

Sparassidae of Japan. I. New Species of *Olios*, *Heteropoda*, and  
*Sinopoda*, with Notes on Some Known Species  
(Araneae: Sparassidae: Sparassinae and Heteropodinae)

Peter Jäger<sup>1</sup> & Hirotsugu Ono<sup>2</sup>

<sup>1</sup> Institut für Zoologie, Johannes Gutenberg-Universität, Saarstraße 22, 55099 Mainz, Germany  
E-mail: jaegp000@mail.uni-mainz.de

<sup>2</sup> Department of Zoology, National Science Museum, Tokyo, 3-23-1 Hyakunin-cho,  
Shinjuku-ku, Tokyo, 169-0073, Japan  
E-mail: ono@kahaku.go.jp

**Abstract** — Four new species of the spider family Sparassidae are described from Japan under the names *Olios japonicus* sp. nov., *Heteropoda simplex* sp. nov., *Sinopoda okinawana* sp. nov. and *S. tanikawai* sp. nov. The genus *Olios* is recorded for the first time from Japan. Taxonomical notes and new records of some known species and comments on diagnostic characters of the subfamilies and genera of the Japanese Sparassidae are presented.

**Key words** — Araneae, Sparassidae, *Micrommata*, *Olios*, *Heteropoda*, *Sinopoda*, Japan, new species, taxonomy

Spiders of the family Sparassidae are distributed worldwide roughly between 40°N and 40°S, with the only exception of the Palearctic species *Micrommata virescens* (Clerck 1757). The species was regarded as the type species of the type genus of the family (Jäger 1999a). The sparassid spiders have been poorly investigated, although most representatives are large hunting spiders which may play an important role in tropical and subtropical ecosystems and agroecosystems. Only the Australian sparassids were studied more sufficiently, and several revisional papers were published by Hirst (e.g. 1990) and Davies (1994).

Since first arachnological investigations were made by Koch (1878), McCook (1878), Karsch (1879, 1881) and Bösenberg & Strand (1906), no revisional work on sparassids has been done in Japan. Publications on the Japanese Sparassidae with some comments are cited as follows. Kishida (1914) reported this family as Heteropodiidae (*sic*) and described *Stasina japonica*, *Micrommata virescens* and *Heteropoda venatoria*. He noted two *nomina nuda*, *Heteropoda kawatei* Kishida (from Ogasawara Islands) and *H. todai* Kishida (from Okinawajima Island). Yuhara (1931) explained on the name and characteristics of the family “Heteropodiidae (*sic*)” and described *Heteropoda venatoria*. Sekiguchi (1941, 1943a, b, 1944) described and illustrated *Heteropoda venatoria* and studied on its biology and life history.

After the World War II, Saito (1959) described *Heteropoda venatoria* and *Thelcticopis severa*, having used Sparassidae as the family name. Yaginuma (1958, 1960, 1986) described or noted all the known Japanese sparassid genera and species of those days. He described a new species of *Heteropoda* from Tokara Islands (Yaginuma 1961) and recorded a strange color anomaly of *Heteropoda venatoria* collected from Mie Prefecture (Yaginuma 1971). Ohno & Yaginuma (1969) reported *Sinopoda forcipata* (sub *Heteropoda f.*) and *Thelcticopis severa* from Goto Islands (Kyushu). Kayashima (1987) published a book on biology of *Heteropoda venatoria* in Japanese. Shinkai &

Takano (1984, 1987) published excellent photographs of *Heteropoda venatoria*, *Sinopoda forcipata* (sub *Heteropoda f.*), *Thectocopsis severa* and *Micrommata virescens*. Chikuni (1989) described *Heteropoda venatoria*, *Sinopoda forcipata* (sub *Heteropoda f.*), *Sinopoda* sp. (sub *Heteropoda stellata*), *Micrommata virescens* and *Thectocopsis severa*. Thus, 13 sparassid species were enumerated in recent checklists of Japan (Yaginuma 1990; Nishikawa 1993; Tanikawa 2000).

However, many of these records seem to be doubtful and some of the names should be synonymous with others. Recently, the senior author established the genus *Sinopoda* based on the type species *Sarotes forcipatus* Karsch 1881, a common species in southern Japan (Jäger 1999b). This species was hitherto regarded as a member of the genus *Heteropoda* in Japan.

For a revision of the spiders of the family Sparassidae in Japan, the authors re-examined type specimens in old collections of the European museums. They also examined new materials mainly deposited in the collection of the Department of Zoology of the National Science Museum, Tokyo. On the basis of these examinations, each species hitherto recorded from Japan has been taxonomically investigated. The first result of the study will be reported in the present paper. Four new species of the genera *Olios*, *Heteropoda* and *Sinopoda* will be described.

Abbreviations used in this paper: ALE - anterior lateral eyes, AME - anterior median eyes, AW - anterior width of prosoma, CC - chelicerae, CH - clypeus height, Cx - coxa, Fe - femur, Mt - metatarsus, NSMT - National Science Museum, Tokyo, OL - opisthosoma (abdomen) length, OS - opisthosoma (abdomen), OW - opisthosoma (abdomen) width, Pa - patella, PH - prosoma height, PJ - consecutive number of the specimens of sparassid spiders examined by Peter Jäger, PL - prosoma length, PLE - posterior lateral eyes, PME - posterior median eyes, Pp - palp, PS - prosoma, PW - prosoma width, RTA - retrolateral tibial apophysis, ST - sternum, TA - tegular apophysis, Ta - tarsus, Ti - tibia; ZMB - Zoologisches Museum der Humboldt Universität, Berlin; I, II, III, IV - legs I to IV.

A list of synonymy is made for each known species only on the basis of the records from Japan. The complete references, especially of *Micrommata virescens* and *Heteropoda venatoria*, were given in the catalogues.

## Taxonomy

### Family Sparassidae Bertkau 1872

The soft, dorsal trilobate membrane distally on each metatarsus is regarded as the diagnostic and apomorphic character. The family name Sparassidae established by Bertkau (1872) was confirmed as valid by Jäger (1999a).

### Subfamily Sparassinae Bertkau 1872

This group cannot be characterised at present (Jäger 1998, 1999a). Shared characters are: mostly two promarginal cheliceral teeth, straight or slightly procurved PE-row and eyes mostly equidistant and equal in size, lateral projections of trilobate membrane reduced.

Genus *Micrommata* Latreille 1804

*Sparassus* Walckenaer 1805 has been synonymized with *Micrommata* very recently (Jäger 1999a). Thus *Micrommata virescens* is the type species of the genus and *Micrommata* is the type genus of the family Sparassidae.

*Micrommata virescens* (Clerck 1757)

(Figs. 1-6)

*Micrommata virescens*: Kishida 1914, p. 45, 2 figs.; Yaginuma 1958, p. 10; Yaginuma 1960, p. 119, pl. 55, fig. 325; Yaginuma 1986, p. 197, fig. 110, pl. 52, fig. 6; Chikuni 1989, p. 131, fig. 4, p. 261.

*Micrommata rosea*: Sekiguchi 1941, add. p. 9, fig. 17; Yaginuma 1958, p. 16, fig. 4.

*Micrommata roseum*: Shinkai & Takano 1984, p. 167, 2 figs.

*Material examined.* 1 ♀ (PJ 1327), Nagato-shi, Yamaguchi Pref., Honshu, Japan, 22-V-1966, Koichi Murai leg. (Coll. Takeo Yaginuma), NSMT-Ar 310. 1 ♂, Numajiri-onsen Spa, 600-800 m alt., Inawashiro-machi, Yama-gun, Fukushima Pref., Honshu, Japan, 8-IX-1994 (adult on 2-XII-1994 after breeding), Hirotsugu Ono leg., NSMT-Ar 3572. 1 ♂ (PJ 698), Bremener Region, Germany, 6-VI-1996, Robert Samm leg., Coll. Peter Jäger.

*Notes.* This Palearctic species appears in Japan only in cold temperate regions (Hokkaido and mountainous regions of Honshu, Shikoku and Kyushu). The diagnosis and description are given by Jäger (1999a). The functional aspects of female genitalia (Figs. 1-3) are described herewith for the first time: slit-shaped copulatory orifices are situated at the lateral margins of the epigyneal plate (Fig. 1). From there the copulatory ducts run first anteriorly, then turn back into enlarged cavities (functional spermathecae). At the posterior end of these spermathecae, glands are present, from which the fertilization ducts continue in two loops. From this point the ducts run in an opposite direction to the copulatory ducts and further to the posterior margin of epigynum. The posterior epigyneal cavity is blind-ending and may serve as an anchor-point for a ♂ palpal apophysis (Figs. 4-6; illustrated with German ♂).

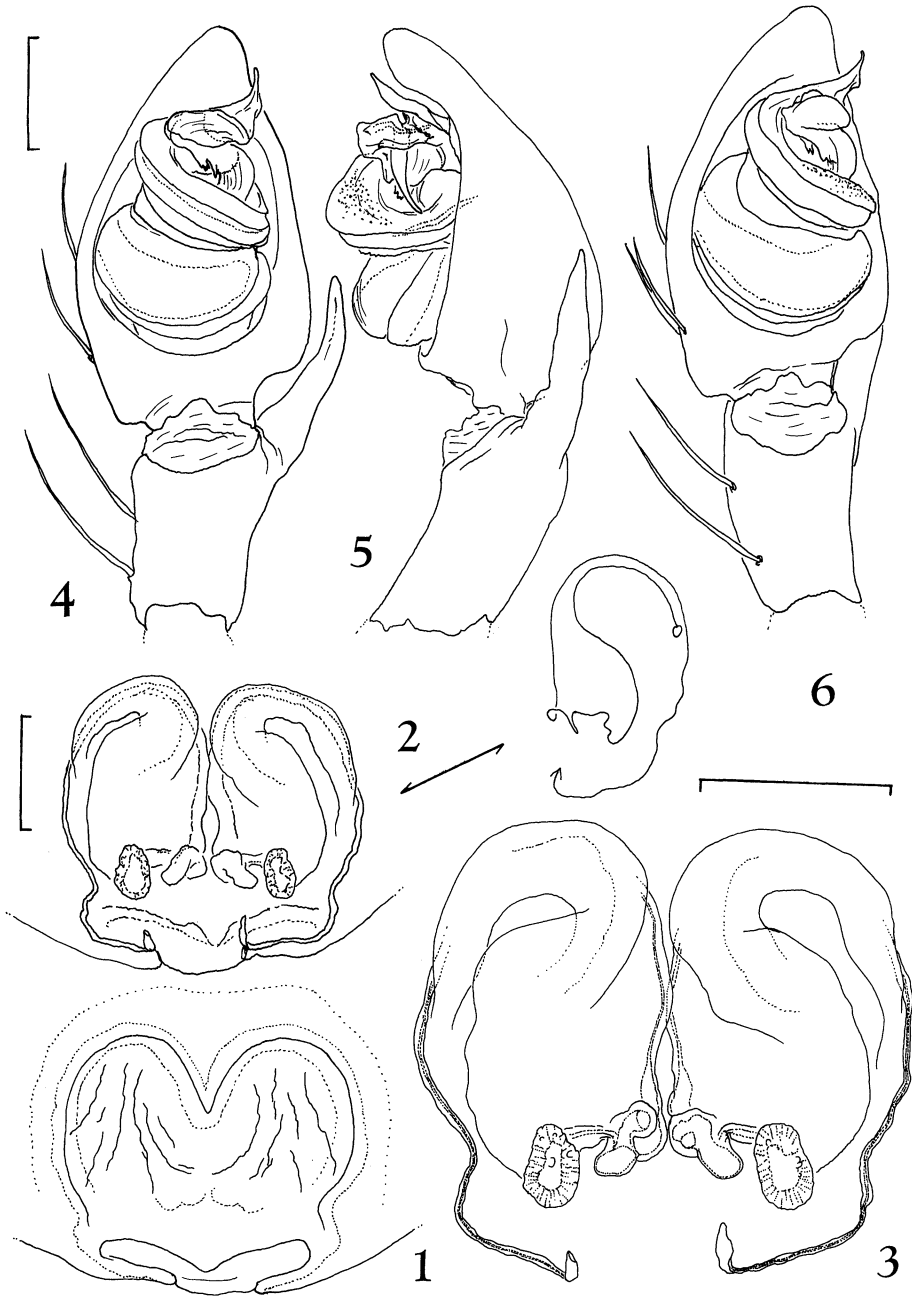
The same course of the posterior part of the fertilization duct (from lateral to median site) occurs also in most other representatives of Sparassinae (except for Polybetini), Deleninae and in the *Palystes superciliosus*-group.

Genus *Olios* Walckenaer 1837

This genus stands in need of a worldwide revision, since many species have been described under *Olios* without any recent, available generic diagnosis. The senior author examined types of many nominal species of this genus as well as identified and unidentified, worldwide material. Species of the genus *Olios* s. str. (in the sense of the senior author) seem to be distributed in Africa, S-Europe and Asia. Species described from Australia most likely belong to the genus *Neosparassus* Hogg 1903. Most "*Olios*" species from S-America seem to belong to another genus. True *Olios* species in the USA (e.g., *O. fasciculatus* Simon 1880) may have been introduced.

Bonnet (1958) listed 23 species of the genus from Asia and Papua-New Guinea, most of which occur in India. Gravely (1931) listed 9 Indian species, Sethi and Tikader (1988) described 3 new species and listed 13 additional species from India also.

The following new species is the first record of this genus in Japan and represents the northeasternmost point in distributional range of this genus. The new species is closely related to *Olios mahabangkawitus* Barrion & Litsinger 1995 from the Philippines



**Figs. 1-6.** *Micrommata virescens* (Clerck 1757): 1-3, ♀ from Yamaguchi Pref., Japan (NSMT-Ar 310); 4-6, ♂ from Germany (PJ 698). — 1, Epigynum, ventral view; 2, internal genitalia, dorsal view; 3, internal genitalia, dorsal view, enlarged; 4, left palp, ventral view; 5, left palp, retrolateral view; 6, left palp, prolateral view. (Scales: 0.5 mm.)

and to an undescribed *Olios* species from N-Vietnam, both examined by the senior author. Two further species, *O. sericeus* (Kroneberg 1875) (Asia Minor) and *O. suavis* (O. Pickard-Cambridge 1876) (Egypt and Israel), also have some characters in common: shape of tibial apophysis (similar in *O. sericeus*, *Olios* sp. (N-Vietnam) and *Olios japonicus* sp. nov.); presence of a tegular apophysis (small in *O. suavis*, very large in *O. sericeus*); embolus, bent distally in a semi-circle. *Olios suavis* (according to Levy 1989) and *O. kiranae* Sethi & Tikader 1988 show similar abdominal patterns as the new species. All these species belong to a derived species group with small-sized representatives. Larger, more primitive *Olios* species occur in India (Gravely 1931; Sethi & Tikader 1988), the Philippines (Barrion & Litsinger 1995; sub *Isopoda* spp.) and other Asian countries.

Further investigations should attempt to draw the generic limits of *Olios* and to recognize species groups within this huge genus.

***Olios japonicus* sp. nov.**

(Figs. 7-15)

*Type material.* ♂ Holotype (PJ 1330), Urauchi, Iriomotejima Is., Okinawa Pref., Japan, 16-VIII-1985, Akio Tanikawa leg., NSMT-Ar 4214.

*Further material examined.* 1 probably immature ♀ (PJ 1331), same data as for the holotype, except for the collecting date: 28-III-1987, NSMT-Ar 4213. The female genitalia were not completed (Figs. 7-9); a pre-epigynum is present as was observed in other representatives of the family (e.g. *Heteropoda venatoria*). The ♀ type specimen of *O. kiranae* Sethi & Tikader 1988 has a similar genital structure. It cannot be excluded that the Indian species was also described with a subadult ♀.

*Etymology.* Named after the country of origin; adjective.

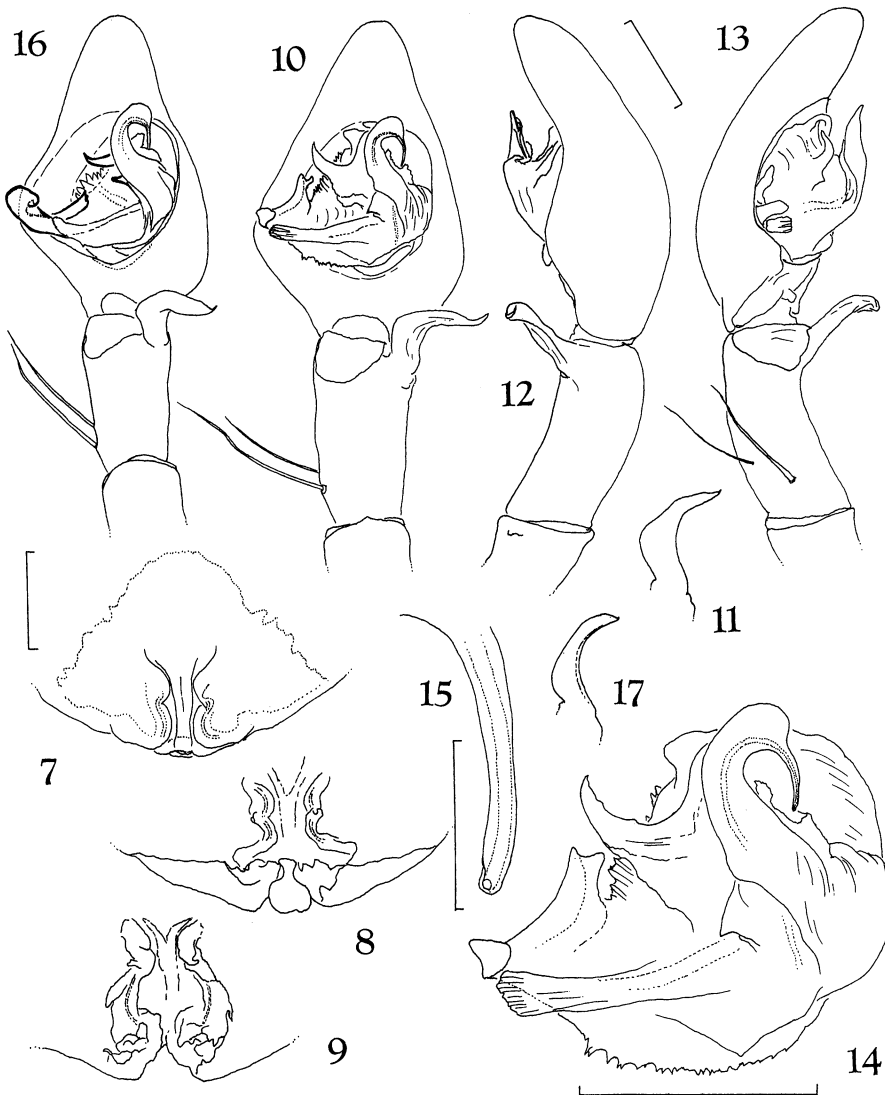
*Diagnosis.* ♂ with RTA hook-shaped, tapering retrolaterad (Figs. 10-13); proximal and prolateral margins of bulb toothed; prolateral apophysis pointing distad, with two teeth; TA as large as the embolus (Fig. 14). The male palp closely resembles that of *Olios mahabangkawitus* Barrion & Litsinger 1995, described from Mindanao Island, the Philippines, but the present new species may be distinguished from the Philippine species by following characters: RTA bent nearly at right angle; proximal and prolateral margin of bulb toothed more distinctly; prolateral apophysis with different shape; TA larger (nearly as large as the embolus), projection at base of embolus larger and triangle-shaped (cf. Figs. 10-15 and 16-17).

*Description.* Measurements (in mm): ♂: PL 3.3, PW 3.1, AW 1.8, PH 1.0, OL 3.8, OW 2.2. Eyes: AME 0.25, ALE 0.22, PME 0.22, PLE 0.21, AME-AME 0.22, AME-ALE 0.08, PME-PME 0.28, PME-PLE 0.28, AME-PME 0.27, ALE-PLE 0.14, CH AME 0.08, CH ALE 0.13. Measurements of palp and legs as in Table 1.

Leg formula: 2143, spination: Pp 121,120,1101, Fe I-II 323, III 322, IV 321, Pa 000,

**Table 1.** Measurements of palp and legs of *Olios japonicus* sp. nov., ♂ holotype (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	1.4	0.6	1.0	1.7	4.7	
I	4.7	1.8	4.6	4.8	1.5	17.4
II	5.3	2.0	5.8	5.6	1.6	20.3
III	3.8	1.4	3.5	3.4	1.2	13.3
IV	4.5	1.5	4.0	4.4	1.3	15.7



**Figs. 7–15.** *Olios japonicus* sp. nov.: 7–9, immature ♀ (NSMT-Ar 4213); 10–15, ♂ holotype (NSMT-Ar 4214) from Iriomotejima Island, Japan. **16–17.** *Olios mahabangkawitus* Barrion & Litsinger 1995, ♂ holotype from Mindanao Island, the Philippines. — 7, Pre-epigynum, ventral view; 8–9, incomplete female internal genitalia, different dorsal views; 10, male left palp, ventral view; 11, RTA, ventral view; 12, male palp, retrolateral view; 13, male left palp, prolateral view; 14, tegulum, ventral view, enlarged; 15, tip of embolus, ventral view; 16, male left palp, ventral view; 17, RTA, ventral view. (Scales: 7–14, 16–17, 0.5 mm; 15, 0.1 mm.)

Ti I-II 2024, III 2124, IV 21(0)24, Mt I-III 2024, IV 3025. Embolus situated in retrolateral half of bulb, curved for 230° (Figs. 10, 14), tip of embolus simple (Fig. 15). Cheliceral furrow with 2 anterior and 5 posterior teeth.

Color: Yellowish brown. Fovea slightly marked with a dark line. Femora with black ventral spots in 2 parallel rows (legs I + II: about  $11 \times 2$  spots, III + IV about  $6-7 \times 2$  spots). Distal parts of legs slightly darker. Abdomen dorsally spotted with an black, elongated Y-shaped pattern, with black lateral spots, patch darker above heart.

♀: Adults unknown (see above).

*Distribution*. Known only from the type locality.

#### Subfamily Heteropodinae Thorell 1873

Diagnostic characters are given in Jäger (1998):  $AME < ALE$ , both rows of eyes recurved, denticles in cheliceral furrow in most case near 3 anterior teeth; ♀ palpal claw with long and curved teeth.

#### Genus *Heteropoda* Latreille 1804

Diagnostic characters are given in Jäger (1999b) as a distinction to *Sinopoda*: ♂ with filiform embolus embedded in a sheath-like conductor arising prolaterally on the bulb. In ♀, epigynum with median septum, in some species covered by lateral lobes; copulatory ducts coiled, separated from each other or touching each other only at their origin.

Revisions made by Davies (1994, Australia) and Sethi & Tikader (1988, India) are the only recent taxonomic investigations on this genus. *Heteropoda* species (except for the cosmopolitan *H. venatoria* and the E-Mediterranean *H. variegata*) occur all over S-Asia and along the coasts of Australia.

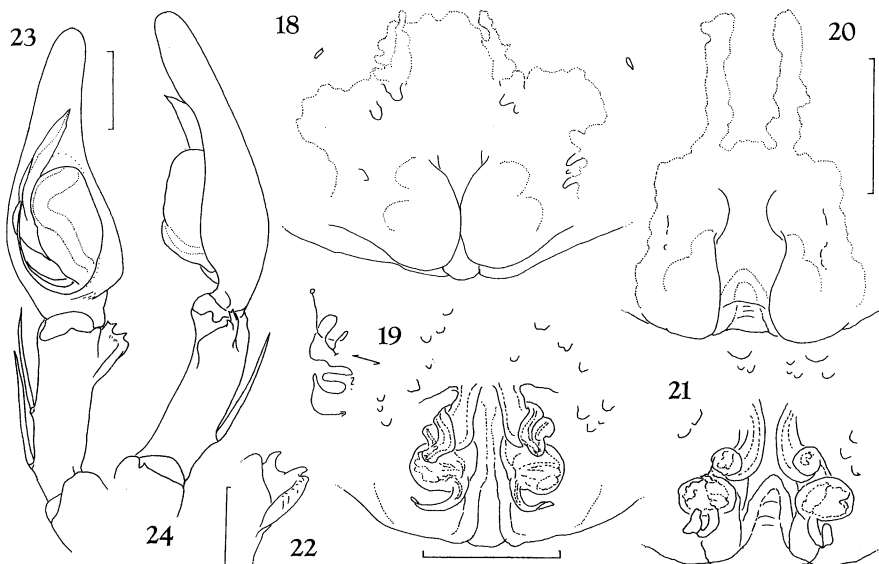
#### *Heteropoda venatoria* (Linné 1767)

(Figs. 18-24)

*Heteropoda venatoria*: Bösenberg & Strand 1906, p. 273, pl. 6, fig. 64, pl. 16, fig. 453; Yuhara 1931, p. 193, figs. 106-107; Sekiguchi 1941, add. p. 9, fig. 18; Sekiguchi 1943a, p. 66, figs. 1, 3-4, fig on cover page; Sekiguchi 1943b, p. 98, fig. 8; Sekiguchi 1944, p. 1, fig. 15; Yaginuma 1958, p. 9; Saito 1959, p. 5, fig. 2(25), p. 6, fig. 3(4), p. 121, pl. 19, fig. 152a, pl. 20, fig. 152b-c; Yaginuma 1960, p. 118, fig. 98(1,3), pl. 54, fig. 322, p. 153, fig. 36; Shinkai & Takano 1984, p. 168, 4 figs.; Yaginuma 1986, p. 199, fig. 111(1), pl. 53, fig. 1; Shinkai & Takano 1987, p. 102, p. 103, fig.; Chikuni 1989, p. 130, fig. 1, p. 260.

*Heteropoda venatorius*: Kishida 1914, p. 46.

*Material examined*. 1 ♂ (PJ 1309), Nakanuma, Minamiashigara-gun, Kanagawa Pref., Honshu, Japan, 25-IX-1995, Yuko Takahashi leg., NSMT-Ar 4198. 1 ♀ (PJ 943), Osaka-shi, Osaka Pref., Honshu, Japan, 21-IX-1952, Takeo Yaginuma leg., NSMT-Ar 412. 2 ♀ (PJ 1311-1312) 1 ♂ (PJ 1310), Shirahama, Wakayama Pref., Honshu, Japan, VIII-1988, Hirotsugu Ono leg., NSMT-Ar 4226. 1 ♀ (PJ 1305) many juveniles, Kochi-shi, Kochi Pref., Shikoku, Japan, 19-VI-1940, collector unknown, NSMT-Ar 4206. 1 ♀ (PJ 1323), Banna-Koen, Ishigakijima Is., Okinawa Pref., Japan, 7-XI-1985, Masaaki Tomokuni leg., NSMT-Ar 4203. 1 ♀ (PJ 1325), Otomi, Iriomotejima Is., Okinawa Pref., Japan, 31-III-1987, Akio Tanikawa leg., NSMT-Ar 4201. 1 ♀ (PJ 1313), Otomi, Iriomotejima Is., Okinawa Pref., Japan, 4-I-1989, Akio Tanikawa leg., NSMT-Ar 4225. 1 ♀ (PJ 1385), Sonai, Iriomotejima Island, Okinawa Pref., Japan, 29-XII-1985, Akio Tanikawa leg., NSMT-Ar 3573. 1 ♀ (PJ 1386), Funaura, Iriomotejima Is., Okinawa Pref., Japan, 24-VII-1991, Akio Tanikawa leg., NSMT-Ar 3574. 1 ♀ (PJ 1384), Urauchi, rice field, Iriomotejima Island, Okinawa Pref., Japan, 16-VIII-1988, Akio Tanikawa leg., NSMT-Ar 3575. 1 ♀ (PJ 1324), Kuantzuling, Taiwan, 25-V-1992, Rokurou Kano leg., NSMT-Ar 4202. 1 ♂ (PJ 1316), Cuc Phuong, 350 m alt., Gia Vien, Ninh Binh Province, Vietnam, 29-IX-1997, Hirotsugu Ono leg., NSMT-Ar 4212. 1 ♂ (PJ 409), Nam Cat Tien, 200 m alt., Vietnam, 17-25-VI-1995, Malicky leg.,



**Figs. 18–24.** *Heteropoda venatoria* (Linné 1767): 18–19, ♀ from Kochi Pref., Shikoku, Japan (NSMT-Ar 4206); 20–21, ♀ from Iriomotejima Island, Japan (NSMT-Ar 4225); 22, ♂ from Vietnam (PJ 409); 23–24, ♂ from Kanagawa Pref., Honshu, Japan (NSMT-Ar 4198). — 18, 20, epigynum, ventral view; 19, 21, internal genitalia, dorsal view; 22, RTA of left palp, ventral view; 23, left palp, ventral view; 24, left palp, retrolateral view. (Scales: 1 mm.)

Coll. Jörg Wunderlich. 1 ♀ (PJ 1319), Miwari, New Guinea, 7-III-1943, Taro Niimura leg., NSMT-Ar 4193.

**Notes.** This species has the widest distribution within the family. Although it is recorded in a great number from all over the world, only little taxonomic work has been done on it. In Japan, two forms in females exist: one (from Kochi Pref., Shikoku) with a trilobate epigyneal field, which includes the epigyneal bands, and with duct coils directed posteriad (Figs. 18–19). The second form (♀ from Iriomotejima Island) has an almost quadratic epigyneal field with separated bands and with dorsad-directed duct coils (Figs. 20–21). In males different forms of the RTA occur not just in Japan but also all over the world (Figs. 22–24). Whether these characters are always combined with each other and how characters of female genitalia are correlated, cannot be stated at present. It is necessary to examine more material (♂ and ♀ from different locations) before further statements can be made.

#### *Heteropoda tokarensis* Yaginuma 1961

*Heteropoda tokarensis* Yaginuma 1961, p. 84, figs. G-L (♀ holotype and 2 ♀ 3 ♂ 1 subadult ♀ paratypes, from Nakanoshima Island, Tokara Islands, Kagoshima Pref., Japan, 4-13-VI-1953, Yoshitaka Tsutsui leg., Coll. T. Yaginuma, in Osaka Museum of Natural History, not examined); Yaginuma 1986, p. 200, fig. 111(4).

**Material examined.** 1 ♀ (PJ 942), Nakanoshima Is, Tokara Isls., Kagoshima Pref., Japan, VII-1953, Yoshitaka Tsutsui leg., NSMT-Ar 309.



*Notes.* This species is closely related to *H. venatoria*. The diagnostic characters of *H. tokarensis* described by Yaginuma (1961) may lie within the variation of the worldwide distributed species, *H. venatoria*. Materials of *H. venatoria* from all over the world have been examined by the senior author. Intensive studies are necessary to evaluate the status of *H. tokarensis* and to prove, whether it is just a smaller form of *H. venatoria*. Smaller forms of *H. venatoria* occur also on Iriomotejima Island, Japan (1 ♀ NSMT-Ar 3575, see the data of material mentioned above) and Krakatau Island, Java (specimens in Coll. Nentwig, Bern; examined).

***Heteropoda simplex* sp. nov.**

(Figs. 25–26)

Type material. ♂ Holotype (PJ 1298), Iriomotejima Is., Okinawa Pref., Japan, 29-VII-1987, Akio Tanikawa leg., NSMT-Ar 4217. 1 ♂ Paratype (PJ1296), Iriomotejima Is., Okinawa Pref., Japan, ?-III-1986, (15-V-1986, adult after breeding), Akio Tanikawa leg., NSMT-Ar 4216.

*Etymology.* Named after the simple shape of retrolateral apophysis of male palp (Latin: *simplex* means simple); adjective.

*Diagnosis.* Males can be recognized by a following combination of characters:



**Figs. 25–26.** *Heteropoda simplex* sp. nov., ♂ holotype (NSMT-Ar 4217). — 25, left palp, ventral view; 26, left palp, retrolateral view. (Scale: 1 mm.)

**Table 2.** Measurements of palps and legs of *Heteropoda simplex* sp. nov., ♂ holotype and 1 ♂ paratype (in parentheses) (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	3.5 (3.2)	1.6 (1.5)	2.9 (2.6)		3.4 (2.8)	11.4 (10.1)
I	10.8 (9.8)	4.3 (3.6)	12.1 (10.9)	11.0 (9.6)	3.3 (2.8)	41.5 (36.7)
II	12.8 (11.1)	4.4 (3.8)	14.0 (12.2)	11.0 (10.2)	3.3 (2.9)	46.3 (40.2)
III	10.1 (9.1)	3.6 (2.9)	10.1 (8.9)	8.3 (7.4)	2.5 (2.3)	34.6 (30.6)
IV	10.5 (9.6)	3.2 (3.0)	10.5 (9.7)	10.2 (9.0)	2.6 (2.7)	37.0 (34.0)

shape of RTA (Fig. 26), sperm duct and conductor and point of arising of embolus (Fig. 25).

*Description.* ♂: Measurements of holotype (in mm) (measurements of paratype in parentheses): PL 7.2 (6.5), PW 7.0 (5.9), AW 3.5 (2.9), PH 1.9 (1.7), OL 8.5 (7.4), OW 4.8 (4.2). Eyes: AME 0.36 (0.30), ALE 0.59 (0.52), PME 0.45 (0.42), PLE 0.62 (0.55), AME-AME 0.21 (0.20), AME-ALE 0.08 (0.06), PME-PME 0.29 (0.28), PME-PLE 0.51 (0.45), AME-PME 0.44 (0.43), ALE-PLE 0.47 (0.45), CH AME 0.66 (0.62), CH ALE 0.45 (0.38). Measurements of palp and legs as in Table 2.

Leg formula: 2143, spination: Pp 131, 101, 2121, Fe I-II 323, III 333, IV 331, Pa I-II 101, III 0(1)01, IV 0(1)01(0), Ti I-III 21(2)26, IV 2126, Mt I-II 1014, III 2024, IV 3036.

Color: Yellowish brown with red-brown markings. PS covered with dark hairs, posteriorly with a light transversal band. CC light red-brown with 3 indistinct longitudinal stripes covered by bristles. ST, Cx, femora, ventral OS light yellow. Femora and tibiae with indistinct patches at bases of spines. Metatarsi and tarsi red-brown. Abdomen dorsally with 2 dark anterior patches, dark sigillae (2 pairs) and short dark transversal posterior band with light patch behind.

♀: Unknown

Variation: Both specimens with one of their chelicerae bearing 5 posterior teeth: one specimen with an additional tooth in distal position, the other one with an additional tooth in front of the 4 regular teeth.

*Distribution.* Known only from the type locality.

*Notes.* No closely related species from neighboring regions is known to the authors. Males of *Heteropoda zhangi* Song & Zhu 1999 from southeastern part of China (Zhejiang Prov.) possesses RTA and cymbium with a different shape and a different course of sperm duct (Song et al. 1999, fig. 269J). *Heteropoda* sp. from the Philippines figured in Barrion & Litsinger (1995, fig. 163, sub *H. venatoria*) differs from *H. simplex* sp. nov. also by the shape of its RTA, conductor, cymbium and by the course of the sperm duct.

#### Genus *Sinopoda* Jäger 1999

Jäger (1999b) placed three East Asian species in this genus: i.e. *Sinopoda forcipata* (Karsch 1881), *S. stellata* (Schenkel 1963) and *S. koreana* (Paik 1968).

The genus *Sinopoda* is distributed in E-India, Thailand, Malaysia, Borneo, China, Japan and S-Korea. According to Barrion & Litsinger (1995) it does not occur in the Philippines, whereas representatives of *Heteropoda*, *Thelcticopis* and *Olios* do so. Ancestors of *Sinopoda* species seem to have a more recent phylogenetic origin, i.e. when the Philippines have been separated from the continental land mass by the sea.

*Sinopoda forcipata* (Karsch 1881)

(Figs. 27–34)

*Sarotes forcipatus* Karsch 1881, p. 38 (3 ♀ 3 ♂ 1 subadult ♂ syntypes from Japan, F. M. Hilgendorf leg., in ZMB, examined; ♂ lectotype (ZMB 2698) and paralectotypes (other specimens, ZMB 2694–2698) were designated by Jäger 1999b).

*Heteropoda forcipata*: Bösenberg & Strand 1906, p. 276, pl. 15, fig. 438; Sekiguchi 1941, add. p. 10, fig. 19; Yaginuma 1958, p. 10, fig. 6; Yaginuma 1960, p. 118, fig. 98(2, 4), pl. 55, fig. 323; Yaginuma 1975, p. 189, figs. 7–8; Shinkai & Takano 1984, p. 169, 2 figs.; Yaginuma 1986, p. 199, fig. 111(2), pl. 53, fig. 2; Shinkai & Takano 1987, p. 102, fig.; Chikuni 1989, p. 130, fig. 2, p. 260.

*Sinopoda forcipata*: Jäger 1999b, p. 21, figs. 1–8.

*Material examined*. 1 ♀ (PJ 1307), Ida, Kawasaki-shi, Kanagawa Pref., ?–1995, Hirotsugu Ono leg., NSMT-Ar 4200. 1 ♂ (PJ 1308), Hounose, Tabayama-mura, Kitatsuru-gun, Yamanashi Pref., Honshu, Japan, 27-VII-1986, Fusae Inoue leg., NSMT-Ar 1235. 1 ♀ (PJ 1304), Mt. Iwawaki-san, Osaka Pref., Honshu, Japan, 3-VIII-1960, Takeo Yaginuma leg., NSMT-Ar 411. 1 ♀ (PJ 1322), Sonai, Iriomotejima Is., Okinawa Pref., Japan, 21-III-1975, Hirotsugu Ono leg., NSMT-Ar 4177. Type series were also examined by both authors; details as in Jäger (1999b).

*Notes*. Diagnosis and description see Jäger (1999b). Characteristics are well recognizable in the male palpal structure (Figs. 31–34 based on the specimen NSMT-Ar 1235; Jäger, 1999b, figs. 1–5 based on the paralectotype). Several females from Japan differ from the type material in the shape of lobes in the posterior part of their epigynum and in the shape of vulval structures. Female genitalia of two individuals from Kanagawa (NSMT-Ar 4200) and Osaka (NSMT-Ar 411) are illustrated in Figs. 27–30. A female from Iriomote Island (NSMT-Ar 4177) shows another variation. Further investigations of material, especially on male palps, are necessary to clarify, whether these differences are in an intraspecific variation or not.

*Sinopoda okinawana* sp. nov.

(Figs. 35–43)

*Type material*. ♂ Holotype (PJ 1301), Takasato, Okinawajima Is., Okinawa Pref., Japan, 1-IV-1997, Takeshi Sasaki leg., NSMT-Ar 4220. 1 ♀ Paratype (PJ 1299), Yona, Okinawajima Is., Okinawa Pref., Japan, 30-III-1997, Akio Tanikawa leg., NSMT-Ar 4221.

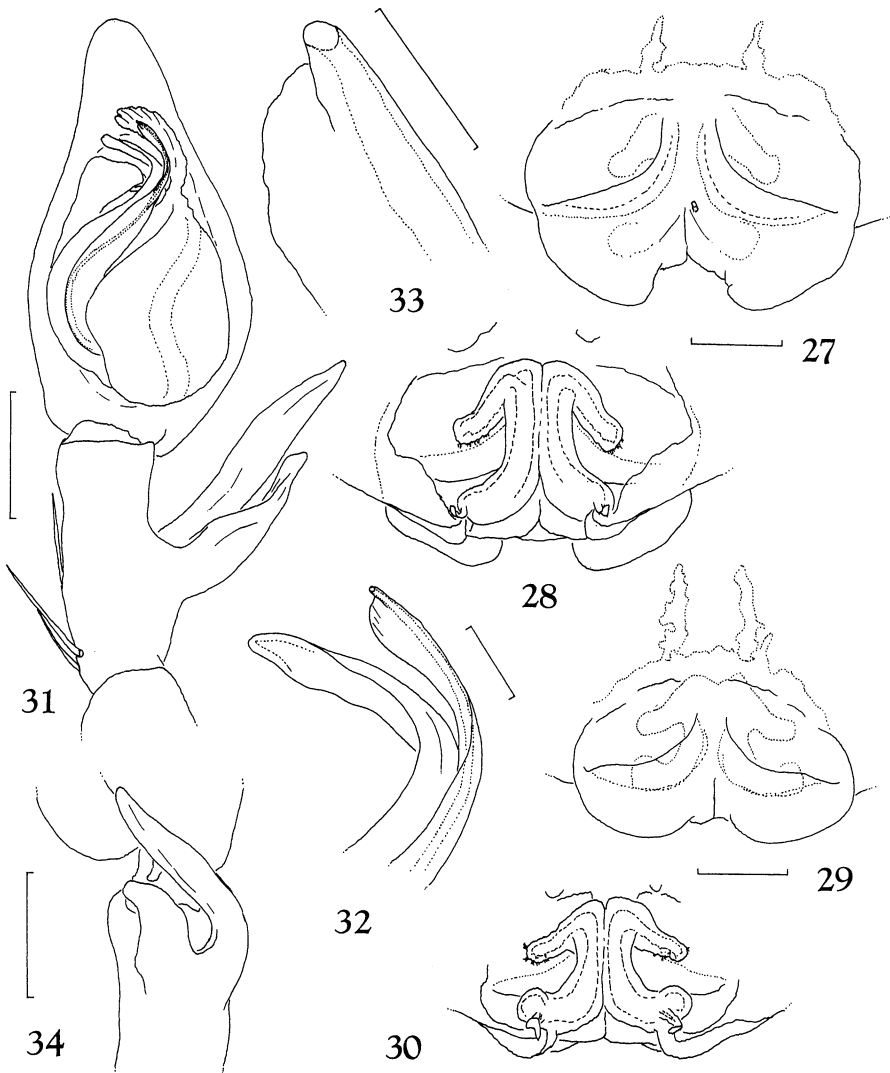
*Further material examined*. 1 ♀ (PJ 1300), Yona, Okinawajima Is., Okinawa Pref., Japan, 22-V-1997, Takeshi Sasaki & Tsukasa Kuwae leg., NSMT-Ar 4218. 1 ♀ (PJ 1297), Iheyajima Is., Okinawa Pref., 27-X-1993, Masaaki Kimura leg., NSMT-Ar 4219.

*Etymology*. Named after the type area (Okinawajima Island); adjective.

*Diagnosis*. Males with embolic apophysis short and pointed (Figs. 42–43); ventral part of RTA reduced, its dorsal part bent in the distal half (Figs. 39–41). Females with anterior part of vulva bent at right angles (to the median part). Vulva posteriorly wider

**Table 3.** Measurements of palp and legs of *Sinopoda okinawana* sp. nov., ♂ holotype (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.2	1.2	1.7		1.8	6.9
I	6.2	2.6	6.5	6.2	2.2	23.7
II	7.1	2.6	7.2	6.9	2.3	26.1
III	5.9	2.3	5.5	5.3	1.8	20.8
IV	6.3	2.2	5.9	6.3	2.3	23.0

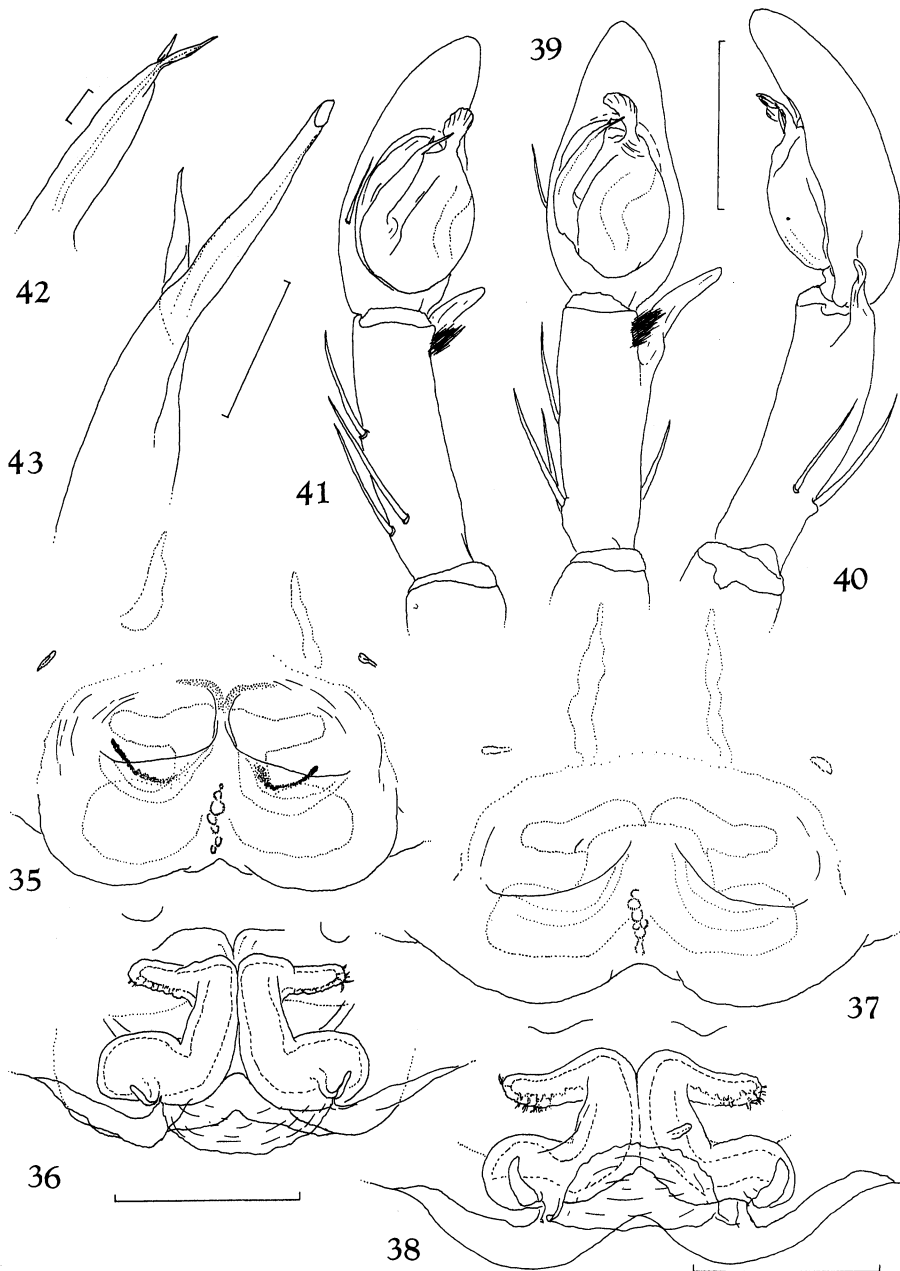


**Figs. 27–34.** *Sinopoda forcipata* (Karsch 1881): 27–28, ♀ from Kanagawa Pref., Japan (NSMT-Ar 4200), 29–30, ♀ from Osaka Pref., Japan (NSMT-Ar 411), 31–34, ♂ from Yamanashi Pref., Japan (NSMT-Ar 1235). — 27, 29, epigynum, ventral view; 28, 30, female internal genitalia, dorsal view; 31, male left palp, ventral view; 32, distal part of embolus, ventral view; 33, tip of embolus, ventral view; 34, RTA, retrolateral view. (Scales: 27–30, 0.5 mm; 31, 34, 1 mm; 32, 0.2 mm; 33, 0.1 mm.)

than anteriorly, posterior parts swollen (Figs. 35–36).

**Description.** ♂: Measurements (in mm): PL 4.9, PW 4.5, AW 2.3, PH1.3, OL 5.6, OW 3.4. Eyes: AME 0.24, ALE 0.39, PME 0.30, PLE 0.41, AME-AME 0.23, AME-ALE 0.06, PME-PME 0.23, PME-PLE 0.36, AME-PME 0.38, ALE-PLE 0.36, CH AME 0.31, CH ALE 0.25. Measurements of palp and legs as in Table 3.

Leg formula: 2143, spination: Pp 131, 101, 2111, 100, Fe I-III 323, IV 331, Pa 001,



**Figs. 35–43.** *Sinopoda okinawana* sp. nov.: 35–36, 1 ♀ paratype from Okinawajima Island, Japan (NSMT-Ar 4221), 37–38, 1 ♀ from Iheyajima Island, Japan (NSMT-Ar 4219), 39–43, ♂ holotype from Okinawajima Island, Japan (NSMT-Ar 4220). — 35, 37, Epigynum, ventral view; 36, 38, female internal genitalia, dorsal view; 39, male left palp, ventral view; 40, male left palp, retrolateral view; 41, male left palp, prolateral view; 42, tip of embolus, prolateral view; 43, tip of embolus, enlarged, prolateral view. (Scales: 35–38, 0.5 mm; 39–41, 1 mm; 42–43, 0.1 mm.)

**Table 4.** Measurements of palps and legs of *Sinopoda okinawana* sp. nov., ♀ paratypes (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.1–2.2	1.0–1.2	1.5–1.8		1.9–2.4	6.5–7.6
I	4.6–5.6	2.2–2.8	4.4–5.1	3.7–4.8	1.4–1.6	16.3–19.9
II	5.1–6.2	2.3–3.0	4.5–5.7	3.7–4.6	1.4–1.8	17.0–21.3
III	4.4–5.3	2.0–2.5	3.8–4.7	3.2–3.9	1.3–1.5	14.7–17.9
IV	4.7–5.8	2.0–2.4	4.3–5.1	4.0–4.3	1.6–1.8	16.6–19.4

Ti I-II 2326, III 2226, IV 2326, Mt I-II 2024, III 2026, IV 3036. Distal part of embolus straight. Proximal part of embolus freely visible. Sperm duct S-shaped. Palpal tibia as long as cymbium.

Color: yellowish with brown markings and dark brown hairs. PS with light transversal median and posterior bands; laterally covered by dark hairs, at margin with light patches. Longitudinal stripes at CC less distinct. ST, Cx and Fe yellow. Fe dorsally with indistinct dark patches at bases of spines; distal parts of legs darker. OS dorso-medially lighter, with irregular dark markings; OS posteriorly with almost triangular whitish brown patch; lateral OS dark with light spots; ventral side light with irregular markings.

♀: Measurements (in mm): PL 4.9–6.1, PW 4.4–5.6, AW 2.7–3.4, PH 1.8, OL 6.5–6.6, OW 3.5–4.0. Eyes: AME 0.22–0.29, ALE 0.38–0.45, PME 0.29–0.35, PLE 0.38–0.43, AME-AME 0.21–0.22, AME-ALE 0.09–0.13, PME-PME 0.28–0.35, PME-PLE 0.42–0.49, AME-PME 0.41–0.42, ALE-PLE 0.39–0.42, CH AME 0.31–0.35, CH ALE 0.27–0.28. Measurements of palp and legs as in Table 4.

Leg formula: 2143, spination: Pp 131,101,2121,1014, Fe I-III 323, IV 331, Pa 000, Ti I 1026, II-III 2026, IV 2126, Mt I 000(1)4, II 100(1)4, III 2016, IV 3036. Palpal claw with 7 teeth. Epigynum widely rectangular to oval (Figs. 35, 37).

Color: as in ♂, but darker and markings in general more distinct.

*Distribution.* Known only from two localities, Takasato and Yona, on Okinawajima Island, Japan; may also be distributed on Iheyajima Island.

*Notes.* 1 ♀ (PJ 1297) collected on Iheyajima Island about 40 km apart (NW) from Yona shows some genital characters which do not correspond with the ♀ paratype designated (cf. Figs. 35–36 and 37–38), but coloration and spination indicate conspecificity. At present it cannot be decided, whether this is due to intra-specific variation or not. The median part of epigynum may be variable in its width (cf. Figs. 35 and 37).

This new species resembles *Sinopoda koreana* (Paik 1968) described from Quelpart Island (Jeju, Cheju Is.), southern Korea, but is distinguishable from the latter by the details in the structure of male palp and female genitalia as given in the above diagnosis.

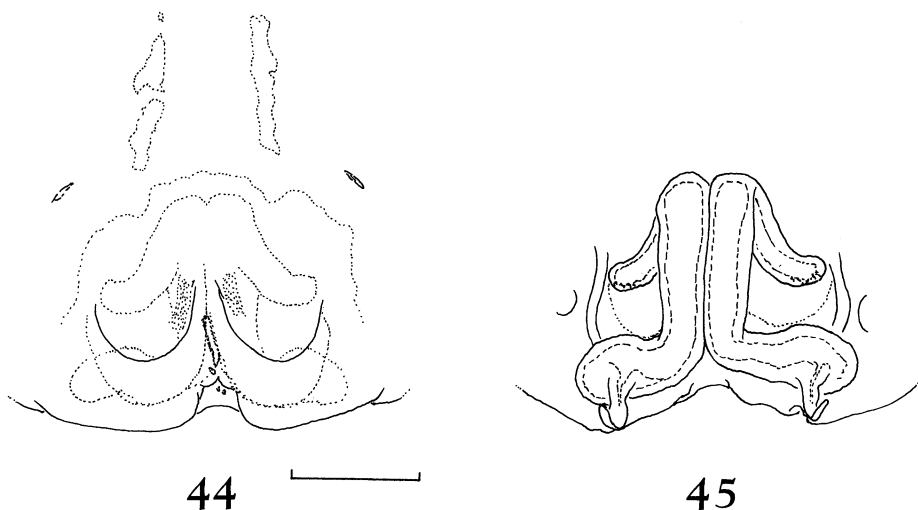
### *Sinopoda tanikawai* sp. nov.

(Figs. 44–45)

*Type material.* ♀ Holotype (PJ 1317), Honcha Pass, Amami-oshima Is., Kagoshima Pref., Japan, 28-VIII-1989, (2-VII-1990, adult after breeding), Akio Tanikawa leg., NSMT-Ar. 4215.

*Etymology.* In honor of the collector, Mr. Akio Tanikawa; noun in genitive.

*Diagnosis.* Female with epigyneal ledges forming a semi-circle (Fig. 44), median part of vulva extended and slender, bent dorsad (Fig. 45). *Sinopoda tanikawai* sp. nov. is closely related to the former species, *S. okinawana* sp. nov., but differs from the species by the differences in genital organs, its larger size, more pronounced leg spination of Pa



**Figs. 44–45.** *Sinopoda tanikawai* sp. nov. ♀ holotype from Amami-oshima Island, Japan (NSMT-Ar 4215). — 44, Epigynum, ventral view; 45, female internal genitalia, dorsal view. (Scale: 0.5 mm.)

**Table 5.** Measurements of palp and legs of *Sinopoda tanikawai* sp. nov., ♀ holotype (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	3.7	2.0	2.8		4.0	12.5
I	8.9	4.3	8.9	7.7	2.5	32.3
II	10.1	4.5	9.4	8.1	2.5	34.6
III	9.0	3.8	7.9	6.5	2.2	29.4
IV	9.1	3.7	8.5	8.2	2.6	32.1

and Ti and more yellowish coloration.

**Description.** ♀: Measurements (in mm): PL 9.3, PW 8.0, AW 5.2, PH 2.7, OL 10.6, OW 6.9. Eyes: AME 0.43, ALE 0.50, PME 0.42, PLE 0.46, AME-AME 0.35, AME-ALE 0.19, PME-PME 0.51, PME-PLE 0.66, AME-PME 0.63, ALE-PLE 0.59, CH AME 0.60, CH ALE 0.55. Measurements of palp and legs as in Table 5.

Leg formula: 2143, spination: Pp 131, 101, 212(1)1, 1014, Fe I-III 323, IV 331, Pa 001, Ti I-III 2026, IV 2326, Mt I-II 1014, III 2015, IV 3036. Epigyneal field approximately square, with 2 anterior bands separated from the field (Fig. 44); posterior part of vulva wider than anterior part (Fig. 45).

**Color:** Yellowish brown with sparse dark hairs and red-brown markings. PS with radial pattern, more distinct in the posterior part; posterior part of prosoma with light transverse submarginal band. Margins darkened discontinually. CC red-brown with 3 darker longitudinal stripes in front. ST, Cx, ventral Fe pale yellow without markings. Fe dorsal with patches at bases of spines and a single longitudinal stripe. Ti also with patches at bases of spines. Distal parts of legs darker. OS red-brown with light anterior median marking and paired light and dark patches behind. Posterior half of OS with a dark transverse bar and a whitish triangular patch behind. OS laterally

spotted; ventrally yellowish, posteriorly darker.

♂: Unknown.

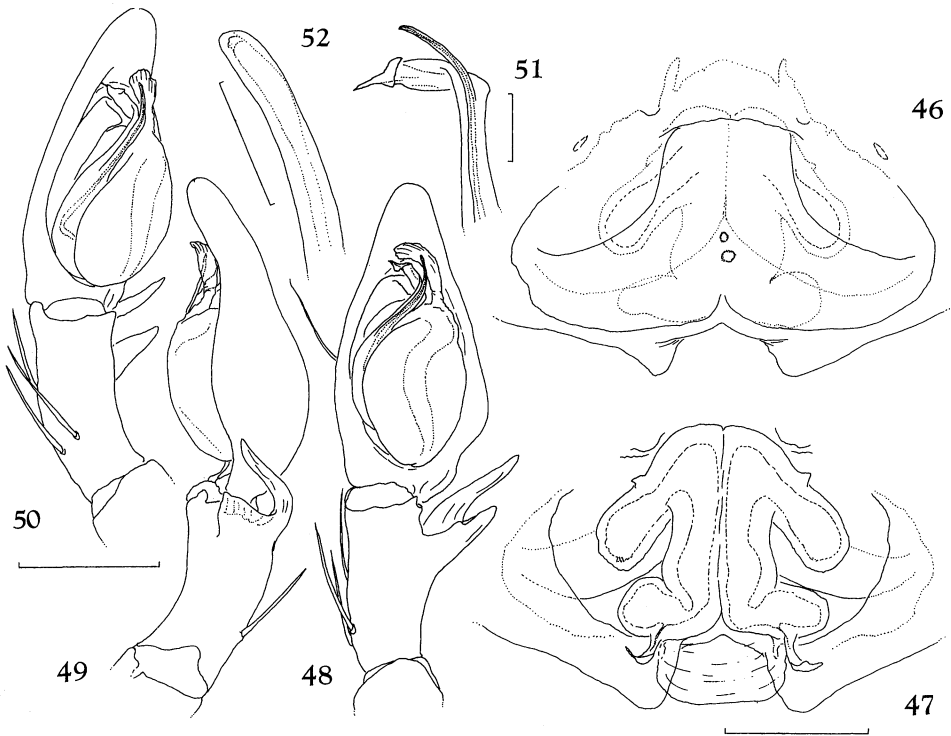
*Distribution.* Known only from the type locality.

*Sinopoda* sp. cf. *stellata* (Schenkel 1963)

(Figs. 46–53)

*Material examined.* 1 ♀ (PJ 1335), Kamisaibara-mura, Tomata-gun, Okayama Pref., Honshu, Japan, 14-X-1990, Yoh Ihara leg., NSMT-Ar 4207. 1 ♂ (PJ1336), Mugidani, Yuki-cho, Saeki-gun, Hiroshima Pref., Honshu, Japan, 14-X-1989, Yoh Ihara leg., NSMT-Ar 4210. 1 ♀ (PJ 1337), Uchiodani, Yuki-cho, Saeki-gun, Hiroshima Pref., 21-I-1990, Yoh Ihara leg., NSMT-Ar 4211. 1 ♂ (PJ 1334), Shimokinbara, Kuchiwa-cho, Hiba-gun, Hiroshima Pref., 7-V-1989, Yoh Ihara leg., NSMT-Ar 4209. 1 ♀ 1 ♂ (PJ 1333/1332), Shionoe-cho, Kagawa-gun, Kagawa Pref., Shikoku, Japan, 1-XI-1989, Yoh Ihara leg., NSMT-Ar 4208.

*Diagnosis.* ♂: Male palp (Figs. 48–52): Embolic apophysis distally with triangle-shaped structure (Figs. 48, 51), dorsal part of RTA digitiform in retrolateral view, ventral part of RTA triangle-shaped (Fig. 49). ♀: Median part of epigynum wide (ca.



**Figs. 46–52.** *Sinopoda* sp. cf. *stellata* (Schenkel 1963), 1 ♀ 1 ♂ from Kagawa Pref., Shikoku, Japan (NSMT-Ar 4208). — 46, Epigynum, ventral view; 47, female internal genitalia, dorsal view; 48, male left palp, ventral view; 49, male left palp, retrolateral view; 50, male left palp, prolateral view; 51, distal part of embolic division, ventral view; 52, tip of embolus, ventral view. (Scales: 46–47, 0.5 mm; 48–50, 1 mm; 51, 0.2 mm; 52, 0.1 mm.)



**Table 6.** Measurements of palps and legs of *Sinopoda* sp. cf. *stellata* (Schenkel 1963), 3 ♂ (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	2.4-2.9	1.4-1.6	1.5-1.8		2.1-2.6	7.5-8.9
I	4.9-6.1	2.3-2.8	4.9-6.5	4.7-6.2	1.6-2.1	18.4-23.7
II	5.7-7.0	2.4-2.9	5.7-7.2	5.3-7.1	1.7-2.1	20.8-26.3
III	4.5-5.8	1.9-2.4	4.1-5.3	3.8-5.1	1.4-1.6	15.7-20.2
IV	4.9-6.4	1.8-2.3	4.6-5.7	4.6-6.0	1.6-2.0	17.7-22.4

**Table 7.** Measurements of palps and legs of *Sinopoda* sp. cf. *stellata* (Schenkel 1963), 3 ♀ (in mm).

	Fe	Pa	Ti	Mt	Ta	Total
Pp	1.8-2.1	1.0-1.2	1.3-1.5		1.9-2.1	6.0-6.9
I	3.8-4.3	2.0-2.1	3.6-4.2	3.1-3.8	1.2-1.4	13.7-15.8
II	4.3-5.0	2.0-2.4	4.0-4.4	3.0-3.9	1.2-1.4	14.8-17.1
III	3.7-4.3	1.9-2.0	3.4-3.6	2.8-3.3	1.1-1.3	12.9-14.5
IV	4.1-4.7	1.5-1.9	3.7-4.1	3.7-4.3	1.4-1.6	14.4-16.6

1/3 of total epigynum width), epigynum oval (Fig. 46), the anterior part of vulva wider than the posterior part (Fig. 47).

**Description.** ♂: Measurements (in mm): PL 4.6-5.6, PW 4.1-4.8, AW 2.1-2.5, PH 1.5-1.8, OL 4.9-6.4, OW 3.2-4.0. Eyes: AME 0.21-0.24, ALE 0.32-0.35, PME 0.24-0.27, PLE 0.34-0.35, AME-AME 0.17-0.24, AME-ALE 0.05-0.06, PME-PME 0.24-0.28, PME-PLE 0.35-0.38, AME-PME 0.29-0.36, ALE-PLE 0.29-0.35, CH AME 0.28-0.31, CH ALE 0.22-0.28. Measurements of palp and legs as in Table 6.

Leg formula: 2143, spination: Pp 131, 101(0), 210(1)1, 1(0)00, Fe I 3(2)23, II 323, III 322(3), IV 32(3)2(1), Pa I 1(0)01, II 101, III 1(0)01, Ti I 23(2)26, II 2326, III-IV 22(3) 26, Mt I-II 201(2)4, III 3026, IV 3036. Embolus slightly s-shaped. Tegulum partly covering proximal part of embolus. Sperm duct slightly s-shaped. Tibia of palp shorter than cymbium.

Color: Yellow-brown with sparse dark hairs, PS posteriorly with light submarginal stripe. CC and distal parts of legs darker, radial pattern of PS indistinct, ST and Cx lighter, yellowish, ST with darker margin, OS dark with lighter dorsal markings: i.e. anterior patch, sigillae, and posterior transversal bars; OS ventrally yellowish, posteriorly darker.

♀: Measurements (in mm): PL 4.4-5.1, PW 3.8-4.3, AW 2.3-2.6, PH 1.4-1.6, OL 4.8-6.1, OW 3.1-3.9, Eyes: AME 0.19-0.21, ALE 0.28-0.34, PME 0.22-0.25, PLE 0.29-0.30, AME-AME 0.22-0.24, AME-ALE 0.06-0.08, PME-PME 0.29-0.30, PME-PLE 0.36-0.40, AME-PME 0.31-0.36, ALE-PLE 0.32-0.36, CH AME 0.25-0.29, CH ALE 0.27-0.28. Measurements of palp and legs as in Table 7.

Leg formula: 2413, spination: Pp 131, 101, 2121, 1014, Fe I 32(1)3, II-III 323, IV 321, Pa I-III 001, IV 001(0), Ti I 2(1)026, II 2026, III 20(1)26, IV 2126, Mt I 1(0)004, II 1(0)01(0)4, III 302(1/0)6, IV 3036. Palpal claw with 7-8 teeth.

Color: as in ♂.

Variation: 1 ♂ has 5 instead of 4 posterior teeth on its right chelicera.

**Distribution.** Japan: Honshu (Okayama and Hiroshima Pref.) and Shikoku (Kagawa Pref.) confirmed; *S. stellata* was described from China (Kansu Prov.) and also reported from Korea (Paik 1968, 1978).

**Notes.** Further investigations on the type material of *Sinopoda stellata* are neces-

sary to make statements, whether these Japanese specimens are conspecific with *S. stellata* or belong to another species. A subadult female specimen with a label "*Heteropoda stellata* Schenkel 1963, Type, Schenkel det. 1946, 10313, *Heteropoda*, Potanin 135" has been found in the Muséum National d'Histoire Naturelle, Paris. However, the figure at the original description shows an epigynum of an adult female.

The description of the Korean spider identified with *Heteropoda stellata* by Paik (1968, 1978) agrees well with that of the present Japanese species. An examination of a series of specimens from the type locality (Mt. "Tschagan," Kansu, China) through Korea to Japan may be necessary, because a delicate variation in genital characters was recognized in this group.

From Aichi Prefecture, Honshu, Ogata (1999) recorded and illustrated an unknown species of *Sinopoda* (as *Heteropoda* sp.) which closely resembles the present species. Having examined the specimens recorded by Ogata, the authors recognized that both the species are certainly different from each other.

#### Doubtful records of *Sinopoda stellata*

*Heteropoda stellata*: Yaginuma 1975, p. 190, figs. 5–6 (based on the specimens from Mt. Hikosan, Fukuoka Pref., Kyushu, Japan, C. Okuma & T. Hamamura leg., and from Tottori Pref., Honshu, Japan, T. Arita leg., depository unknown, not examined); Yaginuma 1986, p. 199, fig. 111 (3), pl. 53, fig. 3 (probably based on the same specimens as above). [*nec Heteropoda stellata* Schenkel 1963.]

*Heteropoda stellata*: Chikuni 1989, p. 131, fig. 3, p. 260 (data of material not given). [*nec Heteropoda stellata* Schenkel 1963.]

*Notes.* Yaginuma (1975) first recorded *Heteropoda stellata* Schenkel 1963 from Japan. However, he has not explained which specimens were used for the figures of the male palp and the epigynum illustrated by him. The material could be based on the specimens of "some" species. According to his figures the spider illustrated was not *Sinopoda stellata* nor the species described by the present authors. Although Chikuni (1989) published excellent photographs of "*Heteropoda stellata*" from Japan, the present authors cannot recognize it because no data on the used material was given. These specimens should be re-examined for a reliable identification.

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