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## A revision of the Canarian species of *Leptobium* CASEY (Coleoptera, Staphylinidae: Paederinae)

V. ASSING

**Abstract:** The types and additional material of the Canarian species of *Leptobium* CASEY are revised. 5 species, one of them with two subspecies, are validated: *Leptobium nigricolle nigricolle* (WOLLASTON 1862) = *L. wollastoni confusum* COIFFAIT 1969, syn. n.; *L. nigricolle canariense* (FAUVEL), stat. n. = *L. wollastoni wollastoni* (COIFFAIT 1954), syn. n.; *L. ruficolle* (WOLLASTON 1862); *L. debilipenne* (WOLLASTON 1865); *L. gomerense* ASSING, in press; *L. gracile* (GRAVENHORST 1802). Lectotypes are designated for *Doliceon nigricollis* WOLLASTON, *Doliceon ruficollis* WOLLASTON, *Doliceon debilipennis* WOLLASTON, *Doliceon wollastoni wollastoni* COIFFAIT, and *Leptobium wollastoni confusum* COIFFAIT. Comparative diagnoses and a key are presented for all Canarian representatives of the genus. The male genitalia as well as additional distinguishing characters are figured. Based on measurements of various body parts, intra(sub)-specific variation is studied and illustrated with special reference to *L. nigricolle* and *L. ruficolle*. The available data on the distribution and bionomics of Canarian *Leptobium* are compiled.

**Key words:** taxonomy, ecology, biogeography, Western Palaearctic, Canary Islands, *Leptobium*, new synonyms, lectotype designations, intraspecific variation, endemism.

### Introduction and taxonomic history

WOLLASTON (1862) was the first to describe species of *Leptobium* CASEY, originally in the genus *Doliceon* LAPORTE, from the Canary Islands: *Doliceon nigricollis* from Lanzarote and Gran Canaria, and *D. ruficollis* from Fuerteventura and Lobos. In the original description of *D. nigricollis*, however, he hesitated to consider the single specimen available to him from Gran Canaria conspecific with the material from Lanzarote stating that "it may be specifically distinct" and naming it "var. β". No further species were added in the catalogue published by the same author two years later (WOLLASTON 1864). In his synopsis of the Coleoptera of the Atlantic Islands, however, WOLLASTON (1865) described a third species from Gomera, *Doliceon debilipennis*, and, having seen material from Algeria, concluded that the distribution of *D. nigricollis* was not confined to the Canarian archipelago, but that it also occurred in North Africa.

Several decades later, FAUVEL (1898) described another new species, *Doliceon canariensis*, from Gran Canaria, without reference to Wollaston's "var. β". In his catalogues of North African and Atlantic Staphylinidae, FAUVEL (1897, 1902) treated *Doliceon nigricollis* WOLLASTON and *D. ruficollis* WOLLASTON as varieties of *D. illyricus* ERICHSON,

recorded *D. nigricollis* also from Fuerteventura and Graciosa, and reported the widespread *Doliceon gracilis* (GRAVENHORST) from Gran Canaria. FAUVEL's taxonomic concept of *D. nigricollis* was not adopted by JARRIGE (1952), who distinguished *Leptobium* CASEY from *Doliceon* LAPORTE, treated *L. nigricolle* (WOLLASTON) as a distinct species, and referred the North African representatives of *L. nigricolle* to a new subspecies, *L. nigricolle continentale*. Without reference to either Wollaston's "var.  $\beta$ " or *Doliceon canariensis* FAUVEL, COIFFAIT (1954a) then described *Doliceon wollastoni* from Gran Canaria, at that time treating *Leptobium* as a subgenus of *Doliceon*. Later, in his synopsis of Western Palaearctic *Leptobium*, the same author adopted the generic concept proposed by JARRIGE (1952) and attributed the Canarian species of the genus to the *L. punctiger* species group, except for *L. ruficolle* (WOLLASTON) and *L. canariense* (FAUVEL), which he listed as incertae sedis (COIFFAIT 1969). In the same paper, he also described a further subspecies from Lanzarote, *L. wollastoni confusum*. Apart from new records of *L. nigricolle* from La Palma and of *L. ruficolle* from Lanzarote, no substantial changes were proposed by COIFFAIT (1982).

Based on the literature referred to above, the recent checklist by HERNÁNDEZ et al. (1994) indicates seven taxa for the Canarian archipelago: *L. canariense* (Gran Canaria), *L. debilipenne* (La Gomera), *L. gracile* (Gran Canaria), *L. nigricolle* (La Palma, Gran Canaria, Lanzarote, Fuerteventura), *L. ruficolle* (Lanzarote, Fuerteventura), *L. wollastoni wollastoni* (Gran Canaria), and *L. wollastoni confusum* (Lanzarote and a doubtful record from Fuerteventura). In the meantime, an additional endemic species has been described from La Gomera: *L. gomerense* ASSING (in press).

A preliminary examination and - based on the key, diagnoses and figures in COIFFAIT (1982) - attempts at identifying personally collected specimens as well as material sent to me by several colleagues gave rise to considerable doubts regarding the current concept of the taxonomy and distribution of Canarian species of *Leptobium* and eventually initiated the present revision.

### Material and measurements

Types and additional material from the following public and private collections were studied:

- BMNH ..... The Natural History Museum, London (M. Brendell)
- DEI ..... Deutsches Entomologisches Institut, Eberswalde (L. Zerche)
- IRSNB ..... Institut Royal des Sciences Naturelles de Belgique, Bruxelles (D. Drugmand)
- MCN ..... Museo de Ciencias Naturales, Santa Cruz de Tenerife (G. Ortega)
- MHNG ..... Muséum d'Histoire Naturelle, Genève (G. Cuccodoro)
- MNHNP ..... Muséum National d'Histoire Naturelle, Paris (N. Berti)
- NHMW ..... Naturhistorisches Museum Wien (H. Schillhammer)
- cAss ..... author's private collection
- cGar ..... Private collection R. García Becerra, Santa Cruz de La Palma
- cGil ..... Private collection G. Gillerfors, Varberg
- cMac ..... Private collection A. Machado, La Laguna
- cOro ..... Private collection P. Oromí, La Laguna

**The measurements in the diagnoses and the key are indicated in mm and abbreviated as follows:**

- HL .....head length from front margin of clypeus to neck  
 HW .....maximal head width  
 PW .....maximal width of pronotum  
 PL .....length of pronotum along median line  
 EL .....length of elytra from apex of scutellum to elytral hind margin  
 OL.....diametre of eye in lateral view (measured from anterior to posterior margin)  
 PgL .....length of postgenae in lateral view (measured from hind margin of eye to neck)  
 AL .....length of aedeagus  
 TL .....total length from apex of mandibles to hind margin of tergum VIII.

### **The Canarian species of *Leptobium* CASEY**

After an examination of the types and additional material of Canarian *Leptobium*, five species, one of them with two subspecies, are verified for the archipelago; due to lack of material and biogeographical data, the specific status of one of the taxa is still doubtful. The external resemblance and particularly the similar morphology of the aedeagus in all the Canarian representatives of the genus suggest that they may form a monophyletic group. However, a verification of this hypothesis would require a much more thorough understanding of the phylogenetic relationships of the continental species of *Leptobium*. The current systematic concept of the genus is based mainly on typological criteria (see COIFFAIT 1969, 1982), and an adelphotaxon of the Canarian species has not been identified.

The present study revealed that intraspecific variation both of external and sexual characters has often been underestimated. This not only applies to external characters such as head shape, size, punctuation, etc., but also to the morphology of the aedeagus (shape of the ventral process and of the subapical ventral sclerite), all of them characters which the available keys in the literature primarily rely on. A diagnosis of the species is additionally complicated by the relatively high morphological uniformity of the species, i. e. the comparatively low number of distinguishing characters and the low degree of character divergence. Differences in the internal structures of the aedeagus, for instance, which are of great diagnostic value in many other Staphylinidae, are barely noticeable, and no appreciable differences were found in the female terminalia.

The two species endemic in La Gomera are clearly more distinctive and characterized by more pronounced adaptive reductions (smaller eyes, shorter elytra, weaker pigmentation) than the remaining Canarian congeners from the eastern islands, which may be interpreted as a result of a longer time of genetic isolation and genetic divergence. The only further islands inhabited by island endemics are Gran Canaria (one subspecies) and Fuerteventura/Lobos (one species whose status is here considered uncertain). One specimen of *Leptobium*, possibly representing a distinct species and island endemic (very small eyes and short elytra), was seen from Tenerife ("Los Cambitos [recte: Campitos], 6-I-1963, J. M. Fernández" (MCN)). However, this specimen had been dissected prior to the present study; the aedeagus was missing and the colour seems to have changed due to

the application of chemical agents, so that a description is here refrained from. The genus is unknown from El Hierro, and the record from La Palma has not been confirmed (see *L. nigricolle nigricolle*). Interestingly, the distribution (and colonization?) pattern of island endemics in *Leptobium* is almost paralleled by the phylogenetically "old" *Othius brachypterous* species group. Two of the three species are endemic in La Gomera, and the third species is restricted to Gran Canaria (ASSING 1998).

***Leptobium nigricolle nigricolle* (WOLLASTON 1862) (Figs 1, 3a, 5-7)**

*Doliceon nigricollis* WOLLASTON 1862: 188f.

*Leptobium wollastoni confusum* COIFFAIT 1969: 878f., syn. n.

**T y p e s e x a m i n e d :** *L. nigricolle* (WOLLASTON): Lectotype ♂, present designation; mounted on label with red-brown mark, according to Wollaston's colour code signifying that it was collected in Lanzarote: syntype [round curator label]/ The Canary Is. T.V. Wollaston. B.M. 1864-80/ nigricollis/ Lectotypus ♂, *Doliceon nigricollis* Wollaston, desig. V. Assing 1999 (BMNH).

Paralectotypes, here designated and labelled accordingly: 1 ♂, same labels as lectotype (BMNH); 1 ♂, syntype [round curator label]/ type [round curator label]/ *Doliceon nigricollis* Woll. type/ The Canary Is. T.V. Wollaston. B.M. 1864-80 (BMNH); 1 ♀, syntype [round curator label]/ 1385/ Canary Is. 99-203/ The Canary Is. T.V. Wollaston. B.M. 1864-80/ nigricollis (BMNH); 1 ♂ (with blue mark - colour code signifying Gran Canaria - and "β" written on mounting label): syntype [round curator label]/ The Canary Is. T.V. Wollaston. B.M. 1864-80/ nigricollis var β/ *Leptobium canariense* (Fauvel), det. V. Assing 1999 (BMNH).

*L. wollastoni confusum* COIFFAIT: Lectotype ♂, present designation: Haria. I. Lanzarote, Canarias, J. Mateu coll./ 13-14-III-52 [overleaf]/ Muséum Paris 1985 Coll. H. Coiffait/ Holotype/ *Leptobium wollastoni* ssp. *confusum* Coiff., H. Coiffait det. 1969/ Lectotypus ♂, *Leptobium wollastoni confusum* Coiffait, desig. V. Assing 1999/ *Leptobium nigricolle* (Wollaston), det. V. Assing 1999 (MNHN).

WOLLASTON (1862) based his original description of *Doliceon nigricollis* on several specimens - with one exception all of them from Lanzarote - without specifying a holotype. He also included one specimen from Gran Canaria ("var. β"), emphasizing, however, the possibility that "it may be specifically distinct". Since the latter may in fact be true - it is here considered a distinct subspecies (see below) -, a lectotype designation was indispensable.

COIFFAIT (1969) described *L. wollastoni confusum* as a nomen novum for his previous interpretation (sic!) of *Doliceon nigricollis* WOLLASTON (COIFFAIT 1954a, b). Since his specification of the "type" in the original description ("Haria, île de Lanzarotte, Canarias") refers to two specimens indicated in COIFFAIT (1954b), both of these specimens have to be considered syntypes. According to the original description, *L. wollastoni confusum* is separated from *L. nigricolle* (WOLLASTON) by the different shape of the aedeagus. An examination of one of the syntypes, however, showed that the shape of the aedeagus is well within the range of intraspecific variation of *L. nigricolle*, so that *L. wollastoni confusum* is here synonymized with that species. In order to secure this synonymy and because the second syntype could not be located, a lectotype designation was deemed necessary.

**Additional material examined:** Lanzarote: 1 ♀, Ermitá de las Nieves, 600m, V.1986, leg. Machado (cMac); 2 ♀ ♀, same data, but 12.V.1986 (cMac); 2 ♂ ♂, Las Valles, 3.XII.1988, leg. Machado (cMac, cAss); 3 ♂ ♂, 1 ♀, Mirador Haria, 450m, 12.V.1986, leg. Machado (cMac, cAss); 1 ♂, 2 ♀ ♀, same locality, 500m, 3.XII.1988, leg. Machado (cMac, cAss); 1 ♀, Haria, 500m, *Rumex*, V.1986, leg. Machado (cMac); 2 ♂ ♂, 1 ♀, Haria, 27.XI.1988, leg. Oromí (MCN, cOro); 1 ♀ [teneral], Castillo de Guanapay, 11.V.1986, leg. Aguiar (MCN); 1 ♂ [teneral], Salinas del Río Fámara, 13.V.1986, leg. Aguiar (MCN); 1 ♀, Tejuise, 14.IV.1974, leg. Machado (cMac); 2 ♂ ♂, Fermés, 22.II.1995, leg. Oromí (cOro, cAss); 1 ♂, Las Nieves, 12.II.1997, leg. Oromí (cOro). La Graciosa: 1 ♂, Mont. Mojón, 23.II.1995, leg. Oromí (cAss); 1 ♂, locality not specified, VIII.1882, leg. Corsaro (NHMW). Montaña Clara: 1 ♂, Caldera, 24.IV.1994, leg. Oromí (cAss). Alegranza: 1 ♀, locality not specified, 15.IV.1994, leg. García (cGar); 4 ♂ ♂, 1 ex., Borde Caldera, 1.-7.V.1990, leg. Oromí (cOro, cAss); 2 ♂ ♂, 1 ♀, Interior Caldera, 1.-7.V.1990, leg. Oromí (cOro); 1 ♂, El Jablito, 1.-7.V.1990, leg. Oromí (cAss). Fuerteventura: 1 ♂, 1 ♀, Cumbre Jandía, 10.V.1974, leg. Machado, Oromí (cMac, cOro); 1 ♂, 1 ♀, Cumbre Jandía, 15.II.1977, leg. Oromí (MCN, cOro); 1 ♀, Valles de Ortega, 14.II.1977, leg. Oromí (MCN); 2 ♂ ♂, Pico Zarze, 19.II.1978, leg. Machado (cMac, cAss); 1 ♂ [teneral], Antigua, 21.III.1990, leg. García (cGar); 2 ♂ ♂, 1 ♀, Antigua, 28.III.1991, leg. García (cGar, cAss); 1 ♂, 3 ♀ ♀, Bco. Canarios, 26.III.1991, leg. García (cGar, cAss); 1 ♀ [teneral], La Pared, 26.III.1991, leg. García (cGar); 3 ♂ ♂, Caldera Jacomar, 19.II.1995, leg. Oromí (cOro, cAss); 1 ♂ [teneral], Jacomar, 26.II.1999, leg. Oromí (cOro); 2 ♂ ♂, 1 ♀, Morro de La Cruz, 13.III.1989, leg. Gillerfors (cGil, cAss); 2 ♀ ♀ [1 teneral], Granadillo, 21.III.1989, leg. Gillerfors (cGil); 1 ♂, Betancuria, 11.III.1949, leg. Lindberg (NHMW); 2 ♂ ♂, Pinar de Betancuria, 17.&19.IV.1989, leg. Medina (MCN).

**Diagnosis:** Measurements (mm) and ratios (range, arithmetic mean; n=67): HL: 0.95-1.39, 1.16; HW: 0.88-1.28, 1.05; PW: 0.89-1.30, 1.08; PL: 1.09-1.53, 1.29; EL: 0.69-1.10, 0.88; OL: 0.22-0.33, 0.27; PgL: 0.45-0.69, 0.56; AL: 1.03-1.28, 1.16; TL: 4.9-8.1, 6.4; HL/HW: 1.05-1.16, 1.10; PW/HW: 0.99-1.10, 1.03; PL/PW: 1.13-1.25, 1.20; EL/PL: 0.61-0.84, 0.68; OL/PgL: 0.41-0.56, 0.48.

**Coloration:** head (except for the mouthparts), pronotum, abdominal segments III-VI, and base of segment VII blackish, elytra and abdominal apex reddish, legs and antennae yellowish to reddish brown.

Head weakly oblong; postgenae in dorsal view weakly and evenly curved, posterior angles completely obsolete (Fig. 3a); central dorsal surface with rather sparse macro-punctuation and interspersed micropunctures; microsculpture absent; eyes moderately large, but size somewhat variable, approximately half the length of postgenae in lateral view (see ratio OL/PgL). Antenna with antennomere III slightly longer than II; IV moderately oblong, the following antennomeres of gradually decreasing length; antennomere X subquadrate or weakly transverse.

Pronotum usually slightly wider than head, and distinctly oblong (see ratios); lateral margins in dorsal view ± straight, weakly to moderately converging posteriorly, sometimes almost parallel. Dorsal punctuation of variable density, usually rather sparse with the interstices 1.5-3x the width of the punctures; median line without or with only very few punctures; microsculpture absent.

Elytra distinctly shorter than pronotum (see ratio EL/PL); punctuation variable, often similar to that of pronotum, but sometimes weaker or coarser; elytra without, scutellum with very weak transverse microsculpture; hind wings reduced.

Abdomen with punctuation moderately dense to rather sparse and distinctly finer than on forebody; tergal surfaces with fine, but distinct microsculpture; posterior margin of tergum VII without palisade fringe.

♂: sternum VIII with deep and narrow posterior incision (Fig. 1f); aedeagus of variable size, ventral process apically weakly pointed or simply rounded; subapical ventral sclerite

of variable shape, asymmetric, on the right side (ventral view!)  $\pm$  distinctly dentate, this dent in material from Fuerteventura usually more pronounced than in specimens from Lanzarote; parameres not reaching apex of ventral process, but distance between parameral apices and apex of ventral process somewhat variable; internal sac with distinctly sclerotized large structure (Figs 1a-e).

**Intraspecific variation and systematics:** Morphological variation in the subspecies is enormous; this not only applies to external characters such as size, head shape, eye size, and punctuation, but also to the size of the aedeagus, the shape of the subapical ventral sclerite of the aedeagus - according to COIFFAIT (1969, 1982) a key character for the distinction of Canarian *Leptobium* - and the relative length of the parameres. The populations from Fuerteventura, Lanzarote and the smaller islands (Alegranza, La Graciosa, Montaña Clara) differ to some extent (see Figs 5-7), but there is considerable character overlap, and differences in average character states can also be observed for samples from one and the same island. Winged specimens of *L. nigricolle* are unknown, so that the dispersal power of this species is evidently very low. Both the pronounced variation and the differences between populations can be explained as a result of a patchy distribution, in which gene flow is impeded by barriers such as the Atlantic Ocean separating the islands and probably also by uninhabitable stretches of land (e. g. semi-desert). Although there is presumably only very little gene flow between the populations of different islands, if any at all, they are here referred to one and the same subspecies. Regarding them as distinct taxa on the subspecific level would not be appropriate in the absence of sufficient evidence supporting such a hypothesis and would also be unworkable, particularly because of pronounced overlap in practically all the characters studied.

An examination of nine specimens of *L. nigricolle continentale* JARRIGE from Morocco (NHMW) revealed that they indeed differ in the shape of the head, which is relatively shorter (Fig. 5) and has more pronounced hind angles, and in the relatively larger eyes (Fig. 6). The male genitalia, in contrast, are indistinguishable. However, since there is only little overlap in the external characters mentioned, the subspecific status of this taxon is here maintained.

**Distribution and bionomics:** *L. nigricolle nigricolle* is more widely distributed than its Canarian congeners. Based on the material examined, it occurs in Lanzarote, Fuerteventura, and in the smaller islands La Graciosa, Alegranza, and Montaña Clara. The record from La Palma (COIFFAIT 1982) could not be confirmed. The specimens listed above were collected from February through May, in August, November, and December. Four beetles taken in February, March, and April were teneral.

***Leptobium nigricolle canariense* (FAUVEL 1898), stat. n. (Figs 2, 3b, 5-7)**

*Doliceon canariensis* FAUVEL 1898: 97.

*Doliceon wollastoni* COIFFAIT 1954a: 98, syn. n.

**Types examined:** *L. canariense* (FAUVEL): Lectotype ♂, present designation: Iles Canaries, Canaria, Ch. Alluaud 1890/ Muséum Paris, Coll. Ch. Alluaud, 1947/ Type/ *D. canariensis* FvI. n. sp./ gardé I [?]/ Lectotypus *Doliceon canariensis* Fauvel, desig. V. Assing 1999 (MNHN). Paralectotypes, here designated and labelled accordingly: 2 ♀♀ [mounted on one label], same labels as lectotype (MNHN); 2 ♀♀ [mounted on one label], G.de Canaria/ Coll. R. I. Sc. N. B., ex coll. Fauvel/ *canariensis* FvI./ R.I.Sc.N.B. 17.479, *Doliceon*, Coll. et det. A. Fauvel/ *Ex-Typis* (IRSNB); 2 ♂♂, 1 ♀, Iles Canaries, Canaria, Ch. Alluaud 1890/ M.N.C.N. Madrid/ *Leptobium nigricollis* W. Hernández det. (MCN).

*L. wollastoni* (COIFFAIT): Lectotype ♂ (aedeagus missing), present designation: Telde, Gran Canaria, J. Mateu coll./ Muséum Paris, 1985, Coll. H. Coiffait/ Paratype/ *Leptobium wollastoni* Coiff., H. Coiffait det. 1954/ *Lectotypus* ♂ *Dolicaon wollastoni* Coiffait, desig. V. Assing 1999/ *Leptobium canariense* (Fauvel), det. V. Assing 1999 (MNHNP).

The original description of *Dolicaon canariensis* FAUVEL is based on material collected in Gran Canaria by C. Alluaud and deposited both in the Fauvel and the Alluaud collection (FAUVEL 1898); a holotype is not specified. Altogether five syntypes were found in these collections, only one of them a male, which is here designated as lectotype in order to preserve the present interpretation of the taxon.

COIFFAIT (1954a) based his original description on "une petite série" collected by J. Mateu in Gran Canaria, without specifying a holotype. Only one of the syntypes, labelled as paratype, was found in the Coiffait collection. An examination of the external morphology of this specimen - its aedeagus is missing - showed that it is conspecific with *L. canariense* (FAUVEL). Consequently, *Dolicaon wollastoni* is here regarded as a junior synonym of that species. In order to secure this synonymy, the only syntype available is here designated as lectotype.

**A d d i t i o n a l m a t e r i a l e x a m i n e d :** Gran Canaria: 3♂♂, 1♀, 2 ex., Las Breñas, 500m, 25.XI.1987, leg. García (cGar, cAss); 1 ex., Pico Bandama, 1.XI.1974, leg. Machado (cMac); 1♂, 1♀, 2 ex., Cruz de Tejada, 2.XI.1974, leg. Machado (cMac); 1♂, Cruz de Tejada, 8.I.1988, leg. Oromí (cOro); 1♂, Cruz de Tejada, 27.X.1992, leg. Oromí (cAss); 2♂♂, Cruz de Tejada, 1450m, 6.V.1968, leg. Benick (cAss, cWun); 1♂, Cruz de Tejada, 15.III.1967, leg. Fernández (MCN); 2♂♂, 2♀♀, Cruz de Tejada, 17.&21.VI.1983, leg. Gillerfors (cGil); 21♂♂, 18♀♀, N Cruz de Tejada, 1600m, *Pinus canariensis* wood, 25.&26.XII.1997, leg. Assing, Wunderle (cAss, cWun); 1♀, 1 ex., N Cruz de Tejada, 1370m, meadow with *Pinus canariensis*, 4.II.1998, leg. Zerche (DEI, cAss); 21♂♂, 16♀♀ [1♂ and 1♀ in copula], Pozo de las Nieves, 1850-1900m, *Pinus* wood, 24.XII.1997, leg. Assing, Wunderle (cAss, cWun); 1 ex., Pozo de las Nieves, 1850m, 6.II.1998, leg. Zerche (DEI); 1♂, Pozo de las Nieves, 18.VI.1985, leg. Aguiar (MCN); 6♂♂, 4♀♀, Cruz de San Antonio, 900m, under stones, 26.XII.1997, leg. Assing, Wunderle (cAss, cWun); 2♂♂, Ojeda, 9.-10.II.1996, leg. Oromí (cAss); 1♀, Moja Sp., 2.III.1994, leg. Hengmith (cAss); 1♂, Presa Chira, 25.IV.1993, leg. García (cGar); 1♂, San Bartolomé, Bco. de Tirajana, 900m, 12.III.1996, leg. Baur (cAss); 1♂, Mogán, El Baranquillo Andres, Bco. de Arguineguin, 350m, 8.III.1996, leg. Baur (cAss); 1♂, 3 ex., Bco. de Mogán, El Pié de la cuesta, 355m, sifted under *Echium decaisnei* and *Euphorbia obtusifolia*, 3.II.1998, leg. Zerche (DEI, cAss); 1♂, 2♀♀, Bco. de Mogan, 24.XII.1984, leg. Gillerfors (cGil); 1♂, Hoya del Gamonel, 25.II.1998, leg. Oromí, (cOro); 1♂, 1♀, Sta. Brigida, 26.III.1986, leg. Oromí, (cOro); 2♂♂ [teneral], Maspalomas, III.1969 (MHNG, cAss); 1♀, Tafira Baja, 1.XI.1974, leg. Machado (cMac); 4♂♂, 1♀, Bco. Fataga, 600m, 29.I.1989, leg. García (cGar); 3♂♂, Pl. Ingles-Fataga, 16.XI.1988, leg. Gillerfors (cGil, cAss); 1 ex., Fontanales, Pinar, 1250m, 5.II.1998, leg. Zerche (DEI).

**D i a g n o s i s :** Measurements (mm) and ratios (range, arithmetic mean; n=98): HL: 0.79-1.12, 0.92; HW: 0.71-1.06, 0.86; PW: 0.71-1.04, 0.86; PL: 0.83-1.19, 1.01; EL: 0.63-0.88, 0.75; OL: 0.18-0.27, 0.22; PgL: 0.35-0.53, 0.43; AL: 0.89-1.10, 0.96; TL: 4.6-7.2, 5.7; HL/HW: 1.01-1.11, 1.07; PW/HW: 0.95-1.04, 0.99; PL/PW: 1.12-1.24, 1.18; EL/PL: 0.66-0.83, 0.74; OL/PgL: 0.43-0.58, 0.51.

Coloration of body usually as in *L. nigricolle nigricolle* (rarely the forebody is ± uniformly reddish to castaneous brown), very similar also in external morphology. A distinction from that Subspecies based on single specimens is sometimes difficult due to considerable intrasubspecific variation and some character overlap.

Body on average smaller (see measurements). Head relatively shorter and wider (see

ratios HL/HW and PW/HW), in most specimens slightly wider than pronotum. Postgenae in dorsal view more convex, often diverging for some distance (Fig. 3b); eyes usually relatively larger (see ratio OL/PgL). Punctuation of dorsal surface of head and pronotum on average denser and coarser.

Pronotum on average relatively shorter (see ratio PL/PW). Elytra usually longer (see ratio EL/PL) and with more distinctly diverging lateral margins.

♂: sternum VIII as in *L. nigricolle nigricolle*; aedeagus, too, of highly similar morphology, but smaller; subapical sclerite of variable shape, but usually with less distinct ventral tooth than in average *L. nigricolle nigricolle* (Figs. 2a-c).

**Remarks:** Morphological Intraspecific variation in the material examined is enormous, though less so than in *L. nigricolle nigricolle*. In addition, the male primary and secondary sexual characters are highly similar to *L. nigricolle* especially from Lanzarote. However, the different head shape appears to be rather constant (Fig. 5), and there is relatively little character overlap in some other characters (size, shape of pronotum, relative length of elytra, size of aedeagus; see Figs 6-7), which suggests that *L. canariense* represents a distinct taxon on either the species or the subspecies level. There is some evidence indicating that the latter may be true. Five specimens collected near Maspalomas, in Tafira Baja, and in the Bco. de Mogán were well within the size range of *L. nigricolle*; in two ♂♂ from Maspalomas, the subapical sclerite of the aedeagus resembled that mostly encountered in *L. nigricolle* from Fuerteventura (Fig. 2c), and in the ♀ from Tafira Baja the head shape approached the typical condition in *L. nigricolle*. Moreover, specimens taken at lower altitudes tended to be larger than those from mountain ranges. In view of the evidence available it is here proposed to treat *L. canariense* (FAUVEL) as a subspecies of *L. nigricolle*.

**Distribution and bionomics:** *L. nigricolle canariense* has become known only from Gran Canaria, where it seems to be rather common (COIFFAIT 1954b; FAUVEL 1897; WOLLASTON 1862; and material examined); the record of *L. nigricolle* from Gran Canaria in UYTENBOOGAART (1935) is very likely to refer to this subspecies. It apparently occurs in various biotopes and at a wide range of altitudes, from the peak of Pozo de las Nieves at 1900m almost down to sea-level. The material examined was collected from September through June. Copulating specimens were observed in December; two teneral beetles were found in March.

### ***Leptobium ruficolle* (WOLLASTON 1862) (Figs 4-7)**

*Doliceon ruficollis* WOLLASTON 1862: 189.

**Type examined:** Lectotype ♂, present designation; mounted on label with brown mark, according to Wollaston's colour code signifying that it was collected in Fuerteventura: Type [round curator label]/ *Doliceon ruficollis* Woll. type/ The Canary Is. T.V. Wollaston. B.M. 1864-80/ *Lectotypus* ♂, *Doliceon ruficollis* Wollaston, desig. V. Assing 1999 (BMNH).

Without specifying a holotype, WOLLASTON (1862) based his original description on two specimens, one from Fuerteventura and one from Lobos. Only one of the syntypes was found in the Wollaston collection. In order to secure the present interpretation of the species, this specimen was designated as lectotype.



**Additional material examined:** *Fuerteventura*: 1 ♀, Betancuria, 28.III.1991, leg. García (cAss); 1 ♀, Betancuria, 12.II.1977, leg. Oromí (MCN); 1 ♂, Betancuria, 8.II.1997, leg. Oromí (cAss); 1 ♀, La Oliva, 13.II.1977, leg. Oromí (MCN); 1 ex., Tetir, 3.IV.1992, leg. Oromí (cOro). *Los Lobos*: 3 ♂♂ [aedeagi missing or deformed], 8 ♀♀, 25. & 27.III.1955, leg. Gonzalez (MCN); 1 ♀ [teneral], 6.V.1955, leg. Gonzalez (MCN).

**Diagnosis:** Measurements (mm) and ratios (range, arithmetic mean; n=12): HL: 0.97-1.30, 1.19; HW: 0.89-1.18, 1.07; PW: 0.88-1.21, 1.09; PL: 1.09-1.40, 1.29; EL: 0.79-0.94, 0.88; OL: 0.24-0.35, 0.31; PgL: 0.45-0.60, 0.54; AL: 1.28-1.31; TL: 5.6-7.6, 6.7; HL/HW: 1.07-1.15, 1.11; PW/HW: 0.98-1.04, 1.02; PL/PW: 1.14-1.24, 1.18; EL/PL: 0.66-0.74, 0.68; OL/PgL: 0.52-0.67, 0.58.

Externally highly similar to *L. nigricolle*, but distinguished as follows:

Coloration different: head, abdominal terga III-VI, and base of segment VII dark brown; pronotum, elytra, apex of abdomen, antennae, and mouthparts light reddish; legs testaceous.

Eyes slightly larger (see measurement and ratio OL/PgL).

♂: posterior incision of sternum VIII as in *L. nigricolle* or deeper (Fig. 4b); aedeagus of similar morphology as in *L. nigricolle*, but larger (Fig. 4a).

**Comments and distribution:** There is still some doubt that *L. ruficolle* is really specifically distinct from *L. nigricolle*. Apart from the reddish pronotum, the only appreciable differences observed were the slightly larger eyes and relatively larger aedeagus (Figs 6, 7), characters which are subject to considerable variation in *L. nigricolle*. Unfortunately, in the majority of the few ♂♂ available the aedeagus was missing (dissected prior to present study) or deformed (in 2 ♂♂ that were almost completely black apparently as a result of the application of some chemical). The hypothesis that *L. ruficolle* represents a vicariant local colour variation must be rejected, since in one locality (Betancuria) both forms were collected. The beetles from Lobos were on average larger than those collected in Fuerteventura. More material of *L. ruficolle* and more data on the distribution of both *L. nigricolle nigricolle* and *L. ruficolle*, especially in Fuerteventura, are needed before the taxonomic status of the latter taxon can be clarified. Meanwhile, *L. ruficolle* is best regarded as a distinct species.

*L. ruficolle* has been recorded from Fuerteventura and the Isle of Lobos (WOLLASTON 1862; and material examined). COIFFAIT (1982) also reports the species from Lanzarote, but this record has not been confirmed and is here considered doubtful; it may well be based on a teneral *L. nigricolle nigricolle*. The examined specimens were collected in February, March, and May. One beetle taken in May was teneral.

### ***Leptobium debilipenne* (WOLLASTON 1865) (Figs 8b, d)**

*Dolicoon debilipennis* WOLLASTON 1865 (appendix): 73.

**Type examined:** Lectotype ♂, present designation; mounted on label with red mark, according to Wollaston's colour code signifying that it was collected in La Gomera: type [round curator label]/*Dolicoon debilipennis* Woll. type (BMNH).

The original description is based on several specimens, but does not specify a holotype. The Wollaston collection contained only one of the syntypes. Since two endemic species of *Leptobium* occur in La Gomera, a lectotype was designated in order to secure the present interpretation of the species.

**A d d i t i o n a l m a t e r i a l e x a m i n e d :** Gomera: 2♂♂, 1♀, El Cedro, 9.I.1983, leg. Machado (cMac, cAss); 1♂, El Cedro, 7.I.1983, leg. Oromí (cOro); 1♂, El Cedro, 1.IV.1972, leg. Oromí (cOro); 1♀, El Cedro, 7.IX.1987, leg. Oromí (cOro); 1♂, Llano de Crispin, 31.IV.1978, leg. Oromí (cOro); 1♀, Meriga, 5.I.1981, leg. Oromí (cOro); 1♀, Meriga, 9.I.1983, leg. Oromí (cOro); 1♂, 2♀♀, Meriga, 9.I.1983, leg. Machado (cMac, cAss); 1♂, Meriga, 25.IV.1984, leg. Gillerfors (cGil); 3♀♀, La Zarcita, 24.IV.1984, leg. Gillerfors (cGil); 2♀♀, Fuensanta, 26.IV.1984, leg. Gillerfors (cGil); 2♀♀, Agua de los Llanos, 1.I.1984, leg. Gillerfors (cGil); 9♂♂, 9♀♀ [2 ex. teneral], NW Vallehermoso, northern slope of Teselinde, 700m, degraded Laurisilva, sifted from leaf litter, 25.XII.1998, leg. Assing (cAss); 1 ex., Teselinde, 30.XII.1981, leg. Gillerfors (cGil); 1♀, NE Arure, Zarza, 1000m, Laurisilva, leaf litter, 25.XII.1998, leg. Assing (cAss); 2♀♀, N Arure, Mir. de Alojera, 1000m, litter of Fayal-Brezal, 25.XII.1998, leg. Assing (cAss); 1♂, 2♀♀, El Cedro, above Ermitá N. S. de Lourdes, 1000-1050m, Laurisilva, leaf litter, 27.XII.1998, leg. Assing (cAss); 1♀, El Cedro, 5.VII.1975, leg. Fernández (MCN); 3♂♂, 1 ex., El Cedro, 25.IV.1984, leg. Gillerfors (cGil); 1♀ [teneral], El Cedro, 30.XII.1983, leg. Gillerfors (cGil); 1♀, El Cedro, 21.VII.1971, leg. Machado (cMac); 2♂♂, Raso Bermejo, 6.V.1962, leg. Fernández (MCN).

**D i a g n o s i s :** Measurements (mm) and ratios (range, arithmetic mean; n=36): HL: 0.76-0.95, 0.83; HW: 0.72-0.85, 0.78; PW: 0.71-0.89, 0.78; PL: 0.85-1.10, 0.94; EL: 0.50-0.63, 0.57; OL: 0.12-0.16, 0.14; PgL: 0.39-0.48, 0.44; AL: 0.94-1.03, 0.99; TL: 4.0-5.5, 4.8; HL/HW: 1.01-1.13, 1.07; PW/HW: 0.98-1.05, 1.02; PL/PW: 1.16-1.24, 1.20; EL/PL: 0.54-0.66, 0.60; OL/PgL: 0.26-0.38, 0.32.

**Coloration distinctive:** Body ferruginous, except for the dark brown to blackish abdominal segments III-VI; legs usually testaceous.

**Size smaller than in *L. nigricolle nigricolle*** (see measurements); eyes distinctly smaller than in the preceding species (see ratio OL/PgL); head shape similar to *L. nigricolle canariense*; punctuation of head relatively coarse.

**Pronotum** approximately as wide as or slightly wider than head. Elytra shorter than in the preceding species.

**♂:** sternum VIII as in Fig. 8d; aedeagus distinctive, apex of ventral process very acute and pointed, subapical ventral sclerite of characteristic shape (Fig. 8b).

**D i s t r i b u t i o n a n d b i o n o m i c s :** The species is endemic in La Gomera, where it is apparently lives in the litter of woodland biotopes (Laurisilva, Fayal Brezal) at intermediate altitudes (700-1050m). It was rather common in a degraded Laurisilva on the northern slope of the Teselinde. The material examined was collected in January, April, July, September, and December. Three specimens taken at the end of December were teneral.

### ***Leptobium gomerense* ASSING, in press (Figs 8a, c)**

**T y p e s e x a m i n e d :** see ASSING (in press).

**D i a g n o s i s :** Measurements (mm) and ratios (range; n=8): HL: 0.92-1.10; HW: 0.86-1.04; PW: 0.83-0.97; PL: 0.97-1.27; EL: 0.62-0.76; OL: 0.14-0.18; PgL: 0.47-0.59; AL: 0.92-1.06; TL: 5.7-6.9; HL/HW: 1.01-1.11; PW/HW: 0.93-0.97; PL/PW: 1.14-1.33; EL/PL: 0.60-0.69; OL/PgL: 0.29-0.39.

**Coloration distinctive:** whole body ± uniformly reddish brown to castaneous.

**Distinguished from the externally otherwise similar *L. debilipenne*** also by larger size (see measurements) and somewhat denser punctuation. For further details see ASSING (in press).

♂: sternum VIII deeply incised, but less so than in *L. debilipenne* (Fig. 8c); aedeagus in relation to body size smaller, apically broader and less acute; subapical ventral sclerite of different shape (Fig. 8a)

**Distribution and bionomics:** *L. gomerense* is endemic in La Gomera, where it is known from Teselinde and La Mérica and where it is apparently much rarer than *L. debilipenne*. In contrast to that species, *L. gomerense* was collected under stones in open grassland. The locality at Teselinde was only a few hundred metres from a degraded Laurisilva (same altitude), where *L. debilipenne* was rather common. The type specimens were all collected in December.

### ***Leptobium gracile* (GRAVENHORST 1802)**

*Lathrobium gracile* GRAVENHORST 1802: 182.

**Material examined:** Gran Canaria: 1♂, Maspalomas, 12.V.1959 (MCN); 2♂♂: Iles Canaries, Canaria, 1890, Ch. Alluaud (MNHN).

**Diagnosis and comments:** Since this species is widespread and well-known, a detailed diagnosis is here refrained from. It is easily distinguished from other Canarian congeners by its bicoloured elytra, which are dark anteriorly and rufous posteriorly, by the presence of a palisade fringe at the hind margin of abdominal tergum VII, and by the characteristic aedeagus, especially the oblong subapical ventral sclerite (see Figs 17a, b in COIFFAIT 1982). In the three Canarian specimens available, the coloration of the elytra differed from the usual condition in Southern European representatives in the less well-defined and much more extensive reddish spot in the posterior area of the elytra, leaving only the anterior 1/5- 1/3 of the elytra surface dark. The hind wings were fully developed.

**Distribution:** *L. gracile* is widespread in the south of the Western Palearctic region. In the Canary Islands, there are only two records from the surroundings of Maspalomas, Gran Canaria (FAUVEL 1898, 1902, record confirmed and the additional specimen listed above). The species is generally found in moist habitats, usually on riverbanks and seashores (HORION 1965; and personal observation). No data are available regarding the ecological circumstances, under which the Canarian specimens were collected.

### **Key to the Canarian species of *Leptobium***

1. Elytra bicoloured, anteriorly dark and posteriorly ± extensively reddish; hind margin of abdominal tergum VII with palisade fringe. ♂: subapical ventral sclerite of median lobe much longer than wide. Widespread in the south of the Western Palearctic region; in the Canary Islands only known from the south of Gran Canaria. ....  
..... *L. gracile* (GRAVENHORST)
- Elytra uniformly yellowish, reddish, or brown; hind margin of abdominal tergum VII without palisade fringe. ♂: subapical ventral sclerite of median lobe much wider than long. Endemics of the Canarian archipelago.....2
2. Head and pronotum uniformly yellowish brown to castaneous; abdominal segment VII of similar colour as forebody; eyes smaller (OL/PgL: 0.26-0.39) and elytra shorter (EL/PL: 0.54-0.69). Endemics of La Gomera.....3

- In mature specimens, at least the head blackish brown to black; abdominal segment VII infusate; eyes larger and elytra slightly longer. (In *L. nigricolle canariense*, head and pronotum may exceptionally be brown, but the abdominal segment VII is always blackish.) Unknown from La Gomera.....4
- 3. Abdominal segments III-VI dark brown to black, distinctly contrasting with the yellowish brown to reddish brown forebody and abdominal apex; size smaller (HW <0.86 mm). ♂: posterior incision of sternum VIII deeper; ventral process of aedeagus apically very acute, subapical sclerite of characteristic shape (Figs 8b, d) ..... *L. debilipenne* (WOLLASTON)
- Whole body ± uniformly reddish brown to castaneous; size larger (HW >0.85 mm). ♂: posterior incision of sternum VIII less deep; ventral process of aedeagus apically less acute, subapical sclerite of different shape (Figs 8a, c)..... *L. gomerense* ASSING
- 4. Pronotum reddish; eyes on average larger (OL/PgL: 0.52-0.67). ♂: aedeagus relatively larger (Fig. 4a). Fuerteventura, Lobos, ?Lanzarote.....*L. ruficolle* (WOLLASTON)
- Pronotum as dark as head; eyes usually smaller (OL/PgL: 0.41-0.58). ♂: aedeagus relatively smaller.....5
- 5. Size on average lower (HL <1.15 mm; PL <1.20 mm); head usually with distinct hind angles, relatively shorter (HL/HW: 1.01-1.11), wider (PW/HW: 0.95-1.04), and on average with denser punctation (Fig. 3b). ♂: aedeagus on average larger (Figs 1a-e). Gran Canaria..... *L. nigricolle canariense* (FAUVEL)
- On average larger (HL >0.95 mm; PL >1.05 mm); head usually without distinct hind angles, relatively longer (HL/HW: 1.05-1.16), narrower (PW/HW: 0.99-1.10), and on average with less dense punctation (Fig. 3a). ♂: aedeagus on average larger (Figs 1a-e). Lanzarote, La Graciosa, Alegranza, Montaña Clara, Fuerteventura, ?La Palma..... *L. nigricolle nigricolle* (WOLLASTON)

### Acknowledgements

I am much indebted to the colleagues indicated in the material section for the loan of types and additional material, which this study is based on.

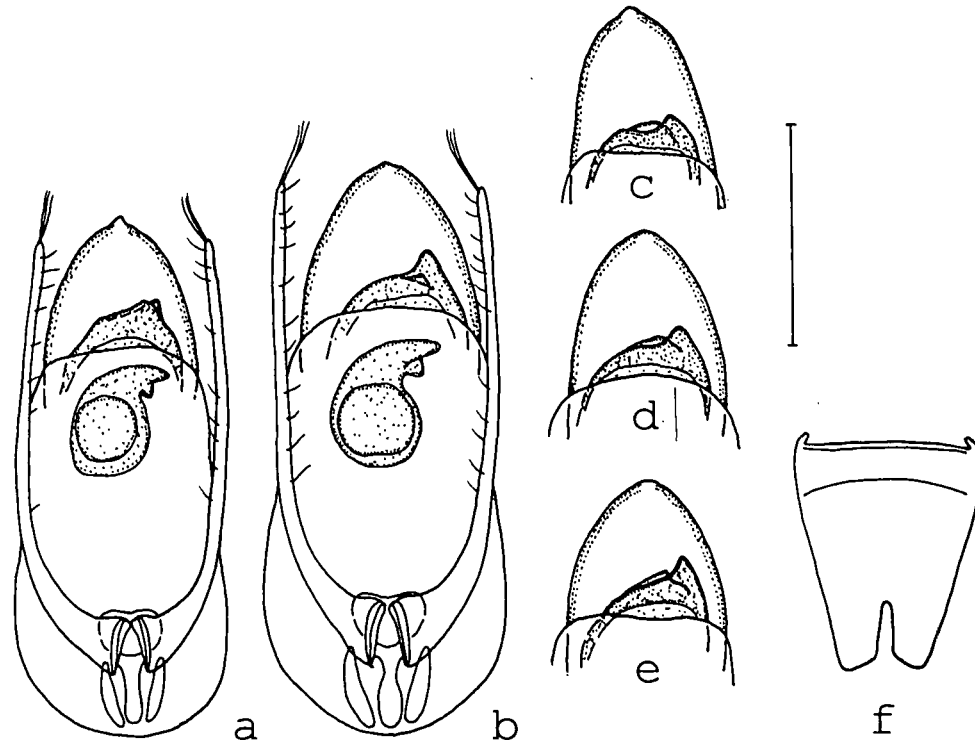
### Zusammenfassung

Nach Revision der Typen und weiteren Materials der kanarischen Arten der Gattung *Leptobium* CASEY werden fünf Arten, davon eine mit zwei Unterarten, für das Archipel verifiziert: *Leptobium nigricolle nigricolle* (WOLLASTON 1862) = *L. wollastoni confusum* COIFFAIT 1969, syn. n.; *L. nigricolle canariense* (FAUVEL), stat. n. = *L. wollastoni wollastoni* (COIFFAIT 1954), syn. n.; *L. ruficolle* (WOLLASTON 1862); *L. debilipenne* (WOLLASTON 1865); *L. gomerense* ASSING, im Druck; *L. gracile* (GRAVENHORST 1802). Für *Doliceon nigricollis* WOLLASTON, *Doliceon ruficollis* WOLLASTON, *Doliceon debilipennis* WOLLASTON, *Doliceon wollastoni wollastoni* COIFFAIT sowie *Leptobium wollastoni confusum* COIFFAIT werden Lectotypen designiert. Für die kanarischen Vertreter der Gattung werden Vergleichsdiagnosen gegeben und ein Bestimmungsschlüssel erstellt. Die männlichen Genitalien und weitere Differentialmerkmale werden abgebildet. Die intra(sub-)spezifische Variabilität insbesondere von *L. nigricolle* und *L. ruficolle* wird morphometrisch untersucht und durch Diagramme illustriert. Die verfügbaren Daten zur Verbreitung und Bionomie kanarischer *Leptobium*-Arten werden zusammengestellt.

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Author's address: Volker ASSING  
Gabelsbergerstr. 2  
D-30163 Hannover, Germany  
email: [vassing.hann@t-online.de](mailto:vassing.hann@t-online.de)



**Fig. 1:** *Leptobium nigricolle nigricolle* (WOLLASTON). Aedeagus (a, b), apical part of median lobe (c-e), and outline of ♂ sternum VIII (f) of specimens from Lanzarote (a, c, d, f; c: LT) and Fuerteventura (b, e). Scale: a-e: 0.5 mm; f: 1.0 mm.

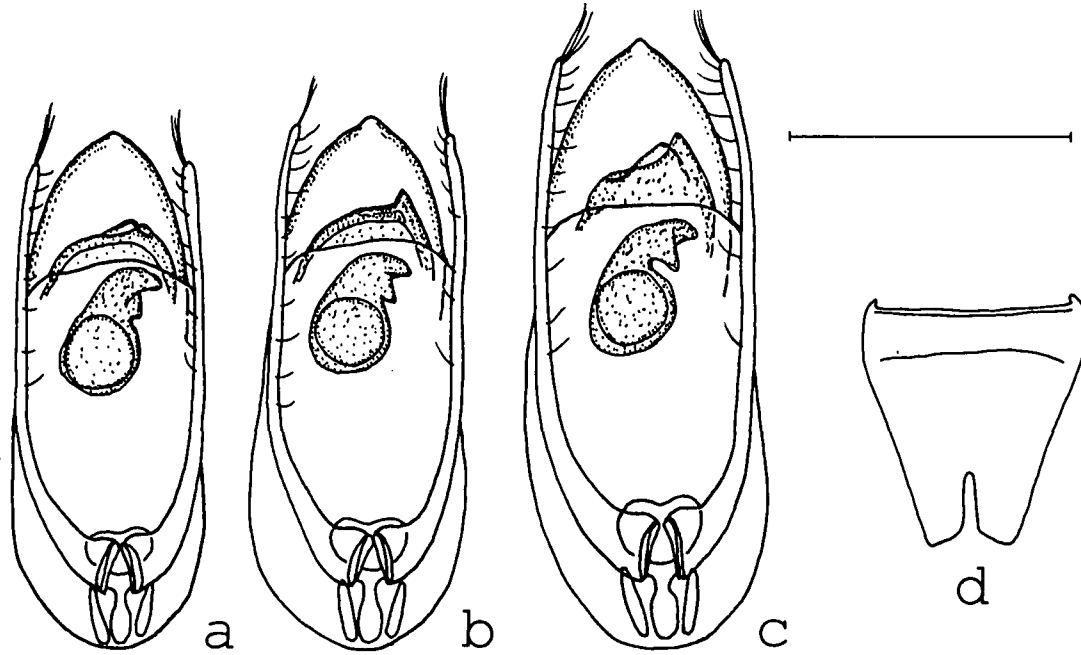


Fig. 2: *Leptobium nigricolle canariense* (FAUVEL). Aedeagus (a-c) and outline of ♂ sternum VIII (d); c: specimen from Maspalomas. Scale: a-c: 0.5 mm; d: 1.0 mm.

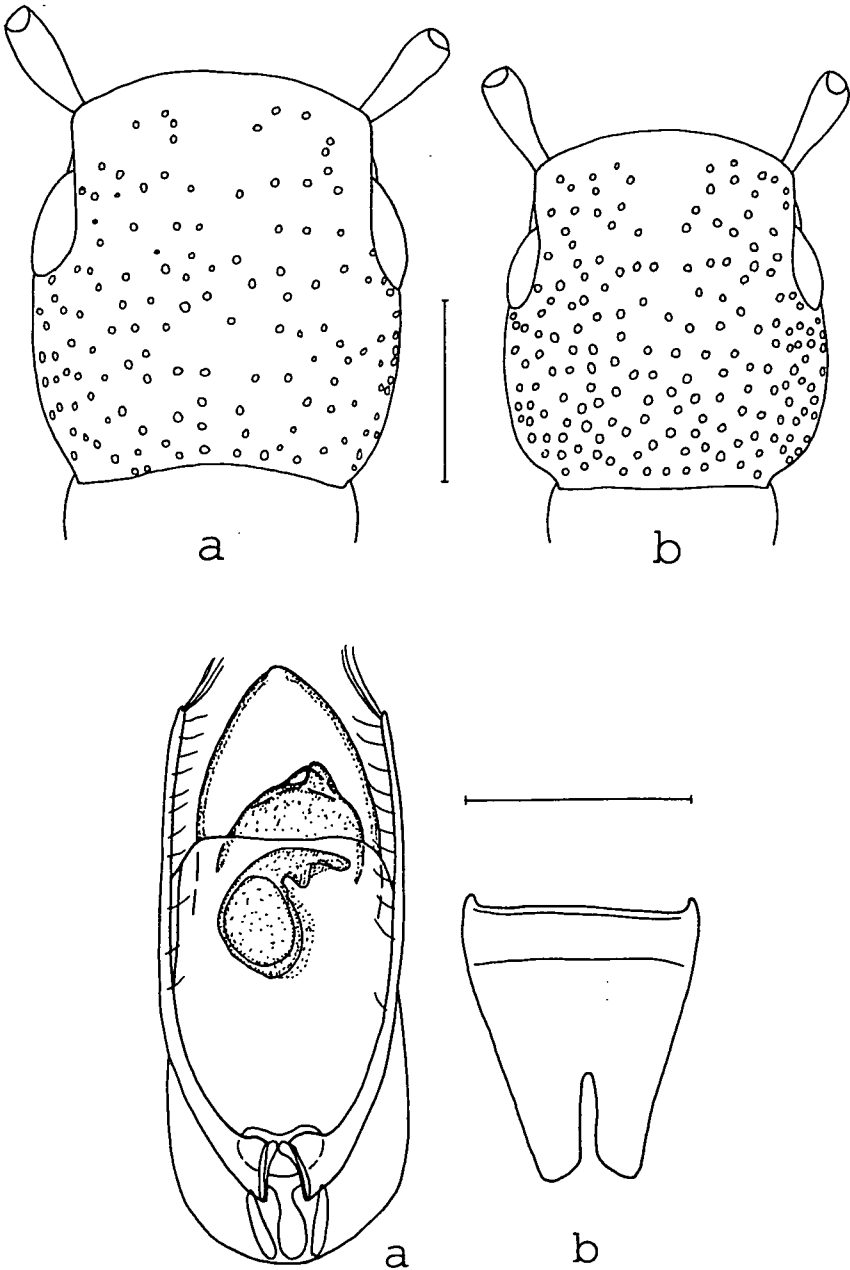


Fig. 3 (above): Outline of head of *L. nigricolle nigricolle* (WOLLASTON) (a) and of *L. nigricolle canariense* (FAUVEL) (b). Scale: 0.5 mm. Fig. 4 (below): *Leptobium ruficolle* (WOLLASTON). Aedeagus (a) and outline of ♂ sternum VIII (b) of lectotype. Scale: a: 0.5 mm; b: 1.0 mm.



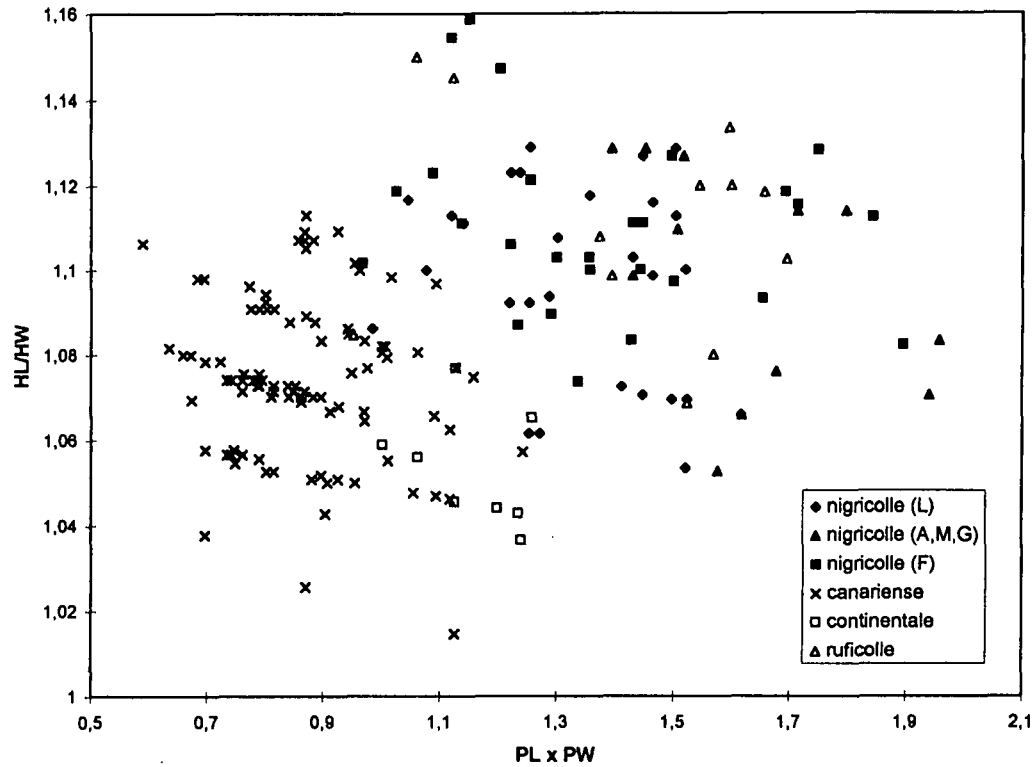


Fig. 5: Variation of head shape (given as the ratio HL/HW) in relation to pronotum size (given as the product of pronotal length and pronotal width) in *Leptobium nigricolle nigricolle* from Lanzarote (L), Fuerteventura (F), and from the smaller islands La Graciosa, Alegranza, and Montaña Clara (A, M, G), in *L. nigricolle canariense*, in *L. nigricolle continentale*, and in *L. ruficolle*.

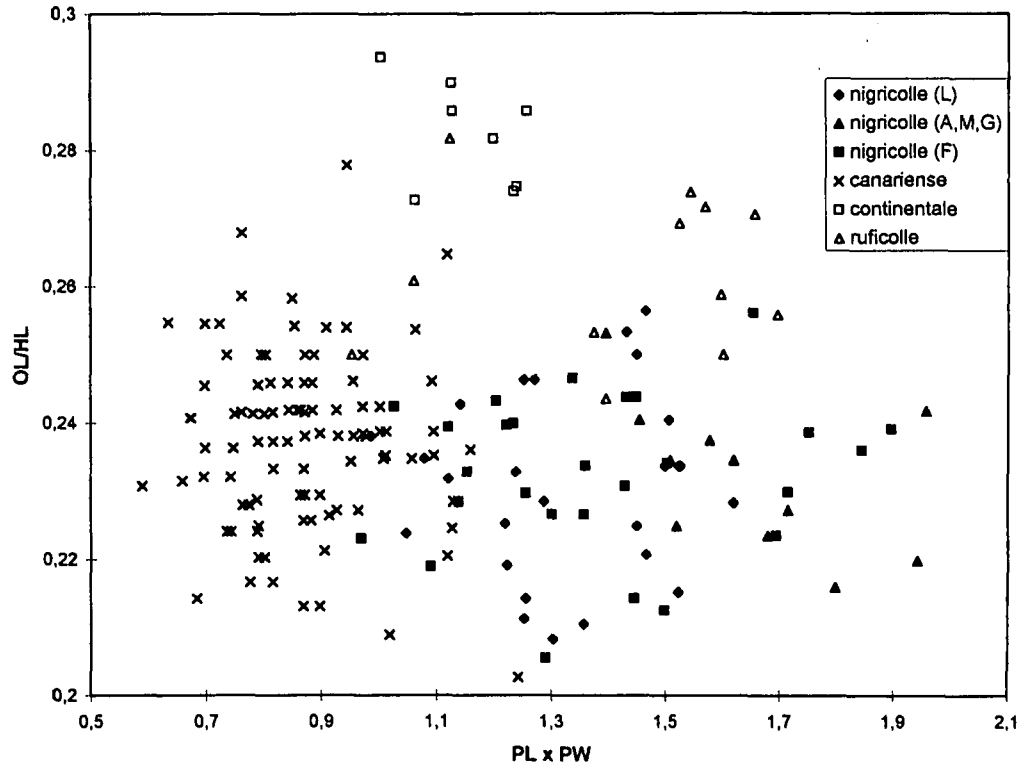


Fig. 6: Variation of relative eye length (given as the ratio OL/HL) in relation to pronotum size in *Leptobium nigricolle nigricolle* from Lanzarote (L), Fuerteventura (F), and from the smaller islands La Graciosa, Alegranza, and Montaña Clara (A, M, G), in *L. nigricolle canariense*, in *L. nigricolle continentale*, and in *L. ruficolle*.

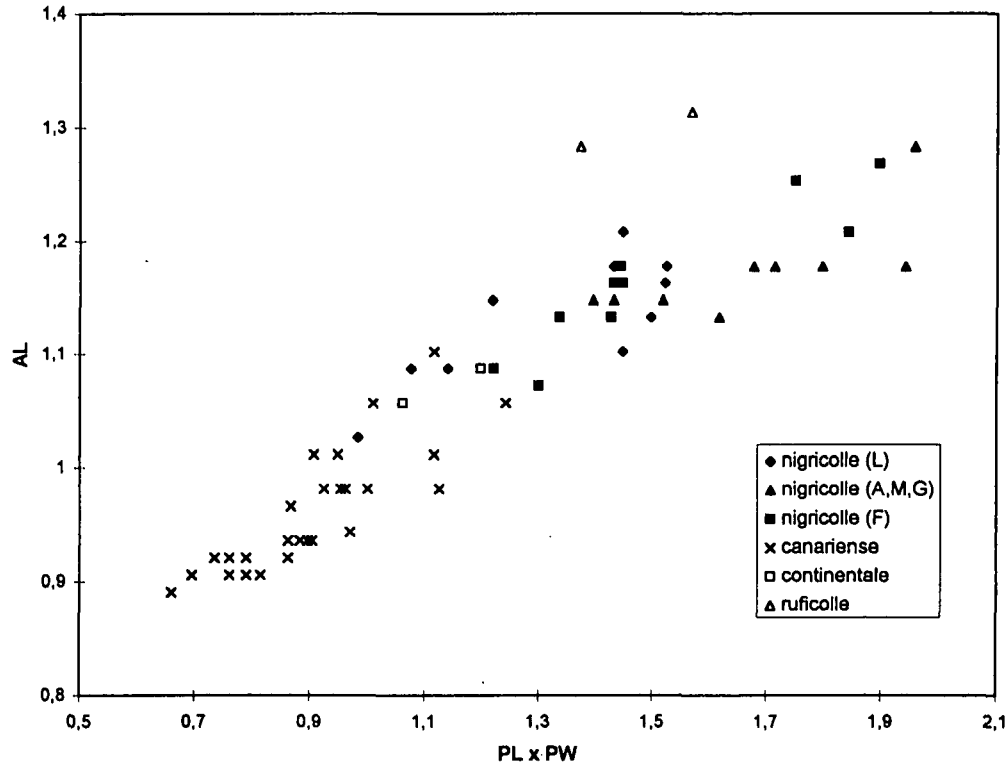


Fig. 7: Variation of the length of the median lobe of the aedeagus (AL) in relation to pronotum size in *Leptobium nigricolle nigricolle* from Lanzarote (L), Fuerteventura (F), and from the smaller islands La Graciosa, Alegranza, and Montaña Clara (A, M, G), in *L. nigricolle canariense*, in *L. nigricolle continentale*, and in *L. ruficolle*.

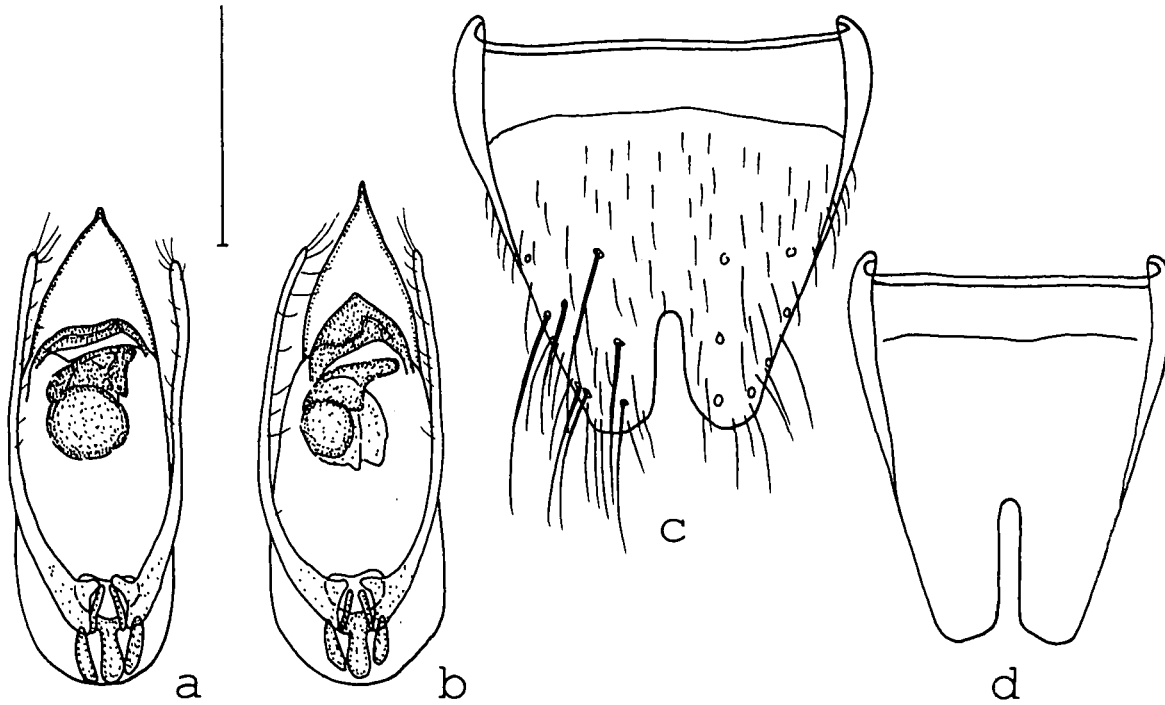


Fig. 8: *Leptobium gomerense* ASSING (a, c) and *L. debilipenne* (WOLLASTON) (b, d). Aedeagus (a, b) and ♂ sternum VIII (c, d); setae and pubescence omitted in d. Scale: 0.5 mm.

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Artikel/Article: [A revision of the Canarian species of \*Leptobium\* CASEY \(Coleoptera, Staphylinidae: Paederinae\). 693-712](#)