

ABSTRACT

Melittobia sp. (hawaiiensis complex), referred to as Melittobia sp.1 in this study, is a parasitoid of Sceliochroa assimile Dahlbom, Zeta abdominale (Drury) and the several other aculeates that live asinquilines in their disused cells or in trapped nests. Melittobia sp.1 was found to be polymorphic with an economical sex-ratio and low developmental mortality (28.50%). The production of fully-winged migrant females was dependent on the larval density. Developmental mortality also was density-dependent, larval competition being one of the major mortality factors. The sex-ratio of one male to 19.86 females prior to emergence was reduced to one male: >100 females soon after emergence due to male pugnacity. The fecundity was 476.53 ± 41.08 in the laboratory and 436.22 (estimated) in the field, but increased with the number of times the female mated. Longevity of starved females ranged from 11.79 ± 0.55 days (L.D.50) in the fliers to 17.53 ± 1.84 days in the crawlers. Search for the host at a nest site was probably non-random.

The distribution of Melittobia sp.1 in Jamaica was clumped, more populations occurring in the south-eastern section of the island than elsewhere. Population indices obtained from the deviation of the observed percentage parasitism from the expected, showed that Melittobia sp.1 was more abundant in places either farther away from the coast or where the mean annual precipitation was >1905 mm. The temporal distribution of Melittobia was dependent on both the monthly rainfall and host density.

Percentage parasitism from Melittobia depended on host density, distance from the coast along the prevailing wind-line, exposure of the host's nesting substratum and altitude. Although Melittobia predation was the major, single

mortality factor in Sceliphron assimile, it did not regulate Sceliphron populations at low densities whereas it did so at high densities, being density-dependent. However, the cumulative response of Melittobia to varying host densities was imperfectly density-dependent as at high densities a greater proportion of the host cells were relatively inaccessible to Melittobia, this spatial heterogeneity being a stabilising factor in the population dynamics of Sceliphron.