

New Species of the Genera *Ryuthela* and *Tmarus* (Araneae, Liphistiidae and Thomisidae) from the Ryukyu Islands, Southwest Japan

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Abstract Spiders obtained from the Ryukyu Islands, Southwest Japan are reported. Four new species of the genus *Ryuthela* (Liphistiidae, Heptathelinae) are described under the names, *Ryuthela sasakii*, *R. secundaria*, *R. owadai* and *R. tanikawai*. A new species of the genus *Tmarus* (Thomisidae, Thomisinae) is described under the name of *Tmarus shimojanai*.

Key words: Taxonomy, Araneae, Liphistiidae, Thomisidae, new species, Japan

Introduction

The occurrence of liphistiid spiders on the Ryukyu Islands south of Amami-ôshima Island was first recognized by Kishida in 1927. However, this was not properly published by himself, although a manuscript of a short report on liphistiids had been almost completed. It was finally printed after his death (Kishida, 1969). In this report, Kishida identified the liphistiid spiders from Amami-ôshima and Okinawa-jima (Okinawa-hontô) Islands with *Heptathela kimurai* (Kishida, 1920) originally described from Kagoshima, Kyushu. The same comment on the distribution of the species was also given by Komatsu (1936) under Kishida's guidance. Saito (1938) included South Kyushu and Okinawa Islands in the distributional range of *Heptathela kimurai*.

"*Heptathela kimurai*" was repeatedly recorded from the islands of the Ryukyus: Amami-ôshima Island (Kishida, 1956; Shimojana, 1971, 1979), Okinawa-hontô Island and its accessory islands, Iejima, Hamahigajima, Miyagijima and Tsukenjima Islands (Kayashima, 1955; Shimojana, 1965, 1979; Murayama *et al.*, 1969), Kumejima Island (Shimojana, 1971, 1979), Tokashikijima Island (Shimojana, 1965, 1979), Ishigakijima Island (Yaginuma, 1964 a, b; Shimojana, 1965, 1966, 1967, 1979; Sakaguchi, 1970) and Iriomotejima Island (Shimojana, 1966, 1967, 1979; Sakaguchi, 1970).

On the basis of both morphological and biological observations, Haupt (1979, 1983, 1990) revised the liphistiid spiders of Japan and classified those of the Ryukyu Islands into four subspecies of two species of two different genera, that is, *Heptathela kimurai amamiensis* Haupt, 1983 (Amami-ôshima Island), *H. kimurai yanbaruensis*

Haupt, 1983 (northern part of Okinawa-hontô Island), *Ryuthela nishihirai nishihirai* (Haupt, 1979) (southern part of Okinawa-hontô Island) and *R. nishihirai ishigakiensis* Haupt, 1983 (Ishigakijima Island). Thereafter, *Ryuthela nishihirai* was recorded from Iheyajima Island (Shimojana, 1981), Iriomotejima Island (Tanikawa, 1989), and Okinawa-hontô and Ishigakijima Islands (Shinkai & Takano, 1984; Yaginuma, 1986; Chikuni, 1989).

Since 1986, I have studied liphistiid spiders not only from Japan but also from some Asian countries (Ono, 1988 a, b, 1997; Ono & Schwendinger, 1990), and published some papers on the spiders of the genus *Heptathela* from Amami-ôshima and Tokunoshima Islands (Ono, 1996; Ono & Nishikawa, 1989). According to these studies, it is considered that speciation has progressed in the liphistiid spiders, and that the distributional range of each species should be limited.

Thus, three species of the genus *Heptathela* and two species of the genus *Ryuthela* as listed below are at present known from the Ryukyu Islands: *Heptathela amamiensis* Haupt, 1983 (Amami-ôshima Island), *H. kanenoi* Ono, 1996 (Tokunoshima Island), *H. yanbaruensis* Haupt, 1983 (northern part of Okinawa-hontô Island), *Ryuthela nishihirai* (Haupt, 1979) (southern part of Okinawa-hontô Island) and *R. ishigakiensis* Haupt, 1983, stat. nov. (Ishigakijima Island). In the present paper, further four new species of the genus *Ryuthela* will be described from Kumejima, Tokashikijima and Iriomotejima Islands.

A new species of the genus *Tmarus* (Thomisidae) from the Island of Iriomotejima will also be described in this paper. After *Tmarus komi* recently described by myself (Ono, 1996), this is a second species of the genus known from the island. However, the new species does not resemble the other species from the same island, but is related to *Tmarus makiharai* Ono, 1988, originally described from Amami-ôshima Island. From the islands lying between Iriomotejima Island and Amami-ôshima Island, no spider of the genus *Tmarus* has been recorded.

The type specimens of the new species to be described in this paper are deposited in the collection of the Department of Zoology, National Science Museum, Tokyo (NSMT). The abbreviations used herein are as follows: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye.

Before going further, I wish to express my sincere thanks to Prof. Matsuei Shimojana, Institute of Education, University of the Ryukyus, Okinawa, Mr. Takeshi Sasaki, Academic Museum, University of the Ryukyus, Okinawa, Dr. Mamoru Owada, National Science Museum, Tokyo, and Mr. Akio Tanikawa, Shichirigahama Senior High School, Kamakura, for offering invaluable specimens. Many thanks are also due to Dr. Shun-Ichi Uéno, National Science Museum, Tokyo for reviewing the manuscript of this paper. This study is supported by the Grant-in-aid No. 07640944 for Scientific Research from the Ministry of Education, Science, Sports and Culture, Japan.

Family Liphistiidae

Ryuthela sasakii sp. nov.

[Japanese name: Kumejima-kimuragumo]

(Figs. 1–8)

Diagnosis. This new species is peculiar in the genus *Ryuthela* in having a straight spine on the contrategulum of male palp and fused spermathecae of female genitalia. The male palp of *Ryuthela sasakii* generally resembles in conformation that of *R. ishigakiensis* Haupt, 1983 rather than those of the other species, though the shape of female genitalia of this new species is utterly different from that of all the other species of the genus.

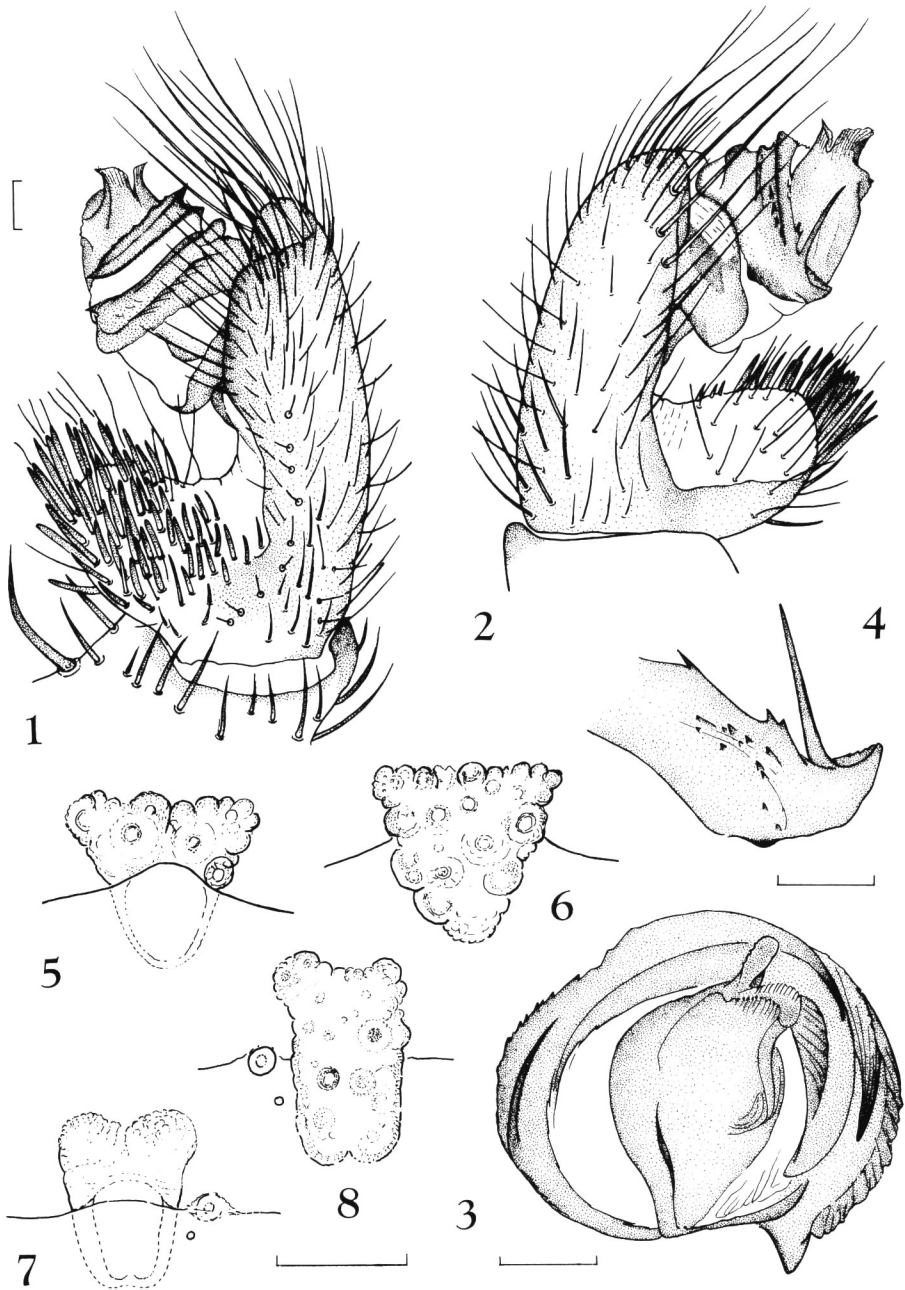
Type series. Holotype: ♀, and allotype: ♂, the middle area of Shirasegawa River, Gushikawa-son, Kumejima Island, the Ryukyu Islands, Okinawa Pref., Southwest Japan, 2–3–XII–1994 (the male allotype became adult on 26–X–1995 after breeding at laboratory), K. Sasaki leg. (NSMT–Ar 3464–3465); paratypes: 3 ♀ 3 juv. ♀, Zenda, 120 m alt., Nakazato-son, Kumejima Island, the Ryukyus, 11–III–1997, H. Ono leg. (NSMT–Ar 3466–3469).

Other specimens examined. 5 spiderlings collected with the holotype (NSMT–Ar 3470).

Description. Measurement based on the holotype and allotype. Body length ♀ 13.0 mm, ♂ 9.5 mm; prosoma length ♀ 5.5 mm, ♂ 5.2 mm, width ♀ 4.7 mm, ♂ 4.6 mm; opisthosoma length ♀ 6.1 mm, ♂ 4.1 mm, width ♀ 4.1 mm, ♂ 3.0 mm; lengths of palps and legs [total length (femur+patella+tibia+metatarsus+tarsus)]: ♀, palp 10.7 mm (3.5+1.8+2.7+–+2.7), leg I 11.2 mm (3.7+1.8+2.1+2.3+1.3), II 11.7 mm (3.6+1.9+1.9+2.6+1.7), III 11.6 mm (3.4+1.8+1.9+2.8+1.7), IV 17.6 mm (4.6+2.4+3.3+4.7+2.6), ♂, palp 9.9 mm (3.3+1.6+3.3+–+1.7), leg I 15.7 mm (4.3+2.2+3.0+3.9+2.3), II 17.3 mm (4.6+2.2+3.1+4.4+3.0), III 17.5 mm (4.3+2.2+3.1+4.9+3.0), IV 19.0+mm (5.7+2.4+4.1+6.8+absent). Body length of ♀ paratypes: 10.3–10.9 mm.

Prosoma longer than wide, head high; ocular tubercle wider than long, ALE>PLE>PME>AME (♀ nearly 17:15:9:2, ♂ 19:15:10:2), AME very small, clypeus wider than ALE–ALE, median ocular area trapezoidal, wider than long. Chelicera with 13–14 teeth on promargin of fang furrow in female, with 13 teeth in male. Leg formula IV, III, II, I or IV, II, III, I; legs of males much longer than those of females; superior claws of tarsi each with 2–4 teeth in female, with 4 teeth in male, claw of female palp with 2 teeth.

Male palp (Figs. 1–4). Tibia without apophysis. Bulb (Figs. 1–2) seemingly more robust than those of *Ryuthela nishihirai* and *R. owadai* sp. nov.; embolus of wide lamella, with two peaks (Fig. 3), distal sclerites in two parts: tegulum with serrated margin, contrategulum with a long, straight spine on the basal part and a long ligula without teeth (Fig. 4), conductor not developed. The spine on the contrategu-



Figs. 1–8. *Ryuthela sasakii* Ono, sp. nov. — 1, Male palp, retrolateral view; 2, same, prolateral view; 3, bulb, distal view; 4, contrategulum, prolateral view; 5, 7, female genitalia, dorsal view; 6, 8, female genitalia, ventral view. [Scales: 0.2 mm; 1–4, male allotype, 5–6, female holotype, 7–8, a female paratype from Zenda.]

lum is much shorter than that of *Ryuthela ishigakiensis*.

Opisthosoma ovate, longer than wide; posterior median spinnerets reduced and fused at the basal part but with two peaks with a seta, respectively.

Female genitalia (Figs. 5–8). Spermathecae fused and forming a triangle or trapezoidal cluster at the middle, cluster longer than wide, a large opening visible.

Coloration and markings. ♀ Prosoma yellowish brown, head darker, ocular tubercle black; chelicera dorsally yellowish brown, ventrally reddish brown, sternum, legs and palps light yellowish brown. Opisthosoma yellowish brown or beige, dorsal sclerites beige mottled with greyish brown; ventral sclerites light yellowish brown, genital part darker, spinnerets yellow. ♂ Similar in coloration to ♀ except for the metatarsus of leg I distally reddish brown.

Distribution. Japan (middle and southern parts of Kumejima Island).

Remarks. This species is dedicated to Mr. Takeshi Sasaki, Okinawa.

***Ryuthela secundaria* sp. nov.**

[Japanese name: Kitakumejima-kimuragumo]

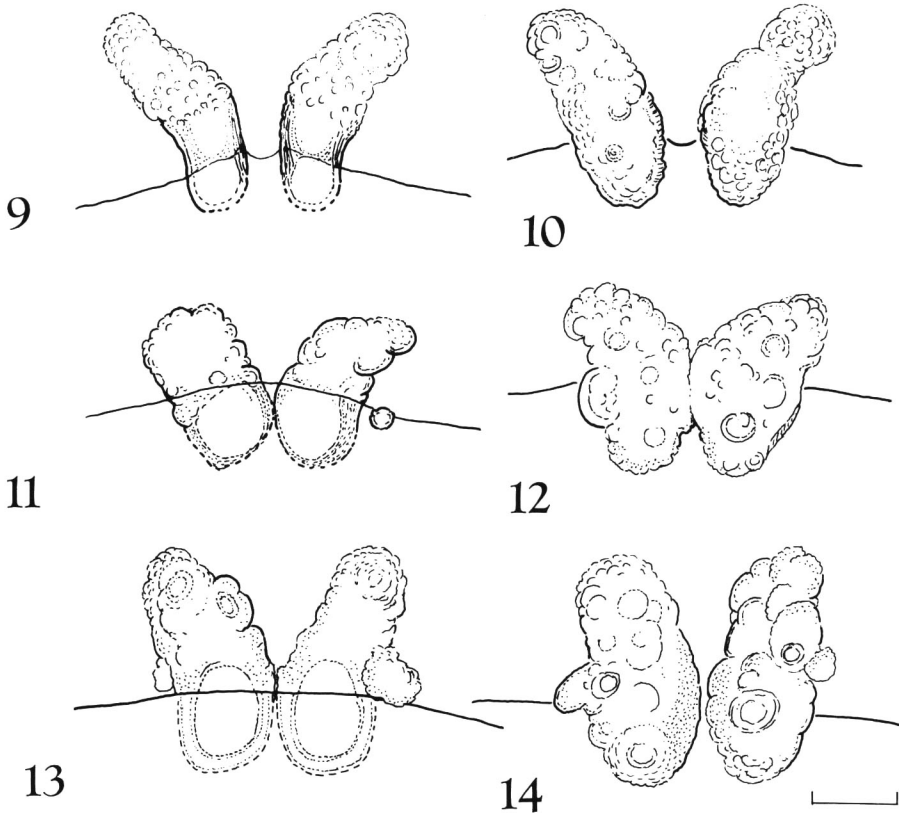
(Figs. 9–10)

Heptathela kimurai: Shimojana, 1971, p. 24; 1979, p. 342. [Nec *Heptathela kimurai* (Kishida, 1920).]

Diagnosis. The female genitalia of this new species resemble in shape those of *Ryuthela nishihirai* (Haupt, 1979), *R. ishigakiensis* Haupt, 1983, and *R. tanikawai* sp. nov. in having spermathecae basally separated. The spermathecal cluster of *Ryuthela secundaria* is long and slender and with small tubercles, while those of the other three species are short and thick and with large tubercles (cf. Figs. 9–10, 19–20, 21–22, Haupt, 1979, p. 366, fig. 12 a, and Haupt, 1983, p. 285, fig. 9, g, h). The other species occurring on Kumejima Island, *Ryuthela sasakii*, is easily distinguishable from this new species by the shape of female genitalia with fused spermathecae.

Type series. Holotype: ♀, Mt. Uegusuku-dake, 280 m alt., northern part of Kumejima Island, Ryukyu Islands, Okinawa Prefecture, southwestern Japan, 10–III–1997, H. Ono leg. (NSMT–Ar 3471); paratypes: 1 ♀ 3 juv. ♀, same data as for the holotype (NSMT–Ar 3472–3473), 3 ♀ 2 juv. ♀ 1 juv. ♂, Maja, 80 m alt., Nakazato-son, Kumejima Island, 10–III–1997, H. Ono leg. (NSMT–Ar 3474–3477), 1 ♀ 1 juv. ♀, Tomunaha Park near Maja, 100 m alt., Nakazato-son, Kumejima Island, 12–III–1997, H. Ono leg. (NSMT–Ar 3478–3479).

Description of females (male unknown). Measurement based on the holotype. Body length 11.3 mm; prosoma length 4.7 mm, width 4.1 mm; opisthosoma length 6.5 mm, width 5.6 mm; lengths of palp and legs [total length (femur+patella+tibia+metatarsus+tarsus)]: palp 8.0 mm (2.8+1.2+1.8+–+2.2), leg I 9.8 mm (3.2+1.8+1.7+2.0+1.1), II 9.4 mm (3.0+1.7+1.7+2.0+1.0), III 10.0 mm (3.0+1.6+1.7+2.3+1.4), IV 15.0 mm (4.2+1.9+2.8+4.0+2.1). Variation of body length: ♀ 9.1–



Figs. 9–14. 9–10, *Ryuthela secundaria* Ono, sp. nov.; 11–14, *Ryuthela* sp. — 9, 11, 13, female genitalia, dorsal view; 10, 12, 14, female genitalia, ventral view. [Scales: 0.1 mm; 9–10, female holotype, 11–12, a female specimen from Uezu, 13–14, a female specimen from Gima.]

11.3 mm.

Prosoma longer than wide, head high; ocular tubercle wider than long, $ALE > PLE > PME > AME$ (nearly 16:15:9:1.5), AME very small, clypeus wider than $ALE-ALE$, median ocular area trapezoidal, wider than long. Chelicera with 12 teeth on promargin of fang furrow. Leg formula IV, III, I, II; superior claws of tarsi each with 1–2 teeth; claw of palp with a tooth.

Opisthosoma ovate, longer than wide; posterior median spinnerets reduced, completely fused and with two pair of setae.

Female genitalia (Figs. 9–10). A pair of spermathecae present; spermathecae long and relatively slender, basally separated from each other; the distal part rounded and granulate.

Coloration and markings. Prosoma light greyish brown, ocular tubercle black; chelicera yellowish brown, fang reddish brown, sternum, legs and palps light yellow-

ish brown. Opisthosoma beige, dorsal sclerites light blackish brown at the sides, ventral sclerites light beige, spinnerets light yellowish brown.

Distribution. Japan (known only from the northern part of Kumejima Island).

Remarks. The specific epithet is derived from Latin meaning second (a second species from the Island of Kumejima).

Some individuals from the same Island [1 ♀, Uezu, 120 m alt., Gushikawa-son, 12–III–1997, H. Ono leg.; 2 ♀, Gima, 60 m alt., Nakazato-son, 11–III–1997, H. Ono leg. (NSMT–Ar 3480–3482)] have thicker spermathecae with a few large tubercles (Figs. 11–14) and may constitute a third species on the island. However, these are left unidentified until males are obtained.

***Ryuthela owadai* sp. nov.**

[Japanese name: Tokashiki-kimuragumo]

(Figs. 15–18)

Heptathela kimurai: Shimojana, 1965, p. 4; 1979, p. 342. [Nec *Heptathela kimurai* (Kishida, 1920).]

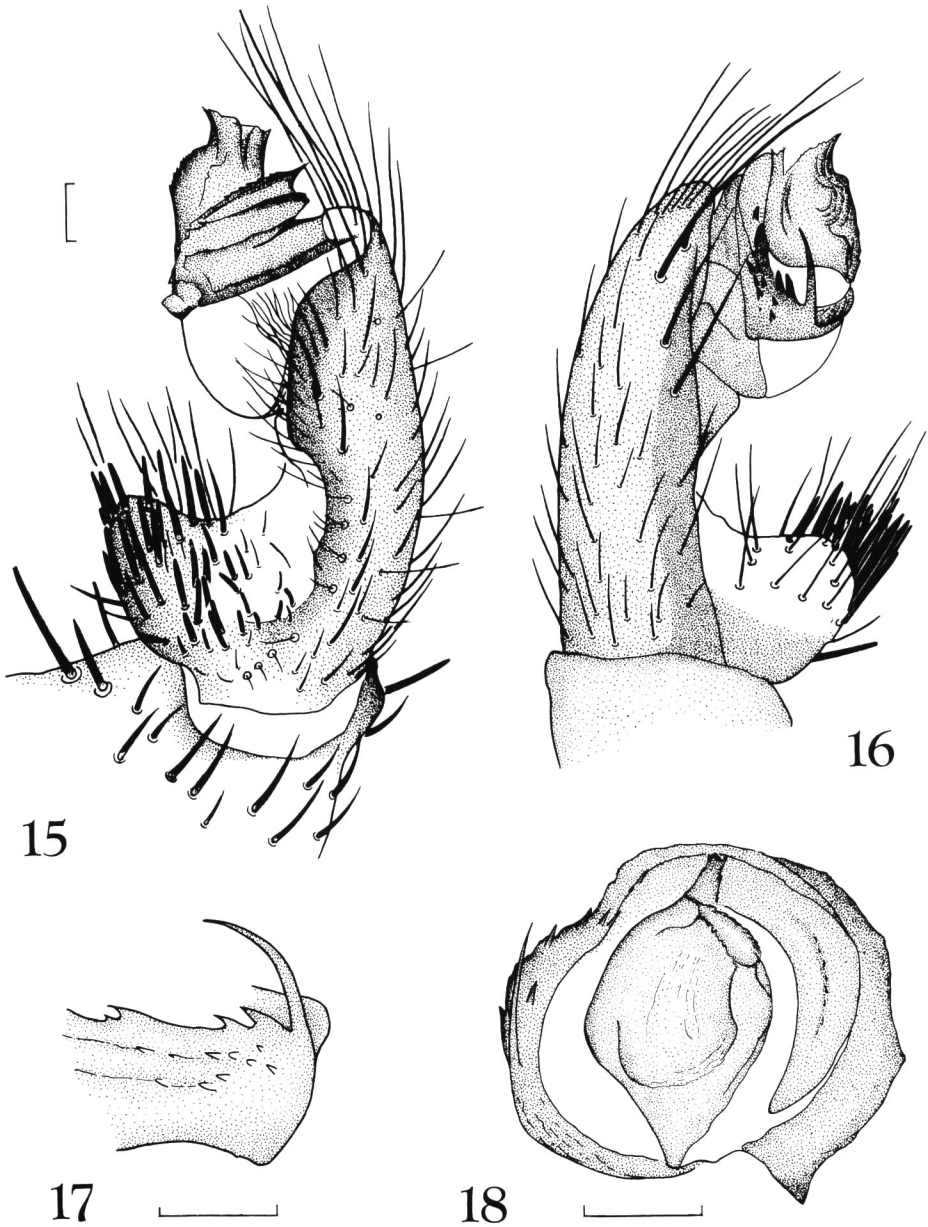
Diagnosis. This new species is closely related to *Ryuthela nishihirai* (Haupt, 1979) from Okinawa-hontô Island, but is distinguished from the latter by the shape of contrategulum of male palp. The spine on contrategulum of the new species is shorter and thinner than that of *R. nishihirai*. Teeth on ligula of contrategulum are not developed in *R. owadai*. Tokashikijima and Okinawa-hontô Islands are about 30 km apart from each other.

Type series. Holotype: ♂, and 1 ♂ 1 juv. ♀ paratypes, Aharen, ca 100 m alt., Tokashikijima Island of the Kerama group of the Ryukyu Islands, Okinawa Pref., SW Japan, 11–X–1990, M. Owada leg. (NSMT–Ar 3459–3461).

Comparative material. *Ryuthela nishihirai* Haupt, 1979, 1 ♀ 1 ♂, syntypes, Shuri, Okinawa-hontô Island, 15–III–1976 (♂ became adult in X–1977), M. Nishihira & J. Haupt leg. (NSMT–Ar 422–423).

Description of males (adult female unknown). Measurement based on the holotype. Body length 9.1 mm; prosoma length 4.7 mm, width 4.2 mm; opisthosoma length 4.3 mm, width 3.0 mm; lengths of palp and legs [total length (femur+patella+tibia+metatarsus+tarsus)]: palp 8.0 mm (2.8+1.3+2.6+–+1.3), leg I 14.3 mm (4.1+1.8+2.8+3.9+1.7), II 14.0 mm (3.6+1.8+2.7+3.8+2.1), III 15.9 mm (3.8+1.9+2.9+4.7+2.6), IV 22.8 mm (7.3+2.2+3.9+6.3+3.1). Body length of the paratype ♂: 7.2 mm.

Prosoma longer than wide, head high; ocular tubercle wider than long, ALE>PLE>PME>AME (nearly 11:10:7:1), AME very small, clypeus wider than ALE–ALE, median ocular area trapezoidal, wider than long. Chelicera with 11 teeth on promargin of fang furrow. Leg formula IV, III, I, II; superior claws of tarsi each with 3–4 teeth.



Figs. 15–18. *Ryuthela owadai* Ono, sp. nov. — 15, Male palp, retrolateral view; 16, same, prolateral view; 17, contrategulum, prolateral view; 18, bulb, distal view. [Scales: 0.2 mm; 15–18, male holotype.]

Male palp (Figs. 15–18). Tibia without apophysis. Bulb (Figs. 15–16) compactly set, embolus of wide lamella, with two peaks, distal sclerites in two parts: tegulum with simple margin (Fig. 18), contrategulum with a basal spine relatively short and curved (Fig. 17), conductor not developed.

Opisthosoma ovate, longer than wide; posterior median spinnerets not clearly visible.

Coloration and markings. Prosoma light yellowish brown, ocular tubercle black; chelicera yellowish brown, fang reddish brown, sternum, legs and palps light yellowish brown. Opisthosoma yellowish brown, dorsal sclerites yellowish brown, beige at the sides; ventral sclerites light yellowish brown, spinnerets yellow.

Distribution. Japan (Tokashikijima Island).

Remarks. This species is dedicated to Dr. Mamoru Owada, Tokyo.

***Ryuthela tanikawai* sp. nov.**

[Japanese name: Iriomote-kimuragumo]

(Figs. 19–20)

Heptathela kimurai: Shimojana, 1966, p. 27; 1967, p. 17; 1979, p. 342. — Sakaguchi, 1970, p. 52. [Nec *Heptathela kimurai* (Kishida, 1920).]

Heptathela nishihirai: Tanikawa, 1989, p. 27. [Nec *Heptathela nishihirai* (Haupt, 1979).]

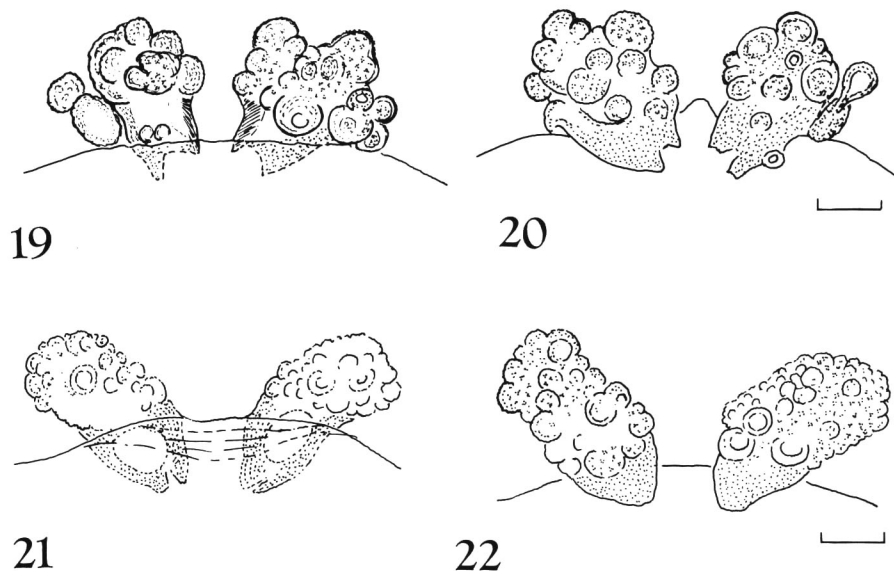
Diagnosis. This new species stands closest to *Ryuthela ishigakiensis* Haupt, 1983, but is distinguishable from the latter by the characteristics of female genitalia. The spermatheca of *Ryuthela tanikawai* is much wider than those of *R. ishigakiensis* and covered with developed tubercles (cf. Figs. 19–20 and 21–22).

Type series. Holotype: ♀, Urauchi, Iriomotejima Island, Ryukyu Islands, Okinawa Prefecture, Southwest Japan, 30–III–1983, A. Tanikawa leg. (NSMT–Ar 3484); paratype: 1 ♀, Funaura, Iriomotejima Island, 28–XII–1988, A. Tanikawa leg. (NSMT–Ar 3485).

Comparative material. *Ryuthela ishigakiensis* Haupt, 1983: 6 ♀ 2 juv. ♀, Hirakubo, Ishigakijima Island, 7–III–1995, H. Ono leg., 4 ♀ 2 juv. ♂ 3 juv., Mt. Houradake, Ishigakijima Island, 7–III–1995, H. Ono leg., 1 ♀, Mt. Omoto-dake, Ishigakijima Island, 23–VIII–1988, A. Tanikawa leg., 8 ♀ 1 juv. ♂, same place, 8–III–1995, H. Ono leg. (NSMT–Ar 3486–3501).

Description of females (male unknown). Measurement based on the holotype. Body length 11.9 mm; prosoma length 5.0 mm, width 4.5 mm; opisthosoma length 6.2 mm, width 4.4 mm; lengths of palp and legs [total length (femur+patella+tibia+metatarsus + tarsus)]: palp 8.4 mm (2.8+1.4+1.9+–+2.3), leg I 11.5 mm (3.7+2.1+2.2+2.3+1.2), II 11.8 mm (3.7+2.0+2.2+2.6+1.3), III 12.7 mm (4.2+2.0+2.1+3.0+1.4), IV 17.9 mm (5.0+2.4+3.3+4.8+2.4). Body length of the paratype ♀: 11.5 mm.

Prosoma longer than wide, head high; ocular tubercle wider than long, ALE>



Figs. 19–22. 19–20, *Ryuthela tanikawai* Ono, sp. nov.; 21–22, *Ryuthela ishigakiensis* Haupt, 1983, stat. nov. — 19, 21, Female genitalia, dorsal view; 20, 22, female genitalia, ventral view. [Scales: 0.1 mm; 19–20, female holotype, 21–22, a female, topotypical specimen from Mt. Omotodake.]

PLE>PME>AME (nearly 14 : 11 : 8 : 1), AME very small, clypeus wider than ALE–ALE, median ocular area trapezoidal, wider than long. Chelicera with 14 teeth on promargin of fang furrow. Leg formula IV, III, II, I ; superior claws of tarsi each with 2–3 teeth, claw of palp with two teeth.

Opisthosoma ovate, longer than wide; posterior median spinnerets reduced, completely fused, with 7 setae.

Female genitalia (Fig. 5). A pair of spermathecae present; spermathecae short, thick and not cylindrical, with many large tubercles covered with granula.

Coloration and markings. Prosoma yellowish brown, ocular tubercle black; chelicera yellowish brown, ventrally reddish, fang reddish brown, sternum, legs and palps yellowish brown. Opisthosoma light greyish brown, dorsal sclerites beige mottled with brown; ventral sclerites light yellowish brown, spinnerets lighter.

Distribution. Japan (Iriomotejima Island).

Remarks. This species is dedicated to Mr. Akio Tanikawa, Tokyo.

Family Thomisidae

Tmarus shimojanai sp. nov.

[Japanese name: Yaeyama-semaru-torafukanigumo]

(Figs. 23–29)

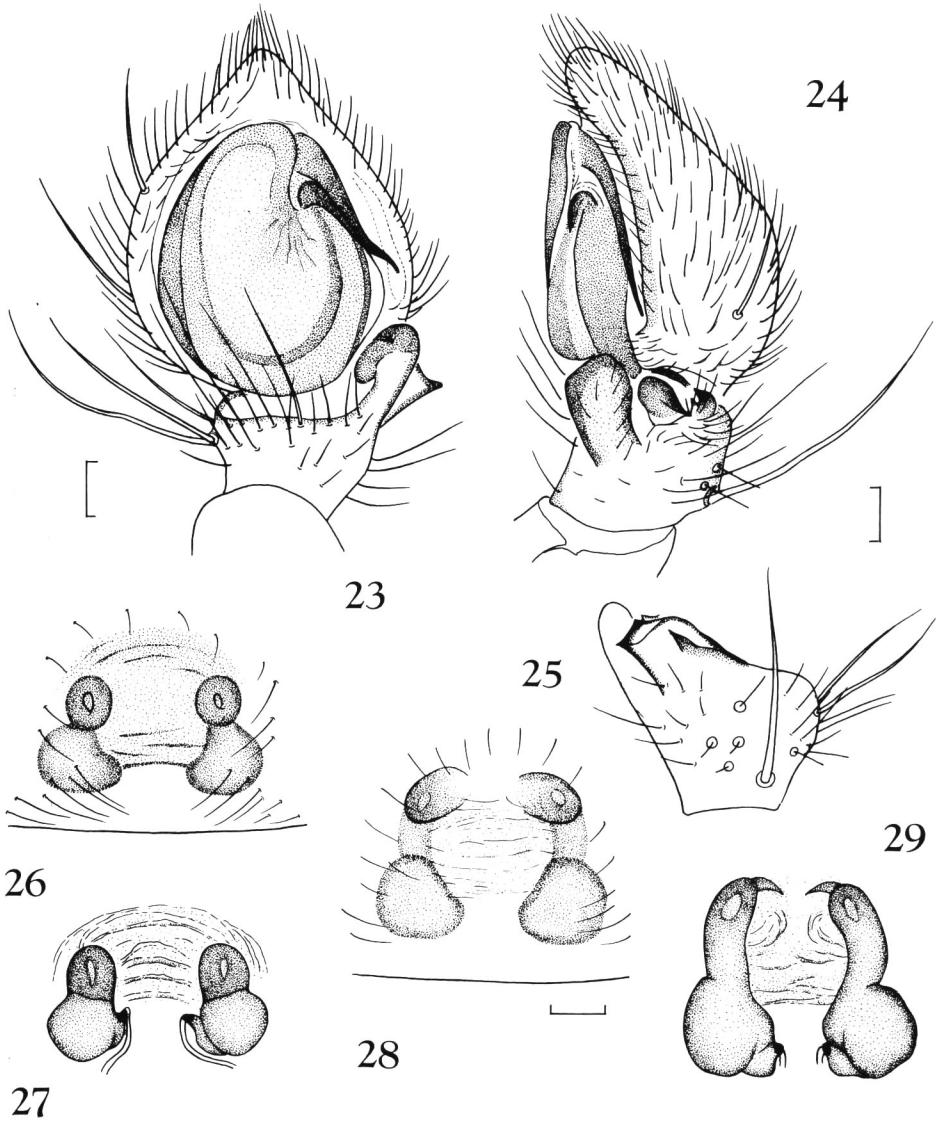
Diagnosis. This new species is closely related to *Tmarus makiharai* Ono, 1988, described from Amami-ôshima Island of the Ryukyu Islands but is distinguished from the latter by the structure of male palp. The dorsal apophysis on the male palpal tibia of *Tmarus shimojanai* is much smaller than that of *T. makiharai* (cf. Fig. 25 and Ono, 1988 c, p. 65, figs. 52–53). The female genitalia of the new species resemble those of *Tmarus yaginumai* Ono, 1977, distributed from Kanagawa Prefecture, Honshu, through southern Shikoku and Kyushu to Nakanoshima Island of the Tokara Islands, but lack a median septum (cf. Figs. 26–29 and Ono, 1977, figs. 49–50). Female of *Tmarus makiharai* is unknown.

Type series. Holotype: ♂, Sonai, Iriomotejima Island, Yaeyama Islands of the Ryukyus, Okinawa Prefecture, Southwest Japan, 27–VII–1996, A. Tanikawa leg. (NSMT–Ar 3502); paratypes: 1 ♀, “Iriomotejima Island,” III–1967, M. Shimojana leg., 1 ♀, Sonai, 11–VIII–1985, A. Tanikawa leg., 6 ♀, Komi, 6–VIII–1987, 13–VIII–1992, 18–VIII–1993, 29–III–1995, A. Tanikawa leg., 1 ♀, Shirahama, 31–III–1986, A. Tanikawa leg., Urauchi (rice field), 30–III–1987, A. Tanikawa leg., 1 ♀ 1 ♂, Kûragawa River between Funaura and Ôhara, 29–VII–1991, 12–VIII–1992, A. Tanikawa leg., 1 ♀, Waterfall of Pinaisâra, 31–VII–1982, M. Shimojana leg., all the specimens from Iriomotejima Island of the Ryukyus (NSMT–Ar 3503–3513).

Comparative material. *Tmarus makiharai* Ono, 1988, ♂ holotype, Nishinakama, Amami-ôshima Island, Kagoshima Pref., Japan, 11–IV–1976, H. Makihara leg. (NSMT–Ar 1522), 1 ♂, paratype, Yakkachi, same island, 12–XI–1962, C. Okuma leg. (NSMT–Ar 1523). *Tmarus yaginumai* Ono, 1977, ♂ holotype, Kajigamori, Nagaokagun, Kochi Pref., Japan, 17–VII–1975, S. Takano *et al.* leg. (Senckenberg Museum, Frankfurt am Main, SMF 29394), 2 ♂, paratypes, Irôzaki, Izu Peninsula, Shizuoka Pref., Japan, 2–VIII–1976, M. Ozawa *et al.* leg. (Arachnological Society of Japan).

Description. Measurement based on the male holotype and a female paratype from Pinaisâra Waterfall. Body length ♀ 6.67 mm, ♂ 4.30 mm; prosoma length ♀ 2.15 mm, ♂ 1.78 mm, width ♀ 2.07 mm, ♂ 1.70 mm; opisthosoma length ♀ 4.67 mm, ♂ 2.44 mm, width ♀ 3.33 mm, ♂ 1.33 mm; lengths of legs [total length (femur+patella+tibia+metatarsus+tarsus)]: ♀, I 9.10 mm (2.74+1.11+2.29+2.00+0.96), II 9.47 mm (2.81+1.11+2.44+2.07+1.04), III 5.36 mm (1.85+0.70+1.48+0.70+0.63), IV 6.00 mm (2.00+0.74+1.41+1.15+0.70), ♂ I 10.33 mm (3.04+0.96+2.70+2.44+1.19), II 10.30 mm (3.11+0.96+2.67+2.37+1.19), III 5.63 mm (1.81+0.56+1.48+1.11+0.67), IV 6.01 mm (2.04+0.56+1.48+1.26+0.67). Variation of body length: ♀ 4.74–7.19 mm, ♂ 4.30–4.59 mm.

Prosoma longer than wide (length/width ♀ 1.03, ♂ 1.05), with long setae. Eyes:



Figs. 23–29. *Tmarus shimojanai* Ono, sp. nov. — 23, Male palp, ventral view; 24, same, retro-lateral view; 25, male palpal tibia, dorsal view; 26, 28, epigynum, ventral view; 27, 29, female genitalia, cleared, dorsal view. [Scales: 0.1 mm; 23–25, male holotype, 26–27, a female paratype from Pinaisâra Waterfall, 28–29, a female paratype from “Iriomotejima Island.”]

ALE>PLE>PME>AME, ALE/AME ♀ 3.00, ♂ 2.36, PLE/PME ♀ 1.71, ♂ 2.00, AME–AME/AME–ALE ♀ 1.00, ♂ 1.09, PME–PME/PME–PLE ♀ 0.65, ♂ 0.53, median ocular area longer than wide (length/width ♀ 1.08, ♂ 1.14), wider behind than in front (anterior width/posterior width ♀ 0.76, ♂ 0.75), clypeus/AME–AME ♀

2.57, ♂ 1.75, lateral eyes on a large tubercle, respectively. Maxillae of male proximally expanded, labium longer than wide (length/width ♀ 2.00, ♂ 2.25), sternum longer than wide (length/width ♀ 1.15, ♂ 1.12).

Spiniformation (terminology see Ono, 1988, p.13). ♀ Femur: I dorsal 0-1-1-0-1 or 0-0-1-0-1, prolateral 0-1-1-0-1, retrolateral 0-0-1-0-1 or 0-0-1-0-0, II dorsal 1-1-1-0-1, prolateral 0-1-1-0-1 or 1-0-1-0-1, retrolateral 0-0-0-0-1, III dorsal 0-1-0-1, prolateral 0-1-0-1, IV dorsal 0-1-0-1, prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1, I-II pro- and retrolateral and IV retrolateral 1, respectively; tibia: I-IV dorsal 1-0-1, I pro- and retrolateral 1-1-0-1, ventral 1-2-2-2 or 2-2-1-2, II prolateral 1-1-0-1, retrolateral 1-0-1-1, ventral 0-2-2, III-IV prolateral 1-1, retrolateral 0-1, III ventral 0-1-1, IV 0-1-2 or 0-1-0; metatarsus: I-II pro- and retrolateral 1-1-0, I ventral 2-1-2-1-2 ap or 1-2-1-2-2 ap, II ventral 2-1-2-1-2 ap or 2-1-1-2-2 ap, III-IV prolateral and III retrolateral 1-1, III ventral 0-2-0, IV retrolateral 1-1-1 ap, ventral 0-2-2 ap. ♂ Femur: I dorsal and prolateral 0-1-1-0-1, retrolateral 0-0-1-0-1, II dorsal 0-1-1-1-1, prolateral 1-0-2-0-1 or 0-0-1-0-1, retrolateral 0-0-1-0-1 or 0-0-0-0-1, III dorsal 1-1-1-1 or 1-1-0-1, prolateral 0-1-0-1 or 0-0-0-1, retrolateral 0-0-1-1 or 0-0-0-1, IV dorsal 1-1-0-1, prolateral 0-0-0-1; patella: I-IV dorsal 1-0-1, I-II pro- and retrolateral and III-IV retrolateral 1, respectively; tibia: I-IV dorsal 1-0-1, I-II pro- and retrolateral 1-1-1, ventral 2-2-2-0, III-IV prolateral and retrolateral 1-0-1, III ventral 0-2-0 or 0-2-1, IV ventral 2; metatarsus I-II pro- and retrolateral 1-1-0, I ventral 2-0-2-1-2 ap, II ventral 1-2-0-2-2 ap or 0-2-0-2-2 ap, III-IV pro- and retrolateral 1-0-1-0, III ventral 2, IV ventral 0-2-2 ap.

Tarsal claws of legs I-IV each with 3-7 long teeth.

Male palp (Figs. 23-25). Femur not expanded. Tibia with ventral, retrolateral and dorsal apophyses: the ventral apophysis digitiform, apically with a blunt hook; the retrolateral one wide and distally pointed; the dorsal one very small. Bulb longer than wide, embolus shorter and thicker than that of *Tmarus makiharai*, the distal part on tutaculum.

Opisthosoma longer than wide (length/width ♀ 1.40, ♂ 1.83), its posterior part not extending beyond spinnerets.

Female genitalia (Figs. 26-29). Epigynum wider than long, intromittent orifices visible, median septum lacking; intromittent direction 5:30 (terminology see Ono, 1977, p. 68, fig. 26), intromittent canal variable in length [cf. Figs. 27 (the shortest) and 29 (the longest)], spermathecae reniform.

Coloration and markings. ♀♂ Prosoma greyish white, beige or yellowish brown, darker at the sides and posterior declivity, tubercles of lateral eyes black, chelicerae, maxillae, labium and sternum light yellowish brown or yellowish white, palps and legs yellowish brown or light yellow. Opisthosomal dorsum greyish white, beige or light yellowish brown, rarely darker at the sides, without any markings, venter light yellowish brown with a wide, longitudinal dark-coloured stripe.

Distribution. Japan (Iriomotejima Island).

Remarks. This species is dedicated to Prof. Matsuei Shimojana, Okinawa.

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