

## ABSTRACT

Zeta abdominale (Drury) and Z.canaliculatum (Oliv.) are solitary mud-wasps belonging to a newly erected and previously unstudied genus. Nests are constructed on sheltered rock surfaces, bridges and buildings, and on twigs and rootlets. The nesting females sting leaf-rolling caterpillars which they use to feed their larvae. The genus shows close affinity to, but is phylogenetically more advanced than Eumenes.

Zeta abdominale and Z.canaliculatum form generally sparse populations in Jamaica and Trinidad respectively, but a third species Z.confusum (Beq. and Salt), exists in Cuba. Mean annual precipitation of >2540 mm and altitude of 300 m limits the effective distribution of Z.abdominale to the southern coast of Jamaica, whereas a.s.p. of >2250 mm limits that of Z.canaliculatum to the western coast of Trinidad. In Jamaica, larger and persistent populations had a greater accumulation of disused cells, and were found in the drier lowlands. Breeding activity reached a peak in the wetter months (May and October) and was controlled by the lushness of the vegetation which increased the availability of caterpillars.

Developmental survival at 57.68% in Z.abdominale and 57.28% in Z.canaliculatum was remarkably similar in both species. However, developmental survival was very low (22.68) for larger populations of Z.abdominale, but was high (66.7%) for sparser and more intermittent ones. The major mortality factor in cells was the eulophid Melittobia sp. (hawaiiensis complex), which acted density-dependently. Inquiline wasps which nested in the disused cells of Zeta abdominale

(Monobia mochii Soika and Pachodynerus nasidens (Latr.)) and Z.canaliculatum (Trypoxylon nitidum Smith and T. sp. near nitidum) were attacked by the same mortality factors as the 'host' wasps, but generally suffered a greater mortality than they did.

In Jamaica, adult females of Z.abdominale had a high survival rate of 0.93 per day, and a longevity ranging from one to 62 days (mean  $13.63 \pm 0.47$ ) in a continuously breeding population. A male:female sex-ratio of about 2:1 and low mean fecundity of  $7.31 \pm 3.36$  limited the overall numbers of the species in Jamaica. But whereas local populations of a low level were regulated by harsh physical conditions preventing continuous breeding, those of a high level were regulated by high developmental mortality.