Functional response and searching efficiency in Pseudogonatopus flavifemur Esaki and Hash.(Hymenoptera: Dryinidae), a parasite of rice planthoppers

ABSTRACT

The functional response of Pseudogonatopus flavifemur E & H (Hym., Dryinidae) was investigated by offering hosts (brown planthopper) at densities ranging from 8 to 160 per cage. The response curve was found to be sigmoid, i. e.Holling's (1959) Type III curve. In experiments involving 310 hosts per cage distributed unevenly in 5 densities (10, 20, 40, 80 and 160 per hill), and a different female parasite density each time (viz. 1, 2, 4, 8 or 16 per cage), the behavioral response was described well by the "random predator equation" ofRoyama (1971) andRoger (1972), which is a convex exponential curve. The area of discovery (a) decreased with an increase in female parasite density (P), and the relationship was described by the equation: log a=−1.0099−0.3638 log P. There was an apparent increase in handling time per host as the number of female parasites increased. Superparasitism, a rare phenomenon under natural conditions, was often observed in the laboratory. The potential of P. flavifemur as a biocontrol agent of the brown planthopper is discussed.