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Three new species of the genus *Polycatus* Heller, 1912 (Coleoptera: Curculionidae: Polycatini) from the Philippines

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Three new species of the genus *Polycatus* Heller, 1912 (Coleoptera: Curculionidae: Entiminae: Polycatini) from the Philippine Islands are described and illustrated: *P. barsevskisi* Bramanti, Bramanti & Rukmane sp. nov., *P. caterinae* Bramanti & Bramanti sp. nov., *P. negrosensis* Bramanti, Bramanti & Rukmane sp. nov. A key for species of the *panayensis* group of Mindanao, Negros and Panay Islands is proposed. Eversion of endophallus is used for the first time within the genus *Polycatus*, as a method for species delimitation. Distribution maps, as well as new faunistic records are provided.

Key words: Coleoptera, Curculionidae, *Polycatus*, fauna, new species, taxonomy, Philippines.

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INTRODUCTION

According to newest literature, genus *Polycatus* Heller, 1912 currently consists of nine species: *P. aurofasciatus* Heller, 1912 (Basilan), *P. bramanti* Rukmane 2020 (Mindanao), *P. eupholoides* Heller, 1912 (Mindanao), *P. jaegeri* Bramanti & Bramanti, 2020 (Mindanao), *P. mimicus* Bramanti, Bramanti & Rukmane 2020 (Mindanao), *P. opulentus* Heller, 1929 (Mindanao), *P. panayensis* Schultze, 1918 (Panay), *P. vivesi* Bramanti & Bramanti, 2020 (Mindanao) and *P. waoensis* Bramanti & Bramanti, 2020 (Heller 1912, Heller 1929, Schultze 1918, Bramanti et. all. 2020).

In our first contribution to the taxonomy of the genus *Polycatus*, we presented five new species of the *aurofasciatus* species group, in the cur-

rent research we therefore describe three new taxa of new *panayensis* species group. Both species groups might be easily distinguished by scally markings on basal part of prothorax in *aurofasciatus* group and scally markings on central part of the disc in *panayensis* species group. Additionally, we provide eversions of endophallus for representatives of both species groups, as additional method for species delimitation, such method is widely used among taxonomists for various groups of Coleoptera (Janovska et. al. 2013; Bollino et. al. 2020).

MATERIAL AND METHODS

The studied material is deposited in the following collections:
BRAA - Bramanti Andrea and Alessandro's private collection, Pietrasanta (Lucca), Italy

DUBC – Daugavpils University beetle collection, Daugavpils, Latvia
MTD - Senckenberg Natural History Collections, Dresden, Germany (O. Jäger)

Carried morphological studies, abbreviations and measurement technology follow Bramanti et al. (2020).

Endophallus eversion methodology follows Janovska et al. (2013).

RESULTS

Key to species of the *panayensis* group from Mindanao, Negros and Panay Islands

1 (2) Prothorax with scally markings on disc along basal margin. In lateral view basal part of eversion of ovate shape, straight, with lateral growth along basal ½. (Fig. 5C)……...…***aurofasciatus* group**

2 (1) Prothorax with scally markings on central part of the disc. In lateral view basal part of eversion curved downwards, with curves and bends, without lateral growth (Fig. 5A, B)…...…***panayensis* group**

3 (5) Elytra smooth, with weakly expressed intervals of puncture rows

4 Scally spots on body, head and legs of pale pink to green colour with metallic tingle, distributed on Mindanao Island.....***P. caterinae* sp. nov.**

5 (3) Elytra rugose, intervals of puncture rows strongly expressed

6 (7) Scally spots of pale pink colour, distributed on Negros Island…...…...….***P. negrosensis* sp. nov.**

7 (8) Scally spots of pale blue colour, distributed on Panay Island…....…***P. panayensis* Schultze, 1918**

8 (6) Scally spots of green colour, distributed on Mindanao Island……...….***P. barsevskisi* sp. nov.**

1. Polycatus panayensis Schultze, 1918 (Fig. 1, 7)

Type locality: Panay Island (Fig. 7)
Type in MTD, examined (Fig. 1)

Male, Typus (red label); Panay, P. I. / Jamindan. (white label); 1921 / B& (yellow label); *Polycatus* / *panayensis* / Det. W. Schultze. *Schultze* (white label); Staatl. Museum fur / Tierkunde. Dresden (white label).

Female, *Cotypus* (red label); Panay, P. I. / Jamindan. (white label); Coll. W. Schultze / Ankauf 1942 (white label); *Polycatus* / *panayensis* / Det. W. Schultze. *Schultze* (white label); Staatl. Museum fur / Tierkunde. Dresden (white label).

2. Polycatus barsevskisi Bramanti, Bramanti & Rukmane, sp. nov. (Fig. 2, 7)

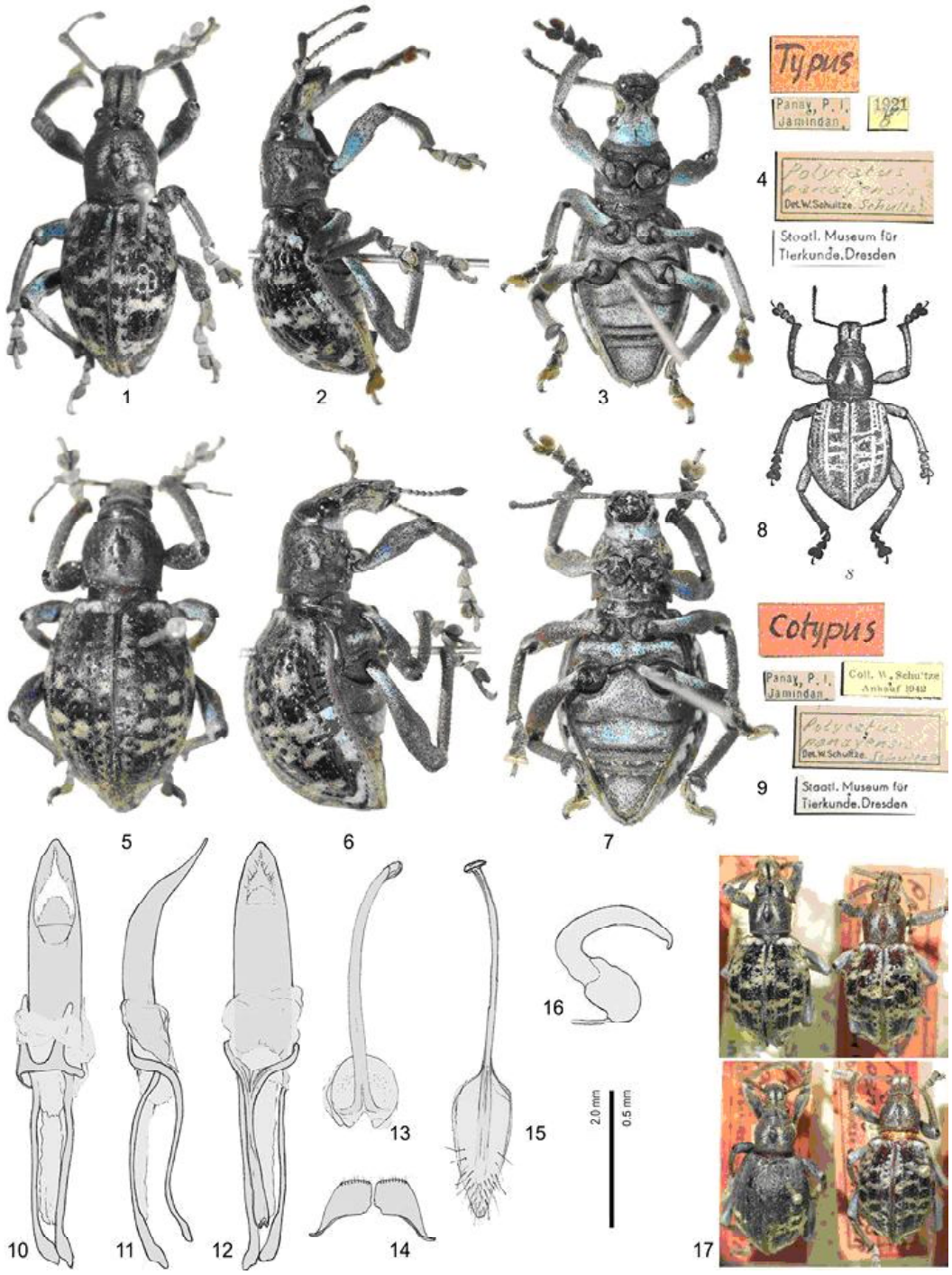


Fig. 1. *P. panayensis* Schultze, 1918 (MTD). 1 – 3 male; 4 – type labels; 5 – 7 female; 8 - drawing (Schultze, 1921); 9 – cotype labels; 10 – 12 aedeagal body; 13 – 14 sternite IX; 15 – sternite VIII; 16 – spermatheca; 17 – type series

Type material. Holotype, Male (Fig. 2.1-5): Mindanao Isl./ Davao del Sur prov./ Mount Apo/ II.2014, local collector leg. (white label); ''HOLOTYPE / *Polycatus barsevskisi* Bramanti, Bramanti & Rukmane'' (red label) (BRAA).

Paratypes (8 males, 2 female): 1 male, Philippines, Mindanao / Sarangani prov./ Kiamba / II. 2015 / local collector leg.; 1 male, same as previous, but III. 2016; 1 male, same as previous, but X. 2018; 1 male, Philippines, Mindanao Is / Sarangani prov./ Malungon / X. 2016 / local collector leg.; 2 males, PHILIPPINES / Mindanao, South Cotabato, T'Boli / X. 2015 / local collector leg. (all on white labels, all in DUBC); 1 male, 1 female, Philippines, Mindanao/ Sarangani prov. / Malungon / X. 2016 / local collector leg; 1 female, Philippines, Mindanao / Sarangani prov., Kiamba / XI. 2019 / local collector leg.; 1 male, Mindanao Isl./ Davao del Sur prov./ Mount Apo/ II.2014, local collector leg. (all on white rectangular labels, all in BRAA). All with additional red label: ''PARATYPE / *Polycatus barsevskisi* Bramanti, Bramanti & Rukmane''.

Distribution. Mindanao Island: Davao del Sur, South Cotabato and Sarangani prov. (Fig. 5).

Description. Male. Measurements (N=9): LB: 10.85-14.8 (holotype 13.2, mean 13.02); LR: 2.1-2.7 (holotype 2.55, mean 2.42); WR: 1.55-2.1 (holotype 2.1, mean 1.84); LP: 2.5-4 (holotype 2.55, mean 3.01); WP: 2.75-3.2 (holotype 2.8, mean 2.98); LE: 6.6-9 (holotype 8.9, mean 7.59); WE: 4.3-4.9 (holotype 4.9, mean 4.98).

Body, head and legs black, gently punctured, with markings of shiny, metallic green, round to recumbent scales on all parts except for antennae with no scally markings. Head gently punctured, without hairs dorsally, with two small patches of scales, one along inner margin of each eye. Eyes small, prominent from the outline of the head, peak just in the middle. Forehead weakly bulging dorsally, three times as wide as eye. Rostrum more than twice as long as head, (LR/WR 1.21), dorsally with oblong medial bulge and two oblong lanceolate impressions one on each side of the bulge, small lanceolate impression subbasally on each lateral part; irregularly dispersed scales mingled with rare, light brown hairs along each dorsal impression; in dorsal contour ventral part strongly increased to apex, dorsal part incurved along antennal scape; laterally space above antennal scrobe covered with sparse short light brown hairs, space bellow and underside completely covered with metallic scales, mingled with long, dense hairs. Antenna strongly punctured, scape mingled with long, dark brown hairs, antennomers mingled with long, light golden hairs; basal antennomere 1.5 times as long as wide, slightly shorter and wider than antennomere II; antennomere II nearly three times as long as wide, two times longer than III-V; III-V subequal in size, same length and width, shorter than VI-VII; VI-VII subequal in size, longer than wide; club strongly narrowed at base, widest at apical 2/3, nearly three times as long as wide. Prothorax with fine puncture on all parts, (LP/WP 0.91), disc with impression medially at apical part; anterior edge dorsally straight, lateral parts slightly folded; posterior edge straight dorsally, dorsolateral part strongly bended then gradually folded to underside, mingled with sparse light brown hairs; prothorax with the following markings: 1) two longitudinal elongated spots medially on disc, each slightly redirected laterally from the middline; 2) longitudinal line along middle of each lateral part, from just before apex to basal 1/2; 3) transverse line from ventral part to middle of each lateral part subapically; 4) ventral part completely covered with metallic scales except space below coxa; in dorsal contour widest at apical ½, narrowed just after the middle and gradually widened to base; in lateral contour nearly straight, widest just in the middle. Elytra slender, LE/WE 1.82, deep longitudinal hollows on all length, hollows reined by deep puncture rows, puncture corresponds by short light brown hairs; dorsally subbasal part folded; apical part mingled with longer light hairs; each elytron with the following scally markings: 1) irregular patch of scales along subbasal fold; 2) longitudinal line along lateral margin; 3) subtriangular patch just before apex; 4) elongated patch near apex along interval II-III; 5) various number of chaotically dispersed

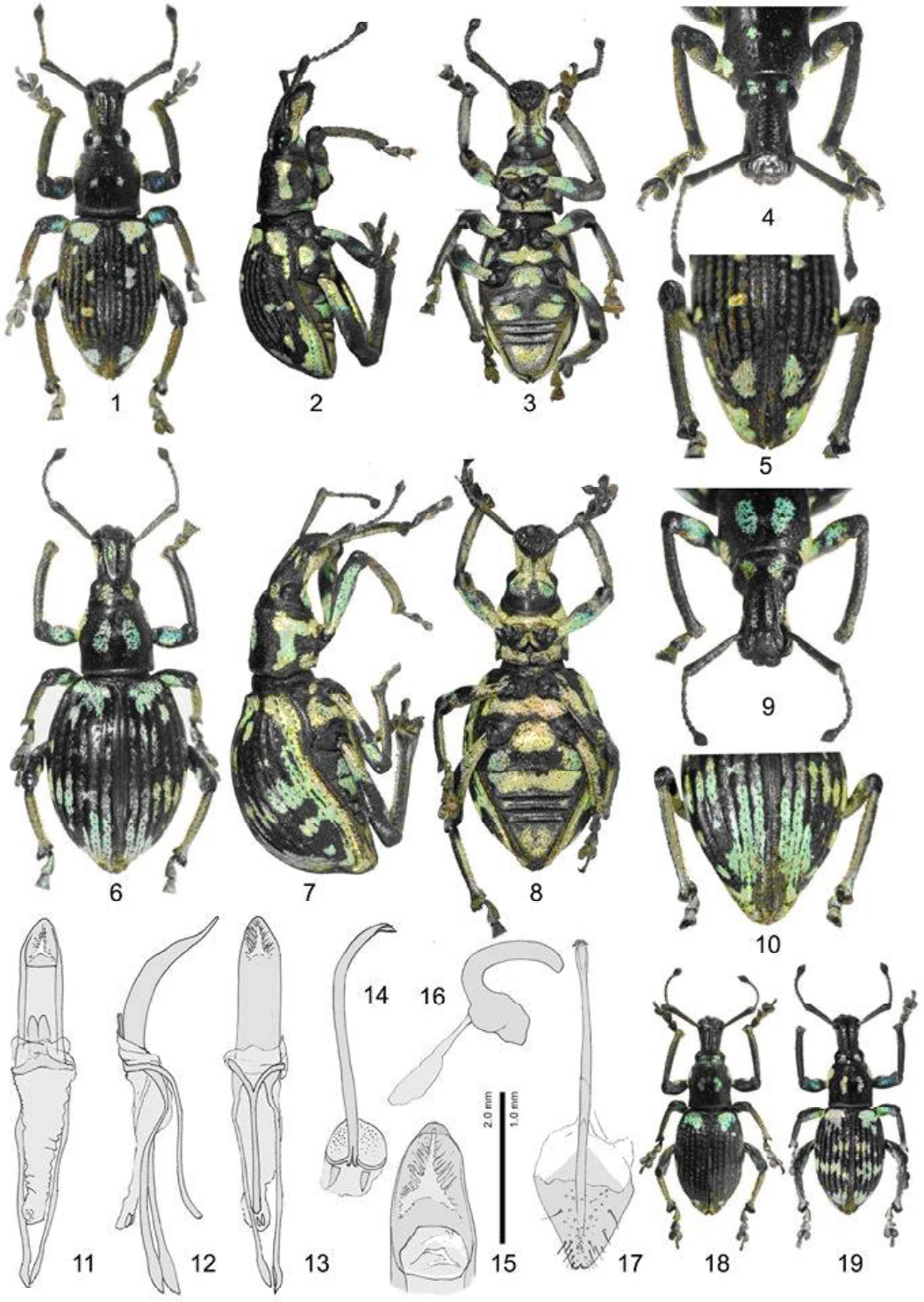


Fig. 2. *P. barsevskisi* sp. nov. (BRAA). 1 – 5 male; 6 – 10 female; 11 – 13, 15 aedegal body; 14 – sternite IX; 16 – spermatheca; 17 – sternite VIII; 18 – 19 elytral marking variations within the species

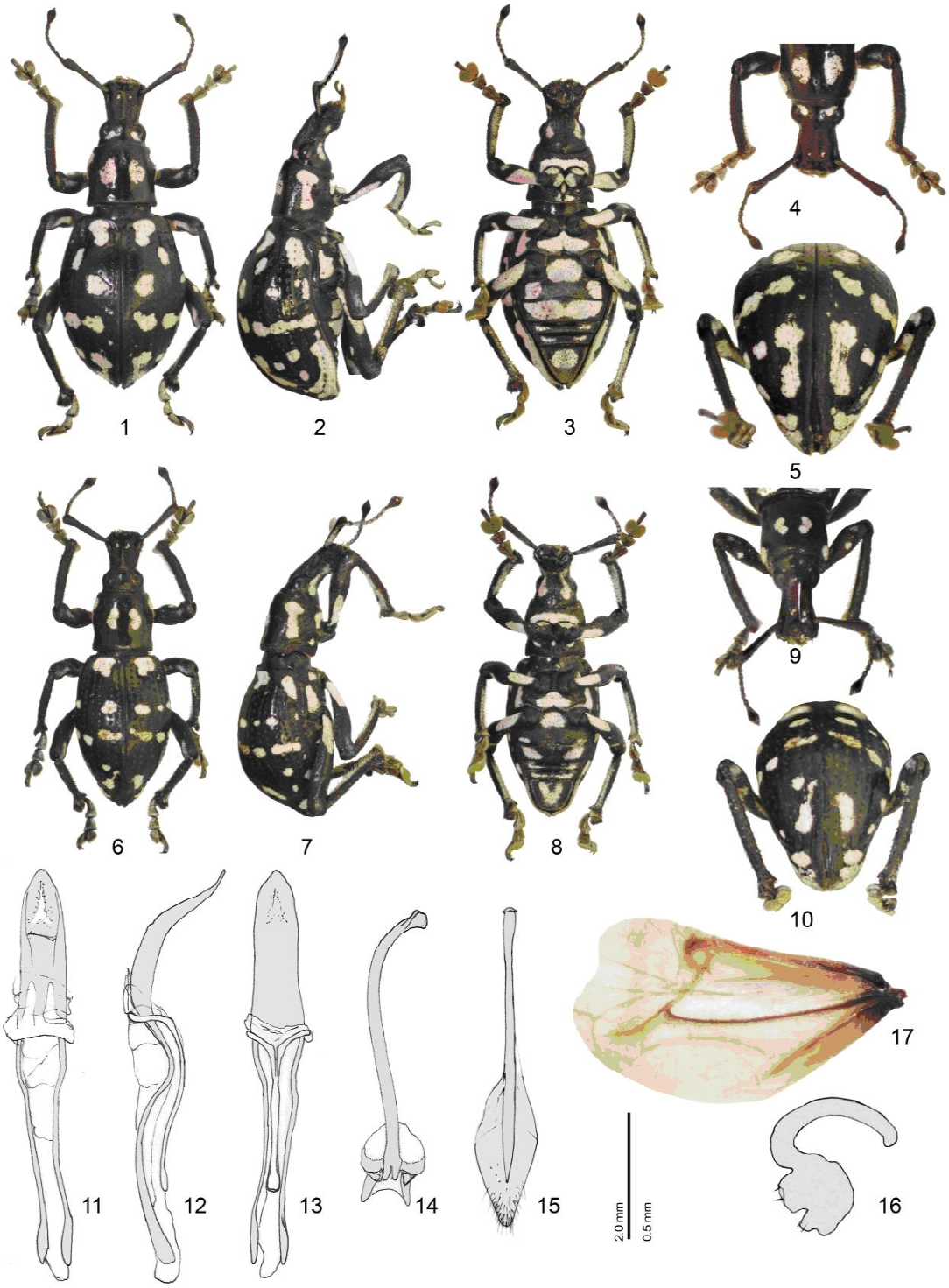


Fig. 3. *P. caterinae* sp. nov. (BRAA). 1 – 5 female; 6 – 10 male; 11 – 13 aedegal body; 14 – sternite IX; 15 – sternite VIII; 16 – spermatheca; 17 – wing

scally patches on the rest parts of elytra (Fig. 2.18-19); LE/LP 3.49, WE/WP 1.75. Coxa, femur, tibia and tarsus with fine puncture on all parts, tarsite I thicker than rest, hind tarsite II longer than wide. Aedeagus as in Fig. 2.11-13, 2.15.
Female (Fig. 2.6-10, 2.16-17). Measurements (n=2): LB: 10.95-11.8 (mean 11.38); LR: 3.35-3.4 (mean 3.38); WR: 1.65-1.75 (mean 1.7); LP: 2.45-2.6 (mean 2.53); WP: 2.25-2.3 (mean 2.28); LE: 8.5-8.8 (mean 8.65); WE: 4.85-5 (mean 4.93). Larger, elytra wider, more strongly rounded (LE/WE 1.76), otherwise as in males.

Differential analyses. *Polycatus barsevskisi* sp. nov. is similar to all species of the *panayensis* group by it's markings on pronotum at central part of the disc. Additionally to geographical isolation, species might be easily distinguished by deep longitudinal continuous hollows on elytra, on contrary, elytra of *P. caterinae* from the same Mindanao Island is nearly smooth, while elytra of *P. panayensis* and *P. negrosensis* from Panay and Negros Islands is with deep discontinued puncture.

Etymology. The species is dedicated to Arvīds Barševskis (Daugavpils, Latvia), famous coleopterologist, as appreciation to his contribution to DUBC and continuous support and advices in study of systematic of coleoptera.

3. Polycatus caterinae Bramanti & Bramanti, sp. nov.

(Fig. 3, 5B, 6B, 7)

Type material. Holotype, male (Fig. 3.6-10, 3.11-14): PHILIPPINES, Mindanao / Sarangani prov./ Kiamba/ XII.2018 local collector leg. (white label); ''HOLOTYPE / *Polycatus caterinae* / Bramanti & Bramanti'' (red label) (BRAA).

Paratypes (45 males, 28 females): 1 male, 1 female, PHILIPPINES, Mindanao / Sarangani prov./ Kiamba / II. 2015 / local collector leg.; 4 males, same as previous, but X. 2015; 1 male, 1 female, same as previous, but I. 2020; 4 males, PHILIPPINES / Mindanao/ Cotabato and Davao del Sur prov./ Mt. Apo / XI.2014 / local collector leg.; 2 males, same as previous, but V. 2015; 2 females, PHILIPPINES / Mindanao, Cotabato / Mt. Matutum. II. 2009 / local collector leg.; 2 males, 1 female, PHILIPPINES, Mindanao / Sarangani prov./Malungon / 600-900 m. VII. 2014 / local collector leg.; 1 male, PHILIPPINES / Mindanao, South Cotabato prov. / Mt. Parker. XII 2013 / local collector leg.; 1 male, 1 female, same as previous, but I. 2014; 1 male, same as previous, but VII. 2014; 1 male, same as previous, but VIII. 2014; 1 male, PHILIPPINES / Mindanao/ South Cotabato prov. / T'Boli. IX. 2015 / local collector leg.(all on white rectangular labels, all in DUBC); 1 male, PHILIPPINES, Mindanao / Sarangani Prov./ Kiamba / X. 2017 / local collector leg; 2 males, 1 female, same as previous, but XI. 2017; 1 female, same as previous, but I. 2018; 3 males, 4 females same as previous, but XI. 2018; 9 males, 8 females same as previous, but XII. 2018; 2 females, same as previous, but I.2019; 4 females, same as previous, but II.2019; 3 males, same as previous, but III.2019; 4 males, same as previous, but IX.2019; 1 female, PHILIPPINES / Mindanao, South Cotabato prov. / T'Boli, Mt. Parker/ XII.2018/ local collector leg.; 3 males, 1 female, same as previous, but XII.2019. (all on white rectangular labels, all in BRAA). All with additional red label: ''PARATYPE / *Polycatus caterinae* Bramanti & Bramanti ''

Distribution. Mindanao Island; Sarangani, South Cotabato, Cotabato and Davao del Sur prov. (Fig.5).

Description. Male. Measurements (n=6): LB: 12.55-15 (holotype 12.55, mean 13.87); LR: 2.2-2.7 (holotype 2.2, mean 2.45); WR: 1.8-2.1 (holotype 1.95, mean 1.94); LP: 2.9-3.1 (holotype 2.9, mean 2.98); WP: 2.8-3.2 (holotype 2.8, mean 3.05); LE: 7.3-7.8 (holotype 7.3, mean 7.4); WE: 4.8-5.3 (holotype 5.2, mean 5.02).

Body black, strongly shiny, very gently punctured, with markings of shiny, metallic pink, round to recumbent scales. Head with fine puncture

except area around the eyes, with small patch of scales along inner margin of each eye. Forehead with moderate dorsal bulge, 2.5 times as wide as eye width. Rostrum roughly dotted, longer than wide: LR/WR, dorsally with oblong medial bulge and two weak impressions one on each side, subbasal lateral impression very weak; lateral parts with metallic scales only on latero-ventral part. Antenna strongly punctured on all length; basal antennomere 1.5 times as long as wide, slightly shorter than antennomere II; antennomere II two times as long as wide, 1.5 times longer than III-VI; III-VI subequal in size, same length and width, shorter than antennomere VII; antennomere VII longer than wide; club strongly elongated, narrow at base, widest just after the middle. Prothorax finely punctured, (LP/WP 1.04); anterior edge straight; posterior edge straight dorsally, dorso-lateral part slightly bended then strongly folded to underside, mingled with short light hairs along dorsal part; prothorax with the following markings: 1) two longitudinal spots medially on disc, each slightly redirected laterally from the middline; 2) longitudinal line along middline of each lateral part, line widened toward apex; 3) ventral part above coxae with transverse line of metallic pink scales and small patches of scales below coxae. Elytra widest just at the middle, LE/WE 1.4, intervals smooth, corresponded by shallow puncture rows with short, light brown hairs; subbasal part folded, apical part without long, dark hairs; each elytron with the following scally markings: 1) patch of scales along subbasal fold; 2) interrupted longitudinal line of scales along lateral margin; 3) 1-5 small patches at apical part towards apex; 4) interrupted transverse line slightly below midline from interval II to lateral margin; 5) 3-6 small patches at basal part. In lateral contour widest just after the midline towards apex. LE/LP 2.52, WE/WP 1.86. Femur with two longitudinal line of scales, one along inner, one along outer margin. Hind tarsite II very short, wider than long. Aedeagus as in Fig. 3. 11-13. Eversion of endophallus as shown in Fig. 5B, 6B.

Female (Fig. 3.1-5, 3.15-16). Measurements (n=5): LB: 15.7-18.9 (mean 16.86); LR: 2.3-2.5 (mean 2.38); WR: 2.0-2.4 (mean 2.18); LP: 3.2-3.9 (mean 3.46); WP: 3.5-4.1 (mean 3.68); LE: 9.8-11.4 (mean 10.36); WE: 6.2-7.8 (mean 6.86).

Differential analyses. *Polycatus caterinae* sp. nov. is similar to *P. barsevskisi* sp. nov, *P. panayensis* Schultze, 1918 and *P. negrosensis* by it's markings on disc of pronotum. Species might be easily distinguished from the rest of the species by its smooth intervals on elytra, rostrum with shallow impressions dorsally and II segment of tarsus, that is wider than long.

Etymology. The species is dedicated to Caterina Moriconi wife of one of the authors (Alessandro Bramanti).

4. Polycatus negrosensis Bramanti, Bramanti & Rukmane, sp. nov.

(Fig. 4, 5A, 6A, 7)

Type material. Holotype, Male (Fig. 4.1-5, 4.11-14): 1 male, PHILIPPINES / Negros Occidental Prov./ Don Salvador Benedicto / III.2019 / local collector leg. (white label); ''HOLOTYPE / *Polycatus negrosensis* Bramanti, Bramanti & Rukmane'' (red label) (BRAA).

Paratypes (8 males, 10 female): 1 male, PHILIPPINES / Negros Occidental prov./Don Salvador Benedicto / XII. 2015 / local collector leg.; 3 males, 1 female, same as previous, but IV. 2019 (all on white rectangular labels, all in DUBC); 7 females, PHILIPPINES / Negros Occidental/ Don Salvador Benedicto / III.2019 / local collector leg.; 1 male, same as previous, but IV. 2019; 3 males, 2 females, same as previous, but V. 2019; (All on

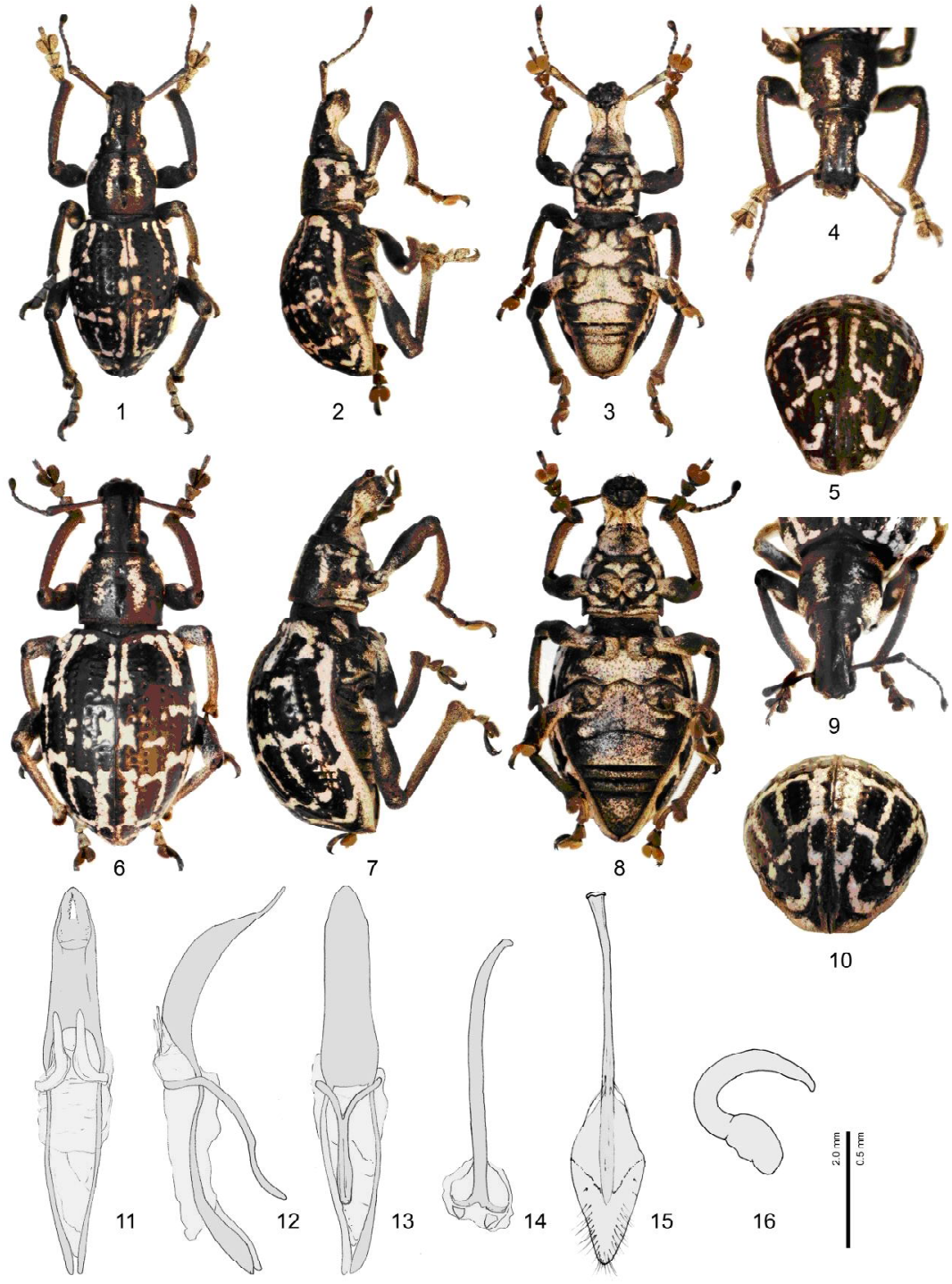


Fig. 4. *P. negrosensis* sp. nov. (BRAA). 1 - 5 male; 6 - 10 female; 11 – 13 aedeagal body; 14 – sternite IX; 15 – sternite VIII; 16 – spermatheca

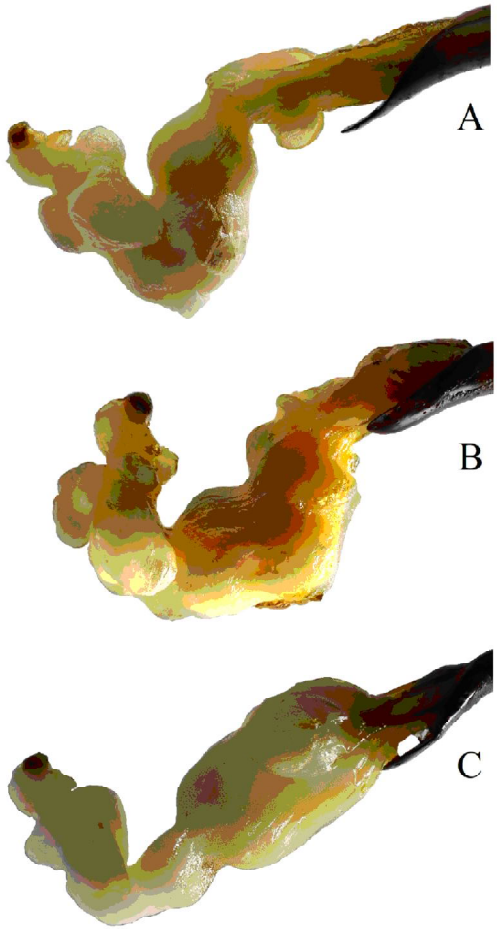


Fig. 5. Eversion of endophallus in lateral view. A – *P. negrosensis* sp. nov; B – *P. caterinae* sp. nov.; C – *P. euphloides* Heller, 1915

white rectangular labels, all in BRAA). All with additional red label: ''PARATYPE / *Polycatus negrosensis* Bramanti, Bramanti & Rukmane''.

Distribution. Negros Island (Fig. 7).

Description. Male. Measurements (n=5): LB: 14.2-15.1 (holotype 14.5, mean 14.64); LR: 2.6-2.8 (holotype 2.8, mean 2.72); WR: 2.0-2.3 (holotype 2.3, mean 2.16); LP: 3.2-3.55 (holotype 3.55, mean 3.37); WP: 3.7-4 (holotype 4, mean 3.82); LE: 7.6-10.0 (holotype 10.0, mean 8.42); WE: 5.6-6.35 (holotype 6.35, mean 5.87).

Body black, strong puncture on all parts, markings of metallic pink, round to recumbent scales. Head punctured except arear around the eyes, without longitudinal line of scales from inner margin of each eye medial portion of rostrum. Forehead with weak dorsal bulge, more than three times as wide as eye width. Rostrum LR/WR 1.22, in dorsal contour widest at base, slightly incurved along antennal scape, ventral part expanded; very slight oblong medial bulge and two stronger impressions one on each side of the bulge, elongated impression subbasally on each lateral part. Antenna evenly punctured, scape mingled with long rare hairs, antennomers with few light hairs; basal antennomer and antennomer II subequal in length, basal antennomer wider than antennomer II, 1.5 times as long as wide, antennomer II two times longer than wide; antennomers III-VI subequal in size, slightly longer than wide, antennomer VII longer than

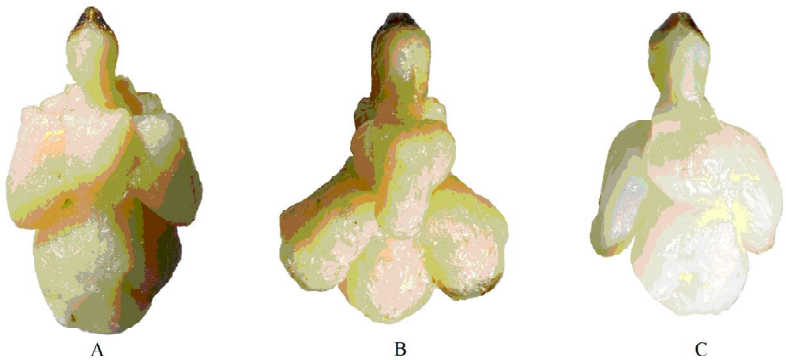
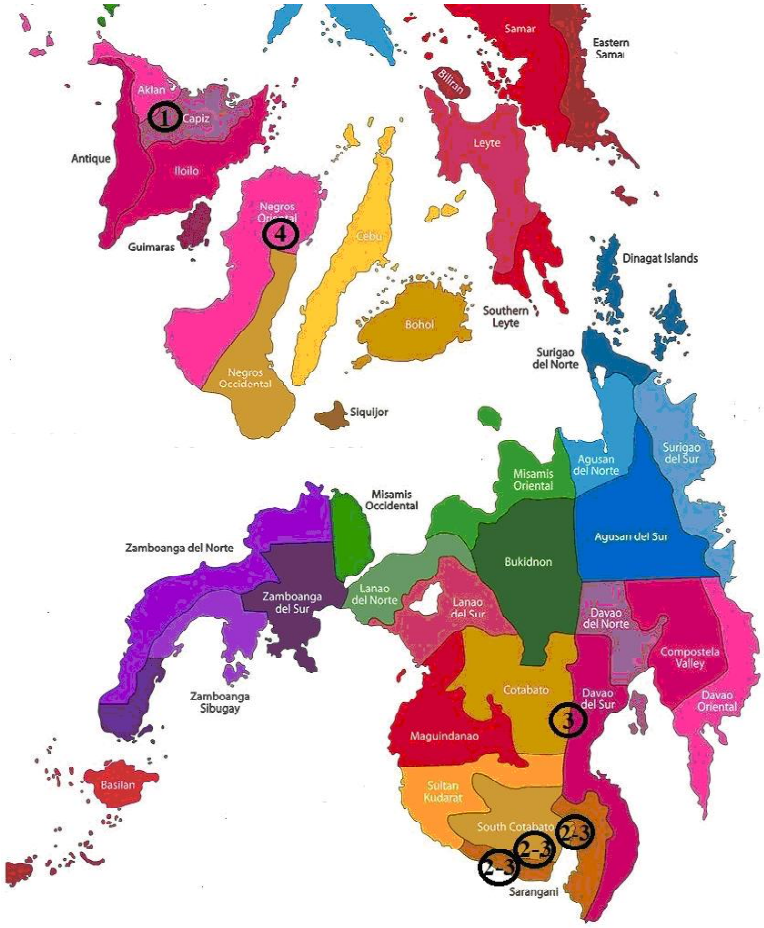


Fig. 6. Eversion of endophallus in ventral view. *P. negrosensis* sp. nov; B – *P. caterinae* sp. nov.; C – *P. euphloides* Heller, 1915



1. *Polycatus panayensis* Schultze, 1918
2. *Polycatus barsevkisi* n. sp.
3. *Polycatus caterinae* n. sp.
4. *Polycatus negrosensis* n. sp.

Fig. 7. Map of species distribution

III-VI, 1.5 times as long as wide; club very narrow at base, widest along apical 1/3. Prothorax strongly punctured, LP/WP 0.89, disc with medial impression; anterior edge curved medially on disc, folded laterally and curved along lateral part; posterior edge straight, mingled with short light hairs; in dorsal contour widest at apical 1/3; prothorax with the following markings: 1) two longitudinal lines medially on disc, each slightly redirected laterally from the midline; 2) 2) longitudinal line along middle of each lateral part, from just before apex to basal 1/2; 3) transverse line from ventral part to middle of each lateral part subapically; 4) ventral part covered with metallic scales except latero-ventral part. LE/WE 1.57, elytra with deep puncture rows arranged in moderately impressed longitudinal hollows; dorsally subbasal part slightly folded; apical part without long hairs; each elytron with the following scally markings: 1) interrupted line of scales along suture to interval II; 2) patch of scales along subbasal fold; 3) longitudinal line along lateral

margin; 4) interrupted longitudinal line of scales along interval V; 5) interrupted transverse line of scales just before the midline and just after the midline; 6) longitudinal line of scales from medial fortion to alex along interval VII. LE/LP 2.82, WE/WP 1.59. Aedeagus as in Fig. 4.11-13.

Female (Fig. 4.6-10, 2.15-17). Measurements (n=5): LB: 18.3-22 (mean 19.67); LR: 2.9-3.3 (mean 3.12); WR: 2.1-2.5 (mean 2.3); LP: 3.6-4.3 (mean 3.91); WP: 3.7-4.4 (mean 4.15); LE: 10.4-14.25 (mean 12.42); WE: 7.8-8.85 (mean 8.23).

Differential analyses. *Polycatus negrosensis* sp. nov. is similar to all species within the *panayensis* species group by it's markings on pronotum at central part of the disc. Additionally to geographic isolation (Negros Island), species might be easily distinguished by deep puncture rows in weakly impressed intervals instead of nearly smooth elytra with shallow puncture rows in *P. caterinae* sp. nov. and deep longitudinal continuous hollows in *P. barsevskisi* sp. nov.. From *P. panayensis* Schultze, 1918 the new species can be distinguished by it's smaller eyes and differences of scally markings on the body.

Etymology. The specific epithet is the latinized adjective derived from the area the specimens were collected from.

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