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Chapter 23

DEINOPIDAE

1 genus, 1 species

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Common name —

Ogre-faced spiders, net-casting spiders.

Similar families —

None, although some Tetragnathidae (p. 232) also adopt similar resting postures along twigs.

Diagnosis —

All instars of this cribellate, orbicularian family can be distinguished by the extremely large posterior median eyes (Fig. 23.2) or by the web architecture. In the field, *Deinopis* spin highly modified orbwebs placed slightly above or to the side of the substrate, and whose catching area is much smaller than the spider.

Characters —

body size: males 10-14 mm; females 12-17 mm.

color: carapace tan, sparse black lateral mottling, abdomen with broad light median dorsal band and tan cardiac mark, faint posterior folium.

carapace: flat, less than half the length of the abdomen (Fig. 23.1).

sternum: broad white central region, gray borders.

eyes: eight, PME massive.

chelicerae: 6 pro-and retrolateral teeth.

legs: unusually long and thin, tarsi with three claws.

abdomen: fusiform, twice as long as carapace.

spinnerets: six spinnerets, entire cribellum in front of anterior spinnerets.

respiratory system: paired book lungs and median tracheal spiracle opening just anterior to spinnerets.

genitalia: entelegyne; **female** have an anchor-shaped epigynum with lateral copulatory slits (Fig. 23.3) leading to spiraled ducts; **male** have a simple, round tegulum with a centrally placed apophysis, around which the flat, thin, blade-like embolus tightly spirals (Fig. 23.4).

Distribution —

Deinopidae is a pan-tropical family. *Deinopis spinosa* MARX 1889b also occurs in Jamaica but in North America is limited to extreme southeastern states.

Natural history —

Deinopis spinosa spin modified orbwebs whose architecture is synapomorphic for the family (Figs. 23.5, 23.6). They are strictly nocturnal, and attack both flying and ambulatory prey. During the day the spiders are stick mimics and keep their legs stretched straight out in front and to the rear of their bodies while resting on twigs. Although deinopids are often considered among the rarest of spiders, *Deinopis spinosa* can be quite common where it occurs. Webs are placed at almost any height in the vegetation and have three radii on each side of the bilaterally symmetric web. The cribellate catching area is small relative to the span of the radii, which connect to one frame line on each side of the web, themselves attached to substrate. After sticky spiral construction the hub of the web is completely bitten out.

The spiders have two behaviorally stereotyped hunting styles, termed “forward” and “backward” strikes (Cod-

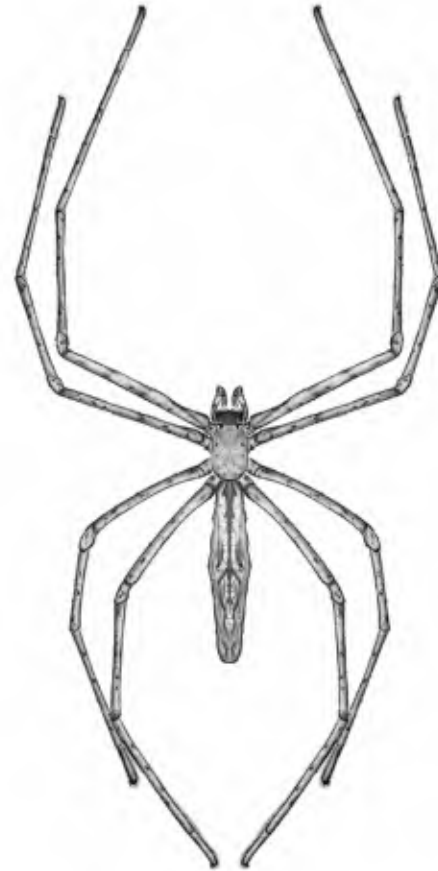


Fig. 23.1 *Deinopis spinosa* MARX 1889b

dington & Sobrevila 1987). To hunt, the spider attaches its dragline to substrate above the midline of the web, and hangs head downward with its first four legs grasping the corners of the catching area. The rear legs reel in the dragline so that, if released, the web and spider swing forward and downward towards the substrate (usually a trunk or twig). During a forward strike at ambulatory prey the spider extends and spreads its first four legs so that the web is distorted into a large, planar sheet, with which they lunge at and enfold the prey. To elicit an attack, the prey must usually walk directly beneath or in front of the web. The forward motion of spider and web is due to the release of dragline slack through the fourth leg claws. For ambulatory prey, at least, *Deinopis spinosa* is primarily a sight hunter.

Their very large posterior median eyes are extremely sensitive with a very short focal length (the equivalent of a fish-eye lens) to better detect prey. In a closely related species the photoreceptors of the PME are destroyed by bright light (e.g., dawn) but synthesized anew at dusk (Blest & Land 1977, Blest *et al.* 1978a, b). Tapeta are absent.

During a “backward” strike at flying prey, the animal extends and stretches the web as in forward strike but instead pivots to sweep the air space in its rear. Each successful strike (and often unsuccessful strikes) involves the

destruction of the web, so to hunt again the animal must rebuild the web. Because their attack behavior and webs are so unusual, deinopid biology is unusually well-studied, of which the more recent literature is cited above, and see Laughlin *et al.* (1980), Peters (1992), Eberhard & Pereira (1993), Getty & Coyle (1996), and Opell (1997). Theuer (1954) is an unpublished master's thesis on the biology of *Deinopis spinosa* itself. Despite the odd form of the web, the actual motor patterns used during construction are fairly typical of orbweaving spiders (Coddington 1986c). Egg sacs are hard, brown spherical balls about the size of a pea. Tropical species bury their egg sacs in moist leaf litter, where presumably the hard casing rots in time to permit the spiderlings to escape (pers. obs.).

Taxonomic history and notes —

The first species of Deinopidae was described by MacLeay in 1839 from Cuba, who erected a new genus for this animal with such striking posterior median eyes. C.L. Koch (1850) raised the genus to family level. MacLeay did

not explain his etymology, which led several subsequent authors to disagree with his orthography. They used the spelling "*Dinopis*" and considered the genus masculine (e.g., Marx 1889b, Bonnet 1956a), whereas the original spelling suggests it is feminine. The unjustified emendation went unnoticed until the mid-1980's. The family currently contains four genera: *Avella* O. PICKARD-CAMBRIDGE 1877b, *Avellopsis* PURCELL 1904, and *Menneus* SIMON 1876f, in addition to *Deinopis*. None of the former have enlarged posterior median eyes, have not been revised, and may not be validly diagnosable. *Deinopis*, of course, is almost certainly monophyletic. Despite its rarity in the field, the family is known from Cretaceous amber (Penney 2003). Early authors usually assumed that Deinopidae and Uloboridae were closely related, which was confirmed by later phylogenetic analyses (Coddington 1990, Griswold *et al.* 1998).

Genus —

Deinopis MACLEAY 1839



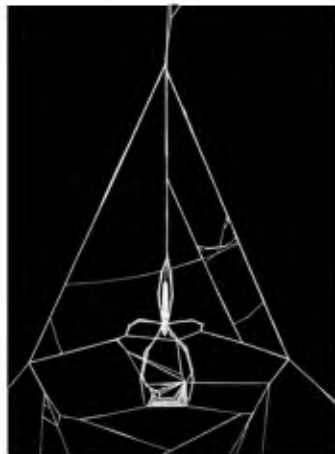
23.3



23.2



23.4



23.5



23.6