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Conservation status of the Family Orchidaceae in Mt. Sinaka, Arakan, North Cotabato, Philippines

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Abstract. *Panal CLT, Opiso JG, Opiso G. 2015. Conservation status of the Family Orchidaceae in Mt. Sinaka, Arakan, North Cotabato, Philippines. Biodiversitas 16: 213-224.* This study determines the conservation status of the family Orchidaceae, as present on Mt. Sinaka, Arakan, North Cotabato, Philippines. A thorough survey and alpha taxonomy was done, from base to peak of the mountain. Identification of the specimens and assessment of their conservation status was based on the *IUCN Red List of Threatened Plants* 2013.2 and *National List of Threatened Philippine Plants* of Fernando et al. (2008). Based on the result conducted on October 2013-March 2014, out of 59 identified species found in the area, 12 species are widespread, 22 are endemic, 1 vulnerable, 1 critically endangered (*Paphiopedilum adductum*), 1 endangered (*Corybas* sp.), 2 least concerned species, and 20 unassessed species (not yet assessed by the *IUCN*). It has been also noted that there are probably some new species, which need thorough study for further identification. The result calls for a desperate need for conservation. Facts from this study helps in addition to the existing wildlife conservation of flora in Mt. Sinaka and to the other forested mountains in Mindanao, the Philippines.

Keywords: Alpha taxonomy, threatened, endangered, endemic

INTRODUCTION

The orchid family (Orchidaceae) contains an estimated 25,000 species (Gravendeel et al. 2004). Orchids exist as epiphytes, terrestrials, lithophytes, and aquatics making conservation a concern when trying to protect this family**.** This is the largest group of flowering plants (Huynh et al. 2009). More than 1,100 species of orchids are found in the Philippines, 80% of which are endemic (Cootes 2001). According to the *National List of Threatened Philippine Plants* of Fernando et al. (2008), the family Orchidaceae has 19 species categorized as critically endangered, 35 endangered species, and 3 vulnerable species.

Mt. Sinaka has an elevation of 1,448 meters above sea level and approximately 3,000 hectares of land area located at Arakan, North Cotabato, Philippines. This mountain is part of the Mt. Apo mountain range. Located east of barangays Marilog of Davao City, San Miguel and west of barangays Tumanding, Salasang, Lanao Koran, and Datu Ladayon of Arakan, North Cotabato (Estremera 2011). This mountain has been threatened by unscrupulous human activities. The secondary forest of this mountain has been destroyed by the entry of palm oil and banana plantations. Both flora and fauna in the area has been destroyed.

Because of the charismatic blooms of orchids they become one of the economic sources of the natives living near the mountains. This group of species becomes more prone to extinction because of their economic importance (ornamental, medicinal, flavoring and perfume). Ecologically, these species are bio-indicator and it has being forgotten that they also provide habitat for microscopic organisms. Many more species await scientific description, but with the rapid destruction of the remaining forests, many species will never be known to the scientific community, or orchid enthusiasts. Thus, there is a need to assess their conservation status for protection and conservation of these species. This will enhance the existing conservation management of the area.

MATERIALS AND METHODS

The sampling site is located on Mt. Sinaka, Arakan Valley, North Cotabato, Philippines (Figure 1). This study was done from October 2013 to March 2014. The species were just photographed for conservation purposes, and the characteristics (petals, sepals, rachis, pseudobulbs if present) were measured and described. Only species that were not identified were collected for further identification. Species located above 5 meters high on tree trunks were excluded. A standard alpha taxonomy (5m both sides) was done from the base to the peak of the mountain. Preliminary identification of the species was based on the book *Philippine Native Orchid Species* by Cootes (2011a) and other published scientific articles and journals. Identification of orchids was further verified by Jim Cootes during his visit to the Central Mindanao University on February 21-22, 2014. The assessment of the collected species was based on Fernando et al. (2008), IUCN (2014), AO-DENR (2007), and from published floristic works and books like that of Cootes (2011a, b).

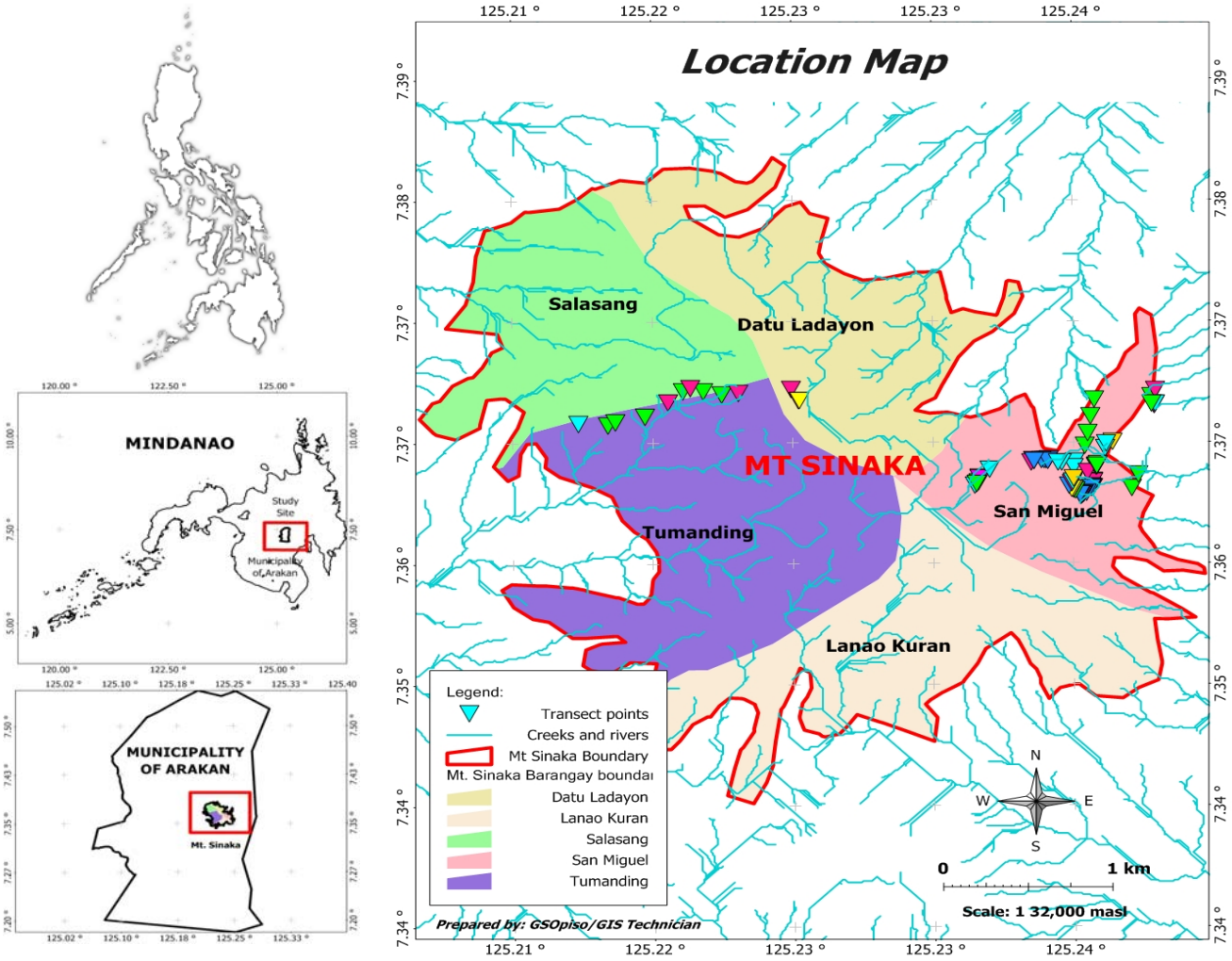


Figure 1. Study site in Mt. Sinaka, Arakan Valley, North Cotabato, Philippines

RESULTS AND DISCUSSION

Diversity

The Table 1 reveals that locally, 15 species were found to be abundant, 14 species are common, 30 species found to be rare. This means that there is a high rate of rarity among the orchid species in the area. This might be because of human intervention. As observed, some natives living near the mountain have been selling orchids as one of their economic sources. It has been also observed that the species in the wild, which captures their attention, has been brought to their gardens and been grown.

Mt. Sinaka harbored endemic, vulnerable, widespread and endangered species of Orchidaceae. There are more endemic species found in this study when compared to the study done by Buenavista (2014) in the five LTER sites in Mindanao (Mt. Kitanglad, Mt. Musuan, Mt. Malindang, Mt. Apo, Mt. Kiamo). But the result of both studies reflects that the family Orchidaceae is not well studied, though it harbors a great percentage of the flowering plants. It has also been noted that some of the species found in the area have not yet been described, nor cited in the list of Fernando et al. (2008) and IUCN (2014) which suggests that there is a need for further identification of these species.

Table 1. Number of endemic, widespread, and critically endangered species found in Mt. Sinaka, Arakan, North Cotaboto.

Status	No. of species
I. Local status	
A. Abundant	15
B. Common	14
C. Rare	30
II. Conservation status	
A. Endemic	22
B. Endangered	1
C. Critically endangered	1
D. Widespread	12
E. Vulnerable	1
F. Least Concerned	2
III. Unassessed	20

Note: Assessment of local conservation status was done by counting the number of individuals, per species, both in the sampling plots and in the transect walk. It was categorized using the following criteria: (i) 1-3 individual/s-rare, (ii) 4-9 individuals-common, (iii) 10 or >10 individuals-abundant.

Table 2. Conservation Status of each Species found in Mt. Sinaka, Arakan, North Cotabato, Philippines.

Genus/species	Conservation status
Agrostophyllum inocephallum	-
Agrostophyllum saccatilabium	-
Anoectochilus sp.	Vulnerable
Appendicula alba	Widespread
Appendicula malindangensis	Endemic
Appendicula micrantha	Endemic
Appendicula torta	-
Bulbophyllum acutum	-
Bulbophyllum alsiosum	Endemic
Bulbophyllum alagense	Endemic
Bulbophyllum dearei	-
Bulbophyllum flavescens	-
Bulbophyllum unguiculatum	-
Calanthe macgregorii	Endemic
Calanthe pulchra	-
Ceratostylis retisquama	Endemic
Ceratostylis subulata	Widespread
Chrysoglossum ornatum	Widespread
Coelogyne chloroptera	Endemic
Corybas sp.	Endangered
Crepidium ramosii	-
Cryptostylis sp.	-
Dendrobium auriculatum	Endemic
Dendrobium diffusum	-
Dendrobium milaniae	Endemic
Dendrobium stricticalcarum	Endemic
Dendrochilum arachnites	Endemic
Dendrochilum glumaceum	-
Dendrochilum mindanaense	Endemic
Dendrochilum serratoi	-
Dendrochilum wenzelii	Widespread
Epipogium roseum	Widespread
Euphlebium josephinae	Endemic
Flickingeria sp.	-
Goodyera sp.	-
Habenaria sp.	-
Liparis condylobulbon	Widespread
Liparis dumaguetensis	Endemic
Liparis terrestris	-
Oberonia sp.	-
Octarrhena amesiana	Endemic
Oxystophyllum cultratum	Widespread
Paphiopedilum adductum	Critically endangered
Peristylus spiralis	-
Phaius tankervilleae	Widespread
Phalaenopsis amabilis	Widespread
Phreatia sp.	Least concerned
Pinalia cylindrostachya	Endemic
Plocoglottis bicallosa	Endemic
Podochilus plumosus	Endemic
Robiquetia compressa	Endemic
Schoenorchis paniculata	Widespread
Spathoglottis plicata	Widespread
Spathoglottis tomentosa	Endemic
Stichorkis amesiana	Endemic
Taeniophyllum gracillimum	Least concerned
Thelasis micrantha	Widespread
Thrixspermum linearifolium	Endemic

Note: (-) not yet assessed by IUCN (2014).

Description

Anoectochilus sp. Blume

Growth habit: upright, sympodial, terrestrial. Rhizomes are succulent. Leaves are petiolate, relatively broad, brownish purple with coppery veins (Figure 2.A).

Distribution: It was found in the montane and mossy forest of Mt. Sinaka at an elevation of 1200-1400 meters asl. It has been recorded in Leyte based on Wenzel 286; also in Malaysia and Indonesia (Cullen 1992).

Appendicula malindangensis (Ames) Schlechter

Growth habit: upright to semi-pendulous, sympodial (Figure 2.B).

Inflorescence: pendulous, up to 3 cm long, bearing numerous 7 mm flowers. Flower is blue to purplish; dorsal sepal is lanceolate, hooded, about 4.5 mm long by 2mm wide; petals are oblong, about 4.5 mm long by 1.5 mm wide; lateral sepals are triangular to lanceolate, about 4.5 mm long by 4 mm wide, forming a short spur; labellum is oblong, without side lobes, about 5 mm long by 2 mm wide (Figure 2.C,D).

Distribution: It was found in the mossy forest of Mt. Sinaka at an elevation of 1400-1500 meters asl. It has been recorded from Bukidnon, Misamis, Negros and is endemic to the Philippines (Cootes 2011a).

Appendicula micrantha Lindley

Growth habit: semi-pendulous, sympodial, epiphyte (Figure 2.E).

Inflorescence: short, bearing up to 6 blooms, 4 mm in diameter. The flower is creamy white in color; dorsal sepal and petals are similar, triangular about 2 mm long by 1.5 mm wide; lateral sepals are elliptic-ovate, 2 mm long by 1.5 mm wide; labellum is oblong, about 3 mm long by 2 mm wide.

Distribution: It was found on Mt. Sinaka at an elevation of 1100-1400 meters asl. It has been recorded from Agusan, Bukidnon, Davao, Surigao, and Zamboanga, Leyte, Negros, and Panay, in the Visayas and Albay, Bataan, Laguna, Mindoro, Pampangga, Polillo, Quezon, Rizal and is endemic to the Philippines (Cootes 2011a).

Bulbophyllum alagense Ames

Growth habit: sympodial, epiphyte (Figure 2.F) .

Inflorescence: arising from the rhizome; flower is light yellow to pale orange; dorsal sepal is triangular to lanceolate, up to 8 mm long by 2 mm wide; petals are small, triangular, up to 3 mm long by 1.5 mm wide; lateral sepals: triangular to lanceolate, up to 8 mm long by 2 mm wide; labellum is curved and three-lobed, 2.5 mm long by 1.5 mm wide (Figure 2.G, H).

Distribution: It was found in the montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It was also recorded throughout Mindanao, Leyte, Mindoro, Benguet, Camarines Sur, Laguna, and Rizal on Luzon (Cootes 2011a; Pelser 2012).

Bulbophyllum alsiosum Ames

Growth habit: upright, sympodial, epiphytic (Figure 2.I).

Inflorescence: single flowered, appearing from the rhizome; the color of the outer surface of the dorsal and lateral sepals is cream to greenish; inner surface is marked with pink to purple, petals are pink, spotted with purple; labellum is pink; dorsal sepal is lanceolate, obtuse at the apex, keeled, to 2.3 cm long by 1.3 cm wide; petals are broadly ovate, to 1.4 cm long by 1 cm wide; lateral sepals are oblong to lanceolate keeled, to 2 cm long by 1.1 cm wide; labellum is thick and fleshy, tongue-shaped, to 9 mm long by 6 mm wide (Figure 2.J).

Distribution: It was found in the mossy forest of Mt. Sinaka at an elevation of 1300-1400 meters asl. It has been found in Leyte, Negros and Rizal and is endemic to the Philippines (Cootes 2011a).

Calanthe mcgregorii Ames

Growth habit: upright, sympodial, terrestrial.

Inflorescence: upright, up to 1 m in length, flowers opening successively; each bloom is backed by a green recurving bract about 1 cm long; flower is white and a yellow spot on the labellum at the junction of the mid lobe; dorsal sepal is reflexing, elliptic to lanceolate, 7 mm long by 3 mm wide; petals are not reflexing; linear to oblong, 6.5 mm long by 2 mm wide; lateral sepals are reflexing; 7 mm long by 3 mm wide; labellum is three lobed; mid-lobe divided into four spreading lobes; side lobes are wedge-shaped being widest at the apex; spur is straight; without hairs (Figure 2.K, L, M).

Distribution: It was found in the Dipterocarp forest of Mt. Sinaka at an elevation of 1100-1200 meters asl. It has been found in Lanao, Leyte, Mindoro, Polillo, Quezon and Rizal and is endemic to the Philippines (Cootes 2011a).

Ceratostylis retisquama Reichenbach f.

Growth habit: upright to semi-pendulous, sympodial, epiphyte (Figure 2.N).

Inflorescence: bear blooms that appear from the base of the plant and are up to 4 cm in diameter; flower is bright reddish orange; labellum white; dorsal sepal is lanceolate, up to 2 cm long by 6 mm wide; petals are oblanceolate, pointed, up to 2 cm long by 5 mm wide; lateral sepals are oblong-lanceolate, pointed, up to 2 cm long by 5 mm wide; labellum is tiny, pointed, 3 mm long by 1.5 mm wide (Figure 2.O).

Distribution: It was found in dipterocarp and montane forests in Mt. Sinaka at an elevation of 1200-1300 meters asl. It has been found in Agusan, Lanao, Bataan, Camarines, Ilocos Norte, Quezon, Rizal, Zambales and is endemic to the Philippines (Cootes 2011a).

Coelogyne chloroptera Reichenbach f.

Growth habit: upright, sympodial, epiphyte (Figure 2.Q).

Inflorescence: upright, appear with the new growth and can reach 25 cm in length. Each inflorescence can carry up to 12 flowers. Blooms are up to 4 cm in diameter; flower is apple-green, labellum is white and brown; dorsal sepal is lanceolate, hooded over the column, up to 2 cm long by 7 mm wide; petals are linear, up to 2 cm long by 2 mm wide. They reflex towards the pedicel; lateral sepals are lanceolate, up to 2 cm long by 7 mm wide; labellum: three-lobed, about 1.9 cm long by 1.2 cm wide (when flattened), lateral lobes rounded, mid-lobe semi-circular, three ridges run lengthways along the labellum (Figure 2.R, S).

Distribution: It was found in the montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It has been found in Mindoro, Negros, Bataan, Benguet, Cagayan, Kalinga-Apayao, the Mountain Province, Nueva Ecija, Nueva Vizcaya, Pampanga, Pangasinan, Quezon and is endemic to the Philippines (Cootes 2011a).

Corybas sp. Salisb, Parad, Lond.

Growth habit: sympodial epiphyte. Leaf solitary, circular to cordate, some are lobed (Figure 2.P).

Distribution: It was found in the mossy forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It has also been recorded from India, South China, Taiwan, Peninsular Malaysia, Borneo, New Caledonia, Vanuatu, Ponape, Indonesia, New Guinea, Solomon Islands, Australia, New Zealand, Tahiti, and Samoa (Pridgeon et al. 2001).

Dendrobium auriculatum Ames & Quisumbing.

Growth habit: upright, sympodial, epiphyte (Figure 2.T).

Inflorescence: single flowered, blooms very showy, about 3.5 cm in diameter; flower is milky white with a short green spur when fresh; dorsal sepal is ovate, up to 2.2 cm long by 1.1 cm wide; petals are oblong, up to 2 cm long by 8 mm wide; lateral sepals are oblong-lanceolate and are joined at their base to form a spur about 1 cm long, overall length 3.3 cm by 1.1 cm wide; labellum is simple, 3.4 cm long by 1.7 cm wide (at the widest point when flattened), lower third circular, the front portion is broadly heart-shaped when flattened (Figure 2.U,V).

Distribution: It was found on Mt. Sinaka at an elevation of 1200-1300 meters asl. It has been found in Davao, Mindoro, Bulacan, Mountain Province, Nueva Ecija, Nueva Vizcaya, Quezon and is recorded as endemic to the Philippines.

Dendrobium milaniae Fessel & Luckel

Growth habit: semi-pendulous; sympodial, epiphyte (Figure 2.W).

Inflorescence: pendulous, bearing up to 4 blooms that are about 1.5 cm in diameter with a short spur; flower is white; labellum has yellow in the center surrounded by purple markings; dorsal sepal: linear, acute, 1 cm long by 5 mm wide; petals are linear, tip rounded, 1.1 cm long by 3.5 mm wide; lateral sepals are triangular, 9 mm long, labellum is about 1.2 cm long with a wavy margin, the middle of the labellum has three ridges, which are short, central part of the labellum is round (Figure 2.X, Y).

Distribution: It was found in montane forest of Mt. Sinaka at an elevation of 1260 meters asl. It is recorded from Leyte and is endemic to the Philippines (Cootes 2011a).

Dendrobium stricticalcarum W. Suarez & Cootes

Growth habit: slightly pendulous to upright, sympodial, epiphyte (Figure 2.Z).

Inflorescence: appear from the leafless pseudobulbs; usually near the apex; to 1.4 cm long, bearing between 3 and 12 flowers. Flowers are about 5 mm across the lateral sepals by 2.3cm long from the tip of the mentum to tip of the dorsal sepal. The flowers of this species do not open widely; flower is pink, anther cap is purplish, odorless. Pollinia are brown in color; dorsal sepal is ovate-lanceolate, acuminate, reflexing slightly, 7 mm long by 3.2 mm wide; petals is narrowly lanceolate to linear, acuminate 7 mm long by 1.5 mm wide; lateral sepals are triangular, together with the mentum 2.5 cm long by 3.5 mm wide; labellum is ovate-elliptic; 1 cm long by 3 mm wide (when flattened); edges rolling around the column (Figure 2.AA).

Distribution: It was found in montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It was also found in Leyte, Mindoro, Laguna and recorded as endemic in the Philippines (Cootes 2011a).

Dendrochilum arachnites Reichenbach f.

Growth habit: upright, sympodial, epiphyte. This species is a bit of a rambler having a distance of about 5 cm between its pseudobulbs (Figure 2.AB).

Inflorescence: arching, appearing with the new growths. The flowers are about 2 cm across the lateral sepals, which is their widest point. Each inflorescence can carry up to 30 blooms; flower is yellow; dorsal and lateral sepals are linear-lanceolate extending into acute tips, up to 1 cm long by 2 mm wide; petals are lanceolate up to 7 mm long by 3 mm wide; labellum is oblong, 4 mm long by 1.5 mm wide, three ridges run its length (Figure 2.AC, AD).

Distribution: It was found in both montane and mossy forest of Mt. Sinaka at an elevation of 1200-1500 meters asl. It has been recorded from Agusan, Bukidnon, Davao, Misamis, Zamboanga, Leyte, Mindoro, Benguet, Ifugao, Mountain Provinces, Nueva Ecija, Nueva Vizcaya, Pampanga, Quezon, Rizal and is endemic to the Philippines (Cootes 2011a).

Dendrochilum mindanaense (Ames) L.O. Williams

Growth habit: upright, sympodial, epiphyte (Figure 2. AE).

Inflorescence: semi-pendulous, bearing minute blooms; color is cream. Labellum is dark orange; dorsal sepal is oblong, about 1.5 mm long by 0.5 mm wide; petals are narrowly elliptic-oblong; lateral sepals are elliptic about 1.5 mm long by 0.5 mm wide; labellum is three-lobed, side lobes are oblique measures 0.5 mm long by 1 mm wide; mid-lobe is subquadrate and has three dentate apex (Figure 2.AF, AG).

Distribution: It was found on Mt. Sinaka at an elevation of >1400 meters asl. It has also been recorded from Cabadbaran, Agusan del Norte. No other information has yet been published other than the Philippines localities (Pedersen 1997).

Liparis dumaguetensis Ames

Growth habit: upright, sympodial, terrestrial (Figure 2.AH).

Inflorescence: upright, to 20 cm long, bearing numerous blooms about 1.3 cm in diameter; sepals and petals are a dull purple. Labellum is yellow when the flower first opens. As the flower ages the labellum goes purplish-red; dorsal sepal is linear to narrowly lanceolate, to 9 mm long by 3 mm wide, reflexing; petals are linear, to 9 mm long by 1 mm wide; lateral sepals are narrowly lanceolate, to 9 mm long by 3 mm wide; labellum is heart-shaped; edges erose, to 1 cm long by 8 mm wide (Figure 2.AI, AJ).

Distribution: It was found in montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It was also found on Camiguin, Negros, Panay, Mindoro, Benguet, Laguna, Nueva Vizcaya, Quezon, Rizal, and recorded is endemic to the Philippines (Cootes 2011a).

Liparis terrestris J.B. Comber

Growth habit: upright, sympodial, terrestrial (Figure 2.AK).

Inflorescence: upright, peduncle: 14 cm long by 1 mm in diameter bearing blooms with 1 cm apart. Pedicel: about 9 mm long by 0.5 mm in diameter. Bracts are linear, about 7 mm long by 1 mm wide; flower is green, yellow column; dorsal sepal is linear, about 5.5 mm long by 0.5 mm wide; petals are linear, about 6 mm long by 0.5 mm wide; lateral sepals are linear, about 5.5 mm long by 0.5 mm wide; labellum is cordate, erose edge, 4 mm long by 5 mm wide (Figure 2. AL, AM).

Distribution: It was found in the montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It is also recorded from Sumatra (Renz 2012).

Paphiopedilum adductum Asher

Growth habit: upright, sympodial, terrestrial (Figure 2.AN).

Inflorescence: upright, bearing up to three blooms; dorsal sepal is creamy-white with dark red vertical striping. Petals are yellowish dark red stripes. Labellum is reddish-brown with darker striping. Synsepalum is creamy-white with dark red vertical striping; dorsal sepal is ovate, pointed tip, up to 5.5 cm long by 3 cm wide; petals are narrowly linear, gradually tapering, drooping, about 10 cm long by 8 mm wide; labellum is up to 4.5 cm long by 2 cm wide; synsepalum is oblanceolate, up to 6 cm long by 3 cm wide.

Distribution: It was found in montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It is also found in Bukidnon and recorded as endemic to the Philippines (Cootes 2011a).

Pinalia cylindrostachya (Ames) W. Suarez and Cootes

Growth habit: upright, sympodial, epiphyte (Figure 2.AO).

Inflorescence: arching, up to 18 cm long, and there can be several per pseudobulb, bearing many. Flowers are about 7 mm in diameter; flower is pale-yellow, almost translucent. Labellum is bright yellow. The outer surfaces, of the dorsal and lateral sepals are covered with very short

reddish-brown hairs. The anther cap is dark red; dorsal sepal is elliptic-oblong, up to 6 cm long by 3.5 mm wide; petals are obovate, 6 mm long by 3 mm wide; lateral sepals are triangular, 7 cm long by 5 mm wide; labellum is three-lobed; wedge-shaped; side lobes oblong; mid lobe is squarish; overall about 7 mm long by 4 mm wide (Figure 2.AP, AQ).

Distribution: It was found in the mossy forest of Mt. Sinaka at an elevation of >1400 meters asl. It was recorded from Bukidnon, Davao, Misamis, Negros, Mindoro, Bataan, Benguet, Rizal and is endemic to the Philippines (Cootes 2011a).

Plocoglottis bicallosa Ames

Growth habit: upright, sympodial, terrestrial (Figure 2.AR).

Inflorescence: upright, longer than the leaves, hairy, bearing numerous attractive blooms; sepals and petals are greenish-yellow, blotched basally with reddish-brown. Labellum is cream with a deep yellow spot between the ridges; dorsal sepal is lanceolate, slightly concave, hairy on the outer surface, 1.6 cm long by 4.5 mm wide; petals are upright, linear, 1.6 cm long by 2 mm wide; lateral sepals are lanceolate, falcate, slightly concave, hairy on the outer surface, to 1.6 cm long by 4.5 mm wide, reflexing backwards; labellum is to 1 cm long by 1.3 cm wide, fan-shaped, edges toothed, apex pointed and curved under, two distinct ridges (calli) under the column, which is curved (Figure 2.AS, AT).

Distribution: It was found in montane forest of Mt. Sinaka at an elevation of 1100-1200 meters asl. It has been recorded from Camiguin, Mindoro, Negros, Sorsogon, Rizal and is endemic to the Philippines (Cootes 2011a).

Podochilus plumosus Ames

Growth habit: upright to semi-pendulous, sympodial, epiphyte (Figure 2.AU).

Inflorescence: appear dorsally near the tip of the stem bearing 4-5; flower is milky white. Dorsal sepal has a patch of purple at the apex Lateral sepals have shades of purple near its apex; dorsal sepal is ovate to lanceolate, up to 2.5 mm long by 1.5 mm wide; petals are oblong to lanceolate, pointing forward, up to 2 mm long by 1 mm wide; lateral sepals are ovate to lanceolate, up to 2.5 mm long by 1.5 mm wide; labellum is triangular, 3 mm long by 1.5 mm (Figure 2.AV, AW).

Distribution: It was found in the montane forest of Mt. Sinaka at an elevation of 1100-1200 meters asl. It has been recorded from Agusan, Cotabato, Surigao, Zamboanga, Basilan in the Sulu archipelago, Bohol, Leyte, Panay, Samar, Camarines Sur, Laguna, Nueva Ecija, Quezon, Zambales and is endemic to the Philippines (Cootes 2011a).

Robiquetia compressa (Lindley) Schlechter

Growth habit: upright to semi-pendulous, monopodial, epiphyte (Figure 2.AX).

Inflorescence: appear opposite the leaf, sometimes branching, up to 20 cm long, bearing many small flowers; flower white with patches of red, side lobes of the labellum are yellow and dark red; dorsal sepal is ovate, concave, up to 4.5 mm long by 2 mm wide; petals are broadly ovate, 3.5 mm long by 2.5 mm wide; lateral sepals are obovate, wedge-shaped, tip broad, 4 mm long by 3 mm wide; labellum is three lobed, side lobes erect, squarish, mid-lobe fleshy, spur curved forward, about 1 cm long (Figure 2.AY, AZ).

Distribution: It was found in the mossy forest of Mt. Sinaka at an elevation of 1300-1400 meters asl. It has been recorded from Davao, Misamis, Zamboanga, Leyte, Panay, Mindoro, Bataan, Camarines Sur, Catanduanes, Quezon, Rizal, Sorsogon and is endemic to the Philippines (Cootes 2011a).

Thrixspermum linearifolium Ames

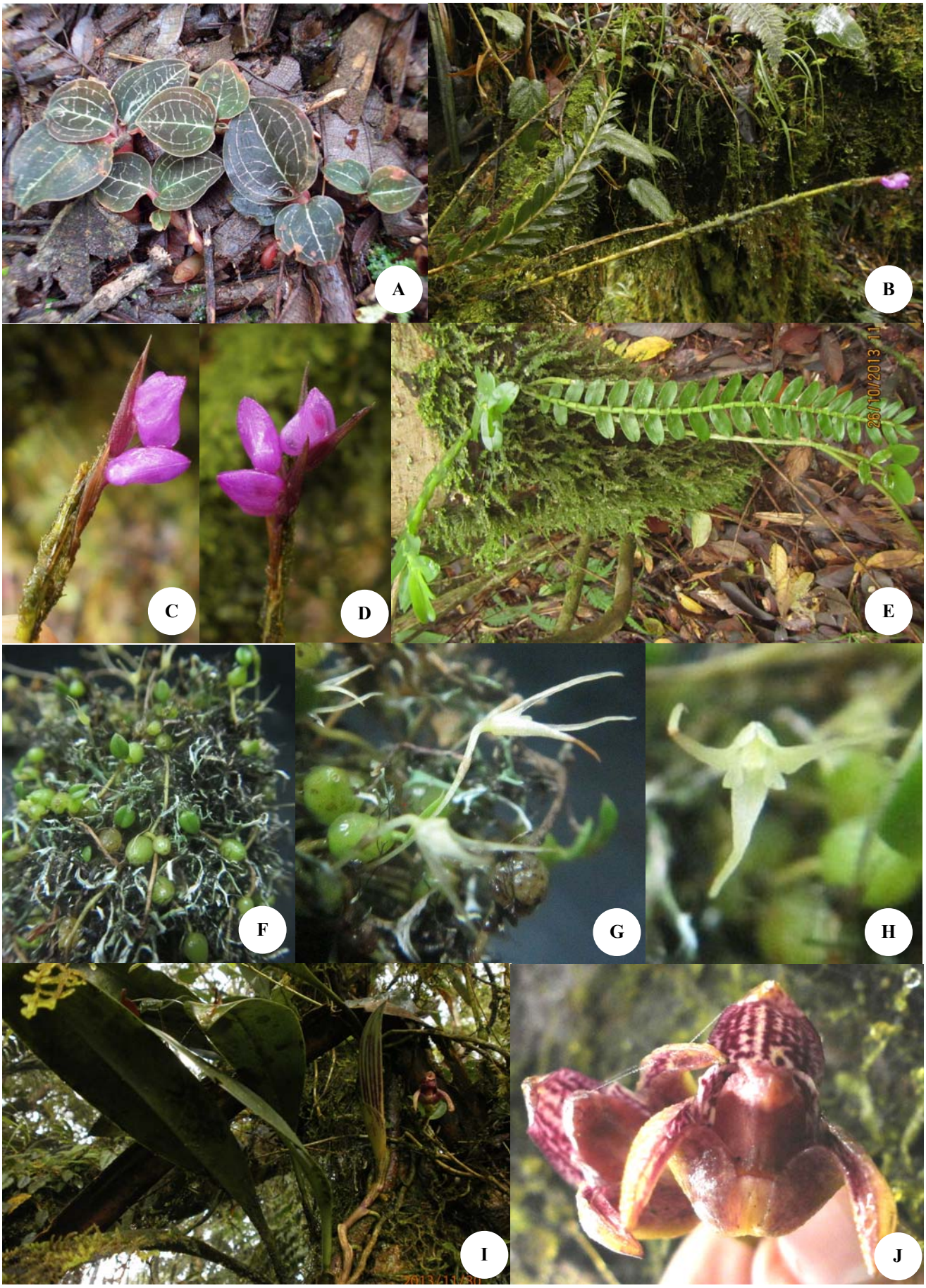
Growth habit: pendulous, monopodial, epiphyte (Figure 2.BA).

Inflorescence: appear opposite the leaf; 10 cm long; rachis flattened bearing the short-lived blooms in succession; sepals and petals yellow, white to cream; labellum white or cream with brown blotches on the inner surface; dorsal sepal is elliptic, concave, 8 mm long by 5 mm wide; petals are obovate, 7 mm long by 4 mm wide; lateral sepals are elliptic, slightly concave, 8 mm long by 5 mm wide; labellum is pouch-shaped; three lobed, side lobes crescent-shaped, 2.5 mm long by 2 mm wide; mid-lobe short and fleshy; pouch 3 mm long, hairy on inner front surface (Figure 2.BB, BC).

Distribution: It was found in the montane forest of Mt. Sinaka at an elevation of 1200-1300 meters asl. It has been recorded from Bukidnon, Misamis, Zamboanga and is endemic to the Philippines (Cootes 2011a).

Habitat, loss and over-collection of species in the wild, can result in the extinction of species. This suggests that there is a desperate need to protect the habitat. Habitat loss is usually the cause of endangerment of species, while habitat protection is the key to species conservation. Considering also the economic uses, and the restricted distribution of endemic species, continuous habitat degradation somehow imposes a high risk of these species becoming threatened and even extinct before they are described. Furthermore, the result suggests that Mt. Sinaka must be given priority in protection and conservation to ensure that orchid habitats will remain intact.

The facts presented in this study serve as supplemental information for the conservation organizations, and agencies, not only in Mt. Sinaka but throughout the world, which will save a myriad of species.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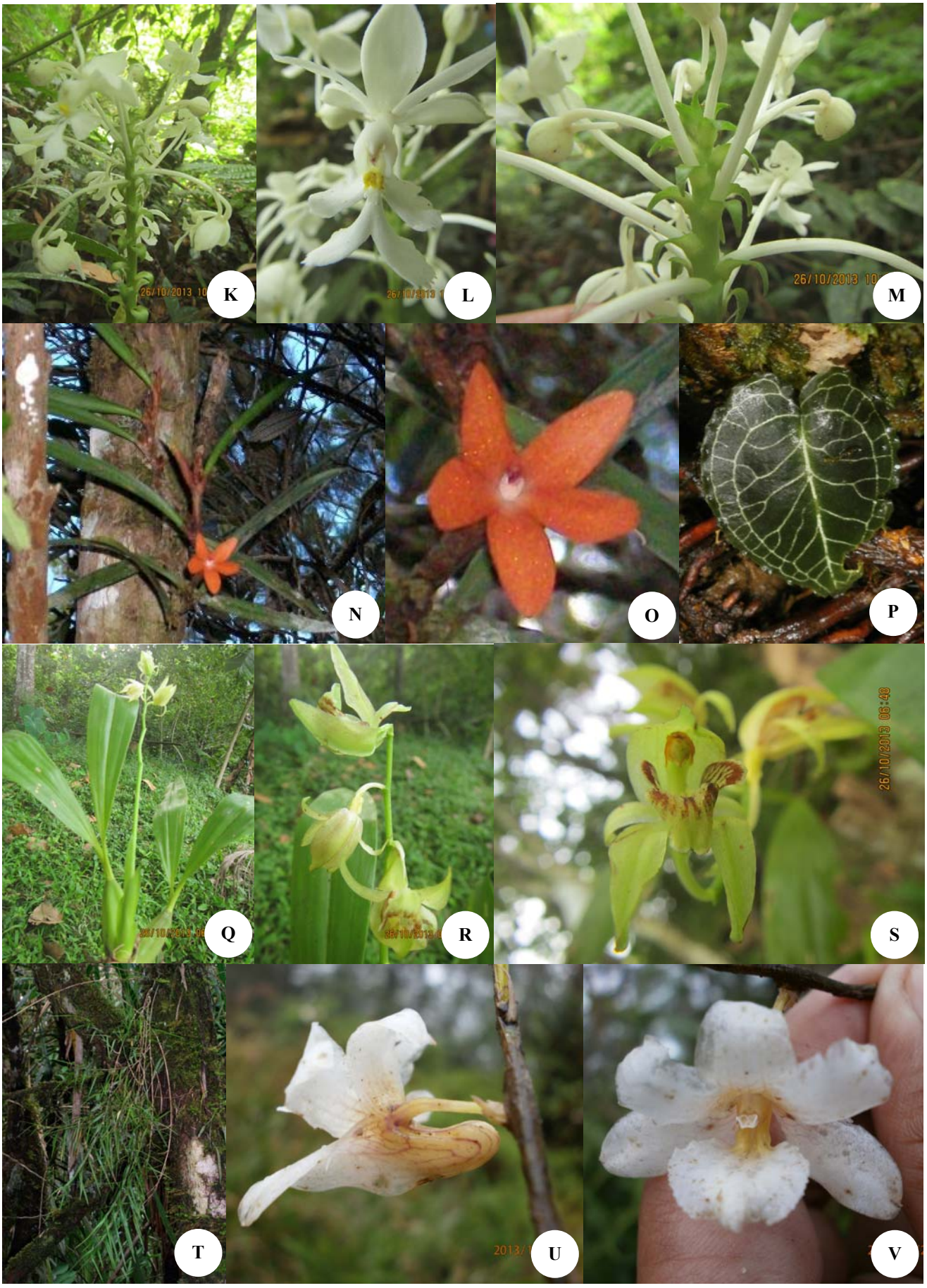
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Figure 2.A. *Anoechtochilus* sp.Blume, B, C, D. *Appendicula malindangensis* (Ames) Schlechter, E. *Appendicula micrantha* Lindley, F, G, H. *Bulbophyllum alagense* Ames, I, J. *Bulbophyllum alsiosum* Ames, K, L, M. *Calanthe mcgregorii* Ames, N, O. *Ceratostylis retisquama* Reichenbach *f.,* P, *Corybas* sp. Salisb, Parad, Lond,.Q, R, S. *Coelogyne chloroptera* Reichenbach *f.*, T, U, V. *Dendrobium auriculatum* Ames and Quisumbing, W, X, Y. *Dendrobium milaniae* Fessel and Luckel, Z, AA. *Dendrobium stricticalcarum* W. Suarez & Cootes, AB, AC, AD. *Dendrochilum arachnites* Reichenbach *f.*, AE, AF, AG. *Dendrochilum mindanaense* (Ames) L.O. Williams, AH, AI, AJ. *Liparis dumaguetensis* Ames, AK, AL, AM. *Liparis terrestris* J.B. Comber, AN. *Paphiopedilum adductum* Asher, AO, AP, AQ. *Pinalia cylindrostachya* (Ames) W. Suarez and Cootes, AR, AS, AT. *Plocoglottis bicallosa* Ames, AU, AV, AW. *Podochilus plumosus* Ames, AX, AY, AZ. *Robiquetia compressa* (Lindley) Schlechter, BA, BB, BC. *Thrixspermum linearifolium* Ames. (photos by J. Opiso)

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