

**Taxonomical and distributional notes on two new and a rare
Leptothorax Mayr, 1855 species for the Hungarian ant fauna
(Hymenoptera, Formicidae)**

S. CSÓSZ

Department of Ecology, Szeged University, H-6701 Szeged, Egyetem u. 2, Hungary
E-mail: csoszs@bio.u-szeged.hu

CSÓSZ, S. (2001): Taxonomical and distributional notes on two new and a rare *Leptothorax* species for the Hungarian ant fauna (Hymenoptera, Formicidae). – *Annales historico-naturales Musei nationalis hungarici* **93**: 99–106.

Abstract – Three species of the genus *Leptothorax* have been reported for the Hungarian fauna. Two ant species, *Leptothorax nigriceps* MAYR, 1855 and *Leptothorax sordidulus saxonicus* SEIFERT, 1995 are new for the Hungarian ant fauna. *Leptothorax gredleri* MAYR, 1855 was hitherto reported from only two localities. The vast majority of the *L. muscorum* (NYLANDER, 1846) proved to be *L. gredleri* MAYR, which is a much more common species in Hungary than they thought before. Morphological and distributional characteristics of these species are presented. With 5 figures.

Key words – Hymenoptera, Formicidae, *Leptothorax*, Hungary.

INTRODUCTION

New methods applied in ant taxonomy, such as biometrical analysis and genetic technics, gave rise to a considerable number of species, or at least taxonomical uncertainties in the last few decades. In case of the genus *Leptothorax*, for example, *Leptothorax slavonicus* SEIFERT, 1995 and *Leptothorax sordidulus saxonicus* SEIFERT, 1995 were described, and the forgotten name *Leptothorax albipennis* (CURTIS, 1854) was recised. ORLEDGE (1998), based on a rich material, including the type specimens of *L. albipennis* (CURTIS) showed that *L. albipennis* is a senior synonym of *L. tuberointerruptus* FOREL, 1915.

The species of the genus *Leptothorax* are distributed all over the world. Out of the 300 *Leptothorax* species nearly 40 occur in Europe, and some of them are endemic (AGOSTI & COLLINGWOOD 1987a, b). Until now 13 *Leptothorax* species were published from Hungary (MAYR 1856, MOCSÁRY 1918, SOMFAI 1959, GALLÉ 1979, 1981, 1986, GALLÉ & SZŐNYI 1988, GALLÉ *et al.* 1998).

MATERIAL AND METHODS

Collections were mainly made by hand-searching, and in a few case by pitfall trap. All of the mentioned specimens are deposited in the author's collection and the collection of Hymenoptera of Hungarian Natural History Museum (HNHM). The identification is based on the works of AGOSTI & COLLINGWOOD (1987*a, b*), BERNARD (1967), KUTTER (1977), RADCHENKO *et al.* (1998, 1999), SEIFERT (1995, 1996) and STITZ (1939).

Since males of the *Leptothorax* species are without reliable external morphological characters, only workers and queens were used for this study.

All measurements have been taken on dry preparations using Olympus BX 40 microscope at magnification 100 \times . All measurements are given in μm , accuracy of the measurements is 5 μm . Measured characters and the explanation of the abbreviations as follows:

Fr = maximum width of frontal carinae immediately posterior to the scape insertions.

HL = maximum head length in median line from the clypeus to posterior border of occiput. The head must be carefully turned until the maximum length would be visible.

HW = maximum head width across the eyes.

ML-spin = mesosoma length measured as maximum distance from the anterior border of promesonotum to the tip of the propodeal spine.

ML-lobus = mesosoma length measured as maximum distance from the anterior border of promesonotum to the most posterior lower margin of lateral propodeal lobe. Both mesosoma lengths have to be taken in lateral view.

SL = maximum scape length in straight line excluding articular condyle.

MH = maximum mesosoma height.

CI = cephalic index, showing the ratio of the head length and width (HL/HW), which characterises the head prolongation.

MI = mesosoma index (ML-spin/MH), showing the mesosoma prolongation.

SURVEY OF SPECIES

Leptothorax nigriceps MAYR, 1855 (Figs 1–2)

Leptothorax tuborum var. *nigriceps* MAYR, 1855, *Verhandlungen der Zoologisch-botanischen Vereins in Wien* **5**: 441.

Leptothorax tuborum tuborum var. *nigriceps*: MAYR & EMERY 1916, *Bollettino della Società Entomologica Italiana* **47**: 174, see BARONI-URBANI, 1971.

Leptothorax nigriceps: MAYR & FINZI 1924, *Bollettino della Società Entomologica Italiana* **A60**: 122, see BARONI-URBANI, 1971.

Material examined – 12 workers, 1 queens, (males have not been found), Jósvalő, Aggtelek National Park, Hungary, 16.06.1998, leg. TARTALLY & CsŐSZ; 1 worker, Hungaria, Jósvalő, Nagy-oldal, 11.05.1989, leg. GRABANT A. (HNHM).

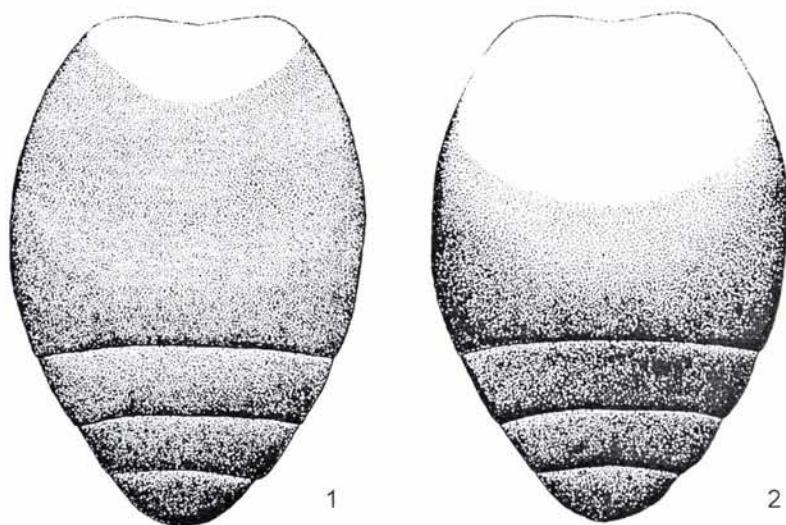
Metrical data of 7 workers. HL: 615, HW: 558, Fr: 220, Sl: 455, ML-spin: 698, ML-lobus: 760, MH: 318, CI: 1,10, HW/Fr: 2,79, MI: 2,20

Metrical data of a unique queen. HL: 730, HW: 700, Fr: 230, Sl: 495, ML-spin: 1200, ML-lobus: 1250, MH: 670, CI: 1,04, HW/Fr: 3.04, MI: 1.79

Description – Antennae with 12 segments, antennal club always distinctly darker than rest of funiculus. Dorsum of alitrunk without a visible mesopropodeal impression. Propodeum with blunt, short pointed teeth gently curved downwards. Frontal and dorsal profile of petiole always rounded, never meeting in angle. Colour of head dark brown or black with lower parts brownish yellow, or brown. Alitrunk brown, or dark red, at least central part of femora brown. Gastral tergites brown except first tergite which is yellow at the base. Head strongly sculptured, frons striated longitudinally, without smooth and shining median parts. Dorsum of mesosoma strongly rugose.

Note – The workers and queens of *L. nigriceps* MAYR are easy to confuse with its sibling species, *L. tuberum* (FABRICIUS, 1775). *L. tuberum* is uncommon, but widely distributed in Hungary. Some distinctive characters have been presented hereunder for recognition of *L. tuberum* and *L. nigriceps*.

Colour: *L. nigriceps* usually darker than its sibling species. Head of *L. tuberum* light to dark brown, alitrunk brownish yellow. At least the middle part of the femora of *L. nigriceps* always brown, in contrast with the femora of *L. tuberum*, which are yellow or dark yellow, without darker band in the middle. Gastral tergites of *L. nigriceps* are dark, with the exception of the base of the first tergite, which is yellow at base only (Fig. 1). The anterior half of first gastral tergite of *L. tuberum* is yellow (Fig. 2).



Figs 1–2. Gastral tergites of *Leptothorax* species. 1 = *L. nigriceps* MAYR, 1855. First tergite is yellow at base only; 2 = *L. tuberum* (FABRICIUS, 1775). The anterior half of first tergite is yellow

Sculpture: Head of *L. nigriceps* is strongly sculptured, frons is striated longitudinally without smooth and shining median part, while frons of *L. tuberculum* always has a smooth and shining middle part. *L. nigriceps* is monogynous, while *L. tuberculum* often forms polygynous colonies.

Distribution – All specimens were collected in dry limestone habitats with dwarfed xerophilous vegetation. The nest was found in a slit of a limestone boulder. It had not any grown up sexuals, but it had many well-developed sexual pupae at the time of collection (16 June 1998). Each sexual pupae were raised to hatch in an artificial nest.

This species has been reported from South and Central Europe (RADCHENKO *et al.* 1999), Bulgaria, Greece, Turkey (European part only) and Yugoslavia (AGOSTI & COLLINGWOOD 1987a, PETROV 2001). This species is new for Hungary.

Leptothorax sordidulus saxonicus SEIFERT, 1995

Leptothorax sordidulus MÜLLER, 1923, *Bollettino della Società Adriatica di Scienze Naturali in Trieste* **28**: 96, pt. I. (partim).

Leptothorax sordidulus saxonicus SEIFERT, 1995, *Abhandlungen und Berichte des Naturkundemuseums Görlitz* **68** (7): 14.

Material examined – 5 workers, Hungary, Aggtelek National Park, Jósvalő, 17.06.1998, leg. TARTALLY & Csősz. 1 queen, Hungary, Budaörs, Csiki-hegyek, 20.04.1997, leg: TARTALLY.

Metrical data of the *L. sordidulus saxonicus* queen. HL: 700, HW: 705, Fr: 250, SL: 475, ML-spin: 1100, ML-lobus: 1120, MH: 620, CI: 0.99, HW/Fr: 2.82, MI: 1.77

Description – Antennae with 12 segments, antennal club always as pale as rest of funiculus. Dorsum of alitrunk with well-visible mesopropodeal impression. Propodeal teeth short and straight. Frontal and dorsal surface of petiole meeting in acute angle at its apex in lateral view, dorsum of petiole with a distinct posterior step backward. Colour of head brown or yellowish brown. Alitrunk lighter than head, yellowish-brown or brownish-red. Gastral tergites light brown or yellow at base, posterior parts darker. Anterior part of head and frons of worker striate, occiput finely striate, while queen with well-visible reticulate sculpture on head.

Notes – This species is new for Hungary. Neither *L. sordidulus saxonicus* nor its nominate subspecies *L. sordidulus sordidulus* have not been found in Hungary until now. *L. s. sordidulus* is spreading from its refuge in southern Apennines, invaded northern Italy, western Austria, Slovenia, Croatia and north-western Serbia, while *L. s. saxonicus* has a southern Balkanian refuge. According to SEIFERT (1995, 1996) *L. s. sordidulus* and *L. s. saxonicus* probably overlap in Austria, Slovenia and middle part of Germany.

Distribution – The specimens were collected at dolomite and limestone sites, the plant coverage was dense, and the stony surface were densely covered by mosses.

L. sordidulus saxonicus is a Mediterranean–Sub-mediterranean subspecies which has been reported from European part of Turkey (AGOSTI & COLLINGWOOD 1987a) and Yugoslavia (AGOSTI & COLLINGWOOD 1987a, PETROV 2001). According to SEIFERT (1995, 1996) *L. sordidulus saxonicus* has a southern Balkanian refuge, and occurs in Austria, Slovakia, Moravia, Bohemia, Saxony and Bavaria.

Leptothorax gredleri MAYR, 1855
(Figs 3–5)

Leptothorax gredleri MAYR, 1855, *Verhandlungen der Zoologisch-botanischen Vereins in Wien* 5: 438

Leptothorax muscorum var. *gredleri* MAYR: STITZ 1939: 163.

Leptothorax gredleri MAYR: BARONI-URBANI: 1971: 98.

Material examined – 3 workers, Hungary, Aggtelek National Park, Jósvalfő, 06.1997, leg. MOLNÁR; 4 workers, Hungary, Tabdi, 11.05.1977, leg. ÁDÁM (HNHM); 5 workers, Hungary, Aggtelek National Park, Jósvalfő, 18.06.1998, leg. TARTALLY & CSÓSZ; 1 queen, Jósvalfő, Aggtelek National Park, Hungary, 06.1997, leg. MOLNÁR.

Metrical data of 12 *L. gredleri* workers: HL: 709, HW: 637, SL: 467, ML-spin: 892, ML-lobus: 863, CI: 1,11, SL/HL: 0.73.

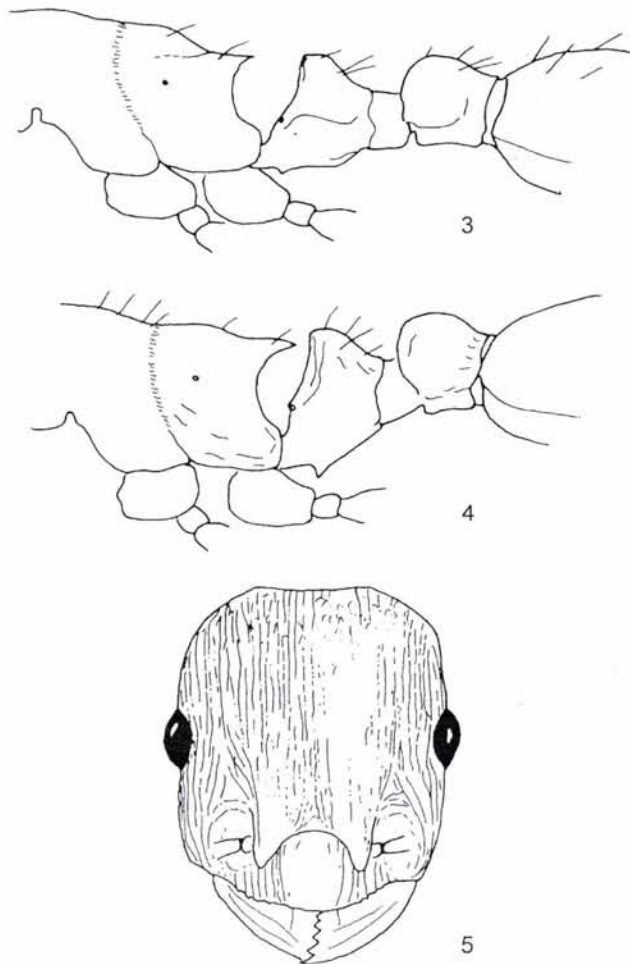
Metrical data of the *L. gredleri* queen: HL: 720, HW: 635, SL: 450, ML-spin: 980, ML-lobus: 1000, CI: 1,13, SL/HL: 0.625.

Description – Antennae with 11 segments, antennal club always as pale as rest of funiculus. Antennal scapes and tibiae with decumbent pilosity only. Central part of clypeus between two longitudinal carinae entirely smooth and shining, without striae. Propodeal teeth short and straight. Frontal and dorsal surface of petiole meeting in angle at apex in lateral view. Ventral surface of petiole with well-visible convex edge. Dorsum of head ochraceous-yellow to yellowish brown. Alitrunk yellowish-brown.

Notes – *Leptothorax gredleri* is closely related to *L. muscorum* (NYLANDER, 1846), but the two species are not so difficult to distinguish morphologically. Both species have been reported from Hungary. KUTTER (1977) gives a reliable key and description for the separation of these two species based on the shape of their petiole (Figs 3–4). BUSCHINGER (1966) gives a more reliable key of the median part of clypeus, which is always smooth and shiny at *L. gredleri* (Fig. 5), while the medial part of clypeus of *L. muscorum* (NYLANDER) is always with short striae. SEIFERT (1996) proposes a new character based on the ratio of scapus and head length. The

scapus of *L. gredleri* is relatively longer ($SL/HL > 0.651$) than that of its sibling species. All of the collected workers meet this requirements ($SL/HL > 0.730$, $n=20$).

Distribution – *Leptothorax gredleri* was a seldom reported species with underestimated frequency of occurrence in Hungary. Until now it was reported from two localities only, but it seems to be much more common than it was believed earlier. This species occurs all over our country. It has been collected from lowland



Figs 3–5. 3–4 = Shape of petiole and alitrunk of *Leptothorax* species: 3 = *L. gredleri* MAYR, 1855; 4 = *L. muscorum* (NYLANDER, 1846); 5 = head of *L. gredleri* MAYR, 1855 with smooth and shining median part of clypeus

forest and marsh, and also from the lower hilly regions in the Carpathian Basin. *L. gredleri* seems to be more common than *L. muscorum*, which is apparently a rare species for the Hungarian ant fauna.

This European species has been recorded from Czechia, Germany, Greece, Yugoslavia, Northern Italy, Poland, Switzerland and Hungary (AGOSTI & COLLINGWOOD 1987a, GALLÉ *et al.* 1998, KUTTER 1977, RADCHENKO *et al.* 1999, SOMFAI 1959, STITZ 1939).

* * *

Acknowledgements – I wish to thank at first LAJOS ZOMBORI (HNHM) and ANDRÁS TARTALLY for loan of *Leptothorax* material. I thank LÁSZLÓ GALLÉ (Department of Ecology, Szeged University) for giving me a lot of valuable suggestions on these *Leptothorax* questions. I wish to thank LÁSZLÓ PEREGOVIĆS whose comments and corrections improved the manuscript.

REFERENCES

- AGOSTI, D. & COLLINGWOOD, C. A. (1987a): A provisional list of the Balkan ants (Hym., Formicidae) and key to the worker caste. I. Synonymic list. – *Bulletin de la Société Entomologique Suisse* **60**: 51–62.
- AGOSTI, D. & COLLINGWOOD, C. A. (1987b): A provisional list of the Balkan ants (Hym., Formicidae) with a key to the worker caste. II. Key to the worker caste, including the European species without the Iberian. – *Bulletin de la Société Entomologique Suisse* **60**: 261–293.
- BARONI-URBANI, C. (1971): Catalogo delle specie di Formicidae d'Italia. (Studi sulla mirmecofauna d'Italia. 10.) – *Memorie della Società Entomologica Italiana* **50**: 5–278.
- BERNARD, F. (1968): *Les Fourmis (Hymenoptera, Formicidae) d'Europe occidentale et septentrionale*. – Masson, Paris 441 pp.
- BUSCHINGER, A. (1966): *Leptothorax* (Mycotothorax) *muscorum* Nylander und *Leptothorax* (M.) *gredleri* Mayr zwei gute arten. – *Insectes Sociaux* **13** (3): 165–172.
- GALLÉ, L. (1979): Data for the knowledge of ant fauna (Hymenoptera: Formicoidea) of Bakony Mts. – *Veszprém megyei Múzeumok közleményei* **14**: 239–244.
- GALLÉ, L. (1981): *The Formicoid fauna of the Hortobágy*. – *The fauna of Hortobágy National Park*. Akadémiai Kiadó, Budapest, pp. 307–311.
- GALLÉ, L. (1986): *The ant fauna of the Kiskunság National Park (Hymenoptera: Formicidae)*. – *The fauna of Kiskunság National Park*. Akadémiai Kiadó, Budapest, pp. 427–434.
- GALLÉ, L. & SZŐNYI, G. (1988): A check list of ants (Hymenoptera: Formicoidea) of a sandy grassland in Kiskunság National Park (Hungary). – *Acta Biologica (Szeged)* **34**: 167–168.
- GALLÉ, L., CSŐSZ, S., TARTALLY, A. & KOVÁCS, É. (1998): A check-list of Hungarian ants (Hymenoptera, Formicidae). – *Folia entomologica hungarica* **59**: 213–220.
- KUTTER, H. (1977): *Insecta Helvetica Fauna. 6. Hymenoptera Formicidae*. – Schweizerische Entomologische Gesellschaft, Zürich 298 pp.
- MOCSÁRY, S. (1918): *Ordo. Hymenoptera*. – *Magyar Birodalom Állatvilága (Fauna Regni Hungariae)*. K. m. TTT, Budapest 72 p.
- ORLEDGE, G. M. (1998): The identity of *Leptothorax albipennis* (Curtis) (Hymenoptera, Formicidae) and its presence in Great Britain. – *Systematic Entomology* **23**: 25–33.

- RADCHENKO, A., CZECHOWSKI, W. & CZECHOWSKA, W. (1998): Ecological and taxonomical notes on *Leptothorax nadigi* Kutter, 1925 (Hymenoptera, Formicidae) – an ant species new to Poland. – *Annales Zoologici* (Warszawa) **48** (1–2): 119–123.
- RADCHENKO, A., CZECHOWSKI, W. & CZECHOWSKA, W. (1999): The tribe Formicoxenini (Hymenoptera, Formicidae) in Poland – Taxonomic review and keys for identification. – *Annales Zoologici* (Warszawa) **49** (1–2): 129–150.
- SEIFERT, B. (1995): Two new Central European subspecies of *Leptothorax nylanderii* (Förster, 1850) and *Leptothorax sordidulus* Müller, 1923 (Hymenoptera: Formicidae). – *Abhandlungen und Berichte des Naturkundemuseums Görlitz* **68** (7): 1–18.
- SEIFERT, B. (1996): *Ameisen: beobachten, bestimmen*. – Naturbuch Verlag, Augsburg, 352 pp.
- SOMFAI, E. (1959): Hangya alkatúak, Formicoidea. – In: *Magyarország Állatvilága (Fauna Hungariae)*, 13, 4. Akadémiai Kiadó, Budapest, 79 pp.
- STITZ, H. (1939): *Hautflügler oder Hymenoptera. I. Ameisen oder Formicidae*. – Gustav Fischer Verlag, Jena, 428 pp.