

A REVISION OF THE MADEIRAN SPECIES OF THE GENUS *OTHIUS* STEPHENS (COLEOPTERA: STAPHYLINIDAE)

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With 5 figures

ABSTRACT: An examination of material from various collections, including the types of all Madeiran taxa of *Othius* STEPH., as well as of further material collected by the authors showed that at present the genus comprises 5 endemic species occurring on Madeira: *O. strigulosus* WOLL., *O. jansoni* WOLL., *O. arieiroensis* PALM, *O. baculifer* n. sp. and *O. ruivomontis* n. sp.. *O. brevicornis* WOLL. and *O. vestitus* WOLL. are considered to be synonyms of *O. jansoni* WOLL. The descriptions of each species point out diagnostic characters in external morphology as well as male genitalia and are followed by notes on distribution and bionomics. A key for identification is provided.

RESUMO: O exame de várias colecções incluindo todos os taxa madeirenses de *Othius* STEPH, assim como material de colheitas efectuadas pelos autores indicam a presença de 5 espécies endémicas de *Othius* na Madeira.

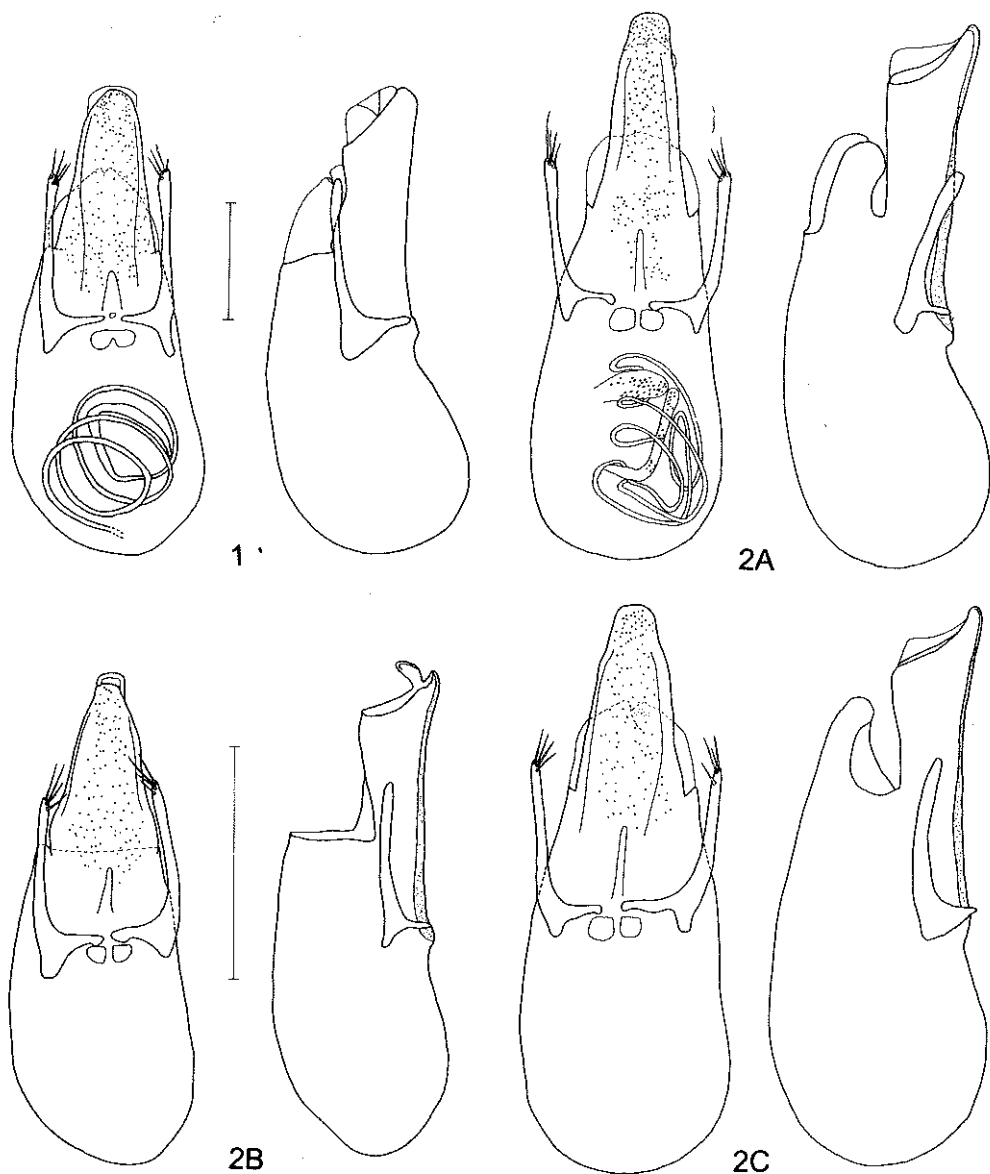
É dada uma chave de identificação assim como uma descrição para cada espécie, baseada em características da morfologia externa e da genitalia masculina.

INTRODUCTION

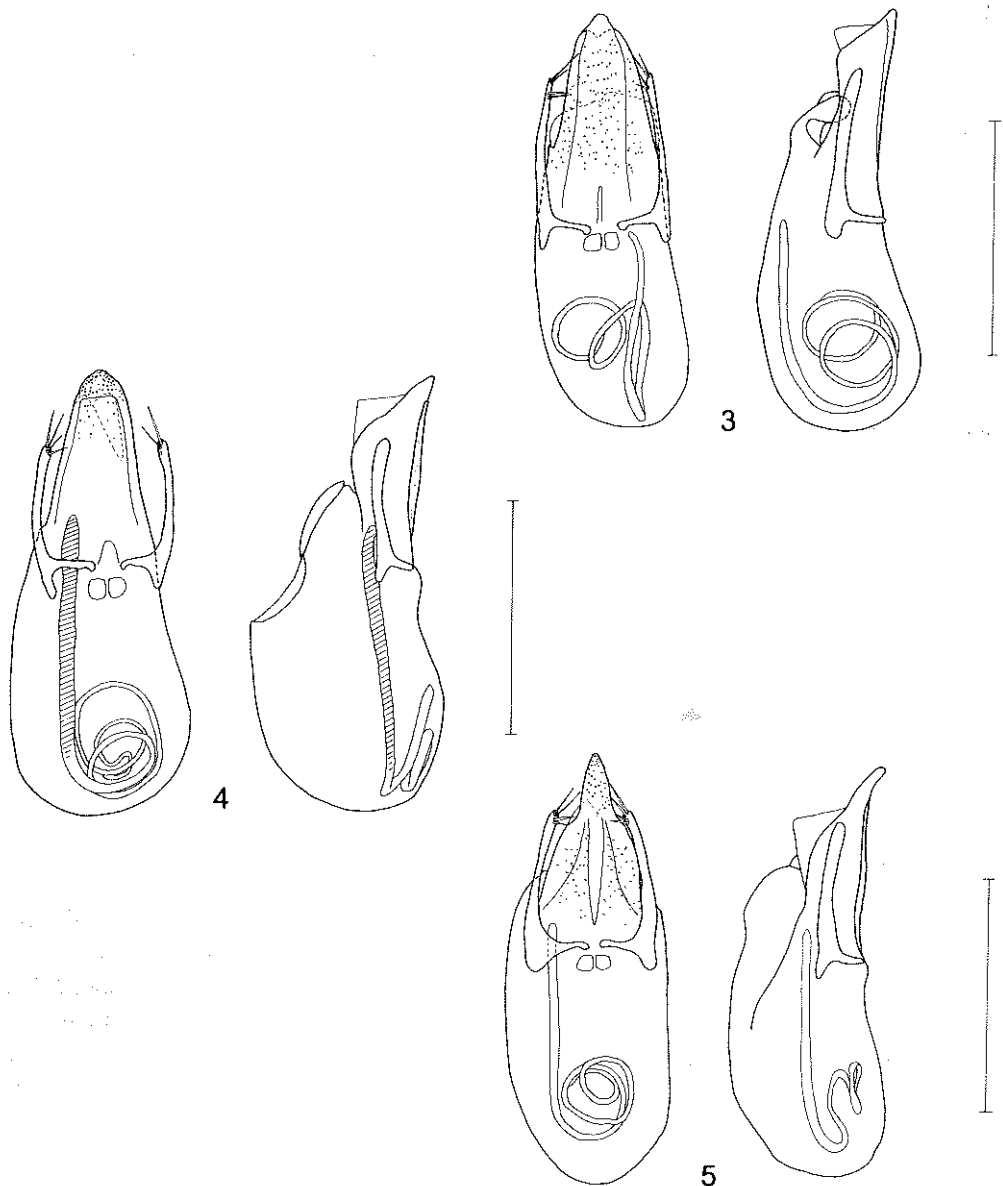
Among the Staphylinid genera present on the Macaronesian Islands *Othius* STEPHENS is among those in which speciation has led to a relatively large number of endemic species. According to PALM (1976,1979), who treated (and keyed) *Othius* of both the Canary Islands and Madeira, the former are inhabited by 6 and the latter by 4 species, each of them occurring on only a single island: *O. brachypterus* WOLL. (Gomera), *O. microphthalmus* COIFF. (Gomera), *O. neglectus* PALM (Gran Canaria), *O. philonthoides* WOLL. (Gran Canaria), *O. intermedius* KORGE (Tenerife), *O. coiffaiti* LOHSE (Hierro, meanwhile also recorded from Gomera (WUNDERLE leg.)), *O. strigulosus* WOLL. (Madeira),

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Figs. 1 - 2: Male genitalia of the Madeiran species of *Othius* in ventral (left) and lateral view (right). - 1. *O. strigulosus* WOLL. - 2. *O. jansoni* WOLL. (A: specimen from authors' collection; B: lectotype of *O. jansoni*; C: syntype of *O. vestitus*).



Figs. 3 - 5: Male genitalia of the Madeiran species of *Othius* in ventral (left) and lateral view (right).
 - 3. *O. arieiroensis* PALM - 4. *O. baculifer* spec. nov. (holotype) - 5. *O. ruivomontis* spec. nov. (holotype). Scale: 0.5 mm.

O. jansoni WOLL. (Madeira), *O. vestitus* WOLL. (Madeira) and *O. arieiroensis* PALM (Madeira). No species of *Othius* seems to have been recorded from the Azores (BERNHAEUER, 1940).

In his first comprehensive account of Madeiran Coleoptera WOLLASTON (1854) described 2 species of *Othius* (*strigulosus*, *jansoni*). Later (1857) he added 2 further species (*vestitus*, *brevicornis*) the former of which he, however, synonymized with *jansoni* in 1865. PALM (1979) regarded *brevicornis* as a synonym of *O. jansoni*, but treated *O. vestitus* as a species propria.

During a joint excursion to Madeira in spring 1993 we collected a considerable number of *Othius*, which clearly belonged to 5 different species. Apart from *O. strigulosus*, our attempts to identify them using PALM's key failed. An ensuing examination of WOLLASTON's and PALM's types then gave rise to the present revision.

Apart from our own material in coll. WUNDERLE (CoW) and coll. ASSING (CoA), the types and further specimens from the following museum collections were studied: The British Museum of Natural History (BMNH) and the Museum of Zoology and Entomology, Lund University, (MZEL), kindly made available to us by Mr P.M. HAMMOND and Mr R. DANIELSSON, respectively.

1. *Othius strigulosus* WOLLASTON, 1854

(Fig. 1)

Type material: Lectotype male, here designated and labelled accordingly, in coll. WOLLASTON (BMNH).

The specimen here chosen as lectotype carries a round label 'type' and a hand-written label '*Othius strigulosus* WOLL., type'. Since the former is a "curator label" (HAMMOND, pers. comm.) and therefore of no taxonomical significance and since WOLLASTON based his original description on several specimens without fixing a type, the six specimens in the WOLLASTON collection must be regarded as syntypes. It seems safe to assume that the lectotype specimen is identical with what PALM (1979), who did not add any labels, considered to be the 'holotype', which he mistook for a female.

Diagnosis and description:

Among the Madeiran *Othius* species *O. strigulosus* is most easily recognized by its tremendous size (11.5 - 17.5 mm) and the size and shape of the aedeagus. Since overall length is strongly dependent on the mode of preparation, measurements of head width (1.8 - 2.6 mm) or distance from labrum to elytral apex (6.2 - 7.2 mm) should be preferred. Further

- but less obvious - differential characters are punctuation, microsculpture (see below) and the lack of a clear sex dimorphism of the protarsi.

Colour of head and pronotum blackish brown to black, that of the abdomen a little lighter, usually dark brown; elytra light to dark brown; antennae red to brown, often darkened distally; legs reddish with the tibia sometimes partly darkened.

Head variable in size and in shape, not always "broadest in posterior half" as pointed out by PALM (1979); with double punctuation, i.e. small punctures with interspersed large punctures especially on sides and back of head; microsculpture fine, transverse, partly reticulate.

Pronotum subparallel with sides slightly converging posteriorly, hind angles rounded; only small punctures present, similar in size to those of head; with fine transverse microsculpture.

Elytra much shorter than pronotum, length of suture little more than half the length of the latter; punctuation variable, punctures often tapering posteriorly in a minute furrow; hind wings reduced.

Abdomen with dense reticulate microsculpture and fine and rather sparse punctuation.

Segments 1-4 of protarsi dilated in both sexes; the extent of dilation may vary, but there is no sex dimorphism as indicated and illustrated by PALM (1979).

Aedeagus as in Fig. 1.

Bionomics:

According to WOLLASTON (1854, 1857) *O. strigulosus* is confined to damp sylvan districts at intermediate altitudes. He collected the species at the Ribeiro de Santa Luzia and at the Ribeiro Frio. Since then it has been recorded from Rabaçal (1080m), Caramujo (JANSSON, 1940), from Terreiro da Luta (ca. 1000m) (PALM, 1979), from Fanal (1200m), Rabaçal (900m and 1300m), Encumeada (1400m), Ribeiro dos Cedros (900m) and Caldeirão Verde (900-1000m) (ERBER *et al.*, 1988). We collected it at Bica da Cana (3 females, 1550m, in litter under *Erica* sp. and *Vaccinium padifolium*, 29.III.1993), at Caramujo (10 males, 3 females, 1220m, in moist woodland litter (*Erica* and *Myrica*), 29.III. and 4.IV.1993), Caramujo (2 females, 1300m, in litter of old stands of *Erica* sp., 4.IV.1993), Achada do Teixeira (1 male, 1580m, northern slope of Pico Ruivo, in litter at the foot of rocks, 6.IV.1993), Achada do Teixeira (3 males, 1 female, 1350m, in the litter of an old stand of *Erica* sp., 6.IV.1993). *O. strigulosus* thus appears to inhabit the litter layer in moist and shady places at a wide range of altitudes. Occasionally it has also been found under stones.

Adults have been observed in winter and early spring (WOLLASTON, 1854), in March and April (our own records), in July and August (JANSSON, 1940) and in September (ERBER *et al.*, 1988). We collected larvae of all instars at Achada do Teixeira on 4.IV.93.

2. *Othius jansoni* WOLLASTON, 1854

(Figs. 2 A-C)

O. jansoni WOLLASTON, 1854

O. brevicornis WOLLASTON, 1857

O. vestitus WOLLASTON, 1857

O. jansoni (WOLLASTON, 1865)

O. vestitus WOLLASTON, (PALM, 1979)

Type material: Lectotype male, here designated and labelled accordingly, coll. WOLLASTON (BMNH).

The specimen chosen as lectotype is one of 3 males (syntypes) in the WOLLASTON collection at the BMNH, and it best fits the original description. Without doubt it is the same specimen which PALM (1979) considered to be the 'holotype', since it carries a round (curator) type label (see remarks on types of *O. strigulosus*) and since PALM (1979) depicts its (damaged) aedeagus (see remarks below).

WOLLASTON (1865) synonymized *O. vestitus* with *O. jansoni*, because "...these extreme phases merge into each other too completely to be regarded as specifically distinct, ...", whereas PALM (1979) claims in his diagnosis of *O. vestitus* that "an examination of the genitalia of the type specimen has clearly demonstrated the difference between them" and that "externally, *O. vestitus* differs from *O. jansoni* by its larger size, the slightly longer antennae [...], by the larger eyes [...] and by the denser and stronger microsculpture on head." We have examined altogether 31 specimens from various collections (BMNH, MZEL, CoA, CoW) including the syntypes of *O. jansoni* and *O. vestitus* as well as the type of *brevicornis* (1 female). Neither measurements of various body parts nor the study of the other external characters mentioned by PALM (1979) yielded any convincing evidence that *O. jansoni*, *O. vestitus* and *O. brevicornis* should be considered different species. True, when comparing very small with very large specimens it is difficult to believe that they should be conspecific. With more material available there are, however, almost continuous transitions in practically every character examined. Above all, PALM's claim that the genitalia of *O. jansoni* and *O. vestitus* are clearly different is based on an artefact. The aedeagus of what he considered to be the holotype of *O. jansoni*, which he depicts in his paper, has, in fact, a broken tip (see Fig. 2B). We have examined the aedeagi of most of the males available (including syntypes of *O. vestitus*) and found no consistent differences that would suggest the presence of more than one species. Nor did a comparison of the female tergites X, which may provide useful characters for the separation of Central European *Othius* species, (UHLIG, pers. comm.), of extremely large and small specimens produce any evidence whatsoever. Therefore, we conclude that the differential characters observed by WOLLASTON and PALM, in fact, refer

to extremes of a highly variable species rather than to real interspecific differences. Consequently, since *jansoni* is the oldest name available, *vestitus* and *brevicornis* must be considered junior synonyms.

Diagnosis and description:

O. jansoni is readily distinguished from the other Madeiran species by its size, the shape of the aedeagus and the internal sac, which can best be examined after microscopic preparation of fresh material. Considering the enormous variability of size in this species and the effects produced by different techniques of preparation, overall body length (in our measurements: 7.5 - 11.5 mm) is of limited diagnostic value. Measurements of length from labrum to elytral apex (3,75 - 5,2 mm) and of head width (1,05 - 1,5 mm) should be preferred.

Colour of head, pronotum and abdomen usually dark brown to blackish brown, the pronotum and the abdomen sometimes a little lighter; elytra yellowish brown to dark brown; body appendices reddish brown with the antennal segments 3-11 and the tibiae sometimes partly darkened.

Head variable in shape and especially in size; dorsally with mostly transverse microsculpture and with rather sparse and minute punctures, interspersed with very large punctures particularly on sides and back of head.

Pronotum parallel or subparallel with the sides slightly converging posteriorly, hind angles rounded; microsculpture mostly transverse, with very minute punctation (only visible at higher magnifications); position of large dorsal punctures variable.

Elytra much shorter than pronotum, at suture half to little more than half (0.5 - 0.59x) the length of the latter; microsculpture usually very superficial, but sometimes clearly reticulate; size and density of punctures rather variable; hind wings reduced.

Abdomen with superficial transverse microsculpture, yellowish hairs and more or less fine punctation.

Protarsi somewhat more dilated in males than in females; however, dimorphism not as pronounced as stated and illustrated by PALM (1979).

Aedeagus as in Fig. 2A (specimen from authors collection), 2B (lectotype, damaged) and 2C (syntype of *O. vestitus*).

Bionomics:

WOLLASTON (1865) found the species "under much the same circumstances as the *O. strigulosus*, and being somewhat the rarer of the two". It has been recorded from the Ribeiro de Santa Luzia (WOLLASTON, 1854), Deserta Grande (type of *O. brevicornis*) (WOLLASTON, 1865), Rib. do Porto Novo, Curral das Freiras (700m) (PALM, 1979), Fonte

do Curral Falso (1400m) and Bica da Cana (1580m) (ERBER *et al.*, 1988). We collected it below the Pico do Arieiro (3 males, 3 females, 1600m, in litter of a stand of *Vaccinium padifolium* and *Erica* sp. with southern exposition; 1 female, 1600m, in litter of *Vaccinium padifolium* and *Erica* sp. with northern exposition; 26.III.1993).

Adults have been observed during the winter months (WOLLASTON, 1854), in February and November (PALM 1979), in July and September (ERBER *et al.*, 1988) and in March (our own data).

We collected a considerable number of *Othius* larvae together with the adults, which may or may not be *jansoni*, since 3 species of *Othius* were present at the site.

3. *Othius arieiroensis* PALM, 1979

(Fig. 3)

Type material: male holotype, Madeira, Pico do Arieiro, 7.II.1978, *leg.* and in coll. PALM (MZEL).

Paratypes: 3 males, 7 females, same data as holotype, *leg.* and in coll. PALM (MZEL) (examined); according to PALM (1979) there are further paratypes (5 males, 3 females, same data as holotype, *leg.* LEILER) in coll. LEILER.

Diagnosis and description:

O. arieiroensis is intermediate in size between *O. jansoni* and the two new species described below: overall body length: 5.8 - 8.0 mm (*cf.* previous remarks concerning this character), length from labrum to elytral apex: 3.0 - 3.4 mm, head width: 0.76 - 0.89 mm.

The males can easily be distinguished from *O. jansoni* and the following species by the shape of the median lobe (especially its apex) and the internal sac.

Colour of head, pronotum and abdomen brown to almost black, elytra yellowish-brown to brown; colour of antennae very variable, reddish, partly darkened or dark brown; legs usually reddish with the (especially the hind- and mid-) tibiae often partly darkened.

Head with central dorsal area transversely striate and with, at most, few large punctures; frons, sides and back of head with patches of reticulate microsculpture and denser punctation.

Pronotum subparallel with the anterior 1/4 of lateral margins usually converging; position of dorsal punctures subject to some variability; with, for the most part, transverse microsculpture.

Elytra little more than half (0.51 - 0.58x) the length of pronotum, with variable, but usually rather dense and clear-cut punctation; microsculpture, if any, very superficial; alae

reduced.

Abdomen with rather dense (much more so than in *O. jansoni*) punctation and whitish pubescence; microsculpture superficial.

Protarsi with strongly developed sex dimorphism, segments 1 - 4 clearly more dilated in males than in females.

Aedeagus as in Fig. 3.

Bionomics:

Records of this species are still scarce. All of the type series (see above) was collected "in February under decaying leaves in thick growths of bilberry and *Erica*" between Pico do Arieiro and Poiso at 1600m. A further 4 males in the PALM collection (MZEL) are labelled: P. Arieiro, 19.8.78. We found the species (6 males, 5 females) near or at the type locality under similar circumstances (1600m, in litter of mixed stands of *Vaccinium padifolium* and *Erica* sp. on a slope with northern (4 males, 2 females) and on a slope with southern (2 males, 3 females) exposition on 26.III.1993. It is interesting to note that on 3.IV. we were unable to collect a single adult specimen of the species at the same localities. 1 male (leg. BENICK; CoA) was captured in the surroundings of Funchal (900m) in November 1967. PALM (1979) states that in April he only found larvae (and no adults) "which might belong to this species". Together with the comparatively few adult specimens we, too, collected a large number of *Othius* larvae at the end of March. These observations could suggest that adults of *O. arieiroensis* are present from summer through winter or early spring and that larval development takes place in winter and spring. However, since it is not certain that the larvae are indeed conspecific with the adults and since the data are still scarce, these conclusions must be considered rather speculative at present.

4. *Othius baculifer* spec. nov.

(Fig. 4)

Type material: male holotype, Madeira, Bica da Cana, 1550m, 29.III.1993 (CoA).

Paratypes: 6 males, 2 females, same data as holotype; 1 female, Pico do Arieiro, 1600m, 26.III.1993; 1 male, 3 females, Pico do Arieiro, 1600m, 3.IV.1993; 1 male, Rabaçal, 1050m, 31.III.1993 (CoA, CoW).

Diagnosis and description:

O. baculifer n. sp. is smaller in size than *O. arieiroensis*: overall body length (with abdomen fully extracted): 6.1 - 7.0 mm, length from labrum to elytral apex: 2.75 - 3.05 mm,

head width: 0.68 - 0.74 mm (no overlap with *O. arieiroensis*). The most characteristic features of this species are the shape of the median lobe and the internal sac with a sclerotized distal part, which - especially when illuminated from below - much resembles a rod (though its name).

Colour of dorsal surface yellowish brown to dark brown; head, pronotum and abdomen often darker; appendices yellowish with the inner surface of mid- and hind tibiae sometimes partly darkened.

Head with - for the most part - superficial transverse microsculpture and large punctures particularly on frons, sides and the posterior region.

Pronotum somewhat wider than head, maximum width at about 1/5 to 1/4 of pronotal length from front margin; with superficial transverse microsculpture; position of large punctures of dorsal pronotal series subject to some variability, but first puncture usually about half way between front margin and second puncture.

Elytra a little more than half (0.57-0.63x) the length of pronotum; rather densely covered with punctures similar in size to those of head; surface between punctures mostly shiny, partly with very superficial microsculpture; alae reduced.

Abdomen with dense, fine punctation and pale pubescence.

Protarsi with strongly developed sex dimorphism; segments 1-4 much more dilated in males than in females.

Aedeagus as in Fig. 4.

Bionomics:

With one exception, all the specimens were collected at an altitude of 1550 - 1600m in litter of mixed stands of *Vaccinium padifolium* and *Erica* sp. with northern exposition. 1 male was found in litter of a *Laurus* wood at 1050m (Rabaçal). Apparently *O. baculifer* n. sp. may coexist with *O. arieiroensis*. It is interesting to note that at the site below Pico do Arieiro we collected 11 specimens of *O. arieiroensis* and only one of *O. baculifer* on 26.III., whereas on 3.IV. we found none of the former and 4 of the latter. Future observations must show whether or not our collection data are a reflection of seasonal segregation in the two species.

5. *Othius ruivomontis* spec. nov.

(Fig. 5)

Type material: male holotype, Achada do Teixeira, 1580m, 6.IV.1993 (CoA).

Diagnosis and description:

Although similar in size (body length with abdomen fully extracted: 6.8 mm, length from labrum to elytral apex: 2.9 mm, head width: 0.73 mm) and general appearance to *O. baculifer* n. sp., *O. ruivomontis* is easily distinguished from the latter by the shape of the median lobe and in that the distal part of the internal sac is transparent.

Colour of whole body surface of holotype \pm unicoloured yellowish brown.

Head with rather sparse punctation on frons, sides and posterior region; dorsal area with superficial, mostly transverse microsculpture.

Pronotum a little wider than head, with superficial transverse microsculpture; general shape and punctures of dorsal series as in *O. baculifer* n. sp..

Elytra with punctation and microsculpture as in *O. baculifer* n.sp., at suture a little more than half (0.61x) the length of pronotum; alae reduced.

Abdomen with punctation and pubescence similar to *O. baculifer* n. sp., transverse microsculpture very superficial.

Protarsi with segments 1 - 4 strongly dilated (as in males of *O. baculifer*).

Aedeagus as in Fig. 5.

Bionomics:

The holotype was sieved from litter and moss at the N-exposed sides of rocks about 2.5 km NE of Pico Ruivo (though its name).

Key to the Madeiran species of *Othius* STEPH.

1. Very large species, body length (BL) 11.5 - 17.5 mm, length from labrum to elytral apex (SL) 6.2 - 7.2 mm, head width (HW) 1.8 - 2.6 mm.
 Aedeagus as in Fig. 1 *O. strigulosus* WOLL.
 - Smaller species, BL 11.5 mm at most, SL < 6 mm, HW < 1.6 mm 2
2. Relatively large species, but size subject to high variability, BL 7.5 - 11.5 mm, SL 3.75 - 5.2 mm, HW 1.05 - 1.5 mm. Aedeagus as in Fig. 2 A - C *O. jansoni* WOLL.
 - Smaller species, BL at most 8.0 mm, SL < 3.5 mm, HW < 1.0 mm; abdomen with denser punctation 3
3. Relatively large species, BL 5.8 - 8.0 mm, SL 3.0 - 3.4 mm, HW 0.76 - 0.89 mm. Aedeagus as in Fig. 3 *O. arieiroensis* PALM
 - Smaller species, BL (with abdomen fully extracted!) 6.1 - 7.0 mm, SL 2.75 - 3.05 mm, HW < 0.75 mm 4
4. Internal sac with sclerotized rod-like distal part, median lobe in ventral view latero-apically ± evenly converging with rounded apex, in lateral view ± straight (Fig. 4) *O. baculifer* n. sp.
 - Distal part of internal sac transparent, median lobe in ventral view latero-apically curved with pointed apex, in lateral view arcuate (Fig. 5). *O. ruivomontis* n.sp.

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