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**A Synopsis of Common and Economic Illinois Ants,
with Keys to the Genera
(Hymenoptera, Formicidae)**

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A Synopsis of Common and Economic Illinois Ants, with Keys to the Genera (Hymenoptera, Formicidae)

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TO THE ILLINOIS HOMEOWNER, gardener, or farmer, ants are probably the best known of all insects. They invade houses in search of food, hollow out house timbers to make nests, make mounds and bare spots in gardens and lawns, tend aphids that injure some of our crops, and the more pugnacious ones bite picnickers. However, ants that intrude upon our privacy are not the only ones living in Illinois. Many live in the house, in the garden under stones, or in the soil, and they forage chiefly at night. Many other species inhabit woodlands, some living in the ground, others in rotten logs, and still others in dead trees.

To date over 90 different kinds or species of ants have been taken in Illinois. Another 20 are known from neighboring states and will likely be found in Illinois with further collecting. These midwestern ants are classified into genera and these are grouped into six large categories called subfamilies. A seventh subfamily is more southern and western in distribution. These seven subfamilies constitute the North American representatives of the family Formicidae, which contains several thousand different species in the entire world.

Although superficially ants may look much alike, those belonging to different genera and species exhibit a remarkable number of differences in such characters as the shapes of the mandibles, sizes of the eyes, projections on the body, and contours of various parts. These characters are most marked between the genera. The species within many genera are frequently difficult to diagnose, and many complexes have not yet been thoroughly studied. As a result, it is not practical to give identification characters for every species occurring in Illinois. The genera and certain of the common and economic species can be identified readily, and these are the units that are treated in this synopsis, intended as a useful guide to the householder, gardener, farmer, and hiker.

LIFE HISTORY

All ants are social insects living in colonies or nests, and they have evolved a highly developed social pattern

associated with the production and rearing of the young and the maintenance of the nest.

Developmental Stages

Ants belong to the large group of insects that have four distinctive stages in the life history: (i) the egg, (ii) the larva, (iii) the pupa, and (iv) the adult, the latter represented by males, females, and workers (Fig. 1). Typical males and females have well-developed wings and sexual organs; the workers are much smaller adult stages that lack wings and sexual organs and differ from the winged adults in many details of morphology.

A typical ant nest centers around a queen, a female that has been fertilized and lost its wings. The queen stays in the nest and lays eggs that hatch into larvae. The larvae are whitish, legless maggots, somewhat egg shaped but tapered toward the head end. They are completely helpless and must be moved about in the nest and fed by the adult ants. When full grown, the larvae transform into whitish pupae, the transformation stage between larva and adult. Some larvae spin cocoons around themselves before pupating, but some do not. The pupae also are helpless. If the nest is badly disrupted, the workers will carry the larvae and pupae out of the nest to hiding places in the soil or under stones. In nests with an active queen, the larvae usually develop into workers or certain workerlike forms.

The eggs, larvae, and pupae are cared for by the workers, who handle the immature stages inside the nest and forage for food outside the nest. The workers obtain enough food for themselves, the queen, and the growing larvae. Most of the larvae grow up to be workers. When these workers are mature, they take up their activities of foraging for food and feeding the queen and the larvae, collectively called the brood. The development from egg to adult takes several weeks.

Castes and Their Duties

Depending on the species, a nest or colony may consist of several hundred to many thousands of individual ants, including a considerable number of different forms or castes in addition to the queen. The commonest caste is called the worker, and these may be of two sizes; the smaller are minor workers and the larger are major workers. In the major worker the head is considerably larger in proportion to the remainder of the body than in the minor worker. In

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COVER ILLUSTRATION: A worker of *Polyergus lucidus*, the pale slave-making ant. Drawn by Mrs. Alice Ann Prickett.

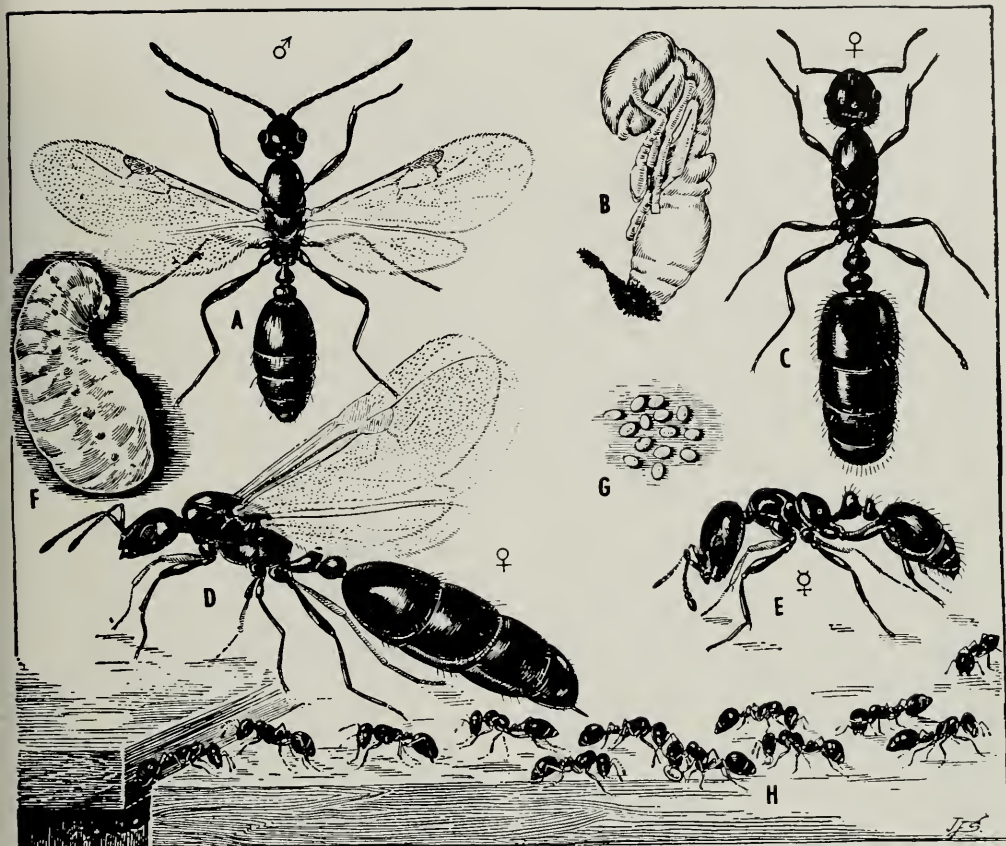


Fig. 1.—The little black ant, *Monomorium minimum*. A, male; B, pupa; C, female; D, female with wings; E, worker; F, larva; G, eggs; H, group of workers in line of march. A to G much enlarged; H, about three times natural size. (From USDA)

some kinds of ants an even larger type of worker, the soldier, is present. The soldiers are very much larger than any of the other workers and usually have extremely long mandibles armed with sharp teeth. The primary function of the soldier caste is to protect the nest; the soldiers do not take care of the brood. In some ant species individuals that look like soldiers because of their larger eyes and much enlarged heads are actually specialized forms that crack plant seeds gathered for food. These nutcrackers are sometimes called the miller caste. Ants in other regions have evolved different castes that are modified workers; that is, they never have wings and cannot reproduce. All worker and soldier castes are females.

Colony Formation

At specific times of the year (different times for different species) a large number of winged males and

females are produced in each colony. These winged ants appear to take no part in the colony activities except for being fed. After they have matured in the nest, these winged forms fly out in great swarms, and it is during these flights that the males and females mate. The males take no further part in the history of the nest, but the fertilized winged females alone start new colonies. The males die soon after mating, usually by being devoured by birds, other ants, or predaceous insects.

Colony formation is extremely interesting. The fertilized female first nips off her wings, then burrows into wood or soil, makes a small cavity, and begins laying a few eggs. When these hatch into the first larvae of the colony, the female feeds them by regurgitation. The food stores used by the female are her fat bodies, formed while she was maturing in the parent nest, and the large wing muscles that are digested

by internal body fluids and converted into food. These first larvae tended by the queen develop into workers. As soon as these workers are mature, they start to forage, and from then on they and not the queen provide food for the colony.

Caste Development

One of the most interesting questions concerning ants is, why does one egg develop into a worker, another into a soldier, another into a winged, reproductive queen, and yet another into a winged, reproductive male? Entomologists who study ants have been sure for some time that some regulatory system determines the number of members of each caste produced within a colony. However, the mechanisms of this regulation are not clearly known as yet. The males arise from unfertilized eggs. This is true also of all ant relatives such as wasps and bees. The queens and worker castes develop from fertilized eggs. When an ant queen mates, she receives enough sperm to last her entire lifetime and keeps it stored in special glands inside her body. The major factor in caste formation, therefore, is the control of the development of fertilized eggs and does not involve heredity directly.

The clue to the differential development of the eggs seems to be found in certain feeding habits. When a worker feeds a larva or the queen or a soldier, the worker licks the body of the individual it has just fed. Apparently the bodies of these creatures exude certain secretions that are sought and enjoyed by the workers. It is believed that these secretions are actually hormones that control the behavior of the workers, primarily influencing the kind of food that they feed to the larvae. It has been found that larvae fed a high-protein diet develop into soldiers, whereas those fed a low-protein diet develop into workers. Presumably, similar dietary differences will cause a larva to develop into a reproductive queen.

TERMINOLOGY

The anatomy of ants differs in several respects from those of many other insects such as grasshoppers and beetles. As a result, several terms used in the following keys may be unfamiliar to the general entomologist. To clarify these terms, many of them are indicated for the worker and queen caste in Fig. 2 and 3. Others are listed in the short glossary below.

The most important morphological difference between ants and many other insects concerns the divisions of the thorax and abdomen. In ants (and all other Hymenoptera) the first segment of the abdomen has become consolidated into the last or third segment of the thorax and forms an indistinct dorsal plate called the epinotum. This epinotal area sometimes bears distinctive spines, epinotal spines. The main bulk of the abdomen (called the gaster) is joined to the thorax-epinotum by a constricted and often beadlike narrow portion called the petiole, which may consist of one or two segments (the second and sometimes third true segments of the abdomen). Unless one is referring specifically to the epinotal area, the epinotum and thorax together are usually referred to simply as the thorax.

Abbreviated Glossary

clypeus—The "upper lip" of the front of the head (Fig. 3).

dorsum—The upper surface or top.

dorsal—Pertaining to the upper surface or top.

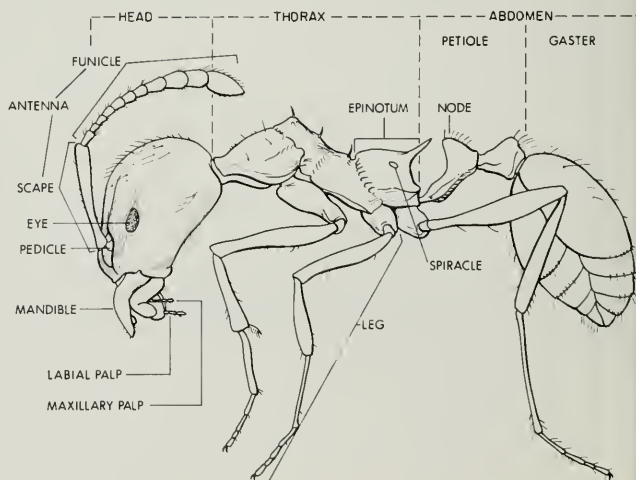
frontal carina—A ridge of the head just to the mesal side of the base of the antenna; this may be elevated or form an overhang over the base of the antenna.

funicle—The many-segmented portion of the antenna beyond the scape or basal segment.

mesal—On or toward the midline of the body.

node—A projection or elevation on the dorsal surface of one of the segments of the petiole.

Fig. 2.—Worker ant of the genus *Aphaenogaster*, side view, showing terms used for diagnostic parts.



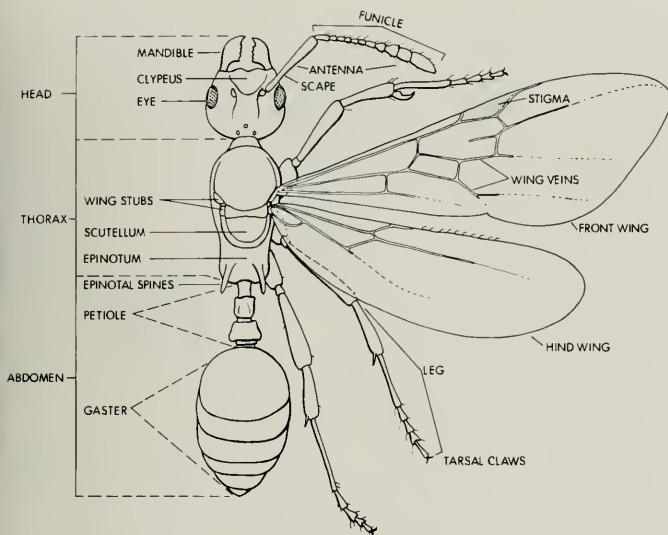


Fig. 3.—Winged female ant of the genus *Aphaenogaster*, dorsal view, showing terms used for diagnostic parts.

petiole—One of the small segments between the thorax and gaster. (If an ant specimen dies with the gaster elevated, the petiole and its structures may be difficult to see, in which case the specimen should be relaxed and the gaster depressed until the entire body is about level.)

scape—The first segment of the antenna. (When measuring this structure, one should not count the small socketlike end piece that actually articulates with the head.)

sclerite—Any area of the body set off by ridges, grooves, or membranes.

scrobc—A long, hollowed-out area on the head above the insertion of the antenna into which the antenna folds when in repose.

striae—Minute, ridgelike ornamentations of the surface.

sutur—Any division between two sclerites.

venter—The underneath side.

ventral—Pertaining to the underneath side.

DIAGNOSIS OF ANTS AND TERMITES

Ants are members of the insect order Hymenoptera, which includes the sawflies, wasps, bees, and ants. Ants resemble some of the wasps, especially those having wingless forms that may resemble worker ants very closely in general appearance.

Ants may be differentiated from wasps by the ants having one or two segments forming a distinct petiole between the thorax and the gaster, each segment of this petiole produced dorsally into an enlargement or node (Fig. 1 and 2). Some of the wasps have a petiole, but none of them has one bearing a dorsal node.

Ants are also confused with termites, often called white ants, because termites also live in large colonies. Ants and termites may be differentiated as follows:

Winged or dark-bodied forms having the abdomen attached to the thorax by a narrow waist or petiole (Fig. 1); whitish, soft-bodied forms (larvae and pupae) found in the nest are grublike, nonambulatory, and often without legs **ants**

Winged and dark-bodied forms having the abdomen joined broadly to the thorax; pale forms found in the nest all have well-developed legs and are ambulatory (Fig. 4) **termites**

Termites constitute the insect order Isoptera, close relatives of cockroaches. Even the youngest stages have legs and are active. If a nest is disturbed, the older individuals do not carry the younger ones to a hiding place. Termites are not discussed further in this synopsis.

If an ant nest is disturbed, the worker ants carry the inactive larvae and pupae to a hiding place.

KEY TO ANT CASTES

The castes of ants may be identified by the following key. In this key the soldiers, nutcrackers, and both major and minor workers are keyed out together under "workers."

1. Tip of abdomen with a set of clasp structures that may be partially or completely retracted (Fig. 16P); wingless or with wings, but never with wing stubs **males**

Tip of abdomen without clasp structures, sometimes with a sharp sting (Fig. 7E and H) or a small cone having a ring of minute hairs (Fig. 6D); wingless or having wings or wing stubs . . . 2

2. Having either wings (Fig. 3) or wing stubs that are visible on the sides of the thorax where the wings have been broken off; dorsum of thorax having several transverse or curved sutures between bases of wings or wing stubs, these sutures

Fig. 4 (Right).—A common Illinois termite, *Reticulitermes flavipes*. A, winged queen; B, worker nymph; C, winged queen. B and C are natural size. (From Illinois Natural History Survey Circular 39)

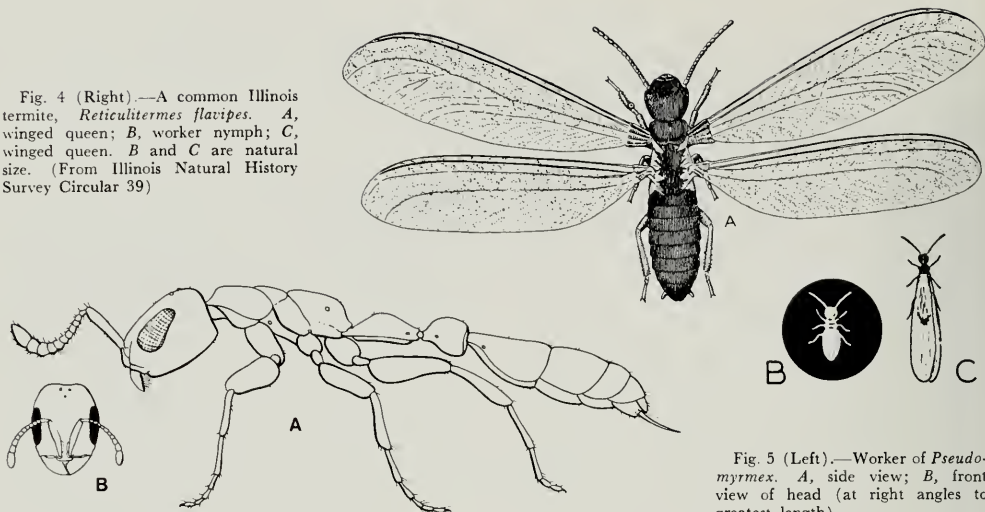


Fig. 5 (Left).—Worker of *Pseudomyrmex*. A, side view; B, front view of head (at right angles to greatest length).

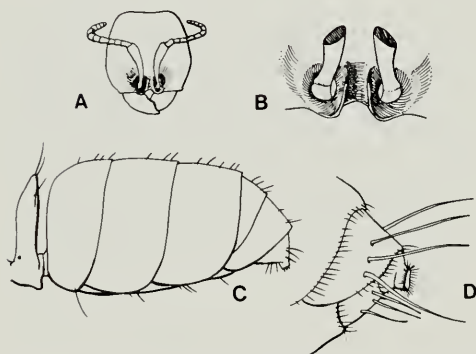


Fig. 6.—Diagnostic parts of worker ants. A, *Labidus*, front view of head; B, *Labidus*, enlarged view of bases of antennae; C, *Camponotus*, side view of petiole and gaster; D, *Camponotus*, nozzle-like anal opening at tip of abdomen.

delineating several sclerites, always including a large V-shaped or U-shaped scutellum (Fig. 3)

..... females
Wingless, lacking wing stubs (Fig. 2); dorsum of thorax without a scutellum and associated sclerites workers

SYNOPTIC KEYS

The following keys include all of the genera known from Illinois and a few others that are known to occur not far from this state and may ultimately be found here. Because most of the Illinois ants have a wide distribution, this synopsis should be helpful for the entire Midwest. The only North American subfamily not represented in these keys is the southwestern subfamily Cerapachyinae.

This subfamily contains only two genera in North America, *Cerapachys* and *Acanthostichus*, whose workers and queens may be distinguished by the spines on the lateral margins of the terminal abdominal sternum.

The genera treated in this synopsis have been numbered serially. To facilitate referring from the keys to the generic synopses, the genera have been given the same numbers in the keys as in the following synopses.

KEY TO SUBFAMILIES AND GENERA (WORKERS)

1. Petiole two segmented (Fig. 2 and 5) 2
Petiole one segmented (Fig. 7C, D, and E) 4
2. Head with long, smooth eyes; antennae always close together at base; scape little more than half length of head (Fig. 5B); medium-sized to large ants of wasplike appearance (Fig. 5A) (subfamily *Pseudomyrmecinae*) 20
Head shorter, eyes no larger than in Fig. 10; bases of antennae frequently well separated (Fig. 10); antenna usually with scape longer, frequently longer than head 3
3. Compound eye represented by only one facet or absent (Fig. 6A); a pair of high, sharp ridges arising from head between antennal bases (Fig. 6B) (subfamily *Ecitoninae*) 6
Compound eye represented by more than a single facet (Fig. 10); head without high ridges like those in Fig. 6B (subfamily *Myrmecinae*) 21
4. Genital opening small and circular, surrounded by stiff hairs forming a terminal nozzle (Fig. 6C and D) (subfamily *Formicinae*) 13
Genital opening slitlike or inconspicuous (Fig. 7) 5
5. Gaster with a distinct constriction between first and second segments; abdomen with a well-developed sting (Fig. 7) (subfamily *Ponerinae*) 7
Gaster without a constriction between first and sec-

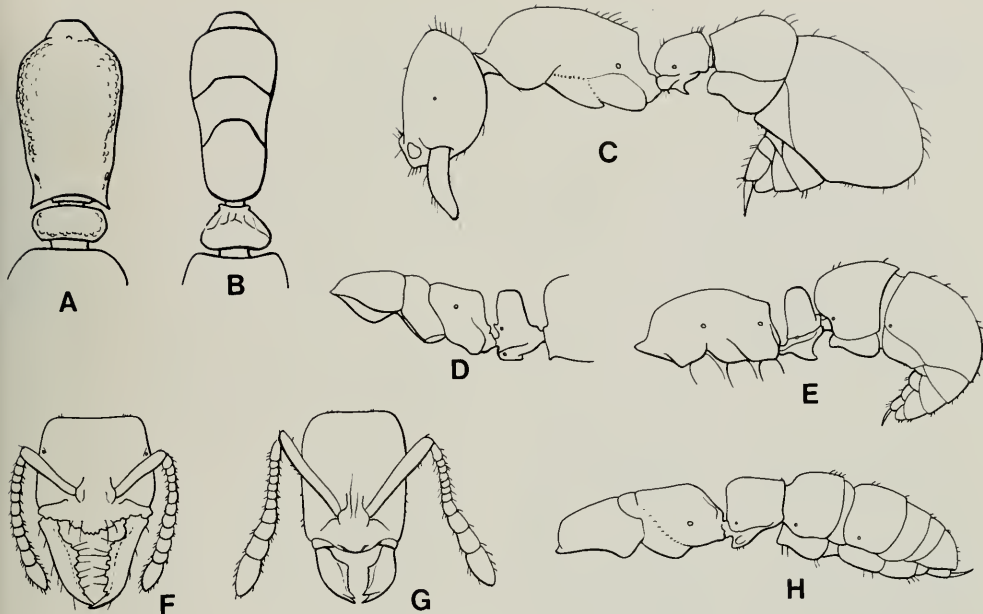


Fig. 7.—Diagnostic parts of worker ants of the subfamily Ponerinae. *A*, *Proceratium*, dorsal view of thorax; *B*, *Ponera*, dorsal view of thorax; *C*, *Sysphincta*, side view of body; *D*, *Ponera*, side view of thorax and petiole; *E*, *Proceratium*, side view of thorax and abdomen; *F*, *Amblyopone*, front view of head; *G*, *Ponera*, front view of head; *H*, *Amblyopone*, side view of thorax and abdomen.

ond segments (Fig. 8) ; abdomen without a sting
(subfamily **Dolichoderinae**)10

Subfamily ECITONINAE

6. Tarsal claw toothed (Fig. 17*A*) 1. *Labidus*
Tarsal claw without a tooth (Fig. 17*B*)
..... 2. *Neivamyrmex*

Subfamily PONERINAE

7. Thorax with no sutures visible in dorsal view (Fig. 7*A*) 5. *Proceratium*
Thorax with two sutures visible in dorsal view (Fig. 7*B*) 8
8. Terminal portion of abdomen arising near anterior end of ventral margin of end of second gastric segment; petiole moderately long and low in lateral view (Fig. 7*C*) 6. *Sysphincta*
Terminal portion of abdomen arising from near posterior end of second gastric segment; petiole high and short in lateral view (Fig. 7*E*) 3. *Amblyopone*
9. Mandibles as long as head (Fig. 7*F*) ; petiole almost square in lateral view (Fig. 7*H*) 4. *Ponera*
Mandibles only about half length of head (Fig. 7*G*) ; petiole rectangular and high in lateral view (Fig. 7*D*)

Subfamily DOLICHODERINAE

10. Epinotum with a flat, U-shaped dorsal projection extending posteriorly (Fig. 8*B* and *E*) 7. *Dolichoderus*
Epinotum with either a conical projection (Fig. 8*D*) or none (Fig. 8*C*) 11
11. Epinotum with a conical process (Fig. 8*D*) ; mandible with a prominent bladelike terminal tooth, maxillary palp with segment 3 as long as segments 4, 5, and 6 combined (Fig. 8*F*) 8. *Dorymyrmex*
No conical process on epinotum (Fig. 8*C*) ; mandible without a bladelike tooth, maxillary palp with segment 3 much shorter than segments 4–6 combined 12
12. Node of petiole vestigial (Fig. 8*A*) 10. *Tapinoma*
Node of petiole as prominent as in Fig. 8*C* 9. *Iridomyrmex*

Subfamily FORMICINAE

13. Antenna with 9 segments 11. *Brachymyrmex*
Antenna with 12 segments (Fig. 2) 14
14. Mandibles sickle shaped, their inner margins with a series of minute bumps or crenulations but no teeth (Fig. 9*A*) 16. *Polyergus*
Mandibles stouter and toothed (Fig. 14*B–D*) ... 15

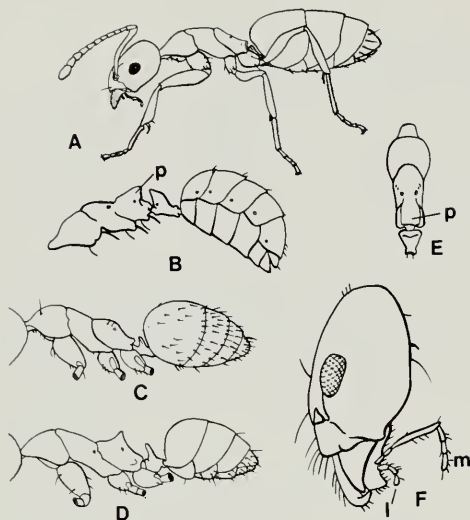


Fig. 8.—Diagnostic parts of worker ants of the subfamily Dolichoderinae. A, *Tapinoma*, side view; B, *Dolichoderus*, side view of thorax and abdomen—p, dorsal process; C, *Iridomyrmex*, side view of thorax and abdomen; D, *Dorymyrmex*, side view of thorax and petioles—p, dorsal process; E, *Dolichoderus*, dorsal view of head—l, labial palp; m, maxillary palp.

15. Maxillary palp with three or four segments 12. *Acanthomyops*
Maxillary palp with five or six segments 16
16. Mesopleuron with a distinct ridge near anterior ventral portion (Fig. 9B) 15. *Camponotus*
Anterior margin of mesopleuron rounded, without ridge 17
17. Node of petiole low and sloping anteriorly, the whole petiole forming a low triangle (Fig. 9D, E, and G) 18
Node of petiole upright, petiole forming a high triangle (Fig. 9C and F) 19
18. Thorax viewed from the side having a distinct constriction or "neck" near middle (Fig. 9G) 17. *Prenolepis*
Thorax viewed from the side having no such distinct constriction or "neck" (Fig. 9D and E) 18. *Paratrechina*
19. Clypeus shorter, as in Fig. 14C, with an indistinct transverse swelling; dorsum of epinotum somewhat angulate (Fig. 9F) 13. *Lasius*
Clypeus longer, as in Fig. 14D, with a slight mesal crest or angulation for most of its length; dorsum of epinotum smoothly rounded (Fig. 9C) 14. *Formica*

Subfamily PSEUDOMYRMECINAE

20. Includes only one genus in North America (Fig. 5) 19. *Pseudomyrmex*

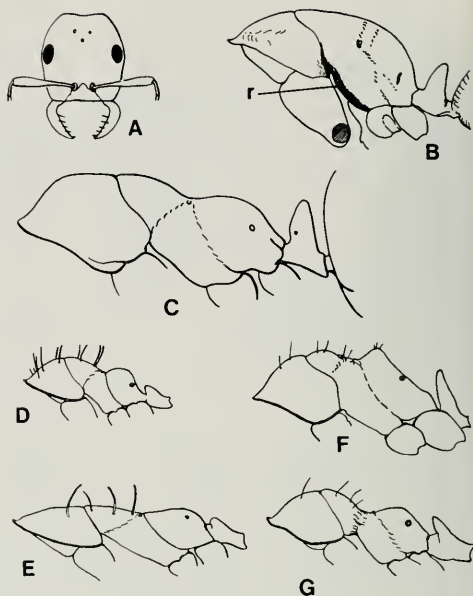


Fig. 9.—Diagnostic parts of worker ants of the subfamily Formicinae. A, *Polyergus*, front view of head; B, *Camponotus*, side view of thorax and petiole—r, ridge; C, *Formica*, side view of thorax and petiole; D, *Paratrechina*, side view of thorax and petiole; E, *Paratrechina*, side view of thorax and petiole; F, *Lasius*, side view of thorax and petiole; G, *Prenolepis*, side view of thorax and petiole.

Subfamily MYRMECINAE

21. Pedicel attached to dorsal surface of gaster, which is flattened dorsally and markedly heart shaped (Fig. 25) 26. *Crematogaster*
Pedicel attached near center of anterior end of gaster, which is ovoid in shape (Fig. 2) 22
22. Dorsum of thorax with tubercles, as in Fig. 23B 21. *Trachymyrmex*
Dorsum of thorax without tubercles 23
23. Front part of mesonotum with long spines projecting forward (Fig. 23A) 20. *Atta*
Front part of mesonotum without spines (Fig. 10C, D, G, H, and I) 24
24. Head somewhat wedge shaped in full-face view (Fig. 24) 25
Head not wedge shaped in full-face view (Fig. 10A and F) 26
25. Mandibles as long as in Fig. 24A and B 22. *Strumigenys*
Mandibles shorter, as in Fig. 24C and D 23. *Smithistruma*
26. Epinotum with dorsal margin smoothly rounded, without spines or angulation (Fig. 1E) 27
Epinotum with spines (Fig. 10C, D, G, and H) or with an angulate posterior dorsal margin (Fig.

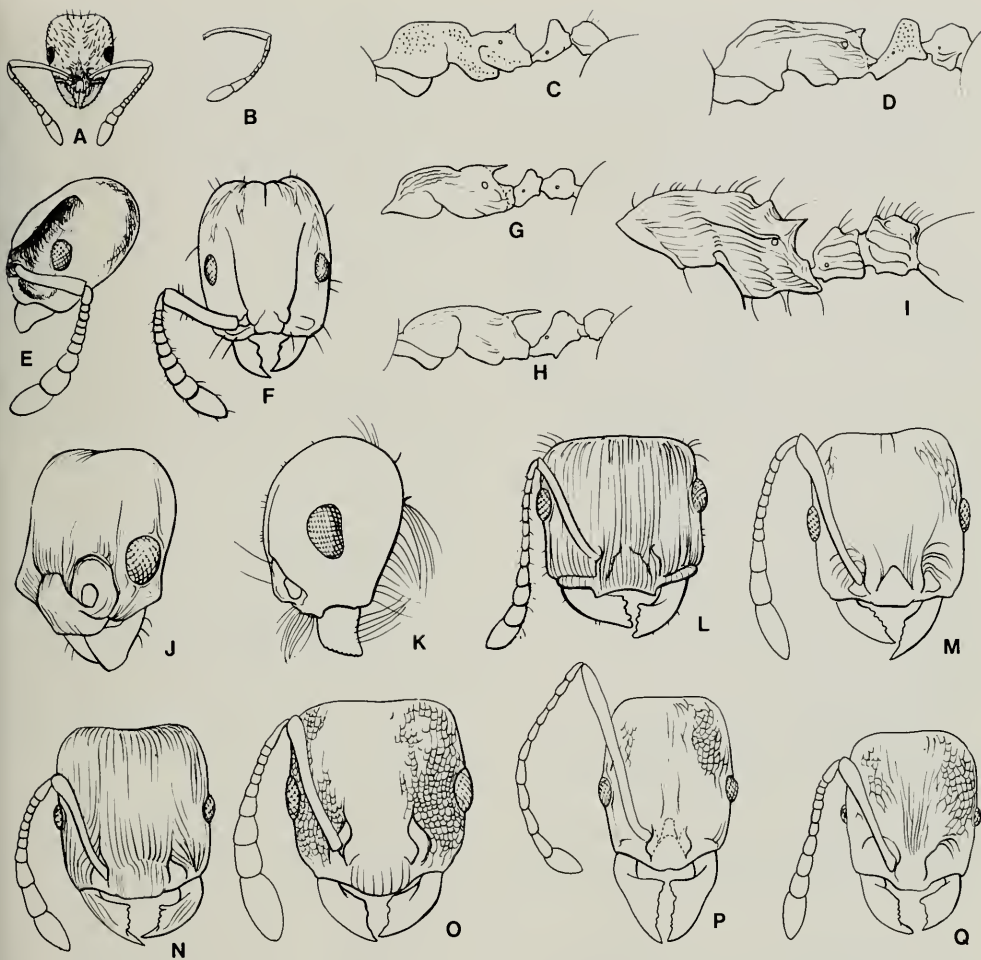


Fig. 10.—Diagnostic parts of worker ants of the subfamily Myrmecinae. A, *Monomorium*, front view of head; B, *Solenopsis*, antenna; C, *Pheidole*, side view of thorax and petiole; D, *Tetramorium*, side view of thorax and petiole; E, and F, *Harpagoxenus*, side and front views of head; G, *Myrmica*, side view of thorax and petiole; H, *Leptothorax*, side view of thorax and petiole; I, *Myrmecina*, side view of thorax and petiole; J, *Myrmica*, tangential view of head; K, and L, *Pogonomyrmex*, side and front views of head; M, *Pheidole*, front view of head; N, *Tetramorium*, front view of head; O, *Leptothorax*, front view of head; P, *Aphaenogaster*, front view of head; Q, *Stenamma*, front view of head.

- | | | | |
|--|-----------------------|---|-------------------------|
| 10I) | 28 | of the eye (Fig. 10J–Q) | 30 |
| 27. Antenna with 10 segments, the last two forming a distinct club (Fig. 10B) | 27. <i>Solenopsis</i> | 29. Minute yellow ants, at most 1.5 mm long | 24. <i>Wasmannia</i> |
| Antenna with 12 segments, club either not distinctly set off or having three or more segments (Fig. 10A) | 28. <i>Monomorium</i> | Brown ants about 2.5 mm long | 25. <i>Harpagoxenus</i> |
| 28. Antennal scrobes well developed, extending beyond the posterior margin of the eye (Fig. 10E and F) | 29 | 30. Posterior border of clypeus with a distinct, semi-circular, deep, sharp depression (Fig. 10J); epinotum with a large lateral flange covering part of base of petiole (Fig. 10G) | 34. <i>Myrmica</i> |
| Antennal scrobes not reaching the posterior border | | Posterior border of clypeus with a short, shallow depression (Fig. 10E) or its margin merging | |

- smoothly into the rest of the head (Fig. 10K); epinotum with a smaller or inconspicuous flange at base of petiole (Fig. 10D) 31
31. First segment of petiole slightly shorter than second; epinotum with an almost spinelike flange above each posterior spine (Fig. 10I) .. 31. *Myrmecina*
- First segment of petiole longer than second, its anterior portion narrow; epinotum usually with-

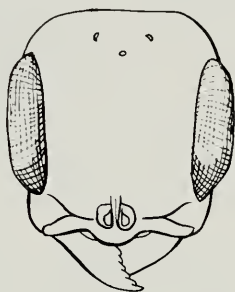


Fig. 11.—*Pseudomyrmex* queen, front view of head.

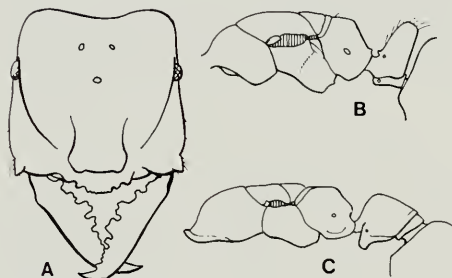


Fig. 12.—Diagnostic parts of queen ants of the subfamily Ponerinae. A, *Amblyopone*, front view of head; B, *Ponerinae*, side view of thorax and petiole; C, *Amblyopone*, side view of thorax and petiole.

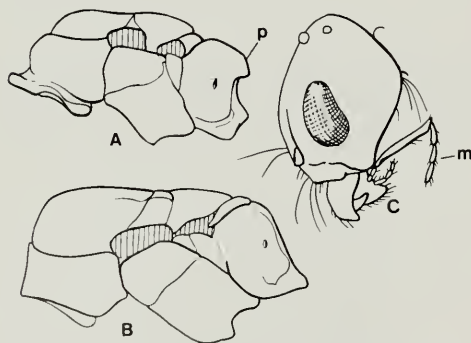


Fig. 13.—Diagnostic parts of queen ants of the subfamily Dolichoderinae. A, *Dolichoderus*, side view of thorax and propodeum—p, posterior projection of epinotum; B, *Tapinoma*, side view of thorax and epinotum; C, *Dorymyrmex*, side view of head—m, maxillary palp.

- out spinelike flange above each posterior spine (Fig. 10C, D, G, and H) 32
32. Mesal portion of anterior margin of clypeus concave (Fig. 10L); ventral side of head with long curved hairs (Fig. 10K) ... 29. *Pogonomyrmex*
- Mesal portion of anterior margin of clypeus produced, convex, or bilobed (Fig. 10M–Q); ventral side of head without such long curved hairs 33
33. Dorsal profile of thorax forming an even (Fig. 10H) or only slightly indented arc (Fig. 10D) 34
- Dorsal profile of thorax markedly steplike or sinuate (Fig. 10C) 35
34. Head with straight and strong striae over its entire front and dorsal surface (Fig. 10N); dark brown ants 35. *Tetramorium*
- Head covered with weak striae, many connected with cross-striae to give a reticulate appearance (Fig. 10O); light brown ants, usually with a pair of dark brown suffusions on the abdomen 36. *Leptothorax*
35. Second antennal segment not much longer than third segment; scape extending far above dorsal margin of head (Fig. 10P) .. 30. *Aphaenogaster*
- Second antennal segment as long as next two or three combined; scape not as long (Fig. 10M and Q) 36
36. Eyes as large as in Fig. 10M and last three antennal segments enlarged into a club; two types of workers, one with a greatly enlarged head 33. *Pheidole*
- Eyes smaller and antennal club not pronounced (Fig. 10Q); only one type of worker, with ordinary-sized head 32. *Stenamma*

KEY TO SUBFAMILIES AND GENERA (QUEENS)

1. Petiole two segmented (Fig. 3) 2
- Petiole one segmented (Fig. 12B) 4

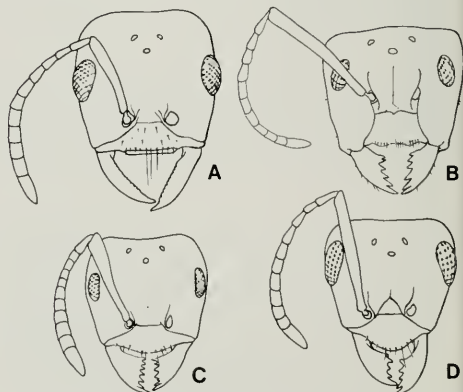


Fig. 14.—Front views of heads of queen ants of the subfamily Formicinae. A, *Polyergus*; B, *Camponotus*; C, *Lasius*; D, *Formica*.

2. Compound eye represented by only one facet or absent (subfamily **Ecitoninae**)6
Compound eye represented by more than a single facet (Fig. 12A)3
3. Head oblong in face view, with large, smooth eyes (Fig. 11); antennae always close together at base, scape little more than half length of head (Fig. 11); medium-sized to large ants of wasp-like appearance (subfamily **Pseudomyrmecinae**)20
Head shorter, eyes no larger than in Fig. 13; bases of antennae frequently well separated; scape usually longer, frequently longer than head (Fig. 3) (subfamily **Myrmecinae**)21
4. Genital opening small and circular, surrounded by stiff hairs forming a terminal nozzle (Fig. 6C and D) (subfamily **Formicinae**)13
Genital opening slitlike or inconspicuous (Fig. 7C)5
5. Gaster with a distinct constriction between first and second segments; abdomen with a well-developed sting that is frequently retracted and not visible externally (Fig. 7C) (subfamily **Ponerinae**)7
Gaster without a constriction between first and second segments (Fig. 8A–D); abdomen without a sting (subfamily **Dolichoderinae**)10

Subfamily ECITONINAE

6. Tarsal claw toothed (Fig. 17A) 1. **Labidus**
Tarsal claw without a tooth (Fig. 17B) 2. **Neivamyrmex**

Subfamily PONERINAE

7. Scale of petiole upright, rectangular (Fig. 12B) .. 8
Scale of petiole ovoid, rounded (Fig. 12C)9

8. Second segment of abdomen unusually large (Fig. 7E) 5. **Proceratium**
Second segment of abdomen of normal size (Fig. 7H) 4. **Ponera**
9. Mandibles with enlarged teeth (Fig. 12A); second segment of abdomen of normal size (Fig. 7H) 3. **Amblyopone**
Mandibles without enlarged teeth; second segment of abdomen unusually large (Fig. 7C) 6. **Sysphincta**

Subfamily DOLICHODERINAE

10. Epinotum with a flat, dorsal projection extending posteriorly and forming an overhang in lateral view (Fig. 13A) 7. **Dolichoderus**
Epinotum without a dorsal projection (Fig. 13B) 11
11. Maxillary palp with segment 3 as long as segments 4, 5, and 6 combined (Fig. 13C) 8. **Dorymyrmex**
Maxillary palp with segment 3 much shorter than segments 4–6 combined12
12. Node of petiole vestigial (Fig. 8A) .. 10. **Tapinoma**
Node of petiole as prominent as in Fig. 8C 9. **Iridomyrmex**

Subfamily FORMICINAE

13. Antenna with 9 segments 11. **Brachymyrmex**
Antenna with 12 segments14
14. Mandibles sickle shaped, their inner margins with minute indentations but no teeth (Fig. 14A) 16. **Polyergus**
Mandibles stouter and toothed (Fig. 14B)15
15. Maxillary palp with three or four segments 12. **Acanthomyops**
Maxillary palp with five or six segments16

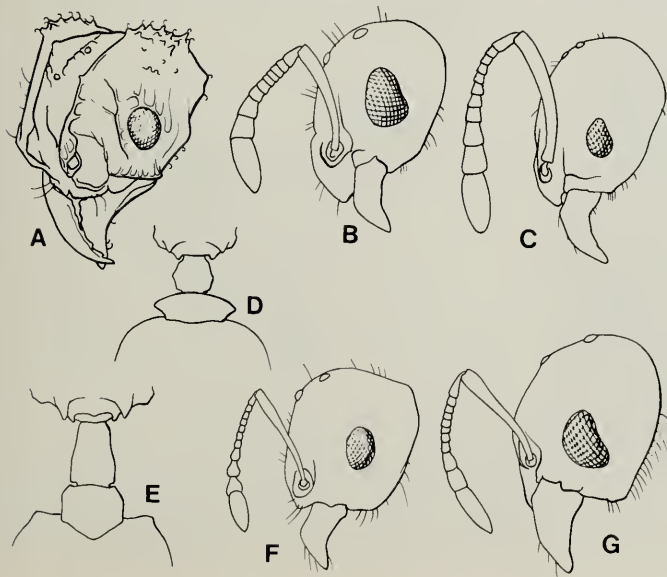


Fig. 15.—Diagnostic parts of queen ants of the subfamily Myrmecinae. A, *Trachymyrmex*, tangential view of head; B, *Leptothorax*, side view of head; C, *Stepanamma*, side view of head; D, *Pheidole*, dorsal view of petiole; E, *Leptothorax*, dorsal view of petiole; F, *Tetramorium*, side view of head; G, *Pheidole*, side view of head.

16. Antennal sockets some distance from posterior margin of clypeus (Fig. 14B); clypeus somewhat rectangular, with part of its lateral margins nearly parallel 15. *Camponotus*
 Antennal sockets close to or touching posterior margin of clypeus (Fig. 14C and D); clypeus almost diamond shaped, its lateral margins very oblique 17

17. Node of petiole low and sloping anteriorly, the whole petiole forming a low triangle (Fig. 9E and G) 18
 Node of petiole upright, the entire petiole forming a high triangle (Fig. 9C and F) 19
 18. Scapes of antennae extending beyond the upper margin of the head by about one-third their length or more 18. *Paratrechina*

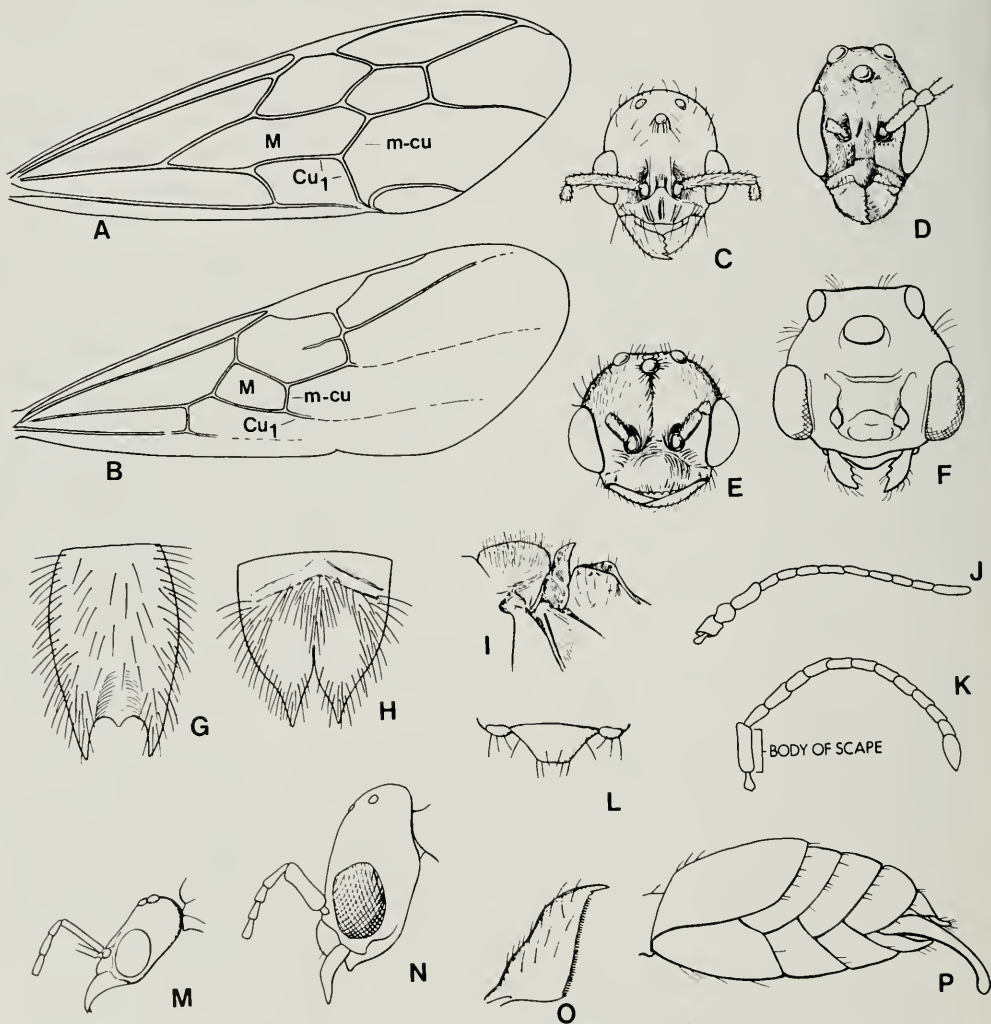


Fig. 16.—Diagnostic parts of male ants. A, *Labidus*, front wing; B, *Myrmica*, front wing; C, *Stenamma*, front view of head; D, *Pseudomyrmex*, front view of head; E, *Amblyopone*, front view of head; F, *Pheidole*, front view of head; G, *Neivamyrmex*, ventral view of subgenital plate; H, *Labidus*, ventral view of subgenital plate; I, *Proceratium*, lateral view of petiole and base of gaster; J, *Solenopsis*, antenna; K, *Dolichoderus*, antenna; L, *Myrmecina*, front view of mandibles and labrum; M, *Aphaenogaster*, side view of head of small specimen; N, *Aphaenogaster*, side view of head of robust specimen; O, *Tapinoma*, front view of mandible; P, *Wasmannia*, side view of abdomen. (All except F, J, K, and N after M. R. Smith, courtesy of the American Midland Naturalist)

Scapes of antennae extending beyond the upper margin of the head less than one-third their length; scale of petiole with a broad median impression 17. *Prenolepis*

19. Clypeus longer, as in Fig. 14D, with a slight mesal crest or angulation for most of its length 14. *Formica*



Fig. 17.—Tarsal claws of army ants. A, *Labidus*; B, *Neivamyrmex*. (After M. R. Smith, courtesy of American Midland Naturalist)

Clypeus shorter, as in Fig. 14C, without a mesal crest but with an indistinct transverse swelling 13. *Lasius*

Subfamily PSEUDOMYRMECINAE

20. Includes only one genus in North America 19. *Pseudomyrmex*

Subfamily MYRMECINAE

21. Head with dorsolateral projections (Fig. 23) ... 22
Head without dorsolateral projections (Fig. 15B) 23
22. Head with long scrobe and several small tubercles (Fig. 15A and 23B) 21. *Trachymyrmex*
Head with short scrobe and no tubercles (Fig. 23A) 20. *Atta*

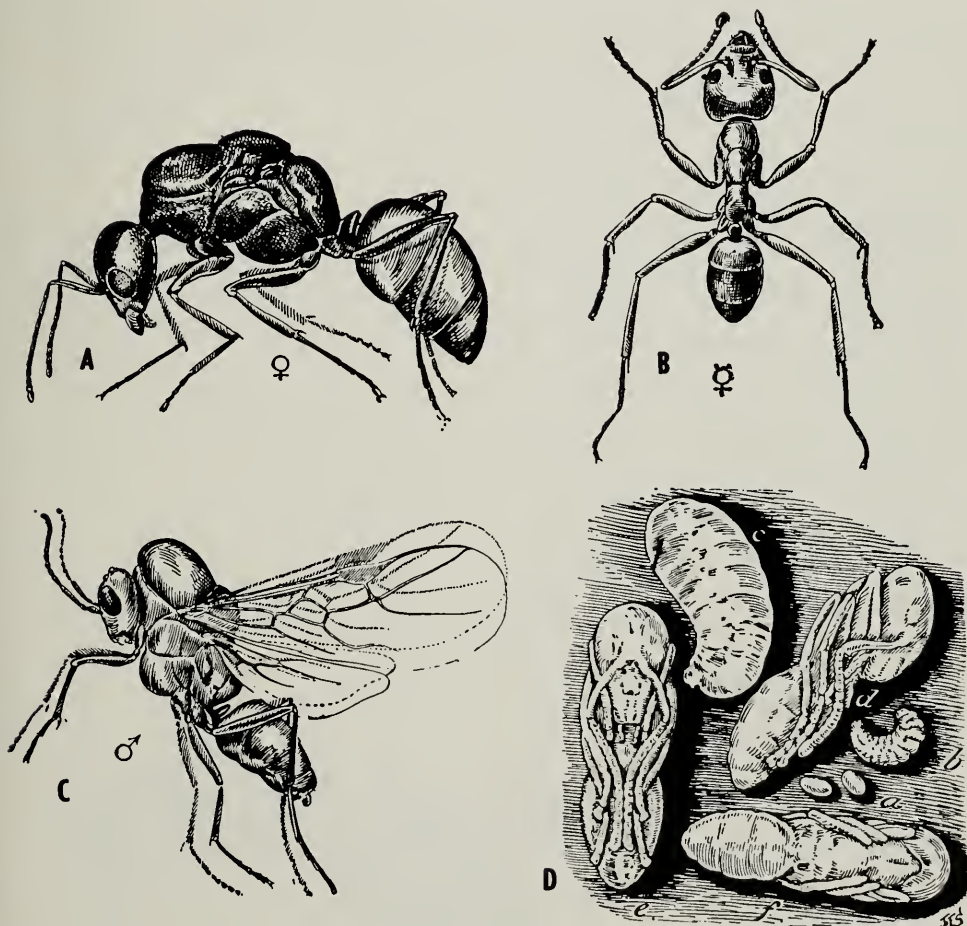
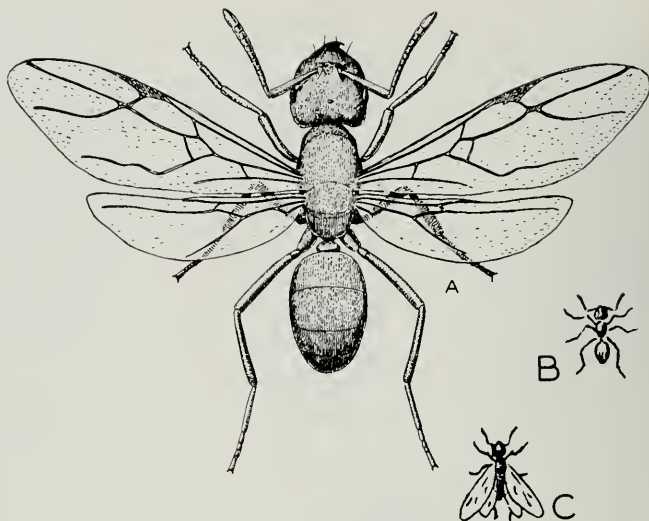


Fig. 18.—The Argentine ant, *Iridomyrmex humilis*. A, wingless female; B, worker; C, male; D, immature stages: a, eggs; b, young larva; c, full-grown larva; d, pupa, side view; e, pupa, ventral view; f, pupa, dorsal view. All about 12 times natural size.

Fig. 19.—A common foundation ant, *Acanthomyops interjectus*. A, winged queen; B, worker; C, winged queen. B and C, natural size. (From Illinois Natural History Survey Circular 39)



23. Head somewhat heart shaped, as in Fig. 24 24
 Head not heart shaped 25
 24. Mandibles longer, as in Fig. 24A and B 22. *Strumigenys*
 Mandibles shorter, as in Fig. 24C and D 23. *Smithistruma*
 25. Antennal scrobe extending to or beyond the posterior margin of the eye (Fig. 10E and F) 26
 Antennal scrobe not reaching the posterior margin of the eye 27
 26. Yellow-orange ants with many deep longitudinal rugae on the head 24. *Wasmannia*
 Brown ants with head dull but not markedly rugose 25. *Harpagoxenus*
 27. Epinotum without spines 28
 Epinotum with spines (Fig. 3) 29
 28. Antenna with a distinct two-segmented club (Fig. 10B) 27. *Solenopsis*
 Antenna without a two-segmented club (Fig. 10A) 28. *Monomorium*
 29. First segment of petiole either shorter than second or without a dorsal projection (Fig. 10I) 30
 First segment of petiole longer than second and with a marked dorsal hump on its posterior half (Fig. 10C, D, G, and H) 31
 30. Head with strong longitudinal rugae, much as in Fig. 10, texture somewhat dull 31. *Myrmecina*
 Head with only faint sculpturing, surface shiny 26. *Crematogaster*
 31. Mesal portion of anterior margin of clypeus concave (Fig. 10L); ventral side of head with long curved hairs (Fig. 10K) 29. *Pogonomyrmex*
 Mesal portion of anterior margin of clypeus either produced, convex, or bilobed (Fig. 10M-Q); ventral side of head without such long curved

- hairs 32
 32. Posterior border of clypeus with a distinct semicircular, deep, sharp depression (Fig. 10J); epinotum with large flange at base of petiole (Fig. 10G) 34. *Myrmica*
 Posterior border of clypeus with either a short, shallow depression (Fig. 10M), or its margin merging smoothly into rest of head (Fig. 10N); epinotum with smaller or inconspicuous flange at base of petiole (Fig. 10C) 33
 33. Pedicel extending far above dorsal margin of head (Fig. 10P) 30. *Aphaenogaster*
 Pedicel not extending above dorsal margin of head (Fig. 10O) 34
 34. Dorsal aspect of second segment of petiole about as wide as long, its sides nearly straight (Fig. 15E) 35
 Dorsal aspect of second segment of petiole about twice as wide as long, its sides angulate (Fig. 15D) 36
 35. Eyes as large as in Fig. 15B 36. *Leptothorax*
 Eyes smaller, as in Fig. 15C 32. *Stenamma*
 36. In lateral view, long axis of eye nearly parallel to long axis of head (Fig. 15F) 35. *Tetramorium*
 In lateral view, long axis of eye markedly tangential to long axis of head (Fig. 15G) 33. *Pheidole*

KEY TO SUBFAMILIES AND GENERA (MALES)

1. Petiole of two segments 2
 Petiole of only one segment 3
 2. Eyes elongate and bean shaped; clypeus not extending close to bases of antennae (Fig. 16D) (subfamily *Pseudomyrmecinae*) 22
 Eyes relatively small, ovoid, or hemiovoid (Fig. 21C

- and *H*) ; clypeus extending dorsally almost to or above level of antennal bases (subfamily **Myrmecinae**)23
3. Subgenital plate elongate, with two or three apical teeth (Fig. 16C, *E*, and *F*) ; front wing with cell M long, vein Cu₁ with a sharp bend at crossvein *m-cu*, and Cu_{1a} distinct and sclerotized (Fig. 16A) (subfamily **Ecitoninae**)5
- Subgenital plate without apical teeth; front wing, if present, with cell M much shorter or open, vein Cu₁ with only a slight curve or none at crossvein *m-cu*, which is sometimes atrophied, and Cu_{1a} usually forming only an indistinct apex to Cu₁ (Fig. 16B)4
4. A pronounced constriction between first and second gastric segments (Fig. 7C, *E*, and *H*) (subfamily **Ponerinae**)6
- No constriction between first and second gastric segments (Fig. 8A and B; Fig. 9B) (subfamilies **Dolichoderinae** and **Formicinae**)10

Subfamily ECITONINAE

5. Tarsal claws with a tooth (Fig. 17A) .. 1. **Labidus**
Tarsal claws simple (Fig. 17B) .. 2. **Neivamyrmex**

Subfamily PONERINAE

6. Wingless 4. **Ponera**
Winged7
7. Metanotum with a dorsal spine (Fig. 16I)8
Metanotum without a spine9
8. Petiole rectangular or angulate at apex in lateral view 5. **Proceratium**
Petiole rounded at apex in lateral view6
9. Clypeus with minute teeth (Fig. 16E) 3. **Amblyopone**
Clypeus without teeth (Fig. 16F) 4. **Ponera**

Subfamilies DOLICHODERINAE and FORMICINAE

10. Antenna 10-segmented; pale cream colored ants 11. **Brachymyrmex**
Antenna with 13 segments11
11. Second segment of funicle longer than body of scape (Fig. 16P) 9. **Iridomyrmex**
Second segment of funicle about the same length as or shorter than body of scape12
12. Third segment of maxillary palp as long as segments

- 4, 5, and 6 combined 8. **Dorymyrmex**
Third segment of maxillary palp much shorter than segments 4, 5, and 6 combined13
13. Maxillary palp three or four segmented 12. **Acanthomyops**
Maxillary palp five or six segmented14
14. Body of scape shorter than the combined lengths of the first three funicular segments (Fig. 16K) 7. **Dolichoderus**
Body of scape as long as or longer than the combined lengths of the first three funicular segments15
15. Mandible sickle shaped, without distinct teeth (Fig. 14A) 16. **Polyergus**
Mandible somewhat triangular, sometimes with teeth16
16. Anterior face of the gaster flat or convex17
Anterior face of the gaster dishd out and concave, forming a shallow cavity into which the petiole fits in repose19
17. Body of scape shorter than combined lengths of first four funicular segments; body length 2–3 mm 9. **Iridomyrmex**
Body of scape much longer than combined lengths of first four funicular segments; body length 5–10 mm18
18. Antennae inserted at a distance from the posterior margin of the clypeus 15. **Camponotus**
Antennae inserted close to the posterior margin of the clypeus 14. **Formica**
19. Body of scape shorter than the first four funicular segments combined 17. **Prenolepis**
Body of scape longer than the first four funicular segments combined20
20. Petiole upright and high 13. **Lasius**
Petiole inclined forward and lower21
21. Mandible with many microscopic teeth (Fig. 16O) 10. **Tapinoma**
Mandible with larger and fewer teeth (Fig. 16C) 18. **Paratrechina**

Subfamily PSEUDOMYRMECINAE

22. Only one genus 19. **Pseudomyrmex**

Subfamily MYRMECINAE

23. Antenna 10 segmented35. **Tetramorium**
Antenna with more than 10 segments24
24. Head and body with many erect long hairs (Fig.

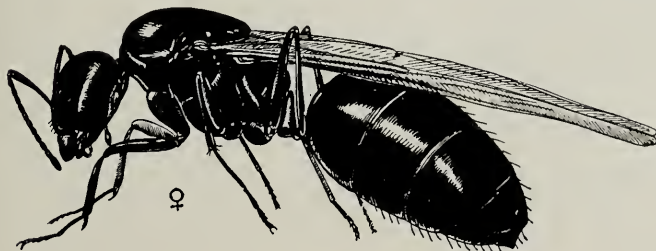


Fig. 20.—Winged female of the large black carpenter ant, *Camponotus pennsylvanicus*. (From USDA)

- 10*K*) ; clypeus shallow, its apical margin concave (Fig. 10*L*) 29. *Pogonomymrmex*
 Head and body with a few erect hairs, but these are never long or numerous; clypeus deeper and somewhat convex (Fig. 10*M*) 25
25. Antenna 11 or 12 segmented 26
 Antenna 13 segmented 29
26. Petiole attached high on anterior face of gaster; segments of funicle appearing somewhat beadlike 26. *Crematogaster*
 Petiole attached low on anterior face of gaster; segments of funicle not at all beadlike 27
27. First funicular segment enlarged, often globose, scape very short (Fig. 16*J*) 27. *Solenopsis*
 First funicular segment not markedly enlarged, scape longer, as in Fig. 16*K* 28
28. Antennal scrobes well developed (Fig. 10*E*) 25. *Harpagoxenus*
 Antennal scrobes weakly developed or absent 36. *Leptothorax*
29. Mandibles vestigial, reduced to short fleshy stubs (Fig. 16*L*) 31. *Myrmecina*
 Mandibles developed and sclerotized, although sometimes small 30
30. Abdomen in lateral view with a pair of elongate processes (the parameres of the genitalia) protruding from the posterior tip (Fig. 16*P*) 24. *Wasmannia*
 Abdomen with only short protruding processes, which are blunt at the tip, or no visible protruding structures 31
31. Scape very long, at least as long as the first eight funicular segments combined 32
 Scape shorter, not as long as the first eight funicular segments 33
32. Front wing with cell R_1 short and wide (Fig. 22*B*) 21. *Trachymymrmex*
 Front wing with cell R_1 long and narrow (Fig. 22*A*) 20. *Atta*
33. Stigma of forewing weakly developed or missing (males too poorly known to permit further identification without other castes) 22. *Strumigenys*
 23. *Smithistruma*
 Stigma of forewing well developed, as in Fig. 16*B*, but sometimes pale 34
34. Head flattened and either shallowly elliptic (Fig. 16*M*) or almost rectangular in lateral view (Fig.

- 16*N*) 30. *Aphaenogaster*
 Head much more rounded 35
35. Base of clypeus ending in a marked semicircular depression (Fig. 10*J*) 34. *Myrmica*
 Base of clypeus ending in a shallow triangular impression, or no depression evident 36
36. Body of scape very short, at most as long as the first and second funicular segments combined 37
 Body of scape longer than the first and second funicular segments combined 38
37. Funicle threadlike, the same thickness for its entire length; ocelli on a high protuberance (Fig. 16*F*) 33. *Pheidole*
 Funicle with last four segments much thicker than first few segments; ocelli not on a protuberance 28. *Monomorium*
38. Ocelli small, separated from each other by twice the diameter of one of them (Fig. 16*C*) ; epinotum concave in lateral view 32. *Stenamma*
 Ocelli large, separated from each other by only the diameter of one of them, somewhat as in Fig. 16*E*; epinotum convex in lateral view 36. *Leptothorax*

SYNOPSIS OF GENERA

Subfamily ECITONINAE

These ants are the native American army ants, differing in many characters from the army ants of the Old World. The New World species occur chiefly in the tropics, where the workers may form long foraging columns. Their food is mostly other insects and small ground-dwelling animals, but they may kill fairly large animals. The nest is a temporary bivouac built around the queen and brood. Only two genera occur in or near Illinois.

1. *Labidus* Jurine

No species have been recorded from Illinois, but *L. coecum* (Latreille) is known from Louisiana, Oklahoma, and Texas and may eventually be found in Illinois. The workers range from 3 to 10 mm long, the larger ones with slightly enlarged heads.

2. *Neivamyrmex* Borgmeier

The southern and southwestern species, *N. nigrescens* (Cresson), has been found sporadically in extreme south-



Fig. 21.—Worker of the crazy ant, *Prenolepis longicornis*. (After Wheeler)

ern Illinois, where it may be an occasional pest in swimming pools and basements. In this species the workers are 3–6 mm long and dark blackish red, the larger ones with slightly swollen heads. Several other species occur to the south and west of Illinois.

Subfamily PONERINAE

The ants comprising this subfamily are seldom found without a deliberate search of rotten logs or beneath leaves and stones on the forest floor. They both forage for small prey and nest in these situations. The nests are small, rarely containing more than 50 workers, and each nest may contain several queens. The workers and queens are reddish or reddish brown, range from 2 to 6 mm in length, and have a sting.

Of the 12 or more genera known from North America, the 4 more northern ones have been taken in Illinois. None of the Illinois species is economic. Only rarely are any of them found in the garden or home.

3. *Amblyopone* Erichson

The sole Illinois species, *A. pallipes* Haldeman, (formerly placed in the genus *Stigmatomma* Roger) is the only one known from North America. It is readily recognized in the worker and queen castes by the elongate mandibles (Fig. 7F). Although widely distributed in Illinois, it is a rare species.

4. *Ponera* Latreille

This is the commonest ponerine ant genus in Illinois, where two of the seven North American species occur. The genus is unusual because some colonies produce wingless, workerlike males.

5. *Proceratium* Roger

Of the three North American species, only *P. croceum* Roger has been found in Illinois. It is a rare species whose nests are usually found in wood attacked by red rot.

6. *Symphincta* Roger

Of the two North American species, only the widespread *S. pergandei* Emery has been found in Illinois. It is moderately rare.

Subfamily DOLICHODERINAE

These ants have no sting and the workers are all alike, with no larger soldier caste. Four of the six North American genera occur in Illinois; all of them are small, brownish or blackish ants, the workers ranging from 2.0 to 4.5 mm. Colonies usually contain several hundred individuals. All Illinois species forage in files.

7. *Dolichoderus* Lund

Two of the four U.S. species occur in Illinois. Their nest, made in the soil, is not craterlike and has a concealed opening. They are not economic and are seldom seen outside woodlands or forest edges. *Dolichoderus* is often found tending aphids.

8. *Dorymyrmex* Mayr

The sole North American species, *D. pyramicus*, has so far been collected in Illinois only in undisturbed

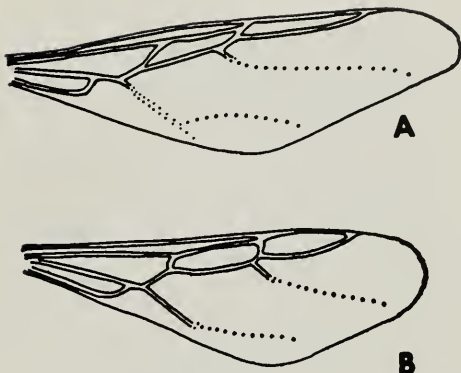


Fig. 22.—Wings of leaf-cutting ants. A, *Atta sexdens* Linnaeus; B, *Trachymyrmex cornetzi* Forel. (After Weber, courtesy of Science)

sandy areas. The nest is usually in the open and craterlike, but occasionally is constructed under stones.

9. *Iridomyrmex* Mayr

Two species occur in Illinois, the introduced species, *I. humilis* (Mayr), (the Argentine ant) (Fig. 18) and the native *I. pruinosus* (Roger). In both, the workers are small, ranging from 2 to 3 mm long. Both species nest in soil or under stones or boards. The workers forage in narrow columns, often tend aphids, and eat a wide variety of vegetable and animal foods.

The Argentine ant is a domestic pest, entering houses and eating all types of sweets, meats, and vegetables. When crushed, the ants have a stale, greasy or musty odor.

KEY TO SPECIES OF IRIDOMYRMEX WORKERS

- Scape extending beyond top of head by only half the length of first funicular segment. Seldom in houses **pruinosus**
- Scape extending beyond top of head by the full length of first funicular segment. Frequently in houses **humilis**

10. *Tapinoma* Foerster

Only the native species, *T. sessile* (Say), occurs in Illinois. It is a small ant, the worker ranging from 2.0 to 3.5 mm, and it is dark blackish brown. It nests in a great variety of sheltered places inside the house and outdoors, often with several thousand workers in a single nest. The species is practically omnivorous. Common in dwellings, it will eat almost any human food and contaminates foods with "Tapinoma odor," a smell somewhat like butyric acid that has earned this species the name of odorous house ant.

Subfamily FORMICINAE

Ants of this subfamily range from nearly the smallest to the largest of Illinois ants. The queens and workers have no sting but are characterized by the curious circle of hairs around the anal opening.

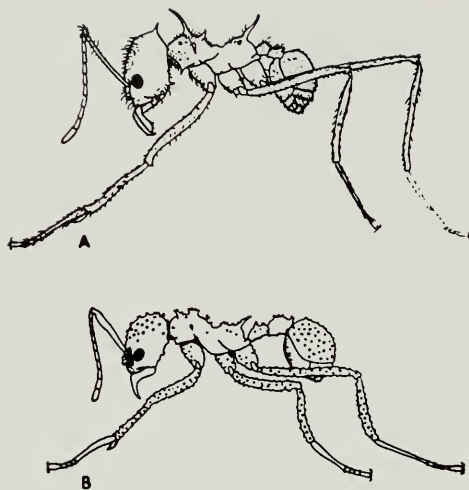


Fig. 23.—Workers of leaf-cutting ants. A, *Atta cephalotes* Linnaeus; B, *Trachymyrmex arizonensis* Wheeler. (After Weber, courtesy of Science)

11. *Brachymyrmex* Mayr

The sole U.S. and Illinois species, *B. depilis* Emery, has minute workers 1.5–2.0 mm long that forage in the leaf litter of woods and meadows. These ants nest under stones or in the soil and are seldom seen without deliberate search.

12. *Acanthomyops* Mayr

Of the nine U.S. species, only three are recorded from Illinois. The workers are 3.0–4.5 mm long and a medium shade of reddish brown. Normally these ants forage in leaf litter or underground, where they tend aphids and mealybugs, and are seldom seen except by a person digging in the garden. During the winter, however, entire colonies (including both workers and winged forms) frequently move to house foundations. If there is a break in the foundation, a colony of both workers and winged forms (Fig. 19) may move into the basement and take up residence under a loose brick or board. They do not raid through the house, but many persons find their company disconcerting. If the colony is disturbed, the ants emit a strong, citronellalike odor. When soil temperatures rise in spring, the ants will depart along the path by which they entered. This winter habit has earned them the name of foundation ants. Formerly these ants were classified in the genus *Lasius*.

13. *Lasius* Fabricius

The seven Illinois species, all native, are among its commonest field and garden ants. In most of them the workers are dark brown, ranging in size from 2 to 4 mm. They actively search for food above ground and may enter houses and eat a variety of sweets and meats. They

make large nests in soil or under covering objects, each nest containing up to 10,000 workers.

Two cornfield ants, *L. alienus* Foerster and *L. neoni-g* Emery, are often found tending aphids on corn and other plants. *L. neoni-g* is known to spread the virus causing barley yellow dwarf by its aphid-tending activities.

14. *Formica* Linnaeus

The dozen Illinois species of this genus, all natives, are the most commonly observed of our entire ant fauna. The workers are brownish black, sometimes with the head red, and range in length from 2.5 to 6.0 mm. They forage actively, often in the open, and are called sidewalk ants.

These ants nest in soil. Some species construct a nest entirely below the soil surface with an obscure entrance. Others build large mounds over the nest, and each may contain 100,000 workers. They are scavengers, predators on other insects, and nectar feeders. In Illinois they enter houses only sporadically and singly, and hence are of no economic importance. If one disturbs them in the wild, however, they bite readily and inflict a painful wound.

Some species are “cuckoo” ants; that is, a young queen uses a colony of another species to start her own colony, first killing off the queen of the host species. This results in temporary colonies of mixed workers.

15. *Camponotus* Mayr

The ants of this genus are the carpenter ants (Fig. 20). Eight native species occur in Illinois, including our largest ants. Depending on the species, the workers may be all black, reddish brown, or tan and range in length from 3 to 13 mm in the same nest. The larger workers have heads disproportionately larger than those of smaller individuals; these large, big-headed workers are called *majors*, the small ones *minors*. They tend aphids, forage in columns, and are general scavengers.

Most species of *Camponotus* nest in dead wood. In the wild they use logs, stumps, and the wood of standing dead trees. They also nest in timbers of houses, railings, and poles, excavating tunnels by chewing out the softer wood between the harder annual rings of beams, siding, and other structures, weakening the wood and frequently causing extensive damage. The species most frequently encountered in buildings is *C. pennsylvanicus* DeGeer, a large black species with long grayish or yellowish hair on its upper surface.

16. *Polyergus* Latreille

These ants are the slave-making ants. Two native species occur in Illinois; the workers of both are reddish brown and 6–8 mm long. The nest is 100–120 cm deep in the soil and has an obscure opening. The workers are out of the nest only when scouting or raiding; they do no foraging.

On a raid the *Polyergus* workers attack a *Formica* nest and carry pupae of *Formica* workers back to the *Polyergus* nest. When these pupae develop and emerge

as adult workers, they adopt their new "household" and do the foraging for the entire nest. A *Polyergus* nest, therefore, contains the *Formica* "slave" workers that come and go freely and the *Polyergus* workers that spend most of their time inside the nest.

17. *Prenolepis* Mayr

The single native North American species, *P. imparis* (Say), occurs commonly throughout Illinois. The workers are dark brown and 2–4 mm in length. These aphid tenders and general scavengers forage in thin columns and build their inconspicuous nests in the ground. They are frequent pests in houses and greenhouses, eating a variety of domestic foods and sometimes gnawing the tips of flower buds and the shoots of plants for their juices. They take honey from weakened bee-hives.

18. *Paratrechina* Mutschowsky

The genus is represented in Illinois by three species, including two native species resembling *Prenolepis imparis* in general appearance and an introduced species, *Paratrechina longicornis*. This latter is also small and dark but has very long, slender legs and a peculiar rolling gait when running, earning the species the common name of crazy ant (Fig. 21).

All of these species nest in the ground and may be general nuisances in the house, eating a variety of foods.

Subfamily PSEUDOMYRMECINAE

19. *Pseudomyrmex* Lund

The five or six native American species occur south of Illinois chiefly in the Gulf states and into the tropics. The workers are 4–10 mm in length, mostly yellow or brown, and wasplike in appearance. Some nest in hollow thorns of acacia trees; if the tree is disturbed, the workers dash out and inflict painful bites and stings.

Subfamily MYRMECINAE

This is a large and diverse subfamily that is especially abundant in the tropics. The Illinois fauna is quite small compared with that of the entire world.

20. *Atta* Fabricius

This and the following genus belong to a New World tribe called the leaf-cutting ants. The reddish-brown workers cut off pieces of leaves, carry them into the nest, work them into a pulpy mass, and seed them with fungus spores. The ants feed only on the fungus produced by these underground gardens. A mature colony contains thousands of individuals, including a large-headed soldier caste and several sizes of workers. The ants forage in columns; a column of returning workers is a curious sight, each ant carrying a piece of leaf nearly as large as itself. This leaf-carrying habit has earned these ants the name of parasol ants.

The leaf-cutting ants are almost entirely tropical, with two genera extending northward into the south-central states. The genus *Atta* occurs north to central Louisiana.

21. *Trachymyrmex* Forel

This small genus is represented in Illinois only by *T. septentrionalis* (McCook), the northern leaf-cutting ant. It occurs only in sandy soil and makes relatively small nests, each having only a few hundred workers.

22. *Strumigenys* F. Smith

This and the following genus belong to a worldwide, distinctive tribe of minute ants whose workers and queens have long, pointed heads. The workers are dark reddish brown and range in size from 1.5 to 2.5 mm. They occur only in wooded areas, making small nests in rotten wood and foraging in leaf mold. They feed on spring-tails and other minute organisms. The sole North American species of this genus, *S. louisianae* Roger, occurs in Illinois (Fig. 24A and B).

23. *Smithistruma* Brown

Several species of this genus occur in Illinois woodlands. In general habits and appearance they resemble *Strumigenys*, but have shorter mandibles (Fig. 24C and D; Fig. 25).

24. *Wasmannia* Forel

This genus is represented in North America and Illinois only by *W. auropunctata* (Roger), an introduced tropical species that occurs this far north only in houses or greenhouses. The dark workers are minute, only 1.5–1.8 mm, but sting severely, earning them the name little fire ants. They nest in soil and under cover, often with several queens and several thousand workers in a nest. They feed on honeydew, minute insects, and a wide variety of domestic foods.

25. *Harpagoxenus* Forel

Of the two North American species only *H. americanus* (Emery) is known from Illinois. The reddish-

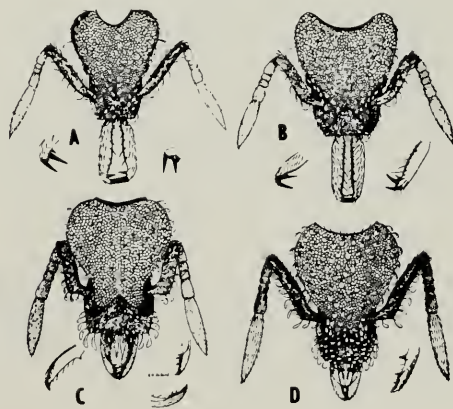


Fig. 24.—Front views of heads of workers. A, B, *Strumigenys louisianae* Roger, showing variation; C, *Smithistruma angulata* Smith; D, *Smithistruma pergandei* Emery. Inset are details of the mandibles. (After M. R. Smith)

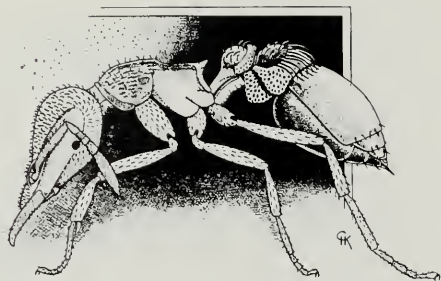


Fig. 25.—Worker of *Strumigenys ohioensis* Kennedy and Schramm, showing the soft, white, funguslike growths that occur on the petiole in many species of this genus. Actual size, 2 mm. (After Kennedy and Schramm)

brown workers are fairly large, ranging in length from 3.0 to 3.5 mm, and forage in leaf mold, under bark, and on low vegetation. This species does not make a nest of its own. Instead, it takes over nests of the genus *Leptothorax*. The *Leptothorax* queen is killed, and the *Leptothorax* workers then assist in raising the brood of the *Harpagoxenus* queen. This genus does not normally inhabit gardens or houses.

26. *Crematogaster* Lund

Several native species of this genus are extremely common in Illinois. The workers (Fig. 26) usually have red heads and black abdomens, and range in size from 2.5 to 4.0 mm. They are easily recognized by the broad head and wide, heart-shaped gaster. These ants nest under stones or other objects on the ground, in dead stumps or logs, and sometimes in posts and rafters, but never in the ground. The colonies may contain several thousand workers. They are general foragers and abundant both in the garden and house, feeding on a variety of domestic foods. In the garden they are often found tending aphids. When disturbed, they bite and sting painfully.

27. *Solenopsis* Westwood

The only Illinois species of this genus is the native *S. molesta* (Say). The workers are dark brown and minute, ranging from 1.3 to 1.8 mm. The nests are usually deep in the ground and each may have several

thousand workers. These are among the commonest of garden and household ants, feeding on a variety of domestic foods and often eating garden seeds.

To this genus also belong the fire ants, several species of which occur south of Illinois. These ants are chiefly agricultural, and when disturbed, bite and sting painfully.

28. *Monomorium* Mayr

The two Illinois species of this genus, the native *M. minimum* (Buckley) and the introduced Pharaoh's ant, *M. pharaonis* (Linnaeus) (Fig. 27), are among our tiniest ants, the workers ranging from 1.2 to 2.0 mm. Both species nest in the soil or in buildings and are frequently abundant in houses, where they eat a variety of domestic food. Pharaoh's ant is especially fond of fats. The introduced species, *M. destructor* (Jerdon), occurs to the south of Illinois and may eventually be found in the state. It also is a domestic pest that causes trouble by removing insulation from electric cables and cutting holes in fabrics and rubber goods; it also inflicts a painful sting.

KEY TO SPECIES OF MONOMORIUM WORKERS

1. Segments of the antennal club successively increasing in length **destructor**
 First two segments of the antennal club about the same size, the terminal segment larger 2
2. Clear reddish yellow **pharaonis**
 Shining black **minimum**

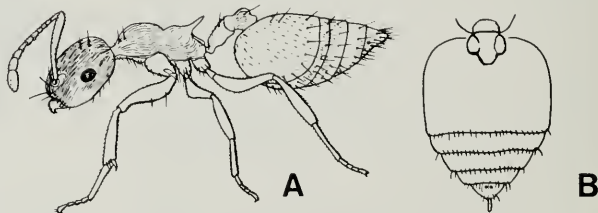
29. *Pogonomyrmex* Mayr

The ants of this genus are the native agricultural ants famous throughout the Great Plains. None has so far been taken in Illinois, but they are known not far to the west. The workers are chiefly reddish brown and large, ranging from 4.5 to 12.0 mm in length. They nest in the ground, constructing a mound of gravel sometimes 45 cm in diameter and clearing all vegetation around it to a distance of about 1 meter. When disturbed, the workers have a potent sting. These ants feed chiefly on seeds supplemented by general scavenging.

30. *Aphaenogaster* Mayr

This large native genus is represented in Illinois by about six species. The workers are very slender and

Fig. 26.—Worker of *Crematogaster lineolata* (Say). A, side view; B, dorsal view of petiole and gaster.



long legged, are usually reddish brown, and vary in size from 3.2 to 7.0 mm. They forage in leaf litter above the ground and in low vegetation, feeding on a variety of foods. They nest in rotten wood, under stones, and in the soil, often making a slightly elevated area on the soil where they have deposited particles from the nest excavation. Each nest may have up to 3,500 workers and several queens.

These ants are frequently abundant in the garden; only rarely does one get into the house. If they locate a nest in a lawn, they may be a persistent nuisance for some time and will frequently inflict painful bites when disturbed. Otherwise, they are not pests.

31. *Myrmecina* Curtis

The two North American species, both native, occur in Illinois. The workers are reddish brown and range in size from 2.5 to 4.5 mm. They construct small nests in rotten wood or leaf litter, primarily in woodlands. They are only rarely found in homes.

32. *Stenamma* Westwood

The three Illinois species of this genus are all natives, similar in size and general appearance to those of the preceding genus. They make their nests chiefly in leaf mold and are restricted to woodland situations.

33. *Pheidole* Westwood

This is primarily a southern genus, having over 40 North American species of which only 2 have been found in Illinois. The workers are dark brown and range in size from 2.5 to 4.5 mm. The nest is made under stones or in soil, commonly with openings between cracks in sidewalks. Each nest may contain several hundred workers. The small workers have normal-sized heads, the larger workers greatly enlarged heads with massive mandibles, and these differences are correlated with their food habits. They naturally feed primarily on small plant seeds that are brought into the nest by the smaller workers and then cracked into fragments by the large-headed workers. Around homes these ants nest commonly in the garden and frequently enter the house, where they feed on a variety of domestic foods.

34. *Myrmica* Latreille

Of the 11 native American species, 4 occur in Illinois. The workers are reddish brown and range in length from 3.5 to 6.0 mm. They build nests in the soil, each nest usually containing only 50-100 workers and one queen. The workers forage in litter and low-level vegetation. Although they usually occur in woodlands, they may at times be common in lawns.

35. *Tetramorium* Mayr

Only a single native species of this genus occurs in Illinois, *T. caespitum* (Linnaeus), the pavement ant. The workers are almost black, 2.5-3.5 mm long. The nests are made in soil, often under stones, boards, or sidewalks. In the house the workers eat a variety of domestic foods;

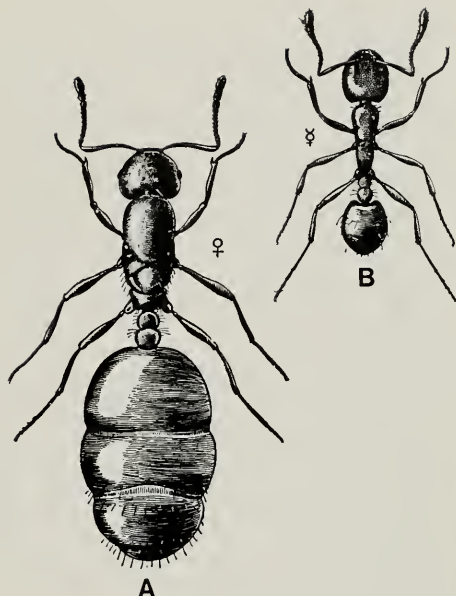


Fig. 27.—Pharaoh's ant, *Monomorium pharaonis*. A, queen after losing her wings; B, worker. Natural size of queen, 4 mm; of worker, 2 mm. (From USDA)

in the garden they may steal seeds and girdle the stems of garden crops.

36. *Leptothorax* Mayr

This abundant North American genus is represented in Illinois by three native species. The workers are usually pale yellow, generally with a dusky spot on each side of the gaster, and range in size from 1.5 to 3.5 mm. They nest in a variety of places, including under rotten wood, under bark, in acorns, and under stones, each nest containing at most a few hundred workers. They are general scavengers, foraging in ground litter and low vegetation. Although their nests may frequently be found in the garden, they very seldom enter the house.

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