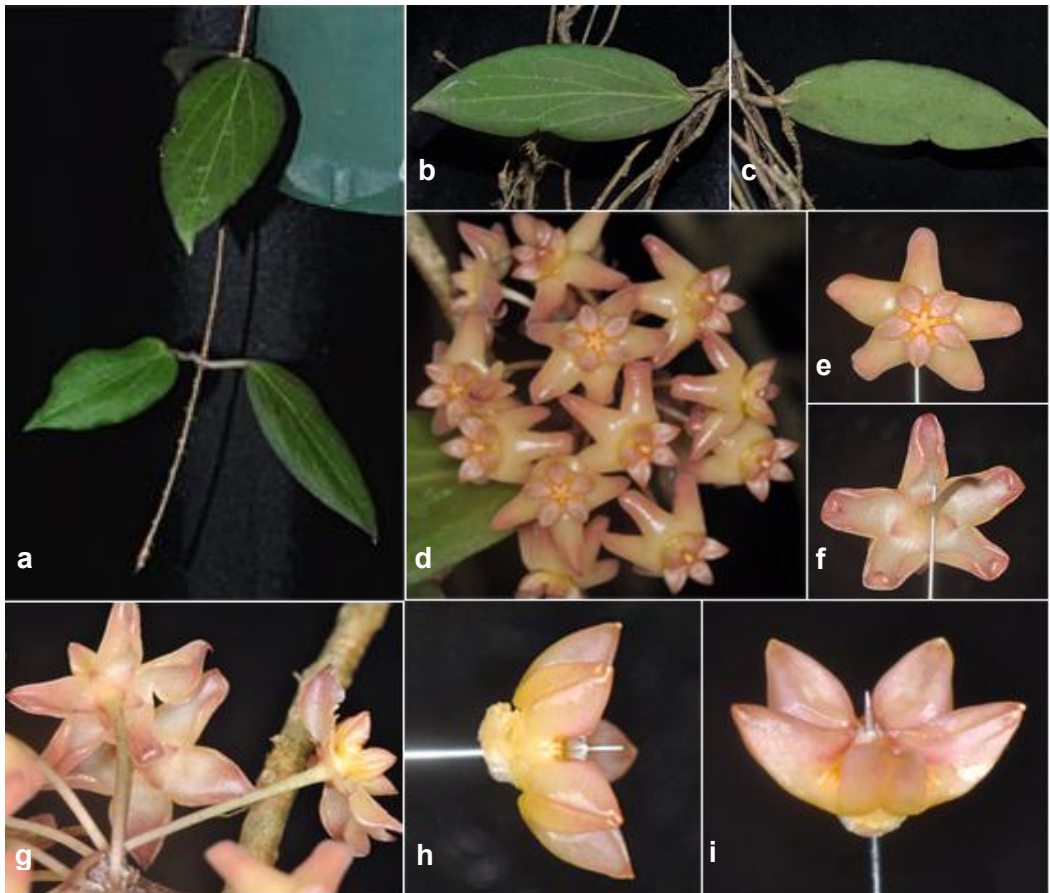


Figure 5. *Hoya persicina* ssp. *rosea* Kloppenburg et al. a. Plant habit; b-c. Adaxial and abaxial leaf surface; d. Inflorescence; e-g. Top, bottom and side view of corolla; h-i. Side view of corona.



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The leaves are opposite, petiolate, glabrous, elliptic, 6.9-8.6 cm long, 2.8-3.5 cm wide. Petiole length is 1.4-1.7 cm, base sub-cuneate, and apex apiculate. Pli-nerved, anastomosing, lighter in color than the leaf surface, undersurface mostly enervis and lighter in color. Nerve angle with midrib ca. 15° (Fig 5a-c).

The inflorescence is a loose umbel of around 12-24 flowers with reflexed corolla that has creamy yellow center with salmon pink shade at outer corolla lobe, and salmon pink corona with outer apex semi erect and pointing upward (Fig 5d-i).

Collected by George Mendoza from Maragondon, Real, Quezon Province, Philippines (GM #48), this subspecies was named after the striking color of its corolla and corona in contrast to that of the species. The plant was found along the streams around 400 m asl.



**Fig 6b.** Calyx enlarged ca. 20x. Ventral surface is glabrous-granulate, outer apices are rounded, small basal overlap.

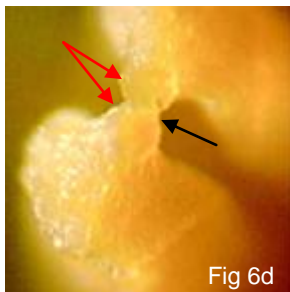
Ovaries are columnar, glabrous, 0.10 cm tall, base pair 0.10 cm wide, the apex has two projections touching the center.



**Fig 6a.** Pedicel section enlarged ca. 42x. It is terete, glabrous, strict, 1.3 cm long and 0.05 cm in diameter.



**Fig 6c.** Calyx dorsal view enlarged ca. 10x. Small ligules are present at the sinuses, basal overlap of sepals ca. 1/3. Sepals are glabrous inside, cupped, 0.14 cm long and 0.10 cm at the widest.



**Fig. 6d.** Ovary apex (black arrow) greatly enlarged to show the unusual structure of the circular finely granulate surface ending in nipple-like (red arrows) projections touching in the center



**Fig 6e.** Corolla ventral surface enlarged ca. 29x. This surface is glabrous, lobes are deeply cut.

Sinus – sinus	0.22 cm
Sinus – center	0.18 cm
Sinus – apex	0.41 cm
Apex – center	0.57 cm
Widest	0.31 cm



**Fig 6f.** Corolla dorsal surface enlarged as above. This surface is very finely puberulent slightly less under the corona. Corolla lobes are widest half way to the apex, the apex itself is tapered to acute end. Indumentum is so fine as to almost appear as glabrous.



**Fig 6g.** Corona ventral view enlarged ca. 20x. The lobes are channeled but leaving the center a little open, with edges rolled over to form a “V” shape, column is thin walled, 0.02 cm tall, clean around outside but with small raised connections toward the anther wing inner channel. Anther wing apices project ca. 0.01 cm with rounded edges. Lobe surfaces are sulcate.



**Fig 6h.** Corona dorsal surface enlarged ca. 12x. The outer lobes are raised, inner lobes are dentate and do not quite touch in the center, dorsal is concave with edges slightly rounded, outer apex is also somewhat rounded.

Apex – apex	0.26 cm
Apex – center	0.28 cm
Widest (dorsal)	0.12 cm
Ret. – ret.	0.07 cm
Ret. – center	0.04 cm
Aw. – aw.	0.14 cm
Aw. – center	0.11 cm

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**Fig 6i.** Coronal lobe side view enlarged ca. 18x. Outer lobe raised, note the emarginate apex (upper left), the inner lobe narrow dentate, all surfaces glabrous; anther wing sides not deeply curved, starting below inner apex (dark area) and curving apically and downward.

<b>Retinaculum</b>	
length	0.15 mm
shoulder	0.12 mm
waist	0.07 mm
hip	0.08 mm
ext.	0.07 mm

<b>Translator</b>	
length	0.11 mm
widest	0.04 mm

<b>Caudicle</b>	
bulb diameter	0.06 mm

**Translator/caudicle type:** d/o



**Fig 6j.** Pollinarium enlarged ca. 133x (arrowhead=0.1mm).

<b>Pollinarium</b>	
length	0.45 mm
widest	0.18 mm

**SUMMARY AND CONCLUSION**

The discovery of these new species brings the total known species of *Hoya* from the Philippines to around 109 (Co, 2013; IPNI, 2013). This confirms the status of Philippines as one of the centers of diversity for this genus (Kloppenborg et al 2012). It is expected that many more undescribed *Hoyas* in the country await discovery.

Thus, there is a need to carry on the pioneering work on genetic diversity conservation of these ornamental plants at the Institute in collaboration with *Hoya* experts and enthusiasts worldwide. Through this activity, plants brought from the wild can be studied, documented, preserved, and conserved for future generations.

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**STATEMENT OF AUTHORSHIP**

The detailed description with photomicrographs was done by RDK with supplements and relevant data from co-authors; photographs of live specimens were supplied by GKM; preparation of herbarium specimens by UFF; manuscript was prepared by MLDG, JMC and UFF.

**LITERATURE CITED**

Co's Digital Flora of the Philippines. 2013. <http://www.philippineplants.org>. [Accessed 8 May 2013].

Conservation International. 2013. <http://www.conservation.org>. [Accessed 2 May 2013].

Kloppenborg RD. 2002. *Hoya siariae*. Fraterna 15(3):1-4.

Kloppenborg RD. 2002. *Hoya buotii*. Fraterna 15(4):1-4.

Kloppenborg RD. 2012. *Hoya alwitriana* sp. nov. Asklepios 114:16-20. <http://www.asclepiad-international.org>.

Kloppenborg RD and Siar SV. 2008. Three new species of *Hoya* R. Br (Apocynaceae) from the Philippines. Asia Life Sciences 17(2):57-70.

Kloppenborg RD and Siar SV. 2009. Additional four new species of *Hoya* R. Br (Apocynaceae) from the Philippines. Asia Life Sciences 18(1):139-154.

Kloppenborg RD, MLD Guevarra, JM Carandang and FS Maranan. 2012. New *Hoya* R.Br. (Apocynaceae) Species from the Philippines. Journal of Nature Studies 11(1&2):34-48. <http://www.pssnonline.org/>

Merrill ED. 1918. New or noteworthy Philippine plants, XIV. Philippine Journal of Science. 13(5):263-344.

Mittermeier, RA, WR Turner, FW Larsen, TM Brooks and C Gascon. 2011. Global Diversity Conservation, The Critical Role of Hotspots. Biodiversity Hotspot. Springer, Berlin, Heidelberg. 22p.

The International Plant Names Index. 2013. <http://www.ipni.org>. [Accessed 8 May 2013].



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