

Spiders from Mikurajima Island, Tokyo, with Descriptions of New Genera and Species of the Families Linyphiidae and Theridiidae (Arachnida, Araneae)

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Abstract Specimens of spiders (Arachnida, Araneae) collected on Mikurajima Island, Izu Islands, Tokyo, Japan, are taxonomically studied and 49 species of 22 families are recorded from the island. A list of 86 spiders species of the island is compiled with obtained data and known records from literatures. Three new species discovered in the present material are described under the names, *Paikiniana mikurana* sp. nov. (Linyphiidae), *Tmeticodes gibbifer* gen. et sp. nov. (Linyphiidae) and *Nesopholcomma izuense* gen. et sp. nov. (Theridiidae). Two new genera, *Tmeticodes* gen. nov. (type species: *Tmeticodes gibbifer* sp. nov.) and *Nesopholcomma* gen. nov. (type species: *Nesopholcomma izuense* sp. nov.), are established and diagnosed.

Key words: Taxonomy, Araneae, Linyphiidae, Theridiidae, Mikurajima Island, Japan.

Introduction

Mikurajima Island is one of the Izu Islands composed of seven main islands and some smaller islands stretching to the south from near the entrance of the Bay of Tokyo. The islands are scattered from north to south in the northwestern Pacific and occupy a wide range between 32 and 35 degrees north latitude. Of these, Oshima, the northernmost island is located about 120 km south from the center of Tokyo Metropolis, while Aogashima, the southernmost island is 240 km apart from Oshima. Mikurajima is situated nearly at the middle between Oshima and Aogashima, and covers 20.55 km².

All of the Islands of Izu are small and volcanic formed by Pleistocene activity, and their spider fauna seems to be poor in the total number of species (Ono, 2001). However, developed evergreen broad-leaved forests are well preserved on a few islands as Mikurajima, and various aspects of zoology are expected, for instance a phase of specialization by isolation on oceanic islands.

The spider fauna of Mikurajima Island has not been well known in general because of lacking convenient transportation services. A faunistic investigation was recently made on Mikurajima Island by the present author under commission of the Environmental Bureau of the Tokyo Metropolitan Government and the Japan Wildlife Research Center. Although the research was made in a short period and out of breeding season, some interesting spiders of the families Linyphiidae and Theridiidae were obtained. In the present paper results of the examination of these specimens are reported with a list of known species and descriptions of some new taxa.

Material and Methods

About 200 spider specimens were collected during a short research trip between 4th and 6th March 2010 by the present author using sifting soil litter on the forest floor as well as collecting by hand. These specimens were preserved in 76% ethanol on location, and examined and iden-

tified under Leica MZ16 stereomicroscope at the Department of Zoology, National Museum of Nature and Science, Tokyo. Three interesting spiders were taxonomically studied and recognized as new to science. Body, legs and eyes were measured, and pro- and opisthosomata, chelicerae and details of female genitalia and male palpal organ of the new species were illustrated. All the specimens including type specimens of the new species are deposited in the Arachnid Collection of the above museum.

Other than the above material, some specimens (17 immature females and 7 adult males) of *Nephila clavata* collected by Mr. M. Tanaka at Sato on Mikurajima Island, 3-X-2009, were also provided for this study (omitted in Table 1).

Results

A total of 49 species of 22 families are recognized in this material. Of these, 25 species are newly recorded from Mikurajima Island. A list of 86 spider species known from this island (Table 1) is made on the basis of the identification of the present specimens and former records in literatures (Ohkouji, 1969; Shinkai, 1977; Okuma, 1984; Ono, 1984, 1988, 2001; Nakajo *et al.* 2009). That may contribute to give a clear picture of the spider fauna of the island. Three new species of the families Linyphiidae and Theridiidae are discovered in the material, of which two species represent new genera. Thus, two new genera and three new species are described in the following lines.

Descriptions of New Taxa

Family Linyphiidae

Genus *Paikiniana* Eskov, 1992

[Japanese name: Tengu-nukagumo-zoku]

Paikiniana mikurana sp. nov.

[Japanese name: Mikura-tengu-nukagumo]

(Figs. 1–7)

Diagnosis. This new species is closely related to Japanese species, *Paikiniana vulgaris* (Oi,

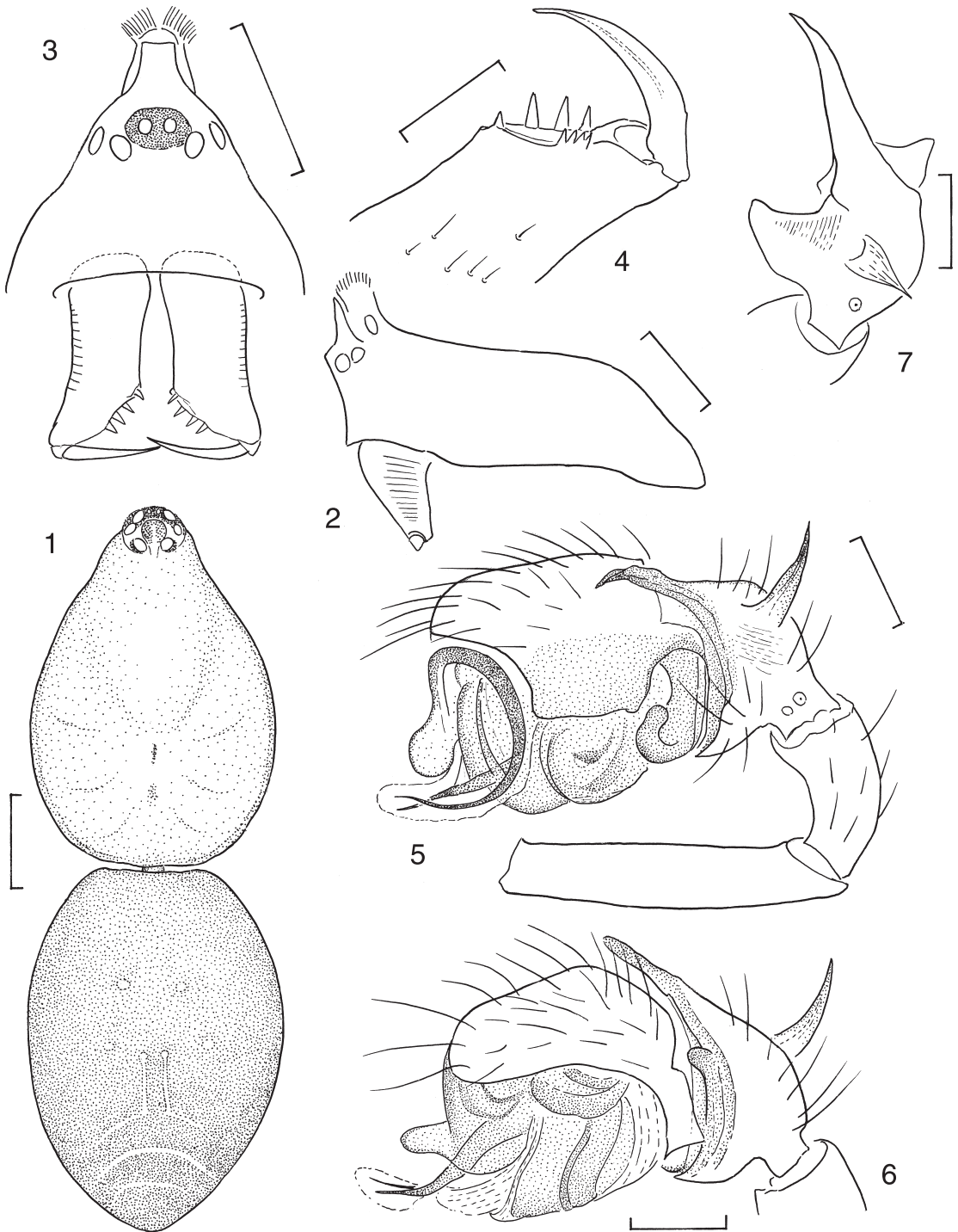
1960) and *P. iriei* (Ono, 2007), but can be distinguished from these known species by the shape of the peculiar apophysis in the eye field of the male (Figs. 2–3) and the structure of male palpal organ, especially of the shape of dorsal apophysis on its tibia (cf. Figs. 5–7 and Ono *et al.*, 2009, p. 299, figs, 551–553 and 556–558).

Type specimens. Holotype: male from primary broad-leaved forest between streams of Borosawa and Aka-zawa, 100–200 m in altitude, Mikurajima Island, Izu Islands, Tokyo, Japan, 5–III–2010, H. Ono leg. (NSMT-Ar 8708); paratype: one male from Kawada, ca. 100 m in altitude, secondary coniferous forest, on the same island, 4–III–2010, H. Ono leg. (NSMT-Ar 8709)

Description [male (holotype); female unknown]. Measurements: Body length 1.88 mm; prosoma length 0.87 mm, width 0.59 mm; opisthosoma length 0.98 mm, width 0.60 mm; lengths of legs [total length (femur+patella+tibia+metatarsus+tarsus)]:

I 2.14 mm (0.66+0.21+0.54+0.43+0.30),
 II 2.06 mm (0.62+0.22+0.51+0.41+0.30),
 III 1.70 mm (0.49+0.19+0.38+0.36+0.28),
 IV 2.30 mm (0.62+0.20+0.60+0.52+0.36).

Prosoma: Carapace longer than wide (length/width 1.47), smooth, with indistinct radial lines and distinct median furrow, a large apophysis present in the ocular area between AME and PME and extending forwards (Figs. 2–3). Eyes relatively small and compactly set, ALE=PME>AME (2:2:2:1), the anterior eye row recurved and the posterior row procurved in dorsal view, AME-AME>AME-ALE (3:2), PME-PME=PME-PLA, median ocular area longer than wide (length/width 1.25), wider behind than in front (anterior width/posterior width 0.69), clypeus almost as long as the length of ocular area. Chelicera (Fig. 4) with four strong teeth on the promargin of fang furrow and a serrated process on retromargin, labium wider than long (length/width 0.67), basally fused with anterior margin of sternum, sternum longer than wide (length/width 1.09). Legs relatively robust, tibial spines of legs 2–2–1–1 (weak), distance between



Figs. 1–7. *Paikiniana mikurana* Ono, sp. nov., male, holotype (NSMT-Ar 8708). — 1, Pro- and opisthosomata (appendages omitted), dorsal view; 2, prosoma, lateral view; 3, prosoma, frontal view; 4, chelicera, retrolateral view; 5, male palp (left), retrolateral view; 6, male palp (right), prolateral view; 7, tibia of male palp, dorsal view. [Scales: for Figs. 1–3, 0.25 mm; for Figs. 4–7, 0.1 mm.]

Table 1. A list of spiders known from Mikurajima Island. — Collecting sites: **A**, Kawada, ca. 100 m in altitude, mainly secondary coniferous forest, 4–III–2010; **B**, near the fork to Mt. Oyama, ca. 200 m in altitude, secondary broad-leaved forest, 5–III–2010; **C**, between streams of Boro-sawa and Aka-zawa, 100–200 m in altitude, primary broad-leaved forest, 5–III–2010; **D**, Sato, 50–100 m in altitude, village, 5–III–2010; **E**, from Sato to a dam southeast of Sato, 100–200 m in altitude, cultivated area, partly with good broad-leaved forest, 6–III–2010; all collected by H. Ono. [Juveniles without possible species identification were omitted. Scientific names and their taxonomical order follow Ono (2009). Species with asterisks indicate new records for Mikurajima Island.]

Families/Species	Collection data	Former records
Atypidae:		
1 <i>Atypus karschii</i> Dönitz, 1887*	B: 1 juv.	
Calommatidae:		
2 <i>Calommata signata</i> Karsch, 1879		Ohkouji (1969), Nakajo <i>et al.</i> (2009)
Ctenizidae:		
3 <i>Conothele fragaria</i> (Dönitz, 1887) *	A: 1 retreat; C: 1 juv.; E: 1 male	
Segestriidae:		
4 <i>Ariadna lateralis</i> Karsch, 1881		Ohkouji (1969), Ono (2001)
5 <i>Ariadna insulicola</i> Yaginuma, 1967		Ono (2001)
Oonopidae:		
6 <i>Ischnothyreus narutomii</i> (Nakatsudi, 1942)*	C: 2 males	
Oecobiidae:		
7 <i>Oecobius navus</i> Blackwall, 1859		Ono (2001)
Uloboridae:		
8 <i>Octonoba sybotides</i> (Bös. et Str., 1906)		Ono (2001)
Urocteidae:		
9 <i>Uroctea compactilis</i> L. Koch, 1878		Ono (2001), Nakajo <i>et al.</i> (2009)
Cybaeidae:		
10 <i>Cybaeus nipponicus</i> (Uyemura, 1938)*	E: 1 juv.	
Coelotidae:		
11 <i>Tegeocoelotes corasides</i> (Bös. et Str., 1906)		Nakajo <i>et al.</i> (2009)
12 <i>Pireneitega luctuosa</i> (L. Koch, 1878)	D: 1 male	Ono (2001)
13 <i>Coelotes kitazawai</i> Yaginuma, 1972		Nakajo <i>et al.</i> (2009)
14 <i>Iwogumoa insidiosa</i> (L. Koch, 1878)	A: 2 juv.	Ono (2001)
Agelenidae:		
15 <i>Allagelena opulenta</i> (L. Koch, 1878)	D: 50 juv. from 1 egg sac	Nakajo <i>et al.</i> (2009)
Pisauridae:		
16 <i>Dolomedes sulfureus</i> L. Koch, 1878*	D: 1 juv.	
Lycosidae:		
17 <i>Pirata procurvus</i> (Bös. et Str., 1906)	B: 7 juv.; C: 10 juv.	Ono (2001)
18 <i>Lycosa coelestis</i> L. Koch, 1878		Ono (2001)
19 <i>Trochosa aquatica</i> Tanaka, 1985		Ono (2001)
20 <i>Pardosa pseudoannulata</i> (Bös. et Str., 1906)		Ohkouji (1969)
Mimetidae:		
21 <i>Ero japonica</i> Bösenberg et Strand, 1906	A: 2 juv.	Ono (2001), Nakajo <i>et al.</i> (2009)
Linyphiidae:		
22 <i>Nematogmus sanguinolentus</i> (Walck., 1837)		Nakajo <i>et al.</i> (2009)
23 <i>Otia imadatei</i> (Oi, 1964)*	A: 2 females; B: 3 fe- males, 2 males; C: 3 fe- males; D: 1 male	
24 <i>Walckenaeria keikoe</i> Saito, 1988*	B: 1 male	
25 <i>Pseudomicrargus asakawaensis</i> (Oi, 1964)*	A: 1 female, 1 male	
26 <i>Paikiniana mikurana</i> sp. nov.*	B: 1 male; C: 1 male	
27 <i>Baryphymula kamakuraensis</i> (Oi, 1960)*	E: 1 male	
28 <i>Neserigone nigriterminorum</i> (Oi, 1960)	B: 1 male; E: 1 female, 1 male	Shinkai (1977)
29 <i>Tmetiodes gibbifer</i> gen. et sp. nov.*	B: 1 male; C: 1 male; D: 1 female, 5 males, 3 juv.	

Table 1. (Continued).

	Families/Species	Collection data	Former records
30	<i>Nippononeta kantonis</i> Ono et Saito, 2001*	A: 2 females, 2 juv.; B: 3 females, 1 male, 1 juv.; C: 1 female, 1 juv.	
31	<i>Neriere oidedicata</i> (van Helsdingen, 1969)	B: 2 females, 1 juv.; D: 1 female	Ono (2001), Nakajo <i>et al.</i> (2009)
	Nesticidae:		
32	<i>Nesticella mogera</i> (Yaginuma, 1972)		Ono (2001)
	Theridiidae:		
33	<i>Enoplognatha abrupta</i> (Karsch, 1879)*	D: 1 female	
34	<i>Steatoda cingulata</i> (Thorell, 1890)	D: 1 female; E: 1 female	Ohkouji (1969), Nakajo <i>et al.</i> (2009)
35	<i>Pholcomma tokyoense</i> Ono, 2007*	A: 1 female, 1 male	
36	<i>Nesopholcomma izuense</i> gen. et sp. nov.*	A: 2 males	
37	<i>Episinus affinis</i> Bös. et Str., 1906		Okuma (1984)
38	<i>Episinus nubilus</i> Yaginuma, 1960	B: 1 juv.	Okuma (1984)
39	<i>Anelosimus crassipes</i> (Bös. et Str., 1906)		Ono (2001)
40	<i>Parasteatoda tepidariorum</i> (C.L.Koch, 1841)	D: 3 female, 1 juv.	Ohkouji (1969), Ono (2001)
41	<i>Parasteatoda ryukyu</i> (Yoshida, 2000)*	E: 1 female, 2 juv.	
42	<i>Argyrodes bonadea</i> (Karsch, 1881)	C: 1 juv.	Nakajo <i>et al.</i> (2009)
43	<i>Rhomphaea labiata</i> (Zhu et Song, 1991)		Nakajo <i>et al.</i> (2009)
44	<i>Yaginumena mutilata</i> (Bös. et Str., 1906) *	A: 4 juv.	
45	<i>Phycosoma mustelinum</i> (Simon, 1888)		Nakajo <i>et al.</i> (2009)
	Theridiosomatidae:		
46	<i>Ogulnius pullus</i> (Bös. et Str., 1906) *	B: 1 juv.	
	Anapidae:		
47	<i>Mysmenella pseudojobi</i> Lin et Li, 2008 *	A: 3 juv.	
	Nephilidae:		
48	<i>Nephila clavata</i> L. Koch, 1878	D: 2 females, 1 egg sac	Nakajo <i>et al.</i> (2009)
	Tetragnathidae:		
49	<i>Meta reticuloides</i> Yaginuma, 1958		Nakajo <i>et al.</i> (2009)
50	<i>Metleucauge yunohamensis</i> (Bös. et Str., 1906)		Ohkouji (1969), Ono (2001)
51	<i>Leucauge blanda</i> (L. Koch, 1878)	A: 6 juv.; D: 1 female, 1 juv.	Ohkouji (1969), Ono (2001), Nakajo <i>et al.</i> (2009)
52	<i>Leucauge magnifica</i> Yaginuma, 1954		Nakajo <i>et al.</i> (2009)
53	<i>Leucauge subblanda</i> Bös. et Str., 1906		Nakajo <i>et al.</i> (2009)
54	<i>Tetragnatha squamata</i> Karsch, 1879	E: 1 female	Nakajo <i>et al.</i> (2009)
	Araneidae:		
55	<i>Argiope minuta</i> Karsch, 1879	D: 1 egg sac	Nakajo <i>et al.</i> (2009)
56	<i>Cyclosa confusa</i> Bös. et Str., 1906	D: 1 female; E: 2 females	Ohkouji (1969), Ono (2001), Nakajo <i>et al.</i> (2009)
57	<i>Cyclosa alba</i> Tanikawa, 1992*	E: 1 juv.	
58	<i>Cyclosa argenteoalba</i> Bös. et Str., 1906	A: 3 juv.; D: 1 juv.; E: 6 juv.	Ono (2001)
59	<i>Neoscona theisi</i> (Walck., 1841)		Ono (2001)
60	<i>Neoscona nautica</i> (L. Koch, 1875)		Ohkouji (1969), Ono (2001)
61	<i>Neoscona subpullata</i> (Bös. et Str., 1906)		Ohkouji (1969), Ono (2001), Nakajo <i>et al.</i> (2009)
62	<i>Araneus ventricosus</i> (L. Koch, 1878)		Nakajo <i>et al.</i> (2009)
63	<i>Acusilas coccineus</i> Simon, 1895		Ono (2001)
64	<i>Polys illepidus</i> C. Koch, 1843		Nakajo <i>et al.</i> (2009)
	Ctenidae:		
65	<i>Anahita fauna</i> Karsch, 1879	A: 1 juv.	Ono (2001)
	Philodromidae:		
66	<i>Philodromus subaureolus</i> Bös. et Str., 1906*	C: 1 juv.	
	Thomisidae:		
67	<i>Xysticus kurilensis</i> Strand, 1907	A: 15 juv.; B: 1 juv.	Ono (1988)
68	<i>Oxyptila nipponica</i> Ono, 1985*	A: 1 female, 1 juv.; C: 1 male	
69	<i>Diaea subdola</i> O. Pickard-Cambridge, 1885	D: 2 juv.	Ono (2001), Nakajo <i>et al.</i> (2009)

Table 1. (Continued).

Families/Species	Collection data	Former records
70 <i>Ebrechtella tricuspadata</i> (Fabricius, 1875)		Ohkouji (1969)
71 <i>Thomisus labefactus</i> Karsch, 1881		Ono (2001), Nakajo <i>et al.</i> (2009)
72 <i>Boliscus tuberculatus</i> (Simon, 1886)		Ono (1984)
Clubionidae:		
73 <i>Clubiona vigil</i> Karsch, 1879		Ono (2001)
Liocranidae:		
74 <i>Itatsina praticola</i> (Bös. et Str., 1906)	A: 12 juv.; B: 1 juv.; C: 1 juv.; D: 1 juv.	Ono (2001)
Corinnidae:		
75 <i>Orthobula crucifera</i> Bös. et Str., 1906		Nakajo <i>et al.</i> (2009)
76 <i>Phrurolithus pennnatus</i> Yaginuma, 1967*	C: 1 juv.	
Salticidae:		
77 <i>Siler vittatus</i> (Karsch, 1879)	E: 1 juv.	Ono (2001), Nakajo <i>et al.</i> (2009)
78 <i>Hakka himeshimensis</i> (Dönitz et Str., 1906)		Ono (2001)
79 <i>Phintella arenicolor</i> (Grube, 1861)	B: 1 juv.	Ono (2001)
80 <i>Bristowia heterospinosa</i> Reimoser, 1934*	A: 1 juv.	
81 <i>Plexippus paykulli</i> (Audouin, 1826)		Ono (2001)
82 <i>Plexippus setipes</i> Karsch, 1879		Nakajo <i>et al.</i> (2009)
83 <i>Menemerus brachygnathus</i> (Thorell, 1877)		Ohkouji (1969)
84 <i>Rhene atrata</i> (Karsch, 1881)		Ohkouji (1969), Ono (2001), Nakajo <i>et al.</i> (2009)
85 <i>Harmochirus insulanus</i> (Kishida, 1914)	E: 1 juv.	Nakajo <i>et al.</i> (2009)
86 <i>Synagelides agoriformis</i> Strand, 1906*	A: 1 juv.; B: 2 juv.	

coxae IV wider than their diameter, Tm I 0.40, Tm IV present, leg formula: IV–I–II–III.

Male palp (Figs. 5–7): Femur shorter than the total of patella and tibia, tibia longer than patella, with a large dorsal apophysis spearhead-shaped, a long and pointed apical apophysis and three trichobothria. Cymbium very large, paracymbium strongly sclerotized, long, curved distally with digitiform tip. Tegular apophysis long and spini-form, extending to the tip of embolus, conductor membranous, embolus acicular and winding, with snub-like apophysis at the base.

Opisthosoma: Longer than wide (length/width 1.63), its dorsum smooth with short hairs. Colulus present.

Coloration and markings (Fig. 1): Carapace shiny orange, eye field black, chelicerae, maxillae, labium and sternum light orange, palps and legs yellowish brown, without annulation. Opisthosoma uniformly black dorsally, grey ventrally, spinnerets light brown.

Variation. Male paratype: body length 1.83 mm; Tm I 0.40.

Distribution. Japan (at present known only

from Mikurajima Island).

Etymology. The specific epithet is derived from the name of the island.

Genus *Tmeticodes* nov.

[Japanese name: Sedaka-nukagumo-zoku]

Type species. *Tmeticodes gibbifer* sp. nov., by monotypy.

Diagnosis. The new genus stands close to *Tmeticus* Menge, 1868, and has some characteristics common with that genus, for instance the ratio of Tm I (*Tmeticus* species 0.54–0.75; the new genus 0.64–0.71), presence of Tm IV, order of tibial spines of legs 2–2–1–1. However, *Tmeticodes* differs from the known genus mainly by the shape of male carapace and the genital morphology. Male head of the new genus has a large hump behind the ocular area. Male palp of this new genus is robust and short with tibia as long as the length of cymbium, while that of *Tmeticus* is very long with tibia much longer than cymbium. Palpal patella of *Tmeticus* has a peculiar, triangle tooth on ventral side of its distal part (Ono

et al., 2009, p. 305, fig. 640), while patella is simple in *Tmeticodes*. In details of palpal organ, paracymbium is bifurcated with digitiform tip in *Tmeticus* but is a simple plate in *Tmeticodes*, and the embolus of *Tmeticodes* is thinner and longer than that of *Tmeticus*. In female genitalia, spermathecae of this new genus is oval, large and connected with genital openings by long intromittent canals, while those of *Tmeticus* is tubular and the intromittent canal is very short (cf. Figs. 11–12 and Wiehle, 1960, p. 412, fig. 753).

Etymology. The generic name is formed by a combination of the existing generic name *Tmeticus* and the Greek suffix ‘-odes’ and means a genus similar or related to *Tmeticus*. The gender is masculine.

***Tmeticodes gibbifer* sp. nov.**

[Japanese name: Sedaka-nukagumo]

(Figs. 8–19)

Diagnosis. See the above generic diagnosis.

Material examined. Holotype: male and allotype: female from near the fork to Mt. Oyama, ca. 200 m in altitude, secondary broad-leaved forest, Mikurajima Island, Izu Islands, Tokyo, Japan, 5–III–2010, H. Ono leg. (NSMT-Ar 8669–8670). Paratypes: five males and three juveniles (non type), same data as for the holotype; one male from primary broad-leaved forest between streams of Boro-sawa and Aka-zawa, 100–200 m in altitude, same island, 5–III–2010, H. Ono leg. (NSMT-Ar 8671–8675).

Description (holotype and allotype). Measurements: Body length female 1.93 mm, male 1.87 mm; prosoma length female 0.77 mm, male 0.76 mm, width female 0.63 mm, male 0.62 mm; opisthosoma length female 1.16 mm, male 1.14 mm, width female 0.76 mm, male 0.73 mm; lengths of legs [total length (femur+patella+tibia+metatarsus+tarsus)]: female:

I 2.21 mm (0.68+0.21+0.49+0.49+0.34),
 II 2.29 mm (0.68+0.21+0.53+0.53+0.34),
 III 1.88 mm (0.56+0.18+0.43+0.41+0.30),
 IV 2.39 mm (0.72+0.21+0.56+0.56+0.34),
 male:

I 2.33 mm (0.67+0.23+0.56+0.51+0.36),
 II 2.37 mm (0.67+0.23+0.56+0.54+0.37),
 III 1.85 mm (0.53+0.18+0.39+0.45+0.30),
 IV 2.39 mm (0.68+0.21+0.56+0.58+0.36).

Prosoma: Carapace longer than wide (length/width female 1.22, male 1.02), with some radial lines, its surface forming minute reticulation, median furrow indistinct, cephalic part sexually dimorphic: male carapace with a large hump behind eye field, but without a deep furrow between eyes and the hump (Figs. 14–15), female carapace without hump, but quite high behind eye field. Eyes relatively small, ALE=PLE=PME>AME (7:7:7:4 in female, 7:7:7:5 in male), the anterior eye row slightly recurved and the posterior row slightly procurved in dorsal view in both the sexes, AME-AME ≥ AME-ALE (8:5 in female, 1:1 in male), PME-PME>PME-PL (3:1 in female, 2:1 in male), median ocular area wider than long (length/width 0.8 in female, 0.75 in male), wider behind than in front (anterior width/posterior width 0.75 in female, 0.54 in male), clypeus almost as long as the width of ocular area. Chelicera (Figs. 9, 16) with two strong hairs dorsally, and four teeth on the promargin of fang furrow, four or five teeth on retromargin, labium wider than long (length/width 0.55 in female, 0.66 in male), sternum as long as wide, female palp without claw. Legs relatively robust, tibial spines of legs 2–2–1–1 (indistinct in male), distance between coxae IV wider than their diameter, Tm I 0.71 in female, 0.64 in male, Tm IV present, leg formula: IV–II–I–III.

Male palp (Figs. 17–18): Femur longer than patella, tibia as long as patella, quite simple without dorsal apophysis other than the apical one (Fig. 18). Cymbium short, without notch, paracymbium simple, with blunt tip, embolus acicular, short and curved, with membranous conductor.

Opisthosoma (Figs. 8, 13, 19): Longer than wide (length/width 1.53 in female, 1.56 in male), its dorsum smooth with dense short hairs. Colulus present.

Female genitalia (Figs. 10–12): Genital field much wider, without scape nor a plate. Intromit-

tent canals relatively long tube and winding, ovate spermathecae visible through integument.

Coloration and markings (Figs. 8, 13): Female: carapace dark grey, lighter margined, eye field black, chelicerae, maxillae, labium and sternum dark grey, palps and legs grey, without annulation. Opisthosoma white dorsally, with black markings, ventrally without markings, spinnerets dark grey; male: carapace yellowish brown, eye field black, hump lighter, thoracic part blackish brown, chelicerae, maxillae, labium and sternum light yellowish brown, palps and legs yellow, without annulation. Opisthosoma white dorsally, with black markings, and grey ventrally.

Variation. Body length of male paratypes 1.78–1.91 mm. Opisthosoma of one male is very dark (Fig. 19), while those of the other males are

nearly same as that of the holotype. Coloration of female subadult specimens is similar to that of males.

Distribution. Japan (at present known only from Mikurajima Island).

Etymology. The species epithet is a Latin meaning gibbiferous and is derived from the hump on carapace of male.

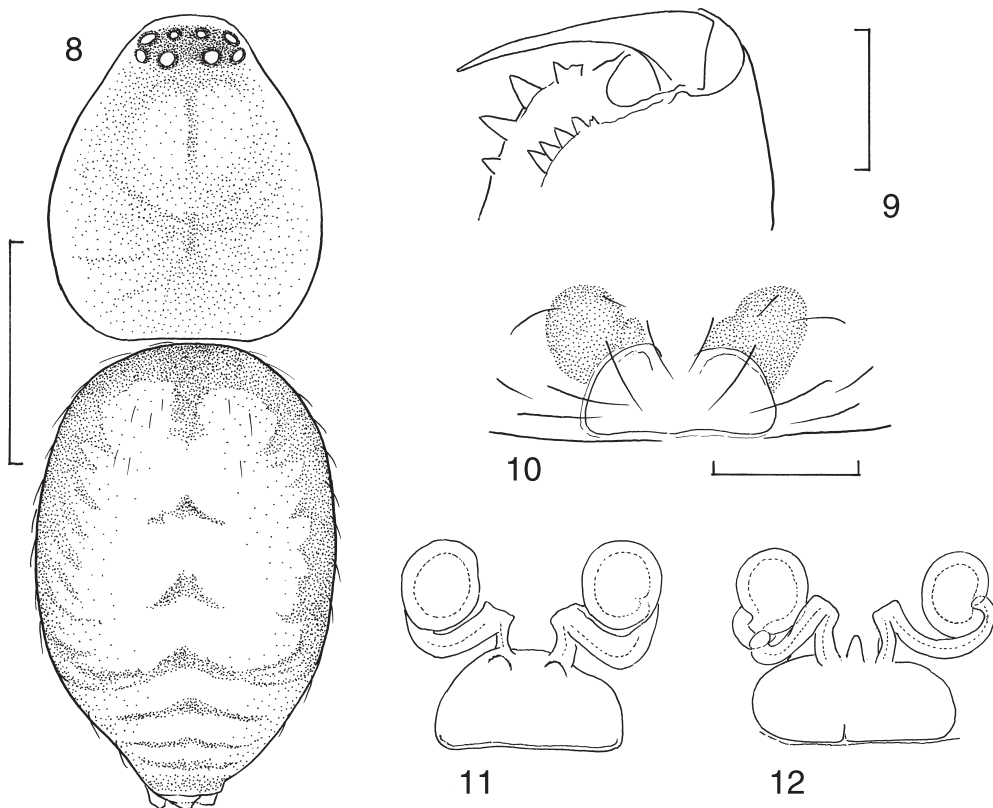
Family Theridiidae

Genus *Nesopholcomma* nov.

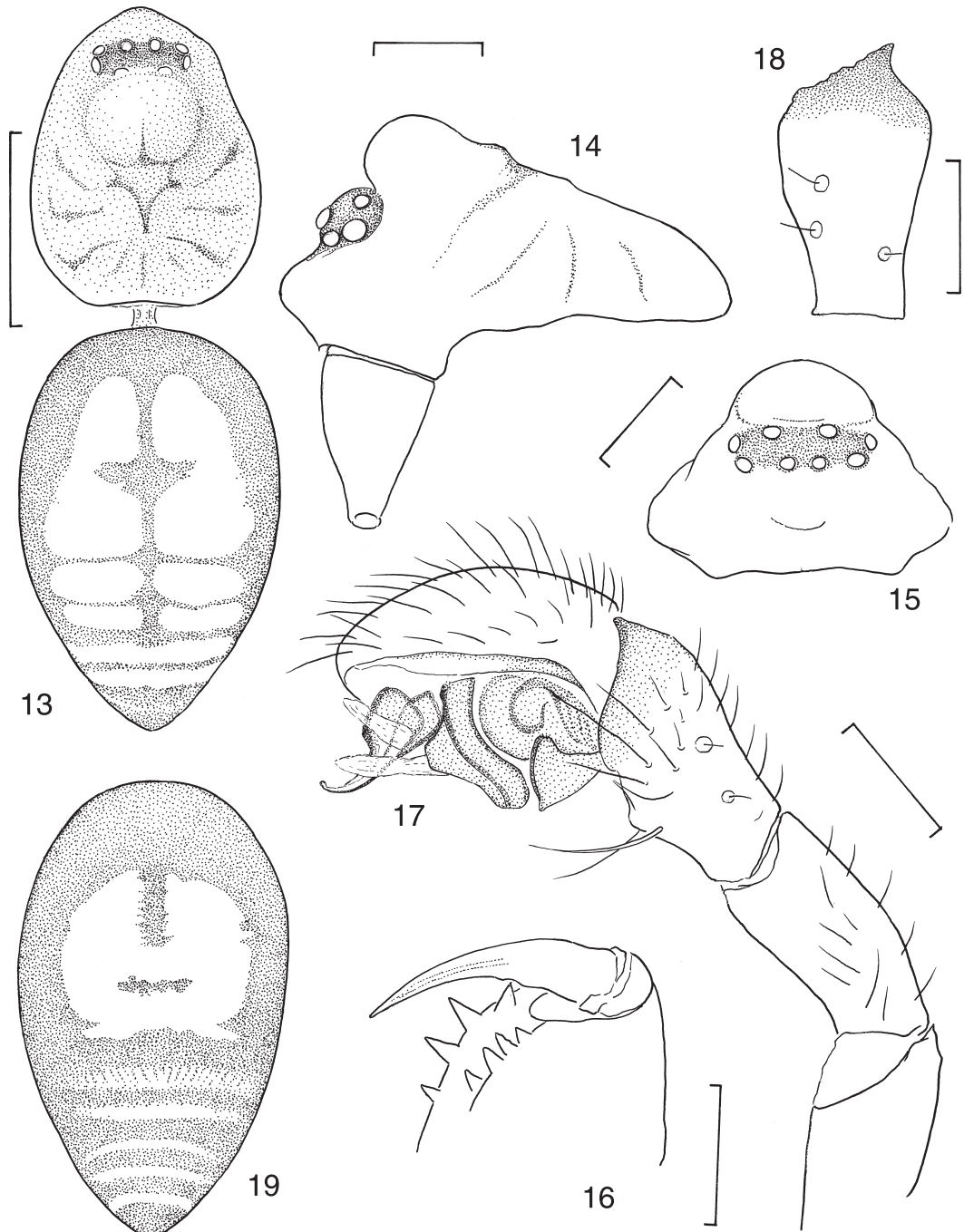
[Japanese name: Shima-himegumo-zoku]

Type species. *Nesopholcomma izuense* sp. nov., by monotypy.

Diagnosis. The new genus seems to be close to the genus *Pholcomma* Thorell, 1869 revised



Figs. 8–12. *Tmeticodes gibbifer* Ono, gen. et sp. nov., female, allotype (NSMT-Ar 8670). — 8, Pro- and opisthosomata (appendages omitted), dorsal view; 9, chelicera, retrolateral view; 10, epigynum, ventral view; 11, female genitalia, ventral view; 12, female genitalia, dorsal view. [Scales: for Fig. 8, 0.5 mm; for Figs. 9–12, 0.1 mm.]



Figs. 13–19. *Tmeticodes gibbifer* Ono, gen. et sp. nov., males: 13–18, holotype (NSMT-Ar 8669), 19, one of the paratype series (NSMT-Ar 8671). — 13, Pro- and opisthosomata (appendages omitted), dorsal view; 14, prosoma, lateral view; 15, carapace, frontal view; 16, chelicera, retrolateral view; 17, male palp, retrolateral view; 18, tibia of male palp, dorsal view; 19, abdomen, dorsal view. [Scales: for Figs. 13, 19, 0.5 mm; for Figs. 14–15, 0.2 mm; for Figs. 16–18, 0.1 mm.]

by Wiehle (1937), in small body size, condition of colulus and construction of male palpal organ, especially of the presence of paracymbium in the distal part of cymbium, and opisthosoma without distinct markings. However, the new genus differs from the latter by the absence of dorsal plate on opisthosoma of male. Other than this general character, the new genus is recognized as an independent genus by the combination of following characteristics: Carapace strongly sclerotized and covered with finely reticulated wrinkles (Figs. 20, 27), chelicera with two teeth on promargin, and three teeth on retromargin; male palpal organ with a developed median apophysis with spini-form tip and fine and filiform embolus; female genitalia with a pair of guide pockets at the copulatory openings on epigynum, complicatedly twisted intromittent canals and large and globular spermathecae.

Etymology. The generic name is formed by a combination of the Greek prefix *neso-* meaning 'of island' and the name of the existent genus, *Pholcomma*. The gender is neuter.

Nesopholcomma izuense sp. nov.

[Japanese name: Izu-shima-himegumo]

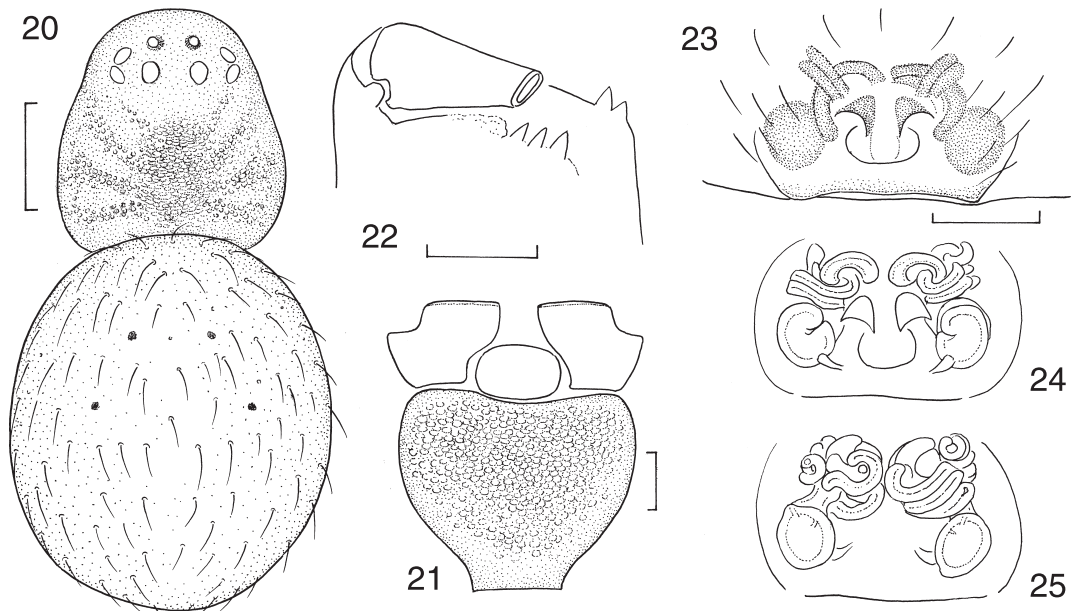
(Figs. 20–32)

Diagnosis. See the above generic diagnosis.

Type specimens. Holotype: male from Kawada, ca. 100 m in altitude, secondary coniferous forest, Mikurajima Island, Izu Islands, Tokyo, Japan, 4–III–2010, H. Ono leg. (NSMT-Ar 8710); allotype: female and one male paratype, same data as for the holotype (NSMT-Ar 8711–8712).

Description (holotype and allotype). Measurements: Body length female 1.31 mm, male 1.50 mm; prosoma length female 0.63 mm, male 0.73 mm, width female 0.56 mm, male 0.64 mm; opisthosoma length female 0.86 mm, male 0.94 mm, width female 0.75 mm, male 0.75 mm; lengths of legs [total length (femur+patella+tibia+metatarsus+tarsus)]: female:

I	1.81 mm	(0.56+0.19+0.39+0.37+0.30),
II	1.53 mm	(0.49+0.18+0.32+0.28+0.26),
III	1.28 mm	(0.37+0.16+0.27+0.23+0.25),



Figs. 20–25. *Nesopholcomma izuense* Ono, gen. et sp. nov., female, allotype (NSMT-Ar 8711). — 20, Pro- and opisthosomata (appendages omitted), dorsal view; 21, labium, maxillae and sternum, ventral view; 22, chelicera, retrolateral view; 23, epigynum, ventral view; 24, female genitalia, ventral view; 25, female genitalia, dorsal view. [Scales: for Figs. 20–21, 0.25 mm; for Fig. 22, 0.05 mm; for Figs. 23–25, 0.1 mm.]

IV 1.60 mm (0.50+0.16+0.37+0.28+0.29), male:

I 2.32 mm (0.75+0.21+0.56+0.46+0.34),

II 2.00 mm (0.63+0.21+0.44+0.38+0.34),

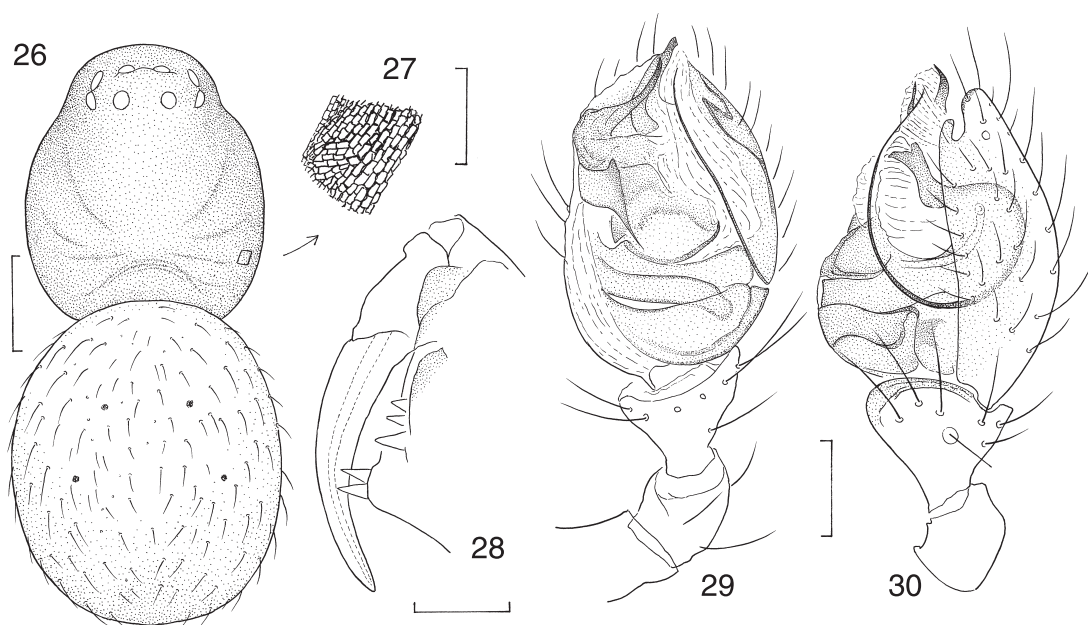
III 1.67 mm (0.51+0.16+0.34+0.34+0.29),

IV 2.07 mm (0.65+0.20+0.48+0.38+0.36).

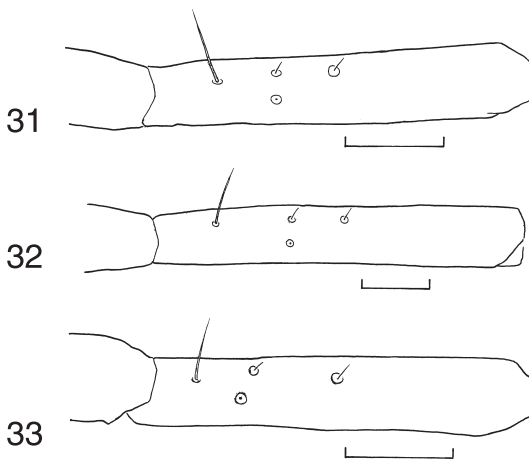
Prosoma: Carapace slightly longer than wide (length/width 1.12 in female, 1.14 in male), its surface strongly sclerotized and covered with finely reticulated wrinkles (Fig. 27), median furrow absent. Eyes almost same in size except for AME smaller than the others, PLE=ALE=PME>AME (3:3:3:2 in female, 4:4:4:3 in male), the anterior eye row slightly recurved and the posterior row procurved in dorsal view, AME-AME>AME-ALE (2:1 in female, 5:3 in male), PME-PME>PME-PLE (3:2 in female, 5:4 in male), median ocular area longer than wide (length/width 1.60 in female, 1.36 in male), wider behind than in front (anterior width/posterior width 0.75 in female, 0.74 in male), clypeus slightly longer than AME-AME. Chelicera (Figs. 22, 28) with two teeth on the promargin of fang

furrow, which are close to each other, and three teeth on the retromargin, labium not fused with the anterior margin of sternum, wider than long (length/width 0.67 in female, 0.69 in male), maxilla twice as long as labium, its anterior margin straight and sharpened, sternum with fine reticulations, almost as long as wide (length/width 0.90 in female, 1.10 in male), posteriorly truncated (Fig. 21). Female palp furnished with a long claw. Legs robust and hairy, tibiae I–IV with a long spine proximally, tibiae I–II with three trichobothria dorsally (Figs. 31–32), metatarsi and tarsi I–II respectively with one trichobothrium proximally. Leg formula: I–IV–II–III.

Male palp (Figs. 29–30): Femur relatively short. Tibia scyphiform and short, its margin strongly sclerotized and with several long hairs, one trichobothrium present on retrolateral surface. Cymbium an oval cup, distally modified with short digitiform process (homologous with paracymbium). Tegular apophysis wide plate with a blunt tooth, median apophysis curved angularly, its distal part spiniform and weakly curved, con-



Figs. 26–30. *Nesopholcomma izuense* Ono, gen. et sp. nov., male, holotype (NSMT-Ar 8710). — 26, Pro- and opisthosomata (appendages omitted), dorsal view; 27, reticulation of carapace, lateral view; 28, chelicera, retrolateral view; 29, male palp, ventral view; 30, male palp, retrolateral view. [Scales: for Figs. 20–21, 27, 0.25 mm; for Figs. 22–26, 28–30, 0.05 mm.]



Figs. 31–33. Tibiae of legs I. — 31–32, *Ne-sopholcomma izuense* Ono, gen. et sp. nov., female, allotype (NSMT-Ar 8711) and male, holotype (NSMT-Ar 8710); 33, *Pholcomma tokyoense* Ono, 2007, female (NSMT-Ar 8713). [Scales: 0.1 mm.]

ductor large and membranous with spiniform apical process, embolus fine filiform and winding, with sclerotized base.

Opisthosoma (Figs. 20, 26) oval, longer than wide (length/width 1.15 in female, 1.25 in male), its dorsum smooth with two pairs of sigilla, and wholly covered with short, strong hairs, dorsal plate absent. Booklungs covered by sclerotized plate. Anterior spinnerets and posterior lateral spinnerets thick and conical, posterior median spinnerets small, colulus present, small with a pair of strong hairs.

Female genitalia (Figs. 23–25): Genital field wider than long, with a weakly sclerotized plate, and internal structure visible through the plate. Genital openings situated at the middle of epigynum, with guide pockets, intromittent canal tubular and long, complicatedly twisted, spermathecae globular, fertilization tubes short.

Coloration and markings (Figs. 20, 26): Female: carapace light chestnut brown, chelicerae, maxillae, labium and sternum chestnut brown, palps and legs yellowish brown, without markings; opisthosoma white dorsally and ventrally, without any markings other than sigilla. Male: carapace dark blackish brown, chelicerae, maxil-

lae, labium and sternum blackish brown, palps and legs reddish brown, without markings; opisthosoma light grey dorsally and dark grey ventrally, without any markings other than sigilla on dorsum and around spinnerets.

Variation. Body length of the paratype male: 1.40 mm.

Distribution. Japan (at the present known only from the type locality).

Etymology. The specific epithet is derived from the name of islands, to which Mikurajima Island belongs.

Remarks. A male specimen (NSMT-Ar 8713) of *Pholcomma tokyoense* Ono, 2007 was obtained at the type locality of this new species. Both the spiders resemble each other at first glance, but the male *Pholcomma* has characteristic opisthosoma covered by a large sclerotized plate (Ono, 2007, p. 160, fig. 29). Although the female of *Pholcomma tokyoense* has not been known, the position of trichobothria on tibia of the first leg may be used to distinguish both the spiders from each other (cf. Figs. 31–32 and 33).

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