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RESEARCH NOTE

Distribution and Ecology of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in Mindanao, Philippines

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***Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 is a Mindanao-endemic species known only in Davao del Sur. Here, we recorded the species first in Bukidnon and the Cotabato region. Moreover, we also provide ecological notes of the species specifically the identities of its food plants, description of its habitat, and potential threats.**

Keywords: food plants, montane forest, Mount Natampod, Mount Apo, threats

The Philippines is biogeographically one of the most diverse countries and is considered one of the biodiversity hotspots in Southeast Asia that are inhabited by many endemic and unique species of flora and fauna (Mittermeier *et al.* 1998; Myers *et al.* 2000). Insects comprise the most speciose group of terrestrial animals, which is true for weevils of the family Curculionidae with about 4,600 genera and 51,000 species known in the world (Oberprieler *et al.* 2007). The Philippines, specifically Mindanao island, is known for its mountainous ecosystems inhabited by many interesting species, of which some are site endemics.

Mount Apo and Mount Natampod, Pantaron Range are among those important mountain ecosystems in Mindanao. The latter is in Bukidnon, located in the central part of Mindanao, and is considered to have high biodiversity value (Gronemeyer *et al.* 2014; Coritico *et al.* 2018). On the other hand, Mount Apo – the highest mountain in the Philippine archipelago – is a declared natural park and home to 856 species of plants and animals (WHC 2011).

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Our recent faunistic inventory in these areas documented an interesting weevil species, *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021. This species of weevil was recently discovered in Toril and Carmen, Davao del Sur based on a male holotype specimen and three and five female and male paratypes, respectively (Cabras and Medina 2021). However, there have been no available live photographs of the species in its natural habitat since its description. In addition, no records of its food plants were available, which is very important for its survival.

Hence, for the first time, our study presents live photographs of the species and its food plants in its natural habitat – specifically around some localities in Mount Apo and Mount Natampod, Pantaron Range, Southern Philippines. Moreover, we provide the new distribution records of the species in Mindanao, Philippines.

Prior to the conduct of the study, the research had been presented to the indigenous community as part of the free, prior, and informed consent. Necessary permits such as an approved gratuitous permit (DENR permit number 2020-06 and XI-2022-26) were then obtained from the

Department of Environment and Natural Resources in compliance with Republic Act No. 9147 for the collection of the specimens.

The present study was conducted in the pristine forest of Mt. Apo in the localities of Sitio Culan, Sta. Cruz, Davao Del Sur (06.98323°N, 125.28601°E; 2000 m asl; 29 Apr– 04 May 2022), Sitio V, Magpet, North Cotabato (7°11'23.34" N, 125°9'53.37" E; 1,257 masl, 14–20 Oct 2020), and lastly, in Barangay Namnam, Mount Natampod, Pantaron Range (7°51'41.2" N, 125°25'24.32" E; 1,098 masl, 22–26 Jul 2022), Mindanao, Philippines (Figure 1). The combination of standard belt-transect and opportunistic and random sampling was implemented in the study. The collection of specimens was conducted along an established 2-km transect covering 10 m x 5 m on both sides. Encountered food plants of the species in the area were identified (FPC: one of the authors; Danilo Tandang: Botanist) using Co's Digital Flora website (Pelser *et al.* 2011 onwards).

Specimens of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 were collected by handpicking when encountered during the diurnal (07:00–15:00 h) and nocturnal (17:00–22:00 h) period. They were then put in vials filled with 95% ethyl alcohol for preservation.

The specimens collected in this study were then deposited in Central Mindanao University, University Museum, Zoological Section.

Materials examined. Philippines • (5/5) 2♂3♀ – North Cotabato, Mount Apo, Barangay Mahongkog, Sitio V, Magpet, 7°11'23.34"N, 125°9'53.37"E (1,257 masl), 14-20 Oct 2020, AM-011; (10/10) 3♂7♀– Davao del Sur, Mt. Apo, Sitio Culan, Sta. Cruz, 06.98323°N, 125.28601°E (2,000 m asl), 02 May 2022; (3/3) 1♂2♀– Bukidnon, Mount Natampod, Pantaron Range, Barangay Namnam, Sitio Natampod, 7°51'41.2"N, 125°25'24.32"E (1,098 m asl), 22–26 Jul 2022.

Distribution. The species is originally known in the old-growth secondary forest of Toril and Carmen, Davao del Sur, Mindanao, Philippines (Cabras and Medina 2021). With the new information herein, the species inhabits tropical upper mountainous rainforests of Mount Apo – specifically in the localities of Sta Cruz, Davao del Sur and Magpet, North Cotabato, and also in Mount Natampod, Pantaron Range, Barangay Namnam, Sitio Natampod (1,098–1,140 masl), Bukidnon, Mindanao, Philippines (present study, as shown in Table 1).

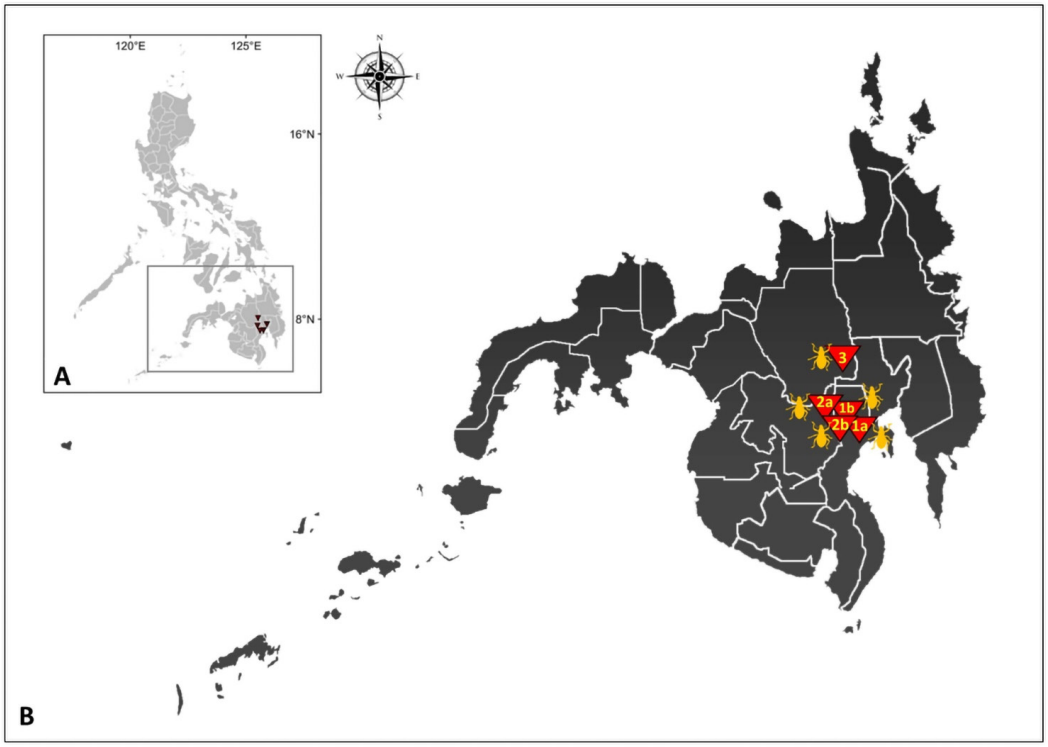

Figure 1. Map of the Philippines (A) and Mindanao (B) showing the updated distribution of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021. Localities are also shown in Table 1.

Table 1. Localities where *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 is known in Mindanao, together with information on coordinates, elevation, collector/s, date of research, and reference for each.

Locality	Coordinates	Elevation	Date	Collector/s	Reference
[1a] Toril, Davao City, Davao del Sur	Unknown	Unknown	May 2019	Local Collector	Cabras and Medina (2021)
[1b] Carmen, Davao City, Davao del Sur	Unknown	Unknown	July 2019	Local Collector	Cabras and Medina (2021)
[2a] Mount Apo, Sitio V, Magpet, North Cotabato	7°11'23.34"N, 125°9'53.37"E	1,257 masl	October 2020	R.R. Patano Jr. and V.B. Amoroso	Present study
[2b] Mount Apo, Sitio Culan, Davao del Sur, Sta. Cruz	06.98323°N, 125.28601°E	2,000 masl	May 2022	R.R. Patano Jr. and V.B. Amoroso	Present study
[3] Mount Natampod, Pantaron Range, Sitio Natampod, Barangay Namnam, San Fernando, Bukidnon	7°51'41.2"N, 125°25'24.32"E	1,098 m asl	July 2022	R.R. Patano Jr. and V.B. Amoroso	Present study

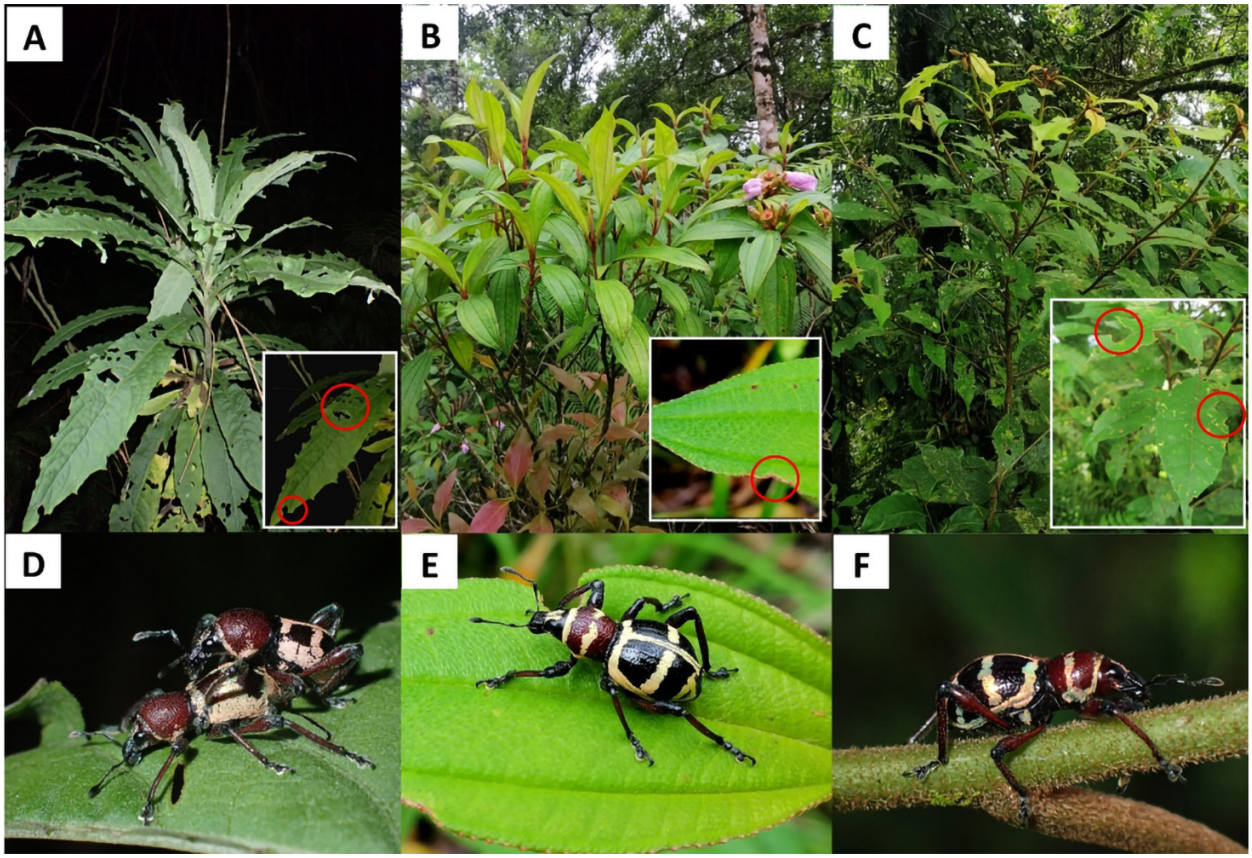

Figure 2. First live photographs of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 (D, E, and F) in its natural habitat perching on its food plants, *Blumea* sp. (D) *Melastoma malabathricum* (E) and *Polyosma* sp. (F). Chew marks are encircled with red.

Habitat, food plants, and threats. The documented and observed specimens of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in North Cotabato, Mount Apo, Magpet were observed perching on its food plant *Melastoma malabathricum* (L.) Smith of the family Melastomataceae (Figure 2E). Chew marks on the leaves of the plant species were observed, suggesting that it is one of their possible food source (Figure 2B, encircled with red). The species positioned itself atop the leaf. The habitat of the species in this area is characterized as a secondary lower montane forest with elevation ranging from 1,246–1,487 masl dominated by trees species such as *Lithocarpus* sp., *Agathis philippinensis*, *Syzygium* spp., *Shorea* spp., and *Cinnamomum* spp., whereas understory

plants are dominated by ferns, lycophytes, aroids, orchids, gesneriads, palms, pandans, *Medinilla* spp., and gingers. The forest is over the clay to loam soil mostly covered with gravel having an average composition (50%) of very common grasses, sedges, herbs, and ferns; bryophyte density (40%); leaf litter (3 inches); an abundance of *Nepenthes* (20%); fallen logs (80%); and exposed rocks (80%) (Figure 3B). Common threats in the area are agricultural activities extending to forested areas, illegal logging, the presence of invasive species (*Piper aduncum*), and poaching.

On the other hand, specimens of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in Davao del Sur, Mt. Apo, Sitio Culan, Sta. Cruz were observed perching and mating on its food plant *Blumea* sp. (Asteraceae). Traces of chew marks were also observed on the leaves of the plant species (Figure 2A encircled with red). Most of the specimens are hiding on the folded petiole and leaf apices of the plant species (Figure 2D). The habitat of the species in this area is characterized as an upper montane forest with elevation ranging from 1,900–2,100 masl dominated by trees species such as *Ardisia* sp., *Aquilaria* sp., *Myrsine* sp., *Elaeocarpus* sp., *Macaranga* sp., *Tasmannia piperita*, *Weinmannia* sp., *Ascarena* sp., *Morilla* sp., *Pittosporum* sp., and *Leptospermum javanicum*, whereas understory plants are dominated by ferns, lycophytes, aroids, and gingers. The forest is over loamy soil mostly covered with gravel having a lesser composition (25%) of very common grasses and ferns, bryophyte density (70%); leaf litter (2 in); an abundance of *Nepenthes* (10%); fallen logs (70%); and exposed rocks (70%) (Figure 3A). Common threats in the area are also the rampant agricultural activities that have now extended into the protected zones of Mount Apo (Figure 4B). Other threats observed are the presence of garbage thrown by trekkers and poaching (Figure 4A).

Lastly, the species was observed in Mount Natampod, Pantaron Range perching on its food plant *Polyosma* Blume (Escalloniaceae). The species also clearly feeds on the plant species as there are a lot of markings on its leaves (Figure 2C, encircled with red). Individuals are observed perching on the stalk and others are hiding at the abaxial part of the leaves (Figure 2E). Mount Natampod (774–1,140 masl) is characterized by having secondary

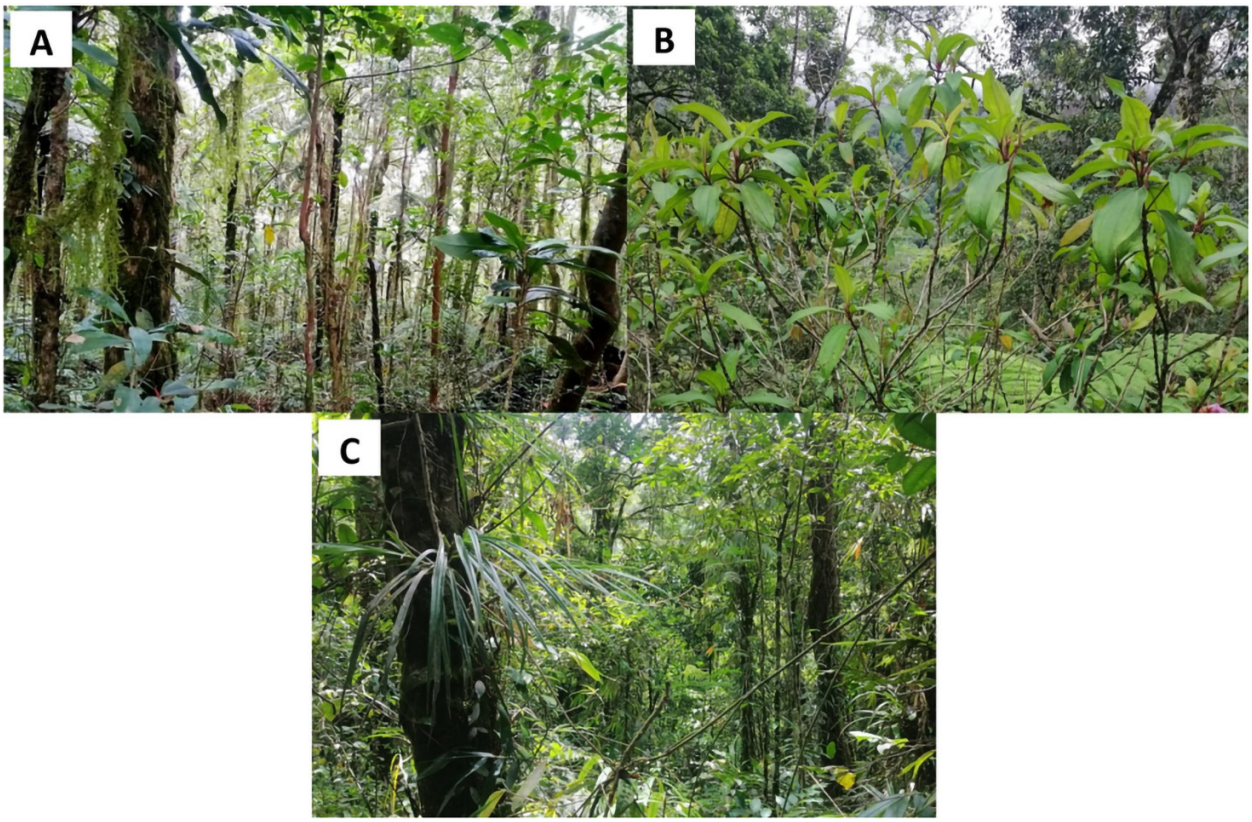

Figure 3. Habitat of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in the secondary montane forests in Mount Apo, Sitio Culan, Sta. Cruz, Davao del Sur, Sitio V, Magpet, North Cotabato (A and B) and Mount Natampod, Pantaron Range, Sitio Natampod, San Fernando, Bukidnon.

Figure 4. Some of the common threats on the natural habitat of *Metapocyrtus* (*Metapocyrtus*) *ged* Cabras & Medina, 2021 in Mount Apo, Sitio Culan, Sta. Cruz, Davao del Sur (A and B) and Mount Natampod, Pantaron Range, Sitio Natampod, San Fernando, Bukidnon (C and D).

montane to agroforest ecosystems. The forest over a loamy substrate with some gravel. The area is dominated by trees and shrubs such as *Spiraeopsis celebica* (Blume) Miq., *Shorea polysperma* (Blco.) Merr., *Callophylum blancoi* Planch & Triana, and *Shorea* sp. It is also rich with ferns dominated by *Taenitis blechnoides* (Willdenow) Swartz, *Lindsaea hamiguitanensis* Karger & Amoroso, *Diplazium cordifolium* Blume, and *Calochlaena javanica* (Blume) Turner & White (Figure 3C). Threats in the area include the destruction of forests for road construction and agricultural activities usually by crop plants such as *Musa textilis* Née (abaca), *Zea may*s L., and *kamote* (*Ipomoea* spp.) (Figures 4C and D).

The occurrence of the species across Davao, Cotabato, and Bukidnon implies that these regions indeed share common species, which clearly supports the observations of Cabras *et al.* (2019). It is important that the species are occurring in different regions having different food plants in Mindanao, as it somehow implies their abundance, reproduction, and polyphagy. However, the species can only be found within pristine and intact forest ecosystems and most of these forest ecosystems are now depleting due to many disturbances. Monitoring and more awareness activities must be done to somehow slowly eradicate these destructive activities in the remaining natural habitat in Mindanao.

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