

First records of *Spermophora kerinci*, *Nesticella mogera* and *Pseudanapis aloha* on the European Mainland (Araneae: Pholcidae, Nesticidae, Anapidae)

Karl-Hinrich Kielhorn

Abstract: The alien spider species *Spermophora kerinci* Huber, 2005, *Nesticella mogera* (Yaginuma, 1972) and *Pseudanapis aloha* Forster, 1959 are recorded from greenhouses in Germany. These are the first records from the European mainland. All these species have recently been found in the British Isles.

Keywords: Central Europe, Germany, introduced species, spiders

The study of exotic spiders in greenhouses of the Botanic Garden in Berlin rendered interesting results (KIELHORN 2008). Consequently, the spider fauna of other greenhouses in Berlin and Brandenburg was examined. Spiders were collected in a hothouse of the Zoo-Aquarium Berlin (52°30'22"N 13°20'29"E, TK 3446, 37 m a.s.l.) and in the 'Tropical Islands' dome, a recreation facility with tropical plants in Brand, Brandenburg (52°2'20"N 13°44'55"E, TK 3948, 78 m a.s.l.).

Several exotic spider species, which had been found in the Botanic Garden Berlin-Dahlem, were also present in the other greenhouses (KIELHORN 2009). Additionally, three species newly reported from the British Isles were caught: the pholcid *Spermophora kerinci* Huber, 2005, the nesticid *Nesticella mogera* (Yaginuma, 1972) and the anapid spider *Pseudanapis aloha* Forster, 1959. In Britain, these spiders were collected from leaf litter in the humid tropical greenhouse of the Eden project, a large greenhouse complex enclosing several artificial ecosystems (SNAZELL & SMITHERS 2007).

Large tropical greenhouses, such as in the Eden project, have become popular attractions and have been built around the globe. It is nearly impossible to reconstruct the path by which exotic spider species may have reached these greenhouses (PAQUIN et al. 2008, SNAZELL & SMITHERS 2007). In the case presented here, a group of species has been imported to various countries in recent years. It is very likely that the institutions have acquired plants from the same common sources.

Spermophora kerinci Huber, 2005

Material: Zoo-Aquarium Berlin: 5 February 2009, 1 ♂ 1 ♀ 2 juv.; 12 February 2009, 3 ♀ ♀; 3 April 2009, 5 ♀ ♀. Tropical Islands dome: 19 March 2009, 2 ♀ ♀ 2 juv., 16 April 2009, 2 ♀ ♀ 2 juv., leg. J. Esser.

Diagnosis: This small pholcid spider reaches about 1.3 – 1.6 mm in length. It has six eyes and differs in this respect from most other Central European Pholcidae. The only other representative of the genus in Central Europe is *Spermophora senoculata* (Dugès, 1836). *S. kerinci* can be separated from *S. senoculata* on first glance by two conspicuous dark bands on the carapace (Fig. 1). A proper identification based on genital morphology can be made using the illustrations in HUBER (2005: 88, f. 22-26).

Distribution: In the wild, the species is known only from Sumatra and Bali (PLATNICK 2009).

Spermophora kerinci has been described recently by HUBER (2005) from rainforests in Indonesia. Little information is available regarding the ecological preferences of this spider. According to HUBER (2005), most species of the genus inhabit the leaf litter layer of tropical forests.

In Berlin, the first animals were discovered on the root balls of potted *Costus*-plants standing beneath a water basin in a hothouse. Further specimens were found on the filter sponge of a large aquarium nearby. This suggested that *S. kerinci* might be a hygrophilous species. Contrary to this, the spiders caught in the Tropical Islands dome in Brandenburg were sifted from rather dry leaf litter. No animals were found in the leaf litter around an artificial pond.

A number of pholcid species have been spread by man all over the world (HUBER 2009). *S. kerinci*

Dr. Karl-Hinrich KIELHORN, Albertstr. 10, D-10827 Berlin;
E-Mail: kh.kielhorn@gmx.de

seems to be another potential member of this group.

Nesticella mogera (Yaginuma, 1972)

Material: Zoo-Aquarium Berlin: 12 February 2009, 1♂ 1♀; 3 April 2009, 1♂ 1♀.

Diagnosis: As sister-group of the Theridiidae, Nesticidae bear a row of serrated bristles at the end of tarsus IV. *N. mogera* could be mistaken for a theridiid species (Fig. 2). The female epigyne is rather simple, the best clue for identification is given by the male palp (Fig. 3; MARUSIK & GUSEINOV 2003: 39, f. 17-21, sub *Howaia*; LEHTINEN & SAARISTO 1980: 61, f. 7-9, sub *Howaia*). The species differs from the other Central European nesticids by its small size (approximately 2 mm in the ♂ and 2.6 mm in the ♀) and the form of the paracymbium.

Distribution: Azerbaijan, Japan, China, Korea, Hawaii and Fiji (PLATNICK 2009).

Nesticella mogera was discovered in Japan (YAGINUMA 1972) and has been introduced to Hawaii (GERTSCH 1973). MARUSIK & GUSEINOV (2003) postulate a disjunctive natural range in the Caucasus and the Far East based on reports from a relic forest in Azerbaijan. This type of distribution has been described for several other spider species (MARUSIK et al. 2004).

The spiders were found in the Zoo-Aquarium Berlin together with *S. kerinci* on the root ball of a *Costus* sp. and later, on the filter sponge of an aquarium. The first male caught in the Zoo-Aquarium was subadult. The spider was kept alive in the laboratory for three weeks until after the last molt.

LEHTINEN & SAARISTO (1980) found the species on the Fiji Islands in a bush near a mangrove swamp and on two occasions in jungle litter. GERTSCH (1973) reported it from caves as well as from epigeal collections on Hawaii. *N. mogera* has been found in Japan mainly in litter and burrows of moles, but rarely in caves (YAGINUMA 1970). In South Korea, it was first recorded in a paddy field (KIM et al. 1999), but also lives in ruderal vegetation of agricultural, industrial and residential areas (JUNG et al. 2008a). In studies of transects from hillocks over paddy fields to stream shores, the spider reached the highest abundance on the border of paddy fields and river embankments (JUNG et al. 2008b).

Pseudanapis aloha Forster, 1959

Material: Tropical Islands dome: 16 April 2009, 1♂ 2♀ ♀, leg. J. Esser.

Diagnosis: *P. aloha* is much smaller than the only other anapid spider in Central Europe, *Comaroma simoni* Bertkau, 1899. Notwithstanding its minute size of 0.8 – 0.9 mm, this spider is readily recognized due to its remarkable appearance (Fig. 4-5, FORSTER 1959: 316, f. 106-110, SNAZELL & SMITHERS 2007: 75, f. 1-8, SUMAN 1967: 26, f. 11-16). The cephalic region is raised. The abdomen bears a dorsal and a ventral scutum in males (females lack the dorsal scutum). Carapace, sternum, and scuta are coarsely punctate. The male palp has two apophyses on the femur and two on the patella. A key to several species of *Pseudanapis* is given in PLATNICK & SHADAB (1979).

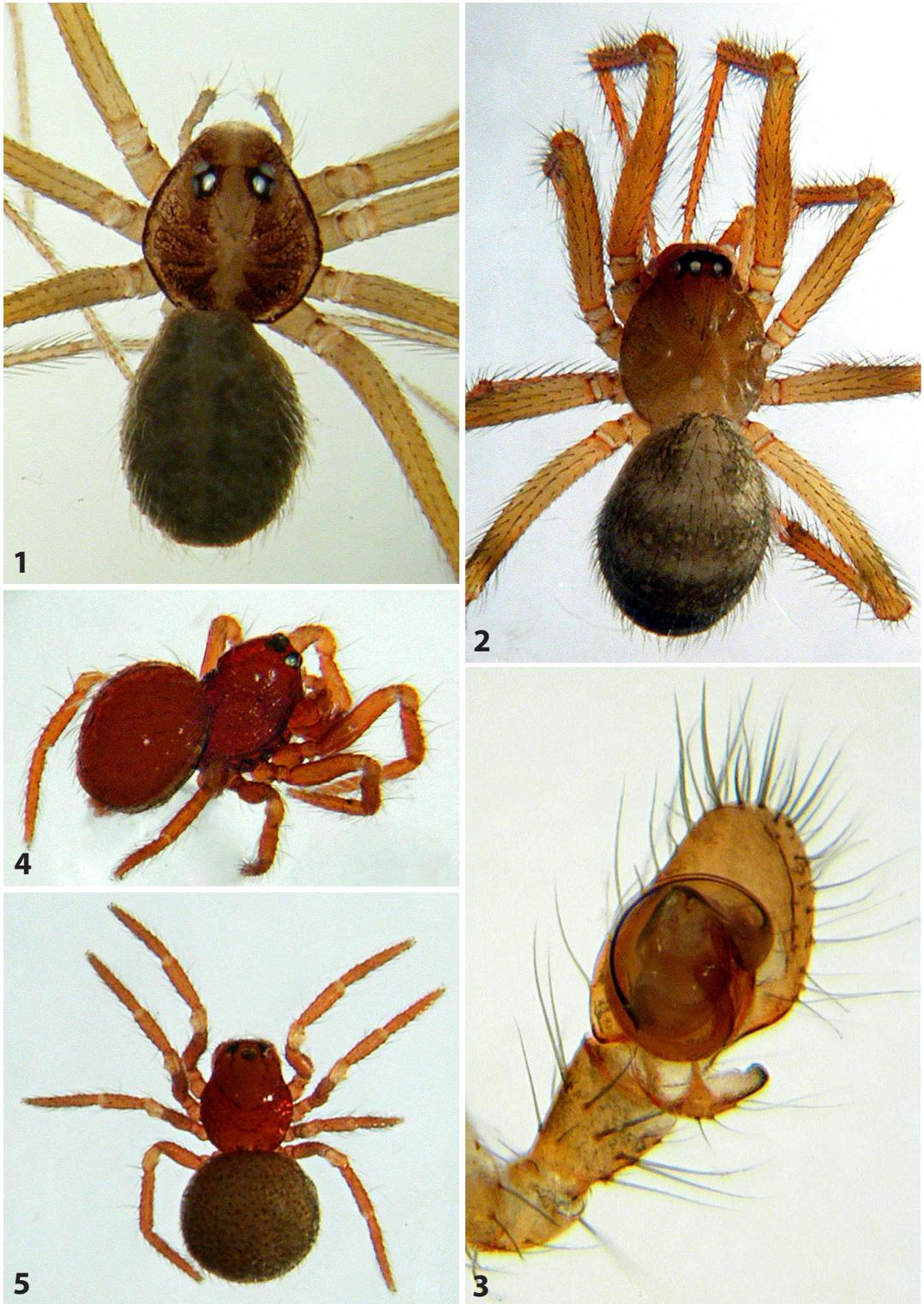
Distribution: Hawaii, Caroline Islands, Queensland, Britain (PLATNICK 2009).

This spider was found on several islands of the Hawaiian archipelago (BEATTY et al. 2000, FORSTER 1959, SUMAN 1967) and on Yap, an island in the Caroline Islands (ROEWER 1963: sub *Gossiblemma yapensis*). Recently, it has been collected on Ogasawara Islands, a group of Pacific Islands south of Japan (ONO 2008). The discovery of a male of *P. aloha* in a Northern Australian rainforest led to the assumption by PLATNICK & FORSTER (1989) that the spider might be of Australian origin and was introduced to Hawaii and the Caroline Islands (see also ROTH & NISHIDA 1997). In 1992, another male was collected in the same rainforest (SNAZELL & SMITHERS 2007). The species appears to be indigenous to Australia.

Anapidae usually live in the litter layer of moist forests. Members of some genera build small, horizontal webs (JOCQUÉ & DIPPENAAR-SCHOEMAN 2007). Apparently the web of *P. aloha* is still unknown.

Acknowledgements

I would like to thank Jens Esser, Bernd Green, Thomas Grosse, Andreas Kahre, Jacob Kielhorn and David Wrase. I would also like to acknowledge the support of the Zoo-Aquarium Berlin and the Tropical Islands resort. The helpful comments of two anonymous referees are appreciated.



Figs. 1-5 – 1: *Spermophora kerinci* female from Berlin. – 2: *Nesticella mogera* female from Berlin. – 3: Male palp of *Nesticella mogera*. – 4: *Pseudanapis aloha* male from Brand (Brandenburg), lateral view. – 5: *Pseudanapis aloha* female from Brand (Brandenburg). Note: Abdomen without scutum.

References

- BEATTY J.A., J.W. BERRY & E.R. BERRY (2000): Additions and corrections to the spider fauna of Hawaii. – Bishop Museum occasional papers 64: 32-39
- FORSTER R.R. (1959): The spiders of the family Symphytognathidae. – Transactions of the Royal Society of New Zealand 86: 269-329
- GERTSCH W.J. (1973): The cavernicolous fauna of Hawaiian lava tubes, 3. Araneae (spiders). – Pacific Insects 15 (1): 163-180
- HUBER B.A. (2005): Revision of the genus *Spermophora* Hentz in Southeast Asia and on the Pacific Islands, with descriptions of three new genera (Araneae: Pholcidae). – Zoologische mededelingen (Leiden) 79: 61-114
- HUBER B.A. (2009): Four new generic and 14 new specific synonymies in Pholcidae, and transfer of Pholcoidea Roewer to Filistatidae (Araneae). – Zootaxa 1970: 64-68
- JOCQUÉ R. & A.S. DIPPENAAR-SCHOEMAN (2007): Spider families of the world. 2nd edition. Royal Museum for Central Africa, Tervuren. 336 pp.
- JUNG M.-P., S.-T. KIM, H. KIM & J.-H. LEE (2008a): Species diversity and community structure of ground-dwelling spiders in unpolluted and moderately heavy metal-polluted habitats. – Water, air & soil pollution 195: 15-22
- JUNG M.-P., S.-T. KIM, H. KIM & J.-H. LEE (2008b): Biodiversity and community structure of ground-dwelling spiders in four different field margin types of agricultural landscapes in Korea. – Applied soil ecology 38: 185-195
- KIELHORN K.-H. (2008): A glimpse of the tropics – spiders (Araneae) in the greenhouses of the Botanic Garden Berlin-Dahlem. – Arachnologische Mitteilungen 36: 26-34
- KIELHORN K.-H. (2009): Neu- und Wiederfunde von Webspinnen (Araneae) in Berlin und Brandenburg, Teil 2. – Märkische Entomologische Nachrichten 11 (1): 101-116
- KIM J.-P., J.-S. YU & Y.-B. LEE (1999): A newly recorded species of the genus *Nesticella* (Aranea, Nesticidae) in Korea. – Korean Journal of Systematic Zoology 15: 183-187
- LEHTINEN P.T. & M.I. SAARISTO (1980): Spiders of the Oriental-Australian region. II. Nesticidae. – Annales Zoologici Fennici 17: 47-66
- MARUSIK Y.M. & E.F. GUSEINOV (2003): Spiders (Arachnida: Aranei) of Azerbaijan. 1. New family and genus records. – Arthropoda Selecta 12 (1): 29-46
- MARUSIK Y.M., E.F. GUSEINOV, S. KOPONEN & H. YOSHIDA (2004): A new case of Caucasus-Far East disjunctive range in spiders (Araneae). – Acta arachnologica 53: 125-129
- ONO H. (2008): Spider fauna of oceanic islands of Japan. Poster presented at the 24th European Congress of Arachnology, Bern. – Internet: <http://www.esa2008.unibe.ch/fileadmin/esa/pdf/Abstracts.pdf>
- PAQUIN P., N. DUPÉRRÉ & S. LABELLE (2008): Introduced spiders (Arachnida: Araneae) in an artificial ecosystem in eastern Canada. – Entomological News 119: 217-226
- PLATNICK N.I. (2009): The world spider catalog, version 9.5. – American Museum of Natural History. Internet: <http://research.amnh.org/entomology/spiders/catalog/index.html>
- PLATNICK N.I. & R.R. FORSTER (1989): A revision of the temperate South American and Australasian spiders of the family Anapidae (Araneae, Araneoidea). – Bulletin of the American Museum of Natural History 190: 1-139
- PLATNICK N.I. & M.U. SHADAB (1979): A review of the spider genera *Anapisona* and *Pseudanapis* (Araneae, Anapidae). – American Museum Novitates 2672: 1-20
- ROEWER C.F. (1963). Araneina: Orthognatha, Labidognatha. – Insects of Micronesia 3: 104-132
- ROTH V.D. & G.M. NISHIDA (1997): Corrections and additions to the spider fauna of Hawaii. – Bishop Museum occasional papers 49: 41-48
- SNAZELL R. & P. SMITHERS (2007): *Pseudanapis aloha* Forster (Araneae, Anapidae) from the Eden Project in Cornwall, England. – Bulletin of the British arachnological Society 14: 74-76
- SUMAN T.W. (1967): Spiders (Prodidomidae, Zodariidae and Symphytognathidae) in Hawaii. – Pacific Insects 9: 21-27
- YAGINUMA T. (1970): Two new species of small nesticid spiders of Japan. – Bulletin of the National Science Museum Tokyo 13: 385-394
- YAGINUMA T. (1972): Revision of the short-legged nesticid spiders of Japan. – Bulletin of the National Science Museum Tokyo 15: 619-622