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SOME CORRELATIONS BETWEEN THE FORAGING BEHAVIOR OF
COMMON NIGHTHAWKS, *Chordeiles minor* (Forster), AND THE
SWARMING BEHAVIOR OF TWO SPECIES OF ANTS, *Atta texana*
(BUCKLEY) AND *Iridomyrmex pruinosus* (ROGER)

Stuart L. Warter

Museum of Zoology, Louisiana State University

John C. Moser

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INTRODUCTION

At about 5:30 AM, May 24, 1961, four Common Nighthawks, *Chordeiles minor*, were collected from a group of nearly a dozen feeding at low level along a roadside in Rapides Parish, west of Alexandria, Louisiana. Upon subsequent examination of the distended stomachs of these birds, it was found that approximately 70% of the contents consisted of winged reproductives of 2 species of ants, *Atta texana* (Buckley) and *Iridomyrmex pruinosus* (Roger). The swarming behavior of these 2 ants seems hitherto unreported in the literature.

ANIMAL SPECIES INVOLVED

Members of the reproductive castes of the town ant, *Atta texana*, are the largest North American ants. This myrmicine species is an important defoliator of forest trees in Louisiana and Texas and destroys large numbers of pine seedlings annually. It builds extensive subterranean galleries which are often grouped together in "towns." An area under observation since 1958 in a clearing in loblolly (*Pinus taeda*) pine forest contained 7 colonies in May, 1961. No other colonies were known to exist within a 5 mile radius.

The first observed swarming flights of *A. texana* were recorded at the above colonies in May of 1960. In the pre-dawn darkness during which the flights occurred, swishing and snapping sounds were heard above the ground, presumably made by predators feeding on the flying ants.

Signs of swarming again became evident on the evening of May 23, 1961, following a heavy rain. Only 4 of the 7 colonies appeared active. Ants of several castes, including alate reproductives of both sexes, began to appear on the surface of the colonies just after dark. The largest colony was chosen for observation and mist nets were erected near it in an attempt to capture some of the predators.

The first ants flew about 3:50 AM, May 24, following a brief "warm-up" period of increased activity on the surface of the colonies, and others continued to leave until 4:00 AM. Of an estimated 3,000 alates visible above ground on the one colony, some 50% was believed to have departed, with the remainder gradually retreating into the galleries. Small flights of less than 50 individuals were witnessed on several succeeding mornings. The next large swarm occurred on June 11, again following a rain.

Iridomyrmex pruinosus, the swarming behavior of which also appears unreported, is a small dolichoderine species closely related to the better known introduced Argentine ant, *I. humilis* (Mayr). It characteristically nests in open areas of sandy soil.

The North American representatives of the avian family Caprimulgidae are principally crepuscular feeders. One of these, the Poor-will, *Phalaenoptilus nuttallii* (Audubon), has been found to have an average period of activity of only 32 minutes in 24 hours (Brauner, 1952); a nearly five-fold increase in activity was demonstrated during the period of the full moon. The nighthawks have perhaps the widest spectrum of activity of any of these birds, often being seen abroad in full daylight. Their characteristic raucus calls are often heard in the night sky, and they may occasionally be seen feeding about bright lights. Their distinctive silhouettes have often been seen in apparently random movements against the face of the full moon during studies of nocturnal migration of other groups of birds (Robert J. Newman, pers. comm.). However, there does not seem to be much evidence bearing upon the activity of these birds in near total darkness.

COLLECTING RESULTS

The mist nets yielded only a single red bat, *Lasiurus borealis* (Muller). No sounds of aerial activity were heard. At dawn, Chuck-will's-widows (*Caprimulgus carolinensis* Gmelin) were heard calling in the woods nearby, but none could be located for collection. A single nighthawk was seen approaching the clearing above shotgun range. Sunup occurred just after 5:00 AM and the observers departed, stopping along the roadside within the five-mile radius to collect the nighthawks.

ANALYSIS OF STOMACH CONTENTS

A count of insects represented in the contents of one of the nighthawk stomachs disclosed that 8 *A. texana* constituted approximately 20% of the volume, 620 *I. pruinosus* 50%, and miscellaneous insects of other groups (Odonata, Coleoptera, Lepidoptera, Hemiptera, Homoptera, Diptera, in that order) the remaining 30%. All 4 stomachs contained a total of 25 town ants with both sexes nearly equally represented (12 ♂♂ and 13 ♀♀).

DISCUSSION

The presence of *A. texana* alates in the nighthawk stomachs raises several interesting questions revolving about distance and duration of the ant flights and, as a corollary, the feeding time of the nighthawks. The mere presence of town ant alates in the stomachs of four nighthawks can hardly be expected to provide definite answers to any of these questions; however, since there is but one town ant area under study and there are only a few nights a year when evidence can be obtained, it is unlikely that much additional information will be obtained in the near future. Under such circumstances, a certain amount of speculation seems in order.

No evidence had been gathered concerning the duration of the town ant flights. Since it appeared that these ants required complete darkness in which to swarm, it had seemed likely that the flights would be concluded by daybreak. Since it is rather unlikely that the nighthawks can hunt effectively in complete darkness, the presence of male and female *A. texana* alates in their stomachs would seem to indicate that at least

some ants of each sex were still on the wing when dawn arrived.

Nighthawks call repeatedly when on the wing and their presence is quite easily detected. None was heard near the *Atta* town during the swarming period. The four nighthawks collected, judging from the fullness of their stomachs, must have been occupied with the *Iridomyrmex* swarm for some time. It seems likely that if the ants which were eaten were drawn from the *Atta* town under observation, they must have flown some distance from their colonies during or following the swarming period.

It would seem safe to assume, from the sparsity of trees in the neighborhood of the *Iridomyrmex* swarm upon which the nighthawks were feeding when collected, that there were no *Atta* towns in the immediate vicinity and that the nighthawks must have been drawn some distance from the *Atta* swarm(s). Nighthawks are not normally close-flocking birds and the likelihood of a flock being drawn any distance *in toto* from swarm to swarm is not great, giving further indication of a more general distribution of the town ants in the air than was formerly accepted. Furthermore, the ants caught by the nighthawks could have been drawn from other colonies which exist elsewhere in the forest, as well as from far-ranging elements of the flight from the one area under observation. The odds of finding ants nearly equally represented in the stomachs of four birds, presumably drawn at random, would not seem to favor the existence of a single concentrated swarm.

The enlarged abdomens of the female *Iridomyrmex* alates are quite soft, yet little, if any, digestion of the majority of the ants in the nighthawk stomachs had taken place. At least some digestion of the remainder of the contents was evident. The fresh condition of the *I. pruinosus* alates together with the tight feeding pattern of the nighthawk flock make it evident that the birds were foraging among a concentration of these insects at the time of collection. The foraging pattern of the birds—back and forth along the road bed between elevations approximating 3 to 20 feet—may be taken as a rough indication of the configuration of the swarm. The birds varied this pattern only in the “turn-about” at the end of their sweeps and in an occasional sortie among the small scattered pines which were present to

either side of the road. Since *I. pruinosus* is predominantly a colonizer of relatively open sandy areas, it may well be a "road-side ant" in these pine woods.

Little else can be said about the swarming behavior of *I. pruinosus* at this time. Some species of the closely related genus *Dolichoderus* are also known to swarm during the early morning hours (Kannowski, 1959). It is interesting to note that of the 620 *I. pruinosus* alates in one stomach, only 38 were males. Kannowski (*op. cit.*) has found that *D. taschenbergi* males outnumber the females by a 4:1 ratio and are usually the first to fly. This observation, plus the fact that several female *I. pruinosus* were dissected and proved to have already been inseminated, would tempt one to conclude that the flight was near an end when the nighthawks arrived. However, it must be borne in mind that male *I. pruinosus* are so tiny (less than 1/6 the length of the females) that it is possible that, in the presence of the larger females, they were simply not selected by the birds and that the males taken were done so either by accident or while *in copula* with the females.

It is significant to note that in the only other species of this genus in North America, the imported Argentine ant, *Iridomyrmex humilis* (Mayr), mating flights do not occur, with the females dropping their wings and remaining within the nest until they become egg producing (Woodworth, 1910). The males were reported to appear at the nest entrance, but did not fly.

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