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## A contribution to the genus *Plectonotum* Gorham, 1891, in Ecuador (Coleoptera, Cantharidae)

by Robert Constantin

**Abstract.** The neotropical genus *Plectonotum* Gorham, 1891, has previously been known in Ecuador with three species. Eleven species are described as new for Ecuador : *Plectonotum seriatum* sp.nov. (Ecuador, province of Azuay), *P. reticulatum* sp.nov. (prov. Napo), *P. latithorax* sp.nov. (prov. Azuay, Morona-Santiago), *P. crassicorne* sp.nov. (prov. Azuay), *P. onorei* sp.nov. (prov. Napo), *P. puncticollis* sp.nov. (prov. Morona-Santiago, Napo), *P. moreti* sp.nov. (prov. Loja, Zamora-Chinchipe), *P. sanfranciscoi* sp.nov. (prov. Zamora-Chinchipe), *P. incisum* sp.nov. (prov. Zamora-Chinchipe), *P. glaber* sp.nov. (prov. Napo), *P. nigricorne* sp.nov. (prov. Azuay, Napo, Carchi). A lectotype for *P. nigrum* Gorham 1891 is designated. *P. ecuadoranum* Wittmer, 1988 syn.nov. is a synonym of *P. nigrum* Gorham, 1891. The genus *Manizalesum* Pic, 1955 syn.nov. (type-species *M. costatum* Pic, 1955 from Colombia) is a synonym of *Plectonotum* Gorham, 1891. The characters of the subfamily Dysmorphocerinae Brancucci, 1980 are recapitulated and a key to its neotropical genera is proposed. A key to the species of *Plectonotum* of Ecuador is provided, together with illustration of the habitus, details of the pronotum, male genitalia and cartographic representation of their distribution.

**Key words.** Coleoptera – Cantharidae – Dysmorphocerinae – *Plectonotum* – new species – Ecuador

### Introduction

The genus *Plectonotum* was erected by GORHAM (1891) for *P. nigrum* Gorham, 1891 (Cantharidae), collected in Ecuador near Quito. The same author also published a description of a second species of *Plectonotum* from Panama. Other representatives of the genus were later found in Brazil, Argentina and Bolivia, which were described by PIC (1906), summarised in PIC (1911), then followed by isolated descriptions by Maurice Pic until 1936. Wittmer became interested in this genus, made a revision of the Brazilian species and described two new species from Ecuador (WITTMER 1949, 1967, 1988).

Two surveys in the Andean mountains of Ecuador, carried out by the author in 2006 and 2007, have brought to light new material of this genus. Eleven species of *Plectonotum* have emerged as new to science and are described here. The majority of the specimens were collected with a beating sheet in the Andes of Ecuador, mainly at the upper edge of the mountain forest and the lower part of the paramos on the eastern cordillera between 2000 m and 3400 m elevation. The paramos, defined as a series of continuous belts of open vegetation between the mountain forest and summits, are covered with highly diverse vegetation of arborescent shrubs, bushes and grasses (ULLOA & JÖRGENSEN 1993) and are considered as a biodiversity hot-spot. In this environment, the biological material collected reveals a high, barely-known variability, and taxonomic revisions are required in many families of Coleoptera (MORET 2005, GIACHINO 2008).

The type material of Gorham's species was acquired by Pic in 1911 and is available for study at MNHN, as are the type specimens of Wittmer at NHMB. Other collections were brought back by Luis Peña, Pierre Moret, Conrad Gillett and Jürgen Schmidl.

Since there is a lack of keys to the neotropical genera of Cantharidae, provisional keys are provided to the neotropical subfamilies of Cantharidae and to the neotropical genera of Dymorphocerinae.

### Material and methods

Specimens were mounted on individuals cards and the male genitalia, carefully extracted from softened material placed in a drop of water, were glued to the same card for dry observation. Female genitalia was observed after short immersion in a solution of potassium dioxide and staining with a drop of chlorazol black solution. Measurements were obtained with a micrometer eye-piece. Illustrations were produced with a camera lucida. Habitus photographs were made using a focus stack assemblage with CombineZ software. Cartographic maps were realised with Carto-Fauna-Flora, software produced by Pr. Y. Barbier and Pr. P. Rasmont at Mons-Hainaut university.

Abbreviations of Institutions in which the studied material (inclusive of the types) is deposited:

|       |       |   |
|-------|-------|---|
| BMNH  | ..... | British Museum, Natural History, London, Great Britain                            |
| MNHN  | ..... | Muséum national d'Histoire naturelle, Paris, France                               |
| MNHUB | ..... | Museum für Naturkunde, Humbolt Universität, Berlin, Germany                       |
| NHMB  | ..... | Naturhistorisches Museum, Basel, Switzerland                                      |
| QCAZ  | ..... | Pontificia Universidad Católica del Ecuador, Museo de Zoología,<br>Quito, Ecuador |
| CCo   | ..... | Robert Constantin collection, Saint-Lô, France                                    |
| CMo   | ..... | Pierre Moret collection, Toulouse, France   |

Abbreviations for measurement indices:

|  |   |
|--|---|
| AL = antennal length                   | EL = elytra length from humerus to apex |
| EW = elytra width together at the base | HW = head width                         |
| IOW = interocular width                | OL = ocular length                      |
| PL = pronotum length                   | PW = pronotum width                     |
| TL = total length                      |   |

### Position and remarks on the genera of South American Dymorphocerinae

The subfamily Dymorphocerinae was erected in BRANCUCCI (1980) to gather several genera sharing characters with either the Silinae or the Malthininae and showing the following assemblage:

- mandibles with an apical tooth
- last maxillar palpomere without apical tip (except *Plectocephalon*)
- abdominal pores hardly visible
- male abdomen with 9 ventral segments, the last one flat and elongate
- female vagina membranous, paraprocts developed

Female specimens of Silinae may be hard to distinguish from Dymorphocerinae. The fourth tarsal joint of the neotropical Silinae genera (*Discodon*, *Polemius*, *Silis*, etc)

is divided by a transverse split at the basal part (Fig. 5), a character absent in the other subfamilies (new observation).

Beside the genera *Afronycha* Wittmer, 1949 (Southern Africa, 42 spp.), *Asilis* Broun, 1893 (New Zealand, 46 spp.), *Compsonycha* Wittmer, 1949 (South Africa, 12 spp.), *Geygiella* Wittmer 1972 (New Guinea, 51 spp.), *Heteromastix* Boheman, 1858 (Australia, 90 spp.), and *Neoontelus* Wittmer, 1972 (New Zealand, 4 spp.), the Dymorphocerinae subfamily is distributed in Central and South America where it is represented by:

|                                    |  |
|------------------------------------|--|
| <i>Dysmorphocerus</i> Solier, 1849 | ..... Chile, 4 spp.  |
| <i>Flabelloontelus</i> Pic, 1911   | ..... Mexico, 1 sp.  |
| <i>Hansasilis</i> Pic, 1936        | ..... Argentina, 1 sp., Brazil, 3 spp.                                     |
| <i>Hyponotum</i> Wittmer, 1949     | ..... Argentina, 2 spp.; Chile, 12 spp.                                    |
| <i>Micronotum</i> Wittmer, 1949    | ..... Chile, 5 spp.  |
| <i>Oontelus</i> Solier, 1949       | ..... Argentina, 4 spp.; Brazil, 22 spp.;<br>Bolivia, 1 sp.; Chile, 3 spp. |
| <i>Plectocephalon</i> Pic, 1928    | ..... Argentina, Chile, 1 sp.  |
| <i>Plectonotum</i> Gorham, 1891    | ..... Panama to Argentina, 38 spp.   |

*Grandonotum* was erected in PIC (1927) as a new subgenus of *Plectonotum*, based on *Plectonotum (Grandonotum) microceps* Pic, 1927. This species is represented in the Pic collection (MNHN) by a single female specimen, labelled "Argentina, Gob. Ta d. Fuego 190., C. Bruch [printed] / Ushuaia, Spegazzini [hand-written] / type / s.g. *Grandonotum microceps* n sp" [both hand-written by Pic]. This syntype, as already noted in WITTMER (1967), shows only weak differences of size and colour with *Micronotum nodicorne* (Solier, 1849) which is the type species of the genus *Micronotum* Wittmer, 1949. Further material of the type locality would help to clarify this taxonomic point.

#### Key to the neotropical subfamilies of Cantharidae

1. Maxillar palpomeres 1–3 subequal. Tibial spurs very small. Male sternite IX and aedeagus asymmetrical. .... ***Chauliognathinae***
- Maxillar palpomeres 1–3 of unequal length (Fig.3). Tibial spurs robust and clearly visible. Male sternite IX symmetrical. .... 2.
2. Fourth tarsomere split across at the base (Fig. 5). Abdomen with eight visible segments, IX and X invaginated. Division of the male sternite VIII reaching the base. .... ***Silinae***
- Fourth tarsomere not split across at the base (Fig. 4). Abdomen with nine visible segments (Fig. 6). .... 3.
3. Last maxillar palpomere globular and apically pointed. .... ***Malthininae***
- Last maxillar palpomere globular or hatchet-like, apically truncate or sharp (Fig. 3), not pointed (except in *Plectocephalon*). ....  
..... ***Dysmorphocerinae***



### Key to the neotropical genera of *Dysmorphocerinae*

1. Elytral punctation coarse, foveate, arranged in nine regular rows. .... 2.
- Elytral punctation confused or impunctate. .... 3.
2. Pronotum ovate or rounded. Antennal joints elongate or feebly dentate. ...  
..... *Oontelus* Solier, 1849
- Pronotum sides quadrate. Male antennae flabellate. ....  
..... *Flabelloontelus* Pic, 1911
3. Large, thick bead on the lateral margin of the pronotum near the anterior  
angle. Prothoracic epipleuron with large basal patch. (Fig. 1). ....  
..... *Plectonotum* Gorham, 1891
- Lateral margin of the pronotum thin, uninterrupted, or with a short and  
narrow bead. .... 4.
4. Apex of the last maxillar palpomere pointed. ... *Plectocephalon* Pic, 1928
- Apex of the last maxillar palpomere flattened or the apical edge steep. ...  
..... 5.
5. Body size from 7.5 to 9 mm. Male antennal joint VI deformed. ....  
..... *Dysmorphocerus* Solier, 1849
- Body size under 7.5 mm. .... 6.
6. Antennae elongate, simple in male. .... *Hyponotum* Wittmer, 1949
- Male antennal joints deformed. .... 7.
7. Male antennal joints IV–V expanded. Elytral punctation coarse and  
arranged in irregular rows. .... *Hansasilis* Pic, 1936
- Male antennal joints V–VI expanded. Elytral punctation small and  
dispersed. .... *Micronotum* Wittmer, 1949

### The genus *Plectonotum* Gorham 1891

*Manizalesum* Pic, 1955: 7 (type species: *Manizalesum costatum* Pic, 1955) **syn.nov.**

**Remark on synonymy.** *Manizalesum* Pic, 1955 was defined for *Manizalesum costatum* Pic, 1955, from Colombia. The collection of Maurice Pic, preserved in MNHN, contains a single male specimen, labelled “Manijales, A. M. Patino [printed] / type / *Manizalesum* ng. *costatum* n sp” (both handwritten by Pic). A detailed examination reveals that *Manizalesum* is a synonym of *Plectonotum* while *Plectonotum costatum* (Pic, 1955) comb.nov. is a valid species.

**Remarks on morphology.** GORHAM (1891) defined the genus *Plectonotum* for the peculiar and unique lateral bead of the pronotum. No other additional characters were provided by further authors. Based only on this character, *Plectonotum* has now become a large genus including very diverse species.

The lateral bead is a thickening of the lateral margin of the pronotum, outwardly followed by the epipleuron and inwardly distinguished from the disc by a thin furrow. It varies in size and shape between species but remains constant within each population, and shows feeble sexual dimorphism. Its development may be in relation with prothoracic defensive glands, as observed in *Plectonotum latithorax*. Another character of the pronotum of *Plectonotum* is a very large, shallow basal patch on the ventral side of the epipleuron (Fig. 1). This basal patch is covered with a dull, strong microreticulation and some short, whitish, adpressed setae. A second, smaller, dull patch is observed at the anterior angle. The basal and apical patches of the epipleura are separated by a smooth transverse arm, the disposition of which varies between the species.

The morphology of *Plectonotum nigrum* Gorham, 1891, has been examined and compared with the observations of BRANCUCCI (1980), a contribution which remains an invaluable source of information on the Cantharidae. The terminology used here follows this publication. Mandibles bidentate subequal in all the examined species. Maxillar palps peculiar for the hatchet-like last joint fitted with a cutting apical edge (Fig.3). Male genital segment IX follows a *Malthinus* pattern: tergite IX developed and basally prolonged with two struts articulated with the basal strut of narrow, elongate sternite IX (Fig. 6). Male aedeagus displays a regular Dymorphocerinae type (BRANCUCCI, 1980). The median lobe is very narrow and small, usually hidden between the two blades of the parameres (Fig. 27). Female genital segments and organs are similar to the *Malthinus* type. The developed paraprocts are basally prolonged with the cupuliform sclerites. The valvifer is short, basally fused with the paraprocts and apically articulated with the coxites. The styles are short and very small. A long seminal duct joins a subspherical bursa copulatrix. (Fig.7).

The type species of the genus is indeed *Plectonotum nigrum* Gorham, 1891, designated twice without any ambiguity. In GORHAM (1885: 306), the author wrote "Plectonotum was adopted by me for a minute species captured by Mr. Whymper at Quito, Ecuador...[Plectonotum nigrum]" Later GORHAM (1891: 51–52) published the descriptions, using the expressions "Plectonotum, *nov. gen. and* Plectonotum nigrum, *n. sp.*" It was then confirmed by CHAMPION (1915: 19–20). Unfortunately, the manuscript of the Ecuadorian species, *P. nigrum*, though written before 1885, was delayed and appeared only in GORHAM (1891), after the publication of the Panamanian species *P. labiale*. Thus, the designation of *Plectonotum labiale* Gorham, 1885 as the type species in DELKESKAMP (1977: 312) "Plectonotum Gorham, 1891 / *spec. typ.*: labiale Gorham (*decl. n.*)" appears erroneous according to rule 68.2 of the International Code of Zoological Nomenclature, Fourth Edition (1999).

#### Key to the species of *Plectonotum* Gorham, 1891 of Ecuador

1. Elytral punctation large and coarse, arranged in irregular lines. Black, pronotum fulvous. .... *P. seriatum* sp.nov.
- Elytral punctation smaller, not arranged in lines. .... 2.

2. Pronotum areolate, deeply punctate, apically costulate. ....  
..... ***P. reticulatum* sp.nov.**
- Pronotum surface smooth or finely punctulate. .... 3.
3. Pronotum strongly transverse, flattened and wider than elytra at the base.  
Legs bicolorous, femora yellow. .... ***P. latithorax* sp.nov.**
- Pronotum convex, not so wide. .... 4.
4. Small species. Antennal joints V–XI strongly (♂) or feebly (♀) flattened.  
..... ***P. crassicorne* sp.nov.**
- Antennal joints not flattened. .... 5.
5. Larger size, over 5 mm. Retro-antennal transverse ridge on the head. ....  
..... 6.
- Smaller size, under 5 mm. .... 7.
6. Larger and prominent eyes. Lateral bead of the pronotum weakly  
punctate. Size over 6 mm. .... ***P. onorei* sp.nov.**
- Smaller eyes, head smaller than pronotum. Lateral bead of pronotum  
punctate. Smaller size 5–6 mm. .... ***P. puncticollis* sp.nov.**
7. Pronotum feebly wider than long, lateral bead narrow, reaching the base,  
not notched in front of the basal angle. .... ***P. moreti* sp.nov.**
- Pronotum wider, lateral bead broader and disposed on the apical two-  
thirds. .... 8.
8. Body reddish-brown. Lateral bead of the pronotum inwardly delimited by  
a cutting edge, the basal and apical edges raised. Antennae longer than  
body. .... ***P. obrieni* Wittmer 1988**
- Body black. Lateral bead of the pronotum without interior cutting edge,  
also lacking raised basal and apical edges. Antennae shorter than body. ...  
..... 9.
9. Small, narrow species. Pronotum notched in front of the basal angles.  
Epistoma yellow. Mandible feebly crenulate. .... 10.
- Larger and wider species. Pronotum feebly emarginate in front of the  
basal angles. Head black. .... 11.
10. Larger size 3.5–3.7 mm. Wider pronotum, deeply notched in front of the  
basal angle. .... ***P. incisum* sp.nov.**
- Smaller size 2.9–3 mm. Pronotum not so wide, feebly notched in front of  
the basal angle. .... ***P. sanfranciscoi* sp.nov.**
11. Pronotum feebly convex and not so wide. Antennae black and elongate.  
..... ***P. nigricorne* sp.nov.**
- Pronotum very convex and wide, lateral bead broad. Antennae shorter,  
first two antennal joints yellow. .... 12.

12. Elytra quasi-hairless, setae sparse and very short. .... *P. glaber* sp.nov.  
 – Elytral yellow pubescence visible. .... *P. nigrum* Gorham, 1891

### Description of new species and taxonomic remarks

#### *Plectonotum seriatum* sp.nov.

Fig. 16; map 44

**Type material.** Holotype: Female. "Ecuador: prov. Azuay, Gualaceo 20 km east, paramos, 3°00'S-78°39'W, 3395 m, 19.XI.2006, R. Constantin". Currently preserved in author's collection (CCo).

**Description.** Black. Mandibles flavotestaceous. Pronotum bicolorous, orange-yellow except for a brown median discal vitta. Legs and abdomen reddish-brown.

Head narrower than the pronotum, with very thin punctation and pubescence. Eyes small and spherical. Vertex without transverse ridges. Temples convex. Antennae elongate, antennomeres III–VII 2.5× longer than wide, their integument verrucose and bearing long, brown setae. Pronotum moderately convex, basal and apical edges thinly bordered, lateral bead narrowly disposed on the apical three-quarters. Basal angles sharp and well marked (Fig. 16). Elytra strongly punctate, punctures as wide as their intervals, arranged in irregular rows, covered with short, brown, oblique setae. Tracks of two costulations. Abdomen: last visible sternite (VIII.) largely emarginated in the middle of the apex.

Dimensions (holotype): TL = 5.8 mm; AL = 2.6 mm; HW = 0.74 mm; IOW = 0.49 mm; OL = 0.20 mm; PL = 0.72 mm; PW = 1.16 mm; EL = 3.6 mm; EW = 1.23 mm.

Male unknown.

**Derivatio nominis.** Refers to the serial elytral punctation.

**Differential diagnosis.** The strong elytral punctation is unique among the Ecuadorian species. It recalls *P. simplicicollis* Pic from Bolivia in the elytral punctation, but differs from the latter in its black antennae, wider pronotum and larger lateral bead.

**Natural history.** A single female was collected beating the shrubby trees of the paramos on the western slope of the pass between Gualaceo and Gualaquiza.

#### *Plectonotum reticulatum* sp.nov.

Figs 14, 20, 27; map 44

**Type material.** Holotype: Male. Ecuador: prov. Napo, Cosanga 10 km south, 3 km S of Mirador de la Virgen de los Catamayos, 0°37'S-77°49'W, 2200 m, 6.XII.2007, R. Constantin. One female paratype: *idem*, Cosanga 3 km south, forest edge, 0°37'S-77°50'W, 2022 m, 5.XII.2007, R. Constantin. Both currently held in the author's collection (CCo).

**Description.** Holotype. Black. Epistoma and frons before the antennae yellow. Ventral side of antennomeres I–III, front coxa and femora, basal half of intermediate femora fulvous yellow.

Head finely and densely punctate. Eyes large, spherical, extruded. Vertex concave, showing transverse ridge behind the antennal foramen. Antennae long and thin, joints IV–IX 4× longer than wide, their integument weakly verrucose and bearing long, brown

setae. Pronotum feebly transverse, 1.3× wider than long, moderately convex, strongly constricted toward the rounded apical edge (Fig. 14) Lateral bead short, disposed along the median third, convex, smooth. Lateral margin notched in front of the basal angle. Discal integument embossed, strongly punctate, covered with an areolate reticulation, the fovae 3× larger than their intervals. Thinly pubescent, with short, yellow setae directed basally. Elytra elongate, 3× longer than wide together, covered with fine, dispersed punctation. Abdomen: Laterophyses of the median lobe arcuate, crescent-shaped, weakly denticulate before the apex. Apical part of the lateral lobes rounded, their internal facet concave (Fig. 20, 27).

Dimensions: TL: 4.6 mm; AL = 3.85 mm; HW = 0.87 mm; IOW = 0.41 mm; OL = 0.34 mm; PL = 0.75 mm; PW = 0.96 mm; EL = 3.55 mm; EW = 1.11 mm.

Female. Differs from the male in darker head, except for the yellow epistoma, and darker legs black except for the yellow front coxae, shorter antennae, smaller eyes.

Dimensions: TL: 4.7 mm; AL = 3.01 mm; HW = 0.79 mm; IOW = 0.46 mm; OL = 0.29 mm; PL = 0.79 mm; PW = 1.01 mm; EL = 3.75 mm; EW = 1.16 mm.

**Derivatio nominis.** Refers to the strongly reticulate punctation of the pronotum.

**Differential diagnosis.** Differs from all known Ecuadorian species. Habitus and the shape of pronotum recall the Chilean *P. pyrocephalum* Solier. The latter very different in body colouration, pronotal microsculpture and male genitalia.

**Natural history.** The male was collected at the upper edge of the mountain forest, attracted to a white sheet by small ultraviolet lamps in about half past seven p.m. The female was collected beating shrubby trees on the edge of mountain forest and meadows near Cosanga village.

### *Plectonotum latithorax* sp.nov.

Figs 21, 25; map 43

**Type material.** Holotype: Male. Ecuador: prov. Morona-Santiago, Gualaceo 30 km east, paramos, east slope, 3°00'S-78°38'W, 3357 m, 28.XI.2007, R. Constantin. 1 ♀ allotype and 5 paratypes (1 ♂ 4 ♀), *idem*. 1 paratype ♂, prov. Azuay, Gualaceo 25 km east, western slope and pass summit, 3°00'S-78°39'W, 3190 m, 28.XI.2007. 1 paratype ♀, *idem*, 3450 m. 3 paratypes (1 ♂ 2 ♀), *idem*, 3432 m, 16.XI.2006. 4 paratypes ♀, *idem*, 3395 m, 19.XI.2006. Holotype deposited in NHMB. Paratypes in MNHN, QCAZ and CCo.

**Description.** Holotype. Lustrous black. Mandibles, epistoma, base and ventral side of the first antennomere fulvotestaceous. All legs bicolorous, coxae and femorae orange-yellow, tibiae and tarsi black. Abdomen brown.

Head narrow, eyes bulging and relatively small. Frons concave, antennal sockets obliquely oriented. Vertex flattened, showing two oblique transverse ridges behind the sockets. Mandible elongate, the apical tooth small. Antennae moderately elongate, thin, antennomeres V–X 4× longer than wide, their integument microreticulate, covered with short, brown setae. Pronotum transverse, 1.6× wider than long, lustrous and reflective. Lateral bead short, limited to the apical region. Lateral margin basally expanded and explanate, maximal width beyond centre. Basal angle not notched. On each side of the pronotum, the apical zone near the anterior angle shows a small elevation, the summit of which has a small pit and a whitish glandular opening. Elytra lustrous, elongate, slightly dilated apically, punctation rough and dispersed, the punctures equal in their width to

their intervals, covered with a thin pubescence of short, erect, apically oriented, brown setae. Abdomen: Aedeagus peculiar for the thin, not denticulate laterophyses of the median lobes and prominent apex of the tegmen ((Fig. 21, 25).

Dimensions: TL: 5.5 mm; AL = 4.4 mm; HW = 1.09 mm; IOW = 0.72 mm; OL = 0.31 mm; PL = 0.99 mm; PW = 1.59 mm; EL = 4.15 mm; EW = 1.45 mm. Other male paratypes : length = 5.2–5.6 mm.

Female: Differs from the male in shorter antennae, smaller eyes. Last visible sternite apically emarginate and notched in the middle.

Dimensions of a medium-sized female paratype : TL: 5.6 mm; AL = 3.54 mm; HW = 1.06 mm; IOW = 0.72 mm; OL = 0.28 mm; PL = 1.01 mm; PW = 1.59 mm; EL = 4.09 mm; EW = 1.49 mm. Other female paratypes : length = 4.8–6 mm.

**Derivatio nominis.** Refers to the wide pronotum with its expanded apical and basal angles.

**Differential diagnosis.** Differs in the very large pronotum, the unique (to date) glandular pores of the prothorax, and the developed ventral apophyses of the aedeagus.

**Natural history.** The specimens were collected beating the bushy paramos, here mainly covered by arborescent shrub, among which were several *Gynoxys* spp. (Asteraceae).

***Plectonotum crassicorne* sp.nov.**

Figs 11, 22, 26; map 43

**Type material.** Holotype: Male. Ecuador: prov. Azuay, Gualaceo 31 km east, paramos, east slope, 3°00'S-78°39'W, 3410 m, 16.XI.2006, R. Constantin. 3 paratype ♂, *idem*. 2 paratypes ♀, *idem*, 3395 m, 19.XI.2006. Holotype deposited in the collection of NHMB. Paratypes in QCAZ and CCo.

**Description.** Holotype. Body wholly black, only the mandibles and the ventral side of the first antennal joint fulvotestaceous.

Head lustrous, minutely punctate. Eyes small, feebly prominent. Antennae relatively short. Antennomere II subglobulose, III–IV triangular, V–XI flattened, progressively enlarged, VIII 1.5× wider than long. Vertex convex, displaying only slight spur of transverse ridges (Fig. 11). Pronotum transverse 1.5× wider than long, convex, lustrous, thinly punctate. Basal and apical margins bordered. Lateral margins arcuate, lateral bead long, rather thin, crescent-shaped, extended from basal to apical corner. Elytra nearly parallel, coarsely punctate, the punctures larger than their intervals, dispersed, not arranged in rows. Elytral setae short, erect, yellow. Abdomen. Aedeagus peculiar for the large apical parts of the lateral lobes (Fig. 22, 26).

Dimensions: TL: 3.7 mm; AL = 2.5 mm; HW = 0.82 mm; IOW = 0.52 mm; OL = 0.25 mm; PL = 0.7 mm; PW = 1.08 mm; EL = 2.72 mm; EW = 0.99 mm. Other male paratypes : length = 3.6–3.8 mm.

Female. Antennae shorter and feebly flattened, the last four antennomeres 1.5× wider than long, subcylindrical. Pronotum wider and more convex. Sternite VIII apically emarginate.

Dimensions: TL: 4–4.4 mm; AL = 1.88 mm; HW = 0.79 mm; IOW = 0.54 mm; OL = 0.18 mm; PL = 0.82 mm; PW = 1.24 mm; EL = 2.96 mm; EW = 1.16 mm.

**Derivatio nominis.** Refers to the thickness of the antennae.



**Differential diagnosis.** *P. crassicorne* sp.nov. is relatively unique in the shape of the male antennae, flattened as in many Lycidae and some *Discodon* Gorham, 1881 (Cantharidae, Silinae). Apart from this character, it is very near to *P. nigrum* and *P. convexum* in the shape of the pronotum, differing from them in the elytral pubescence and the aedeagus. The females of *P. crassicorne* sp.nov. can be distinguished by their wide, cylindrical final antennomeres

**Natural history.** Collected with *P. latithorax* sp.nov. It appears rarer and was not collected during the survey of 2007.

***Plectonotum onorei* sp.nov.**

Figs 8, 18, 23, 24; map 43

**Type material.** Holotype: Male. Ecuador: prov. Napo, Cosanga 8 km south, Mirador de la Virgen de los Catamayos, 0°37'S-77°50'W, 2200m, 6.XII.2007, R. Constantin. 20 paratypes (8 ♂ 12 ♀), *idem*. 17 paratypes (6 ♂ 11 ♀), *idem*, 5.XII.2007. 2 paratypes ♂, *idem*, Cosanga 3 km south, forest edge, 0°35'S-77°50'W, 2022 m, 4.XII.2007, R. Constantin. Holotype deposited in NHMB, paratypes in BMNH, MNHN, MNHUB, QCAZ and CCo.

**Description.** The long series collected around Cosanga village displays a wide variability of colour, which may be categorised into six different patterns: Body black; antennomeres 3–11, pronotum, elytra and all the femorae orange (9 ♂, including the holotype, see Fig. 8, 7 ♀); body black; antennomeres 9–11, pronotum, elytra and all the femora orange (5 ♀); body black; antennomeres 10 (partly)–11, large apical vitta on elytra orange (4 ♂ 7 ♀); body black; lateral margins of the pronotum, a large transverse strip behind the middle of the elytra orange (1 ♂ 2 ♀); body black; antennomeres 10–11, pronotum orange (3 ♂ 1 ♀); body black; antennomeres 10–11 orange (1 ♀).

**Holotype.** Male. Head large. Eyes bulging, prominent. Frons narrow and depressed between the antennal sockets. Vertex finely and densely punctate, retro-antennal bumps short. Antennae elongate, last antennomeres feebly triangular, VIII 3.5× longer than wide, microreticulate and covered with thin, erect, brown setae. Pronotum 1.5× wider than long, feebly convex, lustrous, finely punctate. Anterior margin arcuate, the lateral margins subparallel, not notched in front of the basal angles. Lateral bead rather thin, smooth and thinly punctured, the width of the points equal to their intervals (Fig. 18). Elytra elongate, thinly punctured, the points smaller than their intervals, also displaying three light spurs of costulation. Striking pubescence of short, dense, erect, orange setae. Abdomen. Aedeagus peculiar for the narrow and thin median lobe, extremely thin and elongate laterophyses, lateral lobes excavated at the base and apically subquadrate, thin and straight apico-ventral apophyses (Fig. 23, 24).

Dimensions: TL: 5.8 mm; AL = 5 mm; HW = 1.19 mm; IOW = 0.49 mm; OL = 0.51 mm; PL = 0.94 mm; PW = 1.39 mm; EL = 4.5 mm; EW = 1.5 mm. Other male paratypes : length = 5.3–7.1 mm, mean 5.8 mm.

Female. Differs in much shorter antennae, smaller eyes.

Dimensions of a medium-sized female paratype: TL: 6.3 mm; AL = 3.9 mm; HW = 1.04 mm; IOW = 0.63 mm; OL = 0.35 mm; PL = 0.98 mm; PW = 1.49 mm; EL = 4.65 mm; EW = 1.6 mm. Other female paratypes : length = 5.1–6.5 mm, mean 5.9 mm.

**Derivatio nominis.** Dedicated with homage and gratitude to Pr. Giovanni Onore of Quito, for his constant help and advice, which have been key to the results of author's own survey trips.

**Differential diagnosis.** *P. onorei* sp.nov. is very near *P. puncticollis* sp.nov.: see below. It may be separated from the other species by the elongate antennae, globulous eyes, lustrous, relatively small, pronotum and thin elytral punctation.

**Natural history.** Collected beating arborescent shrub around the Mirador de la Virgen, at dawn in a high level of dampness, including light drizzle, and also in the cool of the morning. This site, lying 8 km south of Cosanga, is a small peak towering above the mountain forest and is now covered with television aeriels and secondary vegetation of trees and bushes. Lit up with several neon lights, the spot was attracting many Cantharidae.

***Plectonotum puncticollis* sp.nov.**

Figs 9, 19, 28, 32; map 43

**Type material.** Holotype: Male. ECUADOR: prov. Morona-Santiago, Lago Atillo, paramos bushes, Asteraceae, 2°11'S-78°28'W, 3078 m, 1.XII.2007, R. Constantin. 2 paratypes (1 ♂ 1 ♀), *idem*. 4 paratypes (3 ♂ 1 ♀), *idem*, 3112 m, 29.XI.2007. 1 paratype ♂, *idem*, 10 km east Lago Atillo, 2°12'S-78°26'W, 2765 m, mountain forest. 2 paratypes (1 ♂ 1 ♀): ECUADOR, prov. Napo, Papallacta lake, woody hedge, 0°22'S-78°09'W, 3364 m, 22.XI.2006, R. Constantin. 1 paratype ♂, *idem*, 23.XI.2006. 1 paratype ♂, *idem*, terms Papallacta, woody edge, 0°22'S-78°08'W, 3307 m, 21.XI.2006. 1 paratype ♂, *idem*, 2 km E Papallacta, 0°22'S-78°07'W, 2983 m. Holotype deposited in NHMB, paratypes in QCAZ, MNHN and CCo.

**Description.** The species is represented by two local colour forms. Specimens from Lago Atillo: Black, feebly lustrous. Mandible fulvotestaceous. Prothorax orange. Elytra sepia brown (Fig. 9). Specimens from Papallacta: Black. Pronotum bicolorous, black, a large crocus-yellow discal strip on the median third, apically enlarged, from basal- to apical margin. Elytra bicolorous black, a large median strip from the base and humeri to the apex but not reaching the apical margin.

Holotype. Head smooth, rather small. Eyes spherical, prominent. Frons depressed between the antennae. Vertex depressed, the median area micro-granulate and obliquely ridged. Antennae very elongate, verrucose, with brown, erect setae, antennomere VIII 7× longer than wide. Pronotum 1.4× wider than long, subquadrate, the anterior corner obliquely truncate. Lateral bead strongly punctate, the points wider than their intervals. Discal surface lustrous, finely and densely punctate (Fig. 19). Elytra elongate, parallel, dull, finely and densely punctate, the points small. Striking pubescence of short, erect, fulvous setae. Abdomen. Sternite VIII long and apically narrowed. Aedeagus peculiar in its very narrow median lobes, laterophyses elongate and apically expanded, lateral lobes apically subquadrate, elongate and thin apico-ventral apophyses (Fig. 28, 32).

Dimensions: TL: 6.1 mm; AL = 6.2 mm; HW = 0.97 mm; IOW = 0.57 mm; OL = 0.33 mm; PL = 0.84 mm; PW = 1.20 mm; EL = 5 mm; EW = 1.5 mm. Other male paratypes : length = 5.2–6.4 mm.

Female. Head smaller, antennae much shorter, elytra expanded in the apical third.

Dimensions of a medium-sized female paratype: TL: 5.7 mm; AL = 3.4 mm; HW = 0.85 mm; IOW = 0.57 mm; OL = 0.26 mm; PL = 0.88 mm; PW = 1.35 mm; EL = 4.6 mm; EW = 1.5 mm. Other female paratypes: length = 5.5–6 mm.



**Variability.** Judging by the available material, the two series from Lago Atillo and Papallacta each exhibit a peculiar, constant colour pattern. They are considered as belonging to the same species, sharing many identical characters of specific value.

**Derivatio nominis.** Refers to the strong punctation of the lateral bead of the pronotum.

**Differential diagnosis.** *P. puncticollis* sp.nov. is very near *P. onorei* sp.nov. and can be distinguished by the elongate antennae, the larger size, the colour pattern and the peculiar aedeagus.

**Natural history.** Collected by beating arborescent shrub in the moistest places above the timberline of the mountain forest.

***Plectonotum moreti* sp.nov.**

Figs 15, 29, 34; map 44

**Type material.** Holotype: Male. Ecuador: prov. Loja, 3 km SW of Saraguro, woody meadow, 3°39'S-79°15'W, 2835 m, 17.XI.2006, R. Constantin. 2 paratypes (1 ♂ 1 ♀), *idem*. 6 paratypes (3♂ 3 ♀), *idem*, 21.XI.2007. 5 paratypes (2 ♂ 3 ♀): Ecuador, prov. Loja, 12 km NE of Saraguro, wet shrub paramos, 3°34'S-79°11'W, 3100 m, 26.XI.2008, R. Constantin. 1 paratype ♂: Ecuador, prov. Zamora, 30 km E of Loja, 3°59'S-79°06'W, 2384m, 18.XI.2006, R. Constantin. 1 paratype ♀, *idem*, 3°59'S-79°08'W, 2751 m, 26.XI.2007. 2 paratypes ♀, *idem*, 3°58'S-79°04'W, 1902 m. 1 paratype ♀: Ecuador, prov. Zamora, 35 km south of Vilcabamba near Tambo Valladolid, 4°28'S-79°09'W, 2697 m, 21.XI.2007, R. Constantin. 1 paratype ♀: Ecuador, Prov. Loja, Estacion cientifica San Francisco, Loma Moras, 2000 m NN, barkspray, 26.IX.2007, J. Schmidl. Holotype deposited in NHMB, paratypes in NHMB, QCAZ and CCo.

**Description.** Holotype. Body entirely lustrous black. Mandibles, anterior margin of epistoma and a small spot beneath the first antennomere yellow. Legs brown. Head weakly micro-reticulate. Frons depressed between the antennae. Vertex with oblique ridges behind the antennal sockets. Eyes relatively small, bulging, prominent. Mandibles not crenulate. Pronotum moderately convex, feebly transverse, 1.3× wider than long. Lateral margin arcuate, narrowed apically, not notched basally. Lateral bead narrow, thin and joined to the anterior margin. Integument lustrous, punctate, setae long, yellowish and backwardly erect (Fig. 15). Elytra elongate, subparallel, rugulose punctate, punctures at intervals equal to their width. Abdomen: Aedeagus peculiar for its narrow median lobe, thin laterophyses with a long median denticle, truncate apex of the lateral lobes and long, triangular apico-ventral apophyses (Fig. 29, 34).

Dimensions: TL: 3.7 mm; AL = 3 mm; HW = 0.74 mm; IOW = 0.43 mm; OL = 0.28 mm; PL = 0.68 mm; PW = 0.89 mm; EL = 2.82 mm; EW = 0.95 mm. Other male paratypes: length = 3.5–4 mm.

Female. Antennae shorter, eyes smaller, frons wider. Pronotum width as in male. Abdomen with sternite VIII apically emarginate.

Dimensions of a medium-sized female paratype: TL: 3.7 mm; AL = 2.42 mm; HW = 0.61 mm; IOW = 0.4 mm; OL = 0.21 mm; PL = 0.61 mm; PW = 0.95 mm; EL = 2.82 mm; EW = 0.95 mm. Other female paratypes of Saraguro: length = 3.5–3.9 mm.

**Variability.** The series collected at Saraguro are homogenously small at 3.5–4 mm. The specimens collected east of Loja and south of Vilcabamba are larger: male 4.3 mm, females 4.0–5.0 mm.

**Derivatio nominis.** The species is dedicated to Dr Pierre Moret of Toulouse, who devoted many years to enhancing knowledge of the Carabidae fauna of the Ecuadorian paramos.

**Differential diagnosis.** *P. moreti* sp.nov. belongs to the *P. nigrum* species-group. Among these species, it differs in the peculiar, less transverse and lustrous pronotum, absence of a notch at the junction of the lateral margin with the pronotal basal angles, and the apically truncate lateral lobes of the aedeagus.

**Natural history.** Collected in a dip in a moist mountain meadow, beating tall grasses at the base of shrubby vegetation near springs.

***Plectonotum obrieni* Wittmer 1988**

Fig. 42; map 43

**Type material examined.** Described from a single male collected in prov. Tungurahua. The collection of NHMB holds this holotype, labelled "Ecuador, 30 km W. Puyo, April 27, 1978, CW & LB O'Brien & Marshall / Holotype / Cantharidae CANTH00017891 [NHMB access number]".

**Remarks.** The peculiar shape of the pronotum, the lateral and anterior margins of which are upturned, is particularly worthy of note. The original description (WITTMER, 1988: 333–335) gives a clear drawing, by Mr. Hodebert, of the aedeagus in dorsal view. A dorso-lateral view, based on the holotype, is added here (Fig. 42).

Dimensions (holotype): TL: 2.7 mm; AL = 3.2 mm; HW = 0.63 mm; IOW = 0.34 mm; OL = 0.23 mm; PL = 0.51 mm; PW = 0.71 mm; EL = 2.18 mm; EW = 0.77 mm.

**Differential diagnosis.** This species can be distinguished by its brown colour, small size, elongate antennae longer than body length, smooth vertex, and aedeagus with widely separated branches of apico-ventral apophyses.

**Natural history.** No additional specimens found. The type locality is located on the western slope of the East cordillera, probably around 1°24'S-78°10'W.

***Plectonotum sanfranciscoi* sp.nov.**

Figs 17, 31, 35; map 44

**Type material.** Holotype: Male. Ecuador: prov. Zamora, 5 km west of Sabanilla, near Estacion cientifica San Francisco, 3°58'S-79°04'W, 1902 m, 26.XI.2007, R. Constantin. 1 paratype ♂, *idem*. 1 paratype ♀, *idem*, 24.XI.2007. 1 paratype ♀: Ecuador, Prov. Loja, Estacion cientifica San Francisco, Loma Moras, 2000 m NN, barkspray, 26.IX.2007, J. Schmidl. 1 paratype ♂, *idem*, X.2008. Holotype deposited in NHMB, paratypes in NHMB and CCo.

**Description.** Holotype. Black-brown. Epistoma, genae, antennomeres I–II yellow. All legs bicolorous yellow, the tibiae and tarsi infuscate. Head lustrous. Frons feebly depressed between the antennae. Vertex convex, without transverse ridges. Mandibles minutely crenulate along the inner edge. Antennae elongate, thin, antennomere VIII 4× longer than wide. Pronotum lustrous, 1.5× wider than long, feebly convex, trapezoidal. Basal corner notched in front of the basal angle, apical corner emarginate. Lateral bead short and relatively narrow (Fig. 17). Elytra elongate, subparallel. Elytral setae yellowish, rearwardly erect. Elytral punctation rough, confused, the punctures wider

than their intervals. Abdomen: Aedeagus peculiar for its wide median lobe, long and thin laterophyses with basal tooth, long and thin apico-ventral apophyses, lateral lobes dorsally developed (Fig. 31, 35).

Dimensions (first: holotype, second: paratype ♂): TL: 3–2.9 mm; AL = 2.7–2.7 mm; HW = 0.61–0.6 mm; IOW = 0.32–0.32 mm; OL = 0.24–0.23 mm; PL = 0.48–0.47 mm; PW = 0.69–0.73 mm; EL = 2.28–2.18 mm; EW = 0.74–0.75 mm.

Female. Differs in smaller eyes, shorter antennae.

Dimensions: TL: 2.9 mm; AL = 1.6 mm; HW = 0.54 mm; IOW = 0.34 mm; OL = 0.19 mm; PL = 0.49 mm; PW = 0.8 mm; EL = 2.23 mm; EW = 0.8 mm.

**Derivatio nominis.** Refers to the proximity of the famous Germano-Ecuadorian research station, which has provided logistical support over the years for many ecological studies of the tropical mountain forests.

**Differential diagnosis.** Very near *P. incisum* sp.nov., distinguished by smaller size, shorter aedeagus and thin laterophyses.

**Natural history.** Collected beating the tall grasses on the steep slope of the ravine facing the building of the San Francisco scientific station, at the base of a tree (possibly identified as *Gaiadendron punctatum*, Loranthaceae). The specimens appeared only at the beginning of light rain.

### *Plectonotum incisum* sp.nov.

Figs 30, 33; map 44

**Type material.** Holotype: Male. Ecuador: prov. Zamora, 5 km west of Sabanilla, near Estacion cientifica San Francisco, 3°58'S-79°04'W, 1902 m, 24.XI.2007, R. Constantin. 2 paratype ♀, *idem*, 26.XI.2007. Holotype held in author's collection (Cco), paratypes in NHMB and CCo.

**Description.** Holotype. Reddish-brown. Epistoma, antennomeres I–II fulvous. Legs bicolourous dirty yellow, the apical halves of the tibiae and the tarsi brown. External characters as in *P. sanfranciscoi*, cf. supra. Abdomen: Aedeagus peculiar for its narrow median lobe, long and wide laterophyses with median tooth, large and conical apico-ventral apophyses, the lateral lobes laterally developed (Fig. 30, 33).

Dimensions: TL : 3.5 mm; AL = 3 mm; HW = 0.71 mm; IOW = 0.35 mm; OL = 0.27 mm; PL = 0.57 mm; PW = 0.89 mm; EL = 2.67 mm; EW = 0.94 mm. Other male paratypes : length = 3.6–3.8 mm.

Female. Differs in smaller eyes and shorter antennae.

Dimensions of the paratypes: TL : 3.5–3.7 mm; AL = 2.2–2.5 mm; HW = 0.69–0.74 mm; IOW = 0.42–0.45 mm; OL = 0.26–0.25 mm; PL = 0.62–0.63 mm; PW = 1–1.06 mm; EL = 2.72–2.87 mm; EW = 1.05–1.12.

**Derivatio nominis.** Refers to the distinct notching of the lateral margin in front of the base of pronotum.

**Differential diagnosis.** Very near *P. sanfranciscoi* sp.nov., *P. incisum* sp.nov. differs in its larger size, more transverse pronotum, darker legs and specific characters of the aedeagus.

**Natural history.** Found together with *P. sanfranciscoi* sp.nov. and hard to distinguish from the former in the field.

***Plectonotum nigrum* Gorham 1991**

Figs 1–4, 6, 7, 12, 36, 39; map 44

*Plectonotum ecuadoranum* Wittmer 1988 **syn.nov.**

**Type material examined.** The collection of Malacodermata made by H. S. Gorham (1839–1920) was acquired by Maurice Pic and preserved within the Pic collection at MNHN, Paris, either in separate boxes or mixed among his own specimens. The four syntypes of *P. nigrum*, quoted in the original description as “Quito and Hacienda Guachala”, have been retrieved at MNHN and comprise: one male labelled “1523-14” / ♂ / Quito Ecuador 9500 feet, Ed. Whympfer / type / *Plectonotum nigrum* Gorham”, two females with same labels (except one numbered “1523-15”, the other numbered “1523-12”) and one female labelled “Hac. Guachala Ecuador 9217 feet Ed. Whympfer”. I herewith designate the first male specimen as the lectotype and the three females as paralectotypes.

The Wittmer collection in NHMB holds the holotype of *Plectonotum ecuadoranum* Wittmer, 1988, labelled “Quito 2000 m, 30.3.56, Förster / *Plectonotum ecuadoranum* Wittmer”, both hand-written by Wittmer. A close examination confirms that *P. ecuadoranum* is a synonym of *P. nigrum*, based on identical shape of the pronotum, characters of the elytral pubescence and details of the male aedeagus. Both came from the same locality.

**Other material examined.** ECUADOR, prov. Azuay, Sigsig 7 km south, paramos, 3°05'S-78°47'W, 2850 m, 15.XI.2006, R. Constantin. Prov. Azuay, Sigsig 20 km south, forest near stream, 3°08'S-78°79'W, 2816 m, 15.XI.2006. Prov. Azuay, Gualaceo 20 km east, paramos, 3°00'S-78°39'W, 3190–3410m, 16.XI.2006, 19.XI.2006, 28.XI.2007, R. Constantin. Prov. Morona-Santiago, Gualaceo 25 km east, 3°00'S-78°40'W, 3357 m, R. Constantin (BMNH, MNHN, MNHUB, NHMB, QCAZ, CCo). No others details : “Ecuador 1965, L. Peña” NHMB. Prov. Pichincha, Bellavista Cloudforest Reserve, 0°00.948'S-78°40.824'W, 2200–2300 m, Tropical Cloudforest general collecting, 24–28.vii.2007, coll. CPDT, Conrad Gillett, BHMH (E) 2007-65.

**Observations.** *Plectonotum nigrum*, together with *P. glaber* sp.nov. and *P. nigricorne* sp.nov., belongs to a group of close species, separated by constant but slight details of pronotal shape, elytral pubescence and apex of the lateral lobes of the aedeagus. The specific characters of *P. nigrum* are relative shortness of the antennae, first two antennal joints yellow, remarkably convex shape of the pronotum, thick and wide lateral pronotal reflections (Fig. 12), medium length of the yellow elytral pubescence, and subquadrate apex of the lateral lobes of the aedeagus (Fig. 36, 39).

The lectotype is a very small specimen, initially stored in spirit, then mounted on a card, a treatment which may have given rise to some artefacts such as shrivelling of the antennomeres and the aedeagus.

Dimensions (male lectotype): TL: 2.7 mm; AL = 2.2 mm; HW = 0.68 mm; IOW = 0.45 mm; OL = 0.19 mm; PL = 0.54 mm; PW = 0.84 mm; EL = 2 mm; EW = 0.77 mm. Female paralectotypes : length = 3–3.5 mm.

**Natural history.** Collected in series on vegetation, beating the shrubby trees in the paramos of Gualaceo, together with *Plectonotum crassicorne* sp.nov. and *P. latithorax* sp.nov.

***Plectonotum glaber* sp.nov.**

Figs 10, 13, 37, 40; map 43

**Type material.** Holotype: Male. Ecuador: prov. Napo, Papallacta 6 km E, mountain forest edge, 0°22'S-78°04'W, 2750 m, 3.XII.2007, R. Constantin. 42 paratypes (17 ♂ 25 ♀), *idem*. 8 paratypes ♀, *idem*, 21.XI.2006, R. Constantin. 1 paratype ♀, *idem*, 22.XI.2006. 10 paratypes ♀, *idem*, 23.XI.2006. Holotype deposited in NHMB, paratypes in BMNH, MNHN, MNHUB, NHMB, QCAZ, CCo.

**Description.** Holotype. Black, lustrous. First two antennal joints, first three maxillar palp joints and mandibles yellow. Legs black, front and intermediate knees and basal

part of tibiae yellowish-brown. Head relatively small. Eyes small, very prominent. Frons and vertex wide, convex, smooth, punctate. Antennae moderately elongate, joints subcylindrical, integument microreticulate and covered with short, yellowish setation, antennomere VIII 2.7× longer than wide (Fig. 10, 13). Pronotum transverse, 1.5× wider than long, very convex; lateral margin arcuate. Lateral bead extended, smooth and thinly punctate. Spur of shallow, shiny micro-reticulation on the discal surface. Elytra elongate, parallel, narrower than the pronotum, punctation thin and shallow. Usual vestiture of head, pronotum and elytra is absent. The setation is poor, the yellow setae very thin and adpressed, the length of one seta equal to half of the interval between two points. Abdomen. Aedeagus peculiar for its narrow median lobe, thin and elongate laterophyses, apically prominent lateral lobes and triangular apico-ventral apophyse of the lateral lobes (Fig. 37, 40).

Dimensions: TL: 3.3 mm; AL = 2.6 mm; HW = 0.76 mm; IOW = 0.45 mm; OL = 0.23 mm; PL = 0.65 mm; PW = 0.99 mm; EL = 2.52 mm; EW = 0.95 mm. Other male paratypes : length = 3.2–3.8 mm.

Female. Differs in larger size, shorter antennae.

Dimensions of a medium sized female paratype: TL: 3.8 mm; AL = 2.5 mm; HW = 0.71 mm; IOW = 0.5 mm; OL = 0.22 mm; PL = 0.74 mm; PW = 1.08 mm; EL = 2.92 mm; EW = 1.1 mm. Other female paratypes: TL = 3.8–4.3 mm.

**Derivatio nominis.** Refers to the peculiar vestiture of the elytra, at first sight hairless but very short, adpressed, thin, yellow setae can be made out on closer observation.

**Differential diagnosis.** *P. glaber* sp.nov. is very near to *P. nigrum*. It can be distinguished by its apparent absence of vestiture, convex pronotum wider than the elytra and the characters of the aedeagus.

**Natural history.** Collected beating several small trees in a moist clearing near the Pappalacta river, east of Papallacta village, together with *Maronius papallactae* Constantin, 2007, and many other Cantharidae.

### *Plectonotum nigricorne* sp.nov.

Figs 38, 41; map 44

**Type material.** Holotype: Male. Ecuador: prov. Azuay, Sigsig 7 km south, paramos, 3°05'S-78°47'W, 2850 m, 15.XI.2006, R. Constantin. 6 paratypes (2 ♂ 4 ♀), *idem*. 1 paratype ♀, prov. Napo, Pallactacta 5 km east, mountain forest, 0°37'S-78°04'W, 2730 m, 21.XI.2006, R. Constantin. 1 paratype ♀, prov. Napo, Papallacta Chalpi, 2800 m, battage, 2.II.1985, Pierre Moret. 1 paratype ♂, prov. Carchi, labelled "Cerro Pelado, 3200 m, 25.VI.1965, Luis Peña / Naturhist. Museum Basel coll. Wittmer / *P. nigrum* Gorh. det. Wittmer" [This last station, circa 0°44'N-77°58', is the south slope of El Pelado, a summit located 7 km south of Volcán Chiles where Luis Peña collected the following day]. Holotype deposited in NHMB. Paratypes in MNHN, QCAZ, CMO and CCo.

**Description.** Holotype. Black, lustrous. Mandibles fulvotestaceous. Head relatively small. Eyes prominent, bulging. Frons and vertex convex, minutely punctate. Antennae elongate, their integument thinly verrucose, with long, erect, brown setae, antennomere VIII 2.7× longer than wide. Pronotum moderately convex, smooth, lustrous, punctate, covered with sparse yellow setae, vestiture absent near of the antero-lateral parts of the disc. Lateral bead elongate, narrow and punctate, points as wide as their intervals.

Lateral margin arcuate, slightly emarginate in front of the rectangular basal angles. Elytra elongate, parallel, lustrous, rugulose punctate, the points dispersed. Abdomen: Aedeagus peculiar in its narrow median lobe, basally enlarged and denticulate laterophyses, elongate apex of the lateral lobes and the thin apico-ventral apophyses of the lateral lobes (Fig. 38, 41).

Dimensions: TL: 3.5 mm; AL = 2.6 mm; HW = 0.74 mm; IOW = 0.46 mm; OL = 0.24 mm; PL = 0.65 mm; PW = 0.98 mm; EL = 2.72 mm; EW = 1 mm. Other male paratypes: length = 3.5–3.8 mm.

Female. Differs in shorter antennae, smaller head and shorter pronotum.

Dimensions of a medium-sized female paratype: TL : 3.8 mm; AL = 1.9 mm; HW = 0.768 mm; IOW = 0.46 mm; OL = 0.2 mm; PL = 0.66 mm; PW = 1.02 mm; EL = 2.72 mm; EW = 1.05 mm. Other female paratypes: length = 3.2–3.8 mm.

**Derivatio nominis.** Refers to the black coloration of the antennae.

**Differential diagnosis.** *P. nigricorne* sp.nov. is very near *P. nigrum* but can be distinguished by its elongate body, long, black antennae, more conspicuous pubescence and characters of the aedeagus.

**Natural history.** Collected in the morning on a mountain slope above Sigsig village on paramos vegetation around a moist meadow. Some specimens, attracted to heavy moisture, were caught sweeping the low grasses near a streamlet.

### Conclusion

Speciation within the genus *Plectonotum* in Ecuador confirms a high diversity. The difficulty was to delimit within a reasonable number of species the material in which each population differs in some details from neighbouring ones.

Apart from variability of genital traits, the variation of colour patterns conformed to two models. For *Plectonotum onorei* sp.nov., specimens from a single station display a wide range of chromatic models. On the other hand, the population of *Plectonotum puncticollis* sp.nov. has constant dark elytra at Lago Atillo, while the population at Papallacta has another constant pattern of elytra, banded with a yellow strip .

The elusive genus *Plectonotum* displays important taxonomic variations; further studies are needed to establish their place among the vast diversity of animal life in the Andean regions.

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### Resumen

Tres especies del género neotropical *Plectonotum* Gorham, 1891 (Coleoptera, Cantharidae), han sido descritas del Ecuador. Se añaden aquí once especies nuevas recolectadas por el autor en el Ecuador en 2006 y 2007: *Plectonotum seriatum* sp.nov. (Ecuador, provincia de Azuay), *P. reticulatum* sp.nov. (prov. Napo), *P. latithorax* sp.nov. (prov. Azuay, Morona-Santiago), *P. crassicorne* sp.nov. (prov. Azuay), *P. onorei* sp.nov. (prov. Napo), *P. puncticollis* sp.nov. (prov. Morona-Santiago, Napo), *P. moreti* sp.nov. (prov. Loja, Zamora-Chinchiipe), *P. sanfranciscoi* sp.nov. (prov. Zamora-Chinchiipe), *P. incisum* sp.nov. (prov. Zamora-Chinchiipe), *P. glaber* sp.nov. (prov. Napo), *P. nigricorne* sp.nov. (prov. Azuay, Napo, Carchi). Se designa lectotipo para *P. nigrum* Gorham 1891. Se establecen nuevas sinonimias: *P. nigrum* Gorham, 1891 = *P. ecuadoranum* Wittmer, 1988 syn.nov. El género *Manizalesum* Pic, 1955 syn.nov. (especie típica *M. costatum* Pic, 1955, de Colombia) es un sinónimo de *Plectonotum* Gorham, 1891. Se recuerdan las características de la subfamilia Dysmorphocerinae Brancucci, 1980 y se propone una clave dicotómica para los géneros neotropicales. Se propone una clave para identificar las especies de *Plectonotum* presentes en el Ecuador, con las fotografías de los adultos y detalles de los pronotos, los dibujos de los caracteres morfológicos y de las genitalia masculinas. Se incluyen mapas de distribución en Ecuador.

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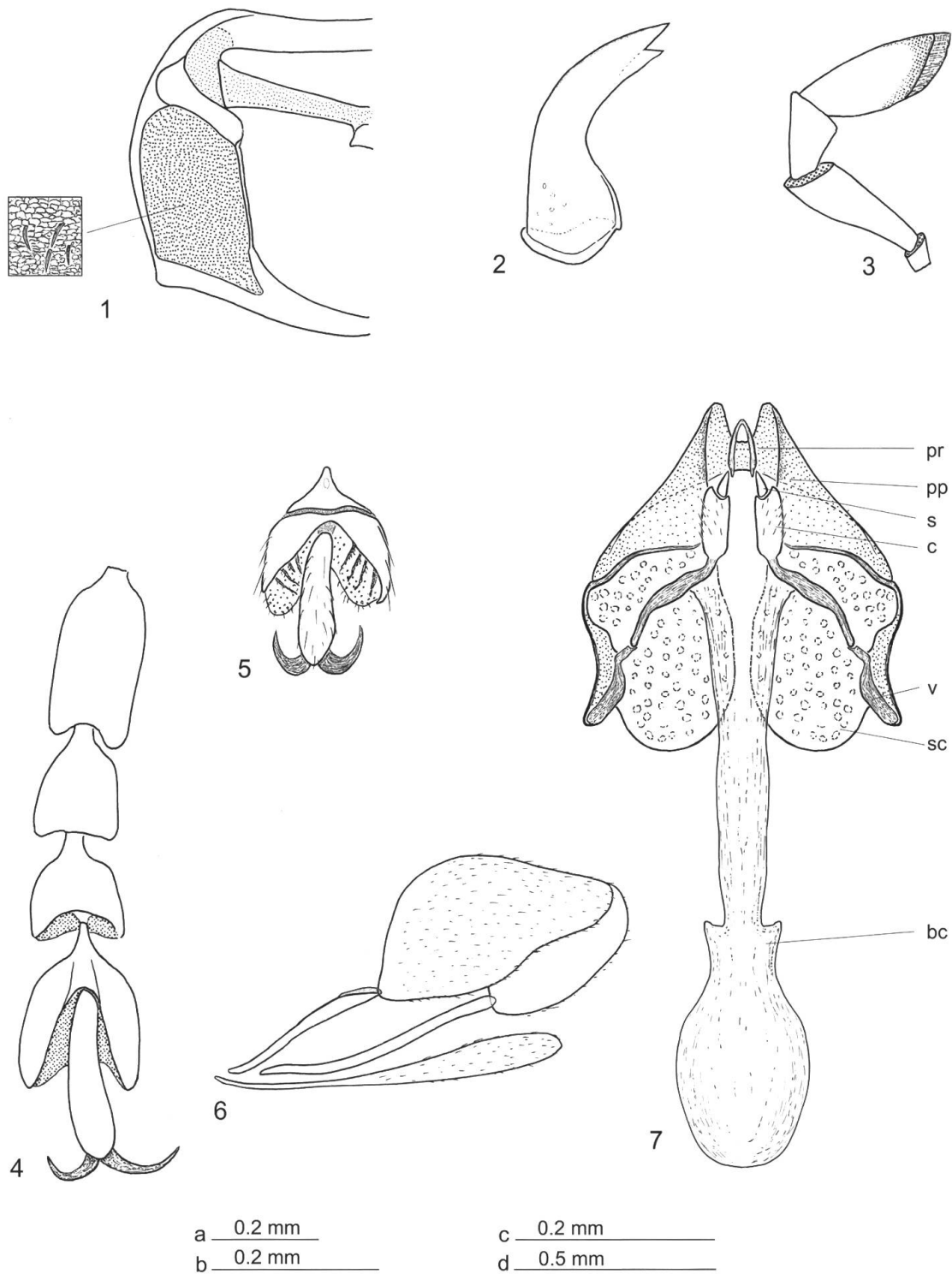
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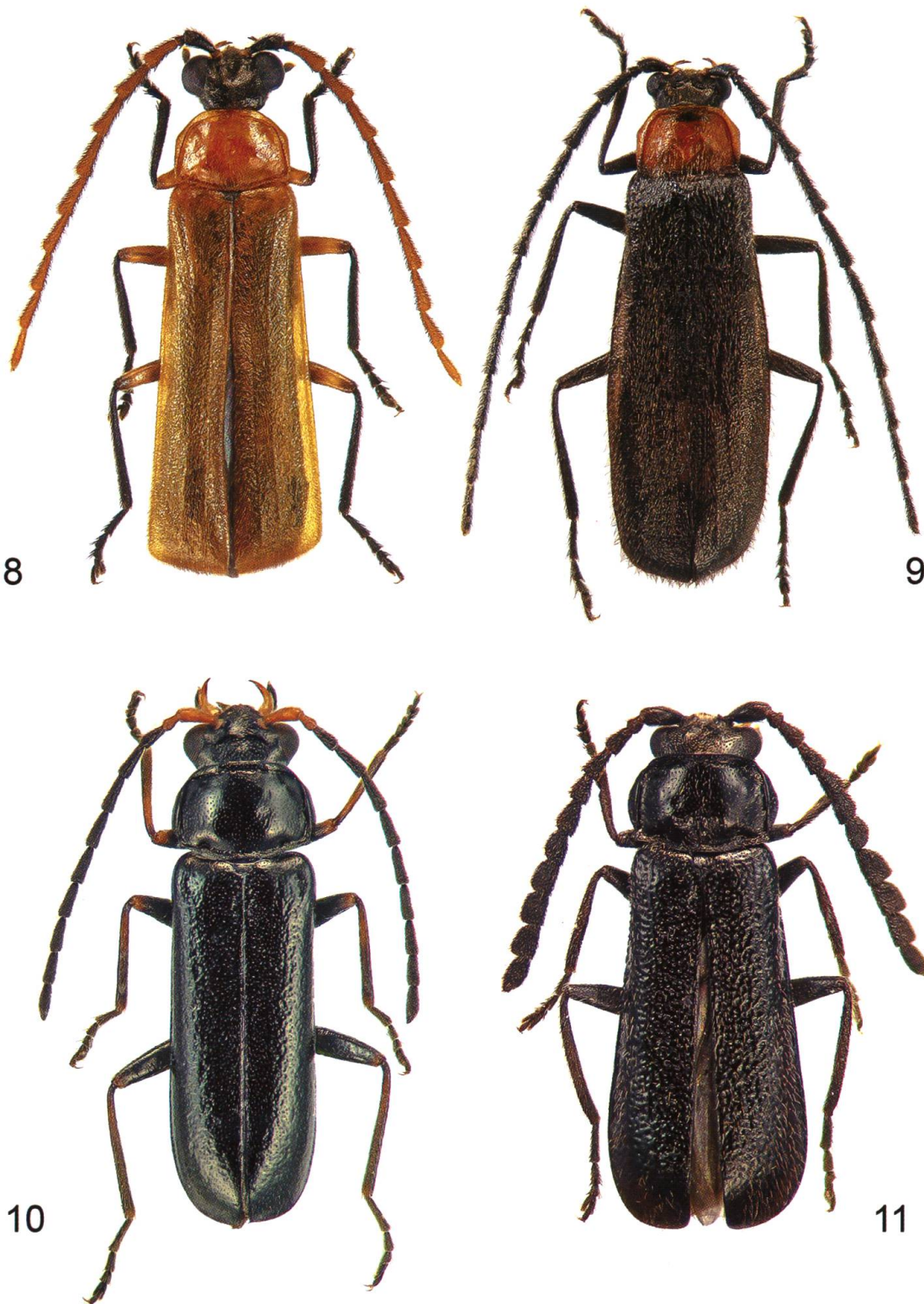
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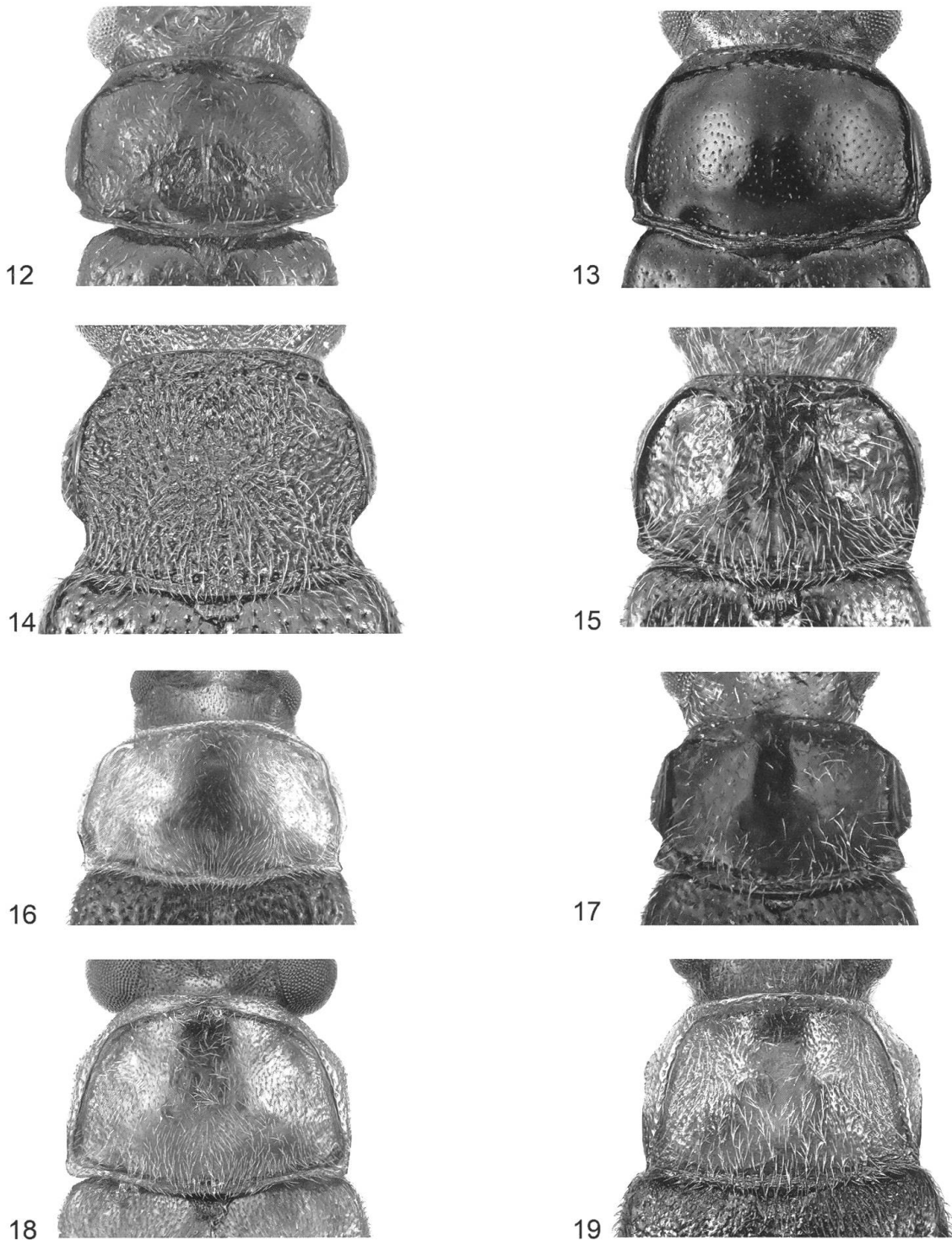




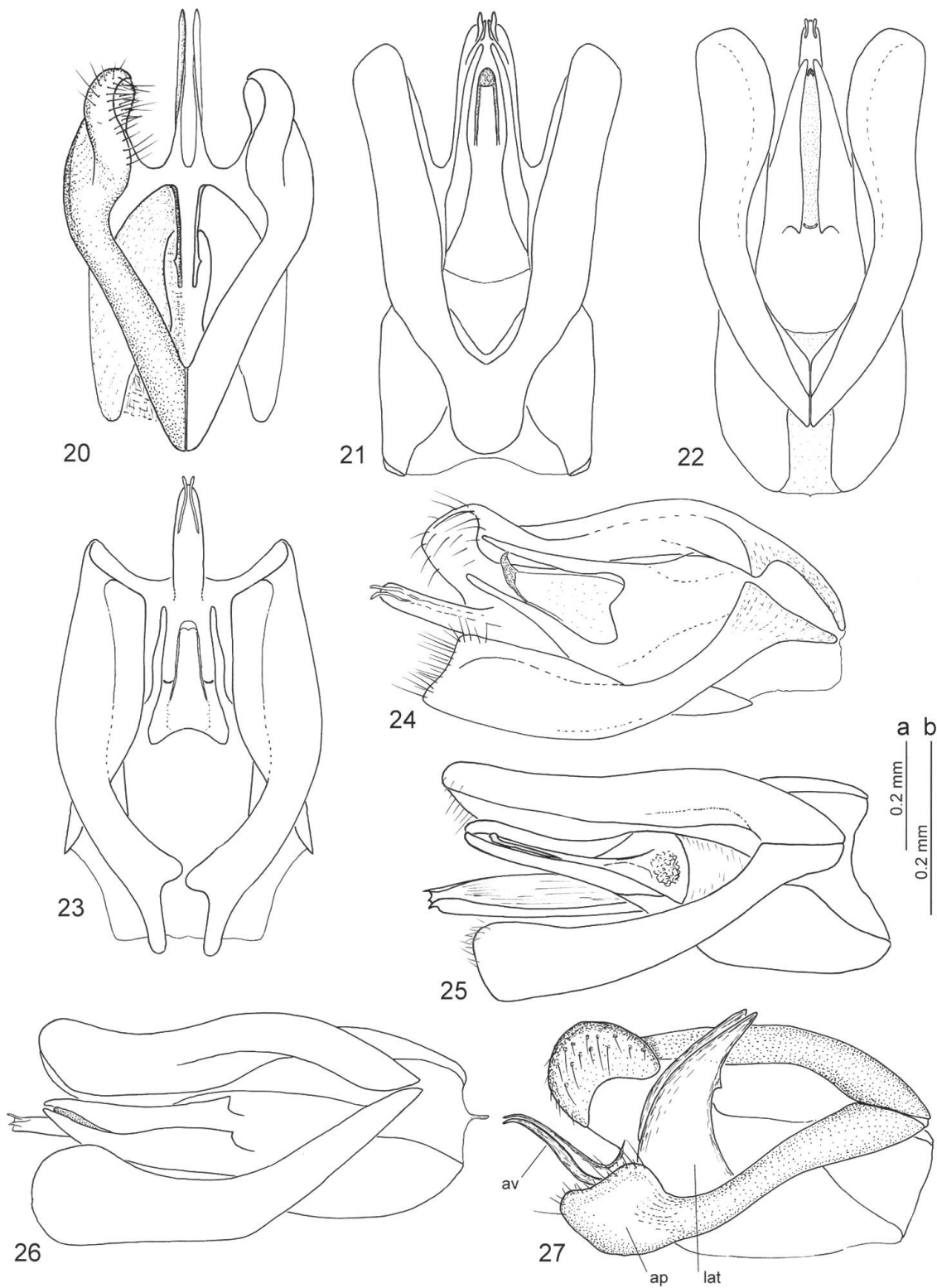
**Figs 1–7.** Figs 1–4, 6–7: *Plectonotum nigrum* Gorham. Fig. 5: *Discodon pici* Delkeskamp. 1, pronotum, right half and detail, ventral view; 2, mandible, ventral view; 3, maxillar palp, ventral view; 4, male front right tarsus, dorsal view; 5, female right front fourth and fifth tarsomeres, dorsal view; 6, male IX tergite and IX sternite, side view; 7, female genital segments and organs, ventral view. (*pr*, proctiger; *pp*, paraproct; *s*, stylus; *c*, coxite; *v*, valvifer; *sc*, cupuliform sclerite; *bc*, bursa copulatrix. Scale a: Figs 6, 7; scale b: Figs 2, 3; scale c: Fig. 4; scale d: Figs 1, 5.)



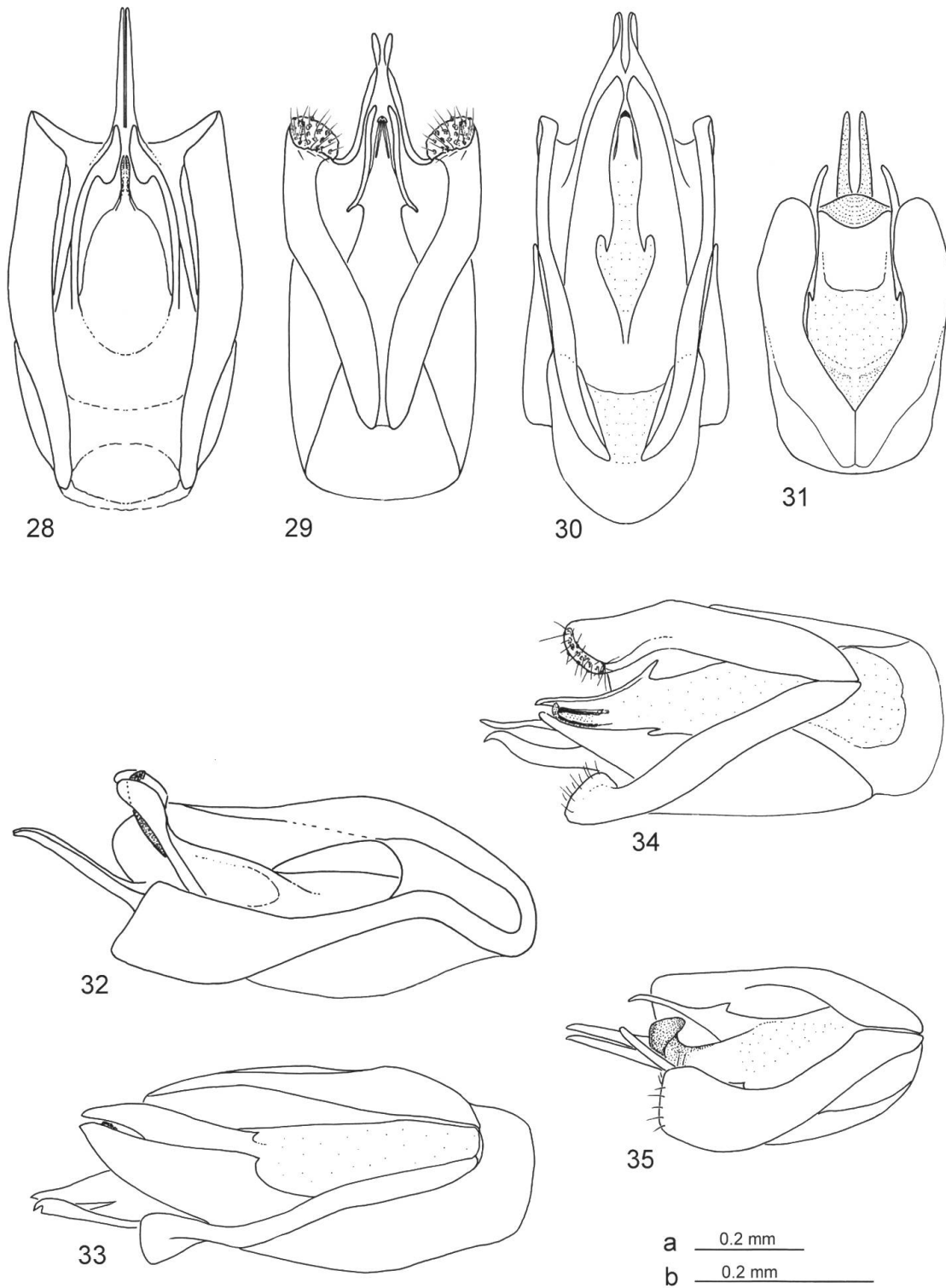
Figs 8–11. Male *Plectonotum* habitus: 8, *Plectonotum onorei* sp.nov.; 9, *Plectonotum puncticollis* sp.nov.; 10, *Plectonotum glaber* sp.nov.; 11, *Plectonotum crassicorne* sp.nov.



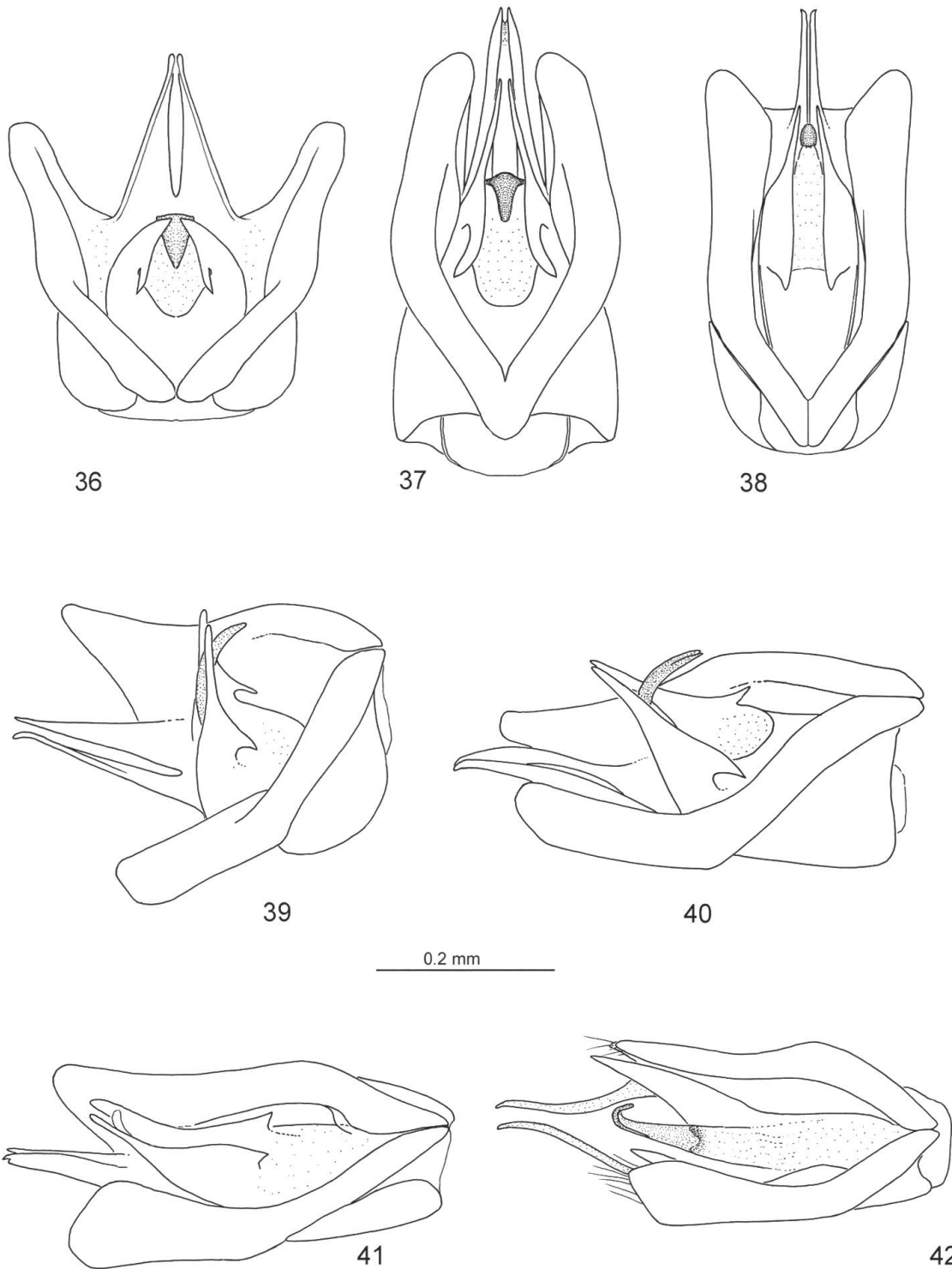
**Figs 12–19.** Pronotum of *Plectonotum*, dorsal view: 12, *Plectonotum nigrum* Gorham, lectotype; 13, *P. glaber* sp.nov.; 14, *P. reticulatum* sp.nov.; 15, *P. moreti* sp.nov.; 16, *P. seriatum* sp.nov.; 17, *P. sanfranciscoi* sp.nov.; 18, *P. onorei* sp.nov.; 19, *P. puncticollis* sp.nov. (Figs 12–15, 17–19: males; Fig. 16: female.)



**Figs 20–27.** Aedeagi of *Plectonotum*, dorsal and latero-dorsal views: 20, 27, *Plectonotum reticulatum* sp.nov.; 21, 25, *P. latithorax* sp.nov.; 22, 26, *P. crassicorne* sp.nov.; 23, 24, *P. onorei* sp.nov. (*ap*, apex of the lateral lobes; *av*, apico-ventral apophyse; *lat*, laterophyse. Scale a: Figs 21, 23–25; scale b: Figs 20, 22, 26, 27.)

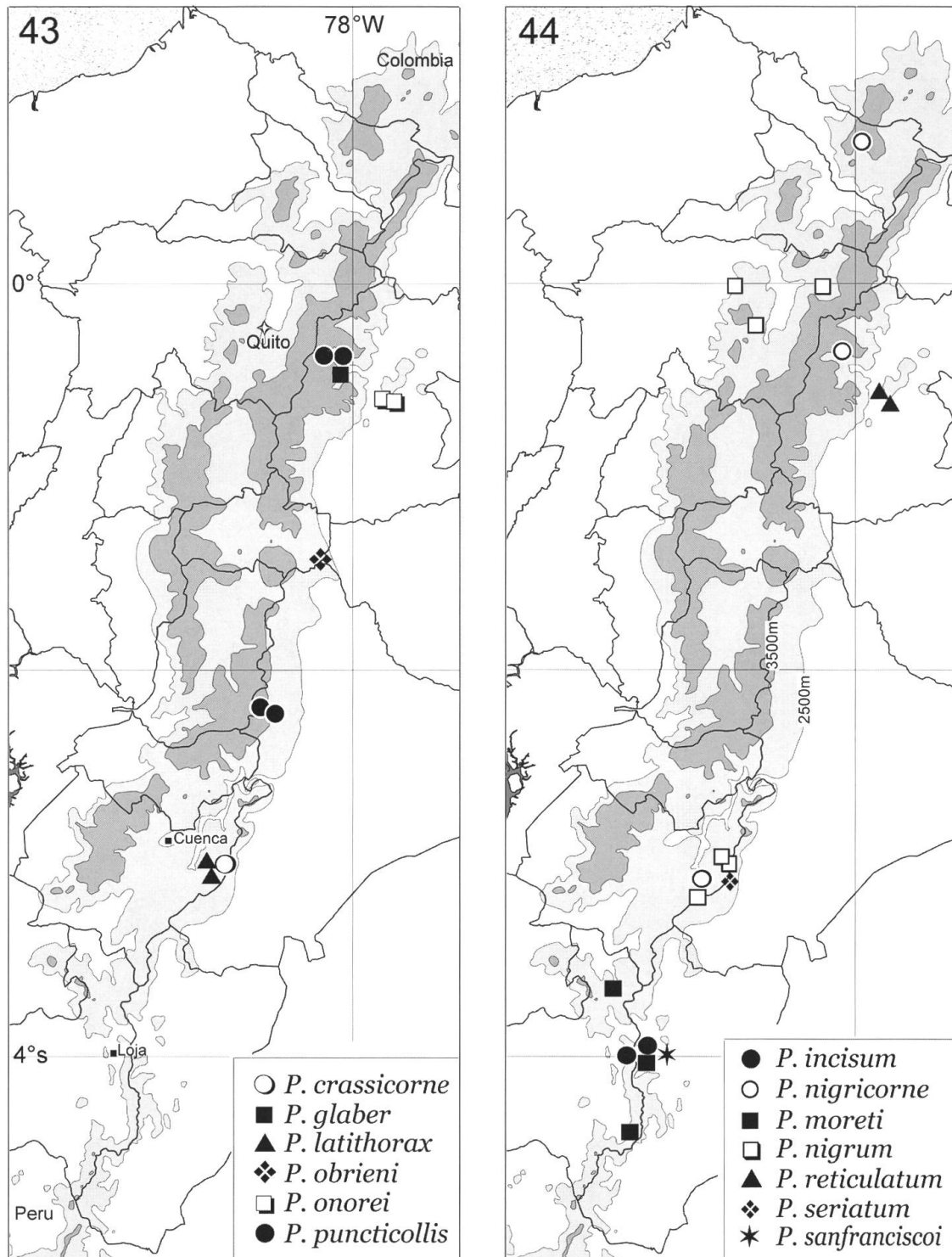


**Figs 28–35.** Aedeagi of *Plectonotum*, dorsal and latero-dorsal views: 28, 32, *Plectonotum puncticollis* sp.nov.; 29, 34, *P. moreti* sp.nov.; 30, 33, *P. incisum* sp.nov.; 31, 35, *P. sanfransiscoi* sp.nov. (Scale a: Figs 28, 32; scale b: Figs 29–31, 33–35.)



**Figs 36–42.** Aedeagi of *Plectonotum*, dorsal and latero-dorsal views: 36, 39, *Plectonotum nigrum* Gorham, lectotype; 37, 40, *P. glaber* sp.nov.; 38, 41, *P. nigricorne* sp.nov.; 42, *P. obrieni* Wittmer, holotype. (Common scale.)





Figs 43–44. Distribution of the genus *Plectonotum* in Ecuador.