

# Redescription of *Liometoxenus paradoxus* (SCRIBA) comb.n., and comments on the systematic position of *Liometoxenus* KISTNER, JENSEN & JACOBSON (Coleoptera: Staphylinidae)

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## Abstract

*Liometoxenus paradoxus* (SCRIBA, 1868) comb.n. (Coleoptera: Staphylinidae: Aleocharinae), which was originally described as *Myllaena* from Italy and long placed in *Homoeusa*, is redescribed. *Homoeusa obscura* STILLER, 1925 is synonymised with *L. paradoxus*. The systematic position of *Liometoxenus* is discussed.

**Key words:** Coleoptera, Staphylinidae, Aleocharinae, *Liometoxenus*, *Homoeusa*, myrmecophily.

## Introduction

SCRIBA (1868) described *Myllaena paradoxa* from “Domo d’Ossela” (now, Domodossola), northern Italy, and he stated “in Gestalt an *Homoeusa acuminata* erinnernd” (in body shape reminiscent of *H. acuminata* MÄRKEL). BAUDI DI SELVE (1870) commented that *M. paradoxa* has the same type of mouthparts and tarsal formula (5-5-5) as the genus *Oxypoda* MANNERHEIM, which is the type genus of the tribe Oxypodini to which the genus *Homoeusa* KRAATZ belongs. Later, he placed this species in *Homoeusa* (BAUDI DI SELVE 1889). GANGLBAUER (1895) cited the discussion and arrangement in BAUDI DI SELVE (1870, 1889), but still used the name *M. paradoxa*. BERNHAUER (1902) placed this species in *Homoeusa*, and in the most influential catalogue of that time, BERNHAUER & SCHEERPELTZ (1926) also listed it under *Homoeusa*. Subsequently, this species has been regarded as a member of *Homoeusa* (SMETANA 2004), including a report on its myrmecophily and a host ant record from *Liometopum microcephalum* (PANZER) (Formicidae: Dolichoderinae) by BERNARD (1968).

Recently, KISTNER et al. (2002) described the genus *Liometoxenus* for two species from California that are associated with *Liometopum* ants. After examining a *H. paradoxa* specimen, I found that this species is actually a member of *Liometoxenus*. The original description of this species (SCRIBA 1868) is devoid of any figures and no subsequent detailed redescription of it was published. The first purpose of this paper is to redescribe this species. KISTNER et al. (2002) stated that *Liometoxenus* is closely related to *Oxypoda*. However, a close examination of *Liometoxenus* species did not support that hypothesis. The second purpose is to discuss its systematic position.

## Material and Methods

The collections of the following institutions and private collection are examined:

cAss	Private collection of V. Assing (Hannover)
FMNH	Field Museum of Natural History (A. Newton)
IRSNB	Institut royal des Sciences naturelles de Belgique (Y. Gérard)
MNHUB	Museum für Naturkunde der Humboldt-Universität Berlin (J. Frisch)

NMW Naturhistorisches Museum Wien (H. Schillhammer)  
 SDEI Senckenberg Deutsches Entomologisches Institut, Müncheberg (L. Zerche)

The methods used for dissection and making permanent slides and line drawings follow MARUYAMA (2004, 2006). Photographs were taken using a Canon EOS Kiss X1 with a Canon MP-E 65 mm 1–5X macro lens and mounted using the automontage software CombineZM.

### *Liometoxenus* KISTNER, JENSEN & JACOBSON, 2002

*Liometoxenus* KISTNER, JENSEN & JACOBSON 2002: 296 (original description; type species: *L. jacobsoni* KISTNER & JENSEN in KISTNER, JENSEN & JACOBSON 2002, by original designation).

### *Liometoxenus paradoxus* (SCRIBA, 1868) comb.n.

*Myllaena paradoxa* SCRIBA 1868: 154 (original description); BAUDI DI SELVE 1870: 377 (discussion on morphology); GANGLBAUER 1895: 51 (comments on systematic position).

*Homoeusa paradoxa*: BAUDI DI SELVE 1889: 47 (catalogue); BERNHAUER 1902: 99 (diagnosis); SMETANA 2004: 467 (catalogue).

*Homoeusa obscura* STILLER 1925: 332 (original description); **syn.n.**

TYPE MATERIAL: *Myllaena paradoxa*: not examined (probably the collection of W. Scriba is lost).

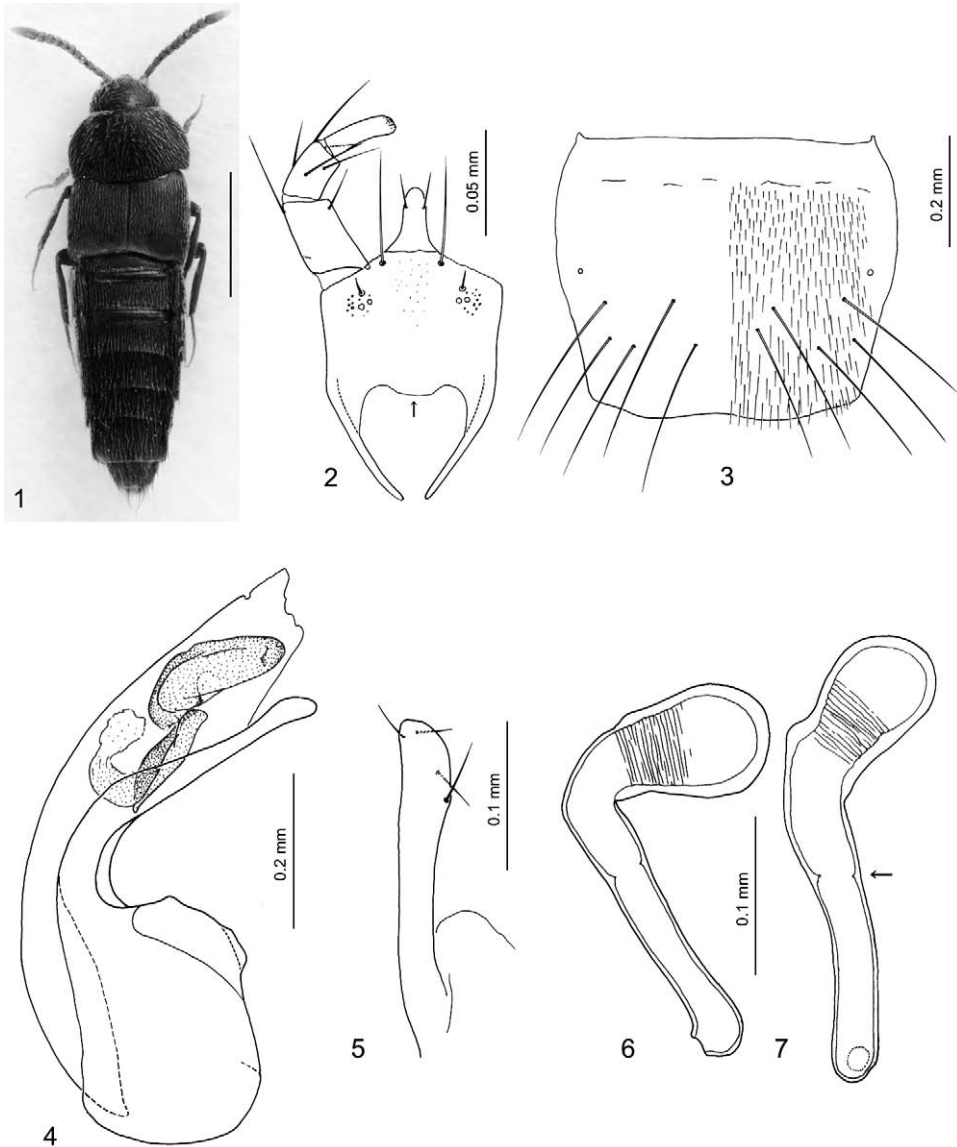
*Homoeusa obscura*: **CROATIA**: holotype ♀, “Zagreb. / (Croatia.) / Victor Stiller // *Homoeusa obscura* Str // Type. // V. Stiller / donavit // *paradoxa* Scriba // ex coll. / Scheerpeltz / TYPUS / *Homoeusa / obscura* / V. Stiller” (a *Lasius microcephalum* ant is pinned under specimen) (NMW).

#### SPECIMENS EXAMINED:

**ITALY**: 1 ex., “Prv. Emilia / Italia bor” (NMW); 1 ex., “Emilia / Paderno [in Emilia Romagna (near San Marino)] / 18. V. 1903 / A. Fiori” (NMW); 3 exs. [2 on same pin], “Emilia / Paderno / 4. V. 900 [1900] / A. Fiori” (MNHUB); 1 ex., “Paderno / Prov. Emilia / 9.5.1901 // *paradoxa* / Scriba Ital. / ded. Fiori” (FMNH); 2 exs., “Emilia / Groara [small stream in Emilia Romagna (Vergato community, SW of Bologna)] / 10 IV 1904 / A. Fiori” (NMW); 3 exs. [same pin], “Emilia / S. Anna [Sant’Anna, near Bologna] / 7. VI. 905 [1905] / A. Fiori (FMNH); 1 ex., “Emilia / S. Anna / 7. IV. 95 [1895] / A. Fiori” (MNHUB); 1 ex., “Emilia / Osservanza [a little hill near Bologna] / 6. V. 98 [1898] / A. Fiori” (MNHUB); 1 ex., “Emilia / Aposa [little river near Bologna] / 3. V. 901 [1901] / A. Fiori” (MNHUB); 1 ex., “Toscana / Betolle [Bettole] / Marchi lg. // *paradoxa* Scr. / Bernhauer det. / Cerruti don.” (FMNH); 1 ex., “Latium: Roma / via Appia antica / 65 m, 22 -VI - 1952 / G. Fagel // G. Fagel det. / *paradoxa* Scriba” (IRSNB); 1 ex., “Lucania / Pietrapertosa (PZ) / m. 1200, 1. VI. 1980 / leg. F. Angelini” (cAss); 1 ex., “Grottaglie / Murgien / leg. Paganetti. // *paradoxa* Scrib. / det. Bernh.” (FMNH); 1 ex., same first label (NMW); 1 ex., “Calabria: Aspromonte / Antonimina, 3. V. 1993 / leg. Angelini & Sabella” (cAss); 1 ex., “Südtalien [south Italy] / Hummler” (FMNH); 3 exs., “San Basilio / Murgien / leg. Paganetti // *paradoxa* Scrib. / det. Bernh.” (2 SDEI; 1 FMNH).

**GREECE**: 2 exs., “Peloponnes: / Lappa / 21 April 22 [1922] / W. Liebmann // determ. / Hubenthal // Coll. / W. Liebmann / Arnstadt” (SDEI); 1 ex., “Morea, / Comani / Brenske. // G. Fagel det. / *paradoxa* Scriba” (IRSNB); 1 ex., “Morea, / Comani / Brenske. // 789 // *paradoxa* Scriba / ex Reitter // Bernh. vid. // ex coll. / Skalitzky // Morea / Süd-Griechenland // *Homoeusa / paradoxa*” (NMW).

**REDESCRIPTION**: Body (Fig. 1) reddish brown throughout, but mouthparts, antennae, legs paler. Whole body surface densely covered with yellowish, long recumbent setae, which are becoming longer toward abdominal apex. Head circular, somewhat transverse; eyes with long erect setae between facets. Antennae thick; segments I–III elongate; segment IV as wide as long; segments V–X transverse; XI oblong oval. Labium (Fig. 2) with medial projection of apodeme (Fig. 2: arrow) rounded at apex; prementum with two real pores, one setal pore, several pseudopores between real and setal pores; ligula with a pair of long setae. Pronotum with anterior margin slightly rounded; surface slightly depressed around lateral margins; posterolateral corners well angled, slightly protruding posteriorly; posterior margin rounded; ratio  $\approx 1.6$ . Elytra slightly convex, dilated, widest around apices. Abdomen gently narrowed apically, widest around segment III or IV; tergite VII and sternite VII each with four macrosetae; tergite VIII with five macrosetae; sternite VIII with three macrosetae.



Figs. 1–7: *Liometoxenus paradoxus*: 1) habitus, holotype of *Homoeusa obscura*, scale = 1 mm, 2) labium, 3) male tergite VIII, 4), median lobe of aedeagus, 5) apical lobe of paramere, 6, 7) spermathecae of two different individuals.

Male: Tergite VIII (Fig. 3) slightly truncate or emarginate posteromedially. Median lobe of aedeagus (Fig. 4) with apical lobe gently curved toward paramere, with a median ridge on parameral surface; apical lobe of paramere dilated apically (Fig. 5).

Female: Tergite VIII slightly rounded posteromedially. Spermatheca (Figs. 6–7) with apical part short, rounded; basal part almost straight or slightly curved.

MEASUREMENTS: Body length  $\approx$  2.9–3.5 mm; fore body length (apex of head to apices of elytra)  $\approx$  1.4–1.5 mm; pronotal length 0.58–0.63 mm; pronotal width 0.94–1.05 mm; elytral width 0.95–1.03 mm; hind tibial length 0.53–0.57 mm (N=5).

DIFFERENTIAL DIAGNOSIS: This species is easily distinguished from the other species of the genus (two species from the United States) by the posterolateral corners of the pronotum protruding posteriorly, median lobe of aedeagus more strongly curved toward paramere, base of spermatheca uncoiled.

COMMENTS ON THE NEW SYNONYMY: No morphological difference was detected between the holotype of *Homoeusa obscura* and specimens of *Liometoxenus paradoxus* from Italy and Greece. Therefore, *H. obscura* is herein synonymised with *L. paradoxus*.

DISTRIBUTION: Italy, Croatia, Greece.

### Comments on systematic position of *Liometoxenus*

*Liometoxenus paradoxus* apparently belongs to *Liometoxenus* as it shares numerous character states with the other congeners, which are described in detail in the original description of the genus (KISTNER et al. 2002). Two species, *Liometoxenus jacobsoni* from Lassen County, California, and *L. newtonarum* KISTNER, JACOBSON & JANSEN from Monterey County, California, were originally known from the United States, and they were found with *Liometopum* ants (KISTNER et al. 2002). *Liometoxenus paradoxus* is also known to be associated with *Liometopum* ants (e.g., BERNARD 1968). Most myrmecophilous aleocharines have strict host specificity to ants at least at the generic level. The shared host specificity also supports the present generic affiliation.

As KISTNER et al. (2002) noted, *Liometoxenus* belongs to the tribe Oxyopodini based on the combination of the following character states: segment XI of antennae with coeloconic sensilla, absence of “athetine bridge” (SEEVERS 1978) in the male aedeagal median lobe, and elongate apical lobe of the paramere. KISTNER et al. (2002) stated that *Liometoxenus* is most closely related to *Oxyopoda* based on several characters (states not specified). However, *Liometoxenus* species are clearly different from *Oxyopoda* in the following character states: medial projection of the labial apodeme very short and rounded apically (Fig. 2: arrow), ligula with a pair of long setulae, and spermatheca with an internal constriction at the middle of the basal part (Fig. 7: arrow). Although the shape of the medial projection of the labial apodeme is slightly variable according to species within *Liometoxenus*, a similar shape was not observed in the species of *Oxyopoda* examined (10+ species). Similar states are also observed in some members of other tribes, such as Lomechusini, which is distant from Oxyopodini. The presence of long setae on the ligula is not uncommon in the Aleocharinae, but is not observed in *Oxyopoda*. The internal constriction of the basal part of the spermatheca has not been observed in any species of *Oxyopoda* or the other species of Oxyopodini that I have examined, e.g., *Devia* BLACKWELDER, *Homoeusa* KRAATZ, *Losiusa* SEEVERS, *Dinarda* LEACH, and *Thiasophila* KRAATZ. This character state is also observed in Aleocharini (all species examined, but minute termitophiles) and Homalotini (some species). These character states are apparently apomorphic and have evolved independently in several lineages within the subfamily Aleocharinae. However, one finds it difficult to state that these character states are not important when considering the systematic position of a genus that shares these states because they are rare in Aleocharinae. Indeed, the presence of an internal constriction of the spermatheca is an important character state used to define Aleocharini (Maruyama, in prep.). Since most *Oxyopoda* do not share these character

states, *Liometoxenus* may not be closely related to *Oxypoda*. To determine the precise systematic position of *Liometoxenus*, examination of many genera of Oxypodini will be necessary.

### Acknowledgments

The author thanks Dr. Volker Assing, Dr. Didier Drugmand, Dr. Johannes Frisch, Dr. Alfred F. Newton, Dr. Harald Schillhammer, and Dr. Lothar Zerche for lending material from their institutional or private collections. Thanks are also due Dr. Arnaldo Bordoni and Dr. H. Schillhammer for kindly deciphering several handwritten labels on old specimens. This study was supported by a Grant-in-Aid for Scientific Research from the JSPS to Young Scientists (B, 22770085).

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Autor(en)/Author(s): Maruyama Munetoshi

Artikel/Article: [Redescription of \*Liometoxenus paradoxus\* \(SCRIBA\) comb.n., and comments on the systematic position of \*Liometoxenus\* KISTNER, JENSEN & JACOBSON \(Coleoptera: Staphylinidae\). 173-177](#)