

Redescription of *Leptothorax schaufussi* (Forel, 1879) (Hymenoptera, Formicidae)

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Abstract

The Iberian endemic ant *L. schaufussi* is redescribed, both on workers and the previously unknown castes and compared with similar species from the *nigratus*-group; its known distribution is presented.

Key words: ant, Iberian Peninsula, *Leptothorax schaufussi*, redescription.

Resumen. Redescrició de *Leptothorax schaufussi* (Forel, 1879) (Hymenoptera, Formicidae)

Se redescrive el endemismo ibérico *Leptothorax schaufussi*, tanto en las obreras como en los sexuados, previamente desconocidos, y se compara con especies similares del grupo *nigratus*. Se pone al día su distribución.

Palabras clave: hormiga, península Ibérica, *Leptothorax schaufussi*, redescrició.

Introduction

Leptothorax schaufussi (Forel, 1879) was described on a single worker from Valencia (Spain); from then, the species remained elusive; Forel (1890) and André (1881) comment on its taxonomic position but they concern the original description, as do other references (Ceballos, 1956). Collingwood (1978) keys this species with characters derived from the description. The type of Forel, the only known material, is not in his collection (Museum d'Histoire Naturelle, Genève), nor in several other Museums; according to André (1881) the type was at the Ludwig Salvator Museum in Dresden (East Germany) but due to Second World War bombings, the type must be considered lost (R. Eck, in litt.). From 1978 we have studied workers of an unidentified *Leptothorax* whose characteristics (*nigratus*-group, long spines, sculpture) matched the original description of *L. schaufussi*; in 1983 we got two complete nests that produced males and females, thus

making a full description possible. Following the recommendations of the International Code of Zoological Nomenclature we have exposed the problem with several ant specialists, concerning the question of the identification in absence of the holotype; all were in full agreement with considering all this specimens as *L. schaufussi*. Measurements and indices follow Bolton (1982), and were made on 20 workers, 6 females and 5 males from Peredilla (León).

At the Naturhistorisches Museum of Basel there is a sample of four workers from Monte Arastepa, Sierra de Ronda, Malaga (Spain), H. Franz leg. identified as *L. schaufussi* by H. Markl; in our opinion they are good *L. cagnianti* Tinaut, 1983 since all their morphology agrees with type material of this species and not with the original description of *L. schaufussi*.

Leptothorax schaufussi (Forel, 1879)

Worker (figure 1a). TL 3.0-3.6; HL 0.77-0.87; HW 0.65-0.75; HI 81-88; SL 0.62-0.75; SI 88-100; HL/SL 1.16-1.32; PW 0.45-0.50; AL 0.92-1.05; AL/PW 1.80-2.11. Colour deep brown with tarsi, mandibles and funicular segments 2-8 somewhat clearer; mandibles longitudinally striated, 5-toothed, the apical very developed. Occiput straight or slightly concave; clypeus smooth and shining, with some lateral striae; frontal triangle shining, poorly delimited; frons smooth; some longitudinal striae, next to frontal laminae, not reaching occiput; in front of the eyes the striae turn into a coarse reticulum in big workers; occiput smooth and shining; eyes with micropilosity; scape reaching occiput; second funicular segment longer than third; antennal club as long as the rest of funiculus; palp formula 5:3. Promesonotal suture present; mesopropodeal impression well developed. Alitrunk shining with longitudinal striae, specially at the sides and mesopropodeum; promesonotal disc usually striated but in small workers it may be smooth; propodeal spines long, straight or slightly curved; Buschinger's index 1.58-1.90. Petiole long, with the node as in fig. 1a; petiole length/height 1.50-1.70; striated reticulated at the sides, reticulated dorsad and sometimes smooth at the apex; postpetiole with similar sculpture; postpetiole width/length 1.05-1.18; femora highly inflated; gaster smooth and shining, with some short diverging striae at the base.

Female (figures 1b, 2a). TL 5.0-5.3; HL 0.92-0.97; HW 0.90-0.92; HI 94-97; SL 0.72-0.75; SI 78-83; HL/SL 1.26-1.34; PW 1.07; AL 1.65-1.75; AL/PW 1.48-1.62. Colour deep brown to black; mandibles, clypeus and bucal palps as in workers; frontal triangle with some slight striae; head completely striated but shining; the occipital corners may be smooth or striated; head relatively shorter than in workers, scape also relatively shorter. Eyes with micropilosity. Pronotum shining, with longitudinal striae; parapsis and mesopleurae smooth and shining; scutum longitudinally striated with an anterior medial zone smooth; scutellum smooth, brilliant. Propodeum rugulose striated at the sides, reticulated between spines; spines long and straight; Buschinger's index 1.85-2.25. Wings hyaline with yellowish nerves and clear brown pterostigma; cubital cell very long; radial short and closed; discoidal assymetric trapezoidal, sometimes not closed. Petiole long, with front and dorsal surfaces meeting at sharp angle, even with a transversal cari-

na; when viewed from behind it has two dorsolateral right angles. Petiole length/height 1.25-1.44, rugose striated laterally, reticulated or smooth dorsad and frontally. Postpetiole similarly sculptured, wider than in workers; postpetiole width/length 1.25; gaster as in workers.

Male (figures 1c, 2b, c, d, e, f, g). TL 2.9-3.1; HL 0.55-0.62; HW 0.51-0.57; HI 91-95; SL 0.21-0.25; SI 40-45; HL/SL 2.30-2.58 PW 0.70-0.75 mm; AL 112-127 mm; AL/PW 1.53-1.70. Black with legs, antennae and mandibles deep brown; pilosity fine and scarce; mandibles variables, with a maximum of 4 teeth. apical always present, others much smaller, sometimes not developed; palp formula 5:3. Head submatt, rugose reticulated with, in one specimen, a smooth front band; clypeus as in workers. scape as long as the first 3.5-4 funicular segments,

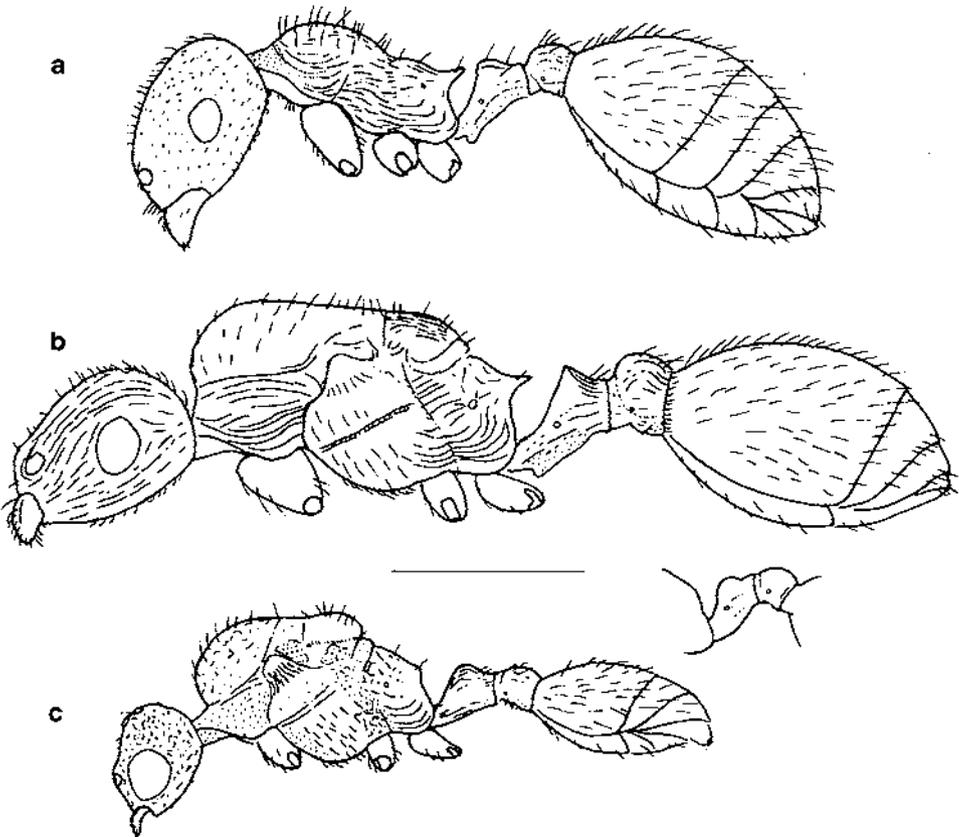


Figure 1. *Leptothorax schaufussi* (Forcl). a) Worker profile. b) Female profile. c) Male profile (inset: variation in petiole shape). Scale: 1 mm.

not reaching median ocellus; eyes with micropilosity. Alitrunk long; pronotum submatt, slightly rugose at the sides; Mayrian furrows absent; mesoscutum submatt, slightly rugose, with a narrow and smooth band at the middle and next to parapsidal furrows; scutellum smooth, brilliant at the center, with lateral striae; mesopleurae smooth and shining with some rugae; propodeum rugose reticulated

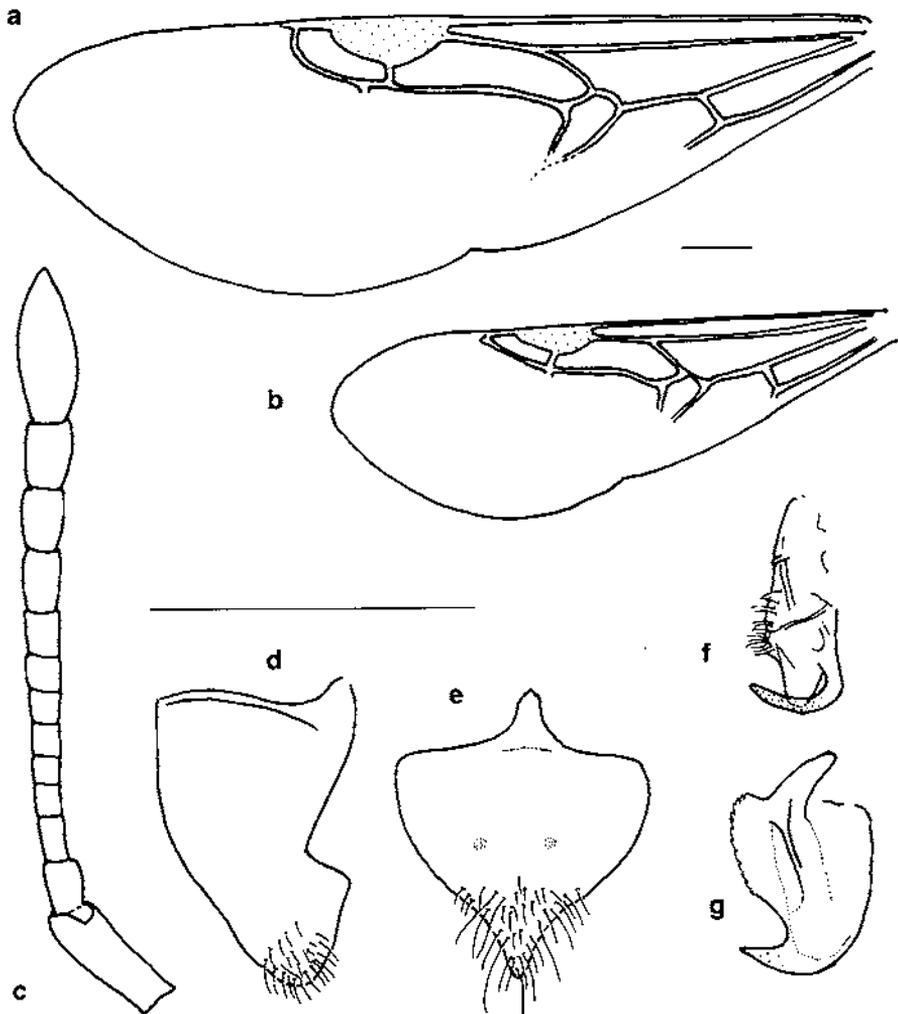


Figure 2. *Leptothorax schaufussi* (Forel). a) Female wing. b) Male wing. c) Male antenna. d) External paramera. e) Subgenital plate. f) Volsella. g) Sagitta. Scale: 0.5 mm.

at the sides, slightly reticulated dorsad, with a pair of short triangular teeth or bluntly angled. Petiole and postpetiole smooth, shining dorsad, faintly reticulated laterally; petiole node rounded; petiole length/height 1.44-1.52; postpetiole as long as wide; wings as in the female. Genitalia. Subgenital plate triangular, with pointed apex and 38-43 hairs; external paramera fused, with 30 short hairs; digitus of volsella curved and narrow, with 17-24 areolae, some spinulose; cuspis rounded; calx of volsella with 12-16 hairs and a rounded protuberance; aedeagus with 11-13 teeth and a long and pointed beccus.

Taxonomic position

Related species are the following: *L. nigrinus* Emery, 1878, with the varieties *rupestris* Forel, 1909, *salambo* Santschi, 1912, *sahariensis* Santschi, 1929; *L. oranienensis* Forel, 1894; *L. rusticus* Santschi, 1912 with the varieties *chobauti* Santschi 1923 and *sergensis* Santschi, 1929; *L. cagnianti* Tinaut, 1983. Type material of all these taxa has been examined. *L. nigrinus* and *L. cagnianti* are known from the Iberian Peninsula but the first species has not been found there again since 1890 (Saunders, 1890; Espadaler & Collingwood, 1982) and, so, former citations are probably best regarded as misidentifications; other species and *L. nigrinus* are North-African. *L. schaufussi* differs from North-African forms by the length of propodeal spines, scape length relative to head length, cephalic and thoracic sculpture. *L. cagnianti* is bigger —up to 4.7 mm— and has reduced head sculpture as compared with *L. schaufussi*; the scape is longer, surpassing occiput: SI 110; HL/SL 1.11; spines are shorter in *L. cagnianti*: Buschinger's index 1.32; males of *L. cagnianti* are less sculptured, have Mayrian furrows and scape is longer; HL/SL 2.12; SI 51. *L. nigrinus* is smaller, with promesonotum less convex and sides of thorax more rugose striated; the petiole is shorter: petiole length/height 1.27; postpetiole is wider: postpetiole width/length 1.5; the female (not seen) has the scutum smooth and shining (Forel, 1890); the male is unknown. A possible relationship of *L. schaufussi* with species belonging in the subgenus *Dichothorax* Emery, from North America has been suggested by MacKay (1993).

Neotype

A worker from Sierra de Albarracín (Teruel, Spain), 12-VI-1980, F.J. Acosta leg. Deposited at the Museum d'Histoire Naturelle (Genève); this is the nearest known site to the original locality. A male, a queen and three workers from Peredilla (León, Spain), 8-VI-1983, Espadaler leg. at the same Museum; a worker, a male and a female from Peredilla (León, Spain) at the Museo Civico di Storia Naturale (Genova).

Distribution

According to the scarce data, *L. schaufussi* is mainly orophilous and widely distributed in the Iberian Peninsula; known localities are: Almería: El Sabinal (Tinaut

et al. 1994); Dos Picos, Sierra de Baza, 2050 m, 13-IV-1991, workers, X. Espadaler leg. Jaén: Sierra de Cazorla, 14-V-1978, workers, A. Tinaut leg; Calarilla, Sierra de Cazorla, 1700 m, 17-V-1982, workers, C.M. Herrera leg; 16-V-1983, workers in flowers of *Prunus prostrata* Labill, C.M. Herrera leg; El Calerón, Sierra de Cazorla, 1250 m, 28-II-1987, workers, under stone, X. Espadaler leg; Hoyos de Muñoz, Sierra de Cazorla, 1050 m, 10-II-1988, workers, queen, rooted roots of *Erica arborea*; Empanadas, Sierra de Cazorla, 1600 m, 30-VII-1983, workers, under stone, X. Espadaler leg. León: Peredilla, 1050 m; 8-VI-1983, workers, queens, males, under stone, X. Espadaler leg. Madrid: Ladera del Chiquillo, Navacerrada, 1350 m; 8-IX-1981, workers, queen; M.D. Martínez leg. Teruel: Albarracín, 12-VI-1980, workers, F.J. Acosta leg. Valencia (loc. typ.) (no data are given in the original description of Forel (1879)).

Four alive nests (two at Peredilla, two at Sierra de Cazorla) show the species as monogynous and with up to 130 workers; one nest produced the sexuals on 20-VI-1983. The aspect of workers in the field is not the usual for the genus since the gaster looks wide and rounded, similar in aspect as the one Forel (1894) comments when describing *L. oraniensis*. *L. schaufussi* feeds partially on nectar (Herrera et al., 1984) and has wintering larvae.

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References

- André, E. 1881. Species des Hyménoptères d'Europe et d'Algérie. Tome II. Fr. Bouffaut Impr., Gray, 404 p.
- Bolton, B. 1982. Afrotropical species of the myrmicine ant genera *Cardiocondyla*, *Leptothorax*, *Melissotarsus*, *Messor* and *Cataulacus* (Formicidae). Bull. Br. Mus. nat. Hist. (Ent.) 45: 307-370.
- Ceballos, G. 1956. Catálogo de los Himenópteros de España. Trab. Inst. esp. Entom. CSIC, Madrid, 554 p.
- Collingwood, C.A. 1978. A survey of Iberian Formicidae with a key to the worker caste (Hym. Aculeata). Eos: 52: 65-95.
- Espadaler, X. & Collingwood, C.A. 1982. Notas sobre *Leptothorax* Mayr, 1855, con descripción de *L. gredosi* n. sp. (hymenoptera, Formicidae). Bol. Asoc. esp. Entom. 6: 41-48.
- Forel, A. 1879. *Aphaenogaster* (?) *Schaufussi* Forel n.sp. Nunquam Otiosus, 3: 465-466.
- 1890. Fourmis de Tunisie et d'Algérie orientale. Ann. Soc. Entomol. Belg. 34: 61-76.
- 1894. Les formicides de la Province d'Oran (Algérie). Bull. Soc. Vaudoise Sci. Nat. 30: 1-45.
- Herrera, C.M.; Herrera, J.; Espadaler, X. 1984. Nectar thievery by ants from southern spanish insect-pollinated flowers. Insectes Sociaux 31: 142-154.

- MacKay, W.P. 1993. The status of the ant *Leptothorax pergandei* Emery (Hymenoptera, Formicidae). *Sociobiology* 21: 287-297.
- Saunders, E. 1890. Aculeate Hymenoptera collected by J.J. Walker, Esq., R.N., F.L.S., at Gibraltar and in North Africa (Part I - Heterogyna). *Entomol. Mon. Mag.* 26: 201-205.
- Tinaut, A.; Ruano, F.; Hidalgo, J.; Ballesta, M. 1994. Mirmecocenosis del sistema de dunas del paraje natural Punta Entinas-El Sabinar (Almería) (Hymenoptera, Formicidae). Aspectos taxonómicos, funcionales y biogeográficos. *Graellsia* 50: 71-84.