

**MERMESSUS SPECIES IN THE NETHERLANDS (ARANEAE, LINYPHIIDAE)****Peter J. van Helsdingen***European Invertebrate Survey – Nederland, Leiden (helsdingen@nmm.nl)*

&amp;

**Steven IJland***Bronkhorststraat 23, 2316 SX Leiden (sijland@gmail.com)***SAMENVATTING**

Drie soorten van het Amerikaanse genus *Mermessus* (voorheen *Eperigone*) zijn tot nu toe in Europa opgedoken. *M. denticulatus* (Banks, 1898) is gevonden in kassen, maar ook in de vrije natuur (recent ook in Nederland). *M. maculatus* (Banks, 1892) is vermeld van een kas in Zwitserland. *M. trilobatus* (Emerton, 1882) heeft inmiddels een ruime verspreiding in Europa en is nu ook in Nederland op de zuidelijke Veluwe in het buitengebied gevonden. De variabiliteit in de vorm van de epigyne bij *M. trilobatus* wordt aangegeven.

Key words: distribution, *Mermessus denticulatus*, *Mermessus trilobatus*

**INTRODUCTION**

The genus *Mermessus* occurs with 79 species in North, Central and South America and – surprisingly – with one species (*M. naniwaensis* (Oi 1960)) in China and Japan. Millidge (1987) published a monograph on *Eperigone* (= *Mermessus*) with descriptions and distribution maps. In 1991 he described five more species (Millidge 1991). Some species have spread outside the original range, probably transported by man. *Mermessus fradeorum* (Berland 1932) scores “cosmopolitan” (Platnick 2007) and has been found outside the New World on the Canary Islands and the Azores, South Africa, New Zealand and the Cook Islands. *M. bryantae* (Ivie & Barrows 1935) apparently was introduced into the Azores. The following three species have penetrated into continental Europe.

**THE GENUS MERMESSUS**

This linyphiid genus comprises small species without a dorsal abdominal pattern. Legs with or without TmIV, TmI near the middle of the segment. Male palpal tibia with a dorsal apophysis distally of diagnostic shape; the palpal organ has a compact radical-embolic element with a small tooth-like embolus. The male chelicerae have a large frontal tooth near the anterior row of usual cheliceral teeth and in some species (e.g. *M. denticulatus* and *M. fradeorum*) a latero-frontal row of denticles, reminding of the cheliceral ornamentation of *Erigone* species. The epigyne has two lobes on which lie the entrances of the spermducts. The epigyne is plugged after copulation by a dark-brown to black shining substance.

**INTRODUCTIONS INTO EUROPE*****Mermessus denticulatus* (Banks, 1898)**

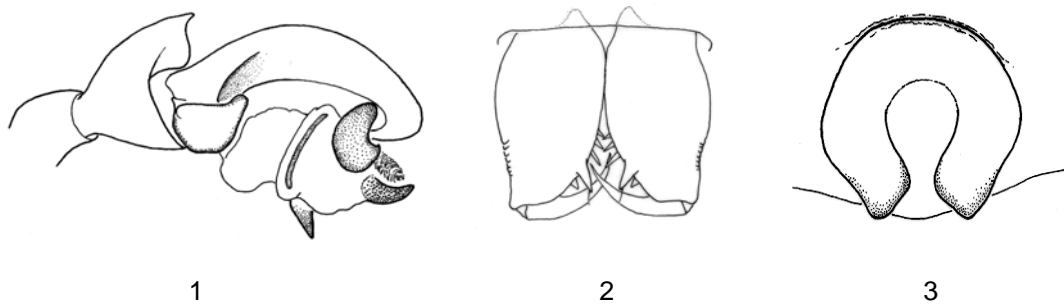
*Mermessus denticulatus* (formerly known as *Eperigone eschatologica* (Crosby 1924)) was introduced in Europe. The species was recorded from Spain (Andalucia and Malaga, in a *Eucalyptus* stand and grassland, respectively) (Bosmans & Vanuytven 1998). In Germany it was recorded from a hothouse (Jäger 1996; Klein & al. 1995). The species was also found in a hothouse in the Netherlands (Prinsen 1996). In 2001 and 2002 a few specimens were collected in two different floodplains in the Netherlands, for the first time outside hothouses (Van Helsdingen, in press). The specimens turned up in material collected with pitfalls during an inventory of a number of floodplains along the river Waal, the main branch of the Rhine river system. One male specimen was captured in the Gamerensche Waard (30.viii.2001, grassland). A second male turned up in the Hurwenensche Waard (3.ix.2002, near the shoreline of the river). Both sites are natural habitats in a dynamic riverine environment with flooding in the winter and extensive grazing during the summer. Since the species was collected in two subsequent years it may be assumed that there is a viable population in the area near the investigated floodplain sites.

***Mermessus maculatus* (Banks, 1892)**

*Mermessus maculatus* (formerly known as *Eperigone maculata* (Banks, 1892)) was found in a hothouse in Switzerland (Holzapfel 1932). This is a record from 1931 which cannot be re-examined because the specimen cannot be located (Hänggi 2003).

***Mermessus trilobatus* (Emerton, 1882)**

*Mermessus trilobatus* (formerly known as *Eperigone trilobata* (Emerton, 1882)) was for the first time found in Europe in Germany in a beech forest near Karlsruhe (Dumpert & Platen 1985). It has also been found in Switzerland (Tessin, dry and wet grassland) (Hänggi 1990, 1992) and in Austria (Voralberg) (Breuss 1999). In France it was discovered in the Alsace (Dept. Haut-Rhin) (Blick 2000). In Belgium *M. trilobatus* was collected in the provinces Limburg (Aminal 2000), Limburg (Mechelse Heide, heathland with strong *Molinia*) (Lambrechts &



Figs. 1-3. *Mermessus trilobatus* (Emerton). Outlines of: 1, male palp; 2, male chelicerae; 3, epigyne.

al. 2002), Namur (Nismes, *Mesobrometum* with partial cover of shrubs and trees) (De Koninck 2004), and Liège (near Büllingen) (Van Keer & al. 2006). All these records come from the eastern part of Belgium. There is one record from the West of Flanders near Antwerp (on a shunting-yard) (Van Keer & al. 2006). Thaler & Knoflach (1995) mention this species to occur in Trentino Northern, Italy, without further details.

*M. trilobatus* has been found in the Netherlands now for the first time. During an inventory with pitfall traps on a site on the southern border of the Veluwe, which is the northwestern part of the province Gelderland (Guelre), a number of male and female specimens turned up. In the investigated area former arable land is planned to be converted into a natural area. It is known as the nature development project Reijerscamp to the North of the municipality Renkum. In 2006 an inventory was carried out to establish the extant carabid and spider fauna before conversion measurements were taken, such as removal of the top layer.

Altogether six specimens were trapped: 1♂, 16.v.2006, former corn-field; 1♀, 17.v.2006, small field with recently planted trees (with small epigyneal plug); 1♂, 4.vi.2006, former arable land; 1♀, 5.vi.2006, former arable land (with epigyneal plug); 1♂, 17.vi.2006, former arable land; 1♀, 25.ix.2006, former arable land (with epigyneal plug). All specimens in National Museum of Natural History, Leiden, Netherlands.

#### DISTINGUISHING CHARACTERS AND VARIABILITY OF *MERMESSUS TRILOBATUS*

The species is characterized by the outlines of the male tibial apophysis (fig. 1) and the epigyne (fig. 3). The male chelicerae (fig. 2) have large meso-frontal tooth with a seta on top. The stridulating files are coarse and restricted to the apical half of the chelicerae. There is no abdominal pattern but the dorsal surface is slightly lighter in the middle.

In a recent treatise of *Eperigone eschatologica* (= *Mermessus denticulatus*) the structure and possible functioning of the male and female genital organs have been outlined *Mermessus denticulatus* (Van Helsdingen, in press). It is assumed that this is the general pattern for the genus. In *M. trilobatus*, too, the radical-embolic section of the male palp is crown-shaped with a short embolus surrounded by three protruding parts. The epigyne and the male tibial apophysis were shown to be variable between eastern and western North American populations by Van Helsdingen (1982, figs 1-12). The male specimens from the Netherlands agree with the specimens from Connecticut depicted there (Van Helsdingen 1982, figs. 9, 10), or generally speaking the eastern population of North America, although the research then was carried out on material from two states only, Oregon and Connecticut. The epigyne of the female of the one specimen without a plug is different from the illustrations provided so far by the different authors in that the two lobes converge in posterior direction (fig. 3). This was not the case in the material studied by me before (Van Helsdingen 1982) and resembles the figure shown by Millidge (1987, fig. x) although the lobes are converging stronger. Millidge did not indicate from which locality or region the depicted specimen originated.

#### MODES OF DISTRIBUTION

Obviously the three species of *Mermessus* were transported by man. Usually this is most likely to happen with species which are common in their original distribution area. For none of the three species the abundance or population densities in their original ranges are known. From Millidge's revision (1987) one can only infer the size of the species' range from the distribution maps produced. Specimens can be transported with plant material or other goods as juveniles, adult specimens or egg batches. The success in their new environment and their chances of establishing a breeding population may depend on the frequency of introduction of new specimens.

*M. denticulatus* has a southern distribution (southern states of the U.S.A. and Mexico) and therefore probably has better chances to survive in a protected environment such as hothouses. On the other hand, *M. maculatus* and *M. trilobatus* are northern species in North America and therefore should be able to survive in the more temperate climatic belt of Europe. Since *M. denticulatus* has now been found in two different localities in two different years it seems to have adapted to the climatic conditions in the Netherlands, which has a comparatively mild maritime climate.

If we summarize the distribution of the three *Mermessus* species which now occur in Europe we can conclude that *M. trilobatus* has settled in the open country over a large area (Austria, Germany, Switzerland, Northern Italy, Belgium and the Netherlands) and thus has become a European species after introduction from the Americas. Of *M. maculatus* we have only a single record from a hothouse in Switzerland. For *M. denticulatus* we now have records from hothouses in the Netherlands and Germany, while it has spread to the countryside in the Netherlands. However, we should realize that specimens of smaller linyphiid species as *Mermessus* are prone to escape attention in the field. They will be detected easier and sooner in hothouses. Only inventories with the use of pitfalls will bring them to light more easily.

#### REFERENCES

- Aminal 2000. Evaluatie van het actuele heidebeheer Limburg. – Aminal-dossier 5: 1-11. [not seen, taken from Van Keer & al. 2006]
- Blick, T. 2000. Inventaire des araignées en Petite Camargue Alsacienne. – Annales Scientifiques de la Réserve Naturelle de la Petite Camargue Alsacienne 1996-2000: 37-40. [not seen]
- Bosmans, R. & H. Vanuytven 1998. *Eperigone eschatologica* een Amerikaanse immigrant in West-Europa (Araneae, Erigonidae). – Nieuwsbrief van de Belgische Arachnologische Vereniging 13: 15-16.
- Breuss, W. 1999. Über die Spinnen (Araneae) und Weberknechte (Opiliones) des Naturschutzgebietes Gsieg-Obere Mähder (Lustenau, Voralberg). – Voralberg Naturschau 6: 215-236.
- De Koninck, H. 2004. Vier nieuwe en enkele zeldzame spinnen voor de Belgische fauna. – Nieuwsbrief van de Belgische Arachnologische Vereniging 19: 51-54.
- Dumpert, K. & Platen, R. 1985. Zur Biologie eines Buchenwaldbodens. 4. Die Spinnenfauna. – Carolea 42: 75-106.
- Hänggi, A. 1990. Beiträge zur Kenntniss der Spinnenfauna des Kt. Tessin III – Für die Schweiz neue und bemerkungswerte Spinnen (Arachnida: Araneae). – Mitteilungen der Schweizerischen entomologischen Gesellschaft 63: 153-167.
- Hänggi, A. 1992. Spinnenänge in Magerwiesen und Braken aus dem Tessin – Unkommentierte Artenlisten. – Arachnologische Mitteilungen 4: 59-78.
- Helsdingen, P.J. van 1982. *Eperigone trilobata* revealed as a trans-American species. – Bulletin of the British Arachnological Society 5: 393-396.
- Helsdingen, P.J. van (in press). *Eperigone eschatologica* (CROSBY, 1924), a new adventive species in the Netherlands (Araneae, Linyphiidae). – Contributions to Natural History (Bern).
- Jäger, P. 1996. Ergänzungen zur Kölner Spinnenfauna (Araneae). – Decheniana, Beiheft 35: 573-578.
- Klein, W., Stock, M. & Wunderlich, J. 1995. Zwei nach Deutschland eingeschleppte Spinnenarten (Araneae) – *Uloborus plumipes* Lucas und *Eperigone eschatologica* (Bishop) – als Gegenspieler der weissen Fliege im geschützten Zierpflanzenbau? – Beiträge zur Araneologie 4: 301-305.
- Lambrechts, J., M. Janssen, M. & Hendrickx, F. 2002. Vier nieuwe spinnensoorten voor de Belgische fauna. – Nieuwsbrief van de Belgische Arachnologische Vereniging 17: 74-79.
- Miller, J. A. 2007. Review of erigonine spider genera in the Neotropics (Araneae: Linyphiidae, Erigoninae). – Zoological Journal of the Linnean Society 149 (Suppl. 1): 1-263.
- Millidge, A.F. 1987. The erigonine spiders of North America. Part 8. The genus *Eperigone* Crosby and Bishop (Araneae, Linyphiidae). – American Museum Novitates 2885: 1-75.
- Millidge, A.F. 1991. Furteher linyphiid spiders (Araneae) from South America. – Bulletin of the American Museum of Natural History 205: 1-199.
- Platnick, N.I. 2007. The World Spider Catalog. American Museum of Natural History. – <http://research.amnh.org/entomology/spiders/catalog/index.html> (Version 8.0).
- Prinsen, J.D. 1996. *Eperigone eschatologica* (Crosby, 1924) (Araneae: Linyphiidae), een nieuwe spin in Nederlandse kassen. – Nieuwsbrief SPINED 11: 1-3.
- Van Keer, K., H. de Koninck, H. Vanuytven & J. Van Keer 2006. Some – mostly southern European – spider species (Araneae), new or rare to the Belgian fauna, found in the city of Antwerp. – Nieuwsbrief van de Belgische Arachnologische Vereniging 21: 33-40.

