

Zoropsis cyprogenia sp. n., a new, probably endemic spider species from Cyprus (Araneae, Zoropsidae)

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Abstract. *Zoropsis cyprogenia* sp. n. (Araneae, Zoropsidae) is described from a female specimen collected on Akamas peninsula, Cyprus. A short overview of the family Zoropsidae, as presently delimited, is presented and detailed illustrations of the new species are given. The new species can be easily distinguished from the other Mediterranean and Atlantic *Zoropsis* species on the basis of external and internal characteristics of the female genitalia.

Samenvatting. *Zoropsis cyprogenia* sp. n., een nieuwe, waarschijnlijk endemische spinnesoort uit Cyprus (Araneae, Zoropsidae)

Zoropsis cyprogenia sp. n. wordt beschreven aan de hand van een vrouwelijk specimen, verzameld op het Akamas schiereiland, Cyprus. Een kort overzicht wordt gepresenteerd van de familie Zoropsidae zoals ze tegenwoordig wordt omschreven en de nieuwe soort wordt in detail afgebeeld. De nieuwe soort kan gemakkelijk onderscheiden worden van de andere mediterrane en atlantische *Zoropsis* soorten aan de hand van uitwendige en inwendige kenmerken van de vrouwelijke genitaliën.

Résumé. *Zoropsis cyprogenia* sp. n., une espèce nouvelle, et probablement endémique de Chypre (Araneae, Zoropsidae)

Zoropsis cyprogenia sp. n. est décrit à partir d'un spécimen féminin, collectionné sur la péninsule d'Akamas, à Chypre. Un bref aperçu de la famille des Zoropsidae, telle qu'elle est délimitée à présent, est présenté et la nouvelle espèce est illustrée en détail. La nouvelle espèce se distingue facilement des autres *Zoropsis* méditerranéens et atlantiques d'après certains caractères externes et internes des genitalia femelles.

Key words: *Zoropsis cyprogenia* – Araneae – new species – Cyprus.

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Introduction

The spider family Zoropsidae Bertkau, 1882, was considered by Simon (1892) as being composed of the following three genera: *Acanthoctenus* Keyserling, 1876, *Raecius* Simon, 1892, *Zorocrates* Simon, 1888, and *Zoropsis* Simon, 1878.

Roewer (1954) lists *Acanthoctenus* in the family Acanthothenidae, but, in addition to the three other genera cited above, included the genera *Uduba* Simon, 1880, and *Zorodictina* Strand, 1907, in the family Zoropsidae.

Lehtinen (1967) dispensed with the family Zoropsidae altogether: he redelimited *Acanthoctenus* and placed it in the Ctenidae, transferred *Raecius*, *Uduba*, *Zorocrates* and *Zorodictina* to the Miturgidae and placed *Zoropsis* in the family Zoridae. Lehtinen (1967) also described a new genus, *Takeoa* Lehtinen, 1967, which was attributed to the Zoridae as well and to which he transferred *Zoropsis nishimurai* Yaginuma, 1963. Several authors (Wunderlich 1986, Levy 1990, Coddington & Levi 1991, Griswold 1993) have since revalidated the family Zoropsidae, because the eye arrangement and the presence of scopulae in *Zoropsis* species do not fit well in Lehtinen's Zoridae. The family Zoropsidae is limited nowadays to the genera *Zoropsis* and *Takeoa* (Platnick, 1993), although cladograms presented by Coddington & Levi (1991) and Griswold (1993) group *Acanthoctenus* together with the Zoropsidae in one clade.

The family Zoropsidae, as presently delimited, has the following diagnostic somatic characters (Levy 1990): presence of a calamistrum and a narrow, bipartite cribellum; carapace with a longitudinal thoracic groove and eight eyes in two rows, arranged in a pattern similar to that of the family Lycosidae; toothed chelicerae; all legs with strong spines, tibiae and metatarsi I and II equipped with several pairs of ventral spines; metatarsi bearing scopulae and an apical, soft membranous rim on dorsum, tarsi bearing scopulae, trichobothria, claw tufts and two tarsal claws.

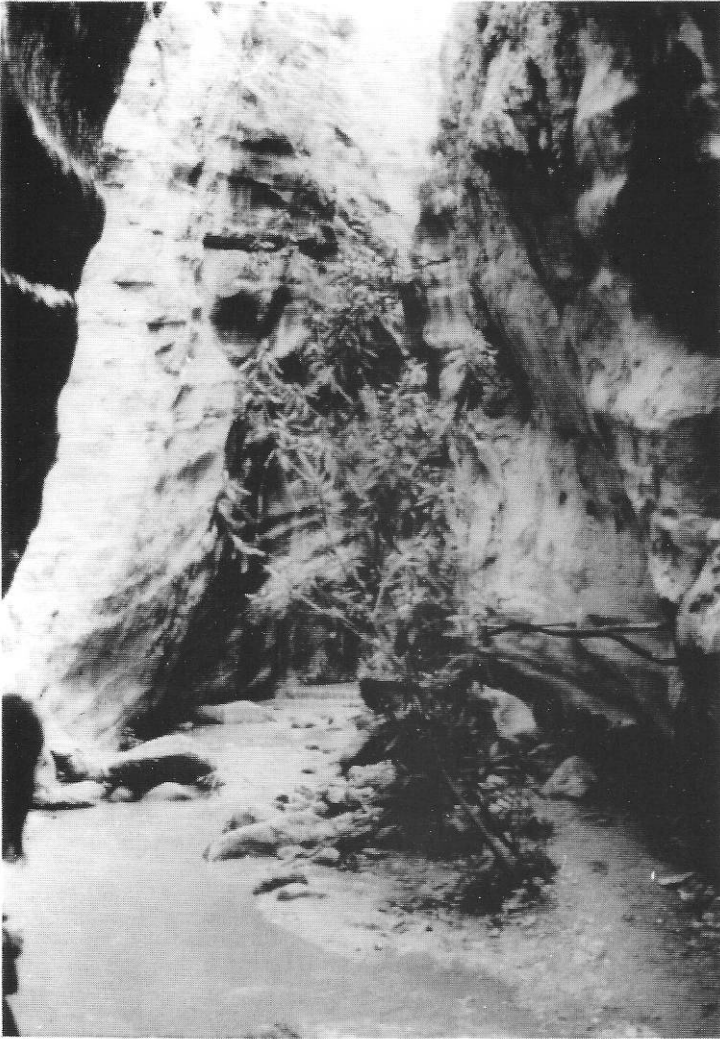


Fig. 1: Type locality of *Zoropsis cyprogenia* sp. n. - Cyprus, Akamas peninsula, bank of Avgas River running through Avakas Gorge.

Roewer (1954) listed 12 species and two subspecies in the genus *Zoropsis*. Brignoli (1983) added five more species and Platnick (1993) yet another species. Many of the species described, e.g. in Dahl (1901a, 1901b), have been synonymised (Lehtinen 1967, Wunderlich 1994). For the time being, in the absence of a complete revision of the family Zoropsidae, this leaves us with ten "good" Zoropsid species: *Z. bilineata* Dahl, 1901, from Morocco, Algeria and Mallorca; *Z. coreana* Paik, 1978, from Korea; *Z. lutea*

(Thorell, 1875), from the eastern Mediterranean; *Z. markamensis* Hu & Li, 1987, from China; *Z. media* Simon, 1878, from the western Mediterranean; *Z. pekingensis* Schenkel, 1953, from China; *Z. quedenfeldti* Dahl, 1901, from Morocco; *Z. rufipes* (Lucas, 1838) from the Canary Islands and Madeira; *Z. spinimana* (Dufour, 1820) from southern Europe and northern Africa and *Takeoa nishimurai* (Yaginuma, 1963), from Japan and China (Chen & Zhang, 1991). The most recent treatment of the six Mediterranean and Atlantic *Zoropsis* species can be found in Wunderlich (1994).

On April 5, 1997, while sieving leaf litter on the stream bank in Avakas Gorge, Akamas peninsula, Cyprus, the author captured an adult female *Zoropsis* belonging to a new species. It is described below. All measurements are in mm. The internal female genitalia were observed after clearing the vulva in methyl salicylate.

Zoropsis cyprogenia sp. n.

Holotype ♀: Cyprus, Akamas peninsula, Avakas Gorge, in leaf litter on the bank of Avgas river, 20 m, 5.IV.1997, J. Bosselaers leg. Deposited in the Royal Belgian Institute for Natural Sciences, Brussels (RBINS).

Diagnosis: the new species is easily recognised by the short stalked epigynal scape, which does not reach the posterior end of the epigyne, by the lateral sclerotised epigynal folds which meet posteriorly and by the long, tortuous vulval ducts.

Description. ♀: total length: 8.0.

Carapace: length: 4.0; width: 3.15. Yellow, somewhat darker in the cephalic part between the eyes. Covered with short, black, forward pointing hairs, except on the radial striae (fig. 2). Some small, light grey spots on the margin and along the radial striae. There is a short (length: 0.45) but pronounced thoracic groove. Width of clypeus: 0.1.

Eyes: eight eyes in two rows, disposed as illustrated in fig. 2, all ringed with black. Width of anterior row: 1.11; width of posterior row: 1.28. Depth of the entire ocular field in frontal view: 0.72. Trapezium of the median eyes, anterior width: 0.48; posterior width: 0.59; depth: 0.57. Diameter of individual eyes: anterior row, laterals: 0.28; medians: 0.17; posterior row, laterals: 0.24; medians: 0.24.

Chelicerae: greyish brown, turning yellow towards margin. Three promarginal and three retromarginal teeth.

Sternum: length: 1.75; width: 1.65. Pale yellow, sparsely covered with dark, pointed setae. Some small grey spots in the centre and along the margin.

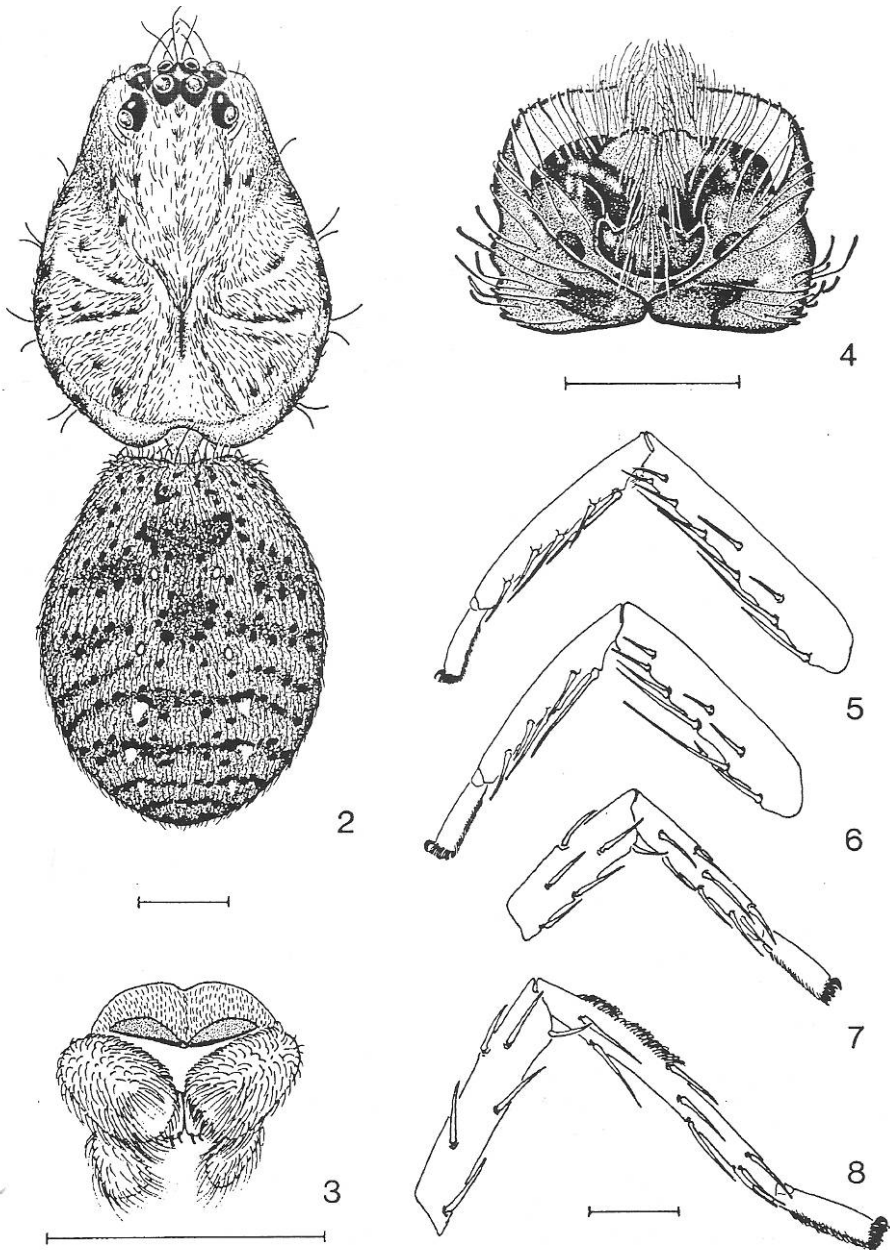
Labium: length: 0.65; width: 0.75. Yellow, mushroom-shaped, obtuse and rounded anteriorly, with a thickened, white margin. Maxillae yellow, parallel-sided, length: 1.03; width: 0.65.

Abdomen: dorsal side reddish brown, peppered with black dots and sparsely covered with dark, pointed setae. In the anterior half there is a red-brown, more or less arrow-shaped median mark with a dark border, pointing backwards (fig. 2). In the posterior half the abdomen bears several transversal dark chevrons and three pairs of white dots. Ventral side yellow-brown, sparsely dotted with black spots. Cribellum bipartite (fig. 3).

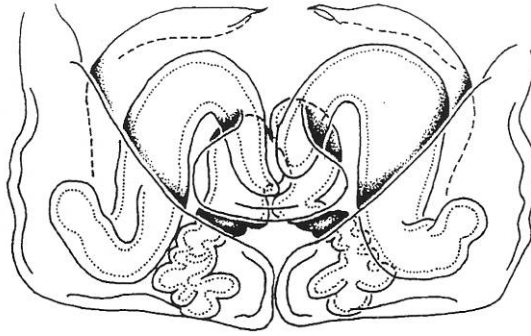
Legs: yellow, covered with thin grey setae, femora with some grey spots. All tarsi bearing scopulae and thick terminal claw tufts.

Measurements:

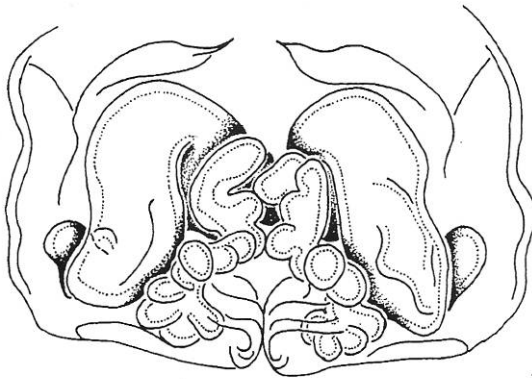
	femur	patella	tibia	metatarsus	tarsus	total
I	3.05	1.50	3.15	2.70	0.95	11.35
II	2.80	1.25	2.65	2.55	0.95	10.20
III	2.35	1.20	1.85	2.15	0.95	8.50
IV	3.10	1.80	2.75	3.45	1.15	12.25



Figs. 2-8: *Zoropsis cyprogenia* sp. n.; holotype ♀. Cyprus, Akamas peninsula, Avakas Gorge, 20 m, 5.IV.1997, J. Bosselaers leg. et del.; 2. Dorsal view of carapace and abdomen, 3. Bipartite cribellum, 4. Epigyne, 5. Leg I, tibia, metatarsus and tarsus, retrolateral view, 6. Leg II, tibia, metatarsus and tarsus, retrolateral view, 7. Leg III, tibia, metatarsus and tarsus, prolateral view, 8. Leg IV, tibia, metatarsus and tarsus, prolateral view. Scale lines: 1 mm, except fig. 4: 0.5 mm.



9



10



Figs. 9–10: *Zoropsis cyprogenia* sp. n.; holotype ♀, Cyprus, Akamas peninsula, Avakas Gorge, 20 m, 5.IV.1997, J. Bosselaers leg. et del.; 9. Cleared vulva, ventral view, 10. Cleared vulva, dorsal view. Scale lines: 0.5 mm.

Leg spination (figs. 5–8):

Leg I: femur with two prolateral spines and four dorsal spines in two rows. Patella with a base of one retrolateral spine. Tibia with six pairs of ventral spines, two prolateral and two or three retrolateral spines. Metatarsus with five pairs of ventral spines.

Leg II: femur with two prolateral spines and six or seven dorsal spines in two or three rows. Patella with a base of one retrolateral spine. Tibia with five pairs of ventral spines, two prolateral and three retrolateral spines. Metatarsus with five pairs of ventral spines.

Leg III: femur with nine dorsal spines in three rows. Patella with one prolateral and one retrolateral spine. Tibia with three pairs of ventral spines, one dorsal spine, two prolateral and two retrolateral spines. Metatarsus with three pairs of ventral spines and one terminal median ventral spine, one dorsal spine, three prolateral and three retrolateral spines.

Leg IV: femur with six or seven dorsal spines in three rows. Patella with one prolateral and one retrolateral spine. Tibia with three pairs of ventral spines, one dorsal spine, two prolateral and two retrolateral spines. Metatarsus with two rows of three ventral spines and one terminal median ventral spine, one dorsal spine and a calamistrum, three prolateral and three retrolateral spines.

Female genitalia: epigyne as illustrated (fig. 4), with a wide median scape attached to a stalk and lateral sclerotised folds which meet posteriorly, behind the stalked scape. Internal genitalia as illustrated (figs. 9–10). Spermathecae elongated and robust, of uniform texture throughout, laterally flattened. An outward oriented ovoid body is connected ventrolaterally to the posterior end of each spermatheca. Anterior end of spermatheca connected to a long tortuous duct with a thick, sclerotised wall.

Male: unknown.

Etymology: cyprogenia is a latinisation of the Greek word kuprogeneia, which means “born on Cyprus”, a nickname for the goddess Aphrodite.

Distribution: Only known from the type locality.

Discussion

Because of its short, stalked and terminally widened epigynal scape (fig. 4), the new species does not fit in the *spinimana* group of species, in which Lehtinen (1967) joined *Z. spinimana*, *Z. bilineata* and *Z. pekingensis* (see illustration in Schenkel 1953), and to which *Z. quedenfeldti* should also be added (Wunderlich 1994). *Zoropsis cyprogenia* has a stalked epigynal scape typical of the *lutea* group of species, consisting of *Z. lutea*, *Z. media* and *Z. rufipes* (Lehtinen, 1967). It differs from *Z. lutea*, which also occurs on Cyprus, and from *Z. media* and *Z. rufipes*, which have a western Mediterranean and Atlantic repartition, respectively, by having a stalked epigynal scape which is much shorter and does not reach the posterior margin of the epigyne. *Z. cyprogenia* also differs by the extended lateral sclerotised lobes, which meet each other posteriorly, behind the stalked scape (fig. 4). Although there is considerable variation in the exact shape of the epigynal scape and lobes of *Z. lutea*, resulting in the synonymy of *Z. lutea asiatica* Kulczynski, 1911, with *Z. lutea* (Levy, 1990), the stalked epigynal scape of *Z. lutea* always reaches the posterior margin of the epigyne, clearly distinguishing it from the presently described species. The same goes true for the equally variable *Z. rufipes* (Wunderlich, 1987). *Z. markamensis* and *Takeoa nishimurai* also have epigyines with lateral sclerotised folds which meet posteriorly (Yaginuma 1963, 1986; Hu & Li 1987), but their general epigynal structure, e.g. shape of the lateral folds and shape and position of the scape, differs significantly from *Z. cyprogenia*.

The internal female genitalia of *Z. cyprogenia* are also very distinctive. *Z. cyprogenia* differs from *Z. lutea* through its more elongated spermathecae (figs. 9–10) and the lateral position of the “ovoid bodies” (Levy 1990). The new species differs from all three species attributed to the *lutea* group through the long, tortuous ducts attached to the spermathecae (figs. 9–10). However, it is closer to *Z. media* and *Z. rufipes* than it is to *Z. lutea*, as far as the internal vulval structure is concerned. In fact, *Z. cyprogenia* might be the eastern Mediterranean equivalent of the Atlantic insular species *Z. rufipes*.

Indeed, the type locality of *Z. cyprogenia*, Avakas Gorge, is situated on the north-western end of Cyprus, on the remote and uninhabited Akamas peninsula, which is one of the three regions where the largest numbers of endemic plants are found in Cyprus (Sfikas 1994). Akamas peninsula is home to 24 endemic plant species, one of them, *Alyssum akamasicum* B.L. Burtt, occurring only on the peninsula. Further sampling is needed in order to decide whether or not *Z. cyprogenia* is an endemic insular species, but such is a definite possibility. The discovery of this rare new spider species once again

stresses the urgent need for more stringent nature conservancy measures for Akamas peninsula, a region which, although uninhabited, is increasingly threatened by tourism.

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References

- Bertkau, P. 1882. Ueber das Cribellum und Calamistrum. — *Arch. Naturgesch.* 48: 316–362.
- Brignoli, P. M., 1983. *A catalogue of the Araneae described between 1940 and 1981*. Manchester University Press. 755 pp.
- Chen, Z. F. & Zhang, Z. H., 1991. *Fauna of Zhejiang: Araneida*. Zhejiang Science and Technology Publishing House. 356 pp.
- Coddington, J. A. & Levi, H. W., 1991. Systematics and evolution of spiders (Araneae). — *Annu. Rev. Ecol. Syst.* 22: 565–592.
- Dahl, F., 1901a. Ueber die Wert des Cribellums und Calamistrums für das System der Spinnen und eine Uebersicht der Zorospiden. — *Sitzungsber. Ges. Naturforsch. Freunde Berlin* 9: 177–199.
- Dahl, F., 1901b. Nachtrag zur Uebersicht der Zorospiden. — *Sitzungsber. Ges. Naturforsch. Freunde Berlin* 9: 244–255.
- Griswold, C. E., 1993. Investigations into the phylogeny of the lycosoid spiders and their kin (Arachnida: Araneae: Lycosoidea) — *Smith. Contr. Zool.* 539: 1–39.
- Hu, J. L. & Li, A. H., 1987. The spiders collected from the fields and the forests of Xizang autonomous region, China (II). — *Agricultural insects, spiders, plant diseases and weeds of Xizang* 2: 257–259.
- Kulczynski, V., 1911. Fragmenta arachnologica, IX. 16. Araneorum species nonnullae in Syria a Rev. P. Bovier-Lapierre et in Palaestina a Rev. E. Schmitz collectae. — *Bull. int. Acad. Sci. Lett. Cracovie* (B) 1911: 12–75.
- Lehtinen, P. T., 1967. Classification of the cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. — *Ann. Zool. Fenn.* 4(3): 199–468.
- Levy, G., 1990. On the cribellate spider *Zoropsis lutea* in Israel (Araneae, Zoropsidae). — *Bull. Br. Arachnol. Soc.* 8(5): 139–143.
- Platnick, N., 1989. *Advances in spider taxonomy 1981–1987*. Manchester University Press, Manchester. 673 pp.
- Platnick, N., 1993. *Advances in spider taxonomy 1988–1991*. The New York Entomological Society and The American Museum of Natural History, New York. 846 pp.
- Roewer, C. F., 1954. *Katalog der Araneae von 1758 bis 1940, bzw. 1954. 2. Band*. Royal Belgian Institute for Natural Sciences, Brussels. 1751 pp.
- Schenkel, E., 1953. Chinesische Arachnoidea aus dem Museum Hoangho-Peiho in Tientsin. — *Bolm. Mus. nac. Rio de J. (N. S., Zool.)* 119: 1–108.
- Sfikas, G., 1994. *Wild flowers of Cyprus*. Efstathiadis Group, Anixi Attikis. 320 pp.
- Simon, E., 1892. *Histoire Naturelle des Araignées*. Librairie Encyclopédique de Roret, Paris. — 1(1): 227–230.
- Wunderlich, J., 1986. *Spinnenfauna gestern und heute*. Erich Bauer Verlag bei Quelle & Meyer, Wiesbaden. 283 pp.
- Wunderlich, J., 1987. *Die Spinnen der Kanarischen Inseln und Madeiras*. Triops Verlag, Langen. 435 pp.
- Wunderlich, J., 1994. Zur Kenntnis der West-paläarktischen Arten der Gattung *Zoropsis* Simon 1878 (Arachnida: Araneae: Zoropsidae). — *Beiträge zur Araneologie* (J. Wunderlich, ed.) 4: 723–727.
- Yaginuma, T., 1963. A new Zoropsid spider from Japan — *Acta arachnol.* 18: 1–6 + pl. 1–III.
- Yaginuma, T., 1986. *Spiders of Japan in color*. Hoikusha Publishing Co., Osaka. 305 pp.