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Descriptions of the Spider Families Desidae and Argyronetidae

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The marine spiders of the genus *Desis* Walckenaer and the Eurasian water spider *Argyroneta aquatica* (Clerck) have been considered by most arachnologists to be aberrant members of the family Agelenidae. The family Desidae was established in 1895 for *Desis* but since has been ignored. The family Argyronetidae, proposed in 1870, has been used as follows: exclusively for the genus *Argyroneta* Latreille; for *Argyroneta* and certain genera of cybaeinids as an expanded family; and for *Argyroneta* and the entire agelenid subfamily Cybaeinae. None of the revisers offered adequate reasons for his placement of the genera in the family Argyronetidae.

The present study was initiated because of the uncertain status of *Desis* and *Argyroneta* and the lack of published evidence supporting placement of them. As a result, I herein propose that each again be elevated to family status. The remaining genera previously associated with the family Argyronetidae belong to the subfamily Cybaeinae of the family Agelenidae (see Roth, 1967a, p. 302, for a description of the family).

The differences among the three families of spiders are listed in table 1.

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TABLE 1
DIFFERENCES AMONG THE SPIDER FAMILIES AGELENIDAE, ARGYRONETIDAE, AND DESIDAE

	Desidae	Agelenidae	Argyronetidae
Head	Not distinctly distinguished from thorax	Distinct from thorax	Distinct from thorax
Chelicerae	Projecting	Vertical	Vertical
Fringe of setae over fang	Absent, only fine hair	Present	Present
Endites	Acuminate	Truncate to angulate	Truncate to angulate
Serrula of endites	Absent	Present	Present
Spines of legs I and II	Absent, occasionally 1 or 2	Present	Present
Ventral tarsal spines	Present	Absent	Absent
Tarsal scopula	Present	Absent	Absent
Third claw of tarsus	Not toothed	Toothed	Toothed
Median spinnerets	Broad as anterior	Much smaller than anterior	Much smaller than anterior
Tarsal trichobothria	Double row	Single row	Double row
Tracheal spiracle	Advanced slightly	At base of spinnerets	Advanced to epigastric furrow
Ostia of heart	Three pairs	Three pairs	Two pairs
Colulus	Present (see text)	Present (two exceptions)	Absent
Integumental cover	Dense, fine hairs	Sparse, coarse hairs	Dense, fine hairs
Habitat	Intertidal zone	Terrestrial (one exception)	Aquatic

FAMILY DESIDAE POCOCK, 1895

The family Desidae was first proposed by Pocock (1895, p. 143) with the following brief diagnosis: "anterior position of the tracheal stigma taken in conjunction with other well-established peculiarities of these spiders justifies their elevation to the rank of a special family which may be called Desidae." Pocock had examined *Desis marinus* (Hector) and *D. martensi* L. Koch and found the "conspicuous slit-like tracheal aperture in the posterior half of the abdominal region, but well in advance of the spinning-mammillae." Hickman (1948, pp. 40, 41) indicated that the spiracle of the male of *D. kenyonae* Pocock "opens close in front of the spinnerets" and that of the female is "situated in front of the spinnerets at a distance about equal to the length of the anterior pair." Pocock made no comment on the positions of the tracheal spiracles in his 1902 paper on *Desis*. Fage (1925, p. 979) believed that the two genera *Desis* and *Desidiopsis* were similar because of the advanced spiracle and other characters and suggested that they form a "groupe parfaitement isolé dans la famille des Agélénides." The two are related only by having similar habits as has been shown by Roth (1967b, table 1). Simon (1898, p. 226) stated in his description of the Desieae, "en dessous son stigmat trachéen, légèrement chitinisé, est situé assez près des filières dont il est cependant un peu plus séparé que celui de la plupart des araignées."

The advanced position of the tracheal spiracle may have been ignored or overlooked by some authors because its position, at times, appears near the anterior spinnerets, a situation typical of the Agelenidae in which *Desis* was placed. The actual position varies among species and, in at least one species, between sexes, and the apparent position varies according to the turgidity of the abdomen. In some spiders that I examined the spinnerets were more or less sunken into the abdomen, causing a fold in the integument between the spinnerets and the tracheal spiracle. This fold prevented an accurate measurement and made the spiracle appear at or near the base of the spinnerets. A dissection is required in such cases to determine the position accurately.

The position of the tracheal spiracle was measured on nine specimens from the following localities: Galapagos Islands, New Caledonia, Chatham Islands near New Zealand, Vanikoro Island near the Solomon Islands, Paulo-Condor (Con Son) Island in the South China Sea, and the Philippine Islands. The tracheal spiracle was advanced in these specimens from 4 per cent to 24 per cent of the total distance from the end of the abdominal integument in front of the spinnerets to the epigastric furrow.

Between the base of the anterior spinnerets and the edge of the ab-

dominal integument (that part covered with fine hairs) is the colulus, a large oval patch of integument, wider than long. This colulus is similar to the remaining integument of the abdomen but is separated from it by a narrow membranous area.

The differences that preclude *Desis* from the family Agelenidae are included in the description of the family. The characters considered the most important are the acuminate endites, the absence of a serrula, the lack of a fringe of stout setae over the fang, the presence of a double row of trichobothria on the tarsi, stout median spinnerets, and the peculiar, integument-like colulus. Lesser but important differences are the advanced position of the tracheal spiracle (also noted in the agelenid genus *Mizaga* and an undescribed genus from New Zealand), the presence of only fine body hairs (usually coarse in the Agelenidae), the presence of ventral spines on the tarsi, the presence of only a few small spines, mainly on the posterior legs, the much longer than wide sternum, and the very large, projecting chelicera. The intertidal-zone habitat is unusual and is reported to be occupied by only one other spider, the agelenid *Mizaga racovitzi* (Fage), formerly of the genus *Desidiopsis* (Roth, 1967b), from the Mediterranean area.

DEFINITION OF FAMILY: Eight eyes in two rows. Carapace longer than wide; head not distinguished from thorax. Chelicera free at base, with boss and with light fringe of fine hairs overlapping fang; both margins of fang groove toothed; short depression receiving tip of fang. Labium almost twice as long as wide, not rebordered. Endites parallel, long, acuminate, lacking serrula. Sternum one-third longer than wide, scalloped laterally. Legs I and II usually lacking spines; III and IV with few to many short spines. Metatarsi II, III, and IV heavily scopulate at tip. Tarsi with few ventral spines, a light scopula, and two rows of trichobothria increasing in length toward tip. Paired claws toothed, in a single row; third claw lacking teeth. (Koch, 1872, pl. 29, fig. 1c, showed the outer claw of the paired claws of a male of *D. vorax* L. Koch as lacking teeth. Both claws were toothed in all specimens studied in the preparation of the present paper.) No spurial claws or claw tufts. Palpal claw of female toothed. Trochanters not notched. Tracheal spiracle advanced slightly from edge of abdominal integument in front of spinnerets. Tracheae confined to abdomen. Heart with three pairs of ostia. Colulus appearing as a patch of integument surrounded by a membranous area. Cribellum and calamistrum absent. Anal tubercle one-segmented. Integument lacking plumose hair, densely covered with fine hair. Spinnerets six, stout, broad; anterior pair contiguous, conical, two-segmented, with distal segment lenticular; posterior spinnerets cylin-

drical, less stout, as long as or longer than anterior pair, with distal segment lenticular; median spinnerets small to quite broad, with spinning area broad, or broader than that of anterior spinnerets, slightly less than that of posterior spinnerets.

Only the genus *Desis* Walckenaer is included in this family. There are 18¹ species recorded from the coasts of southern and eastern Africa, southern India, eastern Asia, Japan, islands of the South Pacific Ocean, Australia, and Galapagos Islands. Two species, listed for the latter islands, are synonymous. Banks (1930, pp. 271, 274, 275) was not aware of *D. galapagoensis* Hirst (1925, p. 271), based on a single male, when he described *D. isolata*, based on two females. *Desis tubicola* Pocock is probably a synonym of *D. formidabilis* O. Pickard-Cambridge, according to Hirst (1925, p. 271).

During these studies it became obvious that a revision of this genus was necessary and might be very productive. In addition to new species and subspecies, the isolated habitats and wide distribution along marine coasts, mainly of the Southern Hemisphere, would make this genus an excellent one for zoogeographical studies.

The family Desidae can be separated in Petrunkevitch's (1939, pp. 141-148) key to the families of spiders by incorporating the following in his key to couplet 51:

- 51. Tarsal trichobothria in a single row, increasing distally in length .Agelenidae
- Tarsal trichobothria in two rows, irregularly distributed or wanting...51a
- 51a. Trochanters not notched.....Desidae
- At least fourth trochanters notched.....52

FAMILY ARGYRONETIDAE THORELL, 1870

The subfamily Argyronetinae was proposed by Thorell (1870, pp. 121, 136) and raised to family rank by Menge (1871, p. 293). The family has been accepted by the following arachnologists: Bonnet (1955-1959, pp. 723-729), Dahl (1937, pp. 115-117), Kaston (1948, p. 50), Kishida (1930, p. 40), Komatsu (1961, pp. 5, 46, 48), Petrunkevitch (1939, pp. 186, 187), Reimoser (1919, p. 159), Roewer (1942-1954, vol. 2, pp. 108, 109), and Yaginuma (1955, p. 39; 1958, pp. 20-23; 1960, pp. 36-39; 1962, pp. 34, 35). It has been ignored or synonymized with the Agelenidae by the following: Berland (1932, p. 364), Gertsch (1949, p. 266), Locket and Millidge (1953, vol. 2, pp. 5, 6), Millot (1949, p. 730), and Saito (1941, pp. 27-61).

¹ There are probably two additional species of *Desis*, as indicated by the following reference: "1921, Kishida, K., Two new submarine spiders of the genus *Desis* from Loo Choo," so recorded, incompletely, by Sakaguchi (1931).

Simon (1898, pp. 224, 228–234) reduced the family to the level of a tribe, Argyroneteae in the subfamily Cybaeinae, and included the genera *Amphinecta* and *Cambridgea*, but this tribal category has not been used by subsequent workers. Kishida (1930, p. 18) placed *Desis* and the subfamily Cybaeinae in the family Argyronetidae. This placement has been followed by the Japanese arachnologists Yaginuma and Komatsu but ignored by Saito. Roewer (1942–1954, vol. 2, pp. 108, 109) gave the taxon family status and added the genera *Gohia* and *Urquhartia*. Bonnet (1955–1959, pp. 723–729) placed only the genus *Argyroneta* in the family.

Characters that separate the Argyronetidae from the Agelenidae are found in the following description of the Argyronetidae. Those that are considered the most important include the double row of trichobothria on the tarsi, the advanced position of the tracheal spiracle, the presence of only two pairs of ostia in the heart, the absence of a colulus, and the absence of a row of setae overlapping the fang.

The Argyronetidae differ from the Desidae mainly by the following characters: truncate endites and the presence of a serrula, a broader than long sternum, the position of the tracheal spiracle at the epigastric furrow, a heart with two ostia, the presence of spines on legs I and II, a toothed third claw, the absence of a scopula from the tarsi, and the absence of a colulus.

DEFINITION OF FAMILY: Eyes eight. Carapace longer than wide. Chelicera free at base, lacking fringe of hairs over fang; boss present; both margins of fang groove toothed. Labium about as wide as long, narrowed apically, truncate at tip. Endites parallel, truncate; serrula present. Sternum slightly wider than long, pointed behind. Legs abundantly spined. Tarsi with many fine hairs but not scopulate, with one or two ventral spines; two rows of eight or nine trichobothria of irregular lengths. Metatarsi III and IV scopulate at tip. Three tarsal claws, toothed, in single row; no spurious claws or claw tufts. Palpal claw of female toothed. Trochanters not notched. Tracheal system extending into cephalothorax, spiracle opening near epigastric furrow. Heart with two pairs of ostia. Colulus absent, area between spinnerets and abdominal integument membranous. Cribellum and calamistrum absent. Anal tubercle one-segmented. Integument covered with fine, dense pile, legs with long, fine hairs. Anterior and posterior spinnerets two-segmented, with lenticular distal segment. Posterior spinnerets as long as anterior, more slender; median spinnerets much smaller, very slender. Spinning-tube area of anterior and posterior spinnerets equal in size, that of median spinnerets less than one-quarter of the others.

This family contains only the genus *Argyroneta* with the two species:

A. aquatica (Clerck), an aquatic spider from Europe and Asia which spins a bell-shaped web beneath the surface of the water, and the Tertiary fossil spider *A. antiqua* C. von Heyden.

The genera *Amphinecta*, *Cambridgea*, *Gohia*, and *Urquhartia* included in the Argyronetidae by Roewer (1942-1954, vol. 2, pp. 108-109) belong elsewhere. *Gohia* has been adequately redescribed by Forster (1964, pp. 75-80) and placed in the Agelenidae. *Urquhartia* is a cribellate spider (Forster, personal correspondence, 1965) and is synonymous with *Matachia* (Amaurobiidae). *Amphinecta* and *Cambridgea* are agelenids and are to be redescribed soon by Forster in his forthcoming revision of New Zealand Agelenidae.

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