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Autor:	Constantin, Robert
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A contribution to the genus *Astylus* Laporte de Castelnau, 1836, in Ecuador, with descriptions of three new species (Coleoptera, Melyridae)

by Robert Constantin

Abstract. Three species of the genus *Astylus* in Ecuador are here described as new to science: *A. lojaensis*, sp.nov. (prov. Loja), *A. longulus*, sp.nov. (prov. Loja) and *A. moreti*, sp.nov. (prov. Azuay). The following new synonymies are established: *Astylus curtus* Pic, 1919, *A. peruvianus* Pic, 1919 and *A. punctatus* Pic, 1919 are synonyms of *A. bonplandi* Erichson, 1847; *Astylus bourgeoisi* var. *quinquenotatus* Pic, 1920, *Astylus bourgeoisi* var. *trimaculatus* Pic, 1920, *Astylus cribrosus* Pic, 1919 and *Astylus riveti* Bourgeois, 1911 are synonyms of *A. bourgeoisi* Kirsch, 1889; *Astylus mutatus* Pic, 1919 and *A. mutatus* var. *subseparatus* Pic, 1920 are synonyms of *A. pallipes* Kirsch, 1889. Lectotypes are designated for *Astylus rubripennis* (Latreille, 1811) and *A. bonplandi* Erichson, 1847. A key to differentiate the eleven Ecuadorian species of *Astylus* is provided, as are illustrations of the habitus of the new species, and details of the genital characters of all the species addressed. New faunistic data are also presented as maps of distribution in Ecuador.

Keywords. Coleoptera – Melyridae – *Astylus* – new species – new synonymies – new faunistic data – Ecuador

Introduction

The genus *Astylus* comprises many species distributed throughout a large part of the Neotropical region from Panama and the West Indies to southern Chile. More than 110 species have been described, with nearly an equal number of varieties, most of them of below-subspecific status.

The genus was created by LAPORTE DE CASTELNAU (1836) with *Astylus lineatus* (Fabricius, 1775) as type-species. The most important work of revision was published by CHAMPION (1918), based on close examination of 39 species and description of the available sexual characters. Shortly afterwards, PIC (1919) published a supplement, describing new species and proposing the division of *Astylus* into nine subgenera: *Apterastylus* Pic, 1919; *Astylus* s.str.; *Heteracrius* Kirsch, 1865; *Macroastylus* Pic, 1919; *Mecoglossa* Solier, 1849; *Melyrastylus* Pic, 1919; *Microastylus* Pic, 1919; *Mimochalchas*, Pic, 1919 and *Pseudodasytes* Pic, 1919. Based on a single character, these subgenera have not benefited from re-examination, although *Apterastylus* defined on the basis of apterism has no significant phylogenetic meaning, and the last-cited is preoccupied by *Pseudodasytes* Mulsant et Rey, 1868. All of the Ecuadorian species belong to *Astylus* sensu stricto, and the existing subgeneric system will not be used here.

The phylogenetic positions of the genera *Astylus* and *Arthrobrachus* within the family Melyridae, in the restricted sense developed by MAJER (1987, 1994), was confirmed by MAJER (1987) and by recent molecular analysis (BOCÁKOVA *et al.* 2011).

The *Astylus* are well represented in the Andes mountains, and Ecuador is peculiarly species-rich. The first specimens examined in Europe were brought back by some of the great travelling naturalists: A. Humboldt and A. Bonpland, H. Lindig, A. Stübel, E. Whymper, R. Haensch, Abbé Gaujon, G.A. Baer, P. Rivet, and Marc de Mathan and were described by P. Latreille, G. Erichson, T. Kirsch, J. Bourgeois, G. C. Champion and M. Pic.

According to the available catalogues (PIC 1929; BLACKWELDER 1945), fifteen species and varieties have been described from Ecuador, among which seven are recognized as of specific status, and the others are synonyms. Recent specimens have brought to light three new species. Studying these led to checking the entire historical collections of the genus *Astylus* described from Ecuador and its neighbouring countries.

Material and methods.

This study is based on the specimens collected by P. Moret, on our own surveys between 2006 and 2011, and on the study of the large collections, over 1500 *Astylus*, held by the Pontificia Universidad Católica del Ecuador in Quito. Examination of Ecuadorian specimens, including the whole type-series preserved in the museums of Berlin, London, Paris and Torino, allows a series of synonymies to be proposed.

The methods employed have previously appeared in a contribution on the genus *Plectonotum* (CONSTANTIN 2008). The specimens, killed with a few drops of ethyl acetate, are dry-mounted and glued to a mounting board. Examination of the male genitalia needs some care, especially with older specimens. A safe method consists of: (1) softening the specimen in warm water for ten minutes; (2) separating the whole abdomen from the thorax with the help of two mounted needles with bent tips; (3) macerating in a small volume of hot potassium hydroxide for a few minutes; (4) using forceps to extract the genital armature through the intermediate tergites; (5) neutralizing in water to which a drop of acetic acid has been added; (6) washing and gluing separately the last abdominal segments, the tegmen and the median lobe to the mounting board. The terminology of the abdomen and genitalia follows MAJER (1987, 1994).

Abbreviations for the institutions in which the studied material (inclusive of types) is deposited

BMNH	British Museum, Natural History, London, UK
MNHN	Muséum national d'Histoire naturelle, Paris, France
MNHUB	Museum für Naturkunde der Humboldt Universität, Berlin, Germany
MRSNT	Museo regionale di Scienze Naturali, Torino, Italy
MTD	Museum für Tierkunde, Dresden, Germany
NHMB	Naturhistorisches Museum, Basel, Switzerland
QCAZ	Pontificia Universidad Católica del Ecuador, Museo de Zoología, Quito, Ecuador
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany
CCo	Robert Constantin collection, Saint-Lô, France

Abbreviations for the measurement indices

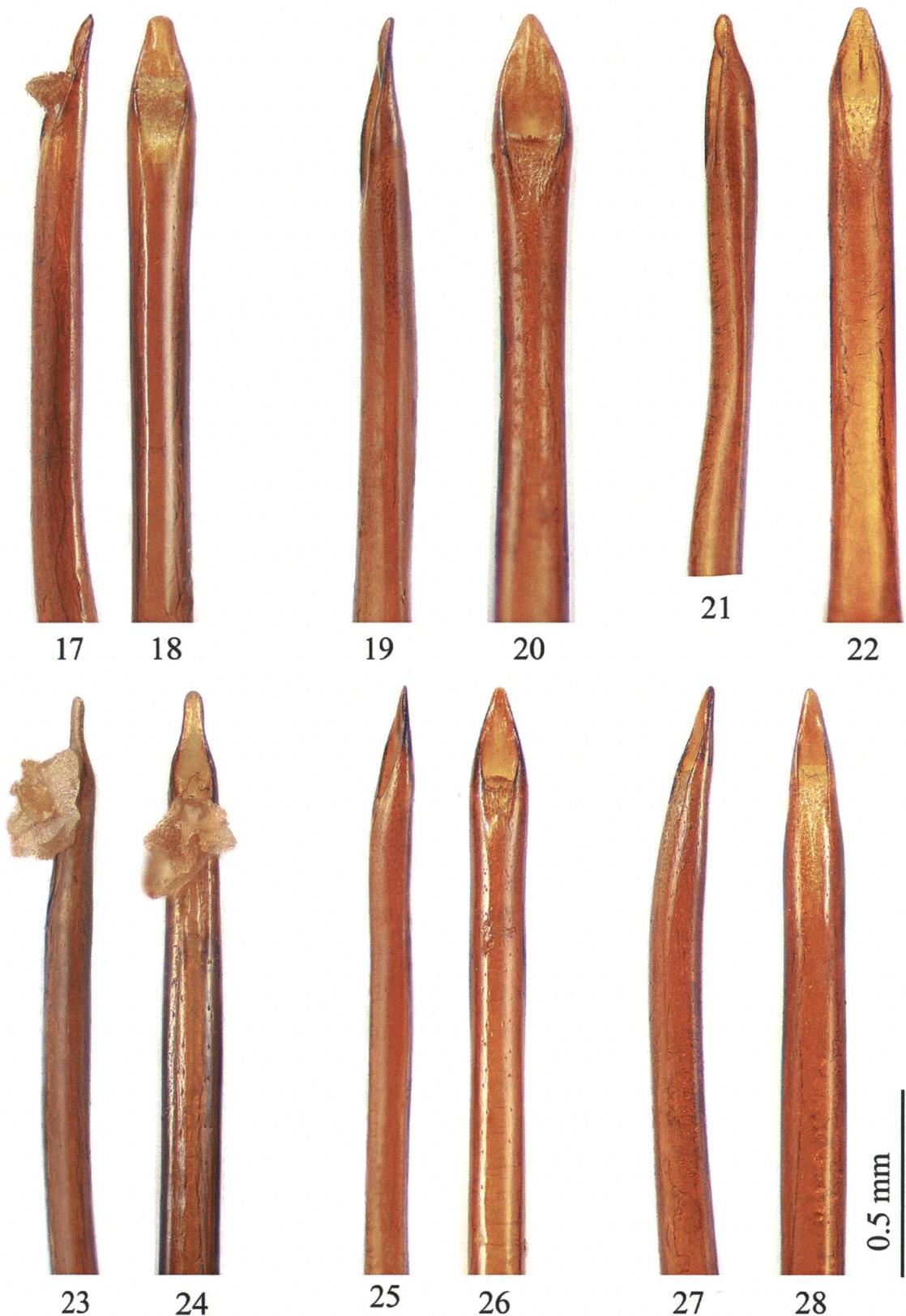
AL	antennal length
EL	elytron length from humerus to apex
EW	elytra width together at the base
HW	head width including the eyes
IOW	interocular width behind the antennal sockets
PL	pronotum length
PW	pronotum width
TL	total length



Figs 1–4. Male habitus: 1 – *Astylus rubripennis* (Latreille); 2 – *Astylus longulus* sp.nov.; 3 – *Astylus moreti* sp.nov.; 4 – *Astylus lojaensis* sp.nov.



Figs 5–16. Apex of the male median lobes (phalli): 5, 6 – *Astylus rubripennis* (Latreille); 7, 8 – *Astylus bonplandi* Erichson; 9, 10 – *Astylus nigrolimbatus* Champion; 11, 12 – *Astylus moreti* sp.nov.; 13, 14 – *Astylus lojaensis* sp.nov.; 15, 16 – *Astylus pallipes* Kirsch. 5, 7, 9, 11, 13, 15 – lateral (slightly dorsal) view; 6, 8, 10, 12, 14, 16 – dorsal view.



Figs 17–28. Apex of the male median lobes (phalli): 17, 18 – *Astylus luteoguttatus* Champion; 19, 20 – *Astylus bourgeoisi* Kirsch; 21, 22 – *Astylus luteicauda* Champion; 23, 24 – *Astylus coeruleotinctus* Champion; 25, 26 – *Astylylus sexpustulatus* Champion; 27, 28 – *Astylus longulus* sp.nov. 17, 19, 21, 23, 25, 27 – lateral (slightly dorsal) view; 18, 20, 22, 24, 26, 28 – dorsal view.

Key to the Ecuadorian species of the genus *Astylus*

1. Elytra in major part red with black patches. 2
- Elytra in major part blue-black or black, with orange-yellow marks. 5.
2. Elongate. Elytra red with basal and preapical patches. Length 12–13 mm. *A. rubripennis* (Latreille)
- Shorter. Elytra orange-red with basal, median and preapical black patches. 3.
3. Outer margin of elytra with complete black edge. Median lobe with thin tip. Length 9–10 mm. *A. nigrolimbatus* Champion
- Outer margin of elytra with its black border interrupted on the anterior half. 4.
4. Length 12–13 mm. Antennae short. Pronotum wide and transverse. Median lobe with thickened tip at the apex. *A. bonplandi* Erichson
- Length 8–10 mm. Antennae slender. Pronotum less transverse. Tip of median lobe with parallel point (Colombia, Venezuela, Peru). [*A. coeruleotinctus* Champion]
5. Elytra yellow with narrow marginal and sutural black borders and two discal longitudinal black strips not reaching the apex. Length 7 mm. *A. pallipes* Kirsch
- Elytra otherwise coloured. 6.
6. Elytra black with large orange-yellow strips, one large basal patch from suture to calus, two discal median and preapical patches forming a broken annulus. Pronotum quite narrow. Length 6 mm. *A. sexpustulatus* Champion
- Elytra with orange-yellow marks reduced or absent. 7.
7. Elytra elongate, 2.2× longer than width together at the base. Male: antennae long. Elytral punctures thin. Body quite narrow with elytral apices pointed. Elytra metallic blue with three or four small, round, red patches and a small round spot under the humeral cali. Median lobe apically elongate. Length 7–8 mm. *A. longulus* sp.nov.
- Elytra shorter, 1.9–2× longer than width together at the base. Antennae shorter. Elytral punctures strong. 8.
8. Apterous. Reduced humeral cali. Elytra strongly convex. Length 8 mm. *A. moreti* sp.nov.
- Winged species. Elytra weakly convex with marked humeral cali. ... 9.
9. Tarsi yellow. Body black. 10.
- Tarsi black. Body blue-black. Pronotum wide and feebly convex. ... 11.
10. Pronotum and elytra convex. Sexual colour differences: Male, elytra black with or without a small preapical patch, female with black elytra or black with a wide, red discal strip. Apex of the median lobe narrow, elongate and dorsally curved. Length 6–7 mm. ... *A. lojaensis* sp.nov.

- Pronotum and elytra less convex. Elytra black with an orange-yellow apical macula. Male antennae elongate. Length 5–6 mm. *A. luteicauda* Champion
- 11 Elytra shorter and strongly pubescent. Pronotum black with bronze-green reflection. Elytra bronze-black with five orange-yellow discal patches and preapical annulus broken. Elytral punctures deeply impressed, the points as wide as the intervals between them. Median lobe slightly enlarged before the apex, the tip shortly triangular and dorsally convex. Length 7–8 mm. *A. bourgeoisi* Kirsch
- Elytra quite narrow, weakly pubescent and with elytral apex pointed. Elytra metallic blue with three or four round, bright orange patches. Elytral punctuation shallower. Median lobe with thinner, flattened apical tip, not enlarged. Length 7–8 mm. *A. luteoguttatus* Champion

Astylus bonplandi Erichson, 1847

Figs 7, 8, 29

Astylus bonplandi Erichson, 1847: 84.

= *A. curtus* Pic, 1919a: 4, **syn.nov.**
 = *A. perforatus* Pic, 1919a, HT: 1–2, **syn.nov.**
 = *A. peruvianus* Pic, 1919b: 20, **syn.nov.**
 = *A. punctatus* Pic, 1919a, HT: 4, **syn.nov.**

A. bonplandi var. *bijunctus* Pic, 1919a, and *A. bonplandi* var. *erichsoni* Pic, 1920, belong to different species.

Type material. *Astylus bonplandi* is represented in MNHUB by a unique female syntype labelled “Bonplandi Dej./D. rubripennis Var. Latr./Perú Bras. Hag.” handwritten on a box-green label. Its original description does not mention the locality but gives a reference to the figure 4 in Latreille’s description of *Dasytes rubripennis*. This may suggest that Erichson described as new a darkly marked specimen of LATREILLE (1811, plate 17, figure 4), restricting the interpretation of *Astylus rubripennis* to the reddish form, as illustrated in Latreille, *loc. cit.* figure 3. According to LATREILLE (1811), both clear and dark forms of *Dasytes rubripennis* came from “Jaen de Bracamoras”. There is no direct evidence that the specimen described by Erichson had been collected by Humboldt & Bonpland. However, it is identical to the figure 4 by Latreille and the locality name “Bras. Hag” may be a contraction of “Bracamoras”. A life history of Alexander von Humboldt mentions that he has been living in Paris during the period 1800–1810. There he submitted his collections of insects to Pierre Latreille. A. von Humboldt lived in Berlin after 1827 where he met Erichson. Considering the need of clarifying the status of *A. rubripennis* Latreille and its variation, the syntype of Berlin is presently designated as the lectotype of *Astylus bonplandi* Erichson, 1847. Our series of Ecuadorian specimens from the Loja province were compared to the lectotype of *A. bonplandi* and are identical.

Astylus curtus is represented by a single male syntype labelled “Pérou/Prov. Huallaga/Rio Mixiollo 1200 m/ G. A. Baer 7-8-1900”. It is a synonym of *A. bonplandi*.

Astylus perforatus is represented in the Pic collection by a single male syntype mis-labelled “Dahomey//rubripennis Latr.//type//perforatus Pic”, an African country but recognized by Pic as coming from South America. It is a synonym of *A. bonplandi*.

Astylus peruvianus: the Pic collection contains four syntypes labelled “Huancabamba, N. Peru 3000, H. Rolle”. This locality is in the Piura province, 5°02'S-79°04'W. One male syntype, after examination of the genital armature, was revealed to be identical with *A. bonplandi*.

Astylus punctatus is represented in the Pic collection, MNHN, by two female syntypes labelled “punctatus/Equateur/type (man.Pic)”. No differences observed with *A. bonplandi*.

Astylus bonplandi var. *erichsoni* Pic, 1920, was described from Peru. One male syntype in the Pic collection labelled “Callanga/Peru/type//v.Erichsoni Pic”. This is not a synonym of *A. bonplandi*, and represents another species, differing in more elongate elytra, deeply incised sternite VIII and lengthily-pointed tip of the median lobe.

Astylus bonplandi var. *bijunctus* Pic, 1919, was described from Bolivia. One male syntype in the Pic collection with the labels “Bolivie//bonplandi v. *bijunctus*”. It is not a synonym of *A. bonplandi* but a different species near to *A. bonplandi* var. *erichsoni* Pic.

Other material examined. COLOMBIA, PUTUMAYO: San Francisco, 2500 m, 7.XI.1968, *M. Deschamps* (MNHN); – *idem*, San José Pasto-Sibundoy, 2900 m, 6.XI.1968, *M. Deschamps* (MNHN). ECUADOR, NAPO: Pununo, 20 km E Puerto Napo, 5.XI.2002, *R. Forster*; – Papallacta, Chalpi, 2800 m, 2.II.1985, *P. Moret*; – Laguna Papallacta, 3350 m, 5.IV.1986, *P. Moret*; – Papallacta pass, 3722 m, 23.XI.2006; – *idem*, 3788 m, 03.XII.2007; – Cuyaja (QCAZ); – PICHINCHA: Cayambe NE, lago San Marcos, 3600 m, 16.IX.1984, *P. Moret*; – *idem*, 3000 m, 26.I.1985, *P. Moret*; – *idem*, 3457 m, 19.V.2011; – COTOPAXI: via Salcedo-Tena (QCAZ); – TUNGURUHUA: Ambato, *Anda Vasconez* (MNHN); – BOLIVAR: Cashca Totoras, (QCAZ); – AZUAY: Gualaceo 30 km E, 3.00-78.38, 3422 m, 16.XI.2006; – *idem*, 28.XI.2007; – Sigsig 15 km SE, carretera de Gualajiza, 2790 m, 15.XI.2006; – CHIMBORAZO: laguna de Atillo, 2°.10'S-78°.30'W, 3551 m, 1.XII.2007; – MORONA-SANTIAGO: Sigsig 30 km E, 2470-2800m, 15.XI.2006; – *idem*, 26.IV.2009; – EL ORO: Chillacocha, 3°29'S-79°38'W, *P. Rivet* (MNHN); – LOJA:–Loja, 2100 m, 4.III.1995, *Hornburg & Krause*; – Loja-La Torre km 17, 2450 m, 24.VI.1986, *P. Moret*; – Loja 20 km S, 3°.52'S-79°.16'W, 2670 m, 7.V.2009; – Amaluza, carretera de las lagunillas, 2850 m, 10–12.V.2011; – ZAMORA: Loja-Zamora km 30, 1900 m, 12.IV.1985, *P. Moret*; – *idem*, 2024 m, 18.XI.2006; – Yangana 18 km S, 2680 m, 28.XI.2008. Unless otherwise mentioned, collection was made by the author.

Taxonomic remarks. *Astylus bonplandi* is a variable species in the extension of the black patches on the elytra, and also in the depth of the elytral punctuation, which may be very thin and shallow or dense and deeply marked as in *A. bourgeoisi*. This variation does not show any particular distribution but within a population in a defined locality the specimens display a similar shallow or deep punctuation. It is important to include an examination of the genital armature in any identification. *A. bonplandi* is unique in the apex of the median lobe, abruptly narrowed, with the narrow apical part thickened distally.

Natural history. While most of the *Astylus* species are observed on flowering vegetation, appearing to favour medium-sized Asteraceae, *Astylus bonplandi* is a species living on the high paramos, often in cloud, and has been observed at ground level, sometime in great numbers on disturbed substrate. In the warmest periods of the day, they appear on stones, eating foliaceous lichens or certain mosses. On the Papallacta pass (Napo province, 3788m, 3.XII.2007), it was surprising to observe both adults and mature larvae of *Astylus bonplandi* active on the earthy soil between stones.

Distribution. In Ecuador, found on the eastern cordillera from Imbabura province to the Peruvian border. Several documented findings in the Oriente at low altitude, but only found in abundance over 2600 m. In Peru, several neighbouring species need to be redefined.

Astylus bourgeoisi Kirsch, 1889

Figs 19, 20, 30

Astylus bourgeoisi Kirsch, 1889: 11, pl. 1 Fig. 21.

- = *A. bissexguttatus* Gorham, 1891, synonymy confirmed.
- = *A. bourgeoisi* var. *quinquenotatus* Pic, 1920: 2, **syn.nov.**
- = *A. bourgeoisi* var. *trimaculatus* Pic, 1920: 2, **syn.nov.**
- = *A. riveti* Bourgeois, 1911: 213, **syn.nov.**
- = *A. cibrosus* Pic, 1919b: 20, **syn.nov.**

Type material. *Astylus bourgeoisi*: The type-locality of *A. bourgeoisi* is in Colombia, prov. Nariño, Tuquerres (70 km NE of El Angel) and it is also from Mindo in Ecuador. The collection of MNHUB contains a syntype with the handwritten green label “Tuquerres”.

Astylus bissexguttatus Gorham is represented by several syntype specimens in the Pic collection at MNHN. Unfortunately, some of these syntypes have been redescribed as the new varieties *bourgeoisi* var. *quinquenotatus* and var. *trimaculatus* Pic, 1920. They are of below-subspecific status and are synonyms of *A. bourgeoisi*. The first syntype of *A. bissexguttatus*, illustrated in GORHAM (1891), was re-examined and confirmed to be a synonym of *A. bourgeoisi*.

Astylus cribrosus Pic, 1919, is represented in the Pic collection at MNHN by a male syntype, labelled “Equateur, Cañar (unknown writing) / ♂ /” “Astylus riveti Bourg. (handwritten by Champion) /” “type (ms by Pic)”. Examination confirms it as a male specimen of *A. bourgeoisi* similar to the specimens from Pichincha province.

Astylus riveti Bourgeois, 1911 has been described from a unique specimen from Tioloma, 4163 m [Pic de Tioloma, 2°18'S-78°38'W] in the Eastern cordillera near Alausi. The holotype (by monotypy) has been found in the MNHN material. This specimen is a female and no conclusion could be drawn as to its status apart from confirmation as a pale-coloured form of *A. bourgeoisi*. However, other similar specimens with the same colour pattern have been observed, namely: Azuay, Gualaceo-Mendez km 13, 3030 m, 28.VII.1985, 1 ♀, P. Moret (CCo); 3 km W Parque Nacional Cajas, 2°48'S-79°19'W, 3370 m, 27.XI.2007, 1 ♂ 2 ♀, R. Constantin. The male specimen has genitalia identical to *A. bourgeoisi* and *A. riveti* is here considered as a synonym of *A. bourgeoisi*.

Astylus bourgeoisi is cited by GORHAM (1891) from Quito, Pichincha, Cotocachi, Antisanilla-Piñantura and Machachi; by BOURGEOIS (1911) from Tulcan, La Rinconda, El Angel, Casitagua.

Other material examined. ECUADOR: CARCHI: El Angel, 3055 m, 7.XII.2007; – IMBABURA: Chachimbiro, 2700 m, 19.I.1985, P. Moret; – Pimampiro, VIII.1986, G. Onore (QCAZ); – La Esperanza, 3200 m, 24.VI.2001, F. Falcone (QCAZ); – Atuntaqui, 2387 m (QCAZ); – PICHINCHA: Perucho, 4.III.1931, R. Benoist (MNHN); – El Corazon, 3480 m, 24.I.1986, P. Moret; – Quito, Mariscal, 2800 m, 16.II.1986; – Rucu Pichincha vers. E, 4100 m, 25.VII.1985; – Guagua Pichincha vers. SSE, 4000 m, 17.III.1985; – Atazaco flanc E, 3500 m, 22.II.1986, these fours localities by P. Moret; – San José de las Minas, Nariz del Diablo, 3160 m, 20.V.2011; – Olmedo 7 km E, 3277 m, 19.V.2011; – *idem*, Olmedo 2 km S, 3100 m; – NAPO: Reventador; Papallacta; San Rafael; Puerto Napo (all QCAZ); – COTOPAXI: Cotopaxi nord, Limpiopongo, 3750 m, 7.X.1986, P. Moret; – Cotopaxi nord, Arenal volitans, 3850 m, 15.IV.1986, P. Moret. – TUNGURAHUA: Baños, Ulba, 30.IX.1968 (SMNS); – Baños, R. P. Blanc, 1895 (MNHN); – *idem*, IX.1984, R. Colime (QCAZ); – MANABI: Chone, 15.IV.2006, 1 ♀, R. Aguinaga (QCAZ); – GUAYAS: Isla Puna, La Concordia, 2°46'S-79°54'W, 5.IV.2003, N. Saeno (QCAZ); – CHIMBORAZO: Riobamba (QCAZ); – Taxan, 2920 m, 24.IV.2009; – CAÑAR: Zhud 1 km N, 2961 m, 6.V.2010; – *idem*, 16.V.2010; – *idem*, 03.V.2011; – AZUAY: Cuenca, G. Onore (QCAZ); – 3 km W of the border of Parque national Cajas, 3370 m, 27.XI.2007; – 3 km E of the border of Parque national Cajas, 3570 m, 27.XI.2007; – La Reina de la Paz, Oña 37 km N, 3246 m, 27.IV.2009; – Passo de La Tinajilla, 50 km S Cuenca, 3187 m, 27.IV.2009; – LOJA: Loja, Rio Zamora, 2064 m, I. Ojeda (QCAZ); Saraguro 3 km S, 3°39'S-79°15'W, 2835 m, 7.V.2009. Unless otherwise specified, collections were made by the author and are preserved in CCo.

Taxonomic remarks. *Astylus bourgeoisi* displays a great variability of the elytral patches. Typical specimens have one or two basal orange spots, one or two median patches and a complete irregular annulus near the apex of the elytra, enclosing an irregularly round black spot. In some specimens the orange markings are reduced to two or three spots and the distinctive annuliform arrangement of the apical spots helps identify the species. The specimens in which the elytral orange patches are more extended than the bluish-black integument correspond to the colour variety *riveti*. The elytral pubescence is also variable, with a development of thin, recumbent, whitish setae in addition to the long, erect, black bristles. These specimens are more frequent in the Carchi and Imbabura provinces, but do not form exclusive groups within any given population.

Natural history. In the first Ecuadorian observations made by E. Whymper in GORHAM (1891), *Astylus bourgeoisi* was given as “found almost everywhere, between 8000 and 11,000 feet” [ca. 2400 – 3400 m] In the inter-Andean valley from the Colombian

border to Peru, it can be found on many flowering plants, with a preference for Asteraceae, including thorny plants such as *Cirsium*. The collections in the QCAZ museum at Quito contain over 650 specimens, most of them from Pichincha province.

Distribution. From Colombia, it is known from the type locality of Tuquerres. In Ecuador, it is found from 2700 m to over 4000 m. Two observations, documented by well-labelled specimens in QCAZ, were made near to, or on, the coast at Chone and Isla Puna. It would be interesting to find from these stations whether these observations are occasional or established. No confirmed data south of Loja.

Astylus coeruleotinctus Champion, 1918

Figs 23, 24

Astylus coeruleotinctus Champion, 1918: 345–346.

Remarks. A species of the *A. bonplandi* group. It resembles *Astylus nigrolimbatus* and differs in more slender antennae, narrower pronotum and elytra, elytral patches and median lobe not dilated before apex, end of the tip parallel at some length.

Distribution. “Colombia”, “Bogota”, “Venezuela”, “Peru”. The actual distribution remains imprecise as only one specimen of the type series has a defined locality.

This species is included in the key because its discovery in Ecuador is highly probable.

Astylus longulus sp.nov.

Figs 2, 27, 28, 30

Type material. Holotype ♂: LOJA, 25 km W Catamayo, camino de Santiago, 3°59'S-79°30'W, 2264 m, 8.V.2011. Paratypes: *idem*, 10 ♂ 9 ♀; – 30 km W Catamayo, road to Tambara, 3°58'S-79°32'W, 1976 m, 3.V.2009, 2 ♂ 3 ♀; – 25 km W Catamayo, road to Zaruma, Zambi, 3°57'S-79°30'W, 2085 m, 12.V.2010, 1 ♂. Holotype and paratypes deposited in QCAZ (Zoological museum of the PUCE), other paratypes preserved in BMNH, MNHN, MNHUB, NHMB and CCo.

Description. Holotype ♂. Length 8.7 mm. Body, legs and abdomen black with greenish-blue to dark blue metallic reflection. Antennae black, the first four joints in major part and the insertion of the following six orange-yellow. Elytra metallic blue with six bright yellow orange spots arranged in a single patch at centre, a minute spot under the humeral calus, a narrow antemedian spot near the epipleura, two post-median spots disposed transversely near the suture and on the lateral margin, one larger preapical V-shaped patch.

Head weakly rostrate, the eyes laterally twice the length of the genae. Frons and vertex depressed, smooth, markedly punctate, the points larger than the intervals between them. Antennae slender, antennomeres I–IV narrow, VII 1.9× longer than wide, VIII–X subparallel, their outer margin slightly concave.

Pronotum 1.22× wider than long, slightly convex, smooth, finely and densely punctate, the points narrower than the intervals between them; sides rounded, narrowing equally anteriorly and posteriorly. Pronotal pubescence quite thin and sparse.

Elytra elongate, parallel, 2× longer than width together, slightly convex, lengthily narrowed apically, humeral calus marked, suture slightly elevated, apex non-crenulate. Elytral punctuation shallow. Elytral pubescence of long, thick, erect black bristles and also, shorter, thinner, upright brown setae. Metatarsi as long as metatibiae.

Abdomen: sternite III (first visible) with a minute hook-like process. Apical margin of sternite VIII with round emargination. Sternite VIII elongate, subtrapezoidal, incised by a longitudinal furrow, the apical margin finely incised. Tergite VIII elongate, apical margin rounded.

Aedeagus: median lobe dilated before the apical part, tip lengthily narrowing. Tegmen split in the apical quarter, parameres long, quite wide and apically rounded.

Dimensions: AL = 4.3 mm; HW = 1.67 mm; IOW = 1.01 mm; PL = 1.94 mm; PW = 2.37 mm; EL = 5.9 mm; EW = 3 mm. Others ♂ paratypes: TL = 8.2 – 9.6 mm; mean 8.8 mm.

♀. Differs in shorter antennae, protarsomere V much thinner, elytra widened in the apical third, sternite VII apically weakly concave, sternite VIII with a shallow furrow.

Dimensions of a medium-sized female paratype: TL = 9.3 mm; AL = 2 mm; HW = 1.1 mm; IOW = 0.66 mm; PL = 1.5 mm; PW = 2.03 mm; EL = 4.9 mm; EW = 2.56 mm. Others ♀ paratypes: TL = 9.5–10.2 mm; mean 9.9 mm.

Etymology. The specific name refers to the elongate body shape.

Differential diagnosis. *Astylus longulus* is very near *A. luteoguttatus* from which it differs in its greater size, more elongate antennae and elytra, an additional spot on the underside of the humeral calus and other form of male genitalia.

Natural history. A few *Astylus longulus* were first found together with *A. sexpustulatus*, *A. lojaensis* and *A. luteoguttatus* at Tambara. Later, the species was found in numbers nearby, at a higher elevation on a mountain slope covered by dense, mixed vegetation of flowering bushes, mainly Asteraceae.

Astylus lojaensis sp.nov.

Figs 4, 13, 14, 29

Type material. Holotype ♂. ECUADOR, LOJA: San Pedro de la Bandita 5 km N, 3°53'S-79°25'W, 1808 m, 10.V.2010. Paratypes. *idem*, 4 ♂ 4 ♀; – *idem*, El Cisne 3 km S, 3°52'S-79°25'W, 2312 m, 10.V.2010, 15 ex.; – 30 km W Catamayo, road to Tambara, 3°58'S-79°32'W, 1976 m, 3.V.2009, 5 ♂ 2 ♀; – *idem*, 5.V.2009, 1 ♂; – *idem*, 11.V.2010, 5 ex; – *idem*, 8.V.2011, 4 ex.; – Carretera Loja-Zaruma km 57, 1900 m, 12.IV.1985, 1 ♂, P. Moret; – Catacocha 25 km NE, carretera de Zaruma km 4, 2341 m, 8.V.2011, 2 ex.; – Utuana 5km E, 4°22'S-79°41', 2622 m, 14.V.2010, 1 ♂. Unless otherwise specified, collection was made by the author. Holotype deposited in QCAZ, paratypes preserved in QCAZ, BMNH, MNHN, MNHUB, NHMB, and CCo.

Description. Holotype ♂. Length 7.6 mm. ♂: Body black with charcoal tint. Antennae fulvous, base of first and apices of terminal five antennomeres brown. First four tarsomeres and base of fifth fulvous. ♀: Black, elytra with variable orange or orange-red discal strip.

Head weakly rostrate, the genae laterally as long as half eye diameter. Eyes slightly convex. Frons and vertex finely punctate, interantennal space nearly impunctate, lustrous. Temples long, subparallel. Antennae moderately elongate, antennomeres V–IX obconical, VII 1.35× longer than wide.

Pronotum 1.27× wider than long, smooth, distinctly convex transversally and anteriorly, the punctuation very thin, points 3× smaller than the intervals between them. Sides thinly bordered, shortly reflexed, rounded, equally narrowed anteriorly and posteriorly. Base bisinuate. Pronotal pubescence of thin, black, erect setae.

Elytra elongate, 1.9× longer than width together, parallel in the basal two-thirds, then triangularly narrowed, coarsely punctate, the points deep-set, a little smaller than

the intervals between them, apex not crenulate. Elytral pubescence of quite long, black, erect setae.

Abdomen: sternite III (first visible) with a small hook-like process at the anterior margin. Sternite VII not emarginate. Sternite VIII long, subtrapezoidal, apical margin with a small triangular incision. Tergite VIII as long as wide, its apical margin truncate.

Aedeagus: the median lobe has a long, narrow apical part directed slightly upwards. Tegmen split in the apical third, parameres long, thin, apically narrowed.

Dimensions: AL = 2.75 mm; HW = 1.53 mm; IOW = 0.97 mm; PL = 1.87 mm; PW = 2.37 mm; EL = 4.9 mm; EW = 2.59 mm. Others ♂ paratypes: TL = 6.5 – 8 mm; mean 7.3 mm.

♀. Differs in shorter antennae, less convex pronotum and the red patterns on the elytra.

Dimensions of a medium-sized female paratype: TL = 7.2 mm; AL = 1.6 mm; HW = 1.31 mm; IOW = 0.87 mm; PL = 1.56 mm; PW = 2.16 mm; EL = 4.6 mm; EW = 2.6 mm. Others ♀ paratypes: TL = 6.4–8.2 mm; mean 7.2 mm.

Variability. *Astylus lojaensis* displays a unique sexual variation in the elytral colouring. The males usually have uniformly black elytra, but 10% of them have a very small orange spot on the elytral base, or two basal and preapical spots. The females usually (70% of them) have striking bicolorous elytra, black with a wide, orange discal strip from base to apex, not reaching the base of the suture, nor the lateral margins, enclosing a round, black preapical point. A few females have the black elytral strip reduced to a narrow juxta-sutural line. About 30% of females have black elytra, completely or with two basal and preapical orange spots.

Etymology. The specific name refers to the province of origin.

Differential diagnosis. *Astylus lojaensis* is very near *A. rufitarsis* Pic, 1903, described from “Pérou, prov. Otuzco, Choquisongo, III.1903, G. A. Baer”, and represented in the Pic collection by a series of syntypes. *Astylus rufitarsis* is different in its smaller size of 6.5 mm, the more slender ♂ antennae (2.6 mm), the less convex pronotum, the shorter and apically crenulate elytra, and the apex of the median lobe shorter and wider.

Natural history. *Astylus lojaensis* was first found as a few specimens together with *A. sexpustulatus*, *A. longulus* and *A. luteoguttatus*. at Tambara. It was found locally abundant on yellow Asteraceae flowers along the road from San Pedro de la Bandita to El Cisne.

Astylus luteicauda Champion, 1918

Figs 21, 22, 29

Astylus luteicauda Champion, 1918: 350–351.

Type material. *A. luteicauda* has been described from 2 ♂ and 3 ♀ from Loja and Zaragura (leg. Rosenberg in coll. Fry, NHM-London). Four syntypes are preserved in BMNH: 1 ♂ 2 ♀ labelled “Equador/Zaragura//Fry coll.//*Astylus luteicauda* [man.Champion] and 1 ♂ same labelling, from Loja. Another ♀ syntype from “Zaragura” is preserved in the Pic collection at MNHN. These five syntypes have been examined and found to conform to their description.

Other material examined. AZUAY: Oña 10 km N, 3029 m, 14.V.2011; – Oña 10 km S, 2866 m, 14.V.2011; – LOJA: Saraguro 30 km N, 2863 m, 4.V.2011. Three observations by R. Constantin (QCAZ, CCo).

Taxonomic remarks. *Astylus luteicauda* belongs to the *Astylus bourgeoisi* group, together with *A. luteoguttatus*, *A. sexpustulatus*, and *A. sexpustulatus* which share stout, short antennae, elytral pubescence of short, dense setae mixed with longer black bristles, and deep elytral punctures. *A. luteicauda* differs in small body size, its unique colour pattern and the characteristic male genital armature. No great variability was observed; in particular, the extension of the orange patch on the apical fifth of the elytra is a consistent character.

Natural history. *Astylus luteicauda* was observed on only a narrow area of paramos alongside the road from Cuenca to Saraguro. Sometime abundant, the adults of both sexes were visiting flowers in bushy paramos with a low covering of vegetation, mainly the low yellow flowers of Asteraceae, some nearly at ground level, others on high bushes of Ericaceae. Unlike most other *Astylus*, *A. luteicauda* appears to have a limited distributional area.

Astylus luteoguttatus Champion, 1918

Figs 17, 18, 30

Astylus luteoguttatus Champion, 1918: 349–350.

Type material. *Astylus luteoguttatus* Champion was described on the basis of a series of fifteen syntypes from Ecuador: Loja, Macas, and Peru, this latter country without defined locality. These syntypes are preserved in BMNH; they have been examined and conform to their descriptions. The male specimen from Macas is labelled by Champion as a non-formalised holotype. The series appears homogeneous, and a dissected male from Peru is identical with the specimens from Loja

Other material examined. ECUADOR: TUNGURUHUA: “Santa Inez (Ecuad.) R. Haensch”, near Baños, col. Pic (MNHN); – CHIMBORAZO: 10 km NE Pallatanga, 1°57'S-78°55'W, 2471 m, 10.V.2009; – Alausí, 2800 m, 25.II.1996, leg. Hornburg & Krause; – Taxan, paramos, 2°09'S-78°48'W, 2920 m, 24.IV.2009; – Chunchi 5 km N, 2303 m, 15.V.2011; – CAÑAR: Zhud 1 km N, 2958 m, 6 et 16.V.2010; – AZUAY: PN Cajas 15 km W, 12 km NW Molleturo, 2°42'S-79°27'W, 2076 m, 9.V.2009; – 37 km N Oña, La Tinajilla n. La Reina de la Paz, 3°10'S-79°0'W, 3242 m; – LOJA: Loja, VI.1986, G. Onore (QCAZ); Nambacola, 1800 m, 20.II.1995, G. Onore (QCAZ); – 30 km W Catamayo, road to Tambara, 3°58'S-79°32'W, 1976 m, 3.V.2009, 2 ♂ 4 ♀; – Catacocha 20 km NE, camino de Tambara, 1985 m, 8.V.2011; – Catacocha 25 km NE, camino de Santiago, 2264 m, 8.V.2011; – El Cisne 1 km S, 3°51'S-79°26'W, 2437 m, 10.V.2010, *idem*, 6.V.2011; – 40 km S Zaruma, windy crest near Zambi, 3°57'S-79°3'W, 2085 m, 12.V.2010; – Utuana 3km NW, 4°21'S-79°43'W, 2266 m, 14.V.2010; – PERU: CAJAMARCA, Baños del Inca, 25.III.1987, 3 ♂ 2 ♀, F. Astholm (QCAZ, CCo)

Taxonomic remarks. *Astylus luteoguttatus* is found in the same environment as *Astylus bourgeoisi* and the two can easily be confused. In the most characteristic specimens, *A. luteoguttatus* differs from *A. bourgeoisi* in more slender body, more elongate head, more triangularly acuminate elytra, shallower punctuation of the elytra, less convex elytra, and deep blue elytral colouring, while *A. bourgeoisi* is more bronze-green, with a thinner apex of the median lobe. They were never found together and *A. luteoguttatus* is distributed from Tunguruhua province to the Peruvian border. In Peru, Banos del Inca, south of Cajamarca, is a documented locality, with identification including examination of the male genitalia.

Natural history. *Astylus luteoguttatus* lives in the paramos, and is found between 2000 m. and 3200 m. Often common alongside roads, mainly on Asteraceae, it was never found at ground level. Sometimes found in great quantities; at Molleturo, *A. luteoguttatus* was seen in thousands on nearly every piece of high flowering vegetation growing on disturbed ground near cultivation.

Astylus moreti sp.nov.

Figs 3, 11, 12, 29

Type material. Holotype ♂ “Azuay: Nudo Las Cajas, accès est, 3678, m, 8.IV.1985, P. Moret. One paratype ♂: “Azuay, Cajas, XI.1988, G. Onore, QCAZ I: 77663”. Holotype deposited in MNHN. Paratype preserved in QCAZ at Quito.

Description. Holotype ♂. Length 9 mm. Body, legs and abdomen black with light bluish tint. Antennae brown, base and the posterior face of antennomeres II–IV orange-yellow. Head, pronotum and elytra bluish-black with bright metallic blue reflection. Five small, orange spots on each elytron: an elongate spot at the centre of the base, a narrow marginal strip under the humeral calus, two antemedian discal and marginal spots, a postmedian marginal spot and a preapical discal spot.

Head short, transverse, the genae laterally half eye-width. Frons lustrous, slightly convex, finely and densely punctate, the points equal to the intervals between them. Antennae not very long, antennomeres IV–VI triangular, VII 1.22× longer than wide, the following subparallel. Maxillary and labial palpi reduced, the last maxillary palpomere 1.4× longer than wide.

Pronotum transverse, 1.5× wider than long, feebly convex, lustrous, thinly punctate, the points 2–3× smaller than the intervals between them. Sides equally rounded, shortly reflexed.

Elytra moderately elongate, convex, dilated in the middle, 2× longer than width together, lustrous, deeply punctate, the points larger than the convex intervals between them. Humeral calus well marked, short. Elytral apex prolonged with a short point, not crenulate. Pronotal and elytral pubescence of long, black, erect setae. Tarsi relatively short. Apterous.

Abdomen: sternite III (first visible) with a very small hook-like process at the anterior margin. Sternite VII with large median apical emargination. Sternite VIII triangular, apical margin shortly and triangularly incised. Tergite VIII elongate, apical margin rounded.

Aedeagus: Tegmen split in the apical quarter, parameres thin, outlying, enlarged at their tips. Median lobe sharply narrowed apically, summit roundly widened.

Dimensions. Holotype ♂: AL = 3.13 mm; HW = 1.76 mm; IOW = 1.27 mm; PL = 1.96 mm; PW = 2.93 mm; EL = 6.36 mm; EW = 3.3 mm. Paratype ♂: TL = 9.4 mm; AL = 3.1 mm; HW = 1.81 mm; IOW = 1.31 mm; PL = 2.03 mm; PW = 3 mm; EL = 6.3 mm; EW = 3.2 mm.

Etymology. Respectfully dedicated to its discoverer, the French entomologist Pierre Moret, a renowned taxonomist and ecologist of the Carabidae of the Ecuadorian paramos.

Differential diagnosis. *Astylus moreti* is unique among Ecuadorian species in its apterism. Its general characters are shared with *A. bourgeoisi*, a winged species, less convex, more densely pubescent and with different male genitalia. CHAMPION (1918) described another apterous species from Chanchamayo, Peru, *Astylus convexus*, very different in shorter body, normal-sized palpi, reduced humeral cali, and black elytra striped with yellow.

Natural history. The two specimens were found 25 km NW of Cuenca, *ca.* 2°47'S-79°12'W, under stones in the upper paramos. Quite rare, not found in the course of two visits to the type-locality in which *Astylus bourgeoisi* had been observed.

A note on apterism among the soft-bodied beetles. Apterism is a evolutionary character that is frequent in many groups of Cantharidae, Malachiidae, Dasytidae and Melyridae. Its emergence is commonly bound to ecological conditions at high elevations, but is sometimes related to the windy or dry conditions pertaining in coastal habitats as well. In the case of *Astylus moreti*, high elevation may be the main factor, although winged specimens of other species, *A. bonplandi* and *A. bourgeoisi* have been found up to 3800–4000 m. It is worthy of note that this apterous *Astylus* has reduced palpi, but no reduction of the humeral cali.

***Astylus nigrolimbatus* Champion, 1918**

Figs 9, 10, 30

Astylus nigrolimbatus Champion, 1918: 346–347.

Type material. Described on the basis of five specimens collected in Ecuador and Peru but lacking detailed localities. These syntypes (four preserved at BMNH and one presented by G.C. Champion to M. Pic in MNHN) have been verified and conform to their description.

Other material examined. ECUADOR. MORONA-SANTIAGO: Sigsig, 15 km S, 2790 m, 15.XI.2006; – AZUAY: Gualaceo-Mendez km 13, 3030 m, 28.VII.1985, *P. Moret*; – LOJA: “env. de Loja, Equateur”, coll. Pic (MNHN); – Loja 14 km E, paramos, 3°59'S-79°09'W, 2713 m, 18.XI.2006; – Loja 20 km S, paramos, 3°52'S-79°16'W, 2670 m, 7.V.2009; – Loja 20 km N, 13.05.2011; – Amaluza, carretera de las lagunillas, 2850 m, 10.05.2011; – *idem*, 3060 m, 12.05.2011. Unless otherwise specified, collection was made by the author.

Taxonomic remarks. *Astylus nigrolimbatus* is very close to *A. bonplandi*. The distinguishing characters of *A. nigrolimbatus* include smaller size, shape of the last tergite and sternite, and very different male genitalia. The colour pattern of the two species is nearly identical and they are easily confused in the field. The continued black elytral margin from shoulder to apex is a useful and consistent identification character.

The distribution appears quite restricted, from Azuay province to the Peruvian border. No precise locality is currently known from Peru.

Natural history. *A. nigrolimbatus* lives on the upper paramos, at elevations between 2700 m and 3000 m, and was often found together with *Astylus bonplandi*.

However, *A. nigrolimbatus* appears to be a pollen eater on flowering bushes, mainly Asteraceae, and also eats the external cuticle of plants, as can be seen on examination of the hind-gut. They are found by beating vegetation, not on the ground.

***Astylus pallipes* Kirsch, 1889**

Figs 15, 16, 29

Astylus pallipes Kirsch, 1889: 11, plate 1 Fig. 22.

= *Astylus mutatus* Pic, 1919, MEE 31: 20., **syn.nov.**

= *A. mutatus* var. *subseparatus* Pic, 1920: 2, **syn.nov.**

Type material. Described by KIRSCH (1889) on the basis of specimens collected by A. Stübel at Loma de Canamballo in Imbabura province in Ecuador. The type-locality [Cananvalle, 0°0'N-78°11'W] is 5 km SW of

Cayambe. No type specimen was found in MNHUB, nor in MTD, but the species is well defined and the figure by Kirsch is accurate. BOURGEOIS (1911) examined specimens collected by P. Rivet at Pinnllar, 2875 m (20 km N of Ibarra) and Casitagua, 3500 m. (0°1'S-78°27'W, 10 km N of Quito).

Astylus mutatus Pic, 1919 was defined on the basis of difference with a Peruvian specimen wrongly identified as *Astylus pallipes* by Bourgeois. The Pic collection contains one syntype labelled “Muséum Paris / Equateur / Pinnlar / 2900 m d'alt; / P. Rivet 1903 (printed) // type // mutatus Pic (both handwritten by Pic)”. It is strictly identical to, and a synonym of, *A. pallipes* Kirsch.

Astylus mutatus var. *subseparatus* Pic, 1920, has two syntypes in the Pic collection, with the same label from “Pinnlar”; it too is a synonym of *A. pallipes*.

Astylus pallipes var. *postconfluens* Pic 1940 is represented in the Pic collection by a syntype from “Madre de Dios” in southern Peru. It differs from typical *A. pallipes* in smaller size and dark coloration and may be reassigned to another species.

Other material examined. CARCHI: Pimampiro, *G. Onore* (QCAZ); – Mira 5 km S, 0°32'N-78°02'W, 2127 m, 7.XII.2007, *R. Constantin* (CCo); – “Muséum Paris, Equateur, Pinnlar, P. Rivet 1903 (imp. vert)”, coll. Pic (MNHN); – IMBABURA: Atrio monumento al Angel Gabriel, 2421 m, 22.IV.2001, *G. Tapia & G. Onore* (QCAZ); – Balneario de Chabimbiro, 0°27'17"-78.13'42", 2600m, 28.V.2005, *F. Maza* (QCAZ); – Chota, 4.IV.1985, *L. Coloma* (QCAZ); – Ibarra-Tulcan km 5, 2250 m, 1.V.1986, *P. Moret* (CCo); – GUAYAS: La Rinconada, 11 m, 1°24'31"-80°47'32", 2.XI.2006, *J. Mezia* (QCAZ); – NAPO: Puerto Napo; Archidona (QCAZ); MORONA-SANTIAGO: Macas, V.1985, *G. Onore* (QCAZ); – PICHINCHA: Calderon, Checa, Cumbaya, Endesa, Guapulo, Guayllabamba, Nayon, Pintag, Pomasqui, Puembo, Quito, Sangolqui, San José de Minas, Tandapi, Tumbaco, Yaruqui (all collected by the P.U.C.E. students and preserved at QCAZ; – Quito, Guapulo, 2650m, 18.V.1986, *P. Moret* (CCo).

Natural history. *Astylus pallipes* is distributed over a large area to the north of Quito. It lives in less elevated localities than the other species, on the flowers of low vegetation in badlands and on disturbed ground. However, in 1987 Pierre Moret (pers. comm.) observed that the localities of *A. pallipes* near to Quito, like Guapulo, are under 2800 m and more arid, while *A. bourgeoisi* was found in more humid places, at higher elevations over 2800 m. Its tolerance to low altitude is corroborated by single findings on the coast and in the Oriente.

Astylus rubripennis (Latreille, 1811)

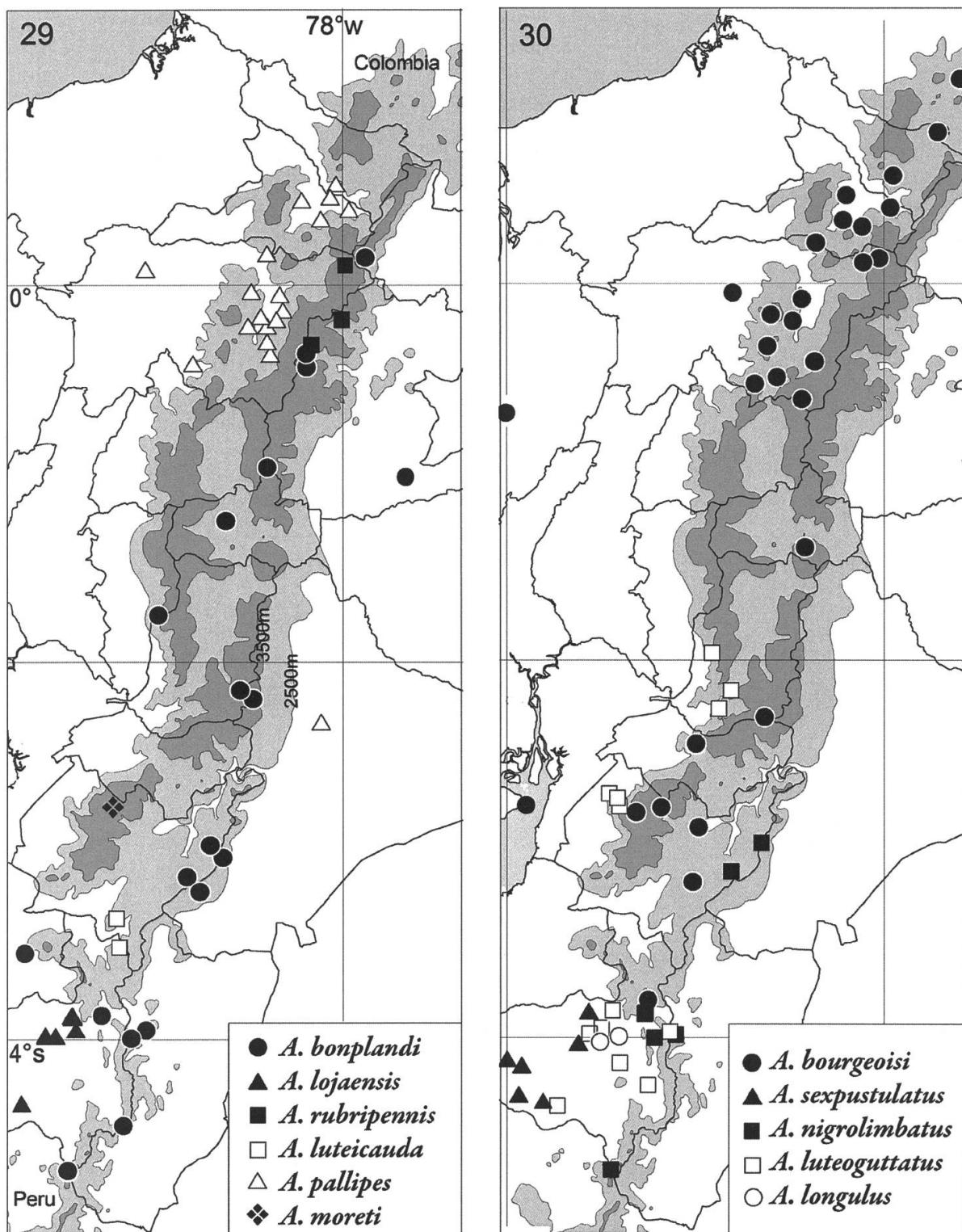
Figs 1, 5, 6, 29

Dasytes rubripennis Latreille, 1811: 178-179 + plate 17, figs 3 & 4.

Type material. *Dasytes rubripennis* Latreille, 1811 was described from a series of specimens collected by Aimé Bonpland and Alexander von Humbolt at “Jaen de Bracamorras”, a locality in what was Cajamarca province, northern Peru, now Bracamorras, 5°42'S-78°47'W. The original publication by LATREILLE (1811) describes (1) a form with a predominance of red marks (figure 3) and (2) a dark form (figure 4). These were later found to be two separate species.

According to one of the classics on the history of entomological collections (HORN *et al.* 1990), Latreille's collection was acquired by Comte Dejean, the Malacodermata from which later passed into the possession of Marquis François de Brême and are now preserved in the Regional Museum of Natural Sciences in Torino. In the course of patient research conducted by Dr. Luca Picciau, Di Breme's collection of *Astylus* was photographed and the Latreille type material was found, together with additional specimens collected in Colombia. Unfortunately, Dejean named several Colombian specimens “*Astylus rubripennis*”. These are very different from the two specimens figured by Latreille and are certainly *Astylus coeruleotinctus*, described later by CHAMPION (1918). On the other hand, Dejean separated off the two specimens originally mentioned by Latreille. They are overlaying with a green label written by Dejean that reads: “*Dasytes bonplandi* mihi / rubripennis var. Latreille / h. in PerouD. Bonpland”.

The binomial *Dasytes bonplandi* Dejean, although published in DEJEAN (1833), was neither properly described nor used by any subsequent author. Later, ERICHSON (1847) described *Astylus bonplandi* as a new species, with a reference to figure 4 in LATREILLE (1811, plate 17). These two syntypes are of same species.



Figs 29–30. Distribution of the genus *Astylus* in Ecuador.

The specimen placed on the right is labelled "Nov Grena" (written on green, 3×7-mm paper) and matches Latreille's figure 3 perfectly. I designate this specimen as the lectotype of *Dasytes rubripennis* Latreille, 1811. The actual place of origin of the specimen may be "Nova Grenada", the former name of Colombia.

Other material examined. COLOMBIA: 2 ♂ labelled "Columb. /44 - 21//Astylus rubripennis Latr./v. near rubripennis Latr. fig. 3 [both handwritten by Champion]", BMNH; – "Colombie, Popayan, Abbé Gaujon, 1899", 7 ex, coll. R. Oberthür, MNHN; – "Colombie, coll Oberthür", 1 ♀, MNHN. – ECUADOR, PICHINCHA: Cayambe NE, laguna San Marcos, 3500-3600 m, 16.IX.1984, 3 ♂ 4 ♀, P. Moret (CCo); – San Marcos, , 3100 m, 17.II.1995, 3 ♂, J. Freile, QCAZ; – San Marcos, 17.V.1995, 2 ♂ 1 ♀, X. Cisneros, QCAZ; – Cayambe 20 km NE, laguna San Marcos, 3457 m, 0°06'N-77°58'W, 19.V.2011, 1 ♀, R. Constantin (CCo); – Quito, Parque Metropolitano, 2810m, 0°11'22"S-78°29'38"W, 29. IV.2006, 2 ♂, G. Ramon, QCAZ; – NAPO: via Baeza, IX.1983, 1 ♂, A. Salazar; QCAZ; – Oyacachi, 3000 m, 31.III.1988, 1 ♀, F. Campos, QCAZ.

Additional description. Lectotype ♂. Length 13 mm. Body, legs and abdomen black with faint bluish sheen. Antennae black, the posterior face of the first four joints partly fulvous. Elytra reddish-orange, with a large basal black patch covering the humeral calus, posteriorly angulate, enclosing an oblong basal reddish patch and a large, round, postmedian black patch; suture, apex and the apical half of the lateral margin black.

Head feebly rostrate, the eyes rather short, convex, laterally 1.5× longer than genae. Frons and vertex depressed, lustrous, finely punctate, the points as large as the intervals between them. Antennae slender, antennomeres II-IV triangular, narrow, VII 1.9× longer than wide, VIII-X subrectangular.

Pronotum 1.45× wider than long, weakly convex, smooth, finely and densely punctate, the points as large as the intervals between them. Sides rounded, more narrowed anteriorly than posteriorly; narrow dimple in front of the basal angles. Cephalic, pronotal and leg pubescence of very long, thin, dense, black setae.

Elytra elongate, parallel, 2× longer than width together, slightly convex, suture slightly elevated, apex non-crenulate. Elytral punctuation dense, shallow, the points wider than the intervals between them. Elytral pubescence distinctive in the contrast between a large reddish surface which is smooth and nearly hairless, while the external half of the black patches is covered with a thick, mat-like pubescence of short, dense, erect black bristles.

Abdomen: sternite III (first visible) with a small hook-like process. Apical margin of sternite VIII with large rounded emargination. Sternite VIII elongate, subtrapezoidal, the apical margin deeply incised. Tergite VIII elongate, the apical margin truncate.

Aedeagus: median lobe gradually narrowing and slightly curved at the tip. Tegmen split in the apical quarter; parameres stout, obliquely truncate at apex.

Dimensions: AL = 5.2 mm; HW = 2.5 mm; IOW = 1.65 mm; PL = 2.65 mm; PW = 3.8 mm; EL = 9.5 mm; EW = 4.9 mm. Others ♂ specimens: TL = 11.5 - 12.6 mm.

♀. Differs in shorter antennae, protarsomere V much thinner, sternite VII apically feebly concave.

Dimensions of a medium-sized female specimen: TL = 13 mm; AL = 4.1 mm; HW = 2.3 mm; IOW = 1.7 mm; PL = 2.6 mm; PW = 3.8 mm; EL = 9.7 mm; EW = 5.4 mm. Others ♀ specimens: TL = 12.1-13.6 mm.

Differential diagnosis. It belongs to the *A. bonplandi* group, which also includes *A. coeruleotinctus* and *A. nigrolimbatus* for the depressed body and the long, thin, dense elytral pubescence, but differs in the slender antennae, the pattern of the elytral patches and the genital armature.

Natural history. *Astylus rubripennis*, in Ecuador, is established on the upper paramos. At Laguna San Marcos (Pichincha), it lives at an elevation of 3500 m, together with *Astylus bonplandi*. Both were found active on the ground near the western bank of the lake but, during a visit on 19.V.2011, only one female was observed as against hundreds of *A. bonplandi*.

***Astylus sexpustulatus* Champion, 1918**

Figs 25, 26, 30

Astylus sexpustulatus Champion, 1918: 348–349.

Type material. *Astylus sexpustulatus* was described on the basis of a pair of specimens collected by W. Rosenberg. The BMNH preserves the two syntypes labelled “Equator//Fry Coll. 1905.100//Type H.T.//♂//*Astylus sexpustulatus* Champion” and “Equator//57635//Fry Coll. 1905.100//♀// *Astylus sexpustulatus* Champion”. The male syntype is confirmed as the holotype. Due to the short original description, lacking examination of the male genitalia, an additional description is provided.

Other material examined. ECUADOR, LOJA, “Equateur, Loja, Abbé Gaujon”, coll. Pic, MNHN; – 30 km W Catamayo, road to Tambara, 3°58'S-79°32'W, 1976 m, 3–5.V.2009; – *idem*, 11.V.2010; – *idem*, 08.V.2011; – Catacocha 2 km N, 4°01'S-79°37'W, 1782 m, 11.V.2010; Road Loja-Zaruma, km 85, 1200 m, 12.IV.1985, *P. Moret*; – Road Catamayo to Zaruma, El Rosario, near La Orchidia, 3°51'S-79°33'W, 977 m, 11.V.2011; – Celica 10 km E, 4°08'S-79°55'W, 1500 m, 7.V.2011; – Macara 12 km N, 4°18'S-79°56'W, 1188 m, 9.V.2011; – Sozoranga 3 km E, 4°20'S-79°46'W, 1147–2055 m, 14.V.2010. Unless otherwise specified, collection was made by the author. Specimens preserved in NHMB, QCAZ, MNHN and CCo.

Additional description. ♂. Length 6.1 mm. Body, legs and abdomen black with pale bluish sheen. Antennae black, the base of the four first joints narrowly orange-yellow. Head and pronotum greenish-black with bronze-green reflection. Elytra black with blue sheen, with six yellow-orange spots: a large basal patch, a small spot under the humeral calus, two antemedian patches transversely placed near the suture and near the lateral margin, and two postmedian patches arranged as a large, incomplete annulus enclosing a large black spot.

Head feebly rostrate, genae laterally shorter than width of the eyes. Eyes elongate. Frons and vertex lustrous, finely punctate. Antennae moderately elongate, antennomere VII 1.46× longer than wide.

Pronotum 1.33× wider than long, smooth, very convex, punctation very thin, with points 2–3× smaller than the intervals between them. Sides thinly bordered, weakly reflexed, rounded, more narrowed anteriorly than posteriorly.

Elytra elongate, parallel, 1.9× longer than width together, coarsely punctate, points almost umbilicate, as wide as the intervals between them, apex finely crenulate. Elytral pubescence of long, thick and upright black bristles. Legs elongate, the metatibiae equal to the metatarsi.

Abdomen: sternite III (first visible) with a small hook-like process at the anterior margin. Sternite VII with large median apical emargination. Sternite VIII subtrapezoidal, the apical margin triangularly incised. Tergite VIII elongate, apical margin truncate.

Aedeagus: the median lobe has a long, thin apex. Tegmen cleft in the apical third, parameres long, thin and apically rounded.

Dimensions: AL = 1.97 mm; HW = 1.14 mm; IOW = 0.66 mm; PL = 1.34 mm; PW = 1.78 mm; EL = 4 mm; EW = 2.06 mm. Other ♂ series from Tambara: TL = 6.3–7.1 mm; mean 6.8 mm.

♀. Differs in shorter antennae, antennomere VII as long as wide, sternite VII not emarginate.

Dimensions of a medium-sized female: TL = 7.6 mm; AL = 2 mm; HW = 1.1 mm; IOW = 0.66 mm; PL = 1.5 mm; PW = 2.03 mm; EL = 4.9 mm; EW = 2.56 mm. Other ♀ series: TL = 6.7–8.8 mm; mean 7.5 mm.

Differential diagnosis. *Astylus sexpustulatus* belongs to the *A. bourgeoisi* group from which species it differs in smaller size, convex pronotum, the characteristic pattern of the elytral patches, and the median lobe with thin and elongate apex.

Natural history and vertical distribution. This species appeared quite common in the verges of the road to Tambara village, foraging on flowering Asteraceae shrubs during the warm part of the day.

It is worth noting that *Astylus sexpustulatus* is more tolerant of low altitude in the south-west of Loja province. Between the towns of Macara, Zaruma and Catamayo, *A. sexpustulatus* was found from an elevation of 900 m to 1800 m, and between these levels is the only *Astylus* species. From 1800 m to 2000 m, it is found together with *A. sexpustulatus* and *A. lojaensis*. In the 2000–2300-m range, *A. lojaensis* is found together with a few rare *A. longulus*. Over 2200 m, *Astylus luteoguttatus* is often present.

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Resumen

Se dan a conocer tres especies nuevas del género neotropical *Astylus* Laporte de Castelnau, 1836, procedentes del Ecuador: *Astylus lojaensis*, sp. nov. (prov. Loja), *Astylus longulus*, sp. nov. (prov. Loja) y *Astylus moreti*, sp. nov. (prov. Azuay). *Astylus curtus* Pic, 1919, *A. peruvianus* Pic, 1919 y *A. punctatus* Pic, 1919 son sinónimos de *A. bonplandi* Erichson, 1847, syn.nov. – *Astylus bourgeoisi* var. *quinquenotatus* Pic, 1920, *Astylus bourgeoisi* var. *trimaculatus* Pic, 1920, *Astylus cibrosus* Pic, 1919 y *Astylus riveti* Bourgeois, 1911 son sinónimos de *A. bourgeoisi* Kirsch, 1889, syn.nov. – *Astylus mutatus* Pic, 1919 y *A. mutatus* var. *subseparatus* Pic, 1920 son sinónimos de *A. pallipes* Kirsch, 1889, syn.nov. Se designan lectotipos para *Astylus rubripennis* (Latreille, 1811) y *A. bonplandi* Erichson, 1847. Se propone una clave dicotómica para identificar las once especies de *Astylus* presentes en el Ecuador, con las fotografías de los adultos de las nuevas especies, así como la ilustración de los caracteres de los genitalia masculinas. Se incluyen nuevos datos faunísticos y mapas de distribución en Ecuador.

Clave de las especies ecuatorianas del género *Astylus*

1. Élitros en su mayor parte de color rojo con manchas negras. 2.
 - Élitros en su mayor parte negros, o azul negruzco con manchas naranja-amarillas. 5.
2. Alargado. Élitros de color rojo con manchas basales y anteadiculares. Longitud 12–13 mm. *A. rubripennis* (Latreille)
 - Más corto. Élitros de color naranja-rojo con manchas negras basales, medianas y anteadiculares. 3.
3. Margen exterior de los élitros con un borde negro completo. Edeago: lóbulo medio con punta fina. Longitud 9–10 mm.
 - *A. nigrolimbatus* Champion
 - Margen exterior de los élitros con un borde negro interrumpido en la mitad anterior. 4.
4. Longitud 12–13 mm. Antenas cortas. Pronoto ancho y transverso. Edeago: lóbulo medio con la punta engrosada en el ápice.
 - *A. bonplandi* Erichson
 - Longitud 8–10 mm. Antenas delgadas. Pronoto menos transverso. Edeago: lóbulo medio con la punta final paralela (Colombia, Venezuela, Perú). [*A. coeruleotinctus* Champion]
5. Élitros de color amarillo con un estrecho borde negro marginal y sutural, y dos franjas longitudinales discales negras que no llegan al ápice. Longitud 7 mm. *A. pallipes* Kirsch
 - Élitros de otros colores. 6.
6. Élitros de color negro con grandes franjas de color naranja-amarillo, una gran mancha basal desde la sutura hasta el callo humeral, dos manchas discales, mediana y anteadical, formando un anillo incompleto. Pronoto más bien estrecho. Longitud 6 mm.
 - *A. sexpustulatus* Champion
 - Élitros con las manchas naranja-amarillo, reducidas o ausentes. 7.
7. Élitros alargados, 2,2 veces más largos que anchos a nivel de la base. Machos: antenas largas. Puntuación elital fina. Forma más bien

estrecha con ápices elítrales agudos. Élitros de color azul metálico con tres o cuatro pequeñas manchas rojas redondas y una pequeña mancha roja redonda bajo el callo humeral. Edeago: lóbulo medio con el ápice alargado. Longitud 7–8 mm. *A. longulus* nov.sp.

– Élitros más corto 1,9–2 veces más largos que anchos a nivel de la base. Antenas más cortas. Puntuación elítral fuerte. 8.

8. Ápteros. Reducción del callo humeral. Élitros fuertemente convexos. Longitud 8 mm. *A. moreti* nov.sp.

– Especies con alas. Élitros débilmente convexos con el callo humeral marcado. 9.

9. Tarsos amarillos. Cuerpo negro. 10.

– Tarsos negros. Cuerpo azul-negro. Pronoto ancho y débilmente convexo. 11.

10. Pronoto y élitros convexos. Diferencias de coloración en los sexos. Machos: élitros negros con o sin una pequeña mancha anteaapical, hembras con élitros enteramente negros o negros con una amplia franja roja sobre el disco. Ápice del lóbulo medio estrecho, alargado y encurvado dorsalmente. Longitud 6–7 mm. *A. lojaensis* nov.sp.

– Pronoto y élitros menos convexos. Élitros negros con una mancha apical naranja-amarilla. ♂ con antenas alargadas. Longitud 5–6 mm. *A. luteicauda* Champion

11. Élitros mas cortos y con pubescencia fuerte. Pronoto negro con reflejo verde broncíneo. Élitros broncíneo-negruzco con cinco manchas discales naranja-amarillas y un anillo anteaapical interrumpido. Puntuación elítral profundamente marcada, los puntos tan amplios como sus intervalos. Edeago: Lóbulo medio ligeramente ensanchado antes del ápice, la punta triangular y convexa dorsalmente. Longitud 7–8 mm. *A. bourgeoisi* Kirsch

– Élitros bastante estrechos, débilmente pubescentes y con ápices elítrales agudos. Élitros de color azul metálico con tres o cuatro manchas redondas de color naranja brillante. Élitros con puntuación fina, superficial. Edeago: lóbulo medio con el ápice mas fino, aplanado, no ensanchado. Longitud 7–8 mm. *A. luteoguttatus* Champion

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Author's adress:

Robert Constantin
 103 impasse de la Roquette
 F-50000 Saint-Lô
 FRANCE
 E-mail: robert.constantin@aliceadsl.fr

