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**A KEY TO THE MACARONESIAN HYPOBORINI, WITH
DESCRIPTION OF TWO NEW SPECIES (COLEOPTERA,
SCOLYTIDAE)**

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With 11 figures

ABSTRACT. A revised key to the Macaronesian Hypoborini so far described is presented. All 11 *Liparthrum* species are illustrated by drawings of their male genitalia. *L. canum* sp. nov. from Canary Is. and *L. semidegener* sp. nov. from Madeira are described.

L. bituberculatum var. β Wollaston (1854) is synonymized with *L. mandibulare* Wollaston (1854).

RESUMO. CHAVE DOS HYPOBORINI MACARONÉSICOS COM DESCRIÇÃO DE DUAS NOVAS ESPÉCIES (COLEÓPTERA, SCOLYTIDAE). No presente trabalho é apresentada uma chave de identificação revista das espécies de Hipoborini Macaronésicos descritos até à data. As genitálias masculinas de todas as 11 espécies de *Liparthrum* são ilustradas. São descritas como espécies novas para a ciência, *L. canum* sp. nov., das Canárias e *L. semidegener* sp. nov., da Madeira. *L. bituberculatum* var. β Wollaston (1854) é sinonimizada com *L. mandibulare* Wollaston (1854).

The tribe Hypoborini, formerly subtribe Hypoborina, is easily reached under Hylesininae (Hylesinini of older works) by the presence of a few

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readily observable, strictly external structures, such as the elytral bases forming a straight, in the sutural region not clearly interrupted, except at the lateral sides distinct and crenulate crest. The recent keys of Wood are more bewildering unfortunately. The group of tribes including Hypoborini, are stated for example in his world monograph of the scolytid genera (1986 : 29) to be recognized by a metatergum of the type illustrated for *Chramesus* (l.c. : fig. 41). This is true for the American *Chaetophloeus* — which was transferred to Chaetophloeini by Schedl (1966 : 36) already — but it is not true for the very type genus, *Hypoborus*, the metatergum of which corresponds to *Hylastes* as drawn by Wood (l.c. : fig. 42) and which therefore gets no indisputable place in his system.

The Macaronesian genera of Hypoborini are generally considered to be two : *Hypoborus* and *Liparthrum*. The former appears to be monotypical with its single species in part widely distributed around the Mediterranean Sea, the latter is scattered all over the globe in several tropics and subtropics. From Wood can be concluded that the total number of species would be somewhat more than 30, a modest figure indicating the relict character of the genus. According to the same source 11 species occur in the Macaronesian archipelagos which, in view of their small total area, would be richest in the world in respect to *Liparthrum*.

This general poverty is perhaps illusory. Small size and obscure modes of life cause these beetles to be easily overlooked. Their habit of restricting their attacks to dying or recently died parts of their hosts cause them to be of little interest from economic points of view.

As far as known all species are phloeophagous or xylophagous. Characteristic of the former are tunnels radiating from an irregularly rounded cave. Attacks are revealed by ultimately often very numerous circular exit holes which are always less than one mm. in diameter. The xylophagous species must be looked for within the wood ; judged by the little so far known no caves but very irregular tunnels would be produced.

Taxonomically convincing features to distinguish the two genera are hardly known. Probably *Hypoborus* and *Liparthrum* should be united on internal characters as was indicated by Nüsslin (1911-12) but I have preferred here to retain the conventional system. There are no practical difficulties whatever to do so because the vestiture alone is sufficiently characteristic in *Hypoborus* for eliminating risks of mixing-up with any *Liparthrum* presently known.

A key to 14 West-Palaearctic species was worked out by Schedl (1959). A new preliminary one to 11 Macaronesian species is presented below. Copious material was at disposal and types of all species were examined. Minor additions occur in Israelson (1980) and Israelson *et. al.* (1982).

Previously neglected for the purpose of identification of species of this tribe the comparatively simple sclerotized skeleton of the aedeagus is introduced here as a very useful tool. The latter, like other skeletal structures, could add to advances in phylogeny.

Occasionally a species can be identified by its aedeagus alone, in other cases, though externally well distinguished, it can not because the organ is quite similar to that of other species.

The terminal portion of the ejaculatory duct is sclerotized — or surrounded by a closely fitting sclerotized tube — in all Macaronesian forms known and is here termed flagellum. Often this is the only sclerite to be found inside the penis ; in other cases structures are found which are interpreted as terminal plates ("Endplatten" of the old authors). Mostly those are strongly reduced and appearing as minor thickenings of the dorsal wall of the penis. In one species (*bituberculatum*) with a wide distribution on the Continent and supposed to be of great age the terminal plates are very strong and elaborate ; this species has one more, rod-like sclerite.

All parts of the aedeagus, the penis, tegmen with its manubrium, and also the spiculum gastrale may offer details of taxonomical interest. For each species drawings are given of the spiculum gastrale and the aedeagus in dorsal and lateral views.

KEY TO THE MACARONESIAN HYPOBORINI

- 1/2 Elytral interstriae 2, 4, often also 6, narrower than neighbouring, posteriorly at least, glabrous ; remaining interstria with about 10 long, slightly scale-like, more or less erect, remotely set setae. Antennae with five-segmented funicle *Hypoborus* Erichson, 1836
Body very short, 1.10 - 1.14 × 57 - 0.68 mm, black with disk dark reddish-brown and appendages yellow. Male sexual organs as in Nüsslin (1911 - 12 : fig. 101). Host *Ficus carica*. Azores (?), Madeira Is., Canary Is. (?), (Mediterranean area) *ficus* Erichson, 1836
- 2/1 Elytral interstriae of equal width, all with a row of more dense scale- or hair-shaped setae ; if exceptionally 2, 4 and 6 narrower than neighbouring, then with vestiture at least anteriorly. Antennae (in the Macaronesian species) with four-segmented funiculus *Liparthrum* Wollaston, 1854
- 3/16 Body parallel-sided ; curvature of pronotal and elytral apex about congruently convex. Pronotum with a pair of distinct denticles visible from above at the middle of anterior margin but often only if at the same time viewed more or less from behind. Punctures of elytral striae inconspicuous with diameter not reaching the width of interstriae. Never breeding in *Euphorbia*.
- 4/13 Elytral interstriae with a row of suberect scale-shaped setae, stray ones of which occasionally substituted for an adpressed hair.
- 5/12 Setae of elytral striae about reaching the base of following, thus forming more or less unbroken lines.

- 6/11 Pronotum often black but at least latero-ventral margins more or less broadly reddish. Scales of elytral declivity twice as long as wide, often with a yellowish tinge. Flagellum not distinctly longer than penis.
- 7/10 Blackish brown or more or less distinctly bicolorous. Apex of penis with no tooth-shaped apical dilations ; tegmen with a distinct manubrium.
- 8/9 Frons flattened in both sexes. Body moderately elongate, $1.34 - 1.86 \times 0.61 - 0.78$ mm (largest species) ; blackish-brown except for lateralmost portions of pronotum being reddish, legs infusate. Penis (Fig. 1) very large, 0.7-0.8 times as long as pronotum, rather abruptly narrowed subapically, from there to apex parallel-sided ; in addition to flagellum with a long, rod-shaped, apically bifurcate, dorsal sclerite and very strong terminal plates. In various Lauraceae. Madeira, Canary Is., (Mediterranean area, scattered localities — probably relicts from tertiary laurel forests) *bituberculatum* Wollaston, 1854, 1864 ;
(*nigricans* Wollaston, 1865, in part)
- 9/8 Frons flattened in the male ; with a distinct impression laterally bounded by a fringe of conspicuous setae in the female. Body short, $1.05 - 1.60 \times 0.53 - 0.74$ mm ; blackish brown with margins of pronotum laterally reddish as well as elytra, except lateral, often also basal margins. Penis (Fig. 6) narrow, parallel-sided, with no additional sclerites ; tegmen dorsally membranous and not sclerotized. Very polyphagous, particularly common in *Ficus carica*. Azores, Madeira Is., Canary Is. *curtum* Wollaston, 1854
- 10/7 Body very elongate, $1.34 - 1.75 \times 0.61 - 0.79$ mm ; head blackish-brown, pronotum and elytra light brown, centre of the former more or less extensively darker. Penis (Fig. 5) with a tooth-like dilation on each side of apex ; tegmen with no manubrium. In *Rubus* and other Rosaceae but not restricted to this family. Madeira, Canary Is., (British Is. — Guernsey) *mandibulare* Wollaston, 1854
(*bituberculatum* var. β Wollaston, 1854, syn. nov.)
- 11/6 Body moderately elongate, $1.10 - 1.36 \times 0.49 - 0.59$ mm ; black, elytra blackish brown, with conspicuous white pubescence ; interstitial scales short and broad, on declivity little longer than wide. Penis (Fig. 4) much shorter than its flagellum. Various Boraginaceae and Compositae. Canary Is. *canum* sp. nov.
- 12/5 Setae of elytral striae inconspicuous, except in juxtasutural row not reaching the base of following seta. Body moderately elongate, $0.90 - 1.25 \times 0.42 - 0.50$ mm ; black to brownish black, with greyish vestiture. Penis as in Fig. 3. In *Artemisia argentea* and *canariensis*. Madeira Is., Canary Is. *artemisiae* Wollaston, 1854
- 13/4 Interstitial setae of elytra hair-like, at least in anterior half. Apical denticles of pronotum very small.
- 14/15 Setae of posterior third of interstriae scale-like. Body moderately elongate, $1.40 - 1.75 \times 0.60 - 0.75$ mm. Black with elytral disk and declivity reddish-brown. Penis as in Fig. 7, about half as long as pronotum, with remains of terminal plates. In *Teline maderensis*. Madeira *semidegener* sp. nov.

- 15/14 Setae of interstria hair-like throughout. Body moderately elongate, $1.12 - 1.75 \times 0.50 - 0.74$ mm ; also colour as in foregoing. Penis as in Fig. 2, about two-thirds as long as pronotum, with no remains of terminal plates. In *Adenocarpus foliolosus*, *Cytisus proliferus* and *Spartocytisus supranubius*. Canary Is. *nigrescens* Wollaston, 1865
... .. (degener Har. Lindberg, 1953)
- 16/3 Body somewhat broadened backward, apex of pronotum distinctly more narrowly rounded than that of elytra. Denticles of pronotal apex indistinct or absent. Punctures of elytral striae conspicuous, with diameter reaching or surpassing the width of adjacent interstriae. Only breeding in *Euphorbia*.
- 17/20 Elytral apex broadly and plainly rounded but not subtruncate or apparently bifurcate.
- 18/19 Juxtaputural interstriae of normal width, with the usual rows of setae, inner with hair-like, outer with scale-like ones. Body short, $0.94 - 1.12 \times 0.45 - 0.53$ mm ; pronotum black, elytra blackish brown, legs reddish-brown. Penis (Fig. 8) with a dorsal subapical impression and remains of terminal plates, Flagellum at least as long as penis. Spiculum gastrale short. In dendroid *Euphorbia* species. Canary Is. *lowei* Wollaston, 1862
- 19/18 Juxtaputural interstriae narrow, with a single row of hair-like setae. Body $1.05 - 1.20 \times 0.50 - 0.56$ mm ; black, elytra dark brown, legs brown. Penis (Fig. 9) with no subapical impression and no remains of terminal plates, very short, 0.4 times as long as pronotum but flagellum much shorter still. Spiculum gastrale normal. In *Euphorbia tuckeyana*. Cape Verde Is. *loweanum* Wollaston, 1868
- 20/17 Elytral apex not simply rounded.
- 21/22 Elytral apex subtruncate, usually with a very slight sutural incision. Body short, $1.05 - 1.20 \times 0.50 - 0.56$ mm ; black, elytra dark reddish-brown, legs brown. Penis as in Fig. 10. In various dendroid *Euphorbia* species. Madeira, Canary Is. (Morocco — perhaps immigrant from some archipelago) *inarmatum* Wollaston, 1860
- 22/21 Elytral apex apparently bifurcate. Body $0.80 - 1.10 \times 0.43 - 0.53$ mm (smallest species) ; black, elytra dark reddish-brown, legs brown. Penis as in Fig. 11. In *Euphorbia balsamifera*. Canary Is. *bicaudatum* Wollaston, 1865

METHODS

As a rule attacked twigs of the host-plants were gathered and brought to the laboratory, kept at room temperature in jars with a lid, sparsely watered, more or less regularly producing adults for about a year or often more. The emerged insects were removed at irregular intervals, stored and finally mounted. The dates given therefore refer to the gathering of the twigs, the following numbers to my mounting journal.

No collector's name being stated for paratypes implies that the material was collected by myself. The insects were stored in the collection of the respective collector.

Liparthrum canum sp. nov.

Diagnosis. Adults might be mistaken for *artemisiae* because of a similar body shape and size but the latter is on average smaller still, the black colour of its integument more dominating, anteriorly in particular ; the setae of the striae on its elytra are shorter than the distance between the attachments. In *canum* the more purely white and more conspicuous vestiture lends a grey tint to the surface (hence the Latin name). Obviously close relatives are not very easy to single out.

Description. Body nearly parallel-sided with both ends congruently nearly semicircular. Length 1.10 - 1.36, width 0.49 - 0.59 mm. Integument black, weakly microreticulate, shiny. Vestiture white and comparatively dense, general appearance therefore grey.

Frons flattened, with a slight impression above epistoma, indistinctly punctured, with vestiture of rather sparse, not very strong hair-shaped setae. Antennal funicle four-segmented.

Pronotum in anterior half with about ten small submedian denticles the anteriormost close-set pair of which emerge a little behind the margin, often difficult to find from above unless pronotum viewed when strongly stooping forward or from the side. Surface rather densely granulate. Vestiture of more scattered spatulate scales and more abundant, somewhat coarse, often slightly curved, recumbent hairs.

Elytra more than twice as long as pronotum, between interstriae 5 each with about six basal crenulations. Striae not impressed, with insignificant punctures and a series of hairs similar to those of the pronotum, each reaching, or nearly so, the base of the following. Interstriae with a row of truncate, subtriangular scales, little longer than broad on the disc but narrower on the lateral sides. Interstitial scales only exceptionally substituted for a hair. Surface slightly rugulose and weakly reticulate.

Front tibiae on the outer third with two denticles separated by more than their length.

Aedeagus (Fig. 4), the distinctly longer flagellum excepted, about two-thirds as long as pronotum. Tegmen with a long, parallel-sided manubrium. Spiculum gastrale somewhat shorter than penis.

Distinct outer sexual markings not noticed.

Material. Holotype, male : Canary Is., La Palma, Lomo Caballo, 500 m, *Echium aculeatum*, 13.6.1965, 352, G. Israelson leg.

Paratypes. Hierro : Puerto Estaca, 10 m, *Argyranthemum* sp., 28.10.1979, 7713.

La Palma : 13, as holotype ; 8, Fuencaliente, ditto, 31.12.1972, 5406 ; 7, ditto, 31.12.1983, R. Garcia Becerra leg.

Gomera : 5, La Caleta, *Argyranthemum frutescens* 9.1982, P. Oromí leg. ; 8, Palmarejo, 700 m, *Echium* sp., 19.12.1983, 8136 ; 1, Valle Gran Rey, 20, *Argyranthemum* sp., 12.12.1983, 8165 ; 40, ditto, 6.2.1985 ; 85,

ditto, 9.3.1986, 9066 ; 46, S. Sebastian, 270 m, *Echium aculeatum*, 10.7.1970, 2442.

Tenerife : 24, M:a Taco, *Argyranthemum* sp., 20.7.1972, 4193 ; 2, Buenavista, ditto, 14.7.1972, 4196.

Gran Canaria : 18, Costa da Silva, *Argyranthemum frutescens*, 7.7.1971 ; 2, El Palmital, 550 m, knocked from *Myrica faya* and *Ilex canariensis*, 20.6.1971, 2976 ; 6, Punta las Arenas, 30.5.1988, R. García leg. ; 1, Maspalomas, knocked from *Schizogyne glaberrima*, 22.2.1973. 3408.

Lanzarote : 8, Bco. de la Pocela, *Asteriscus intermedius*, 22.2.1973, 4952 ; 7, above Haría, ditto, 25.2.1973, 3430 ; 96, ditto, 600 m, 8.12.1987, 9536.

Biological notes. Two plant families are known to provide hosts for *L. canum* ; Boraginaceae (*Echium*) and Compositae (*Argyranthemum* and *Asteriscus*). Single specimens are mentioned in the list from a few more ligneous plants but in these cases no attacks were observed so there is nothing to suggest breeding ; still it would not be too surprising if *Schizogyne*, belonging to the last-named family, turned out to be a suitable host. Being excellent flyers emerged individuals may disperse rapidly and could be found anywhere. However, they are rarely caught by conventional methods, like sweeping, beating or sifting debris from the ground. So far there seems to be nothing to suggest for light to be an attractive force.

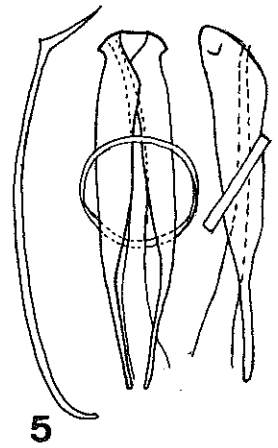
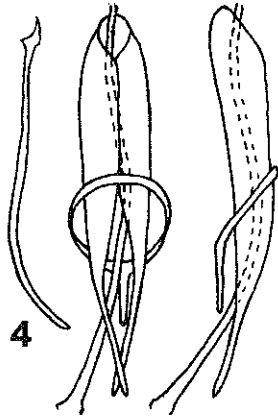
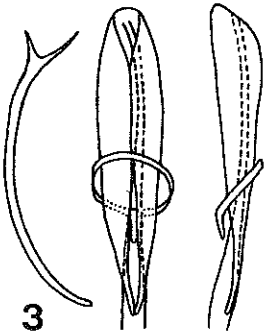
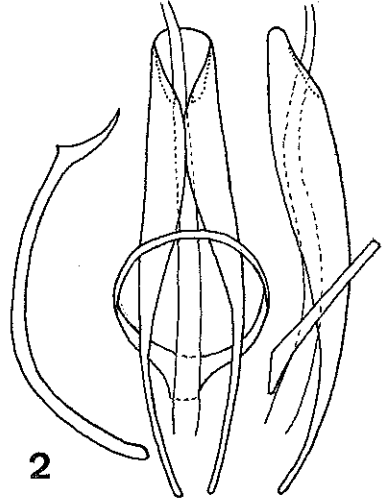
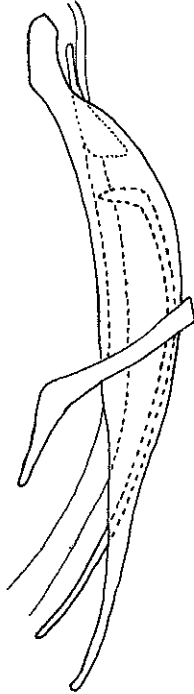
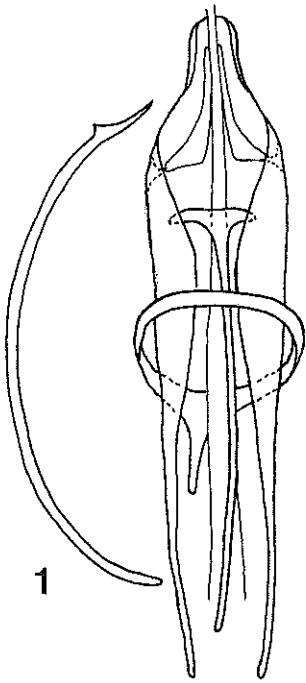
Biogeography. *L. canum* is an endemic of the Canaries where it is known from all islands, Fuerteventura so far excepted. It is typical of the xerophytic zone below the forest zones. The altitudinal range was found to be from little above the sea to 700 m.

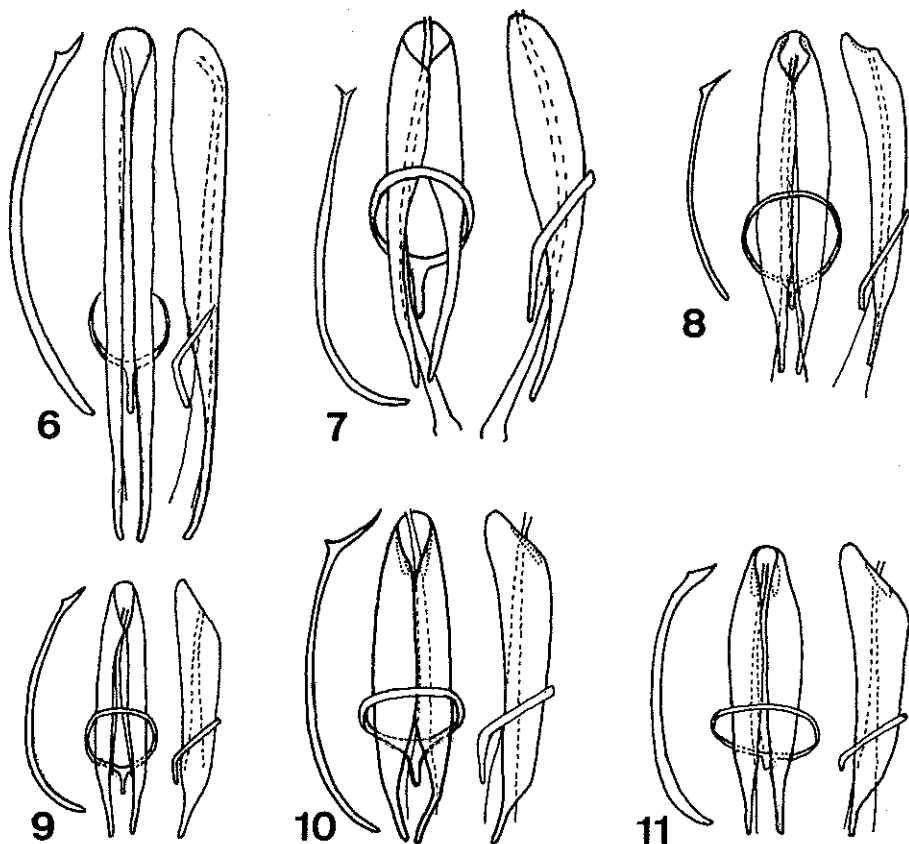
***Liparthrum semidegener* sp. nov.**

Diagnosis. Very reminiscent of its sisterspecies, *nigrescens* Wollaston (1865) (*degener* Har. Lindberg (1953), synonymized by Israelson (1980) : 281) but differing from that species as well as other known species of the genus by the hair-like setae of the elytra on the interstriae 1, the anteriormost portion of interstriae 2 and some times also 3, as well as on the whole declivity being replaced by slightly spatulate scales. The Latin name alludes to Lindberg's *degener*.

Description. Body nearly cylindrical with both ends about uniformly rounded, length 1.40 - 1.75, width 0.60 - 0.75 m, black with the disk and declivity of elytra more or less extensively reddish-brown appendages brown, tarsi and antennae, club excepted, yellowish brown. Surface with strong reticulation except on the elytra.

Frons flattened, with a depression above epistoma, shallowly punctured, very finely pubescent. Antennae with four-segmented funicle and somewhat rectangular, very distinctly segmented club about 1.5 times longer than wide.





Figs. 1-11.—Spiculum gastrale, aedeagus in dorsal and in lateral view of Macaronesian *Liparthrum* species.

1. *bituberculatum* Woll., Madeira ; 2. *nigrescens* Woll., Canary Is. ; 3. *artemisiae* Woll., Madeira ; 4. *canum* sp. nov., Canary Is. ; 5. *mandibulare* Woll., Madeira ; 6. *curtum* Woll., Canary Is. ; 7. *semidegener* sp. n., Madeira ; 8. *lowei* Woll., Canary Is. ; 9. *loweanum* Woll., Cape Verde Is. ; 10. *inarmatum* Woll., Madeira ; 11. *bicaudatum* Woll., Canary Is.

Pronotum in the anterior half with a submedian group of about half a dozen small denticles, the two anteriormost of which form a close-set pair emerging slightly behind the border. Surface with rather dense and coarse granules. Vestiture of very fine and inconspicuous hairs, often slightly raised.

Elytra twice as long as pronotum, base with five or six crenulations on each side between interstriae 4. Striae not impressed, with very fine, adpressed hairs about reaching base of following ones. Interstriae rugulose, much more shiny than the pronotum. The usual row of setae represented by not very broad but distinct scales on the anterior portion of interstriae 1-3, on the two later for a very short distance only, and moreover on all interstriae of the declivity, but by very fine hairs on all other portions of the interstriae.

Protibiae with two widely separated minute denticles on the outer margin of the distal third.

Aedeagus (Fig. 7) with more or less broadly rounded apex, the flagellum excluded, somewhat more than half as long as pronotum. Tegmen normal. Spiculum gastrale shorter than penis with poorly developed subapical branch.

Outer sexual markings not known.

Material. Holotype, male : Madeira, Ribeiro Frio, 1000 m, *Teline maderensis*, 24.3.1981, G. Israelson leg.

Paratypes : 10, as holotype ; 22, ditto, but 26.6.1982 ; 12, ditto, but 4.2.1983.

Biological notes. This rare species develops in the indigenous *Teline maderensis*. Also the very closely related *nigricans* of the Canaries lives in shrubby fabaceous plants. Phloeophagous.

Biogeography. *L. semidegener*, to be judged from its sole locality known, prefers the laurisilva. So does *nigricans* which, however, is well at home in lower portions of the montane zone also, far above the forest zones. Even if *semidegener* would possess the potency of living in the montane zone of Madeira it could not do so because of the absence of suitable host plants.

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