MITE PARASITISM OF THE POLYMORPHIC SPIDER, *ENOPLOGNATHA OVATA* (ARANEAE, THERIDIIDAE), FROM COASTAL MAINE

INTRODUCTION AND METHODS

The theridiid spider *Enoplognatha ovata* (Clerck) is a common inhabitant of weedy vegetation along the northeastern seaboard of North America. Recent research into the ecological genetics of color polymorphism in *E. ovata* in Maine populations (Reillo and Wise 1988a, b, c) has uncovered considerable parasitism of this species by larval *Parasitengona* mites. Here I present parasitism frequencies for color morphs of mature female spiders from 15 natural populations.

Thirty-five coastal Maine populations of *E. ovata* were censused during mid-August from 1986-1987. Populations were distributed between Boothbay, ME (43°50' N. Lat./69°37' W. Long.) and Acadia National Park at Mt. Desert Island (44°25' N. Lat./68°15' W. Long.) (see map in Reillo and Wise [1988b]). Descriptions of the color phenotypes and life history of *E. ovata* can be found elsewhere (Seligy 1971; Oxford 1976, 1985a, b) and Reillo and Wise (1988b). Spiders were examined for mites in the

Figures 1-4.—Scanning electron micrographs of *E. ovata* host and *Parasitengona* mites: 1, adult female spider with trombidiid mites clustered on opisthosoma (32X magnification); 2, trombidiid mite with gnathosoma attached to host at left (260X); 3, gnathosoma of erythraeid mite, dorsal view (940X); 4, gnathosoma, ventral view, showing subcapitalum and palps (1500X).
field with the naked eye. Samples of hosts and mites were preserved in alcohol or by freezing. Specimens were identified by W. Calvin Welbourn, curator at the acarology laboratory of Ohio State University.

RESULTS AND DISCUSSION

Two families of mites were found among the samples: Trombidiidae, likely Trombidium auroraense or a close relative (Figs. 1, 2); and Erythraeidae, probably of the genus Leptus (Figs. 3, 4). Mites were encountered only as larvae (six legs), bright orange in color, usually attached to the host on the dorsal side along the margins of the carapace or on top the opisthosoma, with clusters often nestled on or adjacent to the pedicel (Fig. 1). Total body length ranged from 0.20 mm to >1.0 mm and varied with the extent of engorgement. The number of mites per host was not scored in the field, but examination of preserved specimens usually revealed one or several larvae/host, with occasional heavy loadings in excess of 15 larvae/host.

Since not all mites scored in the field were collected and identified, I will present gross parasitism frequencies for both mite families collectively. Mites were found among 15 of the 35 censused populations (Table 1). The frequency of parasitism among mature females was highly variable for affected populations, ranging from 0.1% to 20.7% (mean ± SE for all populations and years = 0.057 ± 0.012). Mites were also observed among immature spiders of both sexes and mature males, but small sample sizes for these categories prohibited estimating parasitism frequencies. No clear association between mite incidence and environment could be detected; however, populations inhabiting edge vegetation along open fields or areas beneath sparse canopy appeared to consistently contain mites whereas shaded populations were generally found to be mite-free.

Parasitism frequencies did not change significantly between 1986 and 1987 for three of five populations having frequencies ≥ 3% for both years (populations BPP, NL1, MP; Table 1; Chi-squares ≤ 1.46, df = 1, continuity correction, P ≥ 0.226). For the other two populations, parasitism in one (population DM) more than doubled (Chi-square = 6.74, df = 1, continuity correction, P = 0.009), while in the other (population NL2) it decreased by nearly half (Chi-square = 7.73, df = 1, continuity correction, P = 0.005).

I found no evidence of differential parasitism of color morphs of the host E. ovata. For populations in which phenotype and parasitism frequencies were sufficient to conduct contingency chi-square tests (populations MP, NL1, NL2, DM; Table 1), parasitism was random with respect to phenotype in 1986 (Chi-squares ≤ 4.07, df = 2, P ≥ 0.131) and 1987 (Chi-squares ≤ 4.66, df = 2, P ≥ 0.097). I also found no evidence that parasitized females reproduced less successfully than non-parasitized females. For populations with total number of parasitized females ≥ 10 (Table 1), there was no difference between the relative proportions of unparasitized females with egg sacs and parasitized females with egg sacs in 1986 (Chi-squares ≤ 0.106, df = 1, continuity correction, P ≥ 0.744) or 1987 (Chi-squares ≤ 0.544, df = 1, continuity correction, P ≥ 0.461). It is of course impossible to determine from my data whether parasitism may have adversely affected fecundity via decreased egg production or may have rendered females more susceptible to mortality prior to ovipositing. However, these data
suggest that parasitism by Parasitengona larvae to not provide a selective mechanism for maintenance of color polymorphism in coastal Maine *E. ovata* populations.

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**LITERATURE CITED**


NOCTURNAL PREDATION BY MISUMENA VATIA
(ARANEAE, THOMISIDAE)

Spiders of the family Thomisidae are typically small ground or vegetation inhabitants which capture their prey by ambush and do not spin webs (Gertsch 1979). Because of their dependence on vision, thomisids are primarily active during the day (Foelix 1982). The crab spider Misumena vatia (Clerck) is one of the most abundant and widely distributed of the "flower spiders" in North America. It is commonly observed during the day on flowers such as goldenrod in the late summer and fall (Kaston 1978). Misumena vatia has been reported to feed in the daytime on dragonflies and butterflies (Lovell 1915), as well as on bumblebees, honeybees, hoverflies, and various unidentified insects (Morse 1979). To our knowledge, Morse (1981) presents the only record of nocturnal predation. He does not indicate when in the nocturnal period it occurred or the species of the "moth" prey. While conducting nocturnal sampling of cotton insects, we occasionally observed evidence of predation by M. vatia. Although these observations are preliminary, we believe they provide further evidence for the nocturnal activities of this spider.

Observations were conducted in a 1-ha fallow crimson clover field in Washington Co., Mississippi, from 4-9 September 1987. Weather conditions during this period were moderate; temperatures ranged between lows of 16°C and highs of 33°C; there was no precipitation; incidence of solar radiation averaged over 400 langleys/day; and the wind blew occasionally (0-10 km/h) from the southwest. The region is largely agricultural, with nearly all the surface area covered by catfish ponds, roads and drainage ditches, and row crops including: cotton, corn, soybeans, grain sorghum and rice. This particular field had been undisturbed since spring and was overgrown with Johnsongrass. Scattered throughout the field and protruding above the canopy were isolated individuals of the Common Sunflower, Helianthus annuus L. (Compositae). These plants were 1.7-2.0 m tall and contained 8-12 inflorescences each, from 0.3 to 2.0 m above the ground. One particular plant, the only one in full bloom, was examined daily at