

Occurrence of the Genus *Xysticus* (Araneae, Thomisidae) in Taiwan¹⁾

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Abstract A new spider of the genus *Xysticus* C. L. KOCH, 1835, is described from the mountainous areas of Taiwan 1,500–3,300 m in elevation, under the name of *Xysticus chui*. At present, this is the only species of the genus recorded from the island. Though its male palp appears unique in bearing three, much developed tegular apophyses, it seems to belong to the species-group of *Xysticus luctans*.

Containing more than 350 described species mainly from the Holarctic Region, *Xysticus* C. L. KOCH, 1835, seems to be the largest and conspicuous genus in the spider family Thomisidae. Up to the present, about 20 species of thomisid spiders have been recorded from Taiwan (CHU & OKUMA, 1970, 1976; ONO, 1977, 1978a, b, 1980, 1985, 1988), but no representative of the genus *Xysticus* is included in those records.

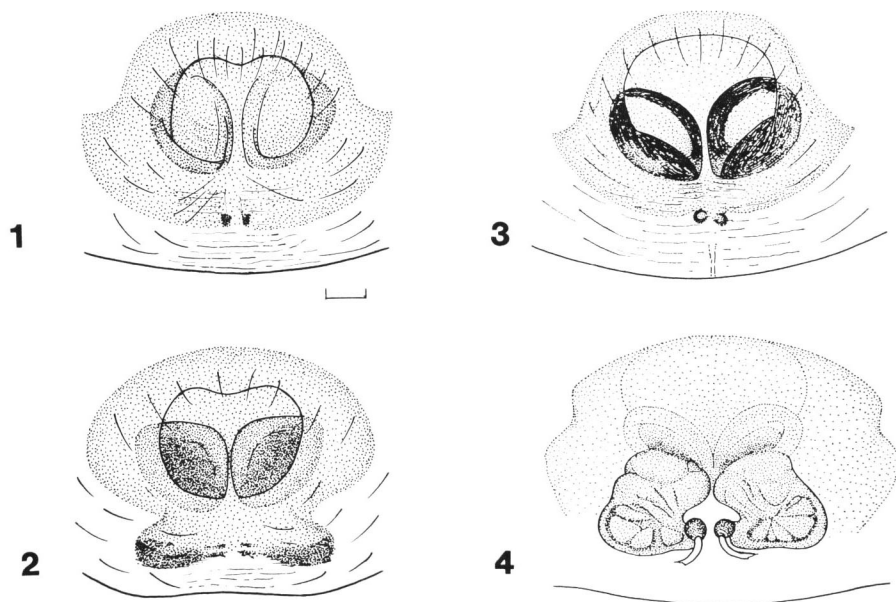
Through repeated field researches of the zoological expedition to the high mountains of Taiwan made by the National Science Museum, Tokyo (1989–1991), many specimens of *Xysticus* spiders were obtained from various places in Taiwan. Though the collecting sites are widespread on the island, these specimens belong to a single species probably endemic to Taiwan. On the other hand, some specimens of the same spider have long been at the present author's hands, since they were collected by Professor Y.-I. CHU of National Taiwan University in 1971 at Sungkang, Nant'ou Hsien. After a careful examination of these materials, it has become apparent that the spider species is new to science. In the present paper, the author is gratefully going to publish the result and to describe the new species under the name of *Xysticus chui*.

All the type specimens of the new species are deposited in the collection of the National Science Museum (Natural History), Tokyo.

The following abbreviations are used: ALE, anterior lateral eye, AME, anterior median eye, PLE, posterior lateral eye, PME, posterior median eye.

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Figs. 1-4. Female genitalia of *Xysticus chui* sp. nov. — 1-3, Epigyna; 4, internal structure. (Scale: 0.1 mm.)

Chiun-chen KO, Mr. Hiroshi MAKIHARA, Prof. Yoshiaki NISHIKAWA, Dr. Chiyoko OKUMA, Dr. Mamoru OWADA, Prof. Masataka SATÔ, Dr. Akihiko SHINOHARA, Mr. Masaaki TOMOKUNI, Prof. Dr. Tsukané YAMASAKI and Mr. Hajime YOSHIDA for their collaboration in the field and for offering important specimens.

Xysticus chui sp. nov.

(Figs. 1-9)

Type series. Holotype ♂, allotype ♀, Alishan, 2,160 m alt., Chiai Hsien, Taiwan, 7-III-1991, H. ONO leg. (NSMT-Ar 2253-2254). Paratypes: 2 ♀ 2 ♂, same data as for the holotype, 1 ♀, Alishan, altitude ?, 10-VII-1977, H. YOSHIDA leg., 2 ♀ 2 ♂, Alishan, 2,000 m alt., 26-V-1971, K. KANMIYA leg. (NSMT-Ar 2255-2257).

Other specimens examined. 1 ♀, Mt. Lala-shan, altitude ?, Taoyuan Hsien, Taiwan, 21-24-V-1980, H. MAKIHARA leg.; 1 ♀ 1 ♂ 2 juv., Yunling-shanchuang, 2,300-2,460 m alt., Mt. Nanhu-ta-shan, T'aichung Hsien, 2-VIII-1990, M. TOMOKUNI leg.; 1 ♂ 3 juv., Mt. Nanhu-ta-shan, NW slope, 2,700-3,100 m alt., 6-VIII-1990, M. TOMOKUNI leg.; 1 juv., Shenma, Mt. Nanhu-ta-shan, 3,100 m alt., 9-VIII-1990, M. TOMOKUNI leg.; 1 juv., Shenmu, 2,440 m alt., Mt. Hsiaohsueh-shan, T'aichung Hsien, 19-X-1889, H. ONO leg.; 2 ♂, Anma-shan, 2,230 m alt., Tahsueh-shan Mts., T'aichung Hsien, 14-16-VI-1989, S. UÉNO leg.; 3 ♂, same locality, 16-VI-1989, M. SATÔ leg.;

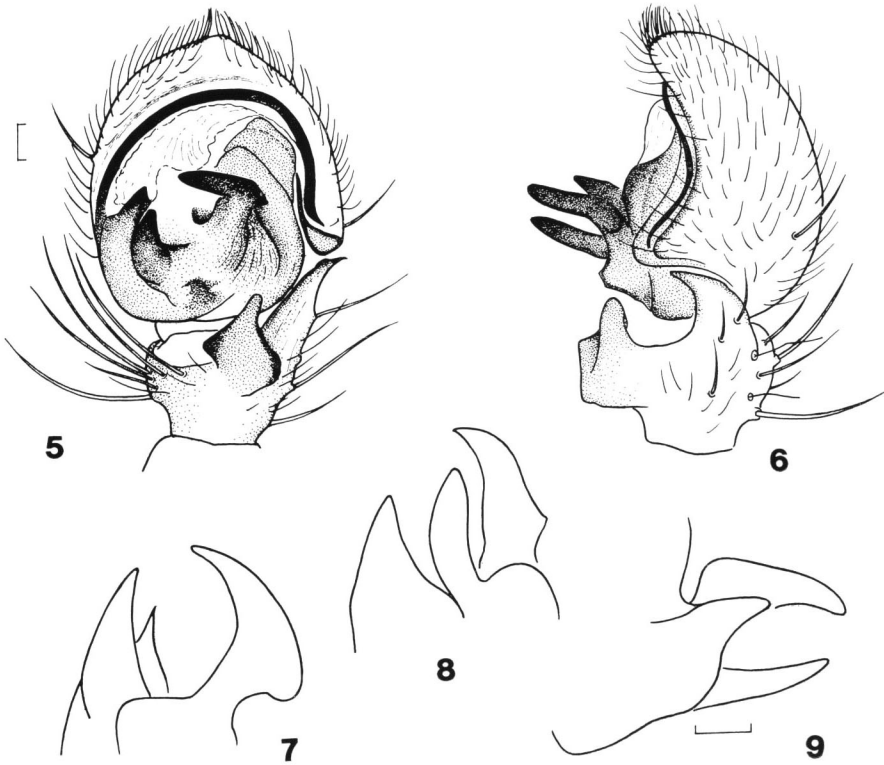
1 ♀, Anma-shanchuang, 2,250 m alt., T'aichung Hsien, 1-III-1991, A. SHINOHARA leg.; 1 ♀, Mt. Ch'uanhsing-shan, 1,590 m alt., T'aichung Hsien, 2-III-1991, A. SHINOHARA leg.; 1 juv., same mountain, 1,700 m alt., 2-III-1991, H. ONO leg.; 1 ♀, Sungkang, Nant'ou Hsien, 9-V-1971, Y.-I. CHU leg.; 3 ♂, Tz'uen, 1,990 m alt., Hualien Hsien, 26-VI-1889, S. UENO leg.; 1 ♂, Yak'ou (W side), 2,700 m alt., Hohuan-shan, Nant'ou Hsien, 27-VI-1889, S. UENO leg.; 1 ♂ 1 juv., Shenmu, 2,180 m alt., Mt. Hohuan-shan, 14-III-1991, H. ONO leg.; 1 ♂ same locality, 13-III-1991, A. SHINOHARA leg.; 1 juv., Sunghsueh-lou, 3,100 m alt., Mt. Hohuan-shan, 22-X-1989, Y. NISHIKAWA leg.; 3 juv., Mt. Shihmen-shan, 3,236 m alt., Nant'ou Hsien, 22-X-1989, H. ONO leg.; 1 ♂ 3 juv., Pilu-chi, between Lishan and Tayuling, Nant'ou Hsien, 22-X-1889, H. ONO leg.; 1 ♂, T'iench'ih, Mt. Nengkao, Nant'ou Hsien, 2,860 m alt., 25-X-1889, H. ONO leg.; 1 juv., same data as for the holotype; 1 juv., Yak'ou (E side), 2,600 m alt., Kuan-shan Mts., T'aitung Hsien, 12-VI-1989, S. UENO leg.; 1 ♀ 1 ♂ 7 juv., between Kuan-shan and Litao, 1,790 m alt., T'aitung Hsien, 11-III-1991, H. ONO leg.; 1 ♀ 1 ♂, between Kuan-shan and Litao, 2,050 m alt., 11-III-1991, H. ONO leg.; 3 juv., Mt. Chinan-shan, S slope, 1,860-2,350 m alt., Kaohsiung Hsien, 31-X-1889, H. ONO leg.—(NSMT-Ar 2258-2281).

Description. Measurement (based on the holotype and allotype). Body length ♀ 6.40 mm, ♂ 4.05 mm, prosoma length ♀ 2.63 mm, ♂ 2.20 mm, width ♀ 2.51 mm, ♂ 2.10 mm, opisthosoma length ♀ 3.64 mm, ♂ 2.20 mm, width ♀ 3.56 mm, ♂ 2.00 mm; lengths of legs [total length (femur+patella+tibia+metatarsus+tarsus)]: ♀ I 6.68 mm (1.97+1.05+1.51+1.40+0.75), II 6.82 mm (2.08+1.06+1.51+1.36+0.81), III 4.79 mm (1.64+0.76+1.01+0.83+0.55), IV 5.46 mm (1.73+0.77+1.28+0.95+0.73), ♂ I 6.83 mm (2.05+0.93+1.51+1.51+0.83), II 6.73 mm (2.05+0.90+1.50+1.50+0.78), III 4.75 mm (1.51+0.70+1.03+0.91+0.60), IV 5.10 mm (1.57+0.68+1.17+1.03+0.65).

Variation of the body length: ♀ 5.30-7.00 mm, ♂ 4.00-4.75 mm.

Eyes (♀ allotype, ♂ holotype): ALE>PLE>PME>AME, ALE/AME ♀♂ 2.00, PLE/PME ♀ 1.37, ♂ 1.25, AME-AME/AME-ALE ♀ 2.00, ♂ 1.78, PME-PME/PME-PLE ♀ 0.91, ♂ 0.77; median ocular area: anterior width/posterior width ♀ 0.92, ♂ 0.95, length/width ♀ 0.88, ♂ 0.97; clypeus/AME-AME ♀ 0.81, ♂ 1.04.

Legs. Tarsal claws I-II with 4-5 teeth, III-IV with 3-4 teeth; leg-formula I-II-IV-III or II-I-IV-III. Spiniformation (♀ allotype, ♂ holotype): ♀ femora: I dorsal 1, prolateral 0-1-1-1, II-IV dorsal 1 each; patellae: I-IV dorsal 1-0-1 (weak); tibiae: I-IV dorsal 1-1-0, I-II ventral 2-2-2-2, III-IV ventral 1-1-1; metatarsi: I-II and IV prolateral 0-1-1, I-III retrolateral 0-1-0, I-II ventral 1-2-0-2-2, III ventral 0-2-2, IV ventral 0-1-2; ♂ femora: I and IV dorsal 0-0-1-1-1, II-III dorsal 0-1-1-1-1, I prolateral 0-2-1-0-0; patellae: III-IV retrolateral 1; tibiae: I-IV dorsal 1-1-0 (weak), I-II prolateral 1-1-0, retrolateral 1-1-1, ventral 2-2-2-2, III-IV pro- and retrolateral 1-1 each; metatarsi: I-II prolateral 0-1-2, retrolateral 0-1-0, I ventral 1-2-2-2, II ventral 2-0-2-2, III pro- and retrolateral 0-1-1, IV pro- and retrolateral 1-1-1, III-IV ventral 2-0-2.



Figs. 5-9. Male palp of *Xysticus chui* sp. nov. — 1, Ventral view; 2, retrolateral view; 3, tegular apophyses, retrolatero-ventral view; 4, same, prolatero-ventral view; 5, same, pro-lateral view. (Scales: 0.1 mm.)

Male palp (Figs. 5-9). Tibia with a large and developed ventral apophysis and rostrated retrolateral apophysis. Tegulum with three developed apophyses; the basal one heeled, the apical and median ones curved retrolaterally; the basal one not lying across the median one; embolus wide filiform.

Female genitalia (Figs. 1-4). Epigynum without median septum, vestibulum large, its margin weakly sclerotized. Intromittent orifices very large, oval and strongly sclerotized, intromittent canal very short, spermathecae reniform.

Coloration and markings. ♀ Prosoma: prodiscus of carapace white, mesodiscus dark-yellow to yellowish brown, allatum dark or blackish brown; chelicerae, maxillae and labium yellowish brown to brown, sternum yellowish brown mottled with brown and white, legs and palps dark-yellow to light-brown; opisthosoma yellowish brown to brown. ♂ Prosoma: prodiscus white, mesodiscus brown, metadiscus distinct and white, allatum chestnut; chelicerae brown with white spots, maxillae and labium brown, sternum brown mottled with white, femora and patellae I-II, distal part of each femora

III–IV blackish brown, other parts of legs dark-yellow to yellowish brown; opisthosoma blackish brown with anterior margin, a pair of bars at the middle and a horizontal stripe in the posterior part, all white.

Diagnosis. This new species possesses characteristics intermediate between the species-group of *Xysticus luctans* and that of *X. cristatus*. The apicotegular process of male palp is developed, forming a large apical apophysis, and the basal apophysis lies apart from the median one and not across the latter. These facts lead the new species to the group of *Xysticus cristatus*. However, the female genitalia of *X. chui* show a structure typical for a species of the group of *X. luctans* in having a distinct, wide and oval vestibulum, very short intromittent canals and large spermathecae (DONDALE & REDNER, 1978; ONO, 1988). Having compared the characteristics of the new species with those of the known species of the genus *Xysticus* from Japan, Korea and China, the author has come to the conclusion that the new species should be regarded as a member of the species-group of *X. luctans*. A distant but positive relationship was recognized in the female between the new species and some Asian species of the group, for example, *X. ephippiatus* SIMON, 1880, *X. insulicola* BÖSENBERG et STRAND, 1906, *X. atrimaculatus* BÖSENBERG et STRAND, 1906, and *X. transversomaculatus* BÖSENBERG et STRAND, 1906. Judging from the male characteristics, however, no close relative has been found in the described species not only from near Taiwan but from Europe, Siberia and North America. Though the male palp of this new species is unique, the author prefers provisionally to put it in the group of *X. luctans* in the broad sense on the basis of the resemblance in the female genitalia. An appropriate systematic position of the new species can be determined in future, when Chinese species of the genus *Xysticus* are fully studied.

Remarks. This species is widely distributed in the mountainous areas of Taiwan between 1,500 m and 3,300 m in elevation.

The specific name is given after Professor Dr. Yau-I CHU of National Taiwan University, Taipei.

References

- CHU, Yau-I, & C. OKUMA, 1970. Preliminary survey on the spider-fauna of the paddy fields in Taiwan. *Mushi, Fukuoka*, **44**: 65–88.
- & ——— 1976. A list of spiders of Taiwan, part 2. *Sci. J. Taiwan Mus.*, **18**: 101–119. (In Chinese.)
- DONDALE, C. D., & J. H. REDNER, 1978. The Insects and Arachnids of Canada, Part 5. The Crab Spiders of Canada and Alaska. Araneae: Philodromidae and Thomisidae. 255 pp. Supply and Services Canada, Hull.
- ONO, H., 1977. Thomisidae aus Japan I. Das Genus *Tmarus* SIMON (Arachnida: Araneae). *Acta arachnol.*, **27** (spec. no.): 61–84.
- 1978a. Thomisidae aus Japan II. Das Genus *Oxytate* L. KOCH, 1878 (Arachnida: Araneae). *Senckenbg. biol.*, **58**: 245–251.
- 1978b. Redescription of the Japanese crab spider *Oxyptila* (?) *truciformis* BÖSENBERG et STRAND, 1906 (Araneae: Thomisidae). *Atypus, Osaka*, (72): 3–7 (In Japanese.)

- ONO, H., 1980. Thomisidae aus Japan III. Das Genus *Lysiteles* SIMON, 1895 (Arachnida: Araneae). *Senckenbg. biol.*, **60**: 203–217.
- 1985. The Thomisidae of Japan V. *Monaeses* THORELL, 1869, and its new junior synonym, *Mecostrabus* SIMON, 1903 (Arachnida, Araneae). *Bull. natn. Sci. Mus., Tokyo*, (A), **11**: 91–97.
- 1988. A Revisional Study of the Spider Family Thomisidae (Arachnida, Araneae) of Japan. 2+ii+252 pp., 1 pl. National Science Museum, Tokyo.