A STUDY OF THE GROUP-FEEDING BEHAVIOUR OF LARVAE OF THE JACK PINE SAWFLY, NEODIPRION PRATTI BANKSIANAE ROH 1)

by

ARTHUR W. GHENT 2)

(Department of Zoology, University of Toronto, and the Forest Insect Laboratory, Sault Ste. Marie, Canada).

(with 2 Plates and 8 Figures)

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I. INTRODUCTION

The great majority of insect sociological studies have been concerned with the most advanced forms of insect social interaction, as exemplified by the complex colonies of bees, ants, and termites. At this level the labour of the colony is divided among different castes or classes, distinguished from each other by specialized morphologies. Feeding colonies of sawfly larvae exhibit a much lower level in the development of social behaviour, being family aggregations of morphologically similar individuals, all members of the aggregation having evidently the same requirements and the same behaviour. Wheeler (1928) designates this primitive level in the evolution of the insect society as infrasocial, restricting the application of social to those societies in which “the progeny are not only protected and fed by the mother, but eventually cooperate with her in rearing additional broods of young, so that parent and offspring live together in an annual or perennial society”. The adequacy of this distinction in terminology will be examined in greater detail at the end of this paper.

As a whole the order Hymenoptera is characterized by degenerate larvae. Sawflies stand markedly opposed to this generality, having active larvae that closely resemble the larval stages of lepidopterous insects in terms of their gross appearance and behaviour. Both solitary and gregarious sawflies occur, but no differences in morphology pertinent to these extremes of behaviour have been demonstrated. Comparatively few species of sawflies had attracted attention as serious defoliators of conifers until recent years. Craighead (1950) attributes their increasing importance in eastern North America to the widespread practice of planting solid blocks of coniferous species. Such plantations duplicate, to some extent, conditions in the Canadian boreal forest, where outbreaks of the jack pine sawfly, for example, must certainly have been favoured for many centuries by broad tracts of pure jack pine, Pinus banksiana Lamb., of fire origin.

The eggs of the jack pine sawfly are laid in late summer in small pockets cut in rows into the edge of jack pine needles of the current year. These pockets, generally from three to six in number, are separated by more or less regular intervals, and in each pocket a single egg is deposited. The oviposition behaviour of this insect has been described and analysed in detail in an earlier paper (Ghent, 1955). Winter is passed in the egg stage, the larvae hatching...