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SOCIETÀ ENTOMOLOGICA ITALIANA via Brigata Liguria 9 Genova

Gianni ALLEGRO*

**Three new *Pseudaptinus* (subgenus *Thalpius*) from Ecuador,
with notes on *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke
(Coleoptera, Carabidae, Zuphiini)**

Abstract: *Pseudaptinus* (*Thalpius*) *bartolozzii* n. sp., *Pseudaptinus* (*Thalpius*) *moreti* n. sp., and *Pseudaptinus* (*Thalpius*) *gracilis* n. sp., three new flightless species from Ecuador, are described. *P. bartolozzii* n. sp. shows a peculiar ant-like habitus; *P. moreti* n. sp. and *P. gracilis* n. sp. form, together with *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke, a morphologically very homogeneous species group. Moreover, the holotype of *P. aptinoides* is illustrated, and a re-description of this species is given. Finally, a key to all species of *Pseudaptinus* subgenus *Thalpius* so far recorded from South America is provided.

Riassunto: Tre nuovi *Pseudaptinus* (sottogenere *Thalpius*) dell'Ecuador, con note su *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke (Coleoptera, Carabidae, Zuphiini).

Vengono descritti *Pseudaptinus* (*Thalpius*) *bartolozzii* n. sp., *Pseudaptinus* (*Thalpius*) *moreti* n. sp. e *Pseudaptinus* (*Thalpius*) *gracilis* n. sp., tre nuove specie brachittere dell'Ecuador. *P. bartolozzii* n. sp. presenta un peculiare habitus mirmiciforme; *P. moreti* n. sp. e *P. gracilis* n. sp. formano, insieme a *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke, un gruppo di specie morfologicamente molto omogeneo. Inoltre, viene illustrato l'olotipo di *P. aptinoides* e viene data una ridescrizione di questa specie. Infine, viene fornita una chiave per l'identificazione di tutte le specie del sottogenere *Thalpius* di *Pseudaptinus* conosciute fino a oggi in Sudamerica.

Key words: *Pseudaptinus* (*Thalpius*) *bartolozzii* n. sp., *Pseudaptinus* (*Thalpius*) *moreti* n. sp., *Pseudaptinus* (*Thalpius*) *gracilis* n. sp., *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke, South America, taxonomy, identification key.

To meet the requirements by the International Code of Zoological nomenclature (ICZN), this article was registered at ZooBank (12 December 2024) under the ZooBank Life Science Identifier (LSID): urn:lsid:zoobank.org:pub:F67D6215-2EA3-4945-A793-99DE2275AB45
Published: 29 August 2025.

INTRODUCTION

The tropical Andes can be considered one of the most biodiverse ecoregions on Earth, with a high level of insect diversity and endemism (Myers *et al.*, 2000). Nevertheless, the huge diversity of tropical insects is a challenge to entomological research, and very little is known about the invertebrate fauna of some ecosystems, such as the Andean humid forests, as well as the forests of the Amazon basin (AA.VV., 2021).

Thanks to Luca Bartolozzi, I was able to find in the collections of the Zoological Museum 'La Specola' at the University of Florence (MZUF) a single specimen of a flightless *Thalpius* from the Ecuadorian Amazon basin showing a peculiar ant-like habitus, which undoubtedly represents a new species for science. At the same time, Pierre Moret (University of Toulouse) gave me for study four brachypterous specimens of *Thalpius* from the Ecuadorian Andean forest, which

proved to belong to two different new species very similar to each other and forming, together with *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke, 1934, described from Venezuela, a morphologically very homogeneous species group. The comparison of the new species with the latter has been made possible thanks to high-definitions photographs of the holotype of *P. aptinoides* taken by David Schimrosczyk, curator of insect collection at the Museum and Institute of Zoology of the Polish Academy of Sciences (MIZ), where this type is deposited (Mroczkowski, 1960).

The genus *Pseudaptinus* Laporte, 1834 includes, at the present state of knowledge, 54 species (Lorenz, 2024) arranged by most authors into the subgenera *Pseudaptinus* s. str. (18 species), distributed in the Western Hemisphere, and *Thalpius* LeConte, 1851 (36 species), distributed in the Western Hemisphere as well as in Australia (Anichtchenko, 2014). Some au-

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thors have treated the two subgenera as genera (Reichardt, 1977; Martinez, 2005; Ball & Shpeley, 2013; Lemaire *et al.*, 2023), but the most important feature distinguishing them, that is the presence (*Thalpius*) or the absence (*Pseudaptinus* s. str.) of a spine at posterior angles of pronotum, is in my opinion too feeble to justify a separation at genus level; for this reason, in agreement with Liebke (1934, 1939), Blackwelder (1957), Messer (2011), Bousquet (2012), Anichtchenko (2014) and Lorenz (2005, 2024), *Thalpius* will be treated as a subgenus of *Pseudaptinus* in the present paper.

Only 11 species of *Thalpius* are currently recorded from South America, none of these from Ecuador, despite many specimens waiting for study in museum collections; moreover, the most recent descriptions of South American *Thalpius* date back to 1939 (Liebke, 1939), and the most comprehensive taxonomic revision of the genus *Pseudaptinus*, which is the richest in species among Zuphiini in South America, dates back to exactly 91 years ago (Liebke, 1934). The main reason for this lack of recent studies can probably be found in the difficulty of studying for comparison old type specimens, some of which are damaged or lost.

In this paper, three new species (*Pseudaptinus bartolozzii* n. sp., *Pseudaptinus moreti* n. sp., and *Pseudaptinus gracilis* n. sp.) are described and illustrated. Moreover, a photographic plate of the holotype of *P. aptinoides* is provided, as this species was never previously illustrated in the literature, and a re-description of the type based on high-resolution pictures is given. Finally, a revised key (based on the key published by Liebke, 1934) to all species of South American *Thalpius*, including the newly described ones, is provided. It is noteworthy that Liebke omitted to consider, in his key, *Pseudaptinus (Thalpius) granulosus* (Chaudoir, 1872), which is instead included in the key of this paper based on a detailed digital photograph of the holotype provided by Olivier Montreuil of the Muséum National d'Histoire Naturelle of Paris (MNHN).

MATERIALS AND METHODS

The specimens studied or mentioned in the text are deposited in the following museums and private collections:

CAI: Gianni Allegro Collection (Moncalvo, Asti, Italy).

CMO: Pierre Moret Collection (Toulouse University, France).

MIZ: Museum and Institute of Zoology of the Polish Academy of Sciences, Warsaw, Poland.

MNHN: Muséum national d'Histoire naturelle, Paris, France.

MZUF: Museo Zoologico 'La Specola', University of Florence, Italy.

The abbreviations used for the type material are:

HT: holotype.

PT: paratype.

The type locality is quoted in the original label form.

Apparent body length (ABL) is measured from the apex of the labrum to the apex of the longer elytron. PL: pronotum length measured from apical to basal margin along midline; PW: pronotum width at the widest point; EL: elytral length from humerus to apex of longer elytron; EW: elytral width at the widest point.

Digital images of *Pseudaptinus bartolozzii* n. sp., *Pseudaptinus moreti* n. sp., and *Pseudaptinus gracilis* n. sp. were taken by a Leica DFC295 camera mounted on a Leica M205 C stereomicroscope, using Leica Application System V4.0 software.

Digital images of the HT of *Pseudaptinus aptinoides* were taken by David Schimrosczyk (MIZ) using a Keyence VHX-7000 Digital Microscope. Before being photographed, genitalia were cleared in 10% cold potassium hydroxide and then stained in chlorazol black.

Pseudaptinus (Thalpius) bartolozzii n. sp.

urn:llsid:zoobank.org:act:

BFC0CA82-82D6-468E-AD60-17726EAE3B4

TYPE LOCALITY. Ecuador: Napo, Rio Hollin, 1200 m.

TYPE SERIES. HT ♂: Ecuador: Napo, Rio Hollin, 1200 m, 9-13.II.1993, L. Bartolozzi legit (Mag. 1406) (MZUF, provisionally at author's address).

DIFFERENTIAL DIAGNOSIS. A small-sized (ABL: 5.82 mm) brachypterous zuphiine species belonging to the genus *Pseudaptinus* (subgenus *Thalpius*), pubescent throughout with striking ant-like external morphology. Fore body (head and pronotum) piceous black and elytra dark brown; pronotum longer than wide, posterior angles provided with a sharp laterally prominent spine; elytral striae deeply impressed, coarsely punctate and rugulose, with intervals punctate and costulated, sutural apex of each elytron prominent. It is easily distinguished from other South American brachypterous *Thalpius* by deeply impressed and coarsely punctate elytral striae, together with costulated intervals.

DESCRIPTION. A small-sized *Pseudaptinus* (subgenus

Thalpius) species with striking ant-like external morphology. ABL: 5.82 mm (HT ♂).

Habitus and color (Fig. 1): body parallel-sided, pubescent throughout, shiny, with mouth parts reddish-brown, fore body (head and pronotum) piceous black and elytra dark brown; antennae and legs paler. Females unknown.

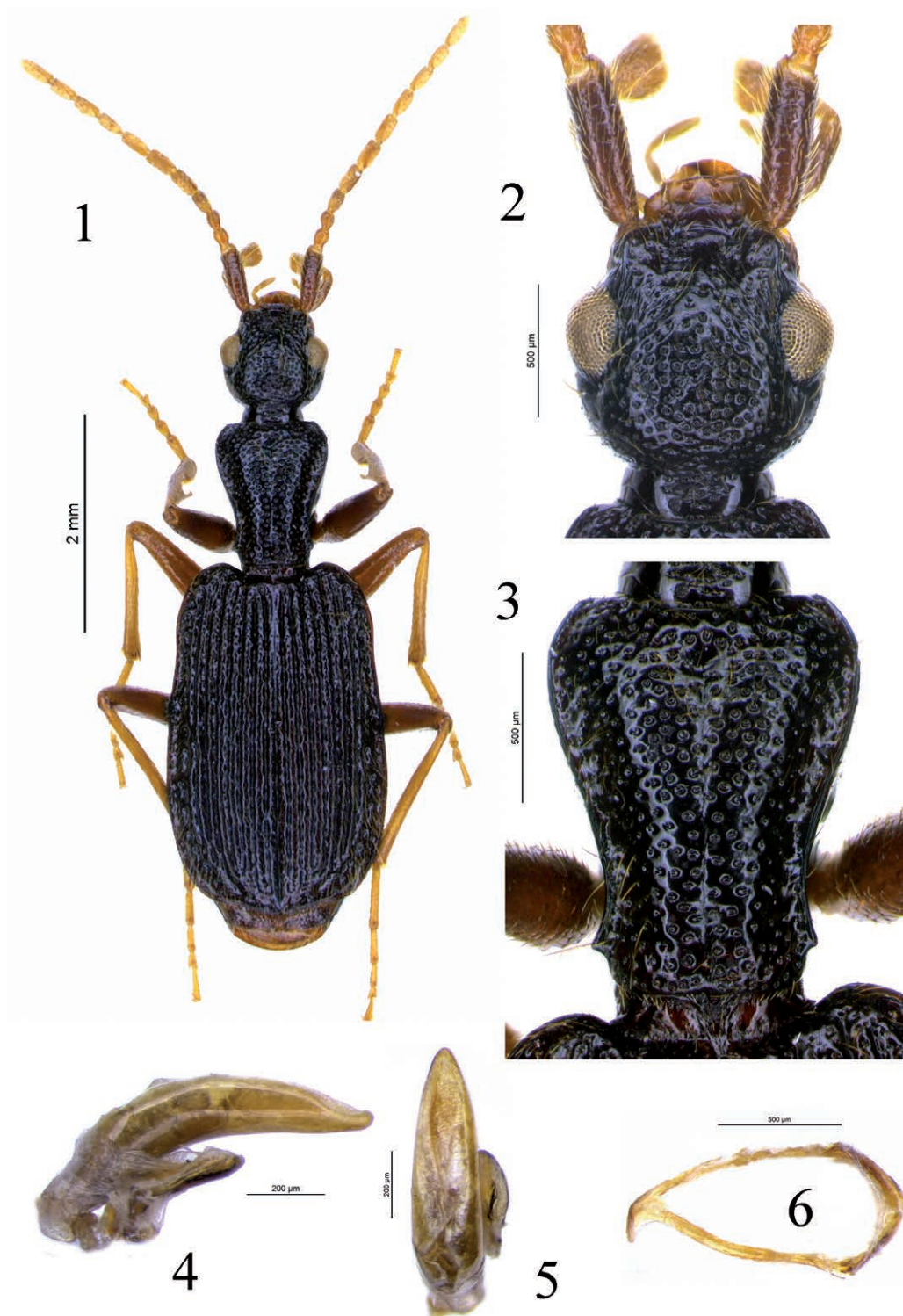
Head (Fig. 2): laterally convex, slightly narrower than pronotum, dorsally coarsely punctate, more densely at vertex, anteriorly rugulose near eyes and posteriorly abruptly constricted in a thick neck punctate at middle, nearly 2/3 as wide as head; collar constriction dorsally distinct; ocular area globose and eyes large, convex, oval but posteriorly obliquely truncate; two supraorbital setae on each side; microsculpture indistinct; frontal impressions deep, broad and very short, ending before the anterior edge of eye; temples convex, densely pubescent with long bristles and nearly as long as diameter of eye; a narrow supraorbital carina distinctly dilated above antennal insertion; labrum rectangular, with six setigerous punctures on anterior margin, which is slightly concave at sides; clypeus transverse trapezoid, rectilinear anteriorly and paler than head; a couple of central setae at anterior margin of clypeus and three further setae at each side. Antennae moderately long and slender, surpassing elytral base when stretched backwards, densely pubescent; the first antennomere darker than followings, which are progressively paler towards apex; the first antennomere nearly as long as antennomeres 2-4 together, the fourth one 1.84 times longer than wide, the followings over 2 times longer than wide. Mandibles moderately long, pointed, and abruptly curved at apex, narrowly darkened at inner side. Mentum distinctly broader than long, sparsely pubescent, anterior margin shallowly emarginate; epilobes rather broad, laterally prominent and anteriorly acutely pointed; mentum tooth acute and not exceeding level of epilobes; suture between mentum and submentum present. Maxillary palpi much larger than labial palpi, with palpomere 4 markedly enlarged; penultimate labial palpomere multisetose with one pair of major erect setae on anterior margin.

Thorax (Fig. 3): PL: 1.30 mm; PW: 1.05 mm; PL/PW: 1.24. Pronotum coarsely punctate throughout, without any distinct microsculpture, pubescent with long yellow erect setae, more dense near anterior margin; form slender, longer than wide, widest at anterior eighth; side margins regularly rounded at anterior fourth and then markedly sinuate backwards up to the basal angles, each provided with a sharp spine laterally prominent

and with an angular seta; posterior margin distinctly pedunculate at middle; basal impressions long and markedly impressed, joining with the lateral border of pronotum at basal half; anterior margin with front angles almost absent; a marginal seta at anterior tenth on each side; lateral marginal bead anteriorly narrow and progressively broader towards base, where it joins with the basal impressions; anterior and posterior margins unbordered; medial longitudinal sulcus deep, ending before apex and base.

Elytra: EL: 3.27 mm; EW: 2.04 mm; EL/EW: 1.60. Subparallel sided, moderately convex but depressed at basal third, slightly narrower at base and widest towards apex, with shoulders rounded and moderately prominent forwards; laterally concave at basal third and delicately sinuate before apex, which is moderately prominent. Surface smooth, without any distinct microsculpture, pubescent with long yellow setae, erect at basal third and reclined at the following 2/3. Epipleura without distinct external plicae ('uncrossed epipleura'). Intervals markedly convex, costulated, deeply punctate; striae deeply impressed for the whole length, distinctly punctate and rugulose. Parascutellar stria absent; scutellar setigerous pore present between striae 1 and 2, adjacent to the first stria. Basal margin nearly indistinct. Each elytron with acute sutural apex; the outer posterior angle rounded. Discal setigerous punctures absent; umbilicate series widely interrupted at middle. Hind wings absent. Ventral surface (thorax and abdomen): prosternum punctate and pubescent with long yellow erect setae; proepisterna anteriorly pubescent and punctate, posteriorly smooth and glabrous. Mesosternum pubescent, densely punctate. Metepisterna moderately short, rugosely punctate, narrowed backwards, and nearly as long as the anterior margin. Prosternal intercoxal process broadly rounded at apex and apically setose. Sterna densely pubescent.

Legs: moderately long and pubescent throughout, light brown with femora a little darker. Metatrochanters very short, as long as 1/4 of metafemora. Protibial antennal cleaning organ well developed, with two clip setae. Protibiae moderately short, robust; mesotibiae and metatibiae slender, about as long as tarsi, without spines except the apical ones, with an apical crown of brush-like setae. Tarsomeres dorsally convex; protarsomeres moderately long, moderately and symmetrically dilated, the first one 1.5 times longer than the 2nd and 3rd, the 4th concave at apex; metatarsomeres slender, the first one 2 times longer than the 2nd; onychium with a double row of adhesive setae; claws smooth.



Figs. 1-6. *Pseudaptinus (Thalpius) bartolozzii* n. sp.: Holotype habitus (1); Head in dorsal view (2); Pronotum (3); Median lobe of aedeagus in lateral view (4); Median lobe of aedeagus in dorsal view (5); Male gonosomite (IX invaginated abdominal segment) (6).

Male genitalia (Figs. 4-6): median lobe of aedeagus in lateral view moderately and regularly curved for most length, rectilinear only near apex, with small basal bulb (Fig. 4); in dorsal view symmetrical and more or less regularly narrowed from base to apex; apical blade short and sub-triangular, blunt at apex (Fig. 5). Ostium moderately long, placed in dorsal position, as long as 2/3 of median lobe, not reaching basal bulb. Right paramere small and narrow, elongate. Male gonosomite (IX invaginated abdominal segment) sub-triangular with proximal apophysis small, right angled and apically acute (Fig. 6).

REMARKS. It is not possible, at the present state of knowledge, to make significant phylogenetic assumptions con-

cerning the closest relatives of *Pseudaptinus* (*Thalpius*) *bartolozzii* n. sp. Maybe these could be found among some other brachypterous South American *Thalpius* living in forest litter (see the '*Pseudaptinus aptinoides* species group'), which, anyway, show evident morphological differences. Due to its peculiar features and its striking ant-like external morphology, *P. bartolozzii* n. sp. can be considered a rather isolated species.

DISTRIBUTION AND ECOLOGY. Geographical distribution: *Pseudaptinus* (*Thalpius*) *bartolozzii* n. sp. is currently recorded only from the Napo province of Ecuador, along the Hollin stream (Fig. 7). This province is part of the Amazon basin, hosting important rainforest areas.



Fig. 7. Distribution map of the new *Pseudaptinus* (*Thalpius*) species in Ecuador (from Google Maps).

Life habits: the unique specimen forming the typical series of *P. bartolozzii* n. sp. was collected at 1200 meters of altitude a.s.l. in forest, along the Hollin stream, by actively searching on the ground and under logs. The striking ant-like external morphology of its body could suggest a behavior involving some degree of myrmecophily, as it was already hypothesized for the zuphiine species *Peruzuphium giachinoi* Allegro, 2024 from Peru (Allegro, 2024).

ETYMOLOGY. I am pleased to dedicate this interesting species to Luca Bartolozzi, former curator at the Entomology Department of the MZUF and specialist in the taxonomy of Coleoptera Lucanidae and Brentidae, who collected the unique specimen recorded so far.

***Pseudaptinus (Thalpius) moreti* n. sp.**

urn:lsid:zoobank.org:act:

4A115AE1-947A-4519-B77F-329C6BFABF08

TYPE LOCALITY. Ecuador, Sucumbíos, Km 9 Sta Bárbara – La Bonita, 2450 m.

TYPE SERIES. HT ♂: Ecuador, Sucumbíos, Km 9 Sta Bárbara – La Bonita, 25.VII.1998, 2450 m, I. Tapia / Nocte ambulans, 20 h – 22 h (CMo). PT ♀: Ecuador, Pichincha, Pataquí dint., m 2575, 14.VIII.2008, legg. Baviera, Bellò, Osella & Pogliano (CAI).

DIFFERENTIAL DIAGNOSIS. A small-sized (ABL: 6.74–6.85 mm) brachypterous zuphiine species belonging to the genus *Pseudaptinus* (subgenus *Thalpius*), pubescent throughout, with *Aptinus*-like elytra. Fore body (head and pronotum) piceous brown and elytra dark brown; mouth parts, antennae and legs paler; pronotum longer than wide, with posterior angles right or moderately acute, not or scarcely laterally prominent; elytra narrow at base and widest towards apex, striae distinctly impressed, irregularly punctate, and intervals delicately convex and densely punctate; elytral apex linearly truncate and sutural angle of each elytron rounded. It is easily distinguished from the South American brachypterous *Thalpius* with *Aptinus*-like elytra by the following set of characters: from *Pseudaptinus gracilis* n. sp. by larger size (6.7–6.9 vs. 5.6–5.7 mm), head dorsally coarsely (vs. delicately) punctate and shape of aedeagus; from *Pseudaptinus aptinoides* Liebke by larger size (6.7–6.9 vs. 5.6 mm), more slender pronotum (PL/PW: 1.24–1.33 vs. 1.15), more slender elytra (EL/EW: 1.58 vs. 1.50) and shape of aedeagus.

DESCRIPTION. A small-sized *Pseudaptinus* (subgenus *Thalpius*) species with *Aptinus*-like elytra. ABL: 6.85 mm (HT ♂), 6.74 mm (PT ♀).

Habitus and color (Fig. 8): body dark brown to piceous brown, slender, shiny, pubescent throughout, with mouth parts, antennae and legs paler.

Head (Fig. 9): laterally convex, slightly narrower than pronotum, dorsally coarsely punctate even at vertex, posteriorly abruptly constricted in a thick neck, punctate at middle, nearly 2/3 as wide as head; collar constriction dorsally distinct; eyes relatively small, scarcely convex, oval but posteriorly obliquely truncate; two supraorbital setae on each side; microsculpture indistinct; frontal impressions moderately deep, broad and short, ending at level of the anterior edge of eye; temples long and convex, densely pubescent with long bristles and about 1.8 times longer than diameter of eye; a narrow supraorbital carina moderately dilated above antennal insertion; labrum rectangular, with six setigerous punctures on anterior margin, which is slightly concave; clypeus transverse trapezoid, rectilinear anteriorly and paler than head; a couple of central setae at anterior margin of clypeus and three further setae at each side. Antennae moderately long and slender, surpassing elytral base when stretched backwards, densely pubescent; the first antennomere longer than antennomeres 2–4 together, the fourth one 1.75 times longer than wide, the following about 2 times longer than wide. Mandibles moderately long, pointed, and abruptly curved at apex, narrowly darkened at inner side. Mentum distinctly broader than long, anterior margin shallowly emarginate; epilobes rather broad, laterally prominent and anteriorly acutely pointed; mentum tooth very short; suture between mentum and submentum present. Maxillary palpi much larger than labial palpi, with palpomere 4 markedly enlarged; penultimate labial palpomere multisetose with one pair of major erect setae on anterior margin.

Thorax (Fig. 10): PL: 1.59 mm, PW: 1.28 (HT ♂); PL: 1.63, PW: 1.23 mm (PT ♀); PL/PW: 1.24–1.33.

Pronotum coarsely punctate throughout, without any distinct microsculpture, pubescent with long yellow semi-adjacent setae, more dense and erect near anterior margin; form slender, longer than wide, widest at anterior fourth; side margins regularly rounded at anterior 2/3 and then markedly sinuate backwards up to the right or moderately acute basal angles, not or scarcely prominent outside and with an angular seta;

posterior margin distinctly pedunculate at middle; basal impressions long and markedly impressed, joining with the lateral border of pronotum at basal third; anterior margin concave with front angles scarcely protruding; a marginal seta at anterior sixth on each side; lateral marginal bead anteriorly narrow and progressively broader towards base, where it joins with the basal impressions; anterior and posterior margins unborded; medial longitudinal sulcus deep, ending before apex and base.

Elytra: EL: 3.74 mm, EW: 2.37 mm (HT ♂); EL: 3.63 mm, EW: 2.31 mm (PT ♀); EL/EW: 1.58 (HT ♂ and PT ♀). Ovoid, moderately convex, narrow at base and progressively widest towards apex, with shoulders markedly prominent forwards; sides sub-rectilinear at basal 2/3, then moderately arcuate towards apex, which is linearly truncate. Apical sutural angle of each elytron rounded; the outer posterior angle widely rounded. Surface smooth, without any distinct microsculpture, pubescent throughout with yellow semi-adjacent setae. Epipleura without distinct external plicae ('uncrossed epipleura'). Intervals delicately convex and densely punctate; striae distinctly impressed for nearly the whole length, more shallowly impressed towards apex, irregularly punctate. Parascutellar stria absent; scutellar setigerous pore present between striae 1 and 2, adjacent to the first stria. Basal margin nearly indistinct. Discal setigerous punctures absent; punctures of the umbilicate series in a continuous row, not interrupted at middle. Hind wings absent.

Ventral surface (thorax and abdomen): prosternum and propisterna punctate and pubescent with long erect yellow setae; mesosternum punctate and sparsely pubescent. Metepisterna moderately short, rugosely punctate, sub-rectangular and nearly as long as anterior margin. Prosternal intercoxal process broadly rounded at apex and apically setose. Sterna densely pubescent.

Legs: moderately long and pubescent throughout, light brown with femora slightly darker. Metatrochanters very short, as long as 1/4 of metafemora. Protibial antennal cleaning organ well developed, with two clip setae. Protibiae moderately short, robust; mesotibiae and metatibiae slender, about as long as tarsi, without spines except the apical ones, with an apical crown of brush-like setae. Tarsomeres dorsally convex; protarsomeres moderately long, moderately and symmetrically dilated, the first one nearly 2 times longer than the 2nd and 3rd, the 4th concave at

apex; metatarsomeres slender, the first one 1.8 times longer than the 2nd; onychium with a double row of adhesive setae; claws smooth.

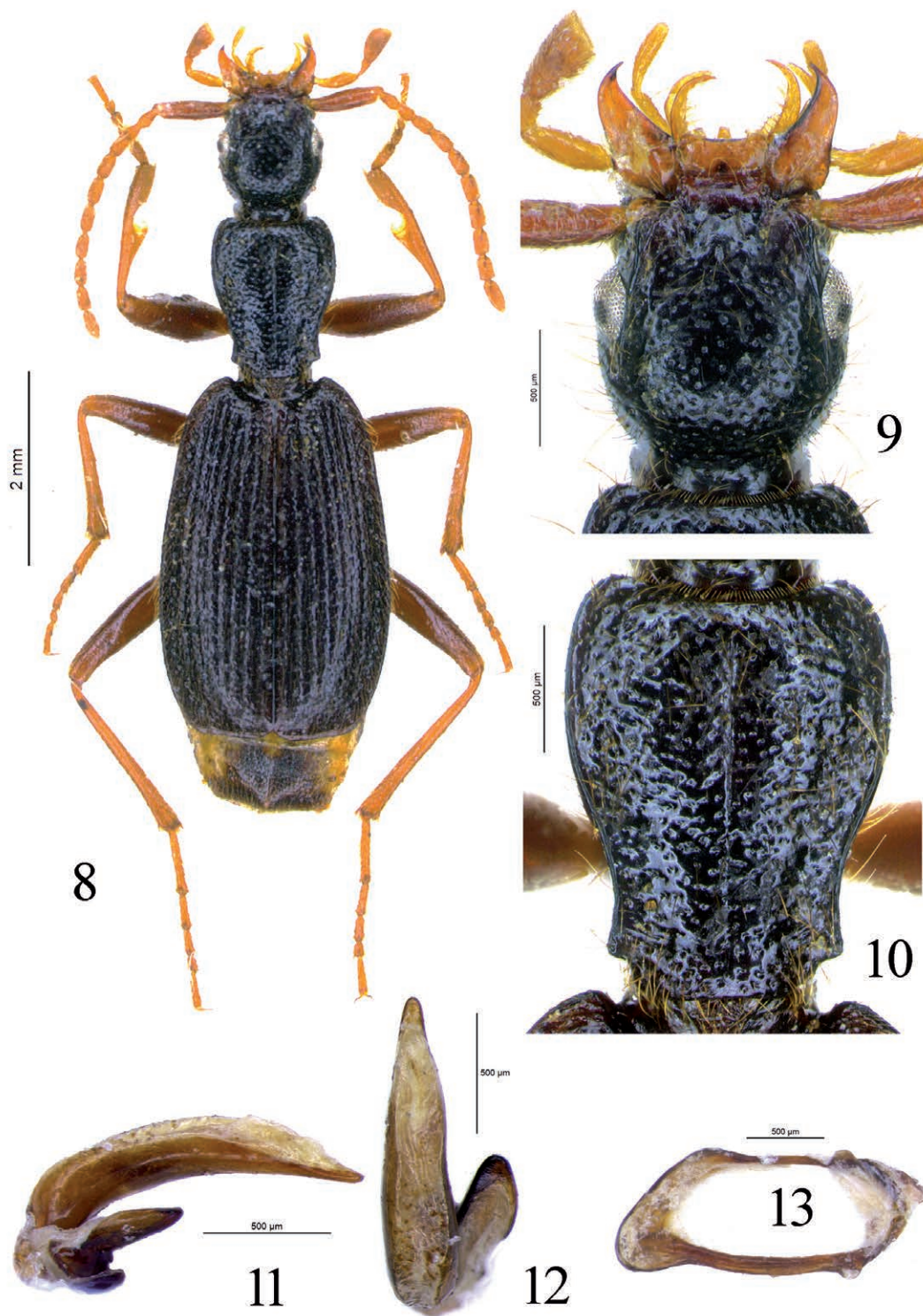
Male genitalia (Figs. 11-13): median lobe of aedeagus in lateral view abruptly curved at 45° just over the small basal bulb, then sub-cylindrical and delicately curved until apex (Fig. 11); in dorsal view more or less symmetrical and regularly narrowed from basal third to apex; apical blade moderately long and slender, sub-triangular and blunt at apex (Fig. 12). Ostium long, placed in dorsal position, as long as the whole dorsal part of median lobe, nearly reaching basal bulb. Right paramere moderately small and narrow, elongate. Male gonosomite (IX invaginated abdominal segment) ovoid with proximal apophysis large, sub-triangular and apically broadly rounded (Fig. 13).

REMARKS. *Pseudaptinus* (*Thalpius*) *moreti* n. sp. shows evident morphological similarities with *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke and with *Pseudaptinus* (*Thalpius*) *gracilis* n. sp., which can be considered, at the present state of knowledge, its closest relatives. Their striking similarities as well as their likely similar way of life indicate the presence of a homogeneous group of species (which is named '*P. aptinoides* species group' after the oldest recognized species), phylogenetically strictly related and recently originated by allopatry due to geographic barriers caused by climatic fluctuations during the Pleistocene. The flightless condition of these species and their consequent reduced dispersal ability may have favoured the specific diversification.

DISTRIBUTION AND ECOLOGY. Geographical distribution: *Pseudaptinus* (*Thalpius*) *moreti* n. sp. is currently recorded only from the provinces of Sucumbios and Pichincha, in northern Ecuador, on both sides of the Andean Cordillera (Fig. 7).

Life habits: the specimens forming the typical series of *P. moreti* n. sp. were collected at 2450-2575 meters of altitude a.s.l. in densely forested areas. On a separate label of the HT, the specimen is reported as 'walking on the ground between 8 pm and 10 pm'. Due to the flightless condition of this species, a forest litter habitat can be hypothesized. Some degree of myrmecophily in its behaviour should not be excluded.

ETYMOLOGY. I am pleased to dedicate this rare and interesting species to Pierre Moret (University of Toulouse), a world-renowned specialist in the taxonomy of Ecuadorian Carabidae, who gave me, in study, the specimens of the type series.



Figs. 8-13. *Pseudaptinus (Thalpius) moreti* n. sp.: Holotype habitus (8); Head in dorsal view (9); Pronotum (10); Median lobe of aedeagus in lateral view (11); Median lobe of aedeagus in dorsal view (12); Male gonosomite (IX invaginated abdominal segment) (13).

***Pseudaptinus* (*Thalpius*) *gracilis* n. sp.**

urn:lsid:zoobank.org:act:

400640D2-9734-4586-84FE-4C56738C15FB

TYPE LOCALITY. Ecuador, Pichincha, Lloa, Rio Blanco, m 2540, S 00°12'95.6" W 78°39'12.3".

TYPE SERIES. HT ♂: Ecuador, Pichincha, Lloa, Rio Blanco, m 2540, 27.VII.2008, S 00°12'95.6" W 78°39'12.3", legg. Baviera, Bellò, Osella & Pogliano (CMo). PT ♀: same data as HT (CAI).

DIFFERENTIAL DIAGNOSIS. A small-sized (ABL: 5.55–5.74 mm) brachypterous zuphiine species belonging to the genus *Pseudaptinus* (subgenus *Thalpius*), pubescent throughout, with *Aptinus*-like elytra. Body brownish with mouth parts, antennae and legs paler; pronotum longer than wide, with posterior angles right or moderately acute, not or scarcely laterally prominent; elytra narrow at base and widest towards apex, striae distinctly impressed, irregularly punctate, and intervals delicately convex and densely punctate; elytral apex linearly truncate and sutural angle of each elytron rounded. It is easily distinguished from the South American brachypterous *Thalpius* with *Aptinus*-like elytra by the following set of characters: from *Pseudaptinus moreti* n. sp. by smaller size (5.6–5.7 vs. 6.7–6.9 mm), head dorsally delicately (vs. coarsely) punctate and shape of aedeagus; from *Pseudaptinus aptinoides* Liebke by more slender pronotum (PL/PW: 1.22–1.25 vs. 1.15), more slender elytra (EL/EW: 1.59–1.61 vs. 1.50) and shape of aedeagus.

DESCRIPTION. A small-sized *Pseudaptinus* (subgenus *Thalpius*) species with *Aptinus*-like elytra. ABL: 5.74 mm (HT ♂), 5.55 mm (PT ♀).

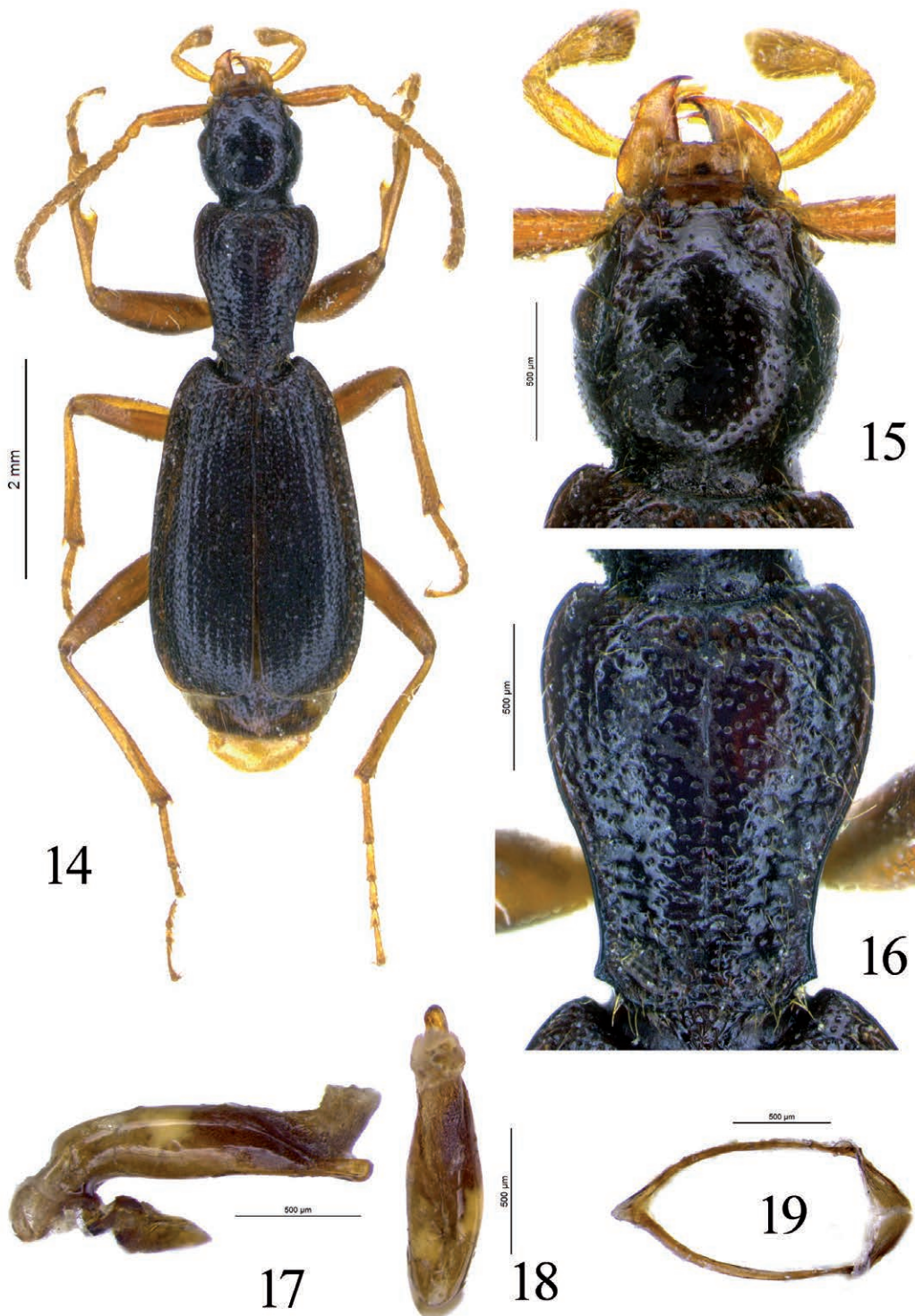
Habitus and color (Fig. 14): body brown, slender, shiny, pubescent throughout, with mouth parts, antennae and legs paler.

Head (Fig. 15): laterally convex, slightly narrower than pronotum, dorsally delicately punctate and nearly smooth at middle, posteriorly abruptly constricted in a thick neck, smooth at middle, nearly 2/3 as wide as head; collar constriction dorsally distinct; eyes relatively small, scarcely convex, oval but posteriorly obliquely truncate; two supraorbital setae on each side; microsculpture indistinct; frontal impressions superficial, broad and short, ending at level of the anterior edge of eye; temples long and convex, densely pubescent with long bristles and about 1.8 times longer than diameter of eye; a narrow supraorbital carina moderately dilated above antennal insertion; labrum rectangular, with six setigerous punctures on anterior margin, which is slightly concave; clypeus transverse trapezoid, recti-

linear anteriorly and paler than head; a couple of central setae at anterior margin of clypeus and three further setae at each side. Antennae moderately long and slender, surpassing elytral base when stretched backwards, densely pubescent; the first antennomere as long as antennomeres 2–4 together, the fourth one 1.75 times longer than wide, the following about 2 times longer than wide. Mandibles moderately long, pointed, and abruptly curved at apex, narrowly darkened at inner side. Mentum distinctly broader than long, anterior margin shallowly emarginate; epilobes rather broad, laterally prominent and anteriorly acutely pointed; mentum tooth nearly indistinct; suture between mentum and submentum present. Maxillary palpi much larger than labial palpi, with palpomere 4 markedly enlarged; penultimate labial palpomere multisetose with one pair of major erect setae on anterior margin.

Thorax (Fig. 16): PL: 1.40 mm; PW: 1.12–1.15 mm; PL/PW: 1.22–1.25. Pronotum coarsely punctate throughout, without any distinct microsculpture, pubescent with long yellow reclined setae, more dense and erect near anterior margin; form slender, longer than wide, widest at anterior fifth; side margins regularly rounded at anterior 2/3 and then markedly sinuate backwards up to the right or moderately acute basal angles, not or scarcely prominent outside and with an angular seta; posterior margin distinctly pedunculate at middle; basal impressions long and markedly impressed, joining with the lateral border of pronotum at basal third; anterior margin concave with front angles scarcely protruding; a marginal seta at anterior fifth on each side; lateral marginal bead anteriorly narrow and progressively broader towards base, where it joins with the basal impressions; anterior and posterior margins unbordered; medial longitudinal sulcus deep, ending before apex and base.

Elytra: EL: 3.14 mm, EW: 1.97 mm (HT ♂); EL: 2.99 mm, EW: 1.86 mm (PT ♀); EL/EW: 1.59 (HT ♂)–1.61 (PT ♀). Ovoid, moderately convex but flattened on disk, narrow at base and progressively widest towards apex, with shoulders markedly prominent forwards; sides sub-rectilinear at basal 2/3, then moderately arcuate towards apex, which is linearly truncate. Apical sutural angle of each elytron rounded; the outer posterior angle widely rounded. Surface smooth, without any distinct microsculpture, pubescent throughout with yellow semi-adjacent setae. Epipleura without distinct external plicae ('uncrossed epipleura'). Intervals delicately convex and densely punctate; striae distinctly impressed for nearly the whole length, more shallowly towards apex, irregularly punctate. Parascutellar stria absent;



Figs. 14-19. *Pseudaptinus (Thalpius) gracilis* n. sp.: Holotype habitus (14); Head in dorsal view (15); Pronotum (16); Median lobe of aedeagus in lateral view (17); Median lobe of aedeagus in dorsal view (18); Male gonosomite (IX invaginated abdominal segment) (19).

scutellar setigerous pore present between striae 1 and 2, adjacent to the first stria. Basal margin nearly indistinct. Discal setigerous punctures absent; punctures of the umbilicate series only a little more spaced at middle. Hind wings absent.

Ventral surface (thorax and abdomen): prosternum punctate and pubescent with long erect yellow setae; proepisterna sparsely pubescent. Mesosternum sparsely pubescent and punctate. Metepisterna moderately short, rugosely punctate, sub-rectangular and nearly as long as anterior margin. Prosternal intercoxal process broadly rounded at apex and apically setose. Sterna densely pubescent.

Legs: moderately long and pubescent throughout, uniformly light brown. Metatrochanters very short, as long as 1/4 of metafemora. Protibial antennal cleaning organ well developed, with two clip setae. Protibiae moderately short, robust; mesotibiae and metatibiae slender, about as long as tarsi, without spines except the apical ones, with an apical crown of brush-like setae; all tibiae longitudinally moderately flattened. Tarsomeres dorsally convex; protarsomeres moderately long, moderately and symmetrically dilated, the first one 1.5 times longer than 2nd and 3rd, the 4th concave at apex; metatarsomeres slender, the first one 1.8 times longer than 2nd; onychium with a double row of adhesive setae; claws smooth.

Male genitalia (Figs. 17-19): median lobe of aedeagus in lateral view abruptly curved at 45° just over the small basal bulb, then rectilinear until apex, moderately swollen at mid length (Fig. 17); in dorsal view more or less symmetrical and regularly narrowed from basal third to apex; apical blade long and stout, thick and rounded at apex (Fig. 18). Ostium moderately long, placed in dorsal position, as long as 2/3 of median lobe, not reaching basal bulb. Right paramere moderately small and narrow, elongate. Male gonosomite (IX invaginated abdominal segment) ovoid with proximal apophysis small, sub-triangular and apically pointed (Fig. 19).

REMARKS. *Pseudaptinus* (*Thalpius*) *gracilis* n. sp. shows evident morphological similarities with *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke as well as with *Pseudaptinus* (*Thalpius*) *moreti* n. sp., which can be considered, at the present state of knowledge, its closest relatives. They probably form, on account of their striking similarities as well as their likely similar way of life, a homogeneous group of species phylogenetically strictly related (see also remarks concerning *P. moreti* n. sp.).

DISTRIBUTION AND ECOLOGY. Geographical distribution:

Pseudaptinus (*Thalpius*) *gracilis* n. sp. is currently recorded only from the Pichincha province of Ecuador, near Lloa, along the Río Blanco stream (Fig. 7).

Life habits: the two specimens forming the typical series of *P. gracilis* n. sp. were collected at 2540 meters of altitude a.s.l., along the Río Blanco stream. This area is densely forested, and therefore, due to the flightless condition of this species, it is very likely a way of life in the forest litter. Some degree of myrmecophily in its behaviour should not be excluded.

ETYMOLOGY. The specific epithet refers to the tiny and slender habitus of this species, in comparison with the other members of the '*Pseudaptinus aptinoides* species group'.

***Pseudaptinus* (*Thalpius*) *aptinoides* Liebke, 1934**
(Redescription based on high-resolution photographs of HT)

Pseudaptinus (*Thalpius*) *aptinoides* Liebke, 1934: 381.

Pseudaptinus (*Thalpius*) *aptinoides* Liebke, 1934:
Lorenz, 2005: 505.

Pseudaptinus (*Thalpius*) *aptinoides* Liebke, 1934:
Blackwelder, 1957: 69.

TYPE LOCALITY. Caràcas, Venezuela.

TYPE SERIES. HT ♂: Caràcas, Venezuela / *Pseudaptinus aptinoides* Lbk. Type. M. Liebke determ. / Sammlung M. Liebke / Type (red label) / Inst. Zool. P.A.N. Warszawa Holotypus n. 1648 (red label) / Mus. Zool. Polonicum Warszawa 31/54.

RE-DESCRIPTION. A small-sized *Pseudaptinus* (subgenus *Thalpius*) species with *Aptinus*-like elytra. ABL: 5.57 mm (HT ♂).

Habitus and color (Fig. 20): body solid reddish-brown, slender, shiny, pubescent throughout, with mouth parts, antennae, and legs paler.

Head (Fig. 21): laterally convex, distinctly narrower than pronotum, dorsally coarsely punctate, more sparsely at vertex, posteriorly abruptly constricted in a thick neck, nearly 2/3 as wide as head; collar constriction dorsally distinct; eyes moderately small, scarcely convex, oval but posteriorly obliquely truncate; two supraorbital setae on each side; microsculpture indistinct; frontal impressions moderately deep, broad and short, ending at level of the anterior edge of eye; temples long and convex, densely pubescent with long bristles and about 1.5 times longer than diameter of eye; a narrow supraorbital carina moderately dilated above antennal insertion. Antennae moderately

short, slightly surpassing elytral base when stretched backwards, densely pubescent; the first antennomere longer than antennomeres 2-4 together, the 4th to 10th about 1.3-1.4 times longer than wide, the terminal one about 1.8 times longer than wide. Mentum distinctly broader than long, anterior margin shallowly emarginate; epilobes rather broad, laterally prominent and anteriorly acutely pointed; mentum tooth nearly indistinct; suture between mentum and submentum present. Maxillary palpi much larger than labial palpi, with palpomere 4 markedly enlarged; penultimate labial palpomere multisetose with one pair of major erect setae on anterior margin.

Thorax (Fig. 22): PL: 1.32 mm, PW: 1.15; PL/PW: 1.15. Pronotum distinctly wider than head, coarsely punctate (much more densely than on head) and rugose throughout, without any distinct microsculpture, pubescent with long yellow semi-adjacent setae; form moderately slender, only slightly longer than wide, widest at anterior third; side margins nearly rectilinear at apical third, then regularly arcuate and finally markedly sinuate at basal third, up to the sharply acute basal angles, scarcely prominent outside and with an angular seta; posterior margin distinctly pedunculate at middle; basal impressions long and markedly impressed, joining with the lateral border of pronotum at mid length; anterior margin concave with front angles scarcely protruding; a marginal seta at anterior fifth on each side; lateral marginal bead anteriorly narrow and progressively broader towards base, where it joins with basal impressions; anterior and posterior margins unbordered; medial longitudinal sulcus deep, ending before apex and base.

Elytra: EL: 3.02 mm, EW: 2.01 mm; EL/EW: 1.50. Ovoid, moderately convex and slightly depressed on disk, narrow at base and progressively widest towards apex, with shoulders markedly prominent forewards; sides scarcely arcuate at basal 2/3, then decidedly arcuate towards apex, which is linearly truncate. Apical sutural angle of each elytron rounded; the outer posterior angle widely rounded. Surface smooth, without any distinct microsculpture, pubescent throughout with yellow semi-adjacent setae. Epipleura without distinct external plicae ('uncrossed epipleura'). Intervals convex and densely punctate; striae distinctly impressed for nearly the whole length, nearly indistinctly punctate. Parascutellar stria absent; scutellar setigerous pore present between striae 1 and 2, adjacent to the first stria. Basal margin nearly indistinct. Discal setigerous punctures absent; punctures of the umbilicate series in a continuous row, not interrupted at middle. Hind wings absent.

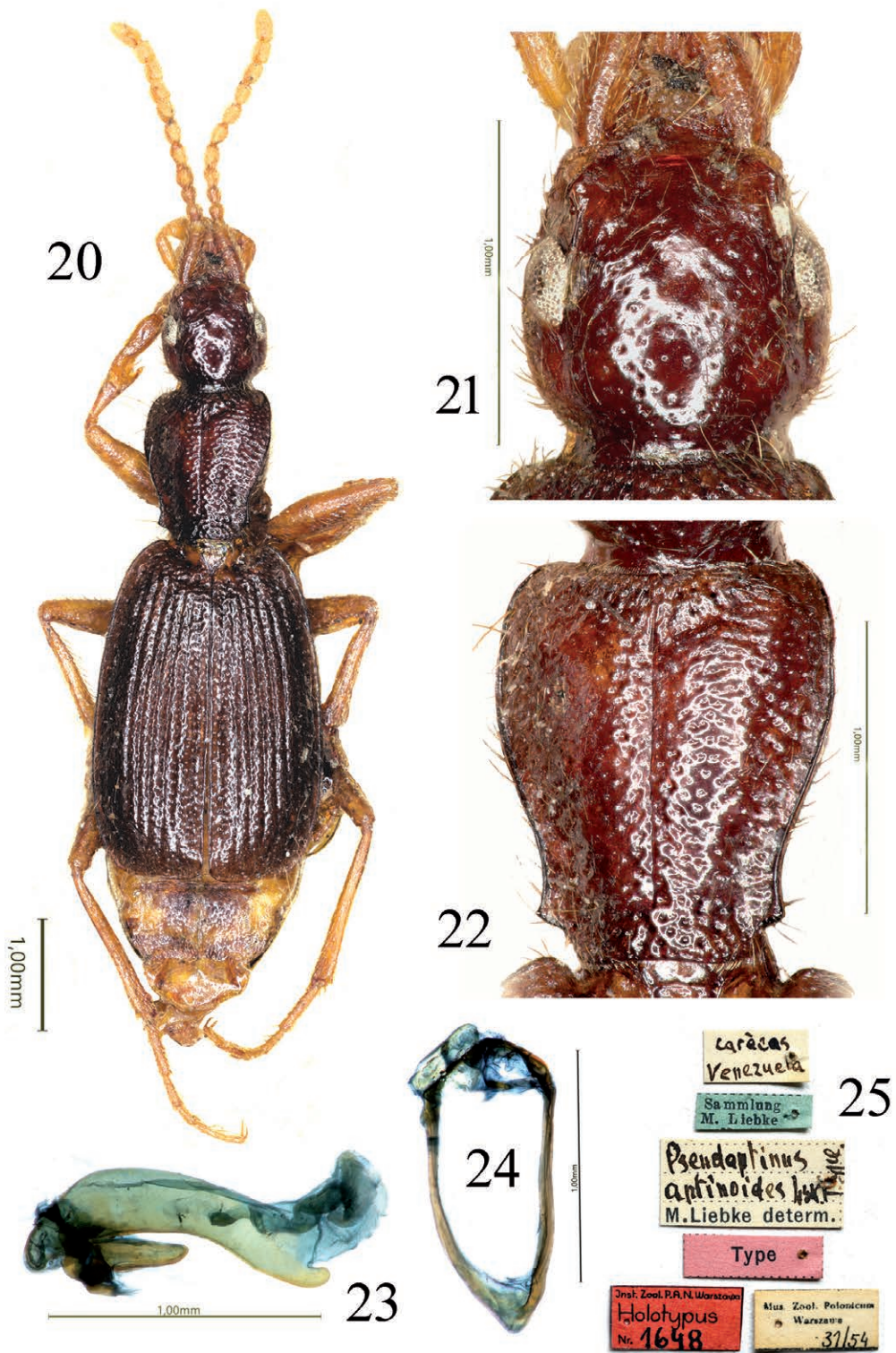
Ventral surface (thorax and abdomen): prosternum densely punctate and pubescent with long erect yellow setae; proepisterna densely punctate only anteriorly; mesosternum punctate and sparsely pubescent. Metepisterna moderately short, rugosely punctate, sub-rectangular, and nearly as long as anterior margin. Prosternal intercoxal process broadly rounded at apex and apically setose. Sterna densely pubescent.

Legs: moderately long and pubescent throughout, light brown with femora slightly darker. Metatrochanters moderately short, as long as 1/3 of metafemora. Protibial antennal cleaning organ well developed, with two clip setae. Protibiae moderately short, robust; mesotibiae and metatibiae slender, about as long as tarsi, without spines except the apical ones, with an apical crown of brush-like setae. Tarsomeres dorsally convex; protarsomeres moderately long, moderately and symmetrically dilated, the first one nearly 2 times longer than the 2nd and 3rd, the 4th concave at apex; metatarsomeres slender, the first one 1.8 times longer than the 2nd; claws smooth.

Male genitalia (Figs. 23 and 24): median lobe of aedeagus in lateral view sub-cylindrical and regularly curved at basal 2/3, then counter wise curved upwards until apex, which is short and blunt (Fig. 23). Male gonosomite (IX invaginated abdominal segment) sub-rectangular with proximal apophysis short, sub-triangular and apically blunt (Fig. 24).

REMARKS. *Pseudaptinus (Thalpius) aptinoides* Liebke shows evident morphological similarities with *Pseudaptinus (Thalpius) moreti* n. sp. and with *Pseudaptinus (Thalpius) gracilis* n. sp., which can be considered, at the present status of knowledge, its closest relatives. Their striking similarities as well as their likely similar way of life indicate the presence of a homogeneous group of species phylogenetically strictly related and recently originated by allopatry due to geographic barriers caused by climatic fluctuations during the Pleistocene. The flightless condition of these species and their consequent reduced dispersal ability may have favored the specific diversification.

DISTRIBUTION AND ECOLOGY. Geographical distribution: *Pseudaptinus (Thalpius) aptinoides* Liebke is currently recorded, according to label data (Fig. 25), only from Caracas, Venezuela. It is the most geographically isolated species within the species group. Life habits: no information is available on the preferred habitat of this species. Due to its flightless condition, it can be hypothesized a way of life in the forest litter, similarly to the newly described species of the same group.



Figs. 20-25. *Pseudaptinus* (*Thalpius*) *aptinoides* Liebke (photos by David Schimrosczyk - MIZ): Holotype habitus (20); Head in dorsal view (21); Pronotum (22); Median lobe of aedeagus in lateral view (23); Male gonosomite (IX invaginated abdominal segment) (24); Labels (25).

DISCUSSION

The four species of *Pseudaptinus* (subgenus *Thalpius*) concerned in this paper are, as far as I know, the only *Thalpius* species so far recorded showing a flightless condition. This condition is fairly common among the high-Andean Carabid species inhabiting paramo (Moret, 2005), but it becomes less common, at least at lower elevations, among the tropical forest species, most of which live in canopies and show good flight dispersal abilities (Basset *et al.*, 2015; Moret, 2024). In forest ecosystems, flightless condition is mainly found among litter inhabitants (Richardson & Richardson, 2013), which sometimes exhibit more or less close relationships with ants (Parker, 2016).

Wing reduction implies reduced dispersal ability, which is one of the causes, together with isolation due to geographic barriers and climatic fluctuations, of the interruption of gene flow and therefore of high levels of species differentiation in geographically restricted areas (Muñoz-Tobar & Caterino, 2019). This seems to be the case of the three new species here described, which are currently recorded only from restricted forest areas of Ecuador.

As the tropical Andean area can be regarded as a set of fragmented alpine islands (Anthelme *et al.*, 2014) and the insect fauna of the Amazon basin is still little known, it is likely that further future research in these Ecuadorian environments will lead to the discovery of other new microendemic species belonging to the genus *Pseudaptinus*, or even to the '*P. aptinoides* species group', although new records of these species, due to their high rarity, will take time and patience.

Key to the species of *Pseudaptinus* (subgenus *Thalpius*) from South America
(modified from Liebke, 1934)

1. Longitudinal diameter of eye longer than temple (interval between posterior eye border and constricted neck) > **2**
 - Longitudinal diameter of eye equal to or shorter than temple > **8**
2. Eye diameter double the temple length > **3**
 - Eye diameter triple the temple length > **4**
3. Pronotum longer than wide (L/W=1.13). Bolivia > *lugubris* Liebke, 1934
 - Pronotum nearly as long as wide (L/W=1.02). Brazil (Santa Catharina) > *granulosus* (Chaudoir, 1872)
4. Antennae very short, segments 5 – 6 as long as wide. Brazil (Santa Catharina) > *plaumanni* Liebke, 1939
 - Antennae short, segments 5 – 6 1.25-1.33 times longer than wide > **5**
 - Antennae longer, segments 5 – 6 1.5 times longer than wide > **6**
5. Antennal segments 5 – 6 1.25 times longer than wide. Dorsum uniformly colored dark red-brown. Argentina > *brunneus* Liebke, 1934
 - Antennal segments 5 – 6 1.33 times longer than wide. Elytra yellow-brown, head and elytra darkened. Brazil (La Plata river basin) > *fluvialis* Liebke, 1934
6. Pronotum short and wide. Dorsum uniformly black. Length 9 mm. Brazil (Amazon) > *batesi* Chaudoir, 1862
 - Pronotum somewhat longer than wide. Smaller species > **7**
7. Larger, 6-7 mm long. Body wide, robust. Pronotum with hind angles strongly protruding. Brazil (Amazon) > *polystichoides* Chaudoir, 1862
 - Smaller, 5.5 mm long. Body more slender. Pronotum with hind angles less protruding. Colombia (Amazon) > *intermedius* Chaudoir, 1872
8. Eye diameter equal to temple length. Elytra more or less parallel-sided > **9**
 - Eye diameter shorter than temple length. Elytra *Aptinus*-like shaped with marked narrowing of shoulders > **11**
9. Pronotum narrower, only slightly wider than head, with hind angles laterally projected as short thorn. Body size smaller (6 mm) > **10**
 - Pronotum much wider than head, with hind angles laterally projected as long thorn. Body size larger (8 mm). Dorsum reddish-brown. Argentina, Uruguay > *argentinicus* Liebke, 1929
10. Dorsum uniformly light yellow-brown, dull. Elytral intervals moderately convex. Argentina > *bruchi* Liebke, 1934

- Dorsum dark brown to piceous black, shiny. Elytral intervals costulated. Ecuador > *bartolozzii* n. sp.
- 11. Antennae relatively short, segments 5 – 6 at most 1.4 times longer than wide. Pronotum more transverse (PL/PW 1.15); elytra stocky (EL/EW 1.50). Venezuela > *aptinoides* Liebke, 1934
- Antennae longer, segments 5 – 6 at least 1.7 times longer than wide. Pronotum more slender (PL/PW >1.20); elytra more slender (EL/EW about 1.60). Species from Ecuador > **12**
- 12. Larger, about 7 mm long. Head dorsally coarsely punctate (Fig. 9). Median lobe of aedeagus evenly curved throughout its length, with thin, pointed apex (Fig. 11). Ecuador > *moreti* n. sp.
- Smaller, 5.7 mm long. Head dorsally finely punctate (Fig. 15). Median lobe of aedeagus nearly rectilinear throughout its length, with thick, blunt apex (Fig. 17). Ecuador > *gracilis* n. sp.

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Gianfranco LIBERTI*

The type species of genus *Malthodes* Kiesenwetter, 1852. An explanatory note (Coleoptera, Cantharidae)

Abstract: Doubts have been recently raised (Bouchard *et al.* 2024) on the type species fixation by Desmarest (1860: 5) of “*M. sanguinolentus* Linné” (sic, no date) for genus *Malthodes* Kiesenwetter, 1852.

The reason for the doubts is that *Cantharis sanguinolenta* Linné, 1767 [= *Meloe cinnaberina* Scopoli 1763 (now in genus *Cucujus* Fabricius 1775)] has nothing to do with the genus *Malthodes*.

The study of these ancient authors’ papers leads to the conclusion that “*M. sanguinolentus*” – in the Desmarest meaning [namely *Cantharis sanguinolenta* Gyllenhal, 1808 (not Linné, 1767)] – was perfectly representative of the Kiesenwetter concept of genus *Malthodes*.

Desmarest indeed “mistook” authorship: the type species “should have” been ascribed to Gyllenhal, 1808, not to Linné; the homonymy between *Cantharis sanguinolenta* Gyllenhal, 1808 [= *Malthodes minimus* (Linné, 1758)] and *Cantharis sanguinolenta* Linné, 1767 [= *Cucujus cinnaberinus* (Scopoli, 1763)] was, no doubt, among the reasons for the misquote.

As a consequence, the type species of the genus *Malthodes* is *Cantharis sanguinolenta* Gyllenhal, 1808 (as *M. sanguinolentus* Linné) (currently a junior synonym of *Malthodes minimus* Linné, 1758) by subsequent designation.

Riassunto: La specie tipo del genere *Malthodes* Kiesenwetter, 1852. Nota esplicativa (Coleoptera, Cantharidae)

Recentemente sono stati sollevati dubbi (Bouchard *et al.* 2024) sulla specie tipo fissata da Desmarest (1860: 5) di “*M. sanguinolentus* Linné” (sic, senza data) per il genere *Malthodes* Kiesenwetter, 1852.

Tali dubbi erano motivati dal fatto che *Cantharis sanguinolenta* Linné, 1767 [= *Meloe cinnaberina* Scopoli 1763 (ora inserita nel genere *Cucujus* Fabricius 1775)] nulla ha a che vedere con il genere *Malthodes*.

Lo studio dei testi di tali antichi Autori ha evidenziato come “*Malthodes sanguinolentus*”, nel significato inteso da Desmarest [cioè *Cantharis sanguinolenta* Gyllenhal, 1808 (non Linné, 1767)] fosse perfettamente rappresentativo del concetto di *Malthodes* di Kiesenwetter.

Desmarest “sbagliò” Autore: “avrebbe dovuto” attribuire la specie tipo a Gyllenhal, 1808, non a Linné; l’omonimia fra *Cantharis sanguinolenta* Gyllenhal, 1808 [= *Malthodes minimus* (Linné, 1758)] e *Cantharis sanguinolenta* Linné, 1767 [= *Cucujus cinnaberinus* (Scopoli, 1763)] fu certo fra le cause dell’errore.

In conclusione, la specie tipo del genere *Malthodes* è *Cantharis sanguinolenta* Gyllenhal, 1808 (come *M. sanguinolentus* Linné) [attualmente sinonimo iunior di *Malthodes minimus* Linné, 1758] per designazione successiva.

Key words: Malthinini, Malthodini, *marginatus*, *minimus*, *sanguinolentus*

INTRODUCTION

Genus *Malthodes* was created by Kiesenwetter, in 1852: 271, by the separation of a few (7-8) *Malthinus* Latreille, 1806 species, with the addition of many others just described by him.

The currently (and wrongly) accepted type species of genus *Malthodes* is *Malthinus marginatus* Latreille, 1806, designated by Brancucci (1980: 307), who overlooked the senior, valid designation of Desmarest (1860: 5) of *Cantharis sanguinolenta* Linné, 1767 (sub “*Malthodes sanguinolentus* Linné [without date]”).

Bouchard *et al.* (2024: 311), in their recent encyclopaedic paper, raised the problem that *Cantharis sanguinolenta* Linné, 1767 is not a Cantharidae: it was

indeed first included in the genus *Cucujus* Fabricius 1775 (Coleoptera Cucujidae) by Latreille (1804: 255) and later listed as a synonym of *Meloe cinnaberina* Scopoli, 1763 (now *Cucujus cinnaberinus*) by Heyden *et al.* (1891: 162). Such synonymy has been accepted by all successive Authors (see, for example, Wegrzynowicz 2006: 502).

Malthodes is now a large, mainly palaearctic genus: the Löbl and Smetana catalogue (Kazantsev & Brancucci 2007: 284-295) lists approximately 500 species [plus about 150 species which have been described from Nearctic and Oriental regions (Delkeskamp 1977: 417)]. A number of important papers recently appeared, dealing with *Malthodes* species (both extant and in amber) by several Authors

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(such as, for example, Brancucci, Costantin, Delkeskamp, Fanti, Kazantsev, Liberti, Takahashi, Wittmer). Many “faunistic” papers have also been recently published reporting long lists of species (often including *Malthodes*) observed in biotopes of particular interest, such as National Parks and other protected areas.

Both the size of the genus and the amount of existing literature critically require nomenclature stability: a suitable definition of the type species of the genus is therefore a paramount prerequisite.

THE DESMAREST DESIGNATION

Desmarest (1860), in his valid designation – eight years after the genus *Malthodes* creation – wisely (see under “History”) selected the second species listed by Kiesenwetter (1852: 275), namely *Malthodes sanguinolentus*, as the type species of *Malthodes*. Dealing with this species, Kiesenwetter explained indeed his doubts on the name *Cantharis minima* Linné, 1758 and used instead *Cantharis sanguinolenta* (by him reputed “safer” name) ascribing it to Linné (1746: 189) (not 1767: see here below under “History”) but also reporting, as successive authors, Fallén (1807) (wrongly) and Gyllenhal (1808) (correctly).

A point of further confusion is that *Cantharis sanguinolenta* Gyllenhal 1808: 343 turns out to be a junior homonym of *Cantharis sanguinolenta* Linné, 1767. A case of homonymy, likely overlooked by Kiesenwetter as well as by Desmarest, that explains why the Desmarest designation is deceiving.

In a nutshell, the Desmarest “error” simply was a misquote of authorship: Linné instead of Gyllenhal. A kind of mistake rather common in old literature [just as an example, please see Bousquet & Bouchard (2013: 6) discussing mistaken authors in the second Dejean Catalogue].

It is therefore possible to state that *Cantharis sanguinolenta* Gyllenhal, 1808 (as “*M. sanguinolentus*, Linné”) [currently junior synonym of *Malthodes minimus* (Linné, 1758)] is the type species of genus *Malthodes* by subsequent valid designation (Desmarest 1860: 5).

It must be added that – with the adoption of *Cantharis sanguinolenta* Gyllenhal, 1808 [= *Malthodes minimus* (Linné, 1758)] as type species of genus *Malthodes* – stability and universality of usage of the

name *Malthodes* in zoological nomenclature are safeguarded. *M. minimus* (Linné, 1758) and *M. marginatus* (Latreille, 1806) are rather close to each other, and none of the existing *Malthodes* subgenera has *Malthodes minimus* as type species.

HISTORY

A detailed understanding of the above-synthesized situation requires a short historical account.

Four names are involved: two of Linné, one of Fallén and one of Gyllenhal:

- *Cantharis minima* Linné, 1758: 402 – a valid species, now transferred to genus *Malthodes* Kiesenwetter, 1852.
- *Cantharis sanguinolenta* Linné, 1767: 647 – a junior synonym of *Meloe cinnaberina* Scopoli, 1763 (now *Cucujus cinnaberinus*).
- *Cantharis sanguinicollis* Fallén, 1807 – a junior synonym of *Cantharis minima* Linné, 1758.
- *Cantharis sanguinolenta* Gyllenhal, 1808 (not Linné) – a junior synonym of *Cantharis minima* Linné, 1758.

Paykull (1798: 268) saw two different pronotum color patterns in *Cantharis minima* Linné, 1758, by him named var. α (pronotum with a yellow margin, namely a dark spot in the middle) and var. β (pronotum entirely reddish).

Fallén (1807: 15) considered the two varieties of Paykull as different species: var. α retained the name *Cantharis minima* Linné, 1758 and var. β was re-named *Cantharis sanguinicollis*.

Gyllenhal (1808: 343) emended the Fallén name *Cantharis sanguinicollis* to *Cantharis sanguinolenta*, so generating a primary junior homonym of *Cantharis sanguinolenta* Linné, 1767.

Kiesenwetter (1852: 271), creating genus *Malthodes*, included in it also *Cantharis minima* Linné, 1757 but preferred to use, as the valid name for it, the Gyllenhal name (in masculine gender): *Malthodes sanguinolentus* (overlooking the homonymy).

The Kiesenwetter meaning of *Malthodes sanguinolentus* is, anyway, very clear because, under such a name, he gives:

- i) a detailed account of his own (reasonable) doubts on the name *Cantharis minima* Linné, 1758, explaining why he chose to use the name *Malthodes sanguinolentus* instead. But, “surprisingly” he quotes, for this name, the author-

ship “Linné, 1746, pag. 189, no. 592 et 598” (please note that, in the Linné 1746 book, genera names are present, but species names are often replaced by progressive numbers, as indeed happens for numbers 592 and 598 quoted by Kiesenwetter). Understanding what really was under “Linné eyes” when he described “*Cantharis* 592” and “*Necydalis* 598” in 1746 might perhaps have been possible to Kiesenwetter in 1852, but it is an impossible task today;

- ii) a rather long list of the previously used, equivalent names – such a list including *Cantharis sanguinolenta* Fallén [sic!], *Cantharis sanguinolenta* Gyllenhal, *Cantharis minima* Linné, *Malthinus ruficollis* Latreille, and others.

When Desmarest (1860: 5) designated the type species of genus *Malthodes* Kiesenwetter, 1852 he wisely selected (other choices might have been unappropriated) “*M. sanguinolentus* Linné” (without date), no doubt taking for good name and authorship supplied by Kiesenwetter. Easy to believe that both

Kiesenwetter and Desmarest overlooked the existence of the Linné senior homonym of the Gyllenhal (1808: 343) name.

Twenty years later, Kiesenwetter (1872: 371) cleared all doubts and, under the heading *Malthodes minimus*, recognized the Linné authorship (as *Cantharis minima* Linné, 1758) and synonymized with it (among others) both *Cantharis sanguinolenta* Gyllenhal, 1808 and *Malthodes sanguinolentus* Kiesenwetter, 1852.

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Beyond yellow: host plants of *Anthocharis euphenoides* in NW Italy (Lepidoptera Pieridae)

Abstract: In recent decades, an alarming decline in butterfly populations has been documented in Europe. The main threats include changes in land use, pollution, and climate change. An in-depth understanding of the ecological requirements of species is crucial for developing effective conservation measures to counteract this decline. In this study, we aimed to clarify which plant species serve as host plants for *Anthocharis euphenoides* in the northernmost part of its Italian range. To gather valuable information for this purpose, we conducted an extensive survey of the butterfly, recording the plant species on which adult females were observed laying eggs or where pre-imaginal stages were present, as well as verifying the use of plants reported in the literature as potential host species. Our research revealed a predominant use of *Erucastrum nasturtifolium*, with only a few cases in which *Biscutella brevicaulis* was used. The former host plant had been reported only in Spain and France, while the use of the latter was previously unknown. In no case was the reproduction of the butterfly associated with *Biscutella laevigata*, which is currently considered the main host plant in Europe, including Italy. The results highlight the need for a more thorough study of the ecological requirements of this butterfly, as misidentification of plants or the spread of unverified information from older literature may lead to inaccuracies in ecological knowledge, which is crucial for planning the conservation of oligophagous butterflies at a local scale.

Riassunto: Oltre il giallo: piante ospiti di *Anthocharis euphenoides* nel nord-ovest d'Italia (Lepidoptera Pieridae).

Negli ultimi decenni, è stato documentato un preoccupante declino delle popolazioni di farfalle in Europa. Le principali minacce includono i cambiamenti nell'uso del suolo, l'inquinamento e il cambiamento climatico. Una conoscenza approfondita dei requisiti ecologici delle specie è fondamentale per sviluppare misure di conservazione efficaci volte a contrastare tale declino. In questo studio, ci siamo proposti di chiarire quali specie vegetali fungano da piante ospiti per *Anthocharis euphenoides* nella parte più settentrionale del suo areale italiano. Per raccogliere informazioni utili a questo scopo, abbiamo condotto un'indagine approfondita sulla farfalla, registrando le specie vegetali su cui le femmine adulte sono state osservate durante la deposizione delle uova o dove erano presenti stadi pre-immaginali, oltre a verificare l'uso di piante riportate in letteratura come potenziali specie ospiti. La nostra ricerca ha rivelato un uso predominante di *Erucastrum nasturtifolium*, mentre in pochi casi in è stata utilizzata *Biscutella brevicaulis*. L'uso della prima pianta era stato riportato solo in Spagna e Francia, mentre l'uso della seconda era finora sconosciuto. In nessun caso la riproduzione della farfalla è risultata associata a *Biscutella laevigata*, attualmente considerata la principale pianta ospite in Europa, inclusa l'Italia. I risultati evidenziano l'importanza di uno studio più approfondito sui requisiti ecologici di questa farfalla, poiché errori nell'identificazione delle piante o la diffusione di informazioni non verificate provenienti da letteratura datata potrebbero causare inesattezze nelle conoscenze ecologiche, fondamentali per pianificare la conservazione delle farfalle oligofaghe a scala locale.

Key words: Lepidoptera, Ecology, Conservation, Susa Valley, Natura 2000, *Erucastrum*, *Biscutella*.

INTRODUCTION

Insects are among the animal groups showing the greatest decline worldwide in recent years (van Klink *et al.*, 2020; Wagner *et al.*, 2021). Many European butterfly species are experiencing rapid habitat loss, primarily due to changes in land use (van Swaay *et al.*, 2010a; Börschig *et al.*, 2013; Filz *et al.*, 2013; van Strien *et al.*, 2019; Warren *et al.*, 2021; Rumohr *et al.*, 2023). Furthermore, there are clear signs that climate change poses an additional threat, leading to range

and phenological shifts in many species (Forister *et al.*, 2010; Rödder *et al.*, 2021; Kerner *et al.*, 2023; Habel *et al.*, 2023). Specialist and low-mobility butterflies show greater vulnerability to this threat (Heikkinen *et al.*, 2010; Habel *et al.*, 2023). Butterflies that feed only on a few plant species are particularly at risk, as several species are shifting upwards faster than their few host plants in the Alps (Kerner *et al.*, 2023). Some basic categories of specificity are traditionally recognized: monophagous (feeding on a single host plant species),

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oligophagous (feeding on a few species, usually belonging to the same genus or family), and polyphagous (feeding on a wide range of host plant species, typically from different families) (Courtney, 1948; Wiklund, 1975). The same species may vary its host plant preference primarily based on local availability and phenology at the time of oviposition (Settele *et al.*, 2009). Understanding the ecological requirements of each butterfly species must be considered fundamental for planning their conservation (Settele *et al.*, 2009). For this purpose, an attempt to gather information from the literature on the host plants of European butterflies has been made (Clarke, 2022, 2024).

The Provence orange tip *Anthocharis euphenoides* Staudinger, 1869 is a monovoltine oligophagous European endemic species (Middleton-Welling *et al.*, 2020), with a stable range in Portugal, Spain, France, and Italy (Kudrna *et al.*, 2011). The sporadic observations occurring in Switzerland (LSPN 1987) should be referred to a non-stable colony (Balletto *et al.*, 2023) or an attempt of introduction (Wermeille *et al.*, 2014). In Italy, it exhibits a fragmented distribution, consisting of

a main population in the central peninsula (Central Apennines), two smaller populations in the northwest (Cottian and Ligurian Alps), and one in the southern peninsula (Pollino Massif) (Balletto *et al.*, 2007; Balletto *et al.*, 2023). Other records from the Piedmont, Lombardy, and Tuscany administrative regions have never been confirmed and, therefore, should be considered doubtful (Balletto *et al.*, 2023), as this very conspicuous species is unlikely to go unnoticed for a long time (Bollino *et al.*, 1996). The host plants indicated throughout their range are all referred to the Brassicaceae family, mainly belonging to the genus *Biscutella* L., while the use of other plants was reported only in a few cases (Tab. 1) (Esper, 1829; Meigen, 1829; Curò, 1874; Duponchel, 1849; Verity, 1905, 1947; Palanca Soler & Galante, 1977; Gomez Bustillo & Fernandez Rubio, 1974; Descimon, 1991; Bollino *et al.*, 1996; Jutzeler *et al.*, 1998; Crozier, 1999; Hellmann & Bertaccini, 2004; Villa *et al.*, 2009; García-Barros *et al.*, 2013; Paolucci, 2013; Obregón & Prunier, 2014; Lafranchis *et al.*, 2015; Bence & Richaud, 2019; Lafranchis, 2020; Moussus *et al.*, 2022; Balletto *et al.*, 2023). According to Balletto *et al.*

Tab. 1. Host plant species of *A. euphenoides* reported in the literature. The species are listed in alphabetical order.

Species	Countries	Reference
<i>Biscutella ambigua</i> DC.	France, Italy	Duponchel (1849), Verity (1905, 1947), Hellmann & Bertaccini (2004), Moussus <i>et al.</i> (2022)
<i>Biscutella auriculata</i> L.	France, Spain	Gomez Bustillo & Fernandez Rubio (1974), Obregón & Prunier (2014), Moussus <i>et al.</i> (2022)
<i>Biscutella cichoriifolia</i> Loisel.	Italy	Verity (1947)
<i>Biscutella didyma</i> L.	France, Italy, southern Europe	Esper (1829), Meigen (1829), Verity (1905, 1947), Hellmann & Bertaccini (2004)
<i>Biscutella flexuosa</i> Jord.	France	Lafranchis <i>et al.</i> (2015), Balletto <i>et al.</i> (2023)
<i>Biscutella laevigata</i> L.	France, Italy, Spain	Curò (1874), Verity (1905, 1947), Descimon (1991), Bollino <i>et al.</i> (1996), Jutzeler <i>et al.</i> (1998), Crozier (1999), Hellmann & Bertaccini (2004), Villa <i>et al.</i> (2009), Paolucci (2013), Lafranchis <i>et al.</i> (2015), Bence & Richaud (2019), Lafranchis (2020), Moussus <i>et al.</i> (2022), Balletto <i>et al.</i> (2023)
<i>Biscutella sempervirens</i> L.	Iberian Peninsula	García-Barros <i>et al.</i> (2013)
<i>Biscutella valentina</i> (Loefl. ex L.) Heywood	Iberian Peninsula	García-Barros <i>et al.</i> (2013)
<i>Erucastrum nasturtiifolium</i> (Poir.) O.E.Schulz	France, Spain	Palanca Soler & Galante (1977), García-Barros <i>et al.</i> (2013), Lafranchis <i>et al.</i> (2015)
<i>Hirschfeldia incana</i> (L.) Lagr.-Foss.	Spain	Lafranchis (2020)

(2023), *B. laevigata* is the host plant of *A. euphenoides* in Italy. This species, together with *B. ambigua* DC. and *B. didyma* L., was indicated by Hellmann & Bertaccini (2004) as hosts for the population of NW Italy of Susa Valley. Outside of these species, only Dannehl (1929) and Hellmann & Parenzan (2010) mentioned the use of the genus *Alyssum* L. in Italy.

According to the most recent global assessment of the International Union for Conservation of Nature (IUCN) Red Lists, *A. euphenoides* was classified as Least Concern (LC) at EU level (van Swaay *et al.*, 2010b). The species was therefore not believed to face significant threats across its range; however, this 15-year-old evaluation should be updated. According to the Climatic Risk Atlas of European Butterflies (Settele *et al.*, 2008), this species is classified as at extremely high risk from climate change. More recent IUCN assessments were made at regional and national levels: it was classified as LC in the Mediterranean region (van Swaay *et al.*, 2014), LC in France (IUCN France *et al.*, 2014), and Not Applicable in Switzerland (Wermeille *et al.*, 2014). In Italy, it was classified as Near Threatened (Balletto *et*

al., 2015; Bonelli *et al.*, 2018), as it has experienced a population decline in central Italy of approximately 20–25% in the last 10 years (Balletto *et al.*, 2016). The causes of this decline are still unclear, and research activities are needed to obtain more information on the threats (Balletto *et al.*, 2016). The number of observations has also decreased since 2000 in the French administrative region of Provence-Alpes-Côte d’Azur (PACA), despite an increase in butterfly data collection during the same period (Bence & Richaud, 2019). With this note, we aim to provide fundamental ecological information collected from the northernmost part of the Italian range of *A. euphenoides* (Susa Valley), which will improve the conservation planning activities for this species.

MATERIALS AND METHODS

Adults of *A. euphenoides* were extensively searched in the Susa Valley during the central hours of sunny days in May, June, and July 2023, as well as in May and June 2024, starting from the localities where the species had been reported in the past (Fig. 1) and in

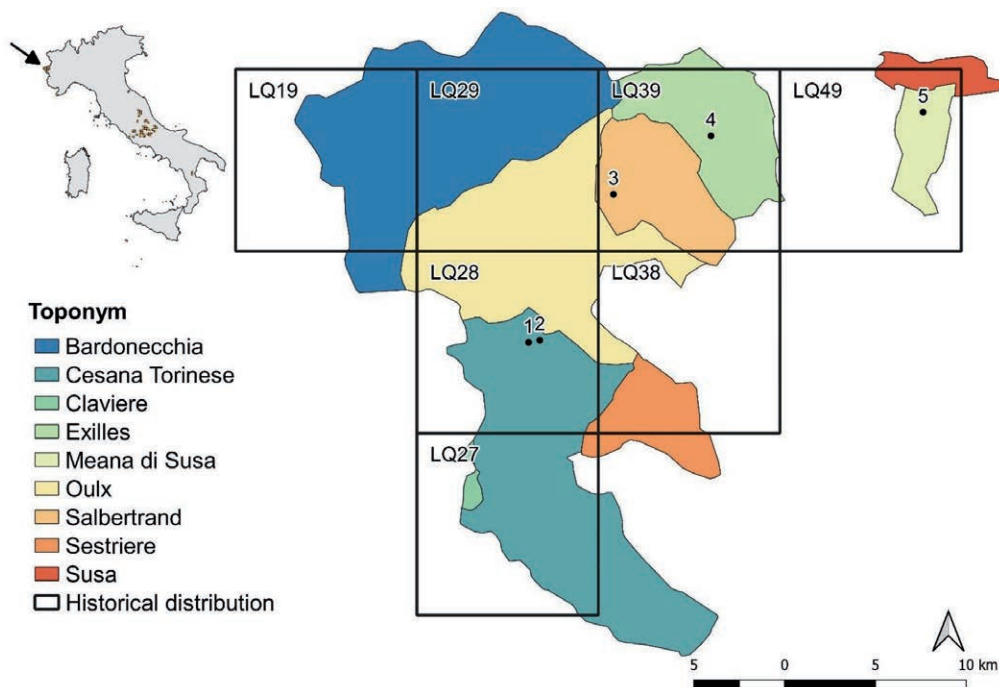


Fig. 1. Map of the geographical information retrieved from literature. The 10×10 km grid provided by Checklist of the Italian fauna is reported (Balletto *et al.*, 2007). Colors identify local municipalities, while numbers correspond to more specific toponyms: 1 - Desertes (Cesana Torinese), 2 - Balbiere (Cesana Torinese), 3 - near Forte Pramand (Salbertrand), 4 - San Colombano (Exilles), 5 - Fontana Maubert (Meana di Susa).

additional areas where it had been occasionally observed by the authors in previous years (unpublished data). Adult females were followed to identify the plants on which they were laying eggs. If adults were spotted but no egg-laying females were seen, the flowering plants present in the site were checked for eggs and subsequently revisited after a maximum of two weeks to search for the pre-imaginal stages. Although eggs are highly visible (bright red a few days after being laid), plants with eggs that were not accompanied by the observation of a female laying them or caterpillars were not considered. Indeed, while the caterpillars exhibit distinctive characteristics compared to other species, the eggs of butterflies from the genus *Euchloe* Hübner, [1819], are very similar in shape and color (Balletto *et al.*, 2023).

When the species was not found at the historical sites, a search was conducted to check for the possible presence of host plants among those reported in the literature (Tab. 1). Preimaginal stages were identified based on the iconography provided by Paolucci (2013) and Lafranchis *et al.* (2015), as

well as descriptions by Balletto *et al.* (2023). Plant species were identified according to Pignatti (2017). The plant nomenclature followed Bartolucci *et al.* (2018).

RESULTS

The presence of *A. euphenoides* was found at 68 sites, between 1026 and 2055 meters above sea level (Fig. 2 and Tab. 2). By monitoring the behavior of adults, several egg-laying females were observed. Adults often used host plants as nectar sources as well. In a large majority of cases, the species used *Erucastrium nasturtiifolium* (Poir.) O.E.Schulz as a host plant (Fig. 3). Only in 11 cases *Biscutella brevicaulis* Jord was recorded as a host plant (Fig. 4). The two plants were found in the same site only in one case (Claviere at 1817 m a.s.l.), in which only the use of *B. brevicaulis* was recorded. Most observations related to the use of *E. nasturtiifolium* occurred in low-density woodland of *Pinus sylvestris* L., particularly in natural river terraces within large floodplains and in calcare-

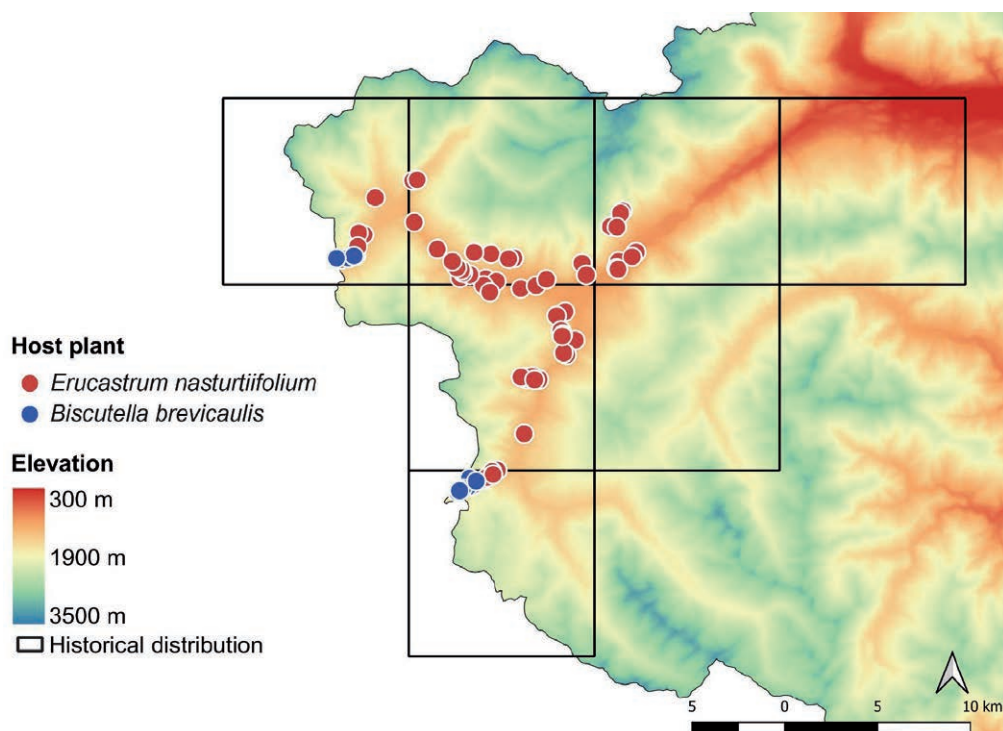


Fig. 2. Occurrences of *A. euphenoides* with associated information on host plant (dots). To compare the previously published distribution with the current one, the 10×10 km grid provided by the Checklist of the Italian fauna was reported (Balletto *et al.*, 2007).

ous sunny slopes. The observations regarding *B. brevicaulis* refer to calcareous stony screes, where the plant grows towards and above the tree line, composed

by *Larix decidua* Mill. and *Pinus mugo* Turra subsp. *uncinata* (Ramond ex DC.) Domin. Plants of *B. laevigata* were not found at any of the sites where *A. eu-*

Tab. 2 Altitudinal distribution of observations.

Host plant	N	Elevation (m a.s.l.)	Min	Max
		Mean		
<i>E. nasturtiiifolium</i>	57	1363.1 (SD=222.0)	1026	1837
<i>B. brevicaulis</i>	11	1736.9 (SD=183.8)	1453	2063

SD, standard deviation.

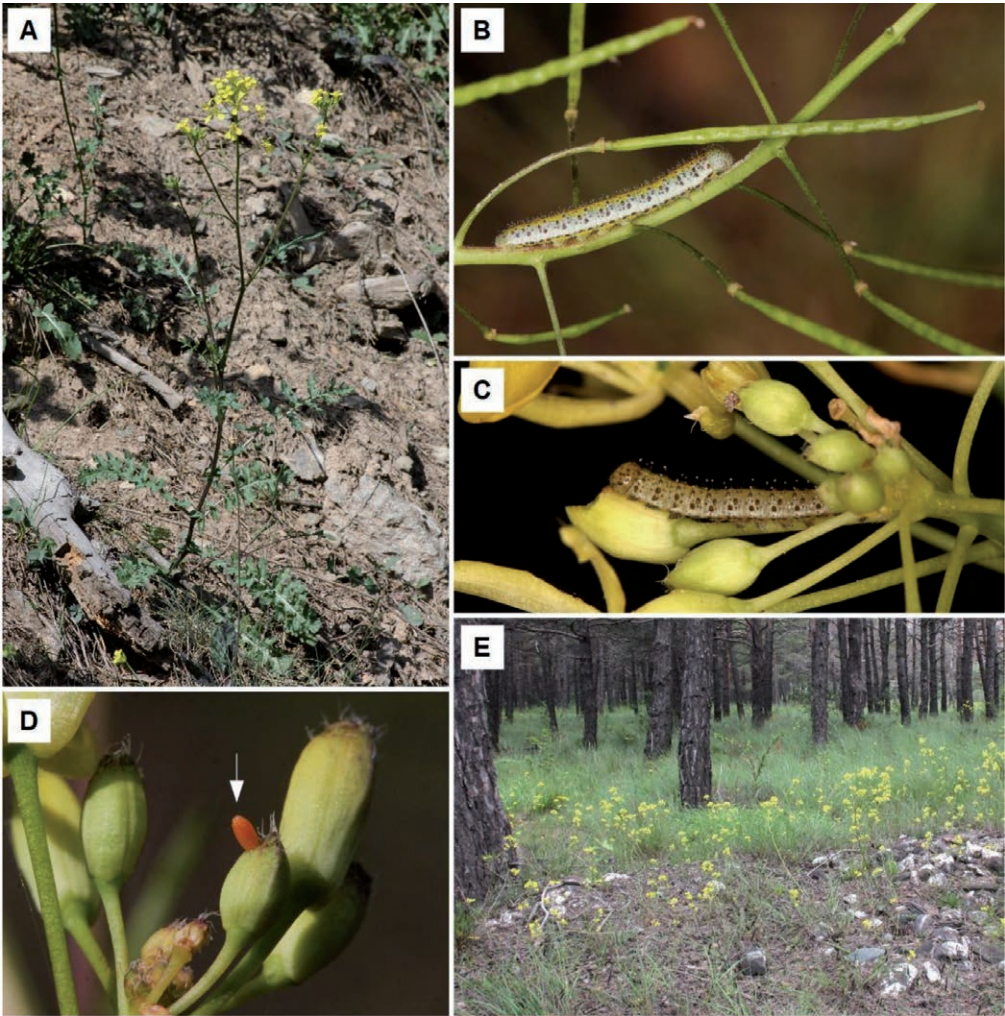


Fig. 3. Reproduction of *A. euphenoides* on *E. nasturtiiifolium*. A) Flowering host plant individual (June 11th, 2023); B) mature caterpillar feeding on the raceme, the characteristic elongated siliques are visible (July 2nd, 2024); C) immature caterpillar feeding on a bud (June 26th, 2024); D) egg laid a few days ago (June 16th, 2023); E - habitat consisting of a terrace hosting low-density Scots pine (*P. sylvestris*) woodland, within a large floodplain of the Dora Riparia River (June 7th, 2023).

phenoides was found, despite being quite common in the pastures of the Susa Valley (pers. obs.), and more generally in the Alps (Aeschimann *et al.*, 2004). Despite several checks, *A. euphenoides* has never been observed in areas hosting a high number of individuals of this plant.

The presence of *A. euphenoides* was not recorded in two of the seven 10×10 km cells where it had previously been reported (Fig. 2 and Tab. 3) (Giorna, 1791; Ghiliani, 1852; Curò, 1874;

Rowland Brown, 1899; Rocci, 1911; Gribodo, 1920, Verity, 19926, 1947; Rocca, 1948; Storace, 1962; Balletto & Toso, 1978; Hellmann & Bertaccini, 2004; Balletto *et al.*, 2007; Hellmann & Parenzan, 2010). However, few individuals of *E. nasturtiifolium* were present in these cells. For example, 12 plants of this species were recorded in the precise toponym Fontana Maubert (Meana di Susa), indicated by Verity (1947), Rocca (1948), and Balletto *et al.* (2007), in a now dense mixed forest.

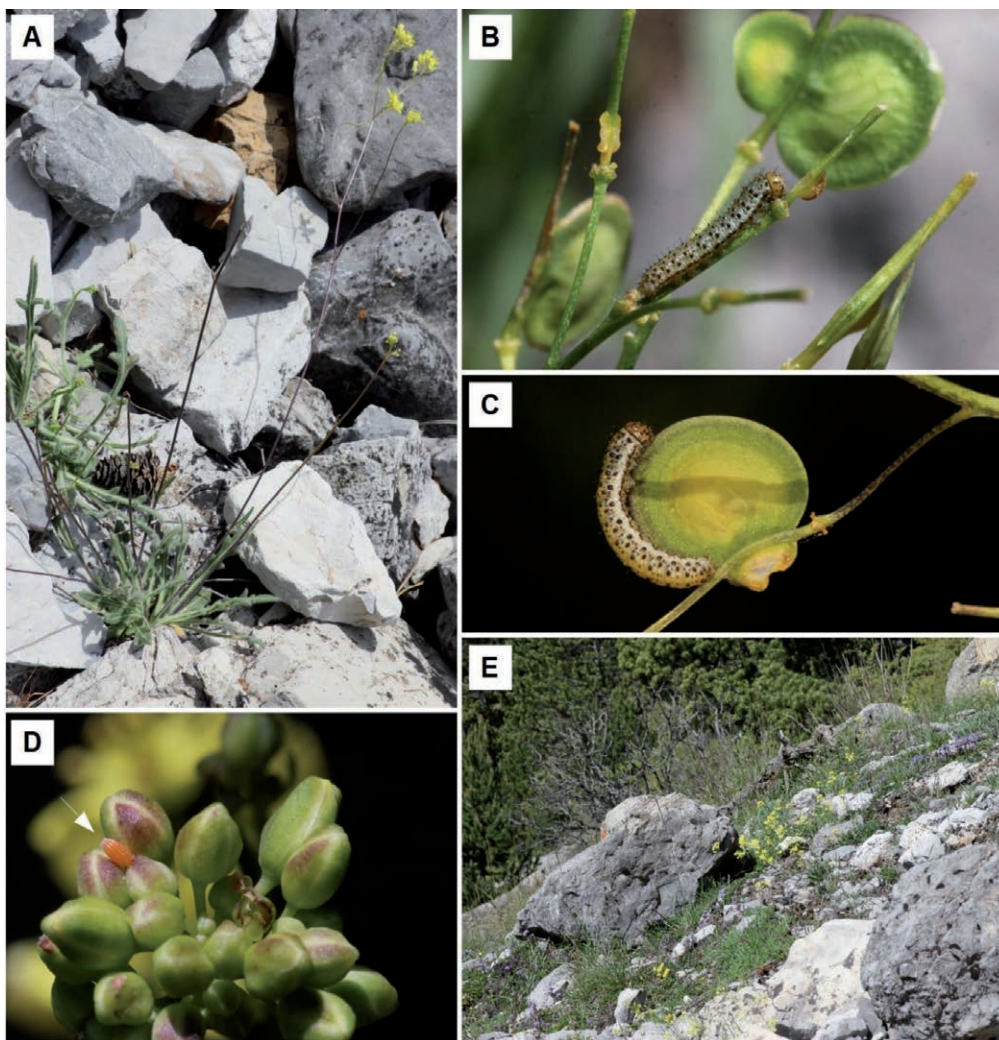


Fig. 4. Reproduction of *A. euphenoides* on *B. brevicaulis*. A) Flowering host plant individual (June 18th, 2024); B) immature caterpillar feeding on the raceme, with the characteristic discoidal siliques (July 15th, 2023); C) immature caterpillar feeding on a silique (July 4th, 2024); D) egg laid a few days ago (June 15th, 2023); E) habitat consisting of a calcareous scree slope colonized by pioneer vegetation (June 15th, 2023).

Tab. 3. Summary of previous records collected from the literature. The included toponyms and corresponding bibliographic references are listed for each 10×10 km grid cell provided by Balletto *et al.* (2007). For each cell, the presence detected during surveys and the associated host plant are reported. Any observed residual presence of host plants is indicated for cells where no presence was detected.

Cell	Toponym	Reference	<i>A. euphenoides</i>	Host plant	
				<i>E. nasturtifolium</i>	<i>B. brevicaulis</i>
LQ19	Bardonecchia	Rocci (1911), Verity (1947), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Balletto <i>et al.</i> (2007)	x	x	x
LQ29	Bardonecchia	Rocci (1911), Verity (1947), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Balletto <i>et al.</i> (2007)	x	x	
	Oulx	Ghiliani (1852), Curò (1874), Rowland Brown (1899)*, Rocci (1911), Verity (1926, 1947), Rocca (1948), Storace (1962), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Balletto <i>et al.</i> (2007), Hellmann & Parenzan (2010)	x	x	
LQ39	Oulx	Ghiliani (1852), Curò (1874), Rowland Brown (1899)*, Rocci (1911), Verity (1926, 1947), Rocca (1948), Storace (1962), Balletto and Toso (1978), Hellmann & Bertaccini (2004), Balletto <i>et al.</i> (2007), Hellmann & Parenzan (2010)	x	x	
	Salbertrand	Rocca (1948)	x	x	
	near Forte Pramand (Salbertrand)	Hellmann & Bertaccini (2004)	x	x	
	Exilles	Giorna (1791), Rocci (1911), Curò (1874), Verity (1947), Rocca (1948)		x	
	San Colombano (Exilles)	Gribodo (1920); Verity (1947)		x	
LQ49	Susa	Ghiliani (1852), Gribodo (1920), Verity (1947), Giorna (1971),		x	
	Meana di Susa	Gribodo 1920, Verity (1947), Balletto & Toso (1978)		x	
	Fontana Maubert (Meana di Susa)	Verity (1947), Rocca (1948), Balletto <i>et al.</i> (2007)		x	
LQ28	Oulx	Ghiliani (1852), Curò (1874), Rowland Brown (1899)*, Rocci (1911), Verity (1947), Rocca (1948), Storace (1962), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Balletto <i>et al.</i> (2007), Hellmann & Parenzan (2010)	x	x	
	Cesana Torinese	Verity (1926, 1947), Storace (1962), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Hellmann & Parenzan (2010),	x	x	
	Balbiere (Cesana Torinese)	Hellmann & Bertaccini (2004)	x	x	
	Desertes (Cesana Torinese)	Hellmann & Parenzan (2010)	x	x	

Continua nella pagina seguente

Tab. 3. *Segue dalla pagina precedente.*

LQ38	Oulx	Ghiliani (1852), Curò (1874), Rowland Brown (1899)*, Rocci (1911), Verity (1926, 1947), Rocca (1948), Storace (1962), Balletto & Toso (1978), Hellmann and Bertaccini (2004), Balletto <i>et al.</i> (2007), Hellmann and Parenzan (2010)	x	
	Cesana Torinese	Verity (1926, 1947), Storace (1962), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Hellmann & Parenzan (2010)	x	
	Sestriere	Storace (1962), Balletto <i>et al.</i> (2007)	x	x
LQ27	Cesana Torinese	Verity (1926, 1947), Storace (1962), Balletto & Toso (1978), Hellmann & Bertaccini (2004), Hellmann & Parenzan (2010)	x	x
	Claviere	Gianelli (1890), Rocci (1911), Verity (1947), Rocca (1948), Hellmann & Bertaccini (2004)	x	x

*The record states “on the Mont Cenis Road, on June 24th, at about 3500 ft”. However, the manuscript incorrectly reports the author crossing the Col du Mont Cenis to reach Oulx from Briançon, whereas the route actually crosses the Col du Montgenèvre. We have therefore attributed this observation to the Montgenèvre road at approximately 1067 m, which falls within the Oulx territory.

The same plant was also present sporadically along some roadsides and along the reaches of the Dora Riparia River in the municipality of Exilles, where *A. euphenoides* was reported in the past by several authors (Giorna, 1791; Curò, 1874; Rocci, 1911; Gridodo, 1920; Verity, 1947; Rocca, 1948). Finally, a few individuals of *E. nasturtiifolium* and *B. brevicaulis* were also present near Sestriere (Storace, 1962, Balletto *et al.*, 2007), but *A. euphenoides* was not found there despite numerous surveys. Overall, 15 observations were recorded within protected areas. The species was reconfirmed in all the protected areas where it had been previously reported, including IT1110049 “Les Arnaud e Punta Quattro Sorelle,” IT1110040 “Oasi xerotermica di Oulx - Auberge,” IT1110043 “Pendici del Monte Chaberton” and IT1110042 “Oasi xerotermica di Oulx - Amazas” (Sindaco *et al.*, 2009). Its presence was also recorded a few hundred meters away from IT1110010 “Gran Bosco di Salbertrand”.

DISCUSSION AND CONCLUSIONS

The reproduction of *A. euphenoides* was recorded at a maximum elevation of 2055 m, which is about 300 m higher than previously reported in the study area (Hellmann & Bertaccini, 2004; Hellmann &

Parenzan, 2010). This could be due to either a previous under-sampling of the species or a response to the rising temperatures observed in recent decades in the Alps (Auer *et al.*, 2007; Gobiet *et al.*, 2014; Begert & Frei, 2018), which have led many butterfly species to shift their range to higher altitudes (Rödder *et al.*, 2021; Habel *et al.*, 2023; Kerner *et al.*, 2023).

Our findings suggest that *A. euphenoides* in the Susa Valley primarily utilizes *E. nasturtiifolium* as its main host plant. Conversely, the use of *B. brevicaulis* was recorded in few sites (Fig. 2 and Tab. 3). However, gravelly slopes where this latter plant typically grows were more difficult to survey, so its use may only appear less frequent. The reproduction of *A. euphenoides* on *E. nasturtiifolium* in Italy is reported here for the first time. However, Balletto *et al.* (2023), in their recent comprehensive monograph on Italian butterflies, indicated a question mark regarding this plant, suggesting a potential use in Italy as well. Its utilization was already reported in the nearby French Pre-Alps, where Lafranchis *et al.* (2015) documented a pre-imaginal stage on this plant, describing this event as occasional. Palanca Soler & Galante (1977) and García-Barros *et al.* (2013) also mentioned this host plant for Spain. The use of *B. brevicaulis* instead represents unpublished information for the species.

Hellmann & Bertaccini (2004) indicated *B. laevigata* as the host plant for the population of *A. euphe-*

noides object of this research, along with *B. ambigua*, *B. didyma* and *B. dentata*, which probably refer to *Biscutella laevigata* var. *dentata* Gren. & Godr., synonymous with *B. laevigata* (Govaerts, 2024). According to our observations, the use of *B. laevigata* is instead highly unlikely in the study area, as despite it being rather common, this plant has never been observed in presence sites. Regarding the other two plants, their distribution does not include the area covered by this study: *B. ambigua* is found in western Liguria and Provence, while *B. didyma* is present in southern Italy (Pignatti, 2017; Bartolucci *et al.*, 2018). Regarding potential sources of confusion, the only shared characteristic between *E. nasturtiifolium* and *B. laevigata* is the bright yellow color of the flowers. In contrast, the overall appearance of the plants is quite distinct, as *E. nasturtiifolium* is notably larger than plants of the genus *Biscutella*, with noticeable differences in the shape of leaves and fruits (Pignatti, 2017). The differences between *B. brevicaulis* and other plants of its genus are instead more subtle, since the latter has a smaller overall size especially of the leaves (Raffaelli, 1986; Pignatti, 2017). We tend to exclude a change in the hosts preferences that occurred over time, as few individuals of *E. nasturtiifolium* were also present even in areas where the species now appears to be locally extinct. Furthermore, it can be excluded that these plants spread in the study area recently. Indeed, in the comprehensive monograph concerning the flora of the Val di Susa written by Re *et al.* (1881), *E. nasturtiifolium* (indicated by the author as *E. obtusangulum* Reich) was reported as present at the end of the 19th century along roads, in sandy areas near water, and in pastures of the study area, *i.e.*, in environmental condition that roughly corresponds to what can still be observed today. This work also referred to *B. brevicaulis* (indicated by the authors as *B. coronopifolia* Re-All.) at high altitude near Cessana, which is a toponym that overlaps with what can be also observed today. This species was previously considered endemic to France, then confirmed in Italy only in the upper Susa Valley (Raffaelli, 1986). Its distribution precisely coincides with the areas where the reproduction of *A. euphenoides* has been documented through this study. Overall, the presence of the recorded host plants was already certain at the end of the 19th century in the study area, *i.e.*, a few decades later and before the first records of *A. euphenoides* (Giorna, 1791; Curò, 1874; Ghiliani, 1852; Rocci, 1911; Gridodo, 1920). According to these considerations, we sug-

gest that a genuine misidentification of plant species may have occurred in the past, and that the information was subsequently transcribed without further verification. In this regard, the host plants reported by Hellmann & Bertaccini (2004) coincide with those listed in earlier publications by Verity (1905, 1947), more than half a century before the publication of the identification keys used in this study.

Given its conspicuousness, which makes it unlikely to be overlooked if present, we believe that *A. euphenoides* was not present in historical sites where it was not detected through our specific investigations. The species was not observed in two of the seven 10×10 km cells where it had been previously recorded. Furthermore, a review of the GBIF (www.gbif.org), iNaturalist (www.inaturalist.org), and Observation (www.observation.org) databases revealed no records for these cells. These data suggest a potential contraction in its distribution in the Susa Valley, as recently reported for central Italy (Balletto *et al.*, 2015; Balletto *et al.*, 2016). In historical sites where the species appears to be locally extinct, but a few individuals of potential host plants persist, we hypothesize that host plant abundance has decreased, reaching a number insufficient to support the persistence of the species, as *A. euphenoides* typically lays only one or a few eggs per plant (Balletto *et al.*, 2023). This decrease may have been caused by woody encroachment, a common consequence of land abandonment in mountainous areas (Tasser & Tappeiner, 2002; Tasser *et al.*, 2005), which represents one of the main drivers of changes in butterfly communities in the Alps over the past 40 years (Bonelli *et al.*, 2022).

From a conservation perspective, the identification of local host plants could constitute a basis for developing management strategies aimed at preserving the *A. euphenoides* population of the Susa Valley. Conservation measures should be applied at least in the protected areas where the species is present. Essential information on the distribution and ecology of host plants is summarized below, along with key recommendations for management aimed at conserving them in suitable habitats for *A. euphenoides*.

- *E. nasturtiifolium*: in Italy, it is distributed in the northern part, where it is more commonly found in riverbanks, gravel deposits, ruins, and railway embankments, between 200 and 2000 m of elevation (Pignatti, 2017). In France, it is distributed from 0 to 2200 m, mainly on the Jura, Alps, and

Pyrenees, where it mainly occupies steppe grasslands, scree, and secondarily in eutrophic wastelands, on calcareous soils (Tison & De Foucault, 2014). According to our observations, this species in the Susa Valley grows on roadside margins, artificial sand accumulations, riverbanks and, overall, in sparse Scots pine woodlands of south-facing slopes and river terraces. In these latter habitats, *A. euphenoides* seems to find higher densities of this host plant. To preserve the plant in these conditions, we suggest avoiding grazing and mowing in presence sites during its vegetative period (April-July), maintaining low-density woodlands by applying forest thinning, and, above all, maintaining the natural dynamics of floodplains to allow the renewal of succession stages suitable for the species.

- *B. brevicaulis*: in Italy, it is exclusively reported from a few areas in the upper Susa Valley, where it selects calcareous scree at altitudes between 1400 and 2700 m of elevation (Raffaelli, 1986, Pignatti, 2017). In France, its range extends south-east, mainly within the PACA and Rhône-Alpes administrative regions, where it occupies mobile to more stable screes and calcareous rocky mead-

ows between 1200-2200 m of elevation (Tison & De Foucault, 2014). Furthermore, it is considered an indicator of calcareous rocky slopes with chas-mophytic vegetation, a protected habitat (code 8120) listed in Annex I of the Habitats Directive 92/43/EEC (Bensettiti *et al.*, 2004). According to Raffaelli (1986), it constitutes a pioneer species which tends to become dominant in shifting gravel habitats, while it tends to disappear in increasingly stabilized soils. The sites where we recorded the presence of *A. euphenoides* associated with this plant consisted of rocky calcareous slopes with sparse coniferous tree cover. To preserve the host plant in this condition, we suggest maintaining the mobility of the slopes occupied by the species, avoiding stabilization measures that could lead to the loss of natural renewal of suitable habitats.

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Massimo TOMBESI*

Descrizione di un ibrido naturale tra *Percus passerinii* (Dejean, 1828) e *Percus dejeanii* (Dejean, 1831) delle Marche (Coleoptera, Carabidae, Pterostichinae)

Riassunto: Viene descritto un *Percus* (Coleoptera, Carabidae) censito nelle Marche (Italia centrale), che mostra caratteri morfologici intermedi tra *Percus* (*Percus*) *passerinii* (Dejean, 1828) e *Percus* (*Percus*) *dejeanii* (Dejean, 1831), e pertanto probabile ibrido naturale tra le due specie. Si tratta del primo ibrido descritto tra specie diverse del genere *Percus* Bonelli, 1810.

Abstract: Description of a natural hybrid between *Percus passerinii* (Dejean, 1828) and *Percus dejeanii* (Dejean, 1831) from the Marche region (Coleoptera, Carabidae, Pterostichinae).

A *Percus* (Coleoptera, Carabidae) sampled in the Marche region (central Italy) showing intermediate features between *Percus* (*Percus*) *passerinii* (Dejean, 1828) and *Percus* (*Percus*) *dejeanii* (Dejean, 1831) is described as a probable natural hybrid. This is the first report of a hybrid between different *Percus* Bonelli, 1810 species.

Key words: *Percus*, Natural hybrid, Marche, Italy.

INTRODUZIONE

Nell'ambito della famiglia dei Coleotteri Carabidi, sono conosciuti numerosi ibridi naturali tra specie del genere *Carabus* Linnaeus, 1758 (Cavazzuti & Ghiretti, 2020; Deuve, 2021), alcuni dei quali noti in esemplari unici, ma diversi altri di non eccezionale ritrovamento (Casale *et al.*, 1982; Cavazzuti, 2004; Casale & Rapuzzi, 2015) o addirittura relativamente frequenti (Mossakowski *et al.*, 1990). Le segnalazioni di ibridi tra specie di altri generi di Carabidi sono invece quasi assenti, e non è chiaro in che misura ciò dipenda da una reale maggiore rarità (biologicamente poco plausibile) rispetto agli ibridi tra *Carabus*, da una maggiore difficoltà di riconoscimento tra specie congeneri e conviventi assai simili (evenienza che non sarebbe invece sorprendente), o infine solo dalla minore mole di ricerche e studi effettuati, rispetto a quella di cui sono da molto tempo fatti oggetto i *Carabus*.

Per quanto attiene la fauna italiana, l'unica segnalazione che mi è nota riguarda 5 esemplari di ibridi tra *Pterostichus* (*Oreophilus*) *flavofemoratus* (Dejean, 1828) e *P. (Oreophilus)* *externepunctatus* (Dejean, 1828) della Val Grande di Lanzo (Allegro, 2022).

È quindi con una certa sorpresa che ho constatato il ritrovamento di un probabile ibrido naturale *Percus* (*Percus*) *passerinii* (Dejean, 1828) × *Percus*

(*Percus*) *dejeanii* (Dejean, 1831) nell'ambito di ricerche effettuate personalmente nella primavera ed estate del 2023 nell'entroterra marchigiano, dove le due specie sono presenti, con *P. passerinii* abbondante a quote boschive collinari e *P. dejeanii* più frequente invece a quote maggiori e in prateria, ma comunque presente in alcune zone anche a medie quote e in sintopia con il congenere.

L'esemplare, unico, è stato censito in una trappola a caduta innescata con aceto e sale, posizionata tra metà giugno e metà luglio 2023, in una zona boscosa della provincia di Ascoli Piceno, a circa m 650 s.l.m., al margine della strada che congiunge Force alla frazione Quinzano (coordinate GPS 42.949607°N, 13.474503°E). Nella medesima trappola erano presenti 25 esemplari di *P. passerinii* e 3 di *P. dejeanii*, più l'esemplare in questione, apparso di incerta determinazione al momento della rimozione della trappola e risultato avere caratteristiche intermedie tra le due specie, una volta esaminato attentamente a domicilio.

DESCRIZIONE DELL'IBRIDO

Si tratta di un *Percus* di sesso maschile, con habitus intermedio tra *P. passerinii* e *P. dejeanii* (Fig. 1). La lunghezza è di 28.5 mm mandibole incluse. Esem-

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plari di *P. passerinii* raccolti in altre località a più alta quota, sopra i 1000 m, possono essere di lunghezza minima attorno a 28 mm, ma tutti quelli che erano nella medesima trappola sono lunghi da 31 a 36 mm. I 3 esemplari di *P. dejeanii* raccolti hanno una lunghezza compresa tra 25 e 29 mm.

Testa e antenne non presentano caratteri distintivi rispetto alle specie parentali.

Il pronoto dell'esemplare ibrido è subquadrato, meno allungato di quello di *P. passerinii*, ma non trasverso e tozzo come in *P. dejeanii*. Gli angoli posteriori, dopo la sinuatura dei margini laterali, sono retti

come in *P. passerinii*, mentre sono in genere leggermente ottusi in *P. dejeanii*.

La conformazione delle elitre offre i maggiori caratteri distintivi intermedi: nel probabile ibrido, le elitre, con massima larghezza al terzo posteriore, sono nettamente meno larghe che in *P. dejeanii*, ma non a lati paralleli, come avviene costantemente in *P. passerinii* nei $\frac{3}{4}$ anteriori. Sul disco, la convessità è intermedia tra quella di *P. dejeanii*, che ha elitre più convesse, e quella di *P. passerinii*, che le presenta pressoché piatte.

Le elitre dell'esemplare ibrido presentano inol-

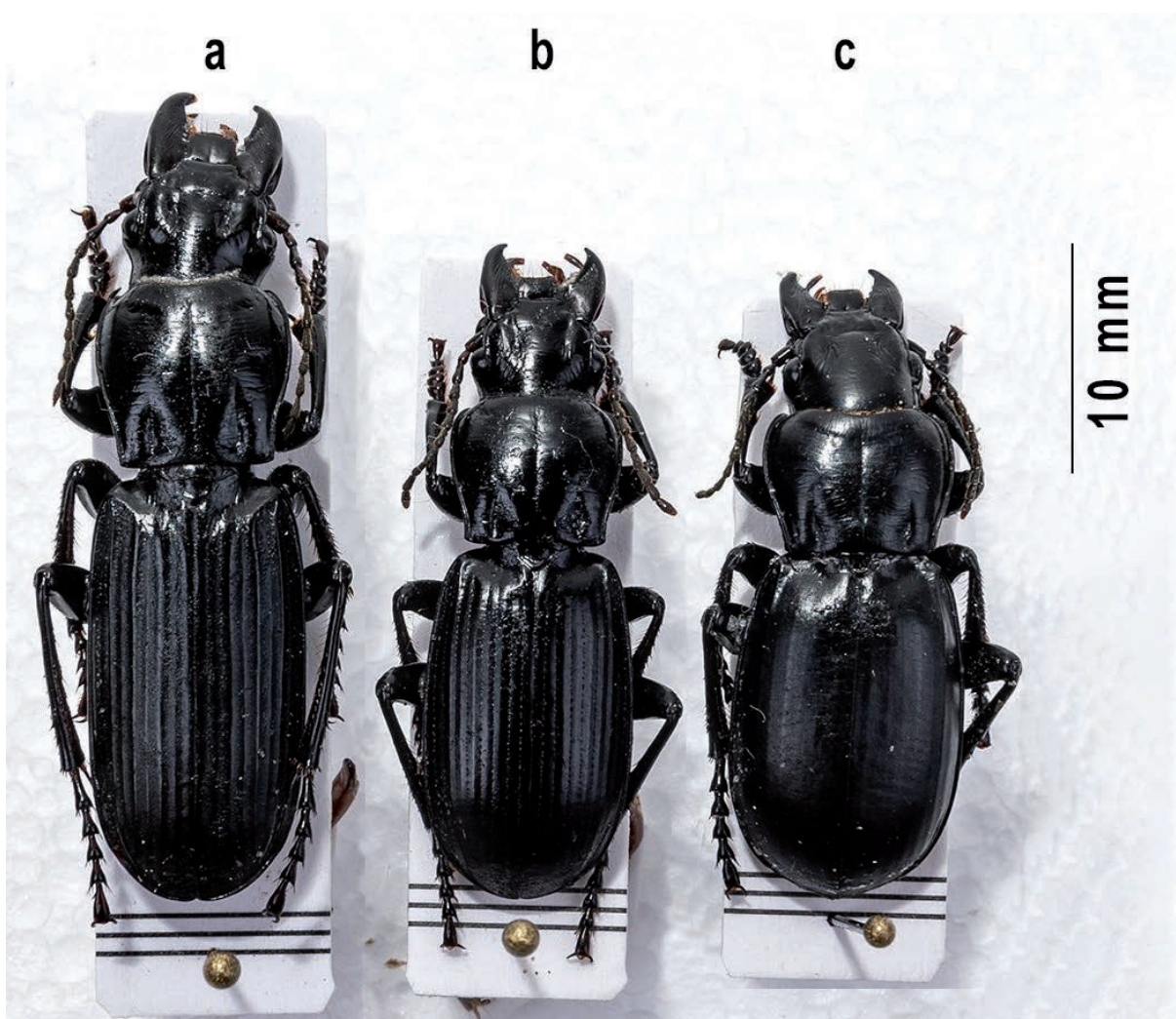


Fig. 1. A) *P. passerinii*; b) probabile esemplare ibrido; c) *P. dejeanii*. I tre esemplari provengono tutti dalla medesima località indicata nel testo.

tre evidenti strie punteggiate, ben visibili anche a occhio nudo, ma sono del tutto lisce, come in *P. dejeanii*, senza le interstrie più o meno sollevate in coste come in *P. passerinii*. Anche *P. dejeanii* presenta una punteggiatura delle strie, variabile ma di solito finissima, spesso visibile solo con adeguato ingrandimento.

La base delle elitre è simile a quella di *P. dejeanii*: lievemente infossata, e senza la netta ed evidente carenatura che in *P. passerinii* inizia dall'angolo omerale e si congiunge obliquamente con il solco elitrale della terza interstria. Il breve solco con punti setigeri sulla parte apicale esterna delle elitre dell'ibrido non differisce da quello delle due specie. La punteggiatura dell'ottava stria è marcata come quella delle altre strie.

I tarsomeri mediani e posteriori sono appena più sottili di quelli di *P. dejeanii*, mentre in *P. passerinii* sono distintamente più esili e più allungati.

Le Figs. 2-4 mostrano gli edeagi di esemplari della medesima località di raccolta dell'ibrido.

In visione laterale, il lobo mediano dell'edeago del probabile ibrido (Fig. 3a) è più simile a quello del *P. dejeanii* (Fig. 4a), per la mancanza del rigonfiamento della parte mediana presente nell'edeago del *P. passerinii* (Fig. 2a). Inoltre, la curvatura della parte basale del lobo mediano è, come nel *P. dejeanii*, meno accentuata rispetto a quella presentata dal *P. passerinii*.

Al contrario, in visione frontale, il lobo mediano dell'edeago del probabile ibrido (Fig. 3b) è più simile a quello del *P. passerinii* (Fig. 2b), per la minore flessione verso destra della metà apicale, rispetto a quella più marcata rilevabile nell'unico esemplare maschio di *P. dejeanii* (Fig. 4b) raccolto nella medesima località.

Indipendentemente dal confronto con l'edeago del probabile ibrido, va comunque sottolineato che, in mancanza di studi sull'eventuale variabilità morfologica dell'edeago di *P. dejeanii* e *P. passerinii*, le differenze dette non possono essere estrapolate con certezza ad altre popolazioni delle due specie. L'esemplare è conservato nella collezione dell'autore.

CONCLUSIONI

Ipotizzando che il numero degli individui censiti nella trappola rifletta approssimativamente la frequenza di *P. passerinii* e di *P. dejeanii* nella zona di cattura, se ne deduce che *P. passerinii* presenterebbe

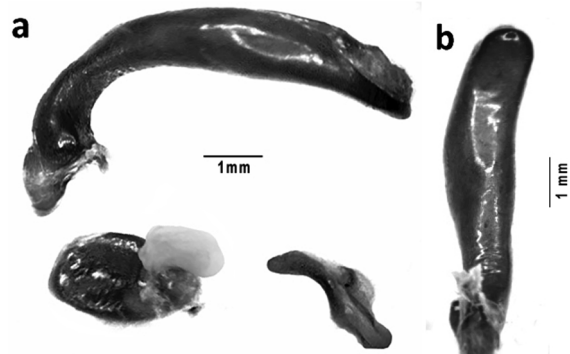


Fig. 2. Edeago di *P. passerinii*. a) visione laterale con parameri; b) lobo mediano in visione frontale.



Fig. 3. Edeago del probabile ibrido. a) visione laterale con parameri; b) lobo mediano in visione frontale.

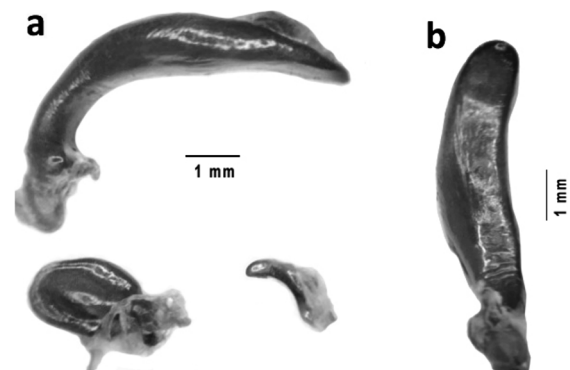


Fig. 4. Edeago di *P. dejeanii*. a) visione laterale con parameri; b) lobo mediano in visione frontale.

una popolazione circa 8 volte maggiore di quella di *P. dejeanii*. Ne consegue una delle condizioni teoricamente facilitanti l'ibridazione: quella in cui tra due specie vicine una è nettamente più rara e quindi la popolazione tra un maschio della specie più rara con una femmina di quella più comune può avvenire con maggiore probabilità.

Si tratta di uno dei pochissimi ibridi noti tra specie di Carabidi al di fuori di quelli del genere *Carabus*, e il primo descritto tra due specie del genere *Percus*. Tenuto conto del vasto areale di sovrapposizione della distribuzione nell'Italia centrale di *P. passerinii* e *P. dejeanii*, sintopici in diverse zone, non si può escludere che la mancanza di segnalazioni precedenti possa essere dovuta, oltre che ad una vera ecce-

zionalità dell'ibridazione, anche al mancato riconoscimento, nel caso in cui un ibrido assomigliasse maggiormente all'una o all'altra specie e non fosse stato esaminato accuratamente. Non appare invece verosimile, stanti le caratteristiche descritte, che l'esemplare riconosciuto come ibrido possa essere un individuo aberrante malformato di una o dell'altra specie, né tantomeno una specie nuova.

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Roberto VANZINI*

Prima segnalazione di *Sphenophorus placidus vestitus* Chittenden, 1904 per l'Albania (Coleoptera, Dryophthoridae)

Riassunto: L'autore riporta per la prima volta il ritrovamento di una coppia di *Sphenophorus placidus vestitus* Chittenden, 1904 per l'Albania (Vlorë) sotto *Cakile maritima* Scop.

Abstract: First record of *Sphenophorus placidus vestitus* Chittenden, 1904 for Albania.

The author first reports the finding of a pair of *Sphenophorus placidus vestitus* Chittenden, 1904 for Albania (Vlorë) under *Cakile maritima* Scop.

Key words: Coleoptera, Curculionoidea, Dryophthoridae, *Sphenophorus*, Albania.

INTRODUZIONE

Viene segnalata per la prima volta la presenza di *Sphenophorus placidus vestitus* Chittenden, 1904 in Albania. La specie risulta introdotta in Europa, Asia e Nordafrica dove è segnalata solamente del Marocco (Pelletier, 2005; Alonso-Zarazaga & Sanchez-Ruiz, 2009).

MATERIALI E METODI

Per la nomenclatura è stato utilizzato il CCPC2 Alonso-Zarazaga *et al.* (2023). Questa sottospecie è stata descritta da Chittenden nel 1904 come *Sphenophorus vestitus* con località tipica Stati Uniti. Nel 1951 Vaurie la tratta come sottospecie e pone in sinonimia *S. placidus* Say, 1832 con *S. venatus* Say, 1832 (Vaurie, 1951: 118). Prena, nel 2018 chiarisce la situazione, dopo aver studiato il materiale tipico di Say (Prena, 2018: 280) rivalidando *Sphenophorus placidus* Say, 1832.

Le foto sono state scattate con una fotocamera Canon 6d con l'ausilio di una lente AICO-PSL 1:3,5 ed elaborate con il programma di stacking Helicon Focus 8 e Faststone image review.

NUOVI DATI

Durante un viaggio effettuato in Albania ho avuto modo di indagare diverse zone nel paese. In par-

ticolare ho raccolto 2 esemplari di *S. placidus vestitus* (Fig. 1) sulla spiaggia di Vlorë, sotto *Cakile maritima* Scop. (Fig. 2). La località si trova nel sud dell'Albania, nell'omonimo distretto. Ha di fronte l'isola di Sazan e alle spalle una collina su cui è situata la piccola frazione di Kaninë.

Il materiale derivato dalla ricerca è il seguente:

Albania: distretto di Vlorë: Vlorë, spiaggia, 40°44'22" N; 19°49'51" E 29.VI.2024, R. Vanzini sotto *Cakile maritima* Scop. 2 esemplari (1♂, 1♀)

DISCUSSIONE

Sphenophorus Schoenherr, 1838 è un genere che conta 10 specie nell'ecozone paleartica di cui 3 risultano introdotte (*S. costipennis* Horn, 1873; *S. placidus placidus* (Say, 1832); *S. placidus vestitus* Chittenden, 1904). Delle 10 specie, 3 risultano già segnalate per l'Albania e sono *S. abbreviatus* (Fabricius, 1787), *S. meridionalis* Gyllenhal, 1838 e *S. piceus* (Pallas, 1771).

Sphenophorus placidus vestitus Chittenden, 1904 è una specie di origine nearctica che è stata recentemente segnalata in diversi stati europei risultando così in evidente espansione ed è stata rinvenuta in particolare a Cipro (Kakouris *et al.*, 2022), Grecia (Korotyaev & Apt, 2019), Spagna (Alonso-Zarazaga & Sanchez-Ruiz, 2009), Francia (Orousset *et al.*, 2008; INPN, 2021), Italia (Sardegna) (Diotti *et al.*, 2024).

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Fig. 1. Habitus del maschio di *Sphenophorus placidus vestitus* Chittenden, 1904, (8,00 mm) Vlorë, spiaggia (40°44'22" N; 19°49'51" E).

Questa specie si sviluppa su piante erbacee e prati. Sono stati effettuati in maniera efficace dei campionamenti tramite trappole semplicemente mettendo dell'erba dentro una vaschetta di plastica, i risultati ne hanno confermato l'efficacia (Hatsukade, 1997).

Per l'Albania si tratta del primo rinvenimento.

CONCLUSIONI

Il ritrovamento di *S. placidus vestitus* Chittenden, 1904 in Albania conferma come la specie sia in



Fig. 2. Pianta sotto cui è stato ritrovato *Sphenophorus placidus vestitus* Chittenden, 1904: *Cakile maritima* Scop.

rapida espansione nel continente europeo e sono attese sicuramente nuove segnalazioni per il futuro.

RINGRAZIAMENTI

Voglio esprimere la mia gratitudine all'amico Enzo Colonnelli (Roma) per la conferma dell'identità della specie e per la revisione del presente .

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REPERTI. 4 ♂♂, 2 ♀♀, Lombardia (CR), Casalmaggiore, Isola di Fossacaprara, 9.IV.2023, Luca Bodei legit et det.; 3 ♂♂, 1 ♀, stessi dati, ma 10.IV.2023. La determinazione è stata controllata mediante estrazione degli eideagi; esemplari tutti in coll. Bodei.

OSSERVAZIONI. La specie, endemica italiana, è diffusa nelle regioni meridionali, e si spinge a nord fino al Piemonte e all'Emilia-Romagna. Si segnala ulteriore presenza in territorio lombardo, nella provincia cremonese, sulla sinistra idrografica del fiume Po, dove sino ad oggi non risultavano reperti.

Monzini (2008) segnala la specie, sulla destra idrografica del fiume, nei territori di Oriolo e Salice Terme.

Gli esemplari sopra citati, sono stati rinvenuti in un piccolo biotopo ben conservato, lontano da attività umane; è possibile che, grazie alle forti secche estive, la specie sia riuscita a colonizzare quei tratti golenali finora esclusi dal proprio areale.

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650 - *Zizeeria karsandra* (Moore, 1865) (Lepidoptera, Lycaenidae, Polyommatainae)

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REPERTI. 3 ♂, Italia, Sicilia, Pantelleria, Kuddie Rosse, 33 m, 36°49'0.20"N - 11°55'47.46"E, 25.X.2024, M. Coviello legit, M. Coviello G. Timossi det., Collezione G. Timossi; 1 ♂1 ♀, Italia, Sicilia, Pantelleria, Scauri, 25m, 36°46'13.78"N - 11°57'44.05"E, 26.X.2024, M. Coviello legit, M. Coviello G. Timossi det., Collezione G. Timossi.

OSSERVAZIONI. La prima segnalazione di questo taxon per l'Italia e l'Europa è quella di Bigot & Stempffer (1954) relativa alla Sicilia occidentale, a seguito di catture effettuate nei pressi di Marsala (TP). Successivamente la specie è stata citata di Lampedusa, sub *Zizeeria knysna* (Trimen, 1862), da Romano & Romano (1995) e in seguito da Romano (2020), presenza confermata da Cassar *et al.* sulla base di analisi genetiche (2022). Infine, del tutto recentemente, è stata rinvenuta a Linosa.

A Pantelleria *Z. karsandra* è stata trovata in due distinte aree dell'isola, in ambienti ruderali molto localizzati, osservata in un numero esiguo di esemplari in volo tra l'erba. Specie polivoltina, gli adulti volano tra fine febbraio e ottobre (Viborg, 2019): sebbene i siti siano stati visitati dagli autori anche nei mesi primaverili ed estivi, sono stati rinvenuti esemplari adulti solo nel mese di ottobre. Come suggerito da Rowlings & Cuvelier (2018) e Viborg (2019), pur trattandosi di una specie con scarsa vagilità (Larsen, 1986), condizioni climatiche poco favorevoli, tra cui periodi di siccità prolungati, possono indurre negli adulti fenomeni dispersivi verso aree con presenza di acqua e irrigui. La larva si alimenta a spese di alcune leguminose dei generi *Medicago* e *Melilotus* (Fiumi, 2007; Tolman & Lewington, 2014).

RINGRAZIAMENTI

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