OBSERVATIONS ON THE BEHAVIOR OF THE CERAPACHYINE ANTS

by

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Although the cerapachyine ants range widely through the tropical and subtropical regions of the world and are even abundant in some local areas, they have long remained among the most poorly known of the major ant groups. With the exception of the published observations of W. M. WHEELER and John CLARK on *Phyracaces* (see below), there has been virtually no usable information on cerapachyine behavior available in the literature. During a recent research tour in Melanesia and Australia, the present author had some excellent opportunities to make observations on species of *Cerapachys*, *Phyracaces*, and *Sphinctomyrmex* under field conditions. The new information obtained along with some valuable unpublished notes on *Sphinctomyrmex* supplied the author by W. L. BROWN, is presented in the sections to follow.

Cerapachys (C.) flavaclavata Donisthorpe.

Cerapachys (*C.*) *flavaclavata* Donisthorpe, 1938, Ann. Mag. Nat. Hist., (11)2: 499, worker. Type locality: Sabron, 350 m, Cyclops Mts., Neth. New Guinea (Syntype examined).

This tiny species was collected by the author during May, 1955, in primary rainforest at the Busu River, near Lae, northeastern New Guinea. One colony (my accession no. 985) was discovered while in the act of raiding a colony of a small species of the ant genus *Pheidole*. When first encountered, during late afternoon of a sunny day, the raid was evidently already in full swing, and activity continued for at least another half hour. At maximum activity during this time, the *Cerapachys* workers were running in a loose file on an average of two to three centimeters apart, but toward the end of the observation period the intensity of the raid had declined to the extent that workers were spaced on an average of approximately thirty centimeters apart. The raiding trail ran from a cluster of small rotting twigs and branches in leaf litter, beneath which the *Cerapachys* nest seemed to be located, up over some dead leaves and onto a nearby small dead branch lying on the ground, down the length of this branch for twenty to thirty centimeters, over to another small branch and down its length for another twenty to thirty centimeters, and finally

down onto the ground in the vicinity of the *Pheidole* nest. It was clear that the *Cerapachys* workers had followed the most open, unobstructed ground route between the two nests in conducting the raid. They were moving at a fast, steady pace, never stopping along the way, even when they encountered a sister worker coming from the opposite direction. Approximately one-third of the homeward-bound workers were laden with pupae and mature larvae of *Pheidole*. At the height of the raid, about ten to fifteen *Cerapachys* workers could be seen at any given moment loitering in the vicinity of the *Pheidole* nest entrance; others were turned up inside the *Pheidole* nest when the latter was excavated at the end of the observation period. A number of *Pheidole* minor workers were walking about outside the nest carrying their own brood, a form of escape behavior common in ants being raided by other ant species. No *Pheidole* major workers were in evidence above ground, and there was no sign that members of this caste had offered any resistance to the *Cerapachys* within the interior of their nest.

When the raid had diminished in intensity, the author opened the *Pheidole* nest by digging in from the side. The main part of the colony was found in galleries and chambers about ten centimeters beneath the soil surface. Workers of *Cerapachys* were found only in the upper, more sparsely populated part of the nest, where they were evidently engaged in robbing from smaller, peripheral groups of brood. No attempt was made at this time to locate and excavate the *Cerapachys* nest. Several days later this sector of the forest was revisited, but no further sign of the *Cerapachys* could be found, even when the soil was turned over in the spot where the *Cerapachys* nest had appeared to be located previously.

Cerapachys (C.) opaca Emery.

Cerapachys opaca Emery, 1902, Természet. Füz., 25: 153-154, worker.
Type locality: Sattelberg, northeastern New Guinea.

This black, medium-sized species was collected in the rainforest at the Busu River, northeastern New Guinea. One colony (accession no. 921), comprising a single nest queen and 75 to 100 workers, was found nesting in several poorly defined galleries beneath the bark of the lower surface of a rotting log. Brood was present and consisted of numerous small larvae, all of which were about the same stage of development. Scattered among the brood were mature larvae, worker pupae, and adult workers of the dacetine ant species *Strumigenys loriae* Emery. This prey was fresh and gave evidence of having been secured in a recent raid. Some of the *Strumigenys* pupae had been mangled and partly eaten.

Phyracaces cohici Wilson.

Phyracaces cohici Wilson, 1957, Breviora, no. 74: 1-4, fig., worker, male. Type locality: Ciu, New Caledonia.

This recently discovered species was found to be abundant in the subtropical evergreen forest that extends south of the Canala River in New Caledonia. The holotype colony (acc. no. 263) was nesting in the soil under a rock in a densely shaded part of the forest. It occupied a single chamber beneath the rock and an adjacent short, vertical gallery. Males present in the nest were very active and attempted to fly when uncovered. Another colony (acc. no. 246) was nesting in open soil in a partial clearing at the side of a native trail. The nest entrance consisted of a single hole, five millimeters in diameter, surrounded by a low, irregular turret of excavated earth. On January 3, 1955, toward the end of the author's stay at Ciu, the nest was opened by digging from the side. Part of the nest structure thus revealed included three or four galleries leading down away from the nest entrance into soil between several buried rocks. Approximately ten centimeters beneath the surface were located two small, adjacent chambers that had been excavated next to the vertical face of one of the rocks. In these were crowded most of the workers and all of the brood. At the time of collection the following population estimate was made: 80-100 workers, 40 worker pupae (in cocoons), 30-40 half-grown to mature larvae, and 30 eggs. No reproductive was found.

On December 31, 1954, the abovementioned colony (no. 246) was found in the act of raiding a nest of a small species of *Pheidole*. The *Phyracaces* workers were running in a nearly straight line over the surface of the ground back and forth to the *Pheidole* nest, which was in the soil beneath a pile of leaf litter approximately seven meters away. They gave the impression of orienting by an odor trail, since as they ran they palpated the ground constantly with rapid movements of their antennae. Few deviated from the main route, and then only for short exploratory trips to the side.

The raid was first noticed at 12:10 p.m., at which time it was mounting in intensity. By 12:50 it had reached maximum intensity. At this point workers were travelling along the trail in both directions and were spaced at intervals averaging roughly eight to ten centimeters. They were moving at a leisurely but steady pace, covering approximately sixty centimeters a minute. About twenty *Phyracaces* workers were milling around the *Pheidole* nest entrance, and ten more around the *Phyracaces* nest entrance. Several *Pheidole* minor workers, laden with brood, were seen wandering over the ground in the vicinity of their own nest. No combat between *Phyracaces* and *Pheidole* workers was observed. Approximately one in every five of the homeward-bound *Phyracaces* was carrying a *Pheidole* larva or pupa in its mandibles.

The raid was continuing in full swing when I left the scene temporarily

at 1:00. At 1:40, when I returned, the raid was found to have ceased. A few *Phyracaces* workers were observed wandering about in the vicinity of both nests, but the transport of *Pheidole* had evidently stopped.

The next day (January 1, 1955) I returned to the same spot in the early morning (8:25 a.m.), before the rays of sun had reached this part of the forest, and while the vicinity of the *Phyracaces* nest was still relatively cool and dark. At this time a raid was already in progress. The *Phryacaces* workers were moving along the same trail used the previous day. Several workers were returning with *Pheidole* larvae. Outgoing workers were rather scarce and could not be traced to within more than three meters of the *Pheidole* nest raided the day before, and no *Phyracaces* were uncovered in the vicinity of this nest. The conclusion was drawn that the activity observed represented the terminal stages of a raid. The *Phyracaces* nest was kept under observation for the remainder of the morning and part of the afternoon, during which time the *Phyracaces* remained within the confines of their nest.

The next day (January 2) I arrived at the nest site at 8:10 a.m., with the hope of remaining there until I could observe the development of a raid. This attempt was rewarded, for activity commenced shortly thereafter. At 8.25 the first worker emerged from the entrance of the nest and began sluggishly wandering around in the immediate vicinity. During the next hour several more workers made their appearance, wandered about for a short while, and reentered the nest. At 9:28 one worker began moving up the thin, dead vine stem that had served as the starting point of the raiding trail on the two previous days. This initial forager ventured only a few centimeters out on the stem, then turned around and came part way back. At 9:30 a second worker started out on this route and soon met the first. Immediately thereafter a party of thirteen additional workers, which had meanwhile emerged from the nest, mounted the vine and moved up it to meet the two original foragers. The entire party now moved further along the vine to a point, fifteen centimeters from the nest entrance, where the original raiding trail continued on to an adjacent vine. Here the party halted, and after a moment of hesitation several of the workers mounted the second vine, continued down its length, and stepped down onto the surface of some adjacent dead leaves that marked an extension of the original raiding trail. These ants moved cautiously, rapidly palpating the ground before them, and gave every impression of following a previously set odor trail.

In the meantime other workers were emerging from the nest and moving onto the raiding trail. A few were wandering in other directions, some as far as thirty centimeters from the nest entrance. By 9:40 there were approximately fifty workers outside the nest, and a majority was moving in a steady stream back and forth on the raiding trail. A few had reached a point sixty centimeters from the nest entrance. There was clearly no individual leadership involved in this movement. Rather, the ants were progressing as a group, with individuals running back and forth for

various distances and frequently halting altogether for short intervals. At the head of the column, first one worker and then another moved into the lead, pressing ahead on its own for a short distance and then turning back to relinquish its lead to the next worker in line.

By 10:00, the workers were showing a marked tendency to disperse from the old raiding trail. There were many brief excursions to the side of the trail, during which a worker would wander off to the side by itself, cautiously exploring the ground with its antennae. Often it would be followed by one or two other workers that picked up and followed its odor trail. In most cases, these little foraging parties turned back after a brief exploration, but many continued on to effect a partial dispersion of the original foraging column. Some of the workers were observed as they made accidental contact with individual foraging workers of *Leptomyrmex pallens* Emery and *Xiphomyrmex tenuicrinis* Emery; in every case the *Phyracaces* showed a strong avoidance reaction.

By 10:25 two workers had reached a point on the old raiding trail approximately two meters from the home nest entrance. At 10:41, more than two hours after the mass foraging had begun, a few workers were seen moving back and forth on the trail at a point three meters from the nest entrance. Behind them the other workers had continued to disperse from the raiding and secondary trails until the entire party was scattered in all directions around the nest area, and a majority of the workers were exploring either on their own or in small parties. Most were still concentrated within two meters distance of the home nest. This pattern of foraging activity continued for the remainder of the morning, beginning to decline about noon. Evidently no nest suitable for raiding was found during this time, for no raid developed during the rest of the day.

One other colony of *Phyracaces cohici* (acc. no. 298) was found while engaged in a raid and is worthy of special mention. The workers were encountered at 2:30 p.m., evidently in the terminal stages of a raid on a nest of *Pheidole xanthocnemis* Emery. Only a few individuals were running along the raiding trail. One was carrying a pupa, another the gaster and pedicel of an adult *Pheidole* major worker.

Phyracaces dumbletoni Wilson.

Phyracaces dumbletoni Wilson, 1957, Breviora, no. 74: 5-7, fig., worker, ergatogyne. Type locality: Chapeau Gendarme, New Caledonia.

This large species occurs in both the dry, semideciduous, "valley-pocket" forest of southwestern New Caledonia and the moister broadleaf evergreen forest near Ciu on the east coast. The type colony (accession no. 65) was nesting in several spacious galleries and chambers in the upper layers of a large, moist, fern-covered log. It contained at least 200 workers, a single ergatogyne, over 100 cocoons and larvae of various ages,

and an indeterminate number of eggs. Among the the brood were found the hollowed-out propodeum of a worker of an undescribed species of *Lordomyrma* and a *Lordomyrma* worker prepupa. These insects appeared to be the prey of the *Phyracaces*.

Phyracaces sp. near *punctatissima* Clark.

The raid of a large, light reddish *Phyracaces*, apparently an undescribed species related to *P. punctatsisima* Clark, was witnessed by Mr. Athol Douglas and the author near Balladonia, Western Australia, on February 13, 1955. The colony (acc. no. 445) was encountered in arid *Eucalyptus* woodland at 5 p.m., in the late afternoon, when the diurnal ant fauna of the area was still actively foraging. At this time the raid appeared to be in its terminal stages. The raiding file consisted of homeward-bound workers spaced at intervals averaging roughly ten meters. These individuals were travelling rapidly in a straight line toward the home nest. Circumstances were such that it was impossible to tell whether they were following an odor trail or orienting visually. Four of the workers were carrying prey, consisting in each case of the gaster and pedicel of a worker of an unidentified species of the formicine genus *Melophorus*. The raided nest could not be found. The exterior of the *Phyracaces* nest consisted of an unadorned hole in the bare earth, just wide enough to admit a single worker at a time. From the entrance hole several galleries penetrated into the soil to a depth of about fifty centimeters. The entire colony was recovered by digging; it contained a single dealate queen and approximately thirty-five workers.

OTHER SPECIES OF *PHYRACACES*

The observations on *Phyracaces* recorded above are not the first to have been made on the behavior of this genus. In 1918 W. M. WHEELER described the raid by a colony of *P. ficosus* Wheeler on the nest of a small, undetermined myrmicine. About a dozen of the *Phyracaces* workers were found running in a loose file, several carrying pupae of the raided species. Wheeler found a few other species of *Phyracaces* group-foraging during the daytime, and, although no other raids were seen, he predicted that as a rule "the large-eyed *Phyracaces* forage in troops (or as whole colonies ?) on the surface of the ground, their prey consisting of the brood of other ants." This prediction has been fully verified by later studies.

After WEELER's initial observations, CLARK (1923, 1924, 1941) added significantly to our knowledge of *Phyracaces* biology. Following extensive experience in the field with many of the Australian species, CLARK stated that the members of the genus are generally robber ants, and in Southwestern Australia at least show the following additional peculiarities:

Most of the smaller species may be found early in the morning from daybreak to eight or nine o'clock, and in the evening from about five o'clock until dark, when they are out raiding the nests of other ants. The larger species are frequently found raiding nests during the hottest part of the day. The nests are generally indicated merely by a small entrance on the surface of the ground, with no mound or other sign that a nest exists; occasionally they are found under stones or logs; as a rule, the nest extends about one foot below the ground level.

The *Phyracaces* Clark studied preyed on species of *Iridomyrmex* and *Crematogaster.* Workers of some of the species, e.g. *O. simmonsae* Clark, foraged as a group, but others, such as *P. punctatissima* Clark, seemed to forage singly.

CLARK's observations on the raiding behavior of *P. simmonsae* are of sufficient interest to deserve quoting here:

The colony taken at Mundaring was noticed whilst its members were raiding a nest of *Cremastogaster rufotestaceus* MAYR, and were traced to their nest, about thirty yards away. The *Phyracaces* were taking both larvae and pupae from the *Cremastogaster* nest, and apparently got very little opposition from the ants of the latter nest, who seemed to concentrate their energy to removing the brood. The *Phyracaces* did not move in a body, but worked much as do the species of *Iridomyrmex*, a constant stream of ants coming and going between the two nests with usually a gap of many inches between the workers. The nest of *Ph. simmonsae* was very inconspicuous, being indicated merely by a small hole, less than one quarter of an inch in diameter, on level ground. This nest extended underground for eleven inches, ending in an elongate chamber where the female and her brood were found. A number of *Cremastogaster* larvae and pupae were also found in the chamber.

Field notes on *Phyracaces* (*Neophyracaces*) *potteri* Clark supplied CLARK by the collecter, Mr. H. POTTER, contain some important details, including the only available description of the early stages of a complete cerapachyine raid. The type *potteri* nest was found in open, cultivated land, and its exterior consisted of a single, inconspicuous hole in the ground. The colony was observed conducting a raid on the afternoon of January 21, 1934. Following is an excerpt of POTTER's notes dealing with this event:

A few workers, each with its abdomen raised upwards, were moving rapidly about. At 3 p.m., with the shade temperature at 90° Fahr., a large number of the ants was seen leaving the nest and travelling to a series of nest holes about twenty-two yards away. The series of nests belong to a small dark coloured ant [*Iridomyrmex viridigaster* Clark]. On reaching these nests the robbers did not hesitate, they went boldly in and apparently got little resistance as they soon emerged again each carrying a larva or pupa of the *Iridomyrmex* with which they returned to their own nest. Little or no order was maintained during the raids, each ant seemed to work independently, but a constant stream kept on coming with nothing and returning with larva or pupa. Later, at 4 p. m. there was no sign of the robbers near the nest which they had been robbing; apparently the raid had ceased.

Sphinctomyrmex steinheili Forel

Sphinctomyrmex (*Eusphinctus*) *steinheili* Forel, 1900, Ann. Soc. Ent. Belg., 44: 72, worker (ergatogyne?). Type locality: Mackay, Queensland.

The following observations are based on unpublished field notes by Dr. W. L. BROWN, who has generously supplied this information for inclusion in the present paper. BROWN found *S. steinheili* relatively common in both wet and dry sclerophyll forest and in open bracken woodland in localities that he visited in the Melbourne area, Western District of Victoria, and southeastern Queensland. Colonies were nesting under rocks and in rotting wood, and the adults and brood of individual colonies were usually all massed together in a single chamber. In at least one case there was evidence that the ants had excavated part of the nest themselves. Each colony contained multiple ergatogynes, and the brood of a given colony was always developmentally synchronized.

At Dandenong Creek, Vermont, Victoria, Brown witnessed the raid of a *steinheili* colony against the colony of a species of the formicine genus *Stigmacros* (probably *S. impressa* Forel). When first encountered, in the mid-afternoon, the raid was already past its peak. The *Sphinctomyrmex* were running at intervals along the bottom of cracks in dry clay soil, and a minority of the homeward-bound individuals were carrying *Stigmacros* pupae. The raided *Stigmacros* nest was situated in the soil at the base of a tree. A number of *Stigmacros* workers were seen running over the ground in the vicinity, many carrying larvae and pupae in their mandibles.

Sphinctomyrmex caledonicus Wilson.

Sphinctomyrmex caledonicus Wilson, 1957, Breviora, no. 74: 8-9, worker, ergatogyne. Type locality: Ciu, New Caledonia.

This species was found only in a small, isolated patch of disturbed woodland at Ciu. It was never encountered in the nearby Canala River forest, where *Phyracaces cohici* abounds, despite an intensive search for it there. The several colonies collected were all quite large and contained multiple ergatogynes, as well as large quantities of developmentally synchronized brood. Portions of two colonies were airmailed to Dr. W. L. BROWN and Mr. R. B. WILLEY, at Harvard University in the United States, in the hope that these investigators would be able to carry on an ethological study of the species under more leisurely laboratory conditions. Unfortunately only a few workers and ergatogynes survived the two-weeks trip (in the case of the principal observation colony, 24 workers and 4 ergatogynes), and these lived in the laboratory for only a little more than

a month thereafter. Nevertheless, during this time BROWN and WILLEY were able to make some suggestive observations on the behavior of this species, which with their permission I have undertaken to summarize below.

The *Sphinctomyrmex* were offered a variety of small insects, including adult workers and brood of the ants *Myrmica rubra* L., *Lasius alienus* (Foerster), and *Acanthomyops claviger* (Roger). Only the ants were accepted as prey. The *Sphinctomyrmex* workers did little foraging within the confines of the artificial nest, but when by chance they encountered other ants they attacked these insects immediately. The attack movement included lunging, seizing with the mandibles, and stinging. The *Lasius* were often able to counter effectively by spraying the *Sphinctomyrmex* with formic acid, which substance sometimes temporarily incapacitated the cerapachyines but rarely seemed to injure them permanently. After such engagements, the *Sphinctomyrmex* workers were seen to intensify their usually incessant grooming activities, evidently in an attempt to remove the acid. Captured worker ants were carried into the brood chambers of the artificial nests, their gasters or heads chewed off, and their soft internal parts eaten by the *Sphinctomyrmex*. Larvae of other species were accepted by the *Sphinctomyrmex*, placed among the *Sphinctomyrmex* brood, and eventually eaten.

The ergatogynes displayed a behavioral character worthy of separate mention. These individuals never left the brood chambers to forage on their own, but remained closely associated with the brood, wrapping their long, slender bodies around small piles of larvae and eggs. This unusual protective posture was also frequently assumed by inactive workers.

DISCUSSION

It is most significant that all of the cerapachyine prey records accumulated to the present time involve other ants. Moreover, it is clear that some of the species, *e.g. Cerapachys opaca* and *Phyracaces cohici*, capture not only larvae and pupae but adult workers as well. Whether this myrmecophagous habit is universal among the cerapachyines can be decided with assurance only when information is made available on the other principal cerapachyine stocks, including the aberrant genera *Acanthosticus* and *Lioponera*.

Phyracaces, the genus about with we know the most, shows considerable latitude in prey choice, various species attacking assorted members of the subfamilies Myrmicinae, Dolichoderinae, and Formicinae. Due to the scattered nature of the observations, however, little information is available on the prey-specificity of individual species of *Phyracaces*. It may be significant that both prey records of *P. cohici* involve species of *Pheidole*, but it still remains to be seen whether this myrmicine genus is the exclusive or even the preferred prey. A fascinating possibility to be

examined is that the two New Caledonian species of *Phyracaces* have mutually exclusive prey choices, the smaller *P. cohici* specializing on species of *Pheidole* and the larger *P. dumbletoni* on the correspondingly larger species of *Lordomyrma*.

The raiding expeditions of *Cerapachys* and *Phyracaces* described herein contain some features worthy of special discussion. The workers of individual colonies were clearly raiding synchronously and as a group (group-predation), a somewhat rare behavior pattern which I have elsewhere (WILSON, 1957) suggested as one of the basic criteria of the "army-ant" adaptive type. The extent to which this behavior form is associated with frequent emigration (nomadism) is not known, but there is an excellent chance that group-predation and nomadism are generally associated where either occurs in the Ponerinae and Cerapachyinae. An extended study of the day-by-day activity of some cerapachyine species, to determine whether it is nomadic in habit in addition to being group-predatory, is clearly needed. As pointed out in the abovementioned paper, the primary adaptive significance of group-predation (and possibly the whole of army-ant behavior) seems to be to allow the colony to prey on large insects and colonies of other social insects, which would not ordinarily be vulnerable to solitary foraging workers. The myrmecophagous cerapachyines fit this psychobiological pattern well.

CLARK (1924) showed that some of the Australian *Phyracaces* hunt singly, but there seems to be little doubt that the individuals thus encountered were acting only as scouts and that the actual raids are always conducted by companies of workers. Every raid thus far recorded has involved multiple workers that were plundering the same nest at the same time and following the same raiding trail. There nevertheless remains the important distinction that CLARK has made between species that hunt (or scout) singly and those that hunt in groups. It is the author's present opinion that such a distinction may eventually prove to be a spurious one, since in the single instance where the foraging activities of a colony have been followed for any extended period of time (*Phyracaces cohici*) foraging commenced as a group activity and ended with a dispersion of solitary hunting workers. It is very likely that CLARK was merely observing different stages of the same process in the Australian *Phyracaces* he watched. We are much in need of supplementary observations of the type reported herein for *P. cohici*. Such a study could well lead to the discovery of behavior patterns and communication forms hitherto unknown in the Formicidae.

The foraging activities of the Ciu colony of *P. cohici* included some noteworthy adaptive features. In the early stages of the scouting expedition of January 2, there was marked group activity and inter-individual stimulation, which served to hasten the outward movement of the worker group as a whole and no doubt served to stimulate individual workers to join the group. The tendency observed in this colony to follow a previous raiding trail would also seem ultimately to add to the colony's

chances of finding a suitable host nest. On January 2, however, the initial group-foraging did not lead to a suitable nest, and after a time the workers began to disperse out along secondary trails of their own making, with the result that they became widely scattered in a circular area centered around the home nest. The observed behavior ended at this stage, but it is predictable that if a new host colony were located in the course of the later, dispersed phase of the foraging pattern, a raid would develop, and a new raiding trail would be established by scent deposition. This trail would then serve as the new route along which the ants would tend to forage on succeeding days. Thus a cycle can be hypothesized, incorporating the following four steps:

1. Raiding by groups of workers.
2. Establishment of a strong olfactory raiding trail by scent deposition.
3. Development of subsequent foraging and raiding along the trail until the host colony is depleted or scattered.
4. Dispersion of foraging workers from the raiding trail until a new host colony is located.

It is easy to see how such an alternation of foraging and raiding behavior might continue indefinitely and result in a highly efficient exploration and exploitation by the *Phyracaces* of the circumnidal territory.

Another matter of especial interest is the docile behavior exhibited by the ant colonies being raided by the cerapachyines. The energies of these ants seemed to be devoted entirely to rescuing and hiding their brood. There was no evidence of active resistance to the cerapachyines, although of course this could have been occurring within the host nest out of sight of the observer. It may be that such submissiveness is of ultimate advantage to the host species, in that it eliminates combat in which the host species would be at a distinct disadvantage. In actual practice the raided colonies usually survive the cerapachyine raids with a substantial part of their brood and worker population preserved intact.

Summary.

Notes on the predatory behavior of species of *Cerapachys*, *Phyracaces*, and *Sphinctomyrmex* are given. All of the species thus far studied have proven to be myrmecophagous, feeding on the brood (and in some cases adults) of other species of ants. Raids are conducted by groups of workers and are usually of short duration. A foraging expedition of *Phyracaces cohici* is described, during which the workers started out as a compact group but later dispersed into small groups and lone individuals deployed in a circular pattern around the home nest. On the basis of these observations there is suggested a hypothetical pattern of alternating foraging and raiding behavior, which is believed to result ultimately in an efficient exploitation by the ants of the surrounding territory. Notes on other phases of biology, including colony size and nest structure, are given.

Résumé.

On a présenté quelques observations sur les habitudes de pillage des espèces *Cerapachys*, *Phyracaces* et *Sphinctomyrmex*. Toutes les espèces étudiées jusqu'à présent sont myrmécophages ; elles dévorent le couvain — et dans certains cas les adultes — d'autres espèces de Fourmis. Les incursions sont effectuées par des groupes d'ouvrières, et sont généralement de courte durée. On décrit une expédition de fourrage de *Phyracaces cohici*, au cours de laquelle les ouvrières, parties en troupe, se dispersèrent par petits groupes et en individus isolés déployés en cercle autour de leur fourmilière. Ces observations suggèrent l'existence d'un cycle alternatif de fourrage et de razzias, ce qui permettrait aux Fourmis l'exploitation efficace des territoires avoisinants. On décrit, de plus, quelques autres aspects de la biologie de ces espèces, notamment les dimensions et le plan de leurs fourmilières.

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