Nat. Hist. Res., Special Issue, No. 1: 195–198. March 1994.

Schizomida (Arachnida) of the Mariana Islands, Micronesia

James C. Cokendolpher[1] and Nobuo Tsurusaki[2]

[1]2007 29th Street, Lubbock, Texas 79411, USA
[2]Department of Biology, Faculty of Education, Tottori University, Tottori 680, Japan

Abstract A new genus of Hubbardiidae, *Orientzomus*, is diagnosed. It consists of three species, *Orientzomus luzonicus* (Hansen, in Hansen and Sörensen) from the Philippine Islands; *Orientzomus sawadai* (Kishida) from the Ogasawara (=Bonin) Islands; and *Orientzomus* sp. from both the northern and southern Mariana Islands. The species from the Marianas is undescribed and most closely related to the species from the Philippines. A second undescribed species occurs in the southern Marianas. It is related to other undescribed taxa from Thailand and the Philippine Islands, and "*Schizomus*" *lunatus* from India.

Key words: Asuncion Island, Guam, Hubbardiidae, Mariana Islands, *Orientzomus luzonicus*, *Orientzomus sawadai*, *Orientzomus*, Saipan Island, Sarigan Island, "*Schizomus*", Schizomida.

The Schizomida of eastern Asia, although little studied, have had a particularly complex taxonomic history. Species have been moved back and forth between *Schizomus* Cook and *Trithyreus* Kraepelin, with no real understanding of these genera. More recent studies of the type species of these genera (Reddell and Cokendolpher, 1985, 1991) revealed that almost all of the species previously referred to those genera were incorrect. Reddell and Cokendolpher (1991) also resurrected the family name Hubbardiidae, to which all known Asian and oceanic island species belong. As a consequence of these studies, Harvey (1992) described several new genera from Australia which also included some species from eastern Asia. Numerous genera remain undiagnosed. A world generic revision is underway (Reddell and Cokendolpher, in prep.). Many species remain undescribed.

Although schizomids are not especially mobile (most species live in or under debris on the soil), they have been transported around the world in botanical collections. Wild populations are also known from island locations suggesting that they are able to cross oceans on floating debris. Gressitt (1961) reported ants and termites are capable of similar transport from continents to islands. Since numerous schizomid species are known to associate (probably as predators) with termites and ants, it is possible that a pair of species might have arrived on the same raft. To date, only four identified species have been recorded from smaller Pacific Islands. *Bamazomus siamensis* (Hansen, in Hansen and Sörensen) has been recorded from Oahu of the Hawaiian Islands, Ryukyu Islands of Japan, Hong Kong, and Thailand (Cokendolpher and Reddell, 1986). Cokendolpher (1988) reported several other hubbardiids occurring on smaller Japanese islands: *Apozomus daitoensis* (Shimojana) from the Daitô Islands; "*Schizomus*" *sawadai* (Kishida) from the Chichijima Island of the Ogasawara (=Bonin) Islands; and "*Schizomus*" *sauteri* Kraepelin from the Ryukyu Islands. This latter species is also known from The Socialist Republic of Vietnam, and Taiwan. Two of these species have been collected from termite colonies (Silvestri, 1947). Two other island populations have been discovered but the species have not been identified. They are from the Fiji and the Samoa Islands (Peck, 1983; Savory, 1977, respectively). Reddell (pers. commun., 1993) has also informed us that he has seen museum material of unidentified hubbardiids from the Marshall and Caroline Islands.

As a result of the survey of soil invertebrates carried out by Dr. Taiji Kurozumi, during the expedition to the northern Mariana Islands in 1992, two additional Pacific Island localities have been discovered. In addition, we report

herein some older specimens of two species collected on the sourthern Mariana Islands from the Bernice P. Bishop Museum and the Field Museum of Natural History collections.

Methods

The terminology follows that of Cokendolpher and Reddell (1992) and Harvey (1992). Measurements are only given for specimens obtained during the 1992 expedition to the northern Mariana Islands. This is done to give the reader a general idea of the size of the species. More detailed measurements and illustrations will have to await the formal species descriptions.

Family Hubbardiidae

Two species of this family occur in the Mariana Islands. *Orientzomus* sp. occurs in both the northern and southern islands and Gen. et sp. occurs only on Saipan. This latter species is known only by females. The two species are easily distinguished without examination of the internal genitalia. *Orientzomus* sp. has a short (about 4–5 times longer than wide), 3 -segmented flagellum and Gen. et sp. has a long (about 8–9 times longer than wide), 4-segmented flagellum.

Orientzomus Cokendolpher and Tsurusaki, New Genus

Diagnosis. Anterior process of propeltidium with one pair of setae followed by a median setae; without distinct eyes; metapeltidium divided; abdomen not elongate; tergite II with two posterior setae; abdominal segment XII without posterodorsal process; male flagellum round to sub-octagonal, without dorsal elevations, dorsoventrally flattened; female flagellum with three segments; pedipalps not strongly sexually dimorphic, without special armature except for mesal spur on trochanter; elongate pedipalps not known in male; movable cheliceral finger with or without single accessory tooth, guard tooth present; spermathecae with three pairs of wide, short, unbranched lobes joined at their bases, not nodular; gonopod long, bifurcate.

Relationships. Members of *Orientzomus* differ from all other schizomids by having the male flagellum round to sub-octagonal without projections (Sekiguchi and Yamasaki, 1972; figs. 14–16; Hansen and Sörensen, 1905: figs. 2k–21) and by having spermathecae with three pairs of wide, short unbranched lobes that are connected at their bases (Cokendolpher, 1988: fig. 4). The only other hubbardiid thus far known with spermathecae that have short, wide, unbranched lobes that are connected at their bases is "*Schizomus*" *tikaderi* Cokendolpher, Sissom, and Bastawade, 1988. That species is known only from India. Like *Orientzomus* spp., "*S.*" *tikaderi* has a somewhat rounded male flagellum that is dorsoventrally compressed (Cokendolpher *et al.*, 1988). There are many differences between these taxa. "*Schizomus*" *tikaderi* has eyes, the metapeltidium is undivided, the pedipalps are sexually dimorphic and males can have either stout or slender pedipalps, and the females lack a gonopod. Members of the genus *Bamazomus* Harvey are probably also related to *Orientzomus*. The members of *Bamazomus* are known from Australia, Papua New Guinea, Thailand, Hong Kong, Ryukyu Islands of Japan, and Hawaii (Harvey, 1992). They have rounded, dorsoventrally flattened male flagella, bifurcate gonopods, an accessory tooth on the chelicerae, like members of *Orientzomus*. *Bamazomus* differs from *Orientzomus* by having a posterodorsal process on the male abdomen and by having the spermathecae either consisting of numerous small lobes or by having 3–4 lobes which are terminally branched (Harvey, 1992; Cokendolpher and Reddell, 1986).

Type species. *Trithyreus sawadai* Kishida, 1930.

Etymology. The generic name is based on the Latin *Orient* [east] and the non-sense name *zomus* taken from the generic name *Schizomus*; considered to be masculine.

Included taxa. The new genus includes three species; *Orientzomus sawadai*, new combination, from the Chichijima Island of the Ogasawara (=Bonin) Islands; *Orientzomus luzonicus* (Hansen, in Hansen and Sörensen, 1905), new combination, from Luzon, Philippine Islands; and *Orientzomus* sp. from the Mariana Islands.

Orientzomus sp.

Comments. The specimens from the Marianas represent a species that is new to science. We have decided not to name this species at this time because we have not had the opportunity to examine the type series (including females) of *O. luzonicus*. That species is not well known and should be redescribed. We based our comparisons on a single male of *O. luzonicus* (from the Texas Memorial Museum, collected at Mt. Makiling, near Los Baños, Luzon, 10 June 1966, leg. Roger Morse) and the original description of the species. Likewise, *O. sawadai* should be reexamined to verify the absence of an accessory tooth on the chelicerae and the dorsal setation of the propeltidium.

We could not detect any differences between the spermathecae of females from the Mariana Islands and *O. sawadai* (from photographs made during studies for Cokendolpher, 1988). The spermathecae of *O. luzonicus* have not been illustrated. The male flagellum of the species from the Mariana Islands is most similar to *O. luzonicus* (Hansen and Sörensen, 1905: figs. 2 k–21). It differs from *O. luzonicus* by having the flagellum less dorsoventrally compressed. The flagellum of *O. sawadai* (Sekiguchi and Yamasaki, 1972: figs. 14–16) is easily distinguished by the lack of the centrally placed dorsal depression. The propeltidium of *O. luzonicus* is unique among hubbardiids in the possession of extra setae. There are 10 pairs of small setae arranged in a longitudinal row beside the larger setae normally found in hubbardiids. The cheliceral jaws differ among the *Orientzomus* spp. *O. luzonicus* has a single accessory tooth while the others apparently lack it. The species from the Mariana Islands has the basalmost tooth on the fixed-jaw depressed in the center, appearing almost bifid. The other two species have the fixed jaw tooth simple or slightly enlarged on one side (Sekiguchi and Yamasaki, 1972: fig.7).

The specimens collected from the northern Mariana Islands are greenish-brown in color, whereas the other known specimens of *Orientzomus* are yellowish-brown to brown in color. It is possible that these represent different species. Because the specimens from the southern islands were collected almost 50 years ago, it is possible that they have changed color during storage. We were unable to detect any other differences between the females (males are unknown from the north) collected in the northern and southern Marianas.

Specimens examined. NORTHERN MARIANA ISLANDS (Coll. by Taiji Kurozumi, from Natural History Museum and Institute, Chiba): SARIGAN west slope, 15 May 1992, 1 female (total body length can not be measured with certainty due to the damage to the body; length of propeltidium: 1.2 mm; length of abdomen from the frontal margin of the first abdominal tergite to the base of flagellum: 2.0 mm). ASUNCION: broad-leaf forest under a coconut palm (*Cocos nucifera*) forest (50 m elevation) 1 June 1992, 1 juvenile female (length from distal edge of propeltidium to base of flagellum: 3.4 mm). SOUTHERN MARIANA ISLANDS: SAIPAN [leg. Henry S. Dybas, from Field Museum of Natural History]: As Akina area, under wood chunk, 10 Dec. 1944, Lot. No. 246, 1 female; As Mahetog area, under board in woods, 19 Jan. 1945, Lot, No. 543, 1 juvenile; in log, 20 Jan. 1945, Lot. No. 556, 1 male; Hagman Point area, under rock in dry streambed on wooded slope, 16 April 1945, Lot. No. 817, 1 male, 1 female, 2 juveniles; Papago area, under bark, 17 Jan. 1945, Lot No. 509, 1 male, 1 female, 7 May 1945, Lot. No. 1044, 1 male; Sadog Talofofo, Tolofofo area, 9 Feb. 1945, underside of fungus covered log , 9 Feb. 1945, Lot. No. 681, 1 female; Tuturam, Laulau Bay, under wood chip, 21 Jan. 1945, Lot. No. 564, 1 juvenile; [leg. E. Hagen, from Bernice P. Bishop Museum]: #57 APO244, 18 Jan. 1945, no. 17282, 1 female. GUAM [leg. G. E. Bohart and J. L. Gressitt, from Bernice P. Bishop Museum]: Pt. Ritidian, 19 June 1945, no. 47289, 1 male.

Gen. et sp.

Comments. Two females of this undescribed species were discovered among samples from the Southern Marianas. It appears (due to similar spermathecal morphology) to be related to females of other undescribed species known from Chiang Dao Cave, Amphoe, Thailand, and Visca, Baybay, Leyte, Philippines. Another closely related species is "*Schizomus*" *lunatus*

Gravely, 1911, from Calcutta, India. All of these species will have to be described or redescribed before they can be assigned to a genus. They currently fit none of the named genera. We have only examined a single female of "S." *lunatus* that was collected in the Botanic Gardens, Sibpur, Calcutta, 22 April 1910, from the Zoologisches Museum Hamburg.

Specimens examined. SOUTHERN MARIANA ISLANDS: SAIPAN [leg. Henry S. Dybas, from Field Museum of Natural History]: hills east of Garapan, under bark, 23 Jan. 1945, Lot. No. 574, 1 female; near Garapan, under coconut bark, 24 Dec. 1944, Lot. No. 307, 1 female.

Acknowledgments

We thank Mr. Taiji Kurozumi of the Natural History Museum and Institute, Chiba, for allowing us to study the specimens from the northern Marianas. We also thank him and his institution for inviting us to publish this paper in the results of the expedition. Mr. James Reddell of the Texas Memorial Museum, Austin, Texas, is also thanked for his numerous conversations on schizomids and for allowing us the opportunity to study the schizomids from the southern Marianas that were on loan to him. We would also like to acknowledge the curators of the two American museums from which Mr. Reddell obtained his loan: Dr. John B. Kethley, Field Museum of Natural History, Chicago, Illinois: Dr. JoAnn Tenorio, Bernice P. Bishop Museum, Honolulu, Hawaii. Their indirect assistance is also greatly appreciated.

References

Cokendolpher, J. C. 1988. Review of the Schizomidae (Arachnida, Schizomida) of Japan and Taiwan. Bull. Natn. Sci. Mus., Tokyo, Ser. A, 14: 159–171.

Cokendolpher, J. C. and J. R. Reddell. 1986. *Schizomus siamensis* (Schizomida: Schizomidae) from eastern Asia and Hawaii. Acta Arachnol. 35: 23–28.

Cokendolpher, J. C. and J. R. Reddell. 1992. Revision of the Protoschizomidae (Arachnida: Schizomida) with notes on the phylogeny of the order. Texas Mem. Mus., Speleol. Monogr. 3: 31–74.

Cokendolpher, J. C., W. D. Sissom, and D. B. Bastawade. 1988. A new *Schizomus* from the Indian state of Maharashtra, with additional comments on eyed schizomids (Arachnida: Schizomidae). Insecta Mundi 2(2): 90–96.

Gravely, F. H. 1911. Notes on Pedipalpi in the collection of the Indian Museum. I. —New Pedipalpi from Calcutta. Rec. Indian Mus. 6: 33–38.

Gressitt, J. L. 1961. Problems in the zoogeography of Pacific and Antarctic insects. Pacific Ins. Monogr. 2: 1–94.

Hansen, H. J. and W. Sörensen. 1905. The Tartarides, a tribe of the order Pedipalpi. Ark. Zool. 2(8): 1–78, pls. 1–7.

Harvey, M. S. 1992. The Schizomida (Chelicerata) of Australia. Invertebr. Taxon. 6: 77–129.

Kishida, K. 1930. On the occurrence of the genus *Trithyreus* in Bonin Islands. Lansania, Tokyo 2(12): 17–19.

Peck, S. B. 1983. Recherches Biospéologiques dans le Sud-Pacifique. Mem. Spéléo-Club de Paris (9): 33–38.

Reddell, J. R. and J. C. Cokendolpher. 1985. Redescription of *Trithyreus grassii* (Thorell) (Arachnida: Schizomida: Schizomidae). Oriental Insects 18: 43–52.

Reddell, J. R. and J. C. Cokendolpher. 1991. Redescription of *Schizomus crassicaudatus* (Pickard-Cambridge) and diagnoses of *Hubbardia* Cook, *Stenochrus* Chamberlin, and *Sotanostenochrus* new genus, with description of a new species of *Hubbardia* from California (Arachnida: Schizomida: Hubbardiidae). Texas Mem. Mus., Pearce-Sellards Ser., no. (47): 1–24.

Savory, T. 1977. Arachnida, 2nd ed. 340 pp. New York, Academic Press.

Sekiguchi, K. and T. Yamasaki. 1972. A redescription of "*Trithyreus sawadai*" (Uropygi: Schizomidae) from the Bonin Islands. Acta Arachnol. 24: 73–81.

Silvestri, F. 1947. Seconda nota su alcuni termitofili dell'Indochina con una appendice sul *Macrotermes Barneyi* Light. Boll. Lab. Entomol. Agr. Portici 7: 13–40.