

Nesticid Spiders from the Hokuriku District, Central Japan¹⁾

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Abstract Nesticid spiders from the Hokuriku District in Central Japan are enumerated. Of the four species found, three are long-legged and one short-legged. All the long-legged species are the *floronoides* type, and one of them is new to science (*Nesticus asuwanus* sp. nov.).

The spiders of the genus *Nesticus* are mostly troglophilous and are commonly found in natural caves as well as in such artificial cavities as various mines and prospecting adits. In the epigeal domain, they are frequently met in dark humid environment, for instance, from under large stones, in spaces of taluses accumulated along mountain streams, or in thick heaps of dead leaves. They are roughly divided into two groups, long-legged and short-legged; the former contains a large number of species, which have become considerably differentiated as the result of allopatric speciation; the latter comprises only four known Japanese species, two of which are widely distributed over the mainland of Japan without showing appreciable geographical variation.

The Japanese species of *Nesticus* were carefully studied and revised by YAGINUMA (1979), who recorded 37 species and 10 subspecies. Since then, 4 more species have been described (YAGINUMA, 1980 a, b, 1981) and another species newly recorded (NISHIKAWA, 1982), and the number of the known Japanese nesticids becomes 42 in total. However, no nesticids have been properly recorded from the Hokuriku District on the Japan Sea side of central Honshu. Only the localities of long-legged species hitherto reported are Kômoriana Cave in Ishikawa Prefecture (YAGINUMA, 1976 a, p. 1005) and Nanatsuoguchi-kô Adit in Fukui City (YAGINUMA, 1979, p. 287). These populations remain undescribed because of the lack of taxonomically important males. Short-legged forms have not been recorded from the district under consideration, either, although *Nesticus brevipes* was recorded from Niigata and Gifu Prefectures neighbouring it (cf. YAGINUMA, 1976 a, pp. 1002, 1004).

In recent years, I have had opportunities of investigating the spider fauna of the Hokuriku District, and was able to obtain four different species of *Nesticus*, three long-legged and one short-legged. One of the long-legged species was not determinable as

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no males were included in my collection, but recording it seemed important for analysing the zoogeographic situation of the nesticid fauna of the Hokuriku District. One of the other two seemed new to science. It will be described in the present paper under the name of *Nesticus asuwanus*.

The abbreviations used herein are the same as those explained by YAGINUMA (1979, p. 260). The holotype and allotype of the new species to be described are preserved in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Before going into further details, I wish to express my heartfelt thanks to Dr. Shun-Ichi UENO of the National Science Museum, Tokyo, for giving me the opportunity to participate in the research project, aiding my investigations in the field and reading through the original manuscript of this paper, and to Professor Takeo YAGINUMA for his continuous guidance and supervision of my study. Deep gratitude is also due to the following friends of mine, whose help in the field greatly facilitated my investigations: Professor Hiroyuki SASAJI, Messrs. Yuzo IGUCHI, Ryuichi INOUE, Kôjirô KATSURA, Kazuo MORI, Junryo MURAMOTO, Akira NOTO, Hirotugu ONO, Masaaki SAKAMOTO, Yoshinori SHIOTANI, Yuzo TARUMI, Osamu TOMINAGA, Shigeru WAKANO and Toshihiko YOSHIMURA.

Nesticus sp.

(Figs. 1-4)

Specimens examined. 2 ♀, abandoned adit of Hokuriku-kôzan, 220 m alt., Ogoya-chô, Komatsu-shi, Ishikawa Pref., 16-VII-1984, Y. NISHIKAWA leg.

Notes. This species is similar to *N. monticola* or *N. floronoides*, but appears specifically different. Its systematic status cannot be determined until males from the same population are obtained.

Nesticus asuwanus NISHIKAWA, sp. nov.

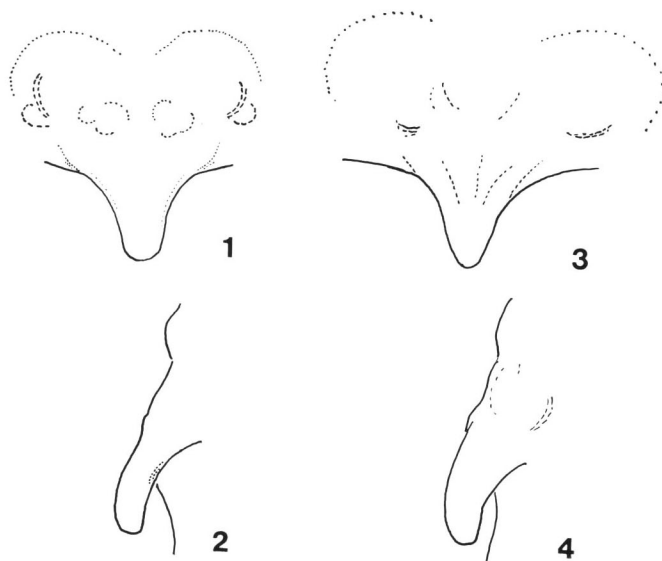
[Japanese name: Asuwa-horahimegumo]

(Figs. 5-10)

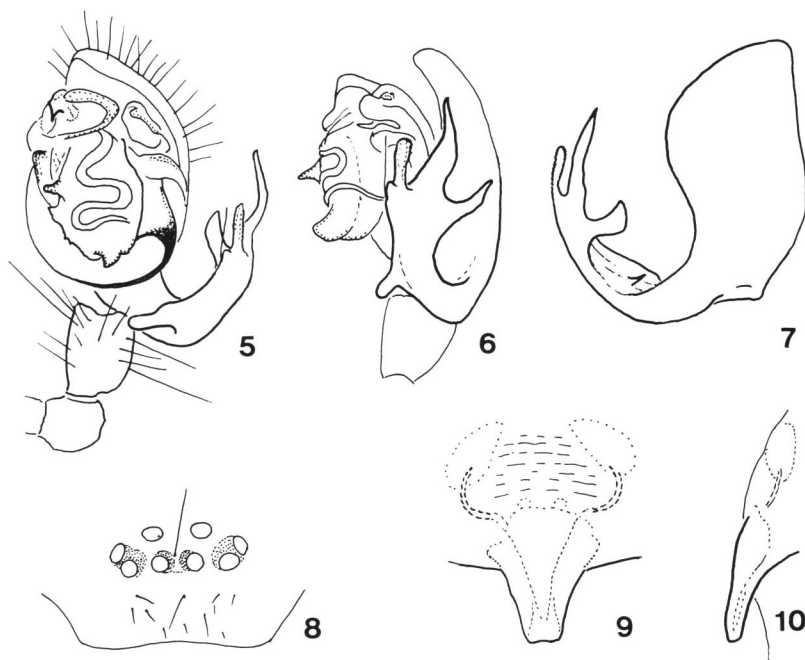
Holotype (♂) and allotype (♀): Shakudaniguchi-kô Adit, at the north-north-western foot of Asuwa-yama, 20 m alt., Fukui City, Fukui Pref., L. C. [C 3612-3603], 30-IV-1984, Y. NISHIKAWA leg. Paratypes (2 ♀): same collecting data, Y. NISHIKAWA & A. NOTO leg.

Measurements (mm):

	Total length	Carapace	Leg I	Leg II	Leg III	Leg IV
Holotype	4.0	1.8	15.4	12.1	9.0	12.5
Allotype	5.3	2.0	15.7	12.5	9.2	12.6



Figs. 1-4. Epigyna of *Nesticus* sp., from Hokuriku-kôzan. (1, 3: Ventral view; 2, 4: lateral view.)



Figs. 5-10. *Nesticus asuwanus* NISHIKAWA, sp. nov. — 5, Male palp, ventral view; 6, same, retrolateral view; 7, paracymbium of male palp, dorsal view; 8, eyes and clypeus, frontal view; 9, epigynum, ventral view; 10, same, lateral view.

Male. AME-AME=AME; Cp>MOA; PLE>ALE; PME-PME $\geq$ PME; AME<ALE<PLE $\approx$ PME. Leg formula 1, 4, 2, 3.

Palpal paracymbium with projections a, b, c, d and e; Pa thick with rounded distal part; Pb and Pd also thick, the latter roughened on the surface; Pc long, flattened and gently curved, with the distal half acuminate; Pe very small.

Carapace and abdomen with normal flecks as in the other species of the same group. Legs with light flecks.

Female. Similar to male in structure and coloration. Leg formula 1, 4, 2, 3. Chitin scape of epigynum projecting posteriorly and slightly curved inwards as in *N. floronoides* and *N. tarumii*.

Other specimens examined. 9 ♀, Nanatsuoguchi-kô Adit, Asuwa-yama, Fukui City, L. C. [C 3612-3603], 14-XI-1976, Y. NISHIKAWA, O. TOMINAGA, K. KATSURA & T. YOSHIMURA leg.

Notes. This new species is also a *floronoides* type, and cannot be distinguished from *N. floronoides* and *N. tarumii* by female alone. It is, however, readily discriminated from the latter two by the conformation of the paracymbial projection a of the male palp, which is rod-like and rounded at the distal end, instead of being acuminate.

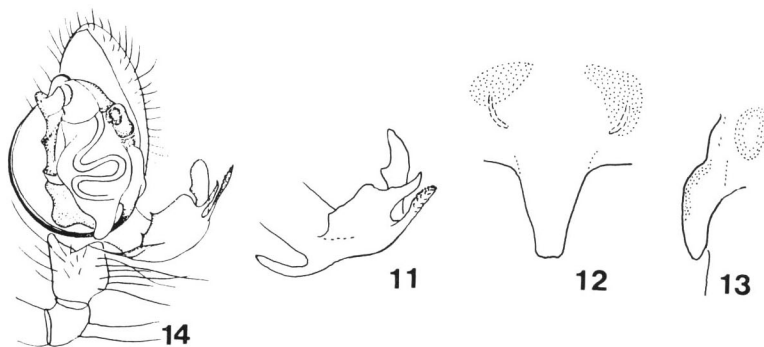
Nesticus tarumii YAGINUMA, 1979

[Japanese name: Onino-horahimegumo]

(Figs. 11-14)

Nesticus tarumii YAGINUMA, 1979, Fac. Lett. Rev. Otomon Gakuin Univ., (13), pp. 258, 270, 285, pl. 4, figs. 14-16.

Specimens examined. 1 ♀, 1 ♂, Shiraishi-no-ana Cave, 100 m alt., Shiraishi, Onyû-ku, Obama-shi, Fukui Pref., 10-VI-1980, Y. NISHIKAWA leg.; 2 ♀, same cave, 22-XI-1980, Y. NISHIKAWA leg.



Figs. 11-14. *Nesticus tarumii* YAGINUMA, 1979. — 11, Paracymbium of male palp, ventral view; 12, epigynum, ventral view; 13, same, lateral view; 14, male palp of an Oni-no-iwaya specimen (after YAGINUMA, 1979).

Notes. Originally described from Oni-no-iwaya Cave on Ôé-yama, this species extends its distribution to a limestone cave about 60 km to the east of the type locality. The single male specimen examined from the newly discovered population shows slight difference from the type in the configuration of the palpal paracymbium, but no infraspecific taxon can be recognized on it. This species is also a *floronoides* type.

Nesticus brevipes YAGINUMA, 1970

[Japanese name: Ko-horahimegumo]

Nesticus brevipes YAGINUMA, 1970, Bull. natn. Sci. Mus., Tokyo, **13**, p. 386, figs. 1-2, 5, 9; 1972, *ibid.*, **15**, p. 619, figs. 3-4.

Nesticus terrestris YAGINUMA, 1970, Bull. natn. Sci. Mus., Tokyo, **13**, p. 390, figs. 3-6, 8 [*partim*]. Other references are omitted.

Specimens examined. 1 ♀, Hôryû-zan (SW foot), 300 m alt., Wajima-shi, Ishikawa Pref., 29-X-1984, Y. NISHIKAWA leg.; 4 ♀, same locality (WSW foot), 300 m alt., 29-V-1985, Y. NISHIKAWA leg.; 1 ♀, 1 ♂, 2 ♂y, same locality (SW foot), 280 m alt., 29-V-1985, Y. NISHIKAWA leg.; 1 ♀y, same locality (WSW foot), 230 m alt., 29-V-1985, Y. NISHIKAWA leg.; 1 ♀, Umakakushi-no-ue-no-ana Cave, 35 m alt., Unoura-machi, Nanao-shi, Ishikawa Pref., 28-X-1984, Y. NISHIKAWA leg.; 1 ♀, Sano, 100-200 m alt., Nanao-shi, Ishikawa Pref., 28-V-1985, Y. NISHIKAWA leg.; 1 ♂y, Fudô-daki, 200 m alt., Kashima-chô, Ishikawa Pref., 31-V-1985, Y. NISHIKAWA leg.; 1 ♀, 1 ♂, Oyanagi, 200 m alt., Tsurugi-chô, Ishikawa Pref., 27-V-1985, Y. NISHIKAWA leg.; 3 ♀, Agehara-yama (SW foot), 300 m alt., Nabetani, Tatsunokuchi-chô, Ishikawa Pref., 15-VII-1984, Y. NISHIKAWA leg.; 1 ♀, Kuzuryû-ko (near Hayashidani-bashi), 580 m alt., Izumi-mura, Fukui Pref., 11-VII-1984, Y. NISHIKAWA leg.; 2 ♀, Ogawa, 60 m alt., Mikata-chô, Fukui Pref., 22-VII-1983, Y. NISHIKAWA leg.; 1 ♀, Yûshi, 60 m alt., Mikata-chô, Fukui Pref., 22-VII-1983, Y. NISHIKAWA leg.; 7 ♀, Tobagawa-zuidô, 45 m alt., Shimoyoshida, Kaminaka-chô, Fukui Pref., 28-IV-1984, Y. NISHIKAWA leg.; 1 ♀, Shiraishi-no-ana Cave, 100 m alt., Shiraishi, Onyû-ku, Obama-shi, Fukui Pref., 22-XI-1980, Y. NISHIKAWA leg.

Notes. Belonging to the short-legged type, this small species measures only 2-3 mm in the length of body. Though recorded from various parts of Japan, it has been unknown from the Hokuriku District, and the localities listed above are all new to science. As compared with long-legged forms, this spider makes its webs near the surface, and frequently found from under stones or dead leaves. Sometimes it coexists with a long-legged species in the same cave, but never dwells in the same microhabitat; the former makes webs in narrow fissures near the floor, while the latter usually occurs at higher spots on the wall or occupies wider spaces. In the present research area, *N. brevipes* was found in coexistence with long-legged *N. tarumii* in the limestone cave called Shiraishi-no-ana in Fukui Prefecture.

Most specimens recorded above are not truly subterranean. They were taken by sifting dead leaves accumulated on the gravelly ground along narrow streams.

Remarks

Of the four species of *Nesticus* recorded from the Hokuriku District, the short-legged one, *N. brevipes*, is widespread over the mainland of Japan. Its occurrence in the research area has been naturally expected, and bears no particular importance from the zoogeographic view-point.

Contrary to this, the long-legged forms are much more interesting. All the three are the representatives of the *floronoides* type, whose members are widely distributed to the northeastern part of Japan and narrowly extend westwards along the coast of the Japan Sea and southwestwards into the Island of Shikoku through the Kii Peninsula. Within the species-group, the three species under consideration have a close affinity with *N. floronoides* and its relatives, which occur mainly in the central part of Honshu. Their localities lie in the area adjacent to that inhabited by the latter. In short, all the areas in central Honshu, with the exception of the small southeastern part, are occupied by *N. floronoides* and its direct relatives, and the eastern part of the San'in District, where only two species, *N. tarumii* and *N. nishikawai*, have hitherto been known, can be regarded as the western extension of their distributional range.

In the Hokuriku District, no extra-cave habitats of long-legged nesticids have been met in spite of careful investigations. Since three of the four species have been found in artificial cavities, and since none of them are very old, long-legged nesticids must occur widely in the epigeal domain. It is to be hoped that future investigations will bring forth more species, especially from epigeal habitats, and will clarify the exact pattern of their speciation in the northern coastal areas of central Honshu.

References

- KOMATSU, T., 1942. Spiders found in the Saishō-dō Caves. *Acta arachnol.*, 7: 54–70. (In Japanese.)
- NISHIKAWA, Y., 1982. Araneae of Minami-Iwojima Island. *Conservation Reports of the Minami-Iwojima Wilderness Area, Tokyo, Japan*, pp. 373–377. (In Japanese, with English summary.)
- YAGINUMA, T., 1970. Two new species of small nesticid spiders of Japan. *Bull. natn. Sci. Mus., Tokyo*, 13: 385–394.
- 1972. Revision of the short-legged nesticid spiders of Japan. *Ibid.*, 15: 615–622.
- 1976 a. Studies in cave spiders of Japan. *Ess. Stud. publ. Commem. 10th Anniv. Otomon-Gakuin Univ.*, 983–1018. (In Japanese, with English title.)
- 1976 b. Studies in cave spiders of Japan (II). *Fac. Lett. Rev. Otomon Gakuin Univ.*, (10): 155–169. (In Japanese, with English summary.)
- 1979. A study of the Japanese species of nesticid spiders. *Ibid.*, (13): 255–287, pls. 1–7. (In English, with Japanese list of collecting records.)
- 1980 a. A new spider, *Nesticus shureiensis* (Araneae, Nesticidae) from Mie Prefecture, Central Japan. *J. speleol. Soc. Japan*, 5: 34–37.
- 1980 b. Supplementary notes on Japanese nesticid spiders, with the descriptions of two new species. *Fac. Lett. Rev. Otomon Gakuin Univ.*, (14): 241–250. (In Japanese, with English abstract and descriptions.)
- 1981. Two nesticid spiders from Shikoku, Japan. *J. speleol. Soc. Japan*, 6: 29–32.
- 1986. Spiders of Japan in Color —New Edition—. i+xxix+305 pp., 64 col. pls. Hoikusha, Osaka. (In Japanese.)