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Two New Species of *Metapocyrtus* Heller 1912 (Coleoptera: Curculionidae: Entiminae: Pachyrhynchini) from Davao de Oro Mindanao Island, Philippines

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Two new species of *Metapocyrtus* Heller 1912 are described from Davao de Oro, Mindanao, Philippines with brief notes on their habitat, plant association, and mimicry complex.

Key words: *Metapocyrtus*, Pachyrhynchini, Entiminae, Curculionidae, new species, Davao, Mindanao, Philippines

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INTRODUCTION

True weevils or curculionids remain one of the highly understudied beetle groups in the Philippines. Many species remain unknown to science even up to the present except for the members of the Tribe Pachyrynchini which received the attention of both international and local researchers. This tribe is known for its bright iridescent coloration and mimicry. Hence it has been the subject of fascination by coleopterists, hobbyists, and photographers for the past century (Heller, 1912; Schultze, 1923, 1925; Yoshitake, 2011, 2012; Rukmane & Barševskis, 2016; Rukmane, 2016; Cabras & Medina, 2018; Cabras & Medina, 2018; Cabras et al., 2019; Cabras et al., 2020; Bollino & Sandel, 2015; Bollino et al., 2017; Bollino et al., 2020).

Despite being relatively well studied many novel species are continually being discovered yearly. For the genus *Metapocyrtus* Heller 1912 alone, many new species have been described in recent years (Cabras & Medina, 2018; Cabras et al., 2018; Cabras et al. 2019; Bollino et al., 2020). Due to the limited distributional range of many species under the group, many novel species await discovery in remote and underexplored mountain ecosystems, especially in Mindanao.

Davao de Oro, situated in the northern section of Davao Region, is one of the sites on our recent project on jewel weevil mimicry. Field survey in the province resulted in the discovery of two new species of *Metapocyrtus* Heller. These new species are the 5th and 6th new species from the Tribe Pachyrhynchini from the province in the last five years. This paper presents the de-

scription and habitus of the new species with a brief description of its habitat and mimicry.

MATERIALS AND METHODS

The specimens deposited in the Coleoptera Research Center of the University of Mindanao "**UMCRC**" were collected through a beating sheet and handpicking and killed with ethyl acetate. Morphological characters were observed under Luxeo 4D and Nikon SMZ745T stereomicroscopes. Stacked digital habitus and images of genitalia were taken with Canon EOS 800D digital camera and Canon MP-E 65mm macro lens. All images were stacked and processed using a licensed version of Helicon Focus version 5.3 and portable Photoshop CS6. Data labels are verbatim. Label breaks are indicated by a slash ("/"). Measurements mentioned in this paper are abbreviated as follows: LB - body length (from the apical margin of pronotum to the apex of elytra); LE - elytral length (from the level of the basal margins to the apex of elytra); WE - maximum width across the elytra; LP pronotal length (from the base to apex along the midline); WP - maximum width across the pronotum; LR - length of rostrum; WR maximum width across the rostrum. All measurements are in millimeters (mm).

The specimens are deposited in **UMCRC**-Coleoptera Research Center, University of Mindanao, Davao City, Philippines

RESULTS

***Metapocyrtus kuehli* sp.nov.**
(Fig. 1A-D)

Holotype male (Fig. 1A, C): Philippines Mindanao / Maragusan / Davao de Oro / June.2018 / Lg. local collector- coll. RJTV (typed on white card) / / HOLOTYPE male / *Metapocyrtus kuehli* / CABRAS, VILLANUEVA, & MEDINA, 2020 (typed on red card). Presently in UMCRC, it will be deposited in the National Museum of Natural History (NMNH) under the National Museum of the Philippines (NMP).

Paratypes (19 males, 15 females): 15 males &, 13 females, Philippines – New Bataan, Davao de Oro, Mindanao Island/ June 2018/ Leg.LC. 4 males, 2 females, Philippines- Maragusan, Davao de Oro, Mindanao Island/September 2018/Lg.LC. All in UMCRC.

Diagnosis: *Metapocyrtus kuehli* sp.nov. superficially resembles the elytral patterns of *Metapocyrtus (Orthocyrtus) mansaka* Cabras, Bollino & Medina, 2018 but is not related at all. *Metapocyrtus kuehli* sp.nov. is most related to *Metapocyrtus lindabonus* Schultze, 1922 but differs from the latter by having wider, and less rugose rostrum with nearly well-defined edges and faint medial groove, presence of two thin bands on anterior and posterior margin of pronotum, having wider and more convex elytra with three prominent, broad, and defined transverse bands. The genitalia of *Metapocyrtus kuehli* sp.nov. has a more blunt and bigger apical orifice and longer temones.

Description: Dimensions: LB: 10.0-12.5 mm (holotype 12.5 mm, â: 11.06). LR: 2.0-2.5 mm (2.5 mm, â: 2.21). WR: 1.4-1.7 mm (1.7 mm, â: 1.53). LP: 3.0- 4.0 mm (4.0 mm, â: 3.42). WP: 3.0- 4.0 (4.0 mm, â: 3.42). LE: 7.0-8.5 mm (8.5 mm, â: 7.73). WE: 4.5-5.4 mm (5.4, â:4.9). N=20.

Integument black. Body surface shiny.

Body mostly glabrous. Head mostly glabrous, sparsely pubescent with minute hairs; forehead between eyes with short adpressed brown hair; median groove distinct reaching the vertex; lateroventral side with yellow-green hairlike scales. Rostrum weakly rugose on basal half, minutely punctured on apical half, longer than wide (LR/WR: 1.47), bearing minute light brown hairs in the dorsal surface, and long light brown hairs at the lateral sides and anterolateral margin; transverse basal groove distinct; longitudinal groove along the midline on basal half slightly distinct; dorsum finely punctured; dorsal surface weakly convex. Eyes medium-sized and feebly

convex. Antennal scape and the funicle nearly as long, moderately covered with fine light-colored hairs. Funicular segments I and II are almost of the same length, 3 times longer than wide; segments III-VII nearly as long as wide; club sub-ellipsoidal, nearly 3 times longer than wide.

Prothorax subglobular, as long as wide(LP/WP: 1.0), glabrous, widest at middle, weakly convex, with the following scaly markings of cream and turquoise round scales: a) thin band at the anterior margin, b) thin band at the posterior margin, and c) broad lateroventral stripe before the coxa confluent with the anterior and posterior marginal band.

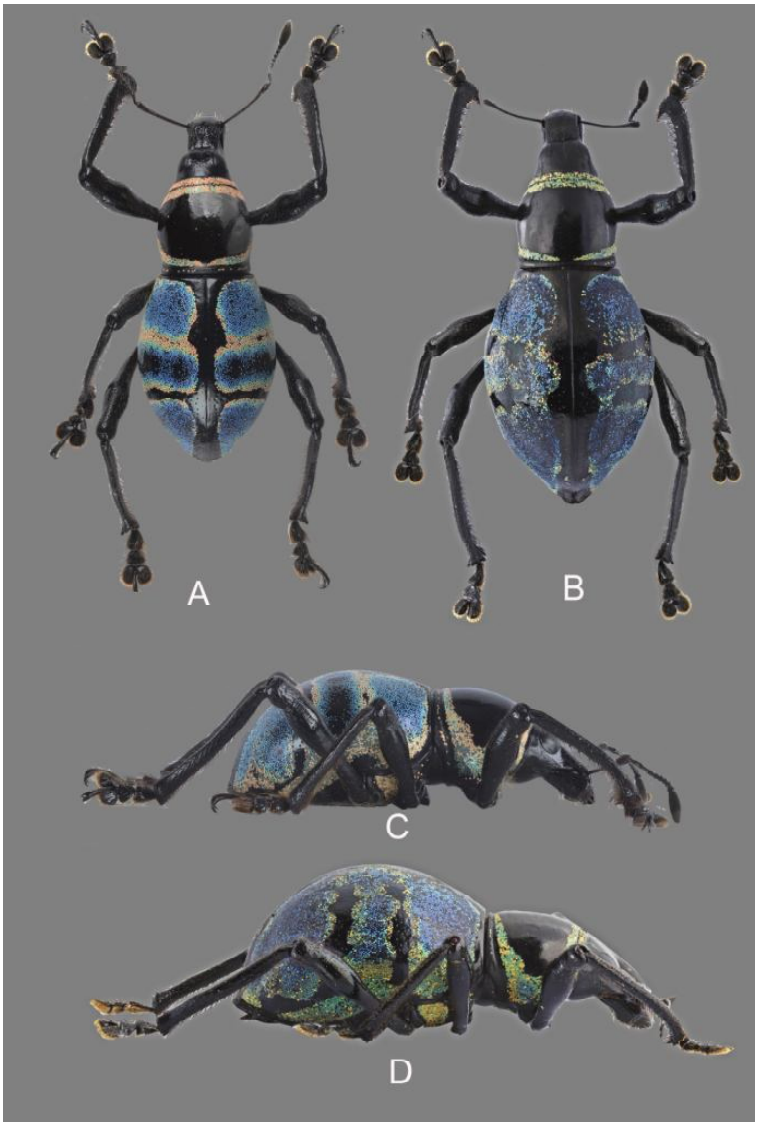

Fig. 1. *Metapocyrtus kuehli* sp.nov. - A, C, Holotype male: A. dorsal view, C. lateral view. B, D, Paratype female: B. dorsal view, D. lateral view

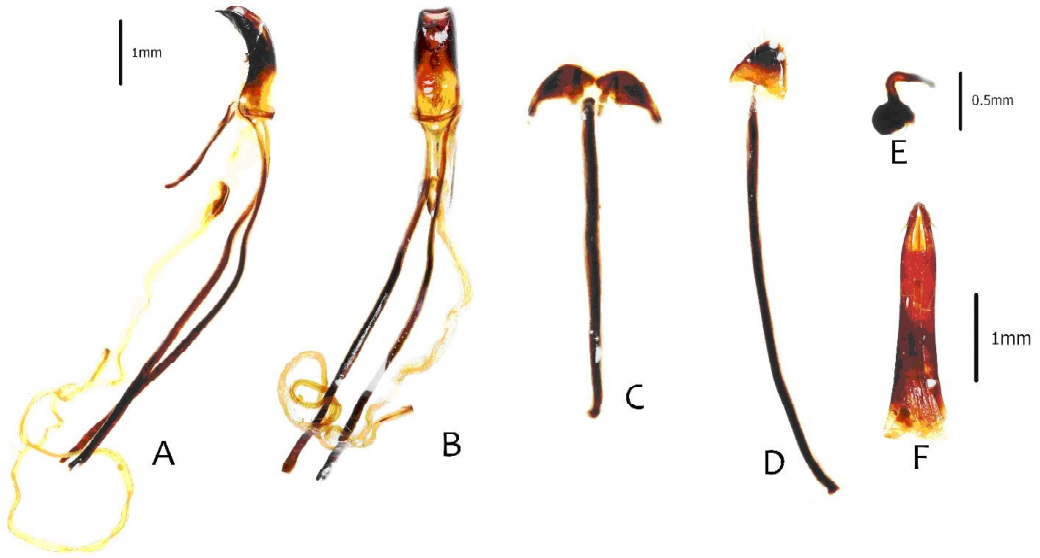

Fig. 2. Male genitalia and female terminalia of *Metapocyrtus kuehli* sp. nov. A: penis in lateral view; B: idem in dorsal view; C: sternite IX in dorsal view; D: sternite VIII in ventral view; E: spermatheca; F: ovipositor in dorsal view

Elytra ovate (LE/WE:1.57), nearly as wide but moderately longer than prothorax(WE/WP: 1.35, LE/LP: 2.13), black, sub-glabrous, with very minute and sparse setiferous punctures, moderately convex, apex rounded, sparsely covered with light colored fine hairs. Each elytron with the following scaly bands of cream, blue, and turquoise-colored round scales: a) basal transverse band which extends from stria I to lateral margin, b) median transverse band from stria I to lateral margin, c) short post-median stripe on lateral margin which reaches apical ¼ and confluent with median band, and d) subtriangular band on apical 1/3 extending from stria I to interval VIII. Each band prominently with blue and turquoise scales and cream-colored scales towards the outer margin.

Legs with moderately clavate femora. Femora, and tibiae covered with light-colored hair. Tibiae covered with sub recumbent light-colored bristles, short on outer margin and long on the inner edge, moderately serrate along the inner edge. Fore and mid tibiae bear mucro at the apex. Tarsomeres are covered with sparse pubescence. Coxae with light-colored hair. Mesoventrite with light-colored adpressed bristles. Metaventrite with light-colored adpressed bristles, very sparse turquoise hair-like scales, and round cream-colored scales towards margin. Ventrite I depressed on disc with light-colored adpressed bristles. Ventrite II with long light brown adpressed bristles dense at middle and short towards margin. Ventrites III-V with sparse light-colored short bristles. Ventrite V flattened, apical half finely densely punctured.

Male genitalia as shown in Figure 2 A-C.

Female. Dimensions: LB: 11.1-13.5 mm (â:12.9 mm): LR: 1.8-2.0 mm (â:1.95 mm): WR: 1.3-1.8 mm (â:1.68). LP: 3.1- 4.0 mm (â:3.78 mm). WP: 3.1-5.0 (â:4.53). LE: 8.0- 9.8 mm (â:9.35). WE: 5.5-7.5 mm (â:7.0). N=15.

Habitus as shown in Figure 1 B-D

Pronotum wider than long, slightly shorter than in the male, not perfectly subglobular. Elytra longer and wider than in male, widest at middle and strongly convex; lateral side with a moder-

ate depression just before the margin. Otherwise mentioned, similar to male.

Female genitalia as shown in Figure 2 D-F

Etymology. Kuehli, a noun in genitive case, name after Dr. Yannick Kuehl for his help in promoting research and conservation activities of Philippine biodiversity through the National Geographic Society.

Distribution. *Metapocyrtus kuehli* sp.n. is known from Maragusan, Davao de Oro. So far this is the only known locality of this species.

***Metapocyrtus salesi* sp.nov.**
(Fig. 2A-D)

Material. Holotype male (Fig. 2A, C): Philippines – Mindanao / Davao de Oro / October 2019 / coll. L.C. (typed on white card) // HOLOTYPE male /

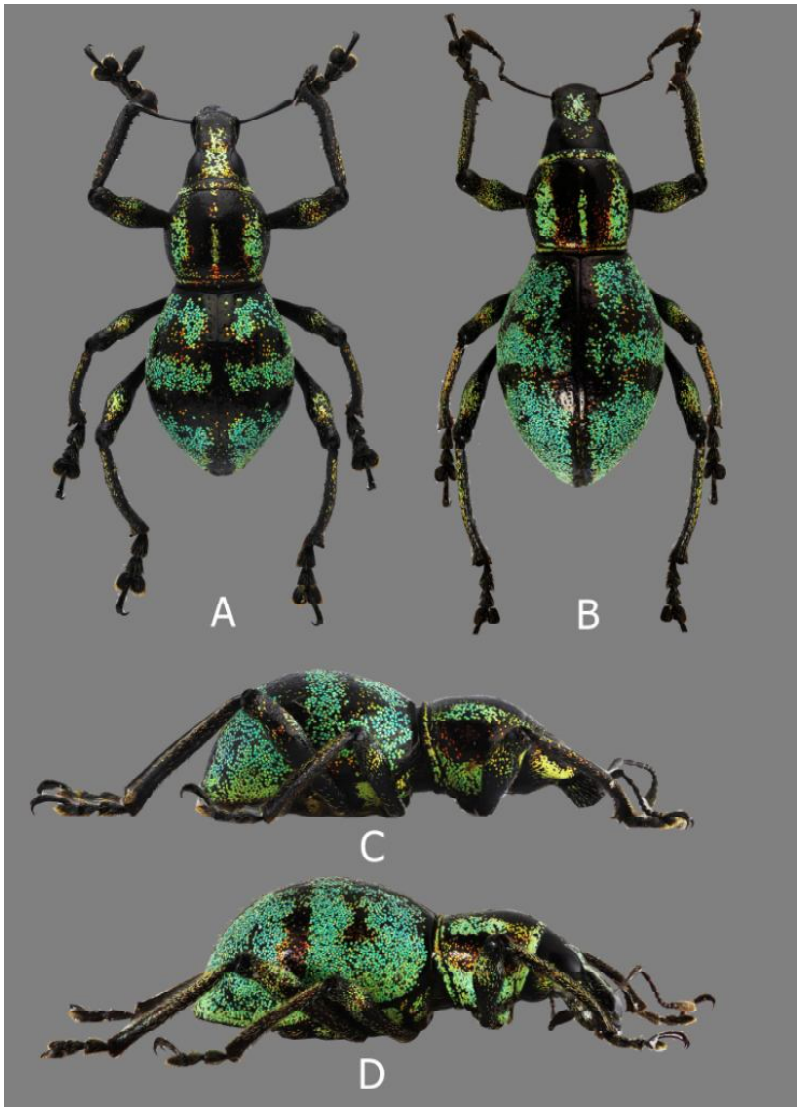

Fig. 3. *Metapocyrtus salesi* sp.nov. - A, C, Holotype male: A. dorsal view, C. lateral view. B, D, Paratype female: B. dorsal view, D. lateral view

Metapocyrtus salesi / CABRAS, VILLANUEVA, & MEDINA, 2020 (typed on red card). Presently in UMCRC, it will be deposited in Philippine National Museum of Natural History (PNMNH) under the National Museum of the Philippines (NMP).

Paratypes. 1 male, 2 females: Philippines - Mindanao/ Davao de Oro/ Maragusan/ V-VII.2018 / coll. Medina.

Diagnosis: *Metapocyrtus salesi* sp.n. is related to *Metapocyrtus kitangladensis* Cabras, Medina & Zhang, 2018 which was described from Bukidnon and Marilog, Davao City. However, *M. salesi* sp.n. is easily distinguishable by the following characteristics: a) smaller size, and stouter body, b) globular and more convex pronotum, c) thick longitudinal bands on each disc of pronotum, c) wider, more arcuate, and strongly convex elytra with unique scaly markings consisting of three transverse bands, and f) genitalia with shorter temones, and strongly curved ventrally near the base of aedeagal body.

Description : Dimensions : LB: 7.5-8.8 (holotype 7.5 mm, â:8.25). LR: 1.5- 1.8 (holotype 1.5 mm, â: 1.65). WR: 1.1-1.5 (holotype 1.1 mm, â:1.3). LP: 2.1-2.9 (holotype 2.1 mm, â:2.55). WP: 2.8-3.8 (holotype 2.8 mm, â:3.3). LE: 5.0-5.9 (holotype 5.0, â:5.4). WE: 3.6- 4.5 (holotype 3.6, â:4.05). N=2. Integument black. Body surface shiny.

Body subglabrous. Head subglabrous, forehead between eyes covered with metallic light-yellow ochre round scales and light-colored and red elliptical scales with a tinge of metallic purple around eyes; lateroventral parts with light yellow ochre round and elliptical scales interspersed with metallic yellow-orange hair-like elliptic scales. Rostrum weakly rugose on basal half, mostly smooth on apical half, sparsely pubescent, slightly longer than wide (LR/WR: 1.36), dorsum bearing minute yellow-orange adpressed hairlike scales, likewise on dorsolateral sides, and long light brown hairs at the anterolateral margin; transverse basal groove distinct; basal half with shallow depression beset with metallic yellow- ochre-colored round and elliptic scales; lateroventral part behind antennal scrobe densely covered with yellow-green to yellow-orange long hair-like scales; dorsal surface weakly convex. Eyes medium-sized and feebly convex. Antenna moderately clavate, scape slightly shorter than funicle,

Fig. 4. Male genitalia and female terminalia of *Metapocyrtus salesi* sp. nov. A: penis in lateral view; B: idem in dorsal view; C: sternite IX in dorsal view; D: sternite VIII in ventral view; E: spermatheca; F: ovipositor in dorsal view

moderately covered with fine light-colored hairs. Funicular segments I and II almost of the same length, nearly 3 times longer than wide; segments III-VII slightly longer than wide; club sub-elliptical, nearly 3 times longer than wide.

Prothorax subglobular, wider than long (LP/WP: 0.75), glabrous, widest before middle, weakly convex, disc and sides beset with yellow-orange round scales, with the following scaly markings of metallic light yellow-green round scales: a) thin band at the anterior and posterior margin, b) thin band along mid-length, c) thick longitudinal bands on each disc, and c) lateroventral stripe before the coxa confluent with the anterior and posterior marginal band.

Elytra strongly ovate (LE/WE:1.39), wider and longer than prothorax (WE/WP: 1.29, LE/LP: 1.39), black, sub-glabrous beset with sparse, minute and weak setiferous punctures, each puncture with light-colored short seta, strongly convex, widest at the middle. Elytra beset with yellow-orange and violet round scales, with the following scaly bands of metallic yellow, and emerald green round scales: a) irregular transverse band behind the base extending from stria I to lateral side, b) median transverse band from stria I to lateral side and c) triangular band on apical third. All three bands confluent on lateral side. Apex round with yellowish hair-like scales.

Legs with moderately clavate femora. Femora covered with light-colored hairlike scales and yellow-green and violet round to elliptic scales towards apical part. Tibiae covered with subrecumbent light-colored bristles, yellow-green, red, and violet long elliptical scales towards outer margin, and serrate along inner edge. Fore and mid tibiae bear a mucro at apex. Tarsomeres covered with pubescence. Procoxae covered with light-colored hair and with pale green and light yellow-ochre elliptic scales on the anterior side. Mesocoxae and metacoxae with light-colored hairs Mesoventrite covered with light-colored adpressed bristles and yellow-green round scales towards lateral margin. Metaventrite with light-colored adpressed bristles and light yellow-ochre round scales at lateral margin. Ventrite I feebly depressed on disc with light-colored adpressed bristles and sparse light yellow-ochre round scales towards lateral margin. Ventrite II with long light brown adpressed bristles, shorter towards margin. Ventrites III-V with sparse light-colored short bristles. Ventrite V flattened, apical half finely densely punctured.

Male genitalia as shown in Figure 4 A-C. Aedeagal body short and stout, thick and nearly as long as its apodeme in profile; apex rounded.

Female. Dimensions: LB: 8.5-9.8 mm (â:9.15): LR: 1.5- 1.9 (â:1.7): WR: 1.1- 1.5 (â:1.3). LP: 2.4- 2.9 (â:2.65). WP: 2.9- 3.5 (â:3.2). LE: 6.0- 7.0 (â:6.5). WE: 4.8- 5.3 (â:5.05). N=2.

Habitus as shown in Figure 3 B, D.

Pronotum wider than long, slightly shorter than in the male, not perfectly subglobular. Elytra longer and wider than the male, widest at middle. Shape of the elytra ovate with a moderate depression in the lateral side just before the lateral margin. Otherwise mentioned, similar to male. Female genitalia as shown in Figure 4 D-F

Etymology. Salesi, a noun in genitive case, named after Dr. Anthony Sales, the regional director of the Department of Science and Technology in Region XI for his contribution in the advancement of research.

Distribution.*Metapocyrtus salesi* sp.nov. is known so far from the province of Davao de Oro

Notes on Sympatric Convergence of Patterns

The two new species have three bands on its elytra which is very similar to *Metapocyrtus mansaka* Cabras, Bollino & Sandel, 2018, *Pachyrhynchus kraslavae* Rukmane & Barševskis, 2016, *Pachyrhynchus miltoni* Cabras & Rukmane, 2016, *Doliops cuellari* Vives, 2012

and three more *Metapocyrtus* species in Maragusan, Davao de Oro. However, despite the similarities of the markings of these species which coincidentally exist in Davao de Oro and specifically Mt. Candalaga range, all species mentioned having similarities of elytral bands are not related with the exception of the two *Pachyrhynchus* species. The 5 species of *Metapocyrtus* which share the same band belong to different subgenera and seem to have analogous resemblances rather than developmental homology. This type of mimicry among the different subgenera of *Metapocyrtus* was already observed by Schultze (1925) but this mimicry in Davao de Oro are new records. As for *Metapocyrtus kuehli* sp.n., it was collected in a similar habitat with *Metapocyrtus mansaka* Cabras, Bollino & Sandel, 2018 and *Doliops cuellari* Vives, 2012. And as for *Metapocyrtus salesi* sp.n. and *Metapocyrtus* sp.1 and sp. 2 were all collected in the same creek with no less than 1km distance. At first glance, all three species can easily be mistaken as one.

Notes on Ecology for *M. salesi* sp.nov. and *M. kuehli* sp.nov.

Interestingly, both species were collected in Davao de Oro Province particularly in the Eastern Mindanao Biological Corridor. This showed the great yet unexplored beetle diversity in this part of the country. *Metapocyrtus salesi* sp.nov. was collected in Maragusan, Davao de Oro (Fig. 6-A) around 1100 masl in a small pristine creek between Barangay Langgawisan and Bahi. While *M. kuehli* sp.n. was documented in New Bataan, Davao de Oro approximately 1200 masl in a separate mountain range approximately 10 kilometers away from the type locality of *M.salesi* sp.nov. The area exhibits high moisture due to its relatively high elevation. The surrounding biotype is marked with montane forests dominated by endemic dipterocarp trees. Several patches of cultivated lands for Coffee and Abaca production are also documented. *M. kuehli* sp.nov. was collected on the following plants: *Mausia setoussa*, *Tabernaemontana pandacaqui*, *Melochia umbellate*, *Coffea* sp. and *Solanum* sp. whereas *M.salesi* sp.nov. was only collected in the fronds of *Angiopteris evecta*.

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