

Discussion. The increase in body weight during the summer was normal. There was no significant difference in adrenal weights, which might indicate good adjustment to stress. The caged controls were selected for statistical analysis since they showed the highest worm count. The t-test of significance using the controls and field animals showed a value of 1.970. The probability of exceeding this observed value is 5-10 per cent. Thus the difference in the mean number of worms in the two groups was not significant.

As the first part of a three-year study the results are especially challenging since they are at variance with most other research results in this field, including previous work by the author. Further study will be made next year using a different approach.

Assisted by Joseph Choi, California State Polytechnic College.  
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Social Organization among Colonies in Ants  
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Project Number 80

Work continued during the summer months in an attempt to describe the characteristics of a population of Formica opaciventris at the level of the population of colonies.

A total census of the mound nests on Moose Island included a tabulation of: density, activity level, size classes, presence of brood, release of sexuals and the occurrence of new and dead nests. Because this population has been under surveillance since 1957 we are able to establish trends in this population and begin to detect events which occur in the ontogeny of individual mounds.

Since 1957, the population size, now at 389 mounds, has declined by 9.1%. There has been a similar decrease in the proportion of active (level 3 and 4) mounds. The proportion of large (diameter > 48 in.) mounds has decreased, with a corresponding increase, by threefold, in the proportion of small (diameter < 24 in.) mounds. Brood are present in 82.9% of the mounds, and 33% of the mounds release sexuals. Of the 75 mounds which released sexuals in 1963, only 5 released females. These findings, with respect to brood presence and sexuals released are consistent with data of earlier years.

The spatial distribution of the population can be characterized as aggregated. Using the distance to nearest neighbor method, we have determined that the mounds are an average of 5.8 meters apart, and that this spacing differs significantly from that expected of a random distribution pattern.

The mean birth rate, averaged over the five years of census, is 8.23%. The mean mortality rate is 9.95%.

Workers visit between nests. Extensive marking of thousands of individual ants at each of 7 nests in a group of nests, together with the results of earlier years permit the following statements.

Workers visit between nests up to a distance of 82 feet. Visiting rate is low, of the order of 1% to 3% with a greater visiting rate between bud nests and presumed parental nests, than between adjacent established nests. Workers from one nest visit at several nests, and individual nests are, in turn, visited by workers from several different nests. Attempts to influence the visiting rate by heavy feeding at one nest and partial mound destruction at another have been unsuccessful.

The operation of a pattern of visiting and the low rate of production of sexuals suggest that colonies in the population do not function independently of one another, but are integrated to form a social organization at the level of the population of societies.

It is planned that future work will continue the population census, attempt to relate microclimate changes to behavioral events at the mating flight, investigate the pattern of feeding and attempt to trace the course of individual ants while visiting at nests. The suspected existence of male polymorphism in this species will be investigated during the coming year using a sample of 500 males collected during the summer.

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Melanophore-Stimulating Substances in Amphibia  
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Project Number 122

A study of the Northwestern tiger salamander, Ambystoma tigrinum melanostictum (Baird), has confirmed a study of the Pacific tree frog, Hyla regilla, that a melanophore-stimulating substance is produced in the infundibulum of the embryo and young larva. In addition, this study has confirmed the observation that this melanophore-stimulating substance can be detected at an earlier stage in the developing embryo than can the melanophore stimulating substance, intermedin, from the adenohypophysis.

Thirty-five infundibula from embryos of modified Harrison stages 32 to 37 were homoplastically transplanted to subcutaneous tissue of 14-16 mm. albino larvae previously hypophysectomized. Thirty-four grafts evoked a pigment response in the hosts melanophores and one was negative. All seven infundibular grafts from hypophysectomized larvae evoked pigment responses.

Sixty one of sixty-six grafts of anterior forebrain, mandibular mesenchyme, and stomodeal and flank ectoderm did not evoke pigment responses. All seven control grafts of larval tissue from the telencephalon and medulla gave negative responses.