

## A redefinition of *Misumenops* F. O. Pickard-Cambridge, 1900 (Araneae, Thomisidae) and review of the New World species

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### Summary

The type species of *Misumenops*, *Misumena maculis-sparsa* Keyserling, 1891 from Brazil is redescribed from its type material. A closely related, but widely confused species, *Misumenops pallidus* (Keyserling, 1880) (♂♀) from Bolivia and eastern Brazil to northern Argentina, is redescribed and compared with the type species. The revised concept of *Misumenops* is briefly discussed and its differences from the Eurasian *Ebrechtella tricuspida* (Fabricius, 1775) as well as the North American *Mecaphesa asperata* (Hentz, 1847) and *Mecaphesa celer* (Hentz, 1847) are summarised. *Misumenops guianensis* (Taczanowski, 1872) from northern South America, *Misumenops bellulus* (Banks, 1896) from Florida and the Caribbean islands, *Misumenops temibilis* (Holmberg, 1876) from southern South America, and *Misumenops variegatus* (Keyserling, 1880), **comb. n.** ex *Misumena* from Peru are redescribed. Lectotypes are designated for *Diaea pallida* Keyserling, 1880 (♀), *Misumena pallens* Keyserling, 1880 (♀) and *Misumena maculis-sparsa* Keyserling, 1891 (♂). A female neotype is designated (from recent material) for *Xysticus temibilis* Holmberg, 1876 and its senior (but homonymous) synonym *Thomisus cinereus* Nicolet, 1849. The six confirmed Neotropical species of the genus *Misumenops* are listed, with four species in the *maculisparsus*-group: *M. maculisparsus*, *M. pallidus*, *M. guianensis* and *M. bellulus*, the last being the only species of *Misumenops* within the USA (Florida); the *M. temibilis*- and *M. variegatus*-groups are both monotypic, but are confirmed as members of the newly diagnosed *Misumenops*. *Misumena exanthematica* Holmberg, 1876 from Patagonia and *Misumenoides nicoleti* Roewer, 1951 as a *nomen novum* for *Thomisus cinereus* Nicolet, 1849 are synonymised with *Misumenops temibilis* (Holmberg, 1876). The junior secondary homonym *Misumenops variegatus* Mello-Leitão, 1917 is regarded as a *nomen dubium*. The resurrected genus *Misumessus* Banks, 1904 is diagnosed and the resurrection of *Runcinioides* Mello-Leitão, 1929 is confirmed, leading to the revalidated combinations *Runcinioides argenteus* Mello-Leitão, 1929, *R. pustulatus* Mello-Leitão, 1929, *R. souzai* Soares, 1942, and *R. litteratus* (Piza, 1933), all **comb. n.** ex *Misumenops*. The synonymisation of *Metadiaea* Mello-Leitão, 1929 with *Misumenops* is not accepted. *Misumenops pallidus* sensu Rinaldi (1983) from Brazil is transferred to the still unrevised “*Misumenops*” *pallens*-group. The monotypic genus *Chorizopsis* Simon, 1864 is treated as a *nomen dubium*, as its type species is now also regarded as a *nomen dubium*. All Nearctic species listed in *Misumenops* by Schick (1965, 1970) and Dondale & Redner (1976), 12 Central American and Caribbean species of various authors, and 21 Hawaiian species listed in *Misumenops* and *Synema* by Suman (1970) are transferred to the newly diagnosed and delimited *Mecaphesa* Simon, 1900. The resulting 43 new combinations in *Mecaphesa* are listed. *Misumenoides*

*obesulus* (Gertsch & Davis, 1940), **comb. n.** ex *Misumenops* and *Misumenoides vazquezae* (Jiménez, 1986), **comb. n.** ex *Misumena* are presented as additional new combinations in the Misumenini.

### Introduction

According to Platnick’s (2006) catalogue the genus *Misumenops* in the subfamily Thomisinae has a world-wide distribution and includes 119 species. Most of the unrevised species still listed there in *Misumenops* are restricted to the New World (81) and particularly to the Neotropical Region (60).

All genera of Misumenini were still known until now from the diagnoses provided by Simon (1895) and Mello-Leitão (1929), which were chiefly based on the eye pattern and some other somatic characters. Minor differences between them are difficult to observe and therefore the species of the New World genera *Misumenops*, *Misumena*, *Mecaphesa*, *Misumessus*, *Misumenoides*, *Runcinioides* and *Metadiaea* have repeatedly been confused with each other in regard to generic placements, and earlier also confused with *Diaea* Thorell, 1869 and *Synema* Simon, 1864, members of different tribes. The number of synonyms of single species is high in groups that have been revised according to modern standards of taxonomy (Lehtinen, 2004), based mainly on detailed structures of the copulatory organs, but accepting slight infraspecific variation in coloration and leg spination.

Considering the lack of proper drawings of the type species and principles applied to the taxonomy of the Misumenini, it is not surprising that the concept of *Misumenops* was quite vague until the recent revision of the misumenine genera by Lehtinen (2004). The study of Palaearctic, Oriental, and some African, Pacific and American species (Lehtinen, 1993, 2004) revealed that the majority of species assigned to *Misumenops* are not related to the type species and belong elsewhere.

The type species of *Misumenops* has been cited in the taxonomic literature outside catalogues only twice after the description of the genus, by Mello-Leitão (1929) and Lehtinen (2004). To most European and Asiatic researchers the concept of *Misumenops* was based on *M. tricuspida* (Fabricius, 1775) (= *Ebrechtella t.*), a species widespread in the Palaearctic. This species has 67 taxonomic and identification entries in Platnick’s (2006) catalogue compared with 3 entries for the type species.

In the New World two widespread North American species, *M. asperatus* (Hentz, 1847) and *M. celer* (Hentz, 1847), have served as the model for *Misumenops* (Kaston, 1948; Schick, 1965; Suman, 1970; etc), although never compared with the type species. The concepts of Southeast Asian (Barrion & Litsinger, 1995) and particularly Indian (e.g. Tikader, 1980) *Misumenops* species were polyphyletic, used without argumentation, and based on unclear reasons (cf. Lehtinen, 2004: 177–180).

Although “*Misumenops*” sensu auct. is almost cosmopolitan and “well known” (i.e. much cited), its type species *Misumena maculis-sparsa* Keyserling, 1891 has been illustrated only once (Mello-Leitão, 1929) after its original description and not by the author of the genus

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(F. O. P.-Cambridge, 1900). The figures of Mello-Leitão (1929) are not detailed enough for undoubted specific identification, and it is not certain whether he saw the syntypes in BMNH. The closely related *M. pallidus* (Keyserling, 1880) has been discussed more often, but its identification has caused many problems, and sometimes large samples identified as *M. pallidus* include up to five different species or even no *pallidus* at all, although three other different species are present (E. Reimoser's labelled samples in NMW collected by himself!). The only revisional study supposed to deal with *M. pallidus* (Rinaldi, 1983) was based entirely on misidentified specimens with regard to this species, but this is not surprising because of repeated confusion by other authors in the past. This confusion is a strong argument for the necessity of the three lectotype designations made in this publication. The syntypes of neither *M. pallidus* nor *M. pallens* were studied by Rinaldi (J. Gruber, pers. comm., 2006), but only Brazilian samples identified by Mello-Leitão, Piza, Soares, etc.

The goal of this paper is to give a revised definition for *Misumenops*, to redescribe the type species and its close relatives, and preliminarily discuss the concept of New World *Misumenops* sensu auct. according to modern principles of taxonomy, and to present a brief comparison of *Misumenops* with the "model" of Eurasian *Misumenops* (= *Ebrechtella tricuspoidata*) and the New World "model" *M. asperatus* (Hentz, 1847). A corrected placement of all North American species of *Misumenops* sensu auct. is also discussed.

## Methods

In addition to traditional light microscope analysis of material (Olympus SZH & Wild M5 with ocular micrometer), scanning electron microscopy with a JEOL 5200 was used for micrographs of male palps and other structures, digitised with SemAfore software. The digital photographs were taken with an Olympus C 5050 digital camera connected with an Olympus SZX 12 light microscope and enhanced using the CombineZS software. All measurements are given in millimetres.

*Abbreviations used in text* (present curator in parentheses, if did not participate in loans or information for this project): BMNH=British Museum, Natural History, Dr Paul Hillyard, Ms Janet Beccaloni; BPBM=Bernice P. Bishop Museum, Honolulu, Hawaii, USA, Dr Scott Miller (Dr Ronald Englund); IZPAN=Instytut Zoologiczny, Polska Akademia Nauk (Mr Tomasz Huflejt), Ms Dominika Mierzwa; DJC=Collection of Dr D. T. Jennings, Maine, USA; MACN=Museu Nacional de Ciencias Naturales "Bernardino Rivadavia", Dr Cristian Grismado; MNHN=Muséum National d'Histoire Naturelle, Paris, France, Dr Michel Hubert, the late Dr Jacqueline Heurtault, Dr Christine Rollard; MLP=Museu de La Plata, La Plata, Argentina, Dr Cristian Ituarte, Dr Luis Alberto Pereira, Ms Monica Tassara; MRJ=Museu Nacional, Rio de Janeiro, Brazil, Dr Adriano Kury, Mr Thiago da Silva Moreira; MZLQ=Departamento de Zoologia, Escola Superior de Agricultura "Luiz de

Queiros": information about type preservation from Dr Isabela Rinaldi; MZSP=Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (Dr Ricardo da Pinta Rocha); MZT=Zoological Museum, University of Turku, Turku, Finland (no present curator); MZUM=Museo de Zoologia, Universidad de Montevideo, Uruguay, Dr Roberto Capocasale, Dr Ricardo Perez-Miles; NHRS=Naturhistoriska Riksmuseet, Stockholm, Sweden, Dr Torbjörn Kronstedt; NMW=Naturhistorisches Museum Wien, Vienna, Austria, Dr Jürgen Gruber, Dr Verena Stagl; PGC=Collection of Ms Peggy Gerba, Arizona, USA; PTL=Temporary personal collection of Pekka T. Lehtinen after retirement; UNAM=Universidad Nacional Autónoma de México, México City, Prof. Oscar Francke & Dr Maria L. Jiménez; ZMB=Zoologisches Museum der Humboldt Universität, Berlin, Germany, Dr Jason Dunlop; ZMMU=Zoological Museum, University of Moscow, Russia, Dr Kirill Mikhailov.

AME=anterior median eyes, PME=posterior median eyes, MOT=median ocular trapezium, RTA=retrolateral tibial apophysis, ITA=intermediate tibial apophysis, VTA=ventral tibial apophysis.

## Taxonomy

### *Misumenops* F. O. Pickard-Cambridge, 1900

*Thomisus*: Nicolet, 1849: 396, in part; Taczanowski, 1872: 90, in part.  
*Diaea*: Keyserling, 1880: 112, in part.  
*Misumena*: Holmberg, 1876: 27, in part; 1881: 155; Keyserling, 1880: 101, in part; 1891: 245; Banks, 1896: 71, in part; Simon, 1897: 9, in part; Petrunkevitch, 1911: 410, in part.  
*Misumenops* F. O. Pickard-Cambridge, 1900: 141; Petrunkevitch, 1911: 410; Mello-Leitão, 1929: 77, in part; Lehtinen, 2004: 173.  
*Misumessus*: Banks, 1910: 50, in part.  
*Metadiaea*: Piza, 1933: 88, in part.  
*Misumenoides*: Roewer, 1951: 448.

References concerning unchecked material of *Misumenops pallidus* are not included.

*Type species*: *Misumena maculis-sparsa* Keyserling, 1891 from eastern Brazil.

*Diagnosis*: *Misumenops* resembles the New World genera *Mecaphesa* Simon, 1900 and *Runcinioides* Mello-Leitão, 1929 in regard to many somatic characters. The dorsal surface of the carapace of *Misumenops* has numerous long rigid setae in and around the ocular region and shorter setae in other parts of the carapace and on the dorsal surface of the abdomen (Figs. 30, 61, 63), in contrast to the presence of only normal hairs in the Old World species of "*Misumenops*". These rigid setae are also present, but more conspicuous and also longer throughout the dorsal surface of the body in *Mecaphesa* (Figs. 64–65) and especially in *Runcinioides* (Figs. 66–67). The lectotype and allolectotype of the type species are strongly bleached and also many of the dorsal setae have been worn off; see also p. 178. All species of *Misumenops* are differentiated from all species of *Misumenoides* by the lack of a serrate margin (Fig. 36) on the thoracic part of the male carapace. Dark annulations on male legs I–II are usually present also on the tarsi of *Misumenops* (Figs. 24, 29, 30, 60, 63), but are

restricted to the patellae, tibiae and metatarsi in males of all other genera of Misumenini. The most useful diagnostic features are found in the structure of the genital organs. The tibial apophyses of *Misumenops* consist of a separate VTA and a distally narrowed apophysis originating from the complete fusion of RTA and ITA (Fig. 2). The tip of RTA has a serrate to lobate margin (Figs. 37–38, 40, 57b) or subapical concentric ridges in *M. variegatus* (Fig. 49), and a central, more or less membranous part with one conspicuous seta (Figs. 10, 40, 56) that is lacking in *Runcinioides* and *Mecaphesa*. All tibial apophyses are lateral processes of a single plate in *Mecaphesa* (Figs. 42–43). Males of *Misumenops* are further differentiated from *Runcinioides* by having a relatively short embolus originating mesally (opposite the tibial apophyses: Figs. 1 & 5) and by a simple tutacular apophysis at the base of the cymbium (Figs. 2–3, 55), while *Runcinioides* has a tutacular groove along the tegular margin ending in a fissure in the tegular margin (Fig. 50). *Runcinioides* also has a lateral boss on the cymbial margin, homologous to the whole tutaculum in *Misumenops*. For some diagnostic details of the copulatory organs of *Misumenops* and groups including the “model” species of recent authors, see Table 1.

Females of *Misumenops* are characterised by a mostly small epigynal hood (Figs. 4, 7) (widest in *M. bellulus*: Fig. 58) and the lack of a thin central septum which is characteristic for most species of *Mecaphesa* (Kaston, 1981: figs. 1485, 1497) or wider, posteriorly rounded septum as in the only species of *Misumessus* (Kaston, 1981: fig. 1486). The vulva of *Misumenops* consists of tubular U-shaped receptacula with short connecting ducts (Figs. 8–9), while the vulva of *Runcinioides* has very long meandering ducts and a posteriorly prolonged quite narrow epigynal hood (Rinaldi, 1988: figs. 3–4).

As was pointed out above, the model species of *Misumenops* were different for European and North American arachnologists. The placement of *Araneus tricuspidatus* Fabricius, 1775 in *Ebrechtella* was made possible by study of the holotype male of the type species of *Ebrechtella*, *E. fruhstorferi* Dahl, 1908 from Java (ZMB); for details, see Lehtinen (2004). Here we

provide comparative SEM figures of the male palp and photographs of both sexes of *E. tricuspidata* and *Mecaphesa asperata*. In Table 1 we briefly summarise the main differences in the palp and female patterns between these three genera.

Species of the revised *Misumenops* are separated from all other Neotropical species currently listed (Platnick, 2006) in this genus by different basic structural patterns of the male and female copulatory organs. Although types or authoritatively identified material of many of them have already been checked by us, a complete revision of this strongly polyphyletic assemblage of misumenine species is beyond the scope of this publication.

**Description:** Small (♂ 2.5–3.5 mm, ♀ 4–6 mm) misumenine spiders with distinct sexual dimorphism in size and leg coloration. Adult specimens of true *Misumenops* pale yellow to pale brown, with distinct paired pattern in posterior half of abdomen (Fig. 22). Pattern of leg annulations in some male specimens obscure, while other specimens of same population may have very distinct dark annuli (Figs. 29–30). Dorsum of male abdomen often lightly sclerotised, but scutum obscurely limited.

Tutacular structures of *Misumenops* consist of a groove along cymbial margin and a hairy process or knob at base of cymbium (Figs. 2–3). Size of this tutacular process is a useful specific character. Tibial apophyses of the revised *Misumenops* consist of fused RTA–ITA with serrate, dentate, lobate or ridged apex (Figs. 37–38, 57b) and a small, distinctly separate VTA (Fig. 1); this is essentially different from the single plate with three distinct lateral processes (RTA, ITA & VTA) in *Mecaphesa* (Figs. 42–43). Mesal face of RTA–ITA excavated, more or less membranous, and a long seta present in centre of this cavity (Figs. 10, 40).

Embolic tip usually with subdistal triangular lamina (Figs. 13, 47, 57a), embolic surface smooth or partly coarsely striated (Figs. 13, 39, 47–48). Female epigynal hood with well sclerotised margin; seminal receptacula long, U-shaped; seminal ducts between receptacula short, uncoiled.

Structures (* on left palp)	<i>Misumenops s. str. (maculissparsus)</i>	<i>Mecaphesa asperata celer</i>	<i>Ebrechtella tricuspidata</i>
VTA	As wide as long (Fig. 1)	As wide as long (Figs. 42–43)	Longer than wide (Fig. 14)
RTA & ITA separate	No (Fig. 2)	Yes (variable in <i>Mecaphesa</i> spp.)	Yes (Fig. 15)
Embolic tip position	Centro-basal part of cymbium (c. 3.30 o'clock*) (Figs. 1, 6)	On prolateral part of cymbium (variable in other <i>Mecaphesa</i> spp.)	Upper-central part of cymbium (c. 2 o'clock*) (Figs. 15, 35)
Opening of embolic duct	Distal, unclear margins (Figs. 1–2)	Distal (Figs. 42–43)	Subdistal oval pit (Figs. 16–17)
Surface ultrastructure of embolus	Coarsely striated to smooth (Figs. 13, 39, 48)	Variably striated to smooth (Figs. 42–43)	Densely striated (Figs. 16–17)
Embolic turns	180° (half a turn) (Figs. 1, 5, 44–45, 54)	>360° in two planes (turns) (Fig. 42)	360° (whole turn) (Fig. 35)
Embolus origin in mid-prolateral part of tegulum	8.30–10 o'clock* (Figs. 1, 5, 44–45, 54) except <i>M. variegatus</i> 11.30 (Fig. 46)	6.30–8 o'clock (Figs. 42–43), variable in other <i>Mecaphesa</i> spp.	From centre of tegulum (c. 2 o'clock*) (Fig. 35)
Cymbium with tutaculum	Yes (Figs. 1, 3)	No (only tutacular groove) (Figs. 42–43)	No (Figs. 14–15)
♀ carapace with sublateral brown bands	Yes (Figs. 18, 22, 29, 30, 60–61, 63)	Variable (Fig. 62), other <i>Mecaphesa</i> spp. (Figs. 64–65)	No (Fig. 26)

Table 1: Some differences between *Misumenops*, *Mecaphesa*, and *Ebrechtella tricuspidata*. *Mecaphesa asperata* (Fig. 42), *Mecaphesa celer* (Fig. 43), *E. tricuspidata* (Figs. 14–17, 25–28, 34–35, 51).



*Composition and range:* The six species which remain in the revised *Misumenops* are best characterised by the structure of the male and female copulatory organs. These six species include a group of four closely related species (the *maculissparsus*-group: *M. maculissparsus*, *M. pallidus*, *M. guianensis* (Taczanowski, 1872) and *M. bellulus* (Banks, 1896), see below) as well as two more or less isolated species, but both sharing the diagnostic characters of *Misumenops*: *M. temibilis* (Holmberg, 1876) and *M. variegatus* (Keyserling, 1880). Only the male of *M. variegatus* is known to us, but its embolic structure and unique modifications of RTA (Fig. 49) can be homologised with modifications in the other five species.

The known range of the revised *Misumenops* extends from Florida and the Caribbean islands (*M. bellulus*) to southern Chile and Argentina (*M. temibilis*). The type species of *Runcinioides*, *Mecaphesa* and *Misumessus* have each been found to represent genera outside the revised *Misumenops*.

*Discussion:* The synonymy of *Metadiaea* Mello-Leitão, 1929 with *Misumenops* proposed by Rinaldi (1988) cannot be accepted, as the type species of *Metadiaea*, *M. fidelis* Mello-Leitão, 1929 was compared neither with the type species of *Misumenops* nor with any of its relatives stated here to belong to this genus. Unfortunately the syntypes, the only known identified material of *M. fidelis*, have obviously become lost and thus the grounds for her synonymisation did not include the study of the type species of either genus.

The original descriptions and drawings (Keyserling, 1880) of two Peruvian species do not exclude the possible relationship of *Misumena punctata* Keyserling, 1880 and *Misumena amabilis* Keyserling, 1880 with *Misumenops*, and the former species was transferred to the old *Misumenops s. lat.* by Petrunkevitch (1911). According to the original description *M. amabilis* has dark annuli also on the tarsi, although not extending to the tip, as in all species placed here in *Misumenops*. Although no dark annuli were described for tarsi I–II in *M. punctata*, the palpal tibia was described as having a very thick anteriorly directed apophysis with a small tubercle at its rounded end. The original drawing does not give such detailed information about the palpal apophyses, but the German text provides no possibility of a different interpretation. Both species are also described as having scattered long setae on the carapace in a pattern more or less similar to that in our *Misumenops* spp.

A proper revision of several Neotropical species, including *M. punctata* and *M. amabilis*, has been impossible because of the loss of the type material. Ms Mierzwa (IZPAN) has informed us that the type collections of Taczanowski (1872) and Keyserling (1880) in the Warsaw Museum do not include any thomisid types. The spider collection of NMW has undergone several phases of possible confusion in the past, owing to careless relabelling and possible changes in the contents of single vials (Dr J. Gruber, pers. comm., March 2006).

*Runcinioides* Mello-Leitão, 1929 (type species *R. argenteus* Mello-Leitão, 1929) has already been treated

as a separate genus by Lehtinen (2004: table 1), and the status of *Misumessus* Banks, 1904 (type species *Misumena oblonga* Keyserling, 1880), formerly part of the traditional *Misumenops*, was also discussed by Lehtinen (2004: 174). The resurrection of these two genera is confirmed and they are diagnosed here (pp. 190 and 195).

The presence of numerous long erect setae on the carapace of all North American “*Misumenops*” (= *Mecaphesa*) explains the erroneous diagnostic characters suggested for “*Misumenops*” by Kaston (1948, 1981), Schick (1965) and Suman (1970). Lehtinen (2004) emphasised the differences in coloration between the Old World and New World species of *Misumenops* auct. This is only partly true, as several Neotropical species also have a lot of greenish or greenish grey colour on the carapace, abdomen and legs in living or freshly caught specimens. Many of these species must be transferred from *Misumenops* to the still unnamed “*Misumenops*” *pallens*-group (= *Metadiaea sensu* Rinaldi, 1988, in part) or to other unnamed taxa.

### The *maculissparsus*-group

The four species of this group are more or less similar in regard to the structure of the male and female copulatory organs, while their somatic characters are also shared by the two species outside the *maculissparsus*-group. The differences between the four species consist of different distal modifications of RTA–ITA, origination of the embolus, as well as ultrastructural details of the embolus. The female epigynes are superficially very similar in the first three species, but the epigynal hood is distinctly wider in *M. bellulus* than in the three other species (cf. also Bryant, 1940).

*Discussion:* Although *M. maculissparsus*, *M. pallidus* and *M. guianensis* are rather easy to identify, when their type material was studied, the type species by light microscopy, the others by SEM (Figs. 1–2, 10–12, 38, 45), the variation of several palpal and epigynal characters was found to be high in large samples from Paraguay and northern Argentina, possibly representing single populations. Therefore the final taxonomic revision of this group must still await additional material from different parts of the range of this species group to exclude the possibility of strong clinal variation in the copulatory organs. Mello-Leitão (1929: 224–225) placed *M. maculissparsus* and *M. guianensis* far from each other in his key, based on presence or absence of an abdominal pattern, most probably without personal study of any material of *M. maculissparsus*, but presented a wide distribution for *M. guianensis* within Brazil.

A fifth, possibly separate taxon of this group, represented by several males in the large sample from Paraguay, may be worthy of specific status. The embolic base of these specimens is surrounded by a raised, marginally crenated outgrowth of the tegulum, and the tip of the RTA is serrated only on one side. More information and material is necessary before description of such a “new” taxon, as all its specimens were found within a large sample of *M. guianensis*.

*Misumenops maculissparsus* (Keyserling, 1891) (Figs. 1–4, 18–20, 29, 32)

*Misumena maculis-sparsa* Keyserling, 1891: 245, pl. 10 fig. 186.

*Misumenops maculissparsus*: F. O. Pickard-Cambridge, 1900: 141; Mello-Leitão, 1929: 232; Lehtinen, 2004: 173 (all figures referred to as *M. aff. maculissparsus* are *M. pallidus*).

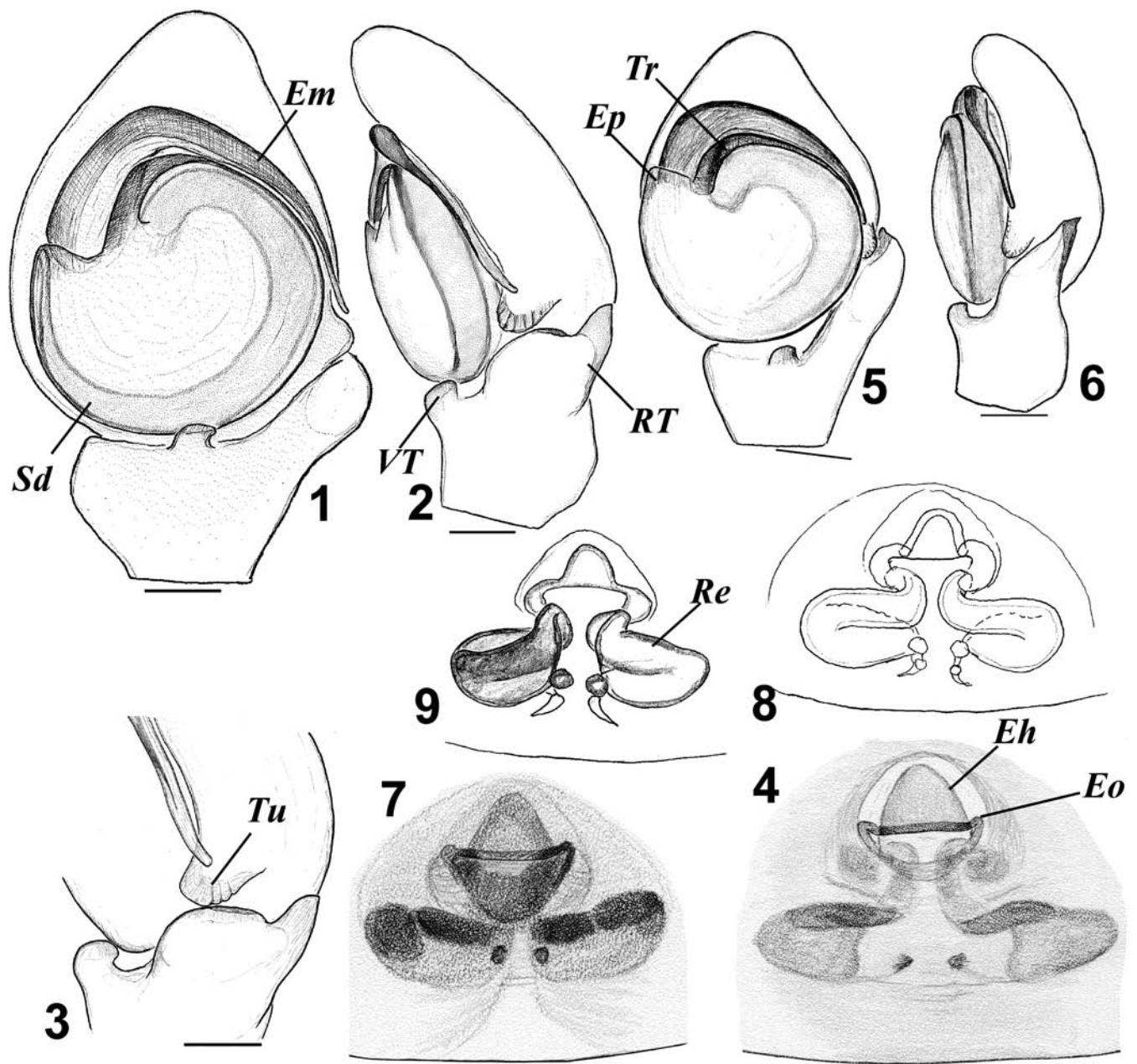
*Types*: Lectotype ♂ designated here from Brazil, Taquara do Mundo Novo, leg. Dr v. Ihering, paralectotype ♀ with same data, both in BMNH.

*Notes*: There are places called Taquara both in Provinces Rio Grande de Sul and Estado do Rio de Janeiro, both close to the eastern coast of Brazil. The range of *M. maculissparsus* was stated to be “Rio Grande do Sul até Rio de Janeiro”, which means from Rio Grande do Sul “to” Rio de Janeiro, as interpreted by Mello-Leitão (1929: 232), but not “or”. However, Dr C. Grismado

(Buenos Aires) kindly informed us (pers. comm., 2006) that Taquara do Mundo Novo is a well known locality in Brazil, in Estado do Rio de Janeiro — a fact that seems to have been unknown to Mello-Leitão (1929), who obviously included both Taquaras in the range of this species, as no other material was mentioned.

The orthography *maculissparsus* conforms to the current Code (ICZN, 1999: Art. 32.5.2.3).

*Other material examined*: ARGENTINA, Jujuy, 1 ♂, leg. E. Reimoser, 1907 (NMW, identified by Reimoser as *M. pallidus*). Some specimens of the large sample from Paraguay in NMW and discussed here under *M. guianensis* possibly belong to *M. maculissparsus* as this sample probably consists of samples from different habitats, but it is difficult to identify all specimens individually without detaching a palpus from each male.



Figs. 1–9: Left male palp and female epigyne. 1–4 *Misumenops maculissparsus*; 5–9 *M. pallidus*. 1, 5 Palp, ventral; 2, 6 Ditto, retrolateral; 3 Part of palp, retrolateral; 4, 7, 8 Epigyne, ventral; 9 Ditto, dorsal. Scale lines=0.1 mm. Eh=epigynal hood; Em=embolus; Eo=epigyne opening; Ep=embolic base pocket; Re=receptaculum; RT=retrolateral tibial apophysis; Sd=seminal duct; Tr=tegular rim; Tu=tutaculum; VT=ventral tibial apophysis.



**Diagnosis:** This species can be distinguished from the sibling species *M. pallidus* by the thicker (wider than long) lateral tibial apophysis (Fig. 2 cf. Fig. 6), closely spaced tibial apophyses, lower position of the embolic base (9.30 o'clock: Fig. 1 cf. Fig. 5), and by the coloration of both sexes (Figs. 18–21 & 29 cf. Figs. 22–25 & 30). The general appearance of the epigynes is practically indistinguishable (cf. Figs. 4 & 7 and 32–33). Males of *M. maculissparsus*, *M. pallidus* and *M. guianensis* all have coarse ridges close to the narrowed apex of the embolus (Fig. 13), while *M. temibilis* has a smooth embolus, except for the widely triangular lateral lamina close to the apex (Fig. 39).

**Description: Female:** Total length 6.0. Carapace 2.25 long, 2.08 wide (Figs. 18–20), light coloured with two wide brownish bands, ocular area white, clearly separated from rest of carapace. Abdomen pentagonal, with 3 pairs of brownish spots in basal half, sides without pattern, venter with dark spot resembling “W” behind epigastric furrow and 5 pairs of dark spots (=muscle apodemes). Legs pale, spines and strong macrosetae of femora I–II surrounded by brown spots, apical parts of patellae, basal and apical parts of tibiae with wide brownish rings (Fig. 20). Femur I with 3 or 4 prolateral and 1–3 dorsal weak spines (one dorsal spine almost prolateral). Tibia I with 6 pairs of ventral spines, metatarsus I with 8 pairs of ventral spines. For length of leg segments, see Table 2.

Epigyne as in Figs. 4 & 32, with triangular anterior hood (apical pocket) and transverse elongate receptacula visible through integument. Hood with posterior more sclerotised rim. Part of receptaculum that touches cuticle appears darker. Receptacula long, horizontal U-shaped (Fig. 4). Receptaculum makes one 180° turn.

**Male:** Total length 3.0. Carapace 1.38 long, 1.48 wide (Figs. 21, 29), light brown, with two wide brownish submedian bands; bands without distinct margins; eyes surrounded by white pigment rings, ocular area not separated from rest of cephalic part by white pigmentation as in female. Abdomen ovoid, light coloured, with series of 5 pairs of brownish spots decreasing in size to spinnerets; some of spots fused in line; sides with brown stripe; venter with rectangular grey-brownish spot; dark spot with 4 pairs of dots (=muscle apodemes) (Fig. 19). Legs light yellow, femora I–II with numerous brown spots (Fig. 29). Legs I–II with darkened terminal half of metatarsus and tibia (Fig. 29); dark distal half of

tarsi typical of all its relatives more or less totally faded in lectotype, but present in specimen from Jujuy, Argentina. Femur I with 5 dorsal and 4 prolateral spines. Tibial and metatarsal spines weak, indistinct.

Palp as in Figs. 1–3, light coloured; tibia with two apophyses, tegulum without apophyses, embolus making half a circle. Ventral tibial apophysis short, wider than long, in mid part of tibia. Fused RTA–ITA strongly swollen (wider than long), pointed and with some distal modifications which could not be figured in detail, because no SEM mounts could be done from single male in type material. Cymbium with small slightly ridged basal tutaculum. Tegulum round, with heavily sclerotised marginal rim, following course of embolus; base of seminal duct thinner than embolic base. Embolus starts from tegular pocket at 9.30 o'clock position (in left palp), its base clearly separated from tegulum. Embolic base relatively wide, width of embolus continuously tapering along its course, its tip flat and not pointed.

**Distribution:** Known from eastern Brazil and northern Argentina, possibly also from Paraguay.

***Misumenops pallidus* (Keyserling, 1880)** (Figs. 5–9, 10–13, 22–25, 30, 33)

*Diaea pallida* Keyserling, 1880: 117, pl. 2 fig. 65.

*Misumena pallida*: Keyserling, 1891: 245.

*Misumenops pallidus*: F. O. Pickard-Cambridge, 1900: 141 (transfer to *Misumenops*); Mello-Leitão, 1929: 229, figs. 27 & 27a–b; not *M. pallidus* sensu Rinaldi, 1983 nor *pallidus*: Lehtinen (2004: 156 & 163, figs. 27–28 & 76).

? *Metadiaea vulgaris* Piza, 1933: 88, fig. 1, syn. Mello-Leitão, 1941.

*Misumenops exanthematicus*: Mello-Leitão, 1941: 164, misidentification (material in MACN checked!).

*Misumenops* aff. *maculissparsus*: Lehtinen, 2004: figs. 5, 24–25, 75.

**Types:** Four syntypes from Brazil (NMW) and several females from Colombia [New Granada] originally in Keyserling's personal collection, later preservation unknown.

One female from Brazil, leg. Helmreich (NMW acquisition no. 1847 II 20) is designated here as lectotype for *Diaea pallida* Keyserling, 1880; the vulva of another syntype from the same vial has been used for a vulval slide mount for comparison with other samples of this species group.

**Other material examined:** BOLIVIA: Santa Cruz Prov.: Amboro N. P., ♂♀, juv.; Montero, ♂♀, juv.; Guarné, Rio Selva, many ♂♀, juv., all in low vegetation, 11–19 August 2007, leg. P. T. Lehtinen (PTL). PARAGUAY: Foncière: numerous ♂♀, leg. Reimoser, 1908 (NMW). URUGUAY: Montevideo, 1♂ 2♀, Punta Espinillo, bushes and trees, 10 October 1996 (leg. R. Perez-Miles & M. Perez) (ZMT and ZMUM), 6♀ 2 juv., 10 November 1996, leg. R. Perez-Miles & M. Perez (ZMUM). ARGENTINA: Salta, Juramento, 1♂ 1 subad. ♂, leg. Maximiliano Biraben, March 1939 (MLP 14781); Salta, 29♀ & numerous juv., leg. E. Reimoser, 1907 (NMW); Cordoba, 5♀ 2 juv., Calamuchita, December 1941, leg. J. M. Viana, A. Lise det. (MACN 10889), 1♂ 1♀, 1985, leg. Viana (MACN); Buenos Aires Prov.: Glew, 3♀ [large juv. not conspecific], leg. Carpintero, 1974, det. A. Lise (MACN 10892); Lomas de Zamora, V. Fiorito, 1♂, March 1991, leg. C. Grismado (MACN 10893), 1♂ 3♀, February 1992, leg. C. Grismado (MACN 10892?), February 1992, leg. C. Grismado (MACN); Santa Fé, 5 October 1962 (MACN 10891).

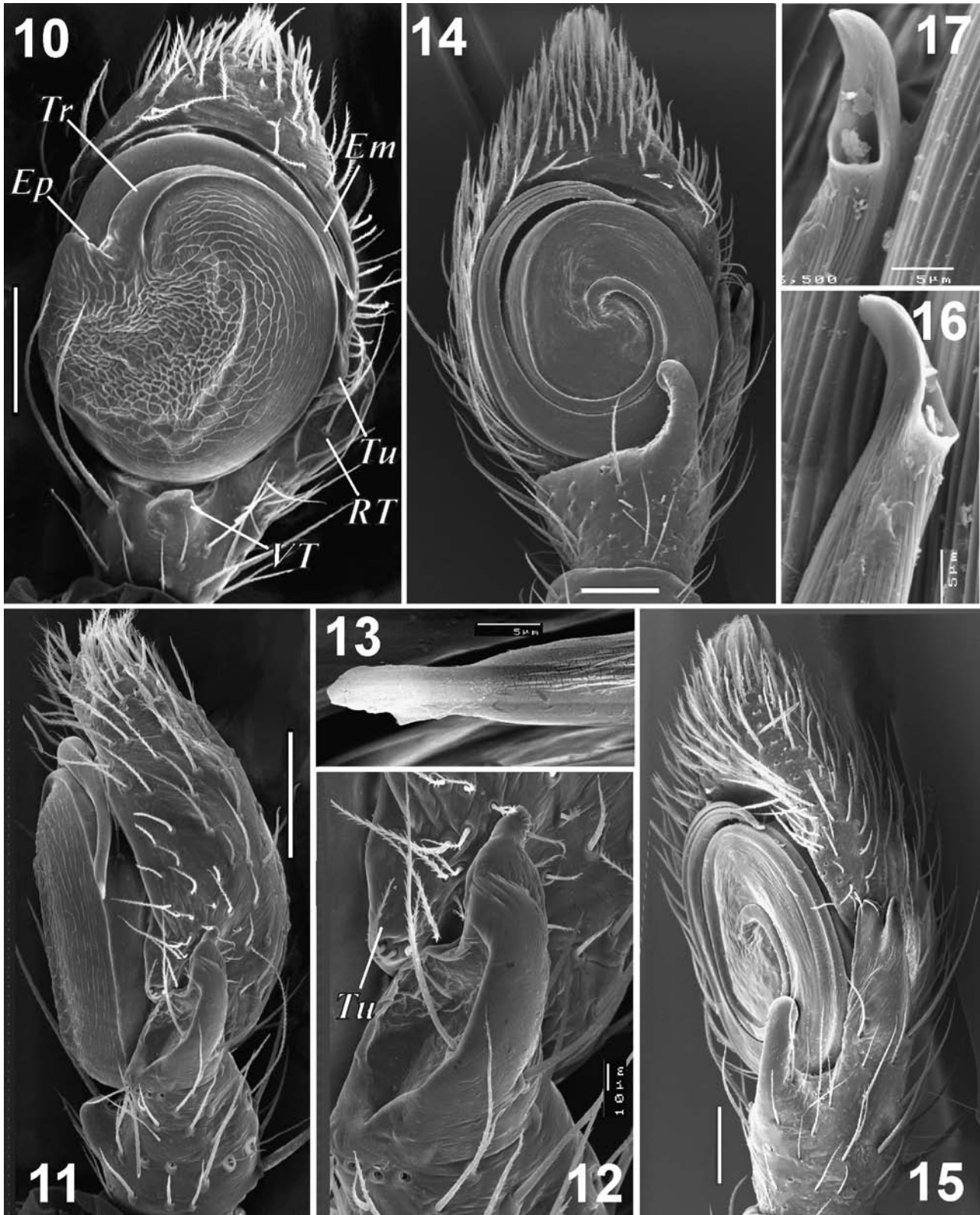
**Notes:** Only references to material that could be personally checked or was reliably represented by

Female	Fe	Pa	Ti	Mt	Ta	Total
I	2.75	1.0	2.25	2.08	1.1	9.18
II	2.6	1.0	2.13	2.08	1.1	8.91
III	1.4	0.75	1.13	1.0	0.63	4.91
IV	1.75	0.8	1.25	1.2	0.67	5.67
Male	Fe	Pa	Ti	Mt	Ta	Total
I	2.25	0.83	1.9	1.9	0.93	7.81
II	2.13	0.8	1.73	1.75	0.85	7.26
III	0.95	0.43	0.75	0.7	0.4	3.23
IV	0.95	0.4	0.83	0.7	0.38	3.26

Table 2: *Misumenops maculissparsus*, leg measurements.

unambiguous drawings have been included. Widespread confusion about the concept of *M. pallidus* has prevailed and, e.g., Mello-Leitão (1929) presented more or less identical synonymic lists for *M. pallidus* and *Misumena pallens* Keyserling, 1880, the latter obviously not congeneric with *M. pallidus*. The identity of fig. 27 in

Mello-Leitão (1929) remains doubtful. The type material of *Diaea pallida* was not available to Rinaldi (1983) and all her figures presented for *M. pallidus* (figs. 3–4, 7–8, 11–12, 14) seem to refer to some species of the *M. pallens*-group. Although Mello-Leitão (1929) gave the same lists of references under the names of the

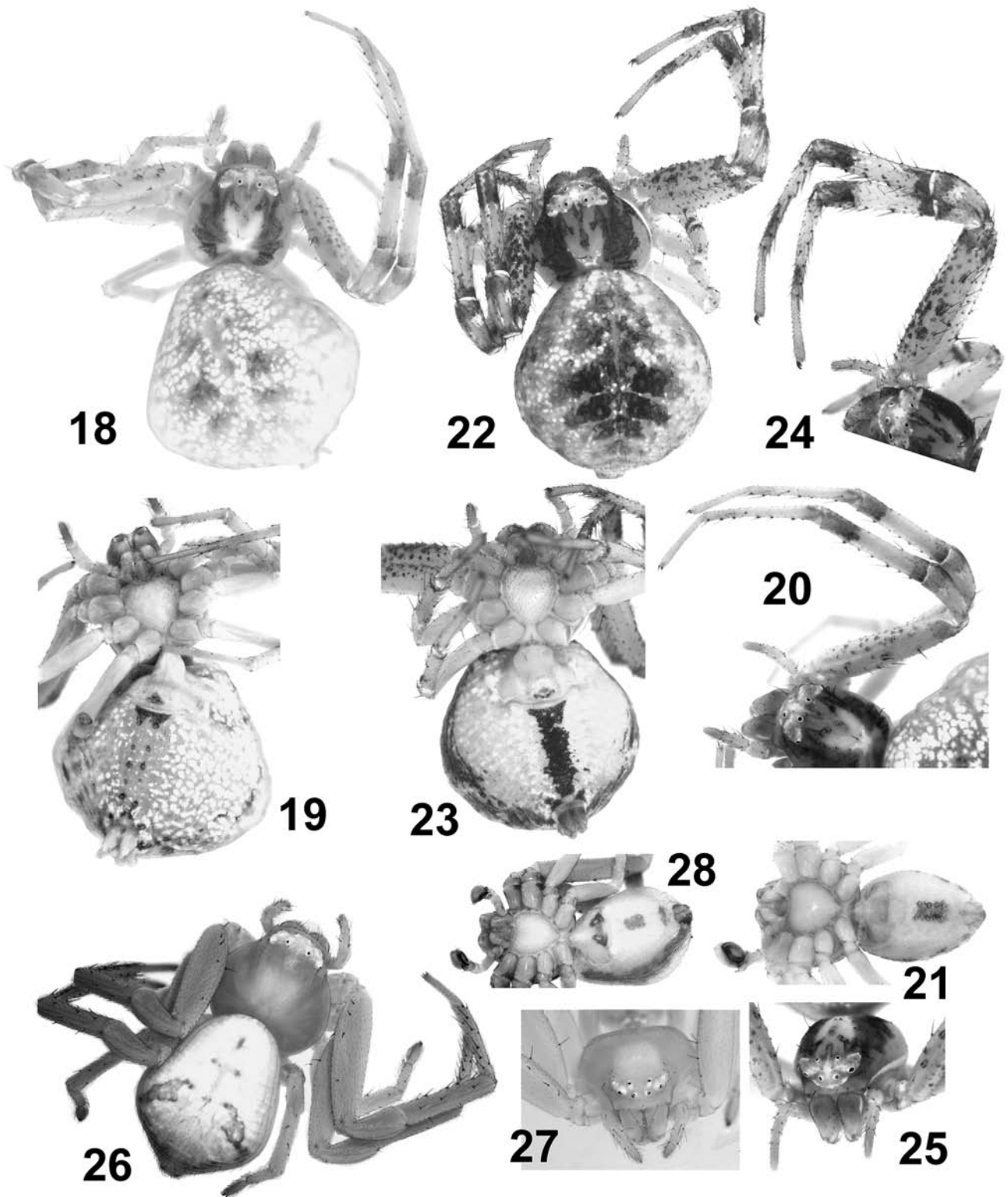


Figs. 10–17: Micrographs of left male palp. **10–13** *Misumenops pallidus* (Uruguay, Punta Espinillo); **14–17** *Ebrechtella tricuspadata* (Ukraine). **10, 14** Ventral; **11–12, 15** Retrolateral; **13, 16–17** Tip of embolus. *Em*=embolus; *Ep*=embolic base pocket; *RT*=retrolateral tibial apophysis; *Tr*=tegular rim; *Tu*=tutaculum; *VT*=ventral tibial apophysis. Scale lines=0.1 mm (10–11, 14–15), 0.01 mm (12), 0.005 mm (13, 16–17).



species for both *M. pallens* and *M. pallidus*, his drawings refer correctly to these two species. He mentions the wide range and common occurrence of *M. pallidus* in Brazil, although most probably he also confused *M. maculissparsus*, *M. pallidus* and *M. guianensis* with each other. Later he (Mello-Leitão, 1941) synonymised *Metadiaea vulgaris* Piza, 1933 with his *Misumenops pallidus* and this synonymy was repeated by Rinaldi

(1983), but no references to localities for specimens depicted by her were presented and it is possible that she simply repeated the synonymy established by Mello-Leitão (1941). The uncertainty of the identifications of *M. pallidus* by Mello-Leitão culminated in the latter publication, where material identified by him as *M. exanthematicus* and checked by us is actually *M. pallidus*.



Figs. 18–28: 18–21 *Misumenops maculissparsus*, lectotype ♂ and paralectotype ♀; 22–25 *M. pallidus* (Uruguay, Punta Espinillo); 26–28 *Ebrechtella tricuspida* (Russia, Sakhalin Area, Moneron Is.). 18, 22, 26 Female, dorsal; 19, 23 Ditto, ventral; 20, 24 Female legs I & II; 25, 27 Female carapace, frontal; 21, 28 Male, ventral.





Figs. 29–31: Dorsal view of male. **29** *Misumenops maculissparsus*, lectotype; **30** *M. pallidus* (Uruguay, Punta Espinillo); **31** *Ebrechtella tricuspudata* (Russia, Sakhalin Area, Moneron Is).

Two females and one juvenile specimen from Colombia, leg. Nolken (NMW acquisition no. 1873 I 15) most probably formed part of the original syntypes, but as all the original labels were changed 60–70 years ago, the possible original handwriting of Keyserling could not be checked. However, these specimens belong either to “*Misumena*” *pallens* Keyserling, 1880 or to a closely related species.

*Misumenops pallidus* and “*Misumena*” *pallens* appear more different when seen through a dissecting microscope than by just looking at strongly pressed specimens on slides. “*Misumena*” *pallens* does not share the most important generic characters of *Misumenops*: dark tarsal annuli on male legs I–II, a long seta on the inner face of RTA, etc. It has a modified tip of RTA (as many other Misumenini, including *Runcinia* and *Runcinioides*), but the ultrastructure is essentially different, rather a distal rod with ridges than a serrate margin of the tip (cf. also Rinaldi, 1983: figs. 13–14).

The coloration is variable in all species of Misumenini, but the weak dorsal patterns of the generally pale “*M.*” *pallens* and very distinct brown pattern of *M. pallidus* hardly overlap, when the details are studied. The presence of repeated confusion makes the lectotype selection for both *Misumena pallens* (see p. 196) and *Diaea pallida* necessary.

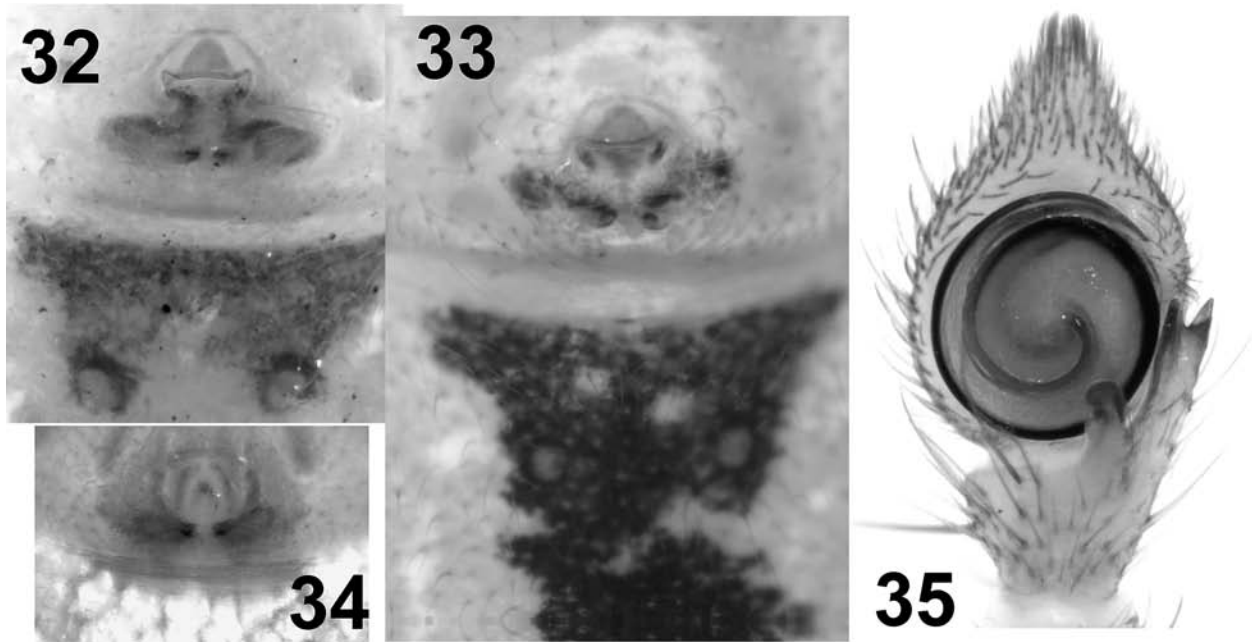
**Diagnosis:** This species can easily be distinguished from the type species by the thinner (longer than wide) tibial apophysis (RTA–ITA) closer to VTA (Figs. 5–6 cf. Figs. 1–2), higher position of the embolic base (10 o’clock), relatively thicker seminal duct (as wide as embolic base) (Fig. 5 cf. Fig. 1), longer tutaculum (Fig. 11 cf. Fig. 3), and by the coloration of both sexes (Figs. 22–25 & 30 cf. Figs. 18–21 & 29). The general appearance of the epigynes is practically indistinguishable (cf. Figs. 7 & 4). *Misumenops pallidus* differs from the other closely related species *M. guianensis* by the less and differently modified tip of RTA and the presence of brown spots on femora I–II (Fig. 24), and from *M. temibilis* also by the shorter and partly striated embolus (Fig. 13 cf. Fig. 39).

**Description: Female:** Total length 5–5.75. Carapace 2.1–2.25 long, 2.0–2.25 wide. Leg I: femur 2.8, patella 1.25, tibia 2.2, metatarsus 1.98, tarsus 1.3, total 9.36; II: 2.55 + 1.13 + 2.05 + 1.88 + 1.07, total 8.68; III: 1.5 +

0.68 + 1.05 + 0.9 + 0.68, total 4.81; IV: 1.68 + 0.68 + 1.1 + 1.18 + 0.65, total 5.29.

Carapace pattern as in Figs. 22 & 25, yellow with two wide submarginal brown bands; median yellow band with brown median stripe, eye field white. Long setae on carapace concentrated on clypeus, U-shaped row along light central band of carapace and transverse row behind this. Very short hair-like setae present on margin of carapace and around ocular tubercles of lateral eyes. Basal part of chelicerae with low raised tubercle, setae on anterior face short. Sternum and mouthparts yellow. Abdomen pentagonal, with pattern formed by dark and whitish transverse stripes and bands; lateral band dark; venter light coloured with wide blackish median band between epigastric furrow and spinnerets (Fig. 23), female with illustrated epigyne has postepigastric area as in *M. maculissparsus*. Legs light brown, ventral side of femora I and II with numerous dark spots, ventral side of tibiae also with some spots, segments from patellae to metatarsi with dark distal parts (Fig. 24), but not on tarsi as in male. Subcutaneous guanine pattern extends to posterior part of carapace as a small spot and irregularly around and inside dark distal areas of patellae and tibiae I–II. Leg spination: femur I with 3 prolateral and 1 or 2 dorsal spines, femur II with 1 or 2 dorsal spines; tibia I with 5 or 6 pairs, metatarsus I with 6 or 7 pairs of ventral spines. Epigyne as in Figs. 7–9 & 33, with triangular apical hood and transverse elongate receptacula.

**Male:** Total length 2.35. Carapace 1.1 long, 1.15 wide (Fig. 30), pattern similar to female. Leg II: 1.9 + 0.65 + 1.6 + 1.43 + 0.75, total 6.33; III: 0.75 + 0.33 + 0.68 + 0.55 + 0.43, total 2.74; IV: 0.88 + 0.3 + 0.65 + 0.6 + 0.43, total 2.86. Abdomen ovoid, with pattern of transverse wide dark bands, sides with dark band; venter yellow with pair of small dark spots behind epigastric furrow and larger spot just before spinnerets. Terminal parts of legs I and II segments darkened. Femur II with 5 dorsal spines. Palp as in Figs. 5–7 & 10–13, light coloured; tibia with two apophyses, tegulum without apophyses, embolus making half a circle. Ventral tibial apophysis short, wider than long, close to lateral apophysis at base of tibia (Fig. 5). Lateral apophysis slightly swollen near tip, longer than wide, mesally with large oval cavity, tip gently serrate (Fig. 12). Cymbium with



Figs. 32–35: **32** *Misumenops maculissparsus*, paralectotype ♀; **33** *M. pallidus* (Uruguay, Punta Espinillo); **34–35** *Ebrechtella tricuspidata* (Moneron Is.). **32–34** Epigynal area; **35** Left male palp, ventral.

basal tutaculum longer than in type species. Tegulum round, with heavily sclerotised apical rim, starting near base of embolus and following whole course of embolus. Seminal duct thick, as broad as embolic base. Embolus starts from pocket at 10 o'clock position (in left palp) (Figs. 5 & 10), its base clearly separated from tegulum. Embolic base relatively wide, width of embolus continuously narrowing along its course, tip flat and not pointed (Fig. 13).

*Distribution*: Bolivia, Paraguay, Uruguay, Brazil and northern Argentina (Colombia not checked).

*Biology*: Some samples were collected from flowering garden bushes, as many other *Misumenini*.

*Discussion*: Differences between some specimens of the two sibling species in colour pattern may partly be due to infraspecific variation, and partly to fading of the old type material. Great colour variation is exceptionally found between fresh specimens of a single population. A large sample from Rio Selva, Bolivia, collected in August 2007 included, e.g. several annulation patterns of male legs and even an adult male with uniformly pale legs, as well as some females without dorsal pattern. The only reliable diagnostic characters are found in the structure of the male palp. It is not clear if there are any distinct differences in the vulvae, because we did not dissect the epigyne of the paralectotype of *M. maculissparsus*.

***Misumenops guianensis* (Taczanowski, 1872)** (Figs. 38, 40, 45, 47)

*Thomisus guianensis* Taczanowski, 1872: 90 (♂♀).

*Diaea guyanensis*: Keyserling, 1880: 112, pl. 2, fig. 62 (♂♀).

*Misumenops guianensis*: F. O. P.-Cambridge, 1900: 141.

*Misumenops guyannensis*: Mello-Leitão, 1929: 233: common in Brazil! (misspelling).

*Types*: Male and female syntypes from French Guiana, originally in IZPAN, not found in February

2006 by the staff and most probably lost, as many other types of Taczanowski. However, a neotype is not designated, as at least the male of this species seems to be identifiable.

*Material examined*: VENEZUELA: Guarico, Miranda: 1♂ 1 subad. ♀, Hato Masaguaral, dry meadow, 29 November 1977; 1♂, Caño Carascal, gallery forest of Rio Guarico, 29 November 1977; 1♀ 2 juv., N of Corozo Pando, savanna, 29–30 November 1977, all leg. & det. P. T. Lehtinen (PTL). PARAGUAY: Foncière, leg. E. Reimoser, 1908, 44♂ 10♀ + numerous juvs; 1♂ with deformed right palp, 1♂ with outstanding process on RTA (NMW, MLP, MNHN, MZT & PTL).

*Diagnosis*: The colour pattern of both sexes of *M. guianensis* is usually simpler than that of both *M. maculissparsus* and *M. pallidus*. Legs I–II of male with dark annulations, but no spotted areas. The longitudinal dark bands on the carapace have more or less parallel margins, not irregularly serrate as in *M. maculissparsus* and especially *M. pallidus*. The abdominal pattern is quite weak or lacking in females, simple in males. The tip of RTA is surrounded by a continuous lamina on both sides (Fig. 40), consisting of tightly placed very distinct lobules with narrow clefts between them (Fig. 38), in contrast to the serrations on only the outer side in *M. temibilis* (Fig. 37) and covering a much wider area than the corresponding modifications in *M. pallidus* (Fig. 12) and probably *M. maculissparsus* (but no SEM micrographs possible for type). The male embolus is mostly smooth, distally tapering and has only a triangular subapical lamina and some indistinct ridges in the distal third (Fig. 47); it originates from a tegular pocket at 9 o'clock (in left palp) (Fig. 45). The tutacular apophysis is reduced to an indistinct knob with a row of transversely placed setae. The epigynal hood is small, as in the related species, and thus not diagnostic in comparison with *M. maculissparsus* and *M. pallidus*.

*Description* (♂/♀): Total length 3.1–3.3/5.7. Carapace 1.57/2.48 long, 1.38/2.05 wide. Abdomen 1.81/3.04 long,



1.14/2.05 wide. Shape of adult male abdomen more elongate than in female. Measurements of total length affected by stretched petiolar area of the only adult female and by partial overlap of carapace by anterior part of abdomen in all adult males. Carapace of both sexes with two dark reddish brown longitudinal bands, ground colour yellow. Most males and some females with distinct paired dark longitudinal areas in posterior half of abdomen, males also with dark stripe around anterior half of abdomen. This pattern more or less entire with irregularly serrate margin in males, but consisting of series of dark spots in females. A whitish submarginal ring of guanine shines through integument of females and some younger males and this guanine pattern may also include a longitudinal central band and extend to lateral faces of abdomen, at least in most subadult specimens. Most old males with weakly sclerotised scutum covering entire dorsal surface of abdomen. Venter of abdomen uniformly yellowish, lacking central dark band of *M. pallidus*. Sternum, gnathocoxae, labium and chelicerae uniform yellowish. Legs I–II of male with patellae and distal half of tibiae, metatarsi, and tarsi dark brown, the rest yellowish, as legs III–IV in male and all legs in female.

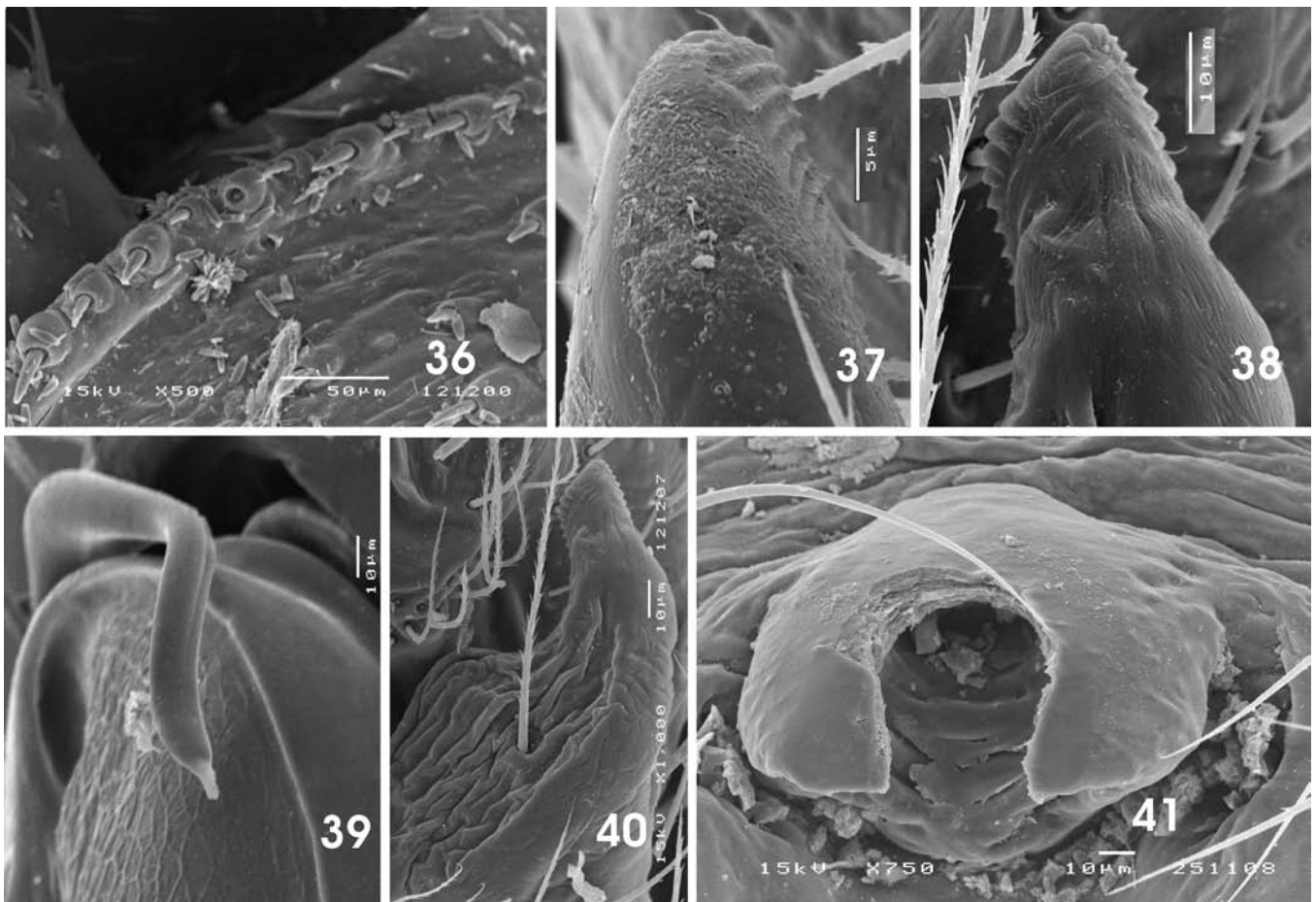
Carapace covered throughout by erect setae, longest in and lateral to ocular area. In most preserved specimens many setae worn off, but their sites easily observed

by scars on surface of carapace. Abdominal setae also numerous, but generally shorter than those on carapace. Lateral eyes on distinct raised whitish tubercles, as in most Misumenini. AME and PME subequal in size, MOT trapezoidal, posteriorly slightly wider. Male femur I with 4–5 long dorsal setae and 2–3 long prolateral setae. Femora II–IV all have setae, but shorter than those of leg I. Female femur I with only 1–2 dorsal setae and 1–3 lateral setae, all weaker than those of male. Tibiae I–II of female with 5 pairs of short ventral spines, metatarsi I–II with 4–6 pairs. Tibiae and metatarsi I–II of males lack ventral spines, but have several irregularly placed dorsal and lateral setae.

*Distribution:* Known from French Guiana, Venezuela, Brazil and Paraguay. No samples from Brazil have been checked by us.

*Discussion:* It is possible that some material identified by Mello-Leitão as *M. guianensis* in the collections of South American museums belongs either to *M. maculissparsus* or to *M. pallidus*, because they are somatically rather similar species. Misidentification of *M. temibilis* is also possible.

The large sample from Paraguay has slightly different details of the male palpal organs in specimens checked with SEM micrographs and may partly represent a separate taxon. It is also possible that this rich sample was collected from more than one habitat and includes



Figs. 36–41: **36** *Misumenoides magnus* ♂ (México, Laguna Verde); **37**, **39** *Misumenops temibilis* ♂ (Chile, Valparaiso, Parque Nacional La Campana); **41** *M. temibilis* ♀ (Chile, Aisen, Puerto Aisen); **38**, **40** *Misumenops guianensis* (Venezuela, Guarico, Hato Masaguaral). **36** “Serrate” margin of carapace; **37–38** Modified apex of RTA; **39** Ventrally grooved embolus; **40** Membranous cavity of RTA–ITA with central seta; **41** Epigyne. Scale lines=0.05 mm (36), 0.01 mm (38–41), 0.005 mm (37).

several taxa of the *M. maculissparsus*-group. However, material from intervening areas is necessary in order to judge whether this is just clinal variation or indicates the presence of more than one species.

***Misumenops bellulus* (Banks, 1896)** (Figs. 54–59)

*Misumena bellula* Banks, 1896: 71 (♀).

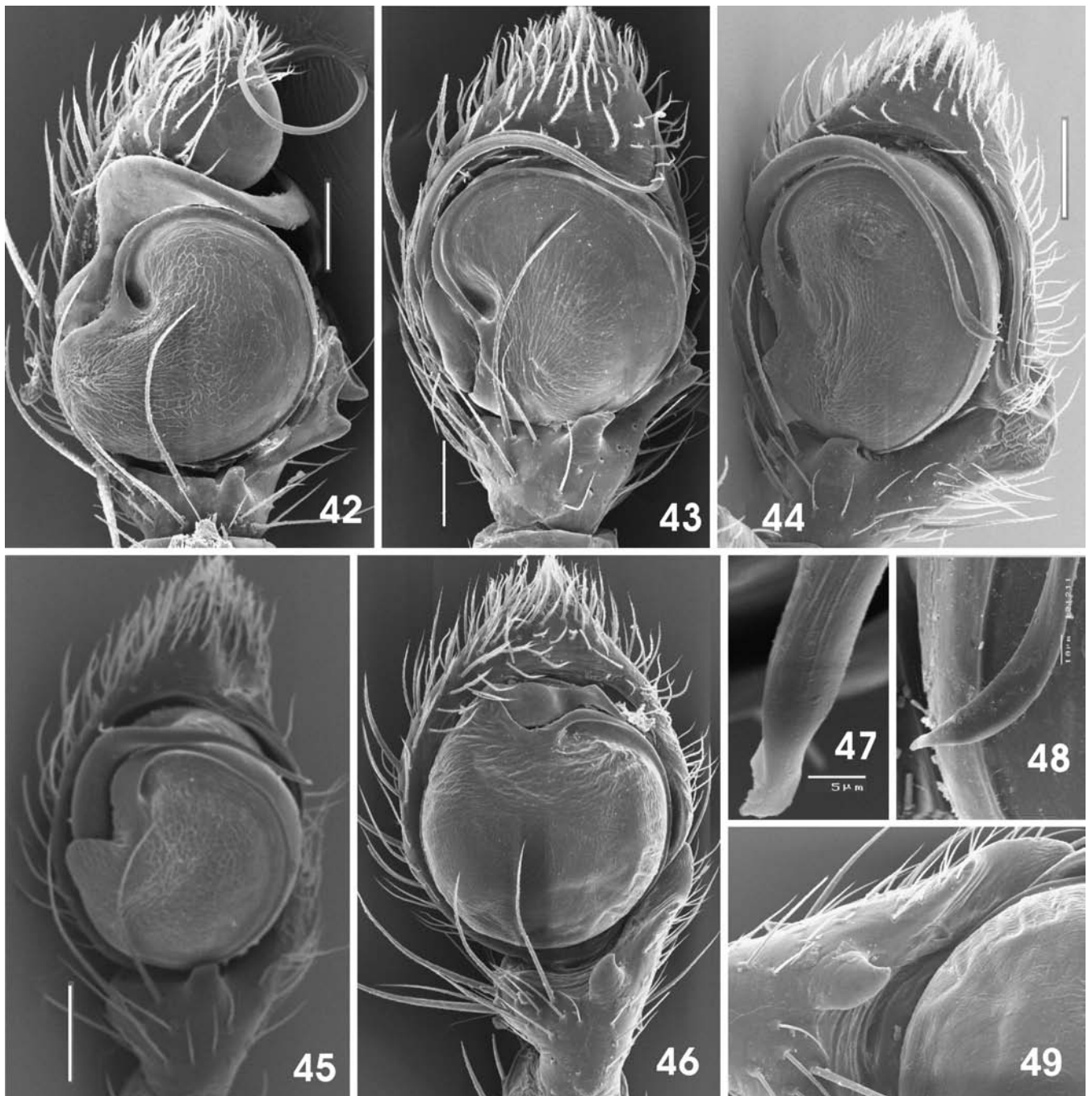
*Misumessus bellulus*: Banks, 1910: 50.

*Misumenops bellulus*: Petrunkevitch, 1911: 410; Gertsch, 1939: 321, figs. 46–47, 65 (♂♀); Bryant, 1940: 413, pl. 14 figs. 188, 191–192 (♂♀), Cuba.

*Type*: Holotype ♀ from Punta Gorda, Florida, USA, probably in MCZ, not examined.

*Material examined*: USA: Florida, 1♂ 2♀ 4 juvs, Ocala Nat. Forest, 0.5 m from central tower, 24 June 1978, leg. P. T. Lehtinen (PTL); Sarasota Co., North Fort, 18 April 1989, on *Scinus terebinthifolius*, 2♂ 1 juv., Sarasota Co., Venice, 25 August 1988, 2♀ 4 juv., both leg. K. Jenkins, det. G. B. Edwards (PTL).

*Remark*: It is strange that this close relative of the type species of *Misumenops* was listed as *Misumessus* by Banks (1910), but it can be explained by the fact that the original definition of *Misumessus* Banks, 1904 included thomisids from four different genera: *Misumessus*, *Misumenops*, *Diaea* Thorell, 1869 and *Parasynema* F. O. Pickard-Cambridge, 1900. The two latter taxa represent genera outside Misumenini.



Figs. 42–49: **42** *Mecaphesa asperata* (USA, Kansas, Lawrence); **43** *Mecaphesa celer* (USA, Wisconsin, Burnette); **44, 48** *Misumenops temibilis* (Chile, Valparaiso, Parque Nacional La Campana); **45, 47** *Misumenops guianensis* (Venezuela, Guarico, Hato Masaguaral); **46, 49** *Misumenops variegatus* (Peru, Loreto, Quistococha). **42–46** Left male palp, ventral; **47–48** Tip of embolus; **49** Right male palp, tibial apophyses, ventral. Scale lines = 0.1 mm (42–45), 0.005 mm (47–48).



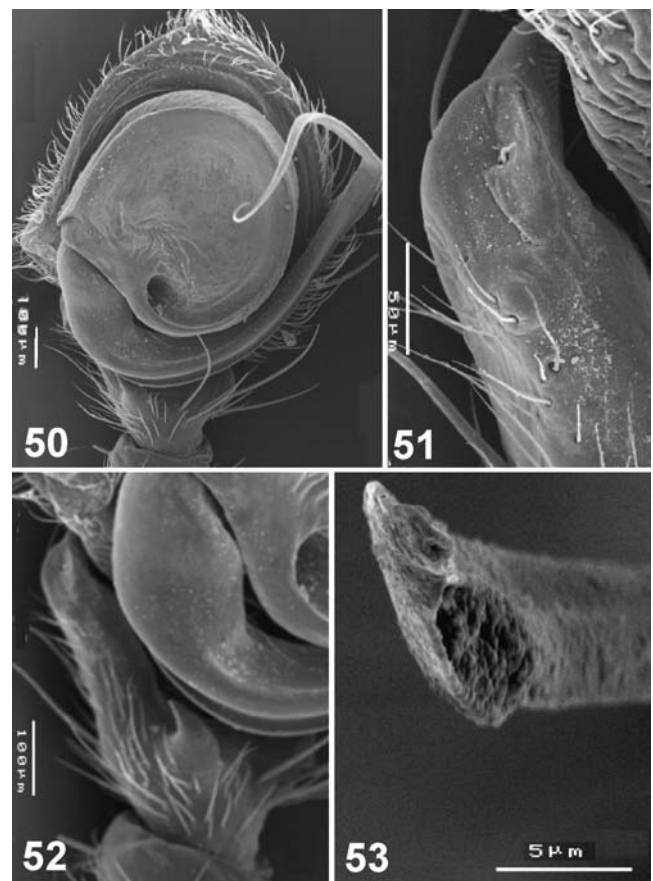
**Diagnosis:** The male of this species is distinguished from all other species of the *maculissparsus*-group by the insignificant tutacular tubercle (Fig. 56) and by the presence of distinct distal ridges only on the inner face of the tip of RTA (Fig. 57b); the outer face has only poorly developed tubercles. According to the origin of the embolus (9.30 o'clock in left palp) it is closest to the type species, but other details of the palp and especially the very wide epigynal hood (Fig. 58) and shape of MOT show that it cannot be the closest relative of *M. maculissparsus*.

**Description: Male:** Total length 1.7. Carapace 0.84 long, 0.95 wide. Abdomen 0.77 long, 0.60 wide. Leg I 1.61 + 0.56 + 1.39 + 1.35 + 0.42. Carapace with two dark reddish brown longitudinal bands, ground colour pale brown. Abdomen pale brown, with paired dark patches in posterior half. Sternum, gnathocoxae, labium and chelicerae uniform yellowish. Leg I (II lacking) of male with patella and distal half of tibia and metatarsus brown, the rest yellowish, as legs III–IV.

Setae on carapace long, their pattern as in *maculissparsus*-group. Lateral eyes on distinct raised tubercles, both larger than median eyes. MOT trapezoidal, posteriorly slightly wider; PME>AME. Femur I with 5 long dorsal setae and 2 prolateral setae. Femora III–IV with 2–3 dorsal setae. Tibia and metatarsus I with several irregularly placed dorsal and lateral setae, but only one distinct prolateral subapical spine, tibiae and metatarsi III–IV with 1–2 dorsal and 1–2 lateral spines.

Structural details of male palp (Figs. 54–56) show that inclusion of this species in *maculissparsus*-group is justified and that synonymy with any of the other three species is completely excluded. Embolus originates from tegular pocket with distinctly furrowed margins at 9.30 o'clock (in left palp). Basal third of embolus as wide as base of tapering parallel tegular ridge. Embolus with two distinct bends, relatively short, not reaching tutacular knob, tip lying in tegular groove close to tutacular knob. Embolic tip (Fig. 57a) is triangular continuation of gradually tapering distal part, with subdistal membrane typical of all species of this group, surface of neighbouring embolic surface smooth. VTA far from base of RTA–ITA (Fig. 54). Membranous inner face of RTA occupies half length of RTA and bears central isolated seta typical of this group. Tip of RTA basally with several very strong ridges, outer surface covered by partly anastomosing narrow ridges (Fig. 57b). Serration of tip extends to both sides of tip, but is longer and more distinct on inner side.

**Female:** Total length 4.4. Carapace 1.61 long, 1.58 wide. Abdomen 1.82 long, 1.74 wide. Leg I 2.06 + 0.85 + 1.69 + 1.55 + 1.00. Longitudinal brown bands on carapace less distinct than in most specimens of this group, but central light stripe wider. Abdomen with very distinct pattern of subcutaneous guanine consisting of paired submarginal and parallel subcentral stripes and longitudinal stripe on posterior half. However, according to Bryant (1940) colour variation of both sexes within single populations is wide, including also female specimens with no abdominal pattern. All legs pale brown, except very distinct dark brown prolateral



Figs. 50–53: *Runcinioides argenteus* (Brazil, SP, Serra do Japi). **50** Right male palp, ventral; **51** Tip and central part of RTA; **52** Tibial apophyses and base of embolus; **53** Tip of embolus. Scale lines=0.1 mm (50, 52), 0.05 mm (51), 0.005 mm (53).

subdistal patches on tibiae I–II. Sternum, gnathocoxae, labium and chelicerae also uniform pale brown.

Setal pattern of body of females studied is well preserved and consists of long setae around ocular region and weaker and shorter setae around cephalic region. Ocular pattern as in male, but PME relatively smaller. Femora I–II with only 1–2 dorsal setae and 1–3 lateral setae. Tibiae I–II with 5 pairs of short, but strong ventral spines, metatarsi I–II with 4–7 pairs of short ventral spines. Legs III–IV with 1–2 weak dorsal spines on femora and tibiae.

Epigynal scape (Fig. 58) wider than in other species of this group. Paired posterior pits filled with short rounded projections (Fig. 59). No vulval mount was made.

**Distribution:** Southeastern USA (Florida), Virgin Islands, and Cuba, where it is quite common in some areas (Bryant, 1940). According to G. B. Edwards (pers. comm., March 2006) this species is also widespread in Florida.

#### Species outside the *maculissparsus*-group

The remaining two species each represent a group of their own, as their copulatory organs are widely different both from those of the *maculissparsus*-group and also from each other. However, the diagnostic characters

of *Misumenops* are found in these two isolated species (cf. p. 175).

### The *temibilis*-group

Monotypic, only *Misumenops temibilis* (Holmberg, 1881) from southern South America.

**Diagnosis:** Males are distinguished from species of the *maculissparsus*-group by the long embolus with a groove along the distal half of its length, as well as by the tip of RTA–ITA with serrations only on the prolateral margin.

Females are separated from all species of the *maculissparsus*-group by the wide, well sclerotised epigyne with a large hood of inverted U-shape (Fig. 41).

***Misumenops temibilis* (Holmberg, 1881), comb. n.** (Figs. 37, 39, 41, 44, 48, 60, 61)

*Thomisus cinereus* Nicolet, 1849: 396, preoccupied by C. L. Koch, 1837. **New synonymy.**

? *Thomisus variabilis* Nicolet, 1849: 396, listed as *nomen dubium* by Roewer (1955: 1692). **New synonymy.**

*Xysticus temibilis* Holmberg, 1876: 27 (common in Argentina!) without exact localities.

*Misumena exanthematica* Holmberg, 1881: 155, pl. 4 figs. 10, 10 a–b; Simon, 1897: 9; Petrunkevitch, 1911: 407. **New synonymy.**

*Misumenops temibilis*: Mello-Leitão, 1933: 54.

*Misumenops cinereus*: Mello-Leitão, 1939: 77.

*Misumenoides nicoleti* Roewer, 1951: 448 (nom. nov. for *T. cinereus* Nicolet, 1849). **New synonymy.**

*Misumenops pallidus*: Lehtinen, 2004: fig. 76 only, misidentification.

**Types:** We designate a neotype ♀ (ICZN, 1999: Art. 75.1 & 75.3.1–5. & 7) both for *Thomisus cinereus* Nicolet, 1849 and for *Xysticus temibilis* Holmberg, 1876 from Chile, Prov. Llanquihue: Puerto Rosales, S of Lago Llanquihue, roadside *Chrysanthemum*, 18 December 1996, leg. P. T. Lehtinen, which will be deposited in MACN. The neotype designation is necessary as the identification of South American *Misumenops* spp. has been erroneous and inconsistent, especially by Mello-Leitão (1929, 1933, 1939, 1941). The neotype is exceptionally a female specimen because its epigyne is very characteristic.

**Remarks:** Although ICZN (1999: Art. 75.3.6 & Recommendation 75A) advises to select the neotype from the same area as the original syntypes, this is a special case, as no exact localities were listed for *X. temibilis* in the original description (only “common in flowers in Argentina”; Holmberg collected mainly in Patagonia), but an exact locality for the oldest synonym of this species, the homonymous *Thomisus cinereus* Nicolet, 1849 was stated to be Valdivia in Chile. The locality for the neotype is the closest possible locality to Valdivia among the material available. This species is most probably the only thomisid in the southern parts of both countries. The male holotype of *Misumena exanthematica* from Argentina, Rio Colorado, could not be found in January 2006 either in MLP or MACN and is most probably lost, as are the majority of Holmberg’s spider types. Syntypes of *T. cinereus* and *T. variabilis* from Chile, Valdivia, originally in MNHN, were not found or examined; most of the material of Nicolet (still

outside the arranged collections) is in very bad condition and most species are hard to trace or without proper labelling. *Thomisus variabilis* possibly represents the same species as *T. cinereus*, as no other thomisids have since been collected from Valdivia or neighbouring areas. The resurrection of a generally accepted *nomen dubium* would not promote nomenclatural stability — the variability of coloration is also shown by the name *variabilis*. Although *Xysticus temibilis* Holmberg, 1876 was described without locality data and there is no known material of spiders published by Holmberg (1876) according to Dr Grismado (pers. comm., 2006), the detailed description of somatic characters, coloration, and the microhabitat in different kinds of flowers make the identification certain. This species was transferred to *Misumenops* by Mello-Leitão (1933).

**Other material examined:** CHILE: Prov. Valparaíso: 1♂ 6 juv., Parque Nacional La Campana, Palmas de Ocoa, under stones and in dry litter, 13 December 1996; 3♂ 5 juv., dry litter of cacti, *Maytenia*, etc., 13 December 1996; 1♂ 1♀, Reserva Nacional Lago Peñuela, meadow in old lake bottom, 14 December 1996; 3♂ 2♀ 2 juv., small-leaved litter, 14 December 1996; 1♀, forest litter, 14 December 1996; Prov. Santiago: 1♂ 2 juv., Santiago, San Cristobal, in bushes and lower vegetation, 11 December 1996; 1♂ 3♀ 4 juv., San Jose de Maipo, Maitenes Puente Sauce, alt. 1450 m, in bushes and sparse litter, 12 December 1996; Prov. Valdivia: 1♀, Parque Nacional Puyehue, Aguas Calientes, Antillanca road, Ericaceae sp. and grass, 15 December 1996; Prov. Llanquihue: 2♀ (in addition to neotype), Puerto Rosales, S of Lago Llanquihue, roadside *Chrysanthemum*, 18 December 1996; Prov. Osorno: 3♀ 1 juv., 6 km W of Osorno, *Matricaria* sp. on roadside, 7 January 1997; Prov. Aisen: 3♂ 3 juv., Coihaique, Parque Nacional Rio Simpson, hill slope with *Fuchsia magellanica* and *Ribes magellanicus*, 2 January, 1997; 1♀, Puerto Aisen, meadow with *Equisetum* and *Myosotis*, 2 January 1997, all leg. & det P. T. Lehtinen (PTL). ? PARAGUAY: 1♀, Foncière, leg. E. Reimoser (NMW).

**Diagnosis:** *M. temibilis* is related to all species of the *maculissparsus*-group, although the male embolus is distally flattened and moderately curved. The most reliable diagnostic character for the male is the ventral furrow along the whole length of the embolus (Fig. 39), up to the narrowed tip. The modifications of the tip of RTA–ITA consist of parallel ridges around only the outer margin (Fig. 37), while the corresponding modifications of all four species of the *maculissparsus*-group extend around the whole tip (though weak on the outer face in *M. bellulus*). The female epigynal hood is continued posteriorly to form an inverted “U” (Fig. 41), which makes the female distinctly different from the four previous species. The colour pattern is simple compared with *M. maculissparsus* and *M. pallidus*.

**Description** (♂/♀, from San Jose de Maipo/Puyehue): Total length 2.81/6.76. Carapace 1.24/2.29–2.57 long, 1.19/2.19–2.43 wide. Abdomen 1.71/5.00 long, 1.05/4.33 wide. Male coloration (Fig. 60) similar to that of *M. guianensis* (with paired dark pattern or rows of spots in posterior half of abdomen), except limits of dark leg annuli less distinct. Female carapace (Fig. 61) with relatively wider brown bands, and additional triangular area in thoracic region darker than rest of carapace, resembling coloration of type species (cf. Fig. 18); dark areas obscure in some specimens from dry habitats. Female abdominal pattern resembles that of male in some specimens, but in most females only subcuticular



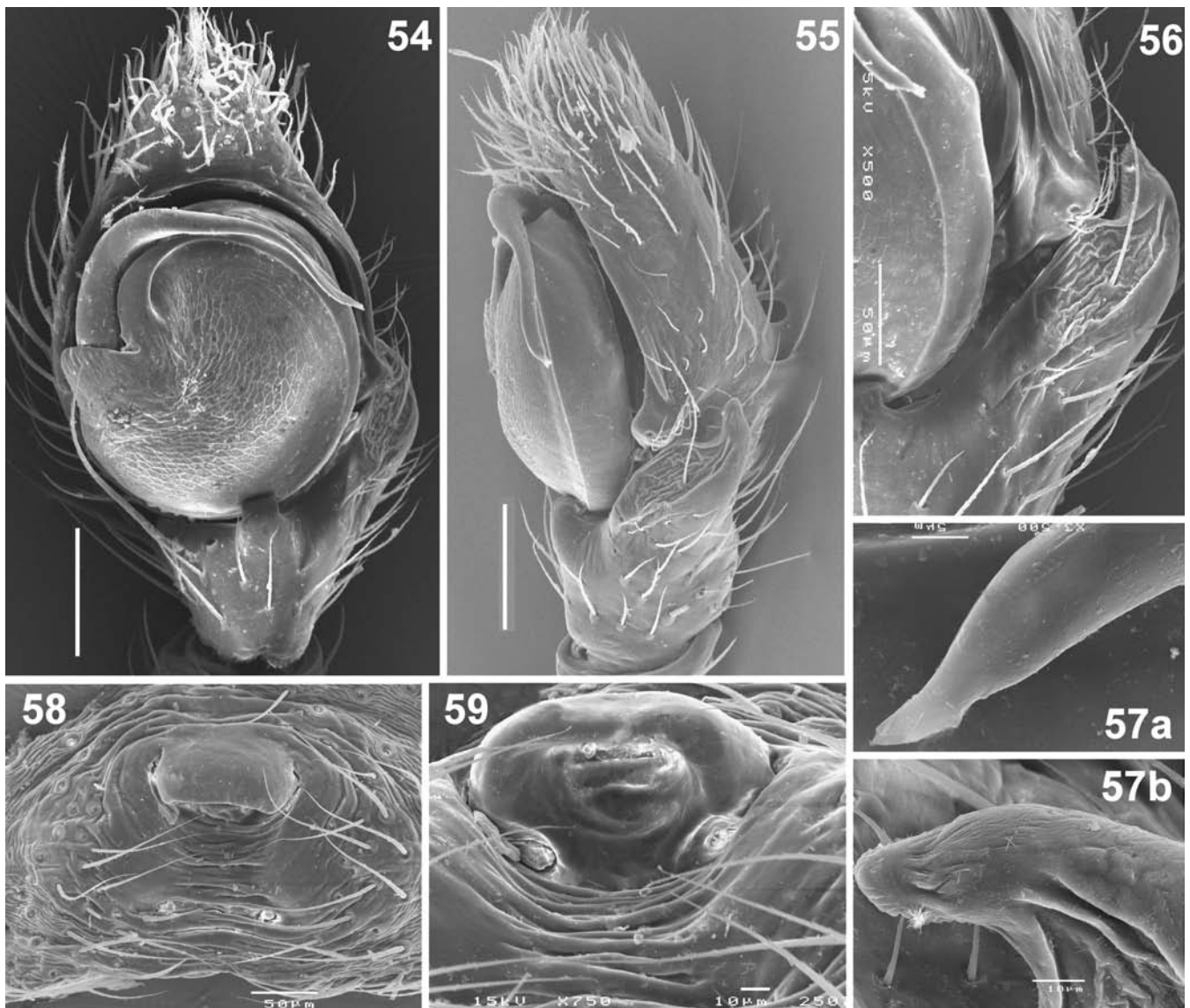
guanine pattern present, with wide submarginal guanine bands continued laterally. In extreme cases, whole abdomen of preserved specimens only has continuous guanine pattern; these specimens greenish grey when freshly caught or living. Some females also have distinct central guanine pattern between obscure paired darker areas in posterior half of abdomen. Venter of abdomen without dark central stripe. Female legs uniform yellowish grey, but wide ventral and narrow dorsal guanine stripes often present on femora, sometimes also on anterior face of chelicerae. Ocular region of female pale brown throughout, its anterior margin forming a distinct white arch as in type species.

Pattern of rigid setae on carapace similar to that of *M. guianensis*, but many setae worn off on adult specimens. AME and PME subequal in size, MOT almost quadrangular. Male abdomen with short rigid setae and weakly sclerotised scutum, female abdomen with only thin and short hairs, in contrast to other species of *Misumenops*. Male femur I with few dorsal and prolateral spines in basal half, spine-like setae of other femora in males and

all femora in females weak and less conspicuous. Female tibiae I–II with 4 pairs of ventral spines, metatarsi with 5–6 pairs of short, strong ventral spines. Most setae on male tibiae and metatarsi hardly different from normal hairs.

**Biology:** As already stated by Holmberg (1876) this species is found on flowers of lower vegetation or bushes, exceptionally also on other parts of various plants.

**Distribution:** This species is so far known from Valparaiso in central Chile and possibly Paraguay to southern parts of Chile and Patagonia in Argentina. Mello-Leitão (1941) recorded this species as *M. exanthematicus* from the central Argentinian provinces of Córdoba, La Rioja, Catamarca, Tucuman & Salta, but at least the males from Salta: Juramento & Caldera (MLP) identified by Mello-Leitão as *M. exanthematicus* belong to the *M. maculisparsus*-group (*M. guianensis* and *M. pallidus*). Within the southern part of its range, Patagonia and southern Chile, it seems to be the only thomisid species. As most of the records are from close to the coast and are not mixed with other species of



Figs. 54–59: *Misumenops bellulus* (USA, Florida, Ocala N.P.). **54** Left male palp ventral; **55** Ditto, lateral, showing tutaculum; **56** RTA, showing membranous face and long seta; **57a** Tip of embolus; **57b** Tip of RTA; **58** Epigyne, ventral; **59** Ditto, posterior, showing paired tubercle. Scale lines=0.1 mm (54–55), 0.05 mm (56, 58), 0.01 mm (57b, 59), 0.005 mm (57a).

*Misumenops*, the labelling of the Paraguayan sample including this species may be incorrect or the contents of samples from different areas may have been unintentionally mixed by Reimoser, who caused much confusion through his strange habits, e.g., relabelling without preserving the original labels and almost certainly uniting numerous samples from one area into a single, very large sample, etc.

### The *variegatus*-group

Monotypic, only *Misumenops variegatus* (Keyserling, 1880) from Peru.

**Diagnosis:** Males are characterised by different modifications of the RTA–ITA and basal parts of the embolus. Females are not known to us.

***Misumenops variegatus* (Keyserling, 1880), comb. n.** (Figs. 46, 49, 63)

*Misumena variegata* Keyserling, 1880: 101, pl. 2 figs. 55 & 55a (♂♀).

**Types:** Male and female syntypes from Peru, Prov. Tarma, Junin district, Amable Maria and Luhugal, originally in IZPAN, now possibly lost (Ms Mierzwa, pers. comm.).

**Material examined:** PERU: Prov. Loreto: 1♂ 1 subad. ♂, 1 subad. ♀ 2 juvs, Iquitos district, Quistococha, low fern meadow, 20 November 1977, leg. & det. P. T. Lehtinen (PTL).

**Remark:** This species belongs to a group that is not closely related to the type species, but without doubt is a true *Misumenops*. The modifications of RTA, coloration of carapace, abdomen and legs prove this, although the modifications of RTA are not serrations, but rather concentric ridges.

**Diagnosis:** Males are easily distinguished from all species of the *maculissparsus*-group by the development of a weakly sclerotised dorsal abdominal scutum, heavily spined male carapace and basally modified and shorter embolus, as well as distinctly separate VTA. The tip of RTA is finely furrowed, while there is a subdistal lateral cavity with concentric ridges along its margin (Fig. 49). The lateral and dorsal spines on femur I are stronger than corresponding spines on the other species of this genus. The femoral spination of the subadult female is less strong, but tibiae I have three pairs of strong ventral spines and metatarsi I five pairs. The male anterior tibiae and metatarsi have numerous irregularly placed strong ventral setae.

**Description: Male:** Total length 4.38. Carapace 2.33 long, 2.10 wide. Abdomen 2.52 long, 1.90 wide, length/width ratio 1.32 (distinctly wider than in *M. guianensis*: 1.60). MOT slightly longer than wide, AME and PME subequal in size. Carapace light brown, with two longitudinal dark brown bands gradually widening posteriorly (Fig. 63). Narrow dark brown marginal bands in whole thoracic region. Spination of carapace similar to that of female *M. pallidus*, except single setae behind posterior lateral eyes very long. Ocular area without whitish colour and especially without white arch between eyes and clypeal margin typical of species

of *maculissparsus*-group and *M. temibilis*. Abdomen with central light stripe, lateral to this stripe dark brown pattern of irregular partly fused spots over whole surface. Pair of transverse guanine patches visible through integument within dark brown areas slightly anterior to centre of dorsum. Sclerotisation of dorsal abdominal surface weaker than in species of *maculissparsus*-group. Further laterally with narrower light bands and finally dark brown arch around anterior half of abdomen. Sides and venter of abdomen uniform light yellowish brown. Sternum and mouth parts similarly coloured, base of chelicerae narrowly darker brown. Abdomen covered throughout with erect setae (well preserved in specimen studied). Femur II and all segments of legs III–IV uniform yellowish, distal parts of patellae, tibiae, metatarsi and tarsi I–II dark brown, rest yellowish. Femur I very strongly spined; 10–12 irregularly placed prolateral and dorsal spines, most exceptionally long. Femora II–IV with 4–6 weaker dorsal spines, patellae III–IV with a single dorsal spine, tibiae I–II with 2 thin bristles only, tibiae III–IV with 3–4 dorsal spines.

Palp as in Figs. 46 & 49. RTA–ITA (Fig. 49) with exceptional modifications: tip rounded and only faintly longitudinally furrowed; with low cavity in ventral surface towards distal end, followed by parallel, rounded, more or less concentric ridges on surface of apophysis. Cymbial tutaculum absent. Embolus basally thick, originating from tegular pocket at 11 o'clock (in left palp), with groove in distal side of basal hump and additional lower hump centrally before gradually narrowed tip; apical part consists of curved spine with its apex at cymbial margin. Embolus in total much shorter than that of other species of *Misumenops*.

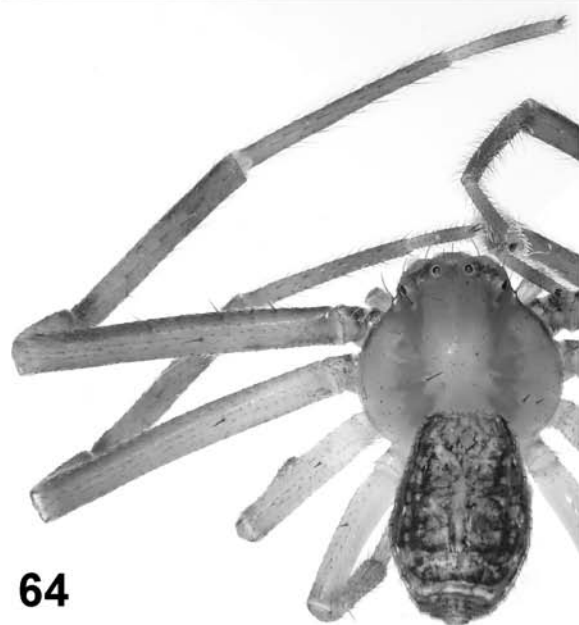
**Female:** Adult females unknown to us. Subadult female specimen has dorsal pattern of carapace and abdomen similar to male, but no dark annulations on legs and no strong spines on femur I. Tibiae I–II with four and metatarsi with five pairs of strong, short ventral spines.

Subadult male has 2–3 pairs of ventral spines on tibiae and metatarsi I–II and faint dark annulations on legs I–II, possibly indicating that sexual dimorphism in *Misumenops* is fully developed first at the final moult.

According to Keyserling's figure (1880: fig. 55a) the epigyne of this species resembles the type of epigyne found in the *maculissparsus*-group more than that of the *temibilis*-group. The anterior hood is relatively small and posteriorly followed by paired semicircular pits with sclerotised margins.

**Discussion:** The modified distal part of RTA–ITA, colour pattern of male legs with darkened distal parts of tarsi, as well as the pattern of setae on the carapace and strong spination of femur I show that *M. variegatus* belongs to *Misumenops*, although it is neither very close to the *maculissparsus*-group nor to *M. temibilis*. The transfer of this species from *Misumena* to *Misumenops* makes it a secondary senior homonym of *Misumenops variegatus* Mello-Leitão, 1917 from Brazil. However, the syntype material of the latter species has certainly become lost (T. da Silva Moreira, pers. comm., October 2006) and this species was not discussed in the monograph of Brazilian Thomisidae by Mello-Leitão (1929).





Figs. 60–65: Dorsal habitus. **60** *Misumenops temibilis* ♂ (Chile, Los Lagos, Osorno W); **61** *M. temibilis* ♀ (Chile, Valparaiso, Parque Nacional de Campana, Palmas de Ocoa); **62** *Mecaphesa asperata* ♂ (USA, Kansas, Douglas Co.); **63** *Misumenops variegatus* ♂ (Peru, Loreto, Quistococha); **64** *Mecaphesa kanakana* ♂ (USA, Hawaii, Maui, Haleakala crater); **65** *Mecaphesa semispinosa* ♂ (USA, Hawaii, Oahu, Mt Kaala summit).

As it is anyway a junior synonym of one or more of the six species of *Misumenops*, of which the identification of the three Brazilian species is very difficult even with information about the vulval structure, the most practical solution is to regard this available name as a *nomen dubium*.

**Distribution:** *M. variegatus* is so far known only from Peru, but seems to be present both in the coastal area and in the eastern jungle area. The intervening area is poorly collected. Our specimens were collected in Iquitos district, Quistococha, in the vegetation layer of jungle close to a brook, where not only the diversity of species, but also the group diversity of all arachnids was exceptionally high.

### ***Runcinioides* Mello-Leitão, 1929** (Figs. 50–53, 66–67)

*Runcinioides* Mello-Leitão, 1929: 211; 1944: 319; 1947: 276; Caporiacco, 1954: 140; Lehtinen, 2004: 151 (not cited by Platnick, 2006).

*Runciniopsis* Mello-Leitão, 1929: 127 (lapsus, cf. Bonnet, 1958: 3886, footnote).

*Misumenops*: Rinaldi, 1988: 20.

**Type species:** *Runcinioides argenteus* Mello-Leitão, 1929 from eastern Brazil, by original designation.

**Diagnosis:** Carapace and abdomen very heavily covered by long and strong setae. Male carapace with marginal short spines as in *Misumenoides*. Pattern of carapace with two longitudinal dark bands, dark annuli on male legs I–II very distinct, but not present on tarsi as in all true *Misumenops*. Most diagnostic features of the males of the genus can be found under *R. argenteus*, as males are known only for the type species. Male palpus with tutacular groove along tegular margin ending in a cleft in the tegular margin (Fig. 50), tip of RTA–ITA with transverse ridges (Fig. 51) as in other Neotropical Misumenini except *Mecaphesa* (males of true *Erissoides* unknown, details of the tip in *Metadidea* unknown). Embolus relatively much longer than in *Misumenops*, *Misumena* and *Misumessus* and its course lies along the tegular margin, not around the cymbium as in species of *Mecaphesa* with a long embolus. The exceptional type of tutaculum and embolus are certainly valid also at generic level, while the structure of the tibial apophyses with ridged or furrowed distal part of RTA may be shared by some other genera as well.

The type of female vulva with strongly coiled ducts between the small receptacula (cf. Rinaldi, 1988: figs. 2, 7, 10) is distinctly different from the short ducts and moderate sized receptacula of *Misumenops* and large globular receptacula with very short connecting ducts in *Mecaphesa*.

**Species included:** At least four species most probably belong to this genus, *R. argenteus*, *R. pustulatus* Mello-Leitão, 1929, *R. litteratus* (Piza, 1933) and *R. souzai* Soares, 1942. All except the type species are placed in *Runcinioides* according to interpretable descriptions and drawings by their authors and revisers (Mello-Leitão, 1929; Piza, 1933; Soares, 1942; Rinaldi, 1988). Their final placing must be confirmed by the study of topotypical males and by checking of type material, when

possible. However, none of them can be included in the revised *Misumenops*.

**Note:** *Metadidea lacticeps* Mello-Leitão, 1944 from Argentina, Prov. Buenos Aires, Tandil, leg. Prosen (holotype ♀ in MLP, not available at the moment) possibly belongs to *Runcinioides* because of its numerous long setae on the carapace and abdomen and the white area in front of the eyes, but the rounded epigyne with two circular hollows would be exceptional for this genus. This species has been totally overlooked in all printed catalogues (by Roewer, Brignoli and Platnick) but the specific name was spelled *latticeps* and listed as such in *Misumenops* by Platnick (2006). Neither *Misumenops latticeps* nor *Misumenops lacticeps* has been published by anyone, but *Metadidea lacticeps* was transferred to *Misumenops* by Platnick (2006 and before). The only explanation for this act seems to be that Rinaldi (1988) synonymised *Metadidea* with *Misumenops*.

### ***Runcinioides argenteus* Mello-Leitão, 1929** (Figs. 50–53, 66–67)

*Runcinioides argenteus* Mello-Leitão, 1929: 211, fig. 22 (♂♀).

*Runcinioides nigromaculatus* Mello-Leitão, 1929: 211, figs. 23, 23 a, b (♂♀); 1944: 319; 1947: 276; Caporiacco, 1954: 140, figs. 42, 42a; synonymised by Rinaldi, 1988: 20 (sic! *nigromaculatus*).

*Misumenops argenteus*: Rinaldi, 1988: 20, figs. 1–3, 4a, b (♂♀).

*Runcinioides argentea*: Bonnet, 1958: 3886.

*Runcinioides nigromaculata*: Bonnet, 1958: 3886 (not *nigromaculata* — cf. Rinaldi, 1988).

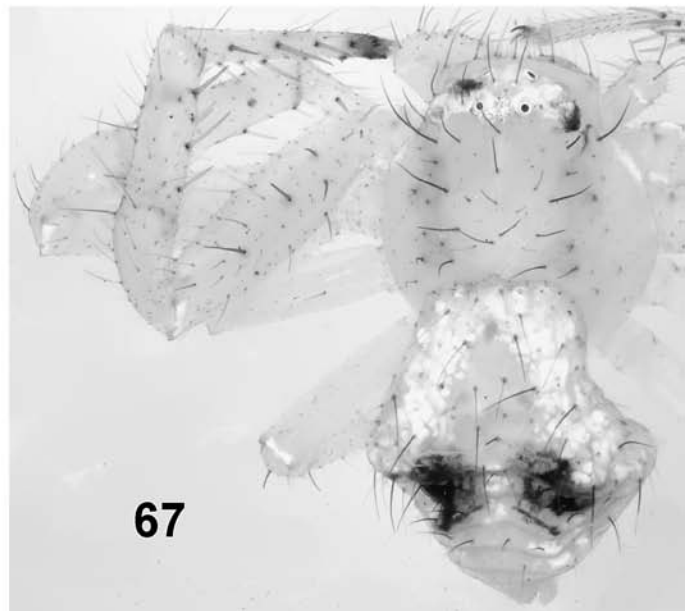
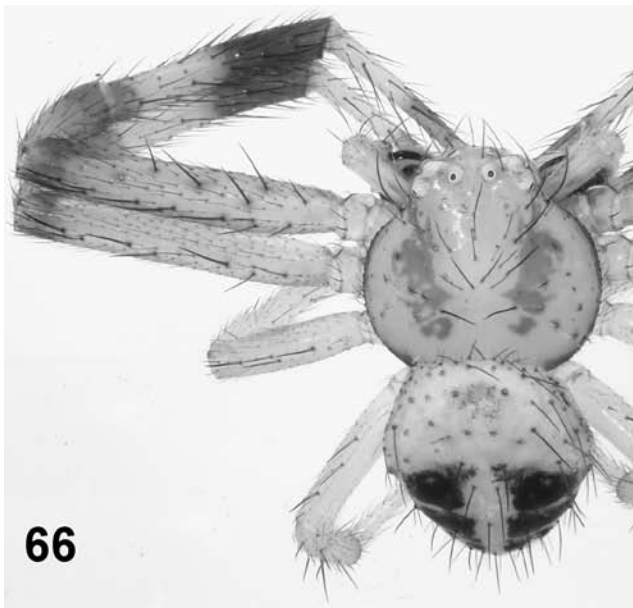
**Types:** Holotype ♂ and paratypes of both sexes from Brazil, Estado do Rio de Janeiro, Petropolis, possibly in MRJ, not examined.

**Material examined:** BRAZIL: São Paulo Prov.: 4♂ 1♀ 2 juvs, Jun Diai, Serra do Japi, 25 November 2003, leg. João Vasconcellos Neto, det. Gustavo Romero.

**Diagnosis:** General habitus as above for the genus *Runcinioides* (Figs. 66–67). Distal tibial dark annuli of male exceptionally wide (Fig. 66). Male palpal embolus very long, basal part thick, laterally with a deep groove, origination of embolus c. 4 o'clock (in left palp) (Fig. 50: right palp), tip of embolus slightly modified (Fig. 53). RTA–ITA fused, its tip with obliquely transverse parallel ridges (Fig. 51 & Rinaldi, 1988: fig. 4b). Tegular ridge basally separated from tegular surface by deep pit. Lateral tegular surface with a narrow tutacular groove ending in a tutacular fissure.

**Description:** **Male:** Total length 3.6. Carapace 2.15 long, 1.96 wide. Abdomen 2.19 long, 1.55 wide. MOT quadrangular as in *R. litteratus* (Piza, 1933), but described as wider than long in *R. souzai* (Soares, 1942); AME slightly larger than PME. Carapace pale brown, with two darker brown longitudinal stripes, abruptly narrowed anteriorly (Fig. 66); thin brown marginal stripes posteriorly widened. Chelicerae, mouth parts and sternum pale, except base of chelicerae dark brown. Palpal cymbium strikingly grey in contrast to coloration of all surrounding structures. Anterior third of abdomen uniformly pale yellowish brown, posterior part with two wide dark brown longitudinal bands, separated by lancet-shaped pale stripe. Two pairs of thin light





Figs. 66–67: *Runcinioides argenteus* (Brazil, SP, Jun Diai, Serra do Japi), dorsal habitus. **66** Male; **67** Female.

transverse stripes break these brown bands into three segments. Venter of abdomen with trapezoidal dark brown patch with four curved light parallel stripes centrally. Legs I–II yellowish brown, with very dark brown distal half of tibiae and slightly paler brown dark annuli on distal part of femora, basal part of tibiae and distal half of metatarsi. Patellae brown throughout. Legs III–IV brownish yellow.

Carapace and abdomen covered throughout with long, strong setae. Femora I–II with 10–12 irregular dorsal spines, femora III–IV with 3–5 shorter dorsal spines. Tibiae and metatarsi I–II covered throughout with spine-like setae, mixed with normal setae, stronger spine only at base and distal end of these metatarsi. Patellae (2–3), tibiae (3–5) and metatarsi (2–3) III–IV also with irregularly spaced dorsal and lateral spines. For male palpal details, see Figs. 50–53 (right palp). Embolus very long, basal part thick (Fig. 52), laterally with deep groove, origin of embolus at *c.* 4 o'clock (in left palp), tip of embolus slightly modified (Fig. 53). Tip of fused RTA–ITA with obliquely transverse parallel ridges (Fig. 51). Tegular ridge basally separated from tegular surface by deep pit; lateral tegular surface with narrow tutacular groove ending in tutacular fissure (Fig. 50).

*Female*: Total length 3.75. Carapace 1.89 long, 1.85 wide. Abdomen 2.22 long, 2.07 wide. Carapace with lighter brown bands than in male, abdominal pattern consisting only of pair of subcircular dark brown spots immediately behind widest point (Fig. 67). Lateral parts of abdomen also with subcuticular guanine areas, but central triangular area in front of dark spots lacks this guanine pattern. Legs yellowish, without any dark annulations.

Setal covering of carapace and abdomen less conspicuous than in male, lateral setae on carapace and most abdominal setae weaker than in male. Femur I with similar pattern of dorsal and lateral spines as male, but all spines shorter. Femora II–IV only with single

short dorsal spine. Tibiae I–II with 4 pairs of ventral spines, metatarsi I–II with 5–6 pairs; 1–2 weak dorsal spines present on tibiae and metatarsi I–II.

Epigyne with narrow hood, for structure of vulva see Rinaldi (1988: fig. 2).

*Note*: Abdominal pattern seems to be variable within each species, resulting, e.g., in the description of two synonymous species by Mello-Leitão (1929) and the placing of specimens with very variable abdominal patterns in one species of her *Misumenops* by Rinaldi (1988). It is obvious that colour patterns are quite insignificant in diagnosing the South American Misumenini, except for the coloration of male tarsi.

#### *Runcinioides pustulatus* Mello-Leitão, 1929

*Runcinioides pustulatus* Mello-Leitão, 1929: 212, fig. 107.

*Types*: Two syntype ♀ from Brazil, Minas Gerais: Caraça and Rio de Janeiro: Therezopolis, both possibly in MNHN, not examined.

*Description*: All parts of the body and appendages are described to have numerous long setae as in other species of *Runcinioides*. The epigyne (Mello-Leitão, 1929: fig. 107) has “uma lingueta chitínica mediana”, also fitting well with the other species listed here in *Runcinioides*. This species is longer (7 mm) than any other species discussed here under *Runcinioides*.

*Note*: Although Rinaldi (1988) synonymised *Runcinioides* with *Misumenops*, this species was not discussed, most probably because she had not seen any material.

#### *Runcinioides litteratus* (Piza, 1933), comb. n.

*Metadiaea litterata* Piza, 1933: 46, fig. 2 (♀).

*Misumenops litteratus*: Rinaldi, 1988: 23, figs. 5–8 (♀).

*Type*: Holotype ♀ from Brazil, São Paulo Prov., Piracicaba, in MZLQ, not examined, but re-examined and depicted by Rinaldi (1988).

*Note:* The transfer of this species to *Runcinioides* is best supported by the central narrowed tip of the epigynal scape, but also the overall complex structure of the vulva is rather similar to that of *R. argenteus* (Rinaldi, 1988: fig. 7). The abdominal pattern is quite variable according to Rinaldi (1988: figs. 5, 8a–d) and this species cannot be identified only by the striking pattern of the holotype.

### *Runcinioides souzai* Soares, 1942

*Runcinioides souzai* Soares, 1942: 258, figs. 3–4 (♀).

*Misumenops souzai*: Rinaldi, 1988: 25, figs. 9–10 (♀).

*Type:* Holotype female from Brazil, Goiás, Urutai, in MZSP, not examined.

*Note:* The assignation of this species to *Runcinioides* is based on the combination of numerous long setae on the carapace, abdomen, chelicerae and anterior faces of legs and palpi, the complex vulval ducts resembling those of *R. argenteus*, and the much longer and especially more coiled connective ducts than in any known species of *Misumenops*. Unfortunately no males are known for this species and therefore a future transfer to a yet undescribed genus cannot be totally excluded.

### Nearctic species misplaced in *Misumenops*

As mentioned above, more than 80 species from the New World have been listed in *Misumenops*. Many of them occur in the Nearctic. The North American species were grouped by Schick (1965) in three groups: *M. celer* (Hentz, 1847), *M. asperatus* (Hentz, 1847) and *M. coloradensis* Gertsch, 1933. To understand the relationships of Nearctic species we studied the nominate species of all these groups (PTL, PGC & DJC) and also *M. rothi* Schick, 1965 (PGC). After examination of these species, as well as illustrations provided by Schick (1965, 1970) and Dondale & Redner (1976) we concluded that all of them must be transferred to *Mecaphesa* Simon, 1900 (see below). The *M. celer*-group has already been transferred to *Mecaphesa* s. lat. (Lehtinen, 1993), but further analysis of the male and female genital characters of all species of the above-mentioned three Nearctic groups shows that the species of all these groups must be included in *Mecaphesa*, together with all Hawaiian and several Central American species of Misumenini.

The Nearctic species groups (*celer*-, *asperatus*-, and *coloradensis*-groups) together with at least six Central American and Caribbean species not previously listed in any group are more or less related to each other. No attempt is made here to redefine the diagnoses of these three species groups of *Mecaphesa*, although it seems that the *celer*-group includes most of the Central American and Caribbean species. Schick (1965, 1970) listed 17 (13+3+1) species from California, some of them widespread in the Nearctic. *Misumenops carletonicus* Dondale & Redner, 1976 from eastern Canada is also a member of the *celer*-group.

Mello-Leitão (1941) listed two samples of *Misumenops celer* from Argentina, Salta, but as this note

does not include taxonomic discussion or figures, these records are not listed by Platnick (2006) and South America is not listed in the distribution of *M. celer*. In that note it was claimed that these samples represent the first Argentinian samples of this North American species. The collection of MACN also has two additional, possibly unpublished, samples identified by Mello-Leitão as *M. celer*. Unfortunately these four samples represent four different species, and possibly four different genera, none of them congeneric with *Mecaphesa celer*, and at least two of the genera are new. One of the samples represents a subadult specimen that seems to belong outside the Misumenini.

### Central American and Caribbean species

The Central American and Caribbean species of Misumenini were first studied by Keyserling (1880), O. Pickard-Cambridge (1896), Banks (1896, 1898), and F. O. Pickard-Cambridge (1900). At first they were all placed in *Misumena*, but by F. O. Pickard-Cambridge (1900) also in his new genera *Misumenoides* and *Misumenops*.

*Material examined:* The type material of *Misumenops revillagigedoensis* Jiménez, 1991 and *Misumena vazquezae* Jiménez, 1986, both from Mexico (UNAM), as well as identified and unidentified material of *Misumenops dubius* (Keyserling, 1880), *Misumenops damnosus* (Keyserling, 1880), *Misumenops deserti* Schick, 1965 and *Misumenops gabrielensis* Schick, 1965 from Mexico (UNAM). For other species discussed here, original drawings have been used for taxonomic conclusions.

*Note:* The type material of *Misumena vazquezae* was compared with the excellent drawings of *Misumenops obesulus* Gertsch & Davis, 1940. These two species with serrate margins of the male cephalic region of the carapace are related to each other and must be transferred to *Misumenoides*: *Misumenoides obesulus* (Gertsch & Davis, 1940), **comb. n.** ex *Misumenops* and *Misumenoides vazquezae* (Jiménez, 1986), **comb. n.** ex *Misumena*. This provides further support to the suggestion (Lehtinen, 2004) that *Misumena* is absent in tropical and subtropical areas. The placing of *M. vazquezae* in *Misumena* seems to have resulted from the lack of long setae on the carapace — a character used by American arachnologists to separate *Misumena* from *Misumenops*, but also most *Misumenoides* have only short hairs or setae on the carapace, the marginal ones modified in males (Fig. 36).

*Discussion:* Some additional poorly described species originally assigned to *Misumena* may belong in *Mecaphesa*, but also in *Misumessus*, *Metadiaea*, *Erissoides* or *Runcinioides*. According to our revisional work on Misumenini we have not found any tropical species of *Misumena* (Lehtinen, 2004). *Misumenops modestus* (Banks, 1898) was synonymised with *Misumena vatia* Latreille, 1804 by Gertsch (1939) and the synonymy was confirmed by Schick (1965). These acts have been omitted from Platnick (2006), where this species is still listed in *Misumenops*.

Platnick (2006: under *Metadiaea* Mello-Leitão, 1929) obviously misunderstood the conclusions of Lehtinen



(1993, 2004) in stating “although North American members of the *asperatus* group of *Misumenops* might belong here as well”. Such an opinion has not been published and it seems to be impossible.

*Misumenops gertschi* Kraus, 1955 and *M. persimilis* Kraus, 1955 from El Salvador belong in the *celer*-group. The North American species *M. dubius* (Keyserling, 1880), *M. californicus* (Banks, 1896) and *M. gabrielenis* (Schick, 1965) at least, also occur in Central America. F. O. Pickard-Cambridge (1900) listed *M. spiralis* (F. O. Pickard-Cambridge, 1900) (♂, Guatemala), *M. prosper* (O. Pickard-Cambridge, 1896) (♂, Guatemala), *M. decorus* (Banks, 1898) (♂♀, Mexico & Guatemala) and *Misumena mexicana* Keyserling, 1880 (♀, Mexico). All these species are here transferred to *Mecaphesa* according to their original descriptions, but their relationships and possible synonymies could not be confirmed, as no type material was available for study. The relationship of the *celer*- and *asperatus*-groups of *Mecaphesa* (*Misumenops* of earlier authors) is widely accepted (cf. Schick, 1965), while the only confirmed *Metadiaea* from Minas Gerais, Brazil, has an anteriorly open epigynal cavity and a curved embolus within the cymbium (not around the cymbium as in species of the *M. asperata*-group).

### Hawaiian species

The nomenclatural history of the Hawaiian *Misumenini* is full of confusions and misidentifications of genera. Simon (1898, 1900) placed the Hawaiian species in *Misumena*, *Synema* and *Diaea*, while Roewer (1955) transferred all Hawaiian species of *Misumenops* to *Misumenoides* in his catalogue without explanation.

Suman (1970) described or redescribed 21 species of *Misumenini* from the Hawaiian Islands, three in *Mecaphesa*, 17 in *Misumenops* and one in *Synema*. All of them are now placed in *Mecaphesa* because of the fundamentally similar structure of the male and female copulatory organs.

**Material examined:** Identified material of *Mecaphesa semispinosa* Simon, 1900 (♂♀) and *Misumenops kanakanus* (Karsch, 1880) [identified by R. Gillespie as *M. vitellinus* (Simon, 1900) — synonymised by Roth, 1995: ♂♀] was available for SEM-micrographs. Type material of all other Hawaiian species preserved in BPBM was checked by P. T. Lehtinen on site during a visit to BPBM.

Garb (1999) thoroughly discussed the speciation of Hawaiian *Misumenini* and even presented a cladogram, in which species originally assigned to *Mecaphesa* were scattered among species listed there as *Misumenops*.

### *Mecaphesa* Simon, 1900 (Figs. 42–43, 62, 64–65)

**Thomisus:** Walckenaer, 1837: 519 & 533–534 (*nomina oblita & nomina dubia*); Hentz, 1847: 446–447, in part.

**Misumena:** Keyserling, 1880: 81, 86, and later papers, in part; O. Pickard-Cambridge, 1891: 86, in part; Banks, 1896: 91, in part; 1898: 263, in part; 1913: 179, in part; Simon, 1899: 416; 1900: 485, in part.

**Diaea:** Karsch, 1880: 80; O. Pickard-Cambridge, 1898: 241, in part.

**Mecaphesa** Simon, 1900: 495; Suman, 1970: 794; Lehtinen, 1993:

587, in part (non *M. kumadai* & *M. insulana*); Garb, 1999: 73, 76.

**Synaema:** Simon, 1900: 433; Suman, 1970: 839, non *Synema* Simon, 1864.

**Misumenops** F. O. Pickard-Cambridge, 1900: 143–144, in part; Petrunkevitch, 1911: 410–411; Gertsch, 1939: 323–330; Chamberlin & Ivie, 1944: 158–160; Kaston, 1948: 414 (regional revision); Kraus, 1955: 54–55; Schick, 1965: 111; Suman, 1970: 800 (regional revision); Jiménez, 1991: 421 (regional revision); Garb, 1999: 73, 76.

**Misumessus** Banks, 1896: 91, in part; 1904: 112, in part; 1907: 742, in part; Comstock, 1912: 530, in part.

**Runcinia:** Banks, 1900: 99.

**Misumenoides:** Petrunkevitch, 1911: 409, in part; Roewer, 1955: 841 (in part: Hawaiian species), non *Misumenoides* F. O. Pickard-Cambridge, 1900.

**Type species:** *Mecaphesa cincta* Simon, 1900 from Hawaiian islands, Maui, Haleakala, designated by Simon (1903).

**Composition:** This is the largest valid genus of the dump genus “*Misumenops* auct.”, still completely catalogued in *Misumenops* by Platnick (2006). *Misumenops asperatus* (Hentz, 1847) is the most widespread representative of this genus in North America and together with *M. celer* (Hentz, 1847) has hitherto served as a model of *Misumenops* for all American authors. Twenty-three other species have been described from North and Central America and an additional 21 species from the Hawaiian islands, many of them originally in *Diaea*, *Misumena*, *Misumenops* or *Synema*, or incorrectly transferred to *Misumenoides* (Roewer, 1955). There is at least one undescribed species from Haiti.

For most of the remaining Neotropical species assigned to *Misumenops*, detailed figures of the male palps are not available and thus the presence or absence of members of *Mecaphesa* among them cannot be confirmed now, but all records of described species from South America have been found to be misidentifications (cf. below).

**Diagnosis:** *Mecaphesa* resembles in general appearance *Misumenops*, *Ebrechtella* and several other *Misumenini* genera with dark annulated legs, longitudinal bands on the male carapace, and numerous tibial and metatarsal spines. According to the structure of the male palp, *Mecaphesa* seems to be related to *Misumenops* in having the base of the embolus on the prolateral margin of the tegulum, clear separation of embolus from tegulum, and small (as wide as long) VTA. However, *Mecaphesa* species can be easily distinguished from *Misumenops sensu stricto* by the coiled tip of the embolus lying on the retrolateral surface of the cymbium, the modified retrolateral surface of the cymbium supporting the embolus at rest, and by the more complex RTA bearing several outgrowths, at least partly homologous with ITA & RTA (no outgrowth in *Misumenops*). Females of *Mecaphesa* can be easily distinguished from *Misumenops* by having a central epigynal septum and a larger, more massive epigynal hood, larger basal parts of the receptacula and coiled ducts (cf. Schick, 1965: e.g. figs. 155, 168, 184, 186, with detailed terminology of different parts).

**Description:** Medium sized to small crab spiders with carapace covered throughout by erect setae; female legs

I–II with 3–8 pairs of ventral spines on tibiae and metatarsi, spination of male legs reduced; male abdomen with distinct abdominal pattern, female pattern obscure; legs with (male) or without (female) dark annulations on femora, tibiae and metatarsi, but lacking on tarsi as diagnostic character in comparison with *Misumenops*. Spotted parts of leg colour pattern also almost lacking.

*Palp*: Cymbium more or less twisted or screwed, at extreme with deep central furrow embracing embolus; embolus long, spiral, basally thick and gradually narrowed, distal part usually lying on external depression of cymbium, no tutacular process at base of cymbium as in *Misumenops*. Central part of embolus with variably striated surface, tip with orifice of ejaculatory duct variously shaped, but more or less similar within species of all groups. Ultrastructure of tip of embolus consists of different modifications of margin of distally tube-like embolus. Tibial apophyses RTA, ITA & VTA form marginal modifications of single, usually flattened plate as also in Pacific relatives of this genus; apex of RTA also evolved into variable structures between species groups. Best diagnostic character in comparison with *Misumenops*, *Runcinioides*, and unnamed *pallidus*-group is lack of distal serrate or ridged areas on or close to apex of plate of tibial apophyses (RTA–ITA).

*Epigyne*: With distinct central longitudinal septum (Kaston, 1981: figs. 1485, 1487), lacking in *Misumenops*, *Metadiaea* and *Runcinioides*; epigynal hood may be present, but much wider than central convex hood of *Misumenops*, seminal receptacula complex, with large compact basal parts and coiled ducts (cf. Schick, 1965: e.g. figs. 155, 168, 184, 186, with detailed terminology of different parts). No attempt is made here to describe the extremely variable ultrastructural details of the copulatory organs of species of *Mecaphesa*.

For description of the large species groups, see works of Schick (1965) for North American groups and Suman (1970) for the Hawaiian groups. The *asperata*-group has the most twisted cymbium and a crenulate although straight margin of the tube at the embolic tip, while the *californica*-group has a totally asymmetric tip of this embolic tube.

*Resulting new combinations* (for explanation of transfers of individual species, see figures of the copulatory organs of males and females for Californian species in Schick (1965) and for Hawaiian species in Suman (1970)): *Mecaphesa asperata* (Hentz, 1847), **comb. n.**, *Mecaphesa celer* (Hentz, 1847), **comb. n.**, *Mecaphesa lepida* (Thorell, 1877), **comb. n.**, *Mecaphesa kanakana* (Karsch, 1880), **comb. n.**, *Mecaphesa damnosa* (Keyserling, 1880: pl. 2 fig. 3+fresh material), **comb. n.**, *Mecaphesa dubia* (Keyserling, 1880), **comb. n.**, *Mecaphesa importuna* (Keyserling, 1881), **comb. n.**, *Mecaphesa insulana* (Keyserling, 1891), **comb. n.**, *Mecaphesa californica* (Banks, 1896), **comb. n.**, *Mecaphesa prosper* (F. O. Pickard-Cambridge, 1896: pl. 26 fig. 13), **comb. n.**, *Mecaphesa decora* (Banks, 1898: pl. 16 fig. 13), **comb. n.**, *Mecaphesa spiralis* (F. O. Pickard-Cambridge, 1900: pl. 10 fig. 2), **comb. n.**, *Mecaphesa anguliventris* (Simon, 1900), **comb. n.**, *Mecaphesa nigrofrenata* (Simon, 1900), **comb. n.**, *Mecaphesa oreades* (Simon, 1900), **comb. n.**,

*Mecaphesa velata* (Simon, 1900), **comb. n.**, *Mecaphesa rufithorax* (Simon, 1904), **comb. n.**, *Mecaphesa coloradensis* (Gertsch, 1933), **comb. n.**, *Mecaphesa devia* (Gertsch, 1939), **comb. n.**, *Mecaphesa gertschi* (Kraus, 1955: figs. 145–146), **comb. n.**, *Mecaphesa persimilis* (Kraus, 1955), **comb. n.**, *Mecaphesa rothi* (Schick, 1965), **comb. n.**, *Mecaphesa quercina* (Schick, 1965), **comb. n.**, *Mecaphesa sierrensis* (Schick, 1965), **comb. n.**, *Mecaphesa gabrielensis* (Schick, 1965), **comb. n.**, *Mecaphesa schlingerii* (Schick, 1965), **comb. n.**, *Mecaphesa deserti* (Schick, 1965), **comb. n.**, *Mecaphesa importuna belkini* (Schick, 1965), **comb. n.**, *Mecaphesa aikoa* (Schick, 1965), **comb. n.**, *Mecaphesa verityi* (Schick, 1965), **comb. n.**, *Mecaphesa lowriei* (Schick, 1970), **comb. n.**, *Mecaphesa arida* (Suman, 1970), **comb. n.**, *Mecaphesa baltea* (Suman, 1970), **comb. n.**, *Mecaphesa bubulcus* (Suman, 1970), **comb. n.**, *Mecaphesa cavata* (Suman, 1970), **comb. n.**, *Mecaphesa discreta* (Suman, 1970), **comb. n.**, *Mecaphesa edita* (Suman, 1970), **comb. n.**, *Mecaphesa facunda* (Suman, 1970), **comb. n.**, *Mecaphesa hiatus* (Suman, 1970), **comb. n.**, *Mecaphesa imbricata* (Suman, 1970), **comb. n.**, *Mecaphesa juncta* (Suman, 1970), **comb. n.**, *Mecaphesa carletonica* (Dondale & Redner, 1976: figs. 1–5), **comb. n.**, and *Mecaphesa revillagigedoensis* (Jiménez, 1991: figs. 5–8), **comb. n.**, all ex *Misumenops*.

*Species groups*: In addition to the three species groups found in North and Central America (*asperata*-, *celer*- and *californica*-groups, cf. Schick, 1965), at least two additional species groups must be created within *Mecaphesa*.

The nominate *cincta*-group with three species (*cincta*, *semispinosa* & *perkinsi* Simon, 1904) from the Hawaiian Islands has a less coiled tip of the embolus than any of the North American groups. The structure of the vulval receptacula is also simpler.

The *kanakana*-group includes 16 species previously included in *Misumenops* (*anguliventris*, *arida*, *baltea*, *cavata*, *edita*, *facunda*, *hiatus*, *imbricata*, *insulana*, *juncta*, *kanakana*, *naevigera* (Simon, 1900), *nigrofrenata*, *oreades*, *rufithorax*, and *velata*), all of them living only on the Hawaiian Islands. The ultrastructure of the tip of the embolus with a simple tube in the *celer*-group (Fig. 43) has evolved into a wide serrate plate in *M. kanakana* (Lehtinen, 2004: fig. 78 as *Mecaphesa vitellina*).

Some of the species seem to be transitional in relation to the group that has undergone a parallel evolution in the Polynesian archipelagos. In these species the cymbium is not twisted as in the majority of North American species, while the cymbial groove anterior to the alveolus is always a more or less straight furrow for the distal part of the embolus. The tutacular furrow of *Mecaphesa* has the same function, but is not homologous to the conductor of some other thomisids (*Pharta*-group and some genera of Stephanopinae) and also of the majority of other labidognath spiders. It is not even completely homologous with the two other types of tutacular structures of some other Thomisidae (in Coriarachnini & Hedanini).

*Distribution*: *Mecaphesa* is the dominant group of Misumenini in all parts of the Nearctic region and is



present also in Central America and in the Caribbean and Hawaiian islands. A regional revision has been done for the Californian species (Schick, 1965: under the generic name *Misumenops*).

*Remarks:* Mello-Leitão (1941) published records of *M. celer* from Argentina, Province of Salta, but they were based on misidentification (cf. p. 192). Several undescribed species are expected, especially in the Caribbean region. Garb & Gillespie (2003) suggested that the Hawaiian species of Misumenini all result from speciation following a single immigration, although Garb (1999) had earlier suggested three immigrations. Although the species were originally placed in many different genera, our results seem to support their conclusion, taking into account also results from other groups dealing with the much investigated speciation in the Hawaiian islands in relation to the number of immigrations. A critical analysis of the Hawaiian Misumenini (Simon, 1900; Suman, 1970) using the taxonomic criteria of Lehtinen (2004) and the present publication is necessary to clarify the detailed relationships of *Mecaphesa* Simon, 1900 to the Pacific species still catalogued in *Misumenops* (Berland, 1927, 1934, 1942). In addition to them, several undescribed Misumenini from the Pacific archipelagos (Polynesia, Galapagos & Juan Fernandez Islands) belong to an unnamed genus related to *Mecaphesa* with only a simple, straight tutacular furrow (Lehtinen, unpublished data), and a simple embolus, but with tibial apophyses as processes of a single plate as in all *Mecaphesa* species.

*Status of Abbot's species:* The oldest descriptions of these spiders are in Abbot's manuscript with colour plates (1792), on which the descriptions of Walckenaer (1837) of *Thomisus delphinus* and *Thomisus fuscatus* were based. All names based on these colour plates and regarded as senior synonyms are now generally treated as *nomina oblita*, and according to ICZN (1999: Art. 23.9.2) none of these names can now enter zoological nomenclature without a decision of the Commission. *Thomisus desidiosus* Walckenaer, 1837 and *Thomisus iners* Walckenaer, 1837 were also based on Abbot's colour plates and were transferred by Chamberlin & Ivie (1944) to *Misumenops*. As they have not yet been synonymised with later described species from Georgia, Art. 23.9 of ICZN (1999) cannot be applied to them, nor can they be treated as *nomina oblita* as are many other species based on Abbot's colour plates. They are both considered here as *nomina dubia*. No application to the Commission will be necessary to declare them as *nomina oblita*, as their possible synonymisation with some widespread and common Georgian *Mecaphesa* species would lead to a break of continuous usage and ICZN Art. 23.9 should anyway be applicable to them. Platnick (2006) did not list these species in *Misumenops*.

According to the opinion of Lehtinen (2004) the generic name *Chrizopsis* Simon, 1864 is a possible member of Misumenini, but has one of the still not synonymised species, *Thomisus purpuratus* Walckenaer, 1837 as its type species. This species and the genus *Chrizopsis* must therefore be treated as *nomina dubia*

instead of *nomina oblita*. (cf. also the partly deviating opinion by Lehtinen (2004: 174)).

Platnick (2006) listed *Chrizopsis maugéi* (Simon, 1864: 428) as a reference for *Camaricus maugéi*, but this action must be based on misinterpretation of some published source unknown to us, because Simon never described a genus spelled as *Chrizopsis* and the status of the obviously misspelled *Chrizopsis* is explained below. Simon (1864: 428) listed *Thomisus maugéi* first in his list of six included species, but this was not as such a valid designation in 1956, although sometimes in the past interpreted as valid. *Chrizopsis* was originally described as a subgenus of *Thomisus*, and *Thomisus purpuratus* Walckenaer, 1837, a species based on a colour plate painted from a spider from Georgia (USA) by Abbot (manuscript 1792), was designated first by Bonnet (1956) as its type species. The status of *Chrizopsis* Simon, 1864 was further discussed by Bonnet (1956: 1079). He preferred the Recommendation 69 A3 (ICZN 1999 and in previous editions) in rejecting *Thomisus maugéi*, previously designated as the type species of *Camaricus* Thorell, 1887. Recommendation 69 A10 clearly states that "All other things being equal" page position precedence should be used. The type designation by Bonnet (1956) is not only valid, but done according to the Recommendations of the Code.

#### ***Misumessus* Banks, 1904**

*Misumena*: Keyserling, 1880: 78, 85, in part; Emerton, 1892: 371; Simon, 1897: 87.

*Misumenops*: F. O. Pickard-Cambridge, 1900: 144, in part; Platnick, 2006, in part (all subgenera omitted).

*Misumessus* Banks, 1904: 112, in part; for later references to American authors, see Platnick, 2006 under *Misumenops oblongus*; Lehtinen, 2004: 174.

*Misumenops (Misumessus)*: Gertsch, 1939: 320; Schick, 1965: 110.

*Type species: Misumena oblonga* Keyserling, 1880 from North America.

*Discussion:* Currently, the genus *Misumessus* is monotypic, but according to the modern concept of spider genera, well justified. The original delimitation by Banks (1904) included species from four different genera, including also *Misumenops*, *Diaea* Thorell, 1869, and *Parasynema* F. O. Pickard-Cambridge, 1900, the last two representing genera outside Misumenini. A close relative of the type species of *Misumenops (M. bellulus)* was added by Banks (1910).

Kaston (1948) did not list subgenera at all and therefore Gertsch (1939) is not mentioned in his references to *Misumessus*. Bonnet (1957) omitted Banks, 1904: 112, the original description of *Misumessus*, from references to the type species, *Misumessus oblongus*.

#### ***Misumessus oblongus* (Keyserling, 1880)**

*Misumena oblonga* Keyserling, 1880: 79, pl. 2 fig. 52; Emerton, 1892: 371, pl. 30 fig. 4.

*Misumena americana* Keyserling, 1880: 85, pl. 2 fig. 44; Simon, 1897: 876.

*Misumenops oblongus*: F. O. Pickard-Cambridge, 1900: 144, pl. 10, figs. 8–9; Gertsch, 1939: 320, figs. 44–45, 62–63; Chickering, 1940: 197, figs. 13–15; Kaston, 1981: 415, figs. 1486, 1504–1506.

*Misumenops (Misumessus) oblongus*: Schick, 1965: 111, figs. 153–155; Dondale & Redner, 1978: 141, figs. 451–454; Breene *et al.*, 1993: 78, figs. 78A–C.

*Misumessus oblongus*: Banks, 1904: 112; Lehtinen, 2004: 174.

**Material examined:** Females from Illinois, USA (PTL) and Mexico (UNAM).

**Diagnosis:** The presence of only small weak setae both on the carapace and on femora I, instead of long strong spines as in *Misumenops* and especially *Runcinioides* and *Mecaphesa*, is diagnostic for *Misumessus* among the somatic characters. In the male palp, RTA and ITA are not fused, but are clearly separate tibial apophyses, and VTA is close to the base of RTA. The origin of the embolus is at *c.* 12 o'clock, but detailed information about the ultrastructure of the embolus is not available. There is no epigynal hood, but a large, posteriorly rounded median scape.

**Description:** Schick (1965: 131, figs. 153–155) presented a good description of both sexes. As no males are available for us, no additions are presented here. As long as no additional species are known for *Misumessus* the diagnosis of the genus cannot be presented separately from that of the type species.

**Relationships:** The sister genus of *Misumessus* can only be defined when all the South American fauna of *Misumenops s. lat.* has been revised based on type material. It is obviously not closely related to either *Mecaphesa* or *Misumenops*.

**Distribution:** *Misumessus oblongus* has been found from Mexico to southern Canada and has one of the widest ranges of North American species of Misumenini.

### Remaining species of *Misumenops s. auct.*

Many other species of *Misumenops* catalogued by Platnick (2006) from the New World lack adequate diagnostic figures to confirm their placement in *Misumenops* or their transfer to another genus. A preliminary check of several types in MLP and unpublished material from NMW, MZUM, and material collected by the senior author from the Neotropical region showed that there are several supraspecific taxa worthy of generic status among the Misumenini of South America.

The still unnamed *pallens*-group partly corresponds to *Metadiaea sensu* Rinaldi (1988) but, excluding the type species, most probably includes many species. No material of *c.* 30 species assigned to *Misumenops* and inadequately described has been available and even the depository of the types is unknown for some of them. They await placement through further study that must be based on type material or at least topotypic material.

As a starting point for this revision a female lectotype is here designated for *Misumena pallens* Keyserling, 1880 from among the syntypes preserved in NMW. This preservation has hitherto not been known to the South American arachnologists working with Thomisidae.

Lectotype ♀ of *Misumena pallens* Keyserling, 1880 designated here from Brazil: Blumenau, leg. Hetschko (NMW acquisition no. 1886 XI 28).

The unrevised and new taxa of the Old World Misumenini are not discussed here.

### Acknowledgements

Ms Janet Beccaloni, British Museum, Natural History, London made the redescription of the type species of *Misumenops* possible by loaning the syntypes. Dr Cristian Ituarte, Dr Luis Alberto Pereira and Ms Monica Tassara, Museo de La Plata, La Plata, Argentina, made possible the checking of misidentified material and also loaned the types of many other *Misumenops sensu auct.* Our retired colleague, Dr Jürgen Gruber, Naturhistorisches Museum Wien, Austria arranged through Dr Verena Stagl the loan of several samples of Misumenini, including numerous originally misidentified specimens of *Misumenops*. Prof. Dr Jerzy Proszynski, Milano'wek, Poland, provided information about the present staff of the Warsaw Museum, while Ms Dominika Mierzwa gave information about the types in the collection of that museum. Prof. Oscar Francke and Dr Maria Luisa Jiménez, Universidad Nacional Autonoma de México, México City, kindly loaned types and partly identified material of Mexican Thomisidae. Dr Cristian Grismado, Museo Argentino "Bernardino Rivadavia", Buenos Aires, Argentina, made available several Argentinian samples of Misumenini and gave essential information about type localities, etc. Dr Scott Miller, then Bernice P. Bishop Museum, Honolulu, Hawaii kindly made available the Hawaiian Misumenini for checking during a visit to Honolulu. Dr Ricardo Perez-Miles, Montevideo, Uruguay, Dr Gustavo Romero, Campinas, SP, Brazil, Dr Jacob Walter, Neuhausen, Switzerland, Dr Jung Sun Yoo, Seoul, Korea, Dr G. B. Edwards, Gainesville, Florida, USA, Ms Peggy Gerba, Tucson, Arizona, USA, Dr D. T. Jennings, Garland, Maine, USA, and Prof. Ossi Lindqvist (now Kuopio, Finland), sent fresh material of other essential species. Prof. Arno Lise, Porto Alegre, Brazil, Dr Isabela Rinaldi, Universidade Estadual Paulista, Botucatu, Brazil, Mr Thiago da Silva Moreira and Dr Adriano Kury, both Rio de Janeiro, Brazil, helped in sending photocopies, reprints and information about type material, type localities and other essential facts on South American Misumenini. Mr Richard Kielb, Library of the British Museum, London, kindly sent copies of colour photographs of some thomisids from the old manuscript of Thomas Abbot.

Dr Seppo Koponen, University of Turku, made possible the visits of Y. M. Marusik to the University of Turku at different phases of the work. Mr Veikko Rinne, University of Turku, assisted with arrangements for making digital photographs as well as with other computer programs. Dr Ilari Sääksjärvi, Zoological Museum, Turku, kindly assisted with translation of some expressions in the old Argentinian Spanish. We also thank the editor, Dr Peter Merrett for exceptionally careful editorial work and two anonymous referees for helpful comments. The help of all these institutions and persons is gratefully acknowledged.



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