

CONTRIBUTION TO THE SCYDMAENID FAUNA OF LA GOMERA (CANARY ISLANDS) (COLEOPTERA: SCYDMAENIDAE)

Stanislav Vit¹ & P. Oromí²

¹ Rue de la Poterie 26, CH-1202 Genève, Suisse

² Depto. Biología Animal, Univ. de La Laguna
38206 La Laguna, Tenerife

ABSTRACT

A new endogean Scydmaenid, *Euconnus specusus* sp.n., is described and the recent material of *Stenichnus* from La Gomera Island is quoted.

Key words: Coleoptera, Scydmaenidae, *Euconnus* s.str, new species, morphology, *Stenichnus*, La Gomera, endogean.

RESUMEN

Se describe un nuevo Scydmaenidae endogeo, *Euconnus specusus* sp.n. de La Gomera, y se aporta nuevo material de *Stenichnus* de esta misma isla.

Palabras clave: Coleoptera, Scydmaenidae, *Euconnus* s.str., especie nueva, morfología, *Stenichnus*, La Gomera, endogeo.

INTRODUCTION

The known representatives of the Staphylinoid family Scydmaenidae in the Canary Islands are relatively few and belong to the genera *Stenichnus* Thomson (9 species and 2 subspecies) and *Euthia* Stephen (one species). In spite of the intensive entomological field-works led in the archipelago since the last century, its Scydmaenid fauna proved to be scarce and markedly restricted to a little amount of species or subspecies of *Stenichnus*. According to Franz [3] and Israelson [7] two species: *St. castaneus* (Wollaston) —respectively *castaneus gomerae* Franz— and *St. caldasi* Franz occur on La Gomera, but *Stenichnus castaneus* —respectively *castaneus hierranus* Franz— was also quoted from El Hierro island [11, 12]. The research carried out on the MSS (Mesovoid Shallow Substratum, after Culver [1]) by the GIET team of the University of La Laguna, and especially by A.L. Medina provided an unexpected capture of the first, strictly endogean species of the Scydmaenidae genus *Euconnus* Thomson (Cyrtoscydmini) [9]. The techniques used at that time to reach the MSS were not very useful because the holes became unsuitable after being used once or twice, and no more specimens of *Euconnus* were found besides the first unique female. On the occasion of setting new traps to search ground beetles in the MSS for a project of the

Spanish Ministry of Science and Technology, more specimens were collected of this endo-glean new species, which is described in this paper. In addition the material of *Stenichnus* resulting from the associated field-work on La Gomera island is reported and commented.

MATERIAL AND METHODS

For the capture of *Euconnus* several traps with blue cheese and beer were set at the farthest end of 80 cm long holes bored horizontally through a mother rock MSS [9]; this layer was accessible thanks to a cutting edge of a road in the laurel forest. More recently the traps were installed at the bottom of vertical tubes dug from the surface and reaching a colluvial MSS partially covered by soil and leaf-litter; these traps contained a solid bait (cheese and liver) and a preservative liquid (propylene glycol) for eventual extractions of DNA from the individuals. Concerning *Stenichnus*, most of the specimens were collected by sieving forest litter also in laurisilva.

Abbreviations given for the collections and the labelling: DZUL – Dept. of Animal Biology (Zoology), University of La Laguna, Tenerife; POM – Pedro Oromí collection, Tenerife; GIET - Grupo de Investigaciones Espeleológicas de Tenerife; CSV - Stanislav Vit collection, Genève, Switzerland.

Abbreviations used in the descriptions (also in combinations): co - combined (Length or Width etc.); A - Antennae; b - basally; E - Elytra; H - Head; L - Length; max. - maximum; P - Pronotum; W - Width. Examples of combined use: HW = Head Width; coLHP = combined Length of Head and Pronotum.

Label data are cited in full with a slash which indicates each single label: // single printed label; /" /" hand written data.

Latent taxonomic and nomenclatorial problems encountered in the Canarian *Stenichnus*, are not examined in this paper and the names given are those conserved by Israelson [7]. Actually a more focussed revision of all Canarian *Stenichnus* is more suitable for a statement of taxonomical discrepancies.

Euconnus (s. str.) *specusus* S. Vit sp. n.

Diagnosis: Apterous and anophthalmous species known only by females; colour from straw-yellowish to medium rust; integuments shiny, un- or ill-punctate, the elytral dorsum only bearing the shallow punctures. Body length 1.78 mm, body width 0.74 mm; pronotum and head markedly smaller than the elytra; elytra inflated, humeraless, their base converging to that of the pronotum; pronotal base with five foveae; four-segmented antennal club well defined; the segments 8, 9, and 10 subpyriform, about as long as wide; apical segment short, subspherical, constricted apically; segments of the flagellum from oblong to slightly elongate. Material examined: 3 ♀♀.

Holotype: 1 ♀ /La Gomera, El Cedro, 7.IX.87, GIET A.L. Medina leg./ MSS Cedro 17/, /G-C4-139/ (DZUL). Paratypes: 2 ♀♀ /La Gomera, Reventón Oscuro, MSS, 16-XI-2003, P. Oromí leg./ (CSV, POM).

Description: Head small, much narrower than the pronotal base, conversely egg-shaped, longly convergent backwards, at least slightly longer than broad, ratio HL/HW: 1.12; supra-antennal prominences pronounced; frons distinctly depressed in the middle, obliquely

sloped to the clypeus; frontoclypeal transverse groove none; eyes absent; vertex flattened, tempora ill-arched, bearing a coat of long setae directed backward and masking the collar; occipital edge projected backward.

Antennae distinctly longer than the combined length of the head and pronotum (ratio AL/coLHP: ♀/1.15 - 1.2), and longer than the elytra combined width (ratio AL/coEW: ?/1.11 - 1.2); 4-segmented antennal club very distinctive, loosely gathered, slightly longer combined than the combined segments 2-7; apical segment unusually short, subspherical, mammilated apically; segments 8-10 subglobose, onion-like shaped, granulate, discretely rimmed basally; segments of the flagellum unrimmed; segment 7 elongate, inflated; segments 3-6 oblong, subequal; pedicel more than twice as long as broad, as long as two following segments combined, discretely shorter than the apical segment.

Pronotum bell-like shaped, convergent anteriorly, about as wide basally as long (ratio PL/PW: ♀/1.02), strongly convex; base rimmless, lacking the transverse groove, bearing at all five foveae of which two lateral ones are strongly reduced in size; parapleural setae short, directed dorsally. Elytra inflated, strongly convex, less than one and half longer than broad, (ratio EL/EW 1.35): (ratio EL/ coLHP: 1.41) provided with moderately long suberect setae; humeral folds none; base free of basal impressions or basal foveae; dorsum provided with shallow punctures, sides impunctate; sutura firmly conate; scutellum indistinct; scutellar ridge none, sutural edge rimmless, apex of elytra subtruncate.

Venter. Anterior edge of the prosternum bilobed, deeply incised medially; metasternum more than one and half time longer than the sternal lamina and nearly as long as the five following abdominal segments combined, discretely flattened in female, provided with scarce, very minute and ill-impressed punctures; intercoxal process broad, deeply notched medially; sternal lamina raised, ventral edge distinctly pigmented, gently tooth-like produced anteriorly then weakly concave.

Legs thin, elongate, stick-like; all tibiae free of apical spurs; apical third of the protibia flattened mesially, provided with a densely setose area (probably a cleaner); apex of the meso- and metatibiae distinctly constricted pre-apically; ratio L.mtTi./L.msTi.: 1.12.

Biology: Species infested to deep layers of soil, actually in the “milieu souterrain superficial” [8] or mesovoid shallow substratum [1] (onward MSS). Male unknown and hitherto not found together with females. The first specimen was captured by means of a pitfall trap in the mother rock MSS at ± 1 m deep, located in El Cedro forest [9]. In spite of more than ten years of trapping in the same area it had never been recaptured. Then in 2003 two other females were captured in a semi-stabilized colluvial MSS, setting the traps at 60 cm deep underground. Accompanying species collected in the same traps were the beetles *Pseudoplatyderus amblyops* (Carabidae), *Domene jonayi* (Staphylinidae), *Laparocerus* sp. (Curculionidae), all eyeless, medium size beetles usually only found in the MSS; however, other traps in the same area placed at similar depth but in earthy soil provided different species like *Lymnastis gaudini gomeræ* (Carabidae) and *Aeletes gemmula* (Histeridae), also blind but much smaller as is usual in true endogean beetles. We therefore think that *Euconnus specusus* n.sp. is an MSS-dwelling rather than a soil-dwelling species.

Distribution: La Gomera (Canary Islands) (Fig. 5); always in the MSS of humid laurel forest at El Cedro (Reventón Oscuro is a particular place within El Cedro forest).

Etymology: The specific epithet uses the latin substantive *specus* as making allusion to the strictly subterranean way of living of the species.

Remarks: An unknown internal structure - a kind of large internal cell or cavity - can be observed dorsally by transparency, under the fore third of the notum, back to the anterior foramen.

DISCUSSION

Euconnus specusus sp.nov. is here tentatively attributed to the subgenus *Euconnus* s.str. Only three species of the subgenus (*E. rutilipennis* Müller & Kunze, *E. hirticollis* Illiger and *E. fimetarius* Chaudoir) are so far known as occurring in the European fauna. All three species are quoted from North and Central Europe but *fimetarius* spreads very easterly (Caucasus [6]). All three species are reported from France but the Monography of the West European *Euconnus* [2] didn't quote any representative of the subgenus in the West Palearctic area. According to Franz [6], the subgenus is defined by elongate antennae characterised by a well singularized, four-segmented club, by markedly shiny or glabrous teguments, by well pronounced humera and by short and convex head of which the tempora are free of stiff, brush-like coat. Actually, the general shape of pronotum, teguments and antennae of *specusus* are of this type, but the ogival shape of the head, markedly depressed frons and the stiff setation of tempora are not. Also the humera of *specusus* are entirely obliterated and the base of elytra free of depression (probably because of the loss of metathoracic wings). The aedeagus of the species remaining unknown, all mentioned differences are here tentatively interpreted as related to the evolutionary adaptations of the species morphology correlated with its strictly endogean habits.

A first cave dwelling species of *Euconnus* (subg. *Tetramelus* Motschulsky), exhibiting several evolutionary adaptations to the cavernicolous habitat, is being reported from Croatia [10]. *Euconnus specusus* exhibits the same kind of inflated elytra (or reduction of the head and pronotum size) with a marked obliteration of the basal characters as humera, depressions or foveae. The mouth parts of *Euconnus* s.str. having hitherto not been described, the possibly adaptations of these cannot be weighted. Nevertheless an external examination of the mandibles of *specusus* attests the thin, elongate and falcate mandible, lacking retinaculum, but only finely serrated on their inner edge, of which the molar edge is equally fairly projected distally in an obtuse tooth-like process and the molar vestiture not markedly developed. Considering the active predator habits of Scydmaenidae which are highly specialised predators on different groups of mites, this shape of mandible (similar to that found in *Stenichnus*) indicates probably also an evolutionary adaptation to the prays of a specialized habitat.

GENUS *STENICHNUS* REITTER

The most cautious treatment of the *Stenichnus* described from the Canary archipelago was done by Israelson [7]. He examined also the original Wollaston's specimens from the British Museum treated anteriorly by Franz. The first author reports for La Gomera two species under the names *S. castaneus gomeræ* Franz and *S. caldasi* Franz.

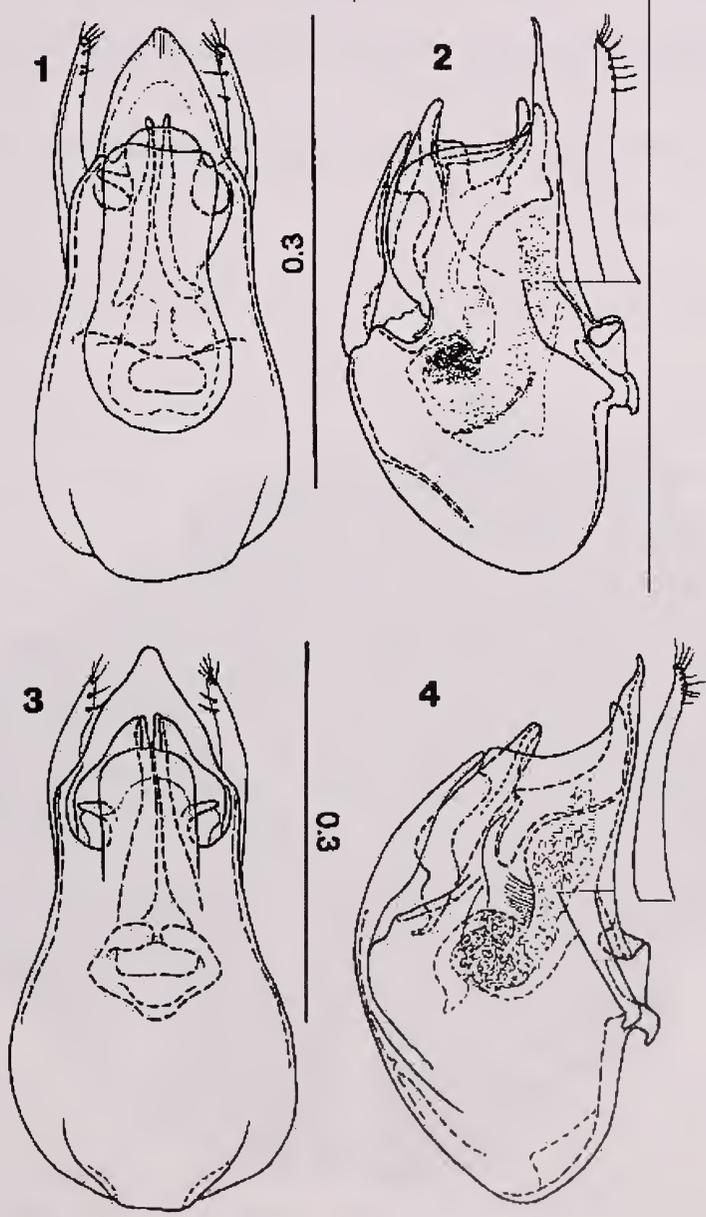
Both species are represented in the herein studied material.

Stenichnus caldasi Franz

Studied material: 1 ♂ La Gomera, Laguna Grande, 28-XII-94, P. Oromí leg./ (POM) (antennae incomplete); 1 ♀ La Gomera, Hermigua, 6-I-1977, P. Oromí leg./ (CSV).

Body size: length 1.32-1.4 mm, width 0.49-0.51 mm; ratio EL/EW - 1.61; ratio AL/co L. H.P. - 1.0 (in ?).

We associate the two specimens with this taxon, even if not strictly responding to Franz's diagnosis. Israelson himself kept critical regarding this taxon, but both specimens, distinctly smaller than *castaneus* Wollaston, are well singularized (see the below listed characters). Aedeagus: Figs. 1-2. Distribution: Fig. 5.



Figs 1-4. - Aedeagus (scale as given). *Stenichnus caldasi* Franz: Fig. 1 ventral aspect, Fig. 2 lateral aspect. *Stenichnus castaneus gomerae* Franz: Fig. 3 ventral aspect, Fig. 4 lateral aspect.

Stenichnus castaneus gomeræ Franz

Studied material: 1 ♂ /La Gomera, Agua de los Llanos, 16-IX-1977, P. Oromí leg./ (POM); 1 ex. /La Gomera, Bosque del Cedro, 25-XII-1978, P. Oromí leg/ (CSV); 1 ex /La Gomera, El Cedro, 1-IX-84 (P. Oromí leg./ (POM); 2 ♂♂, ♀? La Gomera, Mora de Gaspar, 21-XII-84, P.Oromí/ (POM, CSV); 1 ♀ /Gomera, La Zarcita, 17.IV. 1976, ss. pierres, leg. S.Vit/ (CSV); 1 ♂ /Gomera "30-IV-95, Chorros Epina", P. Oromí/ (POM).

Body size: length 1.45-1.63 mm, width 0.56-0.63 mm; ratio EL/EW - 1.53-1.65; ratio AL/co LHP - 1.05-1.14.

This species seems well spread on La Gomera. Aedeagus: Figs. 3 - 4. Distribution: Fig. 5.



Fig. 5.- La Gomera island. Distribution of the treated species. *Stenichnus castaneus* ssp. *gomeræ* Franz: 2 (El Cedro), 3 (La Zarcita), 5 (Mora de Gaspar), 6 (Agua de los Llanos), 7 (Chorros de Epina). *Stenichnus caldasi* Franz: 1 (Hermigua), 4 (Laguna Grande). *Euconnus specus* Vit sp. n.: 8 (Reventón Oscuro), 2 (El Cedro).

COMPARATIVE TABLE OF DISTINCTIVE CHARACTERS

S. castaneus gomerae Franz

body size: length 1.45-1.63 mm,
width 0.56-0.63 mm

elytra more fusiform and convex
ratio EL/EW = 1.52-1.54

pronotum a bit longer than wide

head as wide as pronotal base.

antennae slightly longer than head and
pronotum combined, ratio AL/co LHP =
1.07-1.08

antennal segments 4-11 rimmed basally

6th antennal segment oblong

mesosternum basally with thin median
carina sternal process low, then progres-
sively raised, submetasternal edge ill-vis-
ible

metasternum at least weakly flattened in
male

colour reddish-brown

S. caldasi Franz

body size: length 1.32-1.4 mm,
width 0.49-0.51 mm

elytra more parallel and less convex
ratio EL/EW = 1.58-1.65

pronotum as wide as long

head less than pronotal base

antennae as long as head and pronotum
combined, ratio (♀) AL/co LHP = 1.0

antennal segments 5-11 discreetly rimmed

6th antennal segment slightly reduced,
subspherical

mesosternum basally carinaless, sternal
process raised than sloping to the sub-
metasternal edge

metasternum moderately depressed in
male

colour rusty-brown

ACKNOWLEDGMENTS

Our thanks go to Hermans Contreras and Heriberto López who have worked hardly setting the subterranean traps for endogean fauna in La Gomera, as a part of the researches carried out for the projects REN 2000-0282 and REN 2003-00024/GLO of the Spanish Ministerio de Ciencia y Tecnología; and to the managers of Garajonay National Park for providing the opportunity to collect samples and to use their outbuildings.

REFERENCES

- [1] CULVER, D.C. 2001. Subterranean ecosystems. *Encyclopedia of Biodiversity*, 5: 527-540.
- [2] FRANZ, H. 1957: Monographie der Westmediterranen Arten der Gattung *Euconnus* Thoms. (Coleopt. Scydmaen.). *Eos*, 33(1-4): 177-262.
- [3] FRANZ, H. 1965: I. Beitrag zur Bodenfauna der Kanarischen Inseln. Zur Kenntnis der Coleopterenfauna von Tenerife und La Gomera. *Eos*, 41(1): 59-66.
- [4] FRANZ, H. 1969: Weitere Beiträge zur Kenntnis des Scydmaenidenfauna der Atlantischen Inseln. *Bocagiana*, 20: 1-5.
- [5] FRANZ, H. 1972: Eine blinde *Stenichnus*-Art von Tenerife nebst einer Bestimmungstabelle für alle kanarischen *Stenichnus*-Arten (Col. Scydmaenidae). *Eos* [1971], 47(1): 67-70.
- [6] FRANZ, H. & BESUCHET, C. 1971. 18 Familie: Scydmaenidae pp. 271-303 - In: Freude, H., Harde, K.W., Lhose, G.A. (eds.) *Die Käfer Mitteleuropas*. Vol. 3, Adephaga 2, Palpicornia, Histerioidea, Styphylinoidea 1. Krefeld: Goecke & Evers, 365 pp.
- [7] ISRAELSON G. 1972: The *Stenichnus* species of the Canary Islands (Col. Scydmaenidae). *Entomologische Blätter* 66(2): 103-114.
- [8] JUBERTHIE, C., B. DELAY & M. BOUILLON. 1980. Sur l'existence d'un milieu souterrain superficiel en zone non calcaire. *C.R. Acad. Sci. France*, 290 D: 49-52.
- [9] MEDINA, A.L. & P. OROMI. 1990. First data on the superficial underground compartment on La Gomera (Canary Islands). *Mémoires de Biospéologie*, 17: 87-91.
- [10] VIT, S. & HLAVAC, P. 2004: New cavernicolous ant-like beetle of the genus *Euconnus* (subg. *Tetramelus*) from Croatia (Coleoptera: Scydmaenidae). In: Pavicevic, D. & Jaksic, P. *Book in commemoration of Dr. Guido Nonveiller scientific work*. Beograd: Institut pour la Protection de la Nature - special edition. (In press).
- [11] WOLLASTON, T. V. 1865: *Coleoptera Atlantidum, being an enumeration of the Coleopterous Insects of the Madeiras, Salvages, and Canaries*. London: J. Van Voorst, V-XLVII+526+140 pp.
- [12] WOLLASTON, T. V. 1871: *Atlantic Coleoptera*. The Transactions of the Entomological Society of London 1871. London: G. Roworth, I-XV + 444pp. + 9 Pls.