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Phaenoglyphis "versus" *Hemicrisis*, and the description of a new sculptured species of Charipinae (Hymenoptera: Figitidae)

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Abstract. After comparing the morphology of the genus *Hemicrisis* Förster, 1869 and *Phaenoglyphis* Förster, 1869, and examining the sculpturing in this genus, the synonymy between *Hemicrisis* and *Phaenoglyphis* is re-established. The specific status of *Phaenoglyphis pubicollis* (Thomson, 1877) comb. n. is re-established and differentiated from *Phaenoglyphis ruficornis* (Förster, 1869) comb. n. A new species of Charipinae, *Phaenoglyphis evenhuisi* sp. n. is described from Andorra. It is characterized by the presence of sculpture on the mesonotum, a character only shared with *P. pubicollis*. Some illustrations are provided. Notes on all the sculptured Charipinae are provided as well as a key to the genera of Alloxystini.

INTRODUCTION

The Charipinae is a cosmopolitan subfamily of the Figitidae (Hymenoptera: Cynipoidea), which includes very small wasps and is divided into two tribes: the Alloxystini are hyperparasitoids of the Aphidiinae, braconids that parasitize Aphididae (Hemiptera) and the Charipini, hyperparasitoids of Chalcidoidea that parasitize Psyllidae (Hemiptera). Menke & Evenhuis (1991) discussed the characters that define these tribes. Eight Charipinae genera are recognized (Ronquist, 1999; Carver, 1993). The tribe Alloxystini includes *Alloxysta* Förster, 1869 (the most species rich genus of Charipinae), *Phaenoglyphis* Förster, 1869 and the monospecific genera *Hemicrisis* Förster, 1869, *Lytoxysta* Kieffer, 1909 and *Carvercharips* Kovalev, 1995. The tribe Charipini are represented by *Thoreauana* Girault, 1930, *Apocharips* Fergusson, 1986 and *Dilyta* Förster, 1869.

The Alloxystini are widely distributed throughout the world. *Alloxysta* and *Phaenoglyphis* are found on all continents (Andrews, 1978; Menke & Evenhuis, 1991; Carver, 1992; Paretas-Martínez & Pujade-Villar, 2005), though most of the species described are from Europe and North America. *Hemicrisis* includes a single species distributed in the Nearctic and occidental Palaearctic; this genus has always been problematic because it was synonymized several times with *Phaenoglyphis*. In the most recently published list of Charipinae genera (Ronquist, 1999), *Hemicrisis* is considered a valid genus. *Lytoxysta* includes a single species from North America. Finally, *Carvercharips* is known only from Australia. According to Carver (1992), members of Alloxystini are solitary obligate hyperparasitoids, endoparasitic in Aphidiinae (Hymenoptera: Ichneumonoidea: Braconidae) and *Aphelinus* Dalman, 1820 (Hymenoptera: Chalcidoidea: Aphelinidae), both of which are endoparasites of aphids (Hemiptera: Aphididae). This study of the *Hemicrisis*-*Phaenoglyphis* problem is based on several morphological characters, a description of a new species of *Phaenoglyphis* that is sculptured, as well as notes on all the sculptured Charipinae and a key to the Alloxystini genera.

The new species was collected using Malaise traps in Andorra (Pujade-Villar, 1996), a small country in the middle of the Pyrenean Mountains between France and Spain. Some other important catches by these traps have also resulted in the description of new taxa (Carles-Tolrá, 2001a,b; Quednau, 1999; Tschorsnig & Pujade-Villar, 1997).

MATERIAL AND METHODS

The material of *Hemicrisis* studied includes the type material, borrowed from NHMW (Naturhistorisches Museum, Wien, Austria), Palaearctic specimens from NHML (Natural History Museum, British Museum, London, England) and Nearctic specimens from CNCI (Canadian National Collection of Insects, Centre for Land and Biological Resources, Ottawa, Canada). The type material of *Allotria pubicollis*, borrowed from EMLU (Entomological Museum, Lund University, Lund, Sweden), was studied.

The new species was collected in Malaise traps around Santa Coloma (Andorra) in 1993. The type material is mounted on a card and has been deposited in UB (University of Barcelona; Dr. J. Pujade-Villar collection). The SEM pictures were taken at a low voltage (500 V) in order to preserve the specimen. Morphological terms used in the description follow Gibson (1985) and Ronquist & Nordlander (1989). Terms for sculpture follow Harris (1979). Abbreviations used are: F (flagellomer) and T (tergite).

Phaenoglyphis Förster, 1869 and *Hemicrisis* Förster, 1869

Hemicrisis is a problematic monotypic genus in the subfamily Charipinae. It was characterized by Förster (1869) as having short notauli. Because this character is variable in *Phaenoglyphis* Evenhuis (1973) synonymized *Hemicrisis* with *Phaenoglyphis* and commented extensively on other characters of both genera. Later Andrews (1978) re-established *Hemicrisis* based on the following

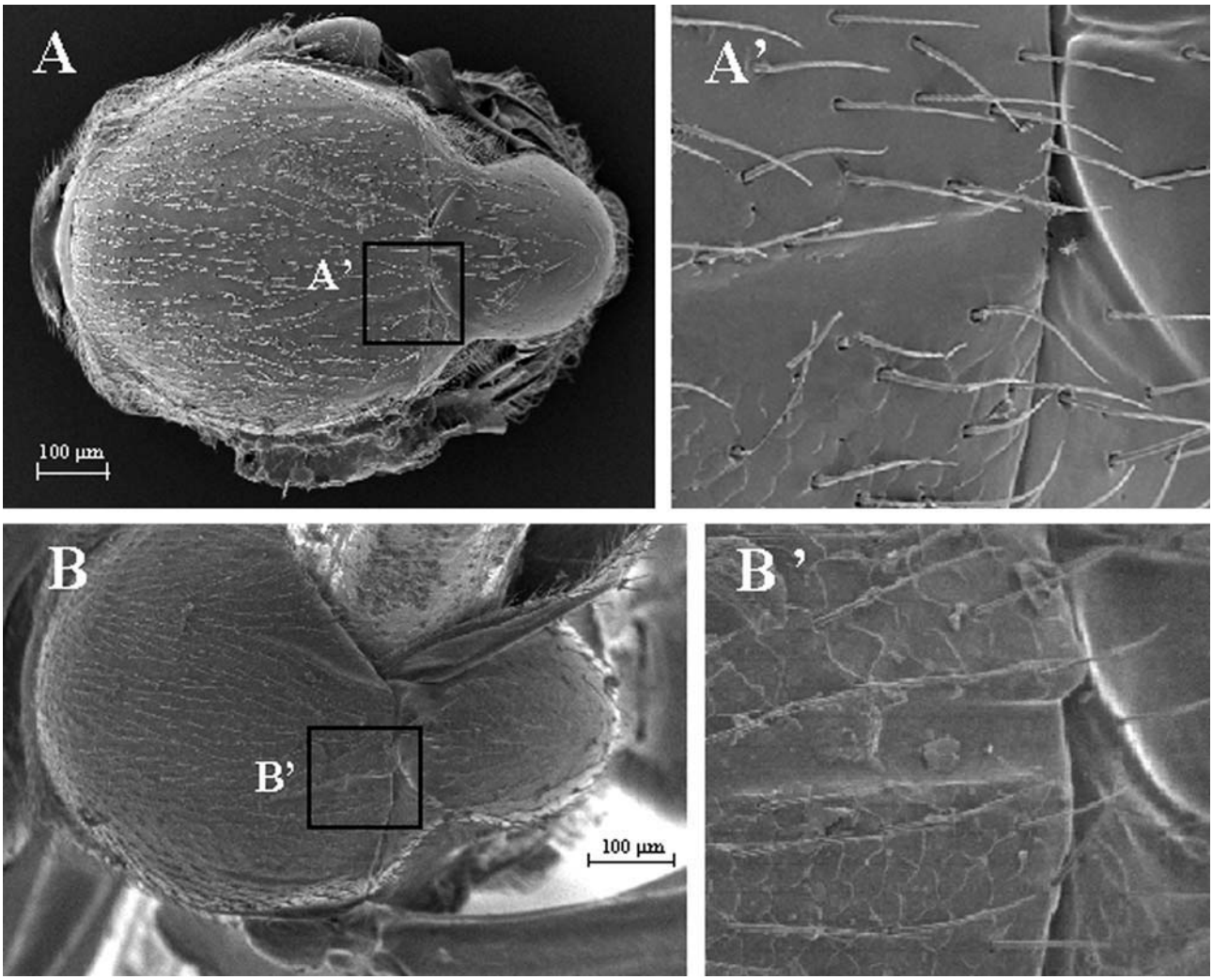

Fig. 1. Dorsal view of the mesosoma showing the detail of its surface in the region of the basal part of left notauli. A, A' – *Phaenoglyphis ruficornis*, not sculptured, mostly smooth with only a few wrinkles on the distal side of the notauli. B, B' – *Phaenoglyphis pubicollis*, with distinctive imbricate sculpturing on all surfaces.

characters: mesoscutum densely pubescent, scutellar pits only faintly impressed and small differences in the antennae, and the specificity of their association with primitive Lachninae aphids and their primary parasites. Fergusson (1986) argued that the morphological characters used by Andrews (1978) cannot justify their differentiation and again synonymized these genera.

Ronquist (1999) re-established *Hemicrisis* on the basis of two plesiomorphies of the Charipinae: distinct notauli and partially sculptured mesoscutum. Nevertheless, the notauli are not a valid character for differentiating *Hemicrisis* and *Phaenoglyphis*, according Fergusson (1986), because *Phaenoglyphis* contains species that have complete notauli, those in which only the basal half of the notauli is present and those that lack notauli. Moreover, after examining the type material it is possible to confirm that *Hemicrisis ruficornis* Förster, 1869 does not have a sculptured scutum. Instead, it has only delicate piliferous points and slight sculpturing (difficult to see even with the SEM) only present in small areas on both sides of the basal part of the notauli (not between them) and anteriorly adjacent to the notauli. For the most part, the mesoscutum and the scutellum are smooth and shiny (Fig. 1A, A').

Allotria pubicollis Thomson, 1877 was synonymized with *H. ruficornis* by Evenhuis (1973). This species is only represented by type material. Morphologically, it is very similar to *H. ruficornis* except for fine imbricate sculpturing over the entire scutum and scutellum (Fig. 1B, B'), while in *H. ruficornis* there are only a few slightly sculptured areas.

Evenhuis (1973) mentions that in *Hemicrisis* the lengths of metasomal T2 and T3 are similar, while in *Phaenoglyphis* T2 is much longer than T3. Nevertheless, in *P. americana* Baker, 1896, the tergum ratio is similar to that in *Hemicrisis* and the scutum is shiny and smooth as in *Phaenoglyphis*. Therefore, this is not a valid character for differentiating these two genera. The pubescence on the scutum is also not a good character for differentiating *Hemicrisis* and *Phaenoglyphis* since this is a variable character in *Phaenoglyphis* and, moreover, in *P. pilosus* Andrews, 1978, it is the same as in *H. ruficornis* and *Allotria pubicollis*. The antennal and scutellar charac-

ters mentioned by Andrews (1978) are similarly unreliable as both are very variable in *Phaenoglyphis*. The antennae of *H. ruficornis* are almost identical to those of *P. americana*, and the faintly impressed scutellar pits are similar to those in *A. pubicollis*.

Finally, Andrews (1978) considered the association of *Hemicrisis* with plesiomorphic conifer inhabiting aphids (Cinarinae and Lachninae) as a biological character that differentiates it from *Phaenoglyphis*, but some *Phaenoglyphis* and *Alloxysta* species are hyperparasitoids of Cinarinae (Andrews, 1978). Furthermore, recent studies show that the Lachninae (Cinarini + Lachnini) may not be plesiomorphic (Normark, 2000; Heie, 2004).

Based on this data, *Hemicrisis* is again considered to be a synonym of *Phaenoglyphis*. Like Evenhuis (1973) we consider the sculpturing to be a specific but not a generic character. All species of Charipinae with a mesopleural sulcus belong to *Phaenoglyphis*, this character is an autopomorphy of the genus. The nomenclatural changes that result are: *Phaenoglyphis ruficornis* (Förster) comb. n. (original combination *Hemicrisis ruficornis* Förster, 1869) and *Phaenoglyphis pubicollis* (Thomson) comb. n. (original combination *Allotria pubicollis* Thomson, 1877). These two species and *Lytoxysta brevipalpis* Kieffer, 1909 are the only sculptured Charipinae known.

***Phaenoglyphis evenhuisi* sp. n.**

Diagnosis. Pronotum and mesoscutum completely sculptured. Only *P. pubicollis* has similar sculpturing but differs from *P. evenhuisi* sp. n. in having notauli and pubescence. Moreover, sensilia are present on all flagellomeres in *P. pubicollis* but absent on F1–F3 in *P. evenhuisi. Phaenoglyphis evenhuisi* is differentiated from all other *Phaenoglyphis* in having a forewing without marginal setae.

Length. Female: 1.0 mm; male unknown.

Coloration. Body brown to dark brown; face light brown and clypeus amber. Antennomeres brown, with A1–A5 lighter. Legs and veins of the forewing yellowish brown.

Head. Broader than mesosoma in dorsal view. Horizontal oval form in frontal view, slightly wider than high (15 : 13). Lacks sculpturing and ridges; malar impression present. Pilosity present next to toruli and below; no hairs on frons; hairs scarce between vertex and posterior of the head. Toruli located above the median part of the eye. Epistomal sulcus present; shallow and weakly diverging clypeo-pleurostomal lines. Clypeus broadly projecting over mandibles, almost straight in its basal part.

Antennae (Fig. 2B). 13-segmented, clavate. Shorter than body (36 : 40). Antennomeres completely separate, covered with plicate hairs. Pedicel slightly shorter than F1. Flagellomeres 1–3 smooth, 4–11 with rhinaria. F1–F3 elongated, straight, around four times longer than wide, thinner than all the others; F1 longer than F2; F2 and F3 subequal; F4 and F5 subequal in length to F2 and F3, but wider; F6–F10 subequal in width and shape.

Mesosoma (Fig. 2A, C, E). Pronotum densely covered with long hairs on proximal margin, lower corners and laterally; centre almost bare; subpronotal plate bare in the middle. Pronotal carinae distinguishable and reaching anterior mesoscutal margin. Mesoscutum completely covered with imbricate sculpture, convex in dorsal view with scattered hairs; notauli only insinuated. Mesopleura rectangular, longitudinal furrow present on the mesopleuron; mesopleural triangle pubescent, with distal vertex cut in half; anterior margin of mesopleural triangle shorter than anterior margin of mesopleuron. Scutellum sculptured with scattered hairs laterally; apex not carinate; foveae present with a transverse posterior carina inside. Propodeal carinae present and parallel.

Forewing (Fig. 2D). Large, longer than body, covered with dense pubescence; marginal setae absent. Radial cell closed, 3.0 times longer than wide; R1 straight and short, as long as 2rm vein, Rs 4.5 times the length of R1, straight; M vein visible.

Metasoma (Fig. 2A). Proximal part with a complete ring of hairs, narrower dorsally. Dorsomedian lengths of T2 and T3 subequal, and they are smooth and cover most of the metasoma.

Type material (1♂). Holotype (♂, deposited in UB) with the following labels: "Santa Coloma (AND), 16–30.VI.93, Trampa Malaise, J. Pujade leg" (white label); "Phaenoglyphis nr. nigripes (Thomson), det. H.H. Evenhuis 1997" (white label); "Holotype" (red label); "Phaenoglyphis evenhuisi J. P-V & Paretas-Martínez n. sp., female" (white label).

Etymology. This new species is named after our late friend, colleague and the best Charipinae specialist in the XX century, and the only person who worked on this group in Europe for many years: Dr. Hendrik Harmannus Evenhuis.

Distribution. Known only from Andorra, in the Pyrenean mountains.

Biology. Host unknown.

Notes on sculptured Charipinae

Although the Charipinae are traditionally characterized by having a shiny and smooth head and mesosoma, three species have fine sculpturing. *Phaenoglyphis pubicollis* comb. n. and *P. evenhuisi* have imbricate sculpturing (Figs 1B, B' and 2E) on the mesosoma (except mesopleura) and *Lytoxysta brevipalpis* reticulate sculpturing over all its body (except metasoma). *Lytoxysta* Kieffer, 1909 deserves the status of a separate genus within the Charipinae not only because of the reticulate sculpturing on the head and mesosoma, but also for other characters: mesopleural triangle absent, brachypterous males, a distinctly shaped head and a radial cell only partially indicated (only the beginning of R1 and Rs are present).

A new genus for *P. pubicollis* and *P evenhuisi* based on the sculpturing is not justified in view of the above comments about *Phaenoglyphis* and *Hemicrisis*. Although the sculpturing is very clear on the pronotum and mesonotum in *P. pubicollis* and *P. evenhuisi*, these species have no other singular characters to differentiate them from the rest of the Charipinae, whereas *Lytoxysta brevipalpis* does.

Other than in sculpturing, *P. pubicollis* does not differ in any diagnostic features from *P. ruficornis*, and *P. evenhuisi* only differs from other members of the genus in specific details (see description above). Furthermore, the head and mesopleuron of these two species are com-

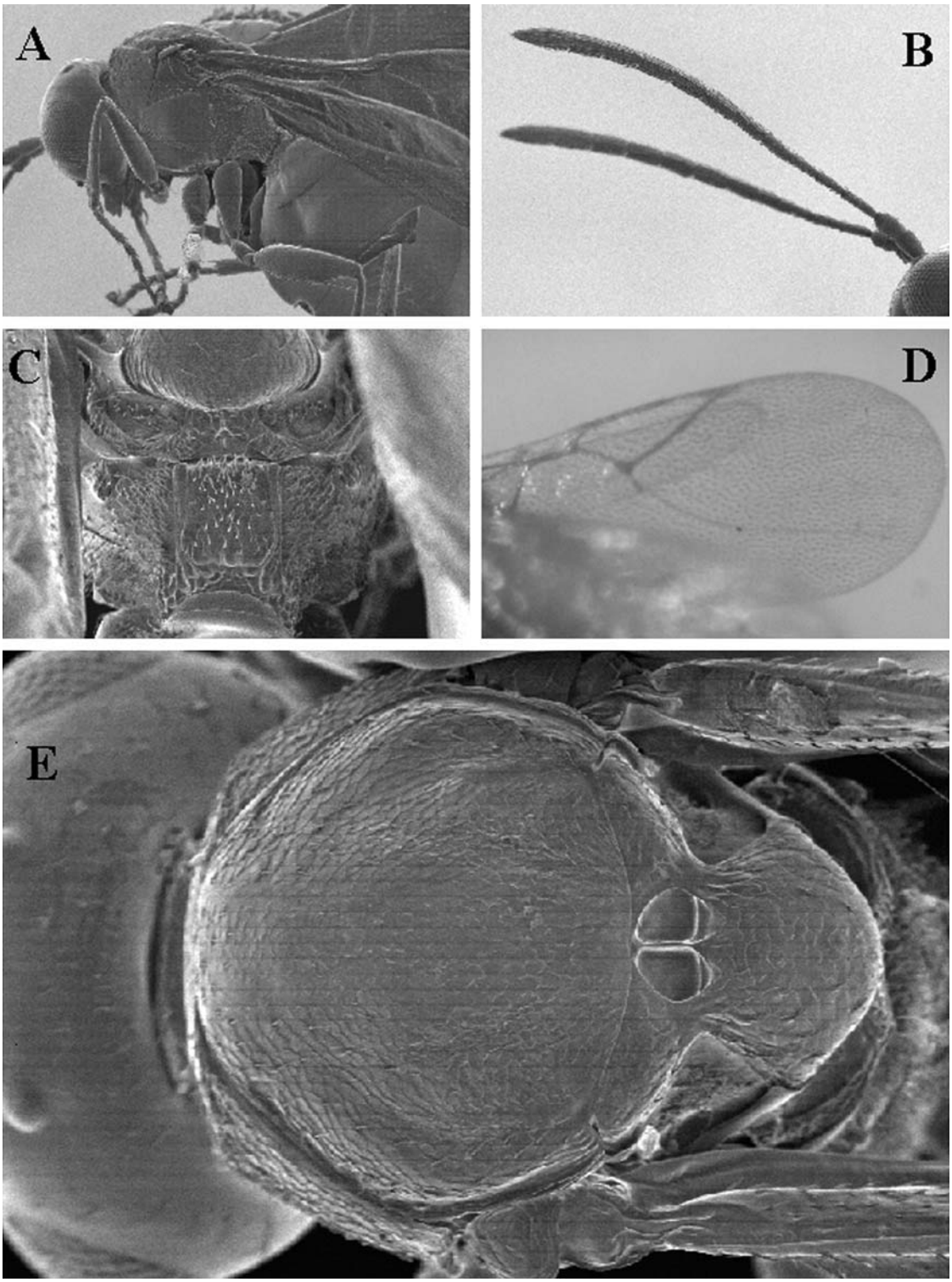

Fig. 2. *Phaenoglyphis evenhuisi* female. A – lateral view; B – antennae; C – apex of scutellum and propodeum; D – forewing; E – mesosoma in dorsal view, sculpturing clearly visible.

pletely smooth, as in the rest of Charipinae (except *Lytoxysta*).

Key for differentiating the genera of Alloxystini

1 Metasoma with two large terga (II–III) of subequal dorsomedian lengths. Antennae filiform or clavate; all flagellomeres separated by constrictions. Biology: hyperparasitoids of Aphididae. . . . . Alloxystini (2)

– Metasoma with only one big segment; tergitum II small or fused with III. Antennae capitate or clavate, with the last two flagellomeres broadly jointed to completely fused (coalesced or connate), usually forming a differentiated apical club; preceding flagellomeres with constrictions between them. Biology: hyperparasitoids of Psyllidae. . . . . Charipini

2 Mesopleuron lacks mesopleural triangle. Head and mesosoma with fine reticulate sculpturing. . . . . *Lytoxysta* Kieffer, 1909
– Mesopleuron with mesopleural triangle. Head not sculptured. 3
3 Lower part of mesopleuron with horizontal sulcus. . . . . *Phaenoglyphis* Förster, 1869
– Mesopleuron lacks horizontal furrow. 4
4 Scutellum strongly carinate on posterior margin. . . . . *Carvercharips* Kovalev, 1995
– Scutellum smooth or with a few marks on apex. . . . . *Alloxysta* Förster, 1869

Note. Probably, *Carvercharips* and *Alloxysta* are synonyms, because the scutellar character of *Carvercharips* may only be an extreme condition within a continuous series. A review of the genus *Alloxysta* is needed to resolve the status of *Carvercharips*.

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