ABSTRACT

Melittobia sp. (hawaiiensis complex), referred to as Melittobia sp.1 in this study, is a parasitoid of Sceliphron assimile Dahlbom, Zera abdominale (Drury) and the several other aculeates that live as inquilines in their host's 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 $476.53 \pm 41.08$ 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 $11.79 \pm 0.55$ days (L.D.50) in the fliers to $17.53 \pm 1.84$ 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 >1300 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*. 