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Species occurrence of weevils (Coleoptera: Curculionidae) in the Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Philippines

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Abstract

Species occurrence of weevils (Coleoptera: Curculionidae) was conducted in Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Southern Mindanao, Philippines on March 5, 2018 to March 10, 2018. Opportunistic, belt transect and random sampling techniques were performed as field sampling techniques. Two different sites were surveyed which include the two (2) secondary forest with the elevation of 1,200 masl (site 1) and a site with a higher elevation of 1,254 masl (site 2). A total of twenty-three (23) species belonging to three (3) genera viz., *Pachyrhynchus*, *Metapocyrtus* and *Alcidodes*, with a total of forty (40) individuals were collected from two (2) different sites. The site 1 with lower elevation has higher number of species collected (15 species) compared to other site with a higher elevation (11 species). Only three (3) species were shared between the two (2) sites. There are three (3) identified species namely, *Pachyrhynchus erchsoni* Waterhouse, 1841 (Philippine endemic), *P. miltoni* Cabras and Rukmane, 2016 (Mindanao endemic) and *Metapocyrtus apoensis* Schultze, 1925 (Mindanao endemic). The results of the survey revealed that Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Southern Mindanao, Philippines has high number of species despite of anthropogenic disturbances occurring in the area. The study implies that Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Southern Mindanao, Philippines must be protected in order to conserve and protect the undiscovered species and also the threatened and endemic species.

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Introduction

Weevils specifically under the tribe *Pachyrhynchini* has an estimated of more than 400 species with more than 90% of endemicity with a Philippine centered distribution (Ballentes *et al.*, 2006; Barsevskis, 2016). The tribe has currently 15 described genera with the latest addition of the genus *Ex-pachyrhynchus* from Palawan (Alonzo-Zaraga and Lyal, 1999; Yap and Gapud, 2007; Yoshitake, 2013). Of these 15 genera, 10 genera are endemic to the country. They are the largest group of beetles (Curculionidae) in the world with 51,000 species under 4600 genera (Oberprieler *et al.*, 2007). Recently, few foreign taxonomists have been doing most of the work on tribe by describing new species (Yoshitake, 2012b and 2013, Bollino and Sandel, 2015) with recently discovered new species from genus German, 1841 (Yoshitake, 2012; Rukmane and Barsevskis, 2016; Rukmane, 2016).

Currently there are more than a hundred species of *Pachyrhynchus* in the Philippines while the genus *Metapocyrtus* has 227 species (Yap and Gapud, 2007; Yoshitake, 2011). These species of weevils must be studied further specifically in their occurrence from different islands in the archipelago as they have high rates of endemism. Thus, this study aimed to record the species occurrence of weevils in Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Philippines.

Methodology

A. Place and time duration

The study was conducted specifically in Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Southern Mindanao, Philippines (Figure 1).

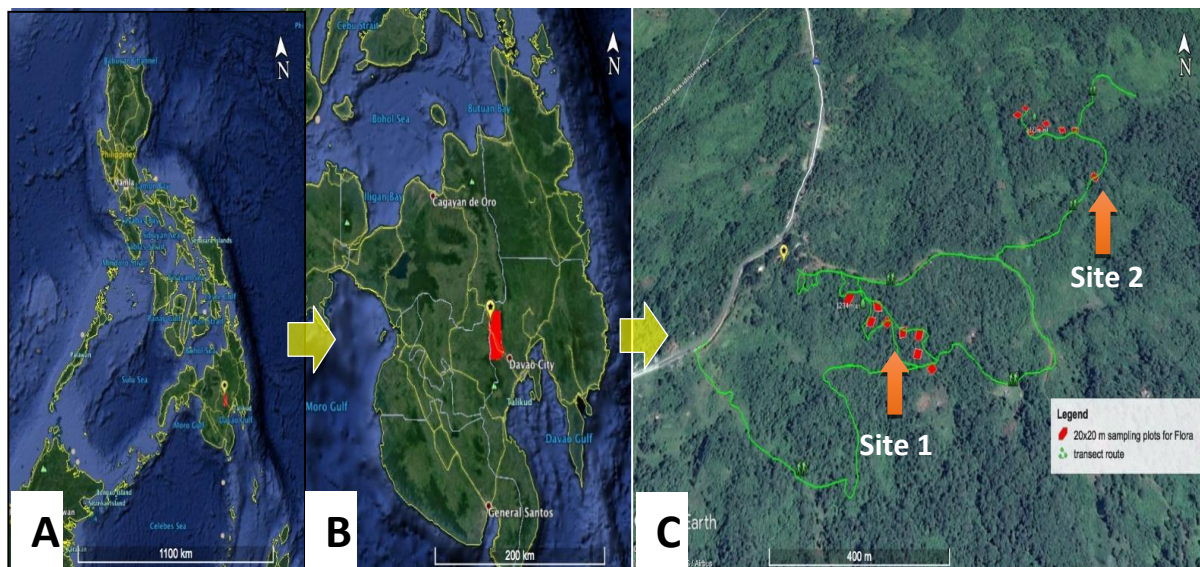


Fig. 1. Map of the Philippines (A) and Mindanao Island (B) showing the Brgy. Baganihan, Marilog District, Davao City and the location of the trail (green route) in the study area (C) (©Google Earth, 2018).

The study area was divided into two (2) sites. The study area was lowland mixed dipterocarp forest about 200m to 300m away from human habitation. Bodies of water such as creeks and ponds were present in the site. The emergent trees were *Ficus* spp., *Pandanus* spp. and *Lithocarpus* spp. that were up to 32m high and 23-65 cm diameter breast height (DBH). The abundance of grasses and sedges range from moderate to common. *Ficus* spp., *Musa* spp. and

other fruit plants abundance were common in study site 1 but were rare in study sites 2. *Nepenthes* species such *Nepenthes truncata* were common in both study sites. Fallen logs are common in both sites. The presence of exposed rocks is common to second site and rare to the first site.

B. Entry protocol

The research proposal was first presented to the stakeholders and Protected Area Management Board (PAMB) of Brgy. Baganihan, Marilog District, Davao City, Southern Mindanao, Philippines to obtain a prior inform consent in compliance to RA 9147. An approved Gratuitous Permit (GP) from the Department of Environment and Natural Resources was then issued.

C. Sampling method

Belt transect walk, visual encounter and photo-documentation were employed on March 5, 2018 to March 10, 2018. Data collection was conducted between 0700 to 2400 hours. Weevils were collected by handpicking and placed in conical tubes containing 95% ethyl alcohol. Collected samples were air dried and mounted and deposited to Central Mindanao University Museum, Zoological Section.

Taxonomic keys and monograph comparison and descriptions provided by Schultze and Yoshitake were also used as guide for the identification of the specimens (Schultze, 1923 & 1925; Yoshitake, 2012). The identification of the specimens was then verified by Ms. Anita Rukmane from Latvia Russia, the expert on weevils.

Results and discussions

A total of twenty-three (23) species belonging to three (3) genera- *Pachyrhynchus*, *Metapocyrtus* and *Alcidodes* were recorded. *Pachyrhynchus* was represented by two(2) species (*Pachyrhynchus erchsoni* Heller, 1912 and *P. miltoni* Cabras and Rukmane, 2016), which are Philippine endemic and Mindanao endemic, respectively. *Alcidodes* sp. with five(5) species while *Metapocyrtus* sp. with sixteen (16) species (*Metapocyrtus apoensis* Schultze, 1925, a Mindanao endemic) (Table 1).

Table 1. Collected weevils in Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City.

Species	number of individuals captured	
	Site 1	Site 2
1. <i>Pachyrhynchus erchsoni</i>	2	0
2. <i>Pachyrhynchus miltoni</i>	1	0
3. <i>Metapocyrtus apoensis</i>	1	0
4. <i>Alcidodes</i> sp. 1	1	0
5. <i>Alcidodes</i> sp. 2	1	0
6. <i>Alcidodes</i> sp. 3	2	0
7. <i>Alcidodes</i> sp. 4	2	0
8. <i>Alcidodes</i> sp. 5	1	0
9. <i>Metapocyrtus</i> sp.1	3	5
10. <i>Metapocyrtus</i> sp.2	0	1
11. <i>Metapocyrtus</i> sp.3	0	1
12. <i>Metapocyrtus</i> sp.4	0	1
13. <i>Metapocyrtus</i> sp.5	0	1
14. <i>Metapocyrtus</i> sp.6	1	0
15. <i>Metapocyrtus</i> sp.7	1	2
16. <i>Metapocyrtus</i> sp.8	1	0
17. <i>Metapocyrtus</i> sp.9	1	0
18. <i>Metapocyrtus</i> sp.10	1	1
19. <i>Metapocyrtus</i> sp.11	2	0
20. <i>Metapocyrtus</i> sp.12	0	2
21. <i>Metapocyrtus</i> sp.13	2	0
22. <i>Metapocyrtus</i> sp.14	0	2
23. <i>Metapocyrtus</i> sp.15	0	1
Total	23	17

Metapocyrtus sp.1 was the most common species in both sites while *Alcidodes* and *Pachyrhynchus* species was only observed and recorded in site 1.

The sites shared three (3) species. Site 1 had a total of 23 individuals while site 2 has 17 individuals with a total of 40 individuals.

There are three(3) species that been identified and verified namely, *Pachyrhynchus erchsoni* Waterhouse, 1841 (Philippine endemic), *P. miltoni* Cabras and Rukmane, 2016 (Mindanao endemic)and *Metapocyrtus apoensis*, schultze, 1925 (Mindanao endemic)(Figure 2).



Fig. 2. Weevilsof Marilog Forest Reserve, Marilog District, Southern Mindanao, Philippines. a) *Metapocyrtus apoensis*, b) *Pachyrhynchus erchsoni*, c) *Pachyrhynchus miltoni*, d) *Metapocyrtus sp.1*, e) *Alcidodes sp.1*, f) *Alcidodes sp.2*, g) *Alcidodes sp.3*, h) *Alcidodes sp.4*, i) *Alcidodes sp.5*, j) *Metapocyrtus sp.2*, k) *Metapocyrtus sp.3*, l) *Metapocyrtus sp.4*, m) *Metapocyrtus sp.5*, n) *Metapocyrtus sp.6*, o) *Metapocyrtus sp.7*, p) *Metapocyrtus sp.8*, q) *Metapocyrtus sp.9*, r) *Metapocyrtus sp.10*, s) *Metapocyrtus sp.11*, t) *Metapocyrtus sp.12*, u) *Metapocyrtus sp.13*, v) *Metapocyrtus sp.14* and w) *Metapocyrtus sp.15*.

The twenty (20) other species are still on progress concerning their identification. This implies that the remaining species could be new as weevils have high rate of endemism. Furthermore, the occurrence of this species must be noted and be studied further.

Conclusions and recommendation

The study recorded a total of twenty-three (23) species of weevils in Brgy. Baganihan, Marilog Forest Reserve, Marilog District, Davao City, Philippines. The two (2) sites have comparable number of species

composition. The area can be considered a sanctuary for these creatures as they managed to become diverse in the area but the threats is occurring in the area as it is just near from anthropogenic environment. The study also recorded unidentified specimens that are potential as being new species. This is possible as weevils have high rate of endemism in the archipelago. Thus, this study recommends that there must be more explorations that will be conducted to record the species occurrence of weevils from other remote areas of the Philippine archipelago specifically in Mindanao islands. The presence of endemic species of weevils in the area makes it suitable for protection and conservation.

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