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SPIDERLING SURVIVAL IN A *MANTISPA* (NEUROPTERA, MANTISPIDAE) INFESTED EGG SAC

Larvae of the insect subfamily Mantispinae (Neuroptera, Mantispidae) are obligatory predators on the eggs of spiders (Redborg 1983). A first instar mantispid must gain access to spider eggs by one of two methods; either the larva boards a female spider and descends into the egg sac during construction, or it locates and penetrates an egg sac that has already been formed (Redborg and MacLeod 1984).

The survival of the eggs and subsequent spiderlings would appear to be nonexistent or very limited once a mantispid larva has successfully entered a spider egg sac, as indicated by previous researchers. No spiders survived from three egg sacs of *Scytodes* sp. which were separately preyed upon by larvae of *Mantispa fuscicornis* Banks (Gilbert and Rayor 1983). An egg sac of *Peucetia viridans* found by Killebrew (1981) contained a *Mantispa* cocoon which filled the entire space of the egg sac, and it is therefore assumed no eggs or spiderlings survived. Valerio (1971) studied *Mantispa viridis* Walker preying upon *Achaearanea tepidariorum* and noted that the mantispid almost always devoured all of the spider eggs and only when the number of eggs was sufficiently high, would a few remain intact and survive naturally. Limited spiderling survival was also observed by Capocasale (1971) with 15 juvenile *Lycosa poliostoma* surviving the larva of *Mantispa decorata* Erichson. Within this egg sac, around 300-400 dehydrated eggs were also found.

However, large numbers of spiderlings can survive in an infested egg sac. On September 27, 1983, a female *Lycosa rabida* Walckenaer with an egg sac was collected from a weedy field in Wharton, Texas. The *Lycosa* egg sac was opened on October 5 and contained 367 live spiderlings plus one mantispid cocoon. All spiderlings appeared healthy and scrambled from the egg sac when it was opened. An adult *Mantispa interrupta* Say subsequently emerged from the cocoon on October 8. Measurements were taken of the following structures to indicate adult size: head capsule width 2.8 mm; pronotal length 5.3 mm; and forewing length 17.7 mm.

This contrast between numerous spiderling survival versus minimal or no spiderling survival may be the result of one or a combination of several factors.

It is not known whether *M. interrupta* is an obligate spider boarder, an obligate egg sac penetrator or a facultative spider boarder/egg sac penetrator although larvae will board lycosids (Viets 1941). If the species is an egg sac penetrator, and the larva entered the egg sac an appreciable amount of time after it had been formed, then the failure to consume all of the eggs may be related to embryonic development. Spiderling eclosion may have occurred before some of the embryos could have been eaten (Redborg pers. comm.).

Spiderling survival may also relate to the larva's ability to locate all of the spider eggs. Under laboratory conditions, *Mantispa uhleri* Banks larvae will occasionally end up surrounded by empty, stuck-together chorions from eggs that it has eaten and may be unable to locate more viable eggs (Redborg pers. comm.).

Another explanation of spiderling survival may be based on a density dependent factor. The three *Scytodes* egg sacs studied by Gilbert and Rayor (1983) contained only

31, 37 and 38 eggs, yet that was a sufficient amount of food for *M. fuscicornis* to complete development to the adult stage. The survival of the 367 *L. rabida* spiderlings not fed upon by the *M. interrupta* larva probably represents a surplus of prey not required by the predator during development. A *Mantispa* species may have a prey resource range whereby a minimum-maximum number of spider eggs would fulfill the necessary nutritional requirements for biological development. Based upon the limits of this single observation, it appears plausible that the probability of any spiderlings surviving a *Mantispa* infestation would be dependent upon the total number of eggs within the sac. A spider species producing an egg sac with relative large numbers of eggs should be more likely to produce progeny than a species laying only a few eggs in a sac if both were to become infested.

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