Taxonomy and distribution of the species of the genus Myrmechixenus Chevrolat, 1835 (Tenebrionidae: Diaperinae) 1

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Taxonomy and distribution of the species of the genus *Myrmechixenus* Chevrolat, 1835 (Tenebrionidae: Diaperinae)[1]

Wolfgang Schawaller

Abstract

The genus *Myrmechixenus* Chevrolat, 1835 (Tenebrionidae: Diaperinae: Myrmechixenini, type species *M. subterraneus* Chevrolat, 1835) contains only three species described in the middle of the 19th century from Europe. Two species are now distributed nearly worldwide, and unknown so far only from the Pacific Islands, New Zealand, Central and South America. The third species has a restricted distribution in Europe, probably because of its association to ants. *M. calvus* Reitter, 1877, described from Sulawesi, is considered as a junior synonym of *M. picinus* (Aubé, 1850), *M. lathridioides* Crotch, 1873 from northern America is considered as a junior synonym of *M. vaporiarorum* Guérin-Méneville, 1843. A species key is added. *Myrmecoxenus* Agassiz, 1846 is an unjustified emendation of *Myrmechixenus*.

K e y w o r d s : Coleoptera, Tenebrionidae, Diaperinae, Myrmechixeni, *Myrmechixenus*, *Myrmecoxenus*, taxonomy, synonymy, distribution, species key.

Zusammenfassung

Die Gattung *Myrmechixenus* Chevrolat, 1835 (Tenebrionidae, Diaperinae, Myrmechixenini, Typusart *M. subterraneus* Chevrolat, 1835) enthält nur drei Arten, die schon in der Mitte des 19. Jahrhunderts aus Europa beschrieben worden sind. Zwei von ihnen sind heute fast weltweit verbreitet, und soweit nur unbekannt von den pazifischen Inseln, Neuseeland und von Mittel- und Südamerika. Die dritte Art hat eine begrenzte Verbreitung in Europa, bedingt wahrscheinlich durch eine Beziehung zu Ameisen. *M. calvus* Reitter, 1877, beschrieben von Sulawesi, wird als jüngeres Synonym von *M. picinus* (Aubé, 1850), *M. lathridioides* Crotch, 1873 aus Nordamerika als jüngeres Synonym von *M. vaporiarorum* Guérin-Méneville, 1843 angesehen. Ein Bestimmungsschlüssel ist beigefügt. *Myrmecoxenus* Agassiz, 1846 ist eine ungerechtfertigte Veränderung von *Myrmechixenus*.

Contents

1 Introduction

The genus *Myrmechixenus* Chevrolat, 1835 (type species *M. subterraneus* Chevrolat, 1835) contains a few species mostly described from Europe (Aubé 1850, Chevrolat 1835, Guérin-Méneville 1843), but distributed nearly worldwide. The assignment of the genus to a family remained doubtful for a long period. Reitter (1877, 1879) placed it into Mycetophagidae and Dajoz (1977) included the genus in Colydiidae (both with an identification key of the three European species).

The recent classification (Bouchard et al. 2005) assigned *Myrmechixenus* to Tenebrionidae (Diaperinae: Myrmechixenini Jacquelin du Val, 1858). *Myrmecoxenus* Agassiz, 1846 is an unjustified emendation of *Myrmechixenus*.

Crotch (1873) and Reitter (1877) described two congeners from outside Europe, from northern America and Sulawesi, respectively. Doyen et al. (1990) were the first to record *Myrmechixenus* from Australia based on *M. vaporariorum*, a species described from Europe. Gardini (1995) published records of *Myrmechixenus* from Italy, Soldati & Soldati (2003, 2014) from France, Lillig et al. (2012) from Malta, Viñolas et al. (2015a, 2015b) from Spain and the Balearic Islands. The author has seen several specimens of this genus in different collections from outside Europe with unclear identification. Thus, the taxonomic separation needs a revision of the genus in a worldwide scope, presented herein.

Reitter (1880) described also *M. atomarioides* from New Zealand. The type material is not present in the collection of E. Reitter in the Hungarian Natural History

[1] Contributions to Tenebrionidae, no. 149. – For no. 148 see: Entomologische Blätter und Coleoptera 114, 2018.

Museum (Merkl in litt.). Dajoz (1977) suggested to exclude this species from *Myrmechixenus*. According to the description, this species has a 3-segmented antennal club (4-segmented in *Myrmechixenus*) and its generic and even familial assignment remains doubtful. In the Hungarian Natural History Museum Museum a single specimen from Tanzania is also present, which seems to be at the first glance a species of *Myrmechixenus*, but the antennal club is 5-segmented, and therefore it is not included herein.

As a result of this study, based on external morphological characters, the genus obviously contains only three species, described already in the middle of the 19th century from Europe. Two of them are now distributed nearly worldwide, and unknown so far only from the Pacific Islands, New Zealand, Central and South America. The third species has a restricted distribution in Europe, probably because it is an inquiline of ants. It would be interesting, if molecular data from different geographical regions would confirm the herein presented morphological species concept of the genus. The minute aedeagi (length about 0.2 mm) of all three species are very similar and show no significant differences (Fig. 5).

The two widely distributed species of *Myrmechixenus* live in rotten vegetable matter, in cattle (also elephant, buffalo, zebra etc.) dung, sometimes also occurring in stored food products, and are usually collected by sifting, with nets installed on top of cars, or at light. The third species (*M. subterraneus*) is restricted to Europe and found regularly in ant nests. The larva of *M. subterraneus* was described by Klausnitzer (1975) and Nikitsky (1983).

The distributional data in this paper are not just cited from the labels (verbatim) but are partly completed by additional data for a better localization and translated in several cases from other languages into English.

Acronyms and depositories

CRG	Collection Dr. Roland Grimm, Neuenbürg, Germany
HNHM	Hungarian Natural History Museum, Budapest, Hungary
MNB	Museum für Naturkunde, Berlin, Germany
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany
TMSA	Ditsong National Museum of Natural History, Pretoria, South Africa
USNM	Smithsonian National Museum of Natural History, Washington, USA

Acknowledgements

For the loan of specimens I thank Bernd Jäger and Johannes Frisch (Berlin), Roland Grimm (Neuenbürg), Ottó Merkl (Budapest), Ruth Müller (Pretoria), and Warren Steiner (Washington). The photographs were taken by Johannes Reibnitz (Stuttgart) with a Leica DFC320 digital camera on a Leica MZ16 APO microscope and subsequently processed by him with Auto-Montage (Syncroscopy) software. Thanks are due also to the referees Roland Grimm and Otto Merkl, the latter kindly added some additional locality data from the Hungarian Natural History Museum.

2 Taxonomy

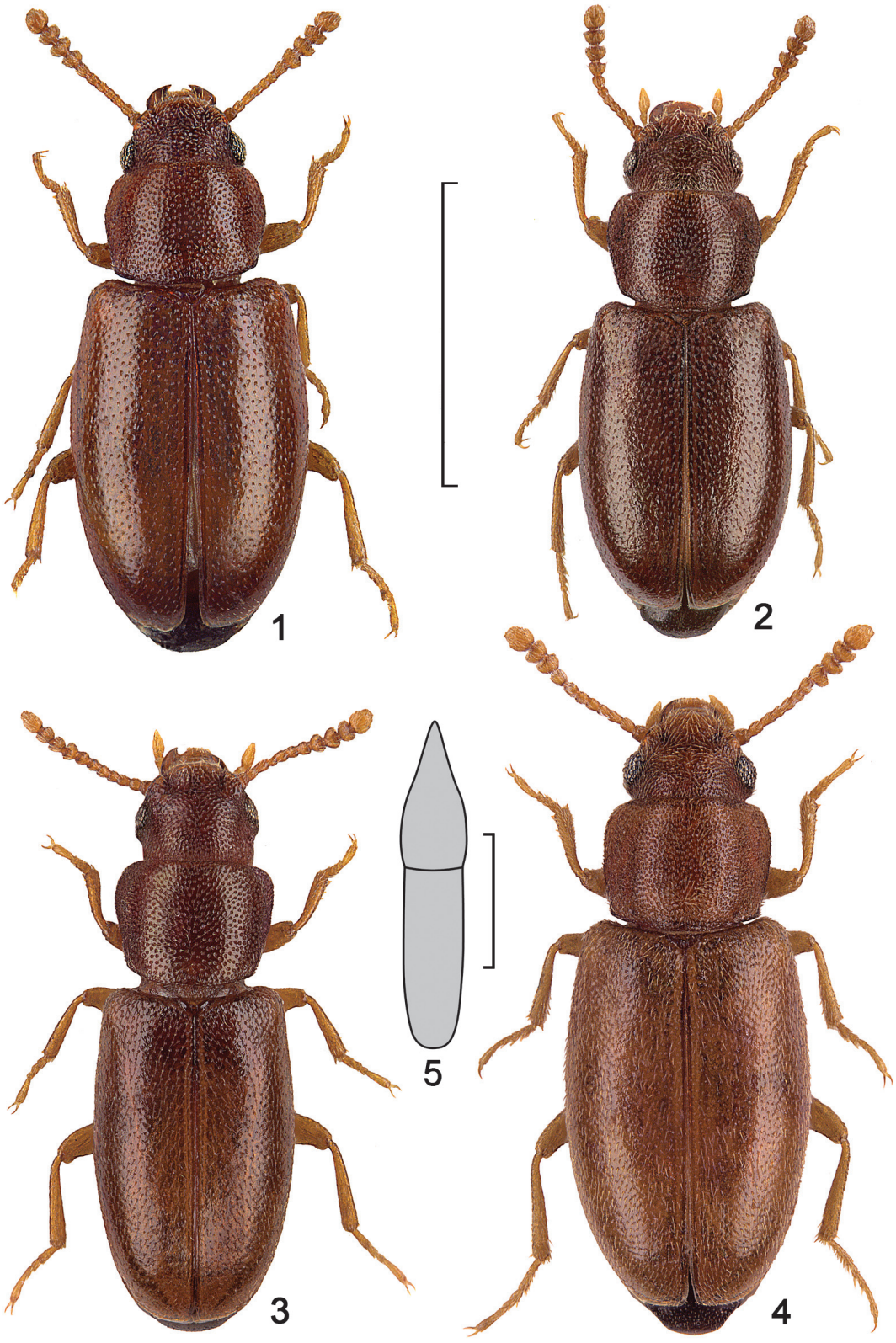
Myrmechixenus picinus (Aubé, 1850)
(Figs. 1, 2)

Myrmecoxenus picinus Aubé, 1850
Myrmecoxenus sordidus Wollaston, 1864 syn.
Myrmecoxenus calvus Reitter, 1877 **n. syn.**

Examined specimens: Italy, Sicilia, without date, leg. Grohmann, 5 ex. MNB (53192). – Italy, Sicilia, Ficuzza, without further data, 3 ex. MNB. – Italy, Sicilia, Palermo, without further data, 1 ex. MNB. – Italy, Sardinia, without further data, 1 ex. MNB. – Italy, Calabria, VIII.1898, leg. A. Fiori, 1 ex. MNB. – Italy, Lazio, 1890–1898, leg. A. Fiori, 2 ex. MNB. – Italy, Salerno, Pioppi, 20.X.–10.XI.1964, leg. W. Liebmann, 16 ex. MNB. – France, Corsica, without further data, 7 ex. MNB. – France, Corsica, Col de Colombana, 700 m, 28.VII.1980, leg. W. Schawaller, 2 ex. SMNS. – France, Corsica, 12 km NW Propriano, Plage de Cupabia, 25.V.2004, leg. W. Rose, 1 ex. CRG. – Spain, Mallorca, without further data, 3 ex. MNB. – Tunisia, Ain Draham, without further data, 1 ex. MNB. – Croatia (labelled as Dalmatia), Metkovich, without date, leg. E. Reitter, 1 ex. MNB. – Turkey, Adana, 22 km N Kozan, S. Eskiyen Geç., 640 m, 7.IV.2004, leg. M. Schülke, 1 ex. SMNS. – Tanzania (labelled as Tanganyika), Peramiho-Songea, 1964, leg. D. Stumpf, 1 ex. SMNS. – S Malawi, 80 km S Blantyre, Masenjere, 21.–22.XII.2001, leg. J. Bezděk, 1 ex. SMNS. – NE Namibia, 20 km SE Divundu, 1000 m, 17.III.2006, leg. W. Schawaller, 1 ex. SMNS. – NE Sumbawa, Tambora NP, Calabai, 11.–13.II.1994, leg. L. Bolm, 2 ex. SMNS. – NE Sumbawa, 4 km NW Dompu, 13.II.1994, leg. L. Bolm, 1 ex. SMNS. – E Java, Baluran NP, Wonorejo, 50 m, 24.–25.II.1994, leg. L. Bolm, 1 ex. SMNS. – Java, Djilatjap, II.1915, leg. Drescher, 1 ex. MNB (det. Heinze as *calvus*). – India, Madhya Pradesh, Jabalpur, 31.III.1967, leg. G. Topál, 1 ex. HNHM. – India, W Bengal, Singur, 26.IX.1967, leg. G. Topál, 1 ex. HNHM. – W Malaysia, Perak, 30 km SW Ipoh, Batu Gajah, 100 m, 19.–21.III.2002, leg. P. Čechovský, 1 ex. SMNS. – NE Thailand, Khon Kaen, 25.V.1980, leg. S. Saowakontha, 1 ex. HNHM. – Laos, Annam, without further data, 1 ex. HNHM. – N Vietnam, Hanoi, 40 m, VIII.–X.1963, leg. T. Pócs, 6 ex. HNHM.

Synonymy: Unfortunately, the type material of *Myrmechixenus calvus* (Reitter, 1877), described from Sulawesi, is not present in the collection of E. Reitter in HNHM (Merkl in litt.). According to the diagnosis, this species is extremely similar to *M. vaporariorum*, but with body shape shorter, elytra shorter, pronotum narrower near base, and with less dorsal setation. Particularly the last character, however, points to *M. picinus*. Additionally, all above listed specimens from the localities Java and Sumbawa close to Sulawesi seem to be identical with *M. picinus*. Thus I hope not to fail in considering *M. calvus* (Reitter, 1877) as a junior synonym of *M. picinus* (Aubé, 1850).

Distribution: Widely distributed in southern Europe, Madeira, Canary Islands (type locality Fuerteventura of *M. sordidus*), Balearic Islands, northern Africa, Turkey, Tanzania, Malawi, NE Namibia, Sulawesi (type locality of *M. calvus*), Sumbawa, Java, India, W Malaysia, Laos, Vietnam.



Figs. 1–4. Dorsal view of *Myrmechixenus* species. – **1**. *M. picinus*, non-type SMNS, Sumbawa. **2**. *M. picinus*, non-type SMNS, Turkey. **3**. *M. subterraneus*, non-type SMNS, Germany. **4**. *M. vaporariorum*, non-type SMNS, Germany. – Scale: 1.0 mm.
Fig. 5. Aedeagus of *Myrmechixenus vaporariorum*, non-type SMNS, Germany. – Scale: 0.1 mm.

Myrmechixenus subterraneus Chevrolat, 1835 (Fig. 3)

Myrmecoxenus espulo Mäklin, 1844 syn.

Examined specimens: France, Paris (labelled as Lutetia), without further data, leg. C. Aubé, 12 ex. MNB (hist. coll. no. 53190). – Germany, Sachsen, Leipzig, without further data, leg. Link, 3 ex. TMSA. – Germany, Rheinland-Pfalz, Landau, Waldrohrbach, 20.VI.1993, leg. F. Köhler & W. Fritz, 7 ex. SMNS. – Germany, Baden-Württemberg, Alb, Westerstetten, 24.I.1965, leg. R. Schrepfer, 2 ex. SMNS. – Germany, Baden-Württemberg, Hegau, Engen, 10.V.1980, leg. H. Hahn, 5 ex. SMNS. – Germany, Baden-Württemberg, Taubertal, Werbach, 19.IV.1980, leg. P. Dynort, 1 ex. SMNS. – Germany, Bavaria, Karlstadt/Main, 4.V.1991, leg. W. Höhner, 1 ex. SMNS. – Poland, Jedwabno (labelled as Ostpreußen, Gedwangen), 1937–1938, leg. B. Folwaczny, 8 ex. SMNS. – Slovakia, Kamenin, 30.IV.1995, leg. R. Fornusek, 1 ex. SMNS. – Slovakia, Trenčín (labelled as Trencsén), without further data, 1 ex. MNB. – Hungary, Esztergom, without date, leg. E. Bokor, 1 ex. HNHM (det. Ślipiński). – Hungary, Pest county, Taksony, 19.X.2014, host *Formica pratensis*, leg. G. Seres, 1 ex. HNHM (det. Seres). – Romania, Tâmpa in city of Braşov (labelled as Kapellenberg), without date, leg. F. Deubel, 6 ex. HNHM (det. Ślipiński). – Romania, Frumoasa, Muntele Păgânului (labelled as Transsylvania, Csíkszépvíz, Pogányhavas), 4.IV.1917, leg. J. Fodor, 5 ex. HNHM (det. Merkl). – Croatia, Ludbreg, without date, leg. V. Apfelbeck, 5 ex. HNHM (det. Ślipiński). – Bosnia, without further data, leg. E. Reitter & J. Lederer, 3 ex. USNM, 1 ex. MNB. – Bosnia and Herzegovina, Nevesinje, without date, leg. V. Zouval, 2 ex. MNB. – Bosnia and Herzegovina, Velež Planina, 1897, leg. E. Reitter, 4 ex. MNB. – Bosnia and Herzegovina, without date, leg. T. von Wanka, 2 ex. MNB. – Italy, Liguria, S Stefano d'Aveto, VIII.1941, leg. M. Francicolo, 1 ex. MNB. – S Russia (labelled as Russia m.), without further data, 3 ex. MNB (labelled as *espulo* Mäklin).

Distribution: Restricted to Europe.

Myrmechixenus vaporariorum Guérin-Méneville, 1843 (Figs. 4, 5)

Myrmecoxenus lathridioides Crotch, 1873 **n. syn.**
Myrmecoxenus beturiensis Reitter, 1879 syn.

Examined specimens: Germany, Rheinland-Pfalz, Bad Kreuznach, XI.1959, collector unknown, 4 ex. SMNS. – Germany, Hessen, Hofgeismar, IV.1933, leg. B. Folwaczny, 20 ex. SMNS. – Germany, Baden-Württemberg, Nürtingen, VII.1983, leg. C. Rieger, 1 ex. SMNS. – Germany, Baden-Württemberg, Grißheim, 6.V.1995, leg. H. Kasper, 1 ex. SMNS. – Austria, Vienna, without further data, 8 ex. MNB. – Italy, Calabria, Cimina, without date, leg. G. Paganetti, 2 ex. SMNS. – Italy, Sicily, Castelbuono, 21.III.1942, leg. P. Wolfrum, 9 ex. SMNS. – Italy, Sardinia, Lostia, without date, leg. A. Fiori, 3 ex. MNB. – Italy, Sardinia, Asuni, without date, leg. A. H. Krause, 4 ex. MNB (det. Bremer). – Slovakia, Liptovský Hrádok (labelled as Liptóújvár), 1.VII.1961, leg. S. Endrődy-Younga, 1 ex. HNHM (det. Merkl). – Hungary, Somogy county, Igal, 22.VII.2003, leg. O. Merkl, 9 ex. HNHM (det. Merkl). – Hungary, Tiszacsege, 13.VII.2001, leg. K. Renner, 1 ex. MNB. – Spain, Mallorca, Son Carió, 19.VII.–2.VIII.2010, leg. B. Feldmann, 3 ex. MNB. – Tunisia, Le Kef, without further data, 1 ex. MNB (labelled as *beturiensis*). – Algeria, without data, coll. E. Reitter, 2 ex. SMNS, 2 ex. USNM. – Egypt, 25.IX1933, leg. A. Rabinovitch, 1 ex. USNM. – Egypt, Bilbeis, 25.VIII.1914, collector unknown, 1 ex. USNM. – Israel, Upper Galilee, S Ziv'on, 750 m, 28.–29.IV.2006, leg. D. Wrase, 1 ex. SMNS. – Israel, Bat-Iam, 20.–24.I.1968, leg. S. Bleszynski, 8 ex. USNM. – Syria, Deir Az Zhor, 195 m, 17.VI.2006, leg. N. Rahmé et al., 1 ex. HNHM. – United Arabian Emirates, Sharjah Desert Park, VII.–VIII.2005, leg. T. van Harten, 9 ex. SMNS. – S Yemen, 20 km W Lawdar, 1100 m, 26.–27.III.2007, leg. M. Rejzek, 11 ex. SMNS. – Yemen, Wadi Zabid, XI.1970, leg. A. Szalay-Marzsó, 1 ex. HNHM. – Iran, Gilan (labelled as Ghuillan), Lahijan, 200 m, VII.–VIII.1961, leg. J. Klapperich, 1 ex. HNHM. – Pakistan, Lahore, VII.–XI. 1957, leg. J. Maldonado, 2 ex. USNM. – Nepal, Bheri Prov., Nepalgunj, 170 m, 11.–12.VII.2001, leg. A. Kopetz, 1 ex. SMNS. – India, Uttar Pradesh, Rishikesh, 6.VIII.1989, leg. A. Riedel, 1 ex. SMNS. – India, Goa, Molem, 20.–22.II.1980, leg. G. Topál, 1 ex. HNHM. – Sri Lanka (labelled as Ceylon), Kowa, Dalio Tante, 2.III.1906, leg. H. Schoede, 1 ex. MNB. – Myanmar, 60 km NNE Yangon, Pegu, 22.XI.2003, leg. M. Hornburg, 1 ex. SMNS. – Thailand, 220 km NW Bangkok, 65 km NW Thai-Thani, 25 km NW Lan Sak, 110 m, IX.1990, collector unknown, 20 ex. MNB (det. Bremer). – Thailand, 220 km NW Bangkok, 55 km W Uthai-Tham, 2 km SW Pak-Muang, 120 m, XII.1991, collector unknown, 12 ex. MNB. – NE Thailand, Khon Kaen, 23.VI.1980, leg. S. Saowakontha, 2 ex. HNHM. – Thailand, Trang Prov., Thung Khai Botanical Garden, 12.–16.XI.2004, leg. A. Orosz, 1 ex. HNHM. – Thailand, Kaen, V.1954, leg. R. E. Elbel, 8 ex. USNM. – Laos, Vientiane, 200 m, 9.–10.IV.1998, leg. O. Merkl & G. Csorba, 1 ex. HNHM. – Philippines, Luzon, Manila, without date, leg. G. Boettcher, 1 ex. MNB. – Indonesia, Sulawesi, Ujung Padang, 5.VII.1996, leg. P. Schüle & P. Stüben, 4 ex. SMNS. – Papua New Guinea, Morobe, Cape King William (labelled as Kap König Wilhelm), without date, leg. J. Hirsch, 1 ex. MNB. – Senegal, Richard Toll, 8.X.1978, leg. G. Hevel & J. Fortin, 6 ex. USNM. – Liberia, Suakoko, I.–II.1952, leg. Blickenstaff, 2 ex. USNM. – Guinea, Coyah,VI.–XII.1963, leg. K. Ferencz, 50 ex. HNHM. – Ghana, Northern Region, Tamale, 185 m, III.1970, leg. S. Endrődy-Younga, 50 ex. HNHM. – Sudan, Medani, 8.X.1979, leg. F. Hieke, 42 ex. MNB (det. Johnson). – Kenya, Tsawo NP, Kitani Lodge, 14.IV.1988, leg. A. Vojnits, 5 ex. HNHM. – Tanzania, Morogoro, 560 m, III.–IV.1987, leg. Pócs & Sontera, 1 ex. HNHM. – South Africa, KwaZulu-Natal, SW Magudu, 4.–5.I.2009, leg. P. Schüle, 3 ex. SMNS. – South Africa, Northern Prov., 33 km NNE Vaalwater, Lindani NR, 18.–19.XI.2004, leg. P. Schüle, 1 ex. SMNS. – South Africa, N Transvaal, Mmabolela Estate, 6.III.1973, leg. S. Endrődy-Younga, 23 ex TMSA, 1 ex. SMNS. – South Africa, Krüger NP, Skukuza, Sabie River, 14.I.1996, leg. S. Endrődy-Younga, 1 ex. TMSA. – Namibia, Kaokoveld, Warmquelle, 190 m, 2.II.1975, leg. S. Endrődy-Younga, 1 ex. SMNS. – Namibia, Etosha Pan, Halali Camp, 26.XII.1974, leg. S. Endrődy-Younga, 1 ex. TMSA. – Namibia, Damaraland, Bethanis Farm, 19.II.1975, leg. S. Endrődy-Younga, 1 ex. TMSA. – Namibia, Kavango, Mahango Game Reserve, 17.IV.1993, leg. B. & M. Uhlig, 18 ex. MNB. – Namibia, E Caprivi, Mudumu NP, Nakatwa, 8.–13.III.1992, leg. M. Uhlig, 3 ex. MNB. – Namibia, E Caprivi, 30 km SE Katima Mulilo, 6.III.1992, leg. M. Uhlig, 2 ex. MNB (det. Bremer). – USA, S California, without further dates, 3 ex. MNB. – USA, California, Passadena, without date, leg. A. Fenyes, 6 ex. MNB. – USA, Arizona, Casa Grande, 5.VIII.1924, leg. Schroeder & Ahl, 1 ex. MNB. – USA, New York, West Point, IV.–V.1909, leg. W. Robinson, 11 ex. USNM.

– USA, California, Palm Springs, IX.1932, Blackwelder collection, 1 ex. USNM. – USA, California, Pasadena, without date, Wickham collection, 3 ex. USNM. – USA, California, Riverside Co., 4.VIII.1964, leg. E. F. Legner, 3 ex. USNM. – USA, Arizona, Ft. Yuma, without date, collection Hubbard & Schwarz, 1 ex. USNM. – USA, Washington D.C., without date, collection Hubbard & Schwarz, 5 ex. USNM. – USA, Alabama, Mobile, without date, leg. H. D. Soling, 4 ex. USNM. – USA, Nebraska, N. Platte, 18.VII.–30.IX.1984, leg. R. Seymour, 3 ex. USNM. – USA, Texas, Orange, without date, 2 ex. USNM. – USA, Texas, SW Hidalgo Co., 27.IX.1946, leg. G. B. Vogt, 6 ex. USNM. – USA, Colorado, Englewood, without further dates, 1 ex. USNM. – USA, Arkansas, Little Rock, 19.VI.2002, leg. B. Baldrin, 1 ex. USNM. – Mexico, Baja California, 8 km N Cabo San Lucas, 11.XI.1981, leg. W. E. Steiner, 2 ex. USNM.

S y n o n y m y : All the reexamined specimens from northern America, identified as *M. lathridioides* Crotch, 1873, show no external differences from European specimens of *M. vaporariorum* Guérin-Méneville, 1843. Thus *M. lathridioides* is considered as a junior synonym.

D i s t r i b u t i o n : Described from Europe, but distributed nearly worldwide. Australia (Doyen et al. 1990), United States (Steiner 2008), Mexico, Syria, Iran, Pakistan, Nepal, India, Sri Lanka, Thailand, Laos, Luzon, Sulawesi, New Guinea (only a single old record), Yemen, Liberia, Ghana, Guinea, Kenya, Tanzania, Namibia, South Africa.

3 Species key

1 Pronotum widest in anterior quarter, narrowed towards base in a straight line, posterior corners nearly rectangular. Punctation on head and pronotum densely set and large, on elytra very fine. Antennal club short, last 4 antennomeres slightly widening toward tip. Restricted to Europe. Body length 1.3–1.6 mm. – Fig. 3. ..... ***M. subterraneus***

– Pronotum widest shortly before middle, lateral margins rounded, posterior corners not prominent. Antennal club longer, last 4 antennomeres of similar width. Punctation on pronotum similar as on elytra. Distributed nearly worldwide. **2**

2 Punctures of whole dorsal surface small and densely set, surface nearly dull, pronotal and elytral setation long, 1.7–2.0 mm. Figs. 4, 5. ..... ***M. vaporariorum***

– Punctures of whole dorsal surface large, on pronotum and elytra separate, surface shining, pronotal and elytral setation short. 1.6–2.0 mm. Figs. 1, 2. ..... ***M. picinus***

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