

TAXONOMIC STUDIES ON SOME ANTS (FORMICIDAE-HYMENOPTERA)

-23-

OF SAUDI ARABIA

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ABSTRACT

This work deals with the taxonomy of ants belonging to three subfamilies: Ponerinae, Myrmicinae and Formicinae (Family: Formicidae, Order: Hymenoptera) collected from different areas in Saudi Arabia comprising 8 genera and 11 species and subspecies. Diagnosis, and keys accompanied with illustrations are given to these species and subspecies.

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INTRODUCTION

The faunistic approach of investigations in Saudi Arabia is new and the findings will make it possible to gain a better knowledge of the correlations between the various biotopes within Saudi Arabia.

The Arabian peninsula measures approximately 2.4 million Km<sup>2</sup>, extending from about 32° 15' E to Yemen and from the Red Sea to the Persian Gulf. The surface morphology is characterized by the plateau of 600 to 1,000 m. altitude east of the Hijaz and Asir mountain range, it gradually declines to the east ends along the shores of the Gulf. The distance between the Red Sea and

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the Gulf is on the order of 1,200 km and between the Northern and Southern border some 1,500 km or more (Wittmer and Büttiker, 1979).

Saudi Arabia is one of the hottest, and driest countries in the world. The heat along the coastal belts is oppressive in summer with some relief in the winter months particularly along the Gulf during spells of cold northerly winds.

Ants occupy a unique position among all insects on account of their dominance as a group, and this dominance is shown in their high degree of variability as exhibited in the great number of their species and subspecies, in their wide geographical distribution and in their manifold relationships with plants and other animals--man included (Wilson, 1971).

The aim of the present work is to identify some species and subspecies of ants collected from Saudi Arabia during the period from February to April 1985. Ants have been discussed before by many authors, Emery (1908, 1909, 1912 and 1925); Santschi (1915); Crawley (1925); Finzi (1930); Menozzi (1930-1931) and (1931); Shalaby (1961); Wheeler (1960); Wheeler and Wheeler (1972); and Hassanein (1979).

#### MATERIALS AND METHODS

Sampling was done by means of direct collecting

from underneath stones, on the soil surface, and from different types of vegetations.

Specimens were collected from several regions in Saudi Arabia representing the Northern, Southern, Eastern, Western, and Middle regions (Fig. 1). These localities show different habitats, desertic, mountaneous, agricultural and vallies.

The specimens were examined and identified accurately from four main collections; the Ministry of Agriculture, Entomological Society, Cairo University and Ain Shams University collections, in addition to the Commonwealth Institute, British Museum, Entomology Department. Localities of each species are cited and number of specimens examined is written between brackets.

### RESULTS

Ants show variation in several characters. The head varies enormously in shape, and the mandibles present an almost bewildering variety of form. The labrum is vestigial, the maxillary palps 1-6 segmented, the labial palps 1-4 segmented, the antennae 4-13 segments and usually the male has one more segment than the female or worker; compound eyes and three ocelli are well developed in the males, but in the females and specially the workers, the eyes are usually reduced or vestigial.

Specimens collected from Saudi Arabia is confined in three subfamilies: Ponerinae, Myrmicinae and Formicinae.

Key to subfamilies, genera, species and subspecies  
of ants from Saudi Arabia

- 1(8) Anal orifice terminal, circular (Fig. 2); sting vestigial; abdominal pedicel one segmented scale like (Fig. 3); no constriction between first and second gastral segments..... FORMICINAE
- 2(3) Insertion of antennae distant from the posterior margin of clypeus; wings long; ♂ gaster elongate...  
..... CAMPONOTUS Mayr
- Occiput divergent in the posterior border of head; first funicular segment longer than the second.....  
..... Camponotus compressus thoracicus Fabricius .
- 3(2) Insertion of antennae close to the posterior margin of clypeus; wings short or moderately long; ♂ gaster short thick or oval.
- 4(5) Maxillary palps short, the 4<sup>th</sup> segment about equal to the 5<sup>th</sup>; funiculus elongate, antennal cavities separated from clypeus; abdomen covered with raised white hairs; scale depressed and very small .....  
..... PARATRECHINA Mantschulsky.
- Head finely striated longitudinally; thorax well striated; abdomen distinctly punctuated .....  
..... Paratrechina longicornis (Latreille).
- 5(4) Maxillary palps very long, 4<sup>th</sup> segment about twice in length as the 5<sup>th</sup>; abdomen with a bronzy reflect; funiculus elongate, 2<sup>nd</sup> segment at least twice longer than large; female with thorax narrower than head; scale thick obtuse at apex.....  
..... CATAGLYPHIS Foerster

- 6(7) Glazy black with silvery hairs on the sides; abdomen globular; petiole flattened dorsally scale like; three spots present instead of ocelli; head as large as thorax..... Cataglyphis albicans livida (André).
- 7(6) Body reddish brown, gaster black; abdomen oval; petiole rounded; ocelli present in worker; head broader than thorax..... Cataglyphis bicolor nodus (Brullé).
- 8(1) Anal orifice ventral, slit shaped; sting well developed (Fig. 4) or vestigial; abdominal pedicel one or two segmented.
- 9(10) Abdominal pedicel consisting of a single segment; gaster with a distinct constriction between the first and second segment (Fig. 5). Frontal carinae separated or closed together, when closed dilated to form oblique or horizontal laminae partly covering insertions of antennae. Mandibles articulated near the middle of the ventral border of the head (Fig. 6). Sting well developed..... PONEERINAE.
- Eyes well developed; wings very broad; petiole with a squarish node..... Fachycondyla sennaarensis (Mayr)
- 10(9) Abdominal pedicel two segmented, nodiform or pedunculate with rounded node; postpetiole cup-shaped or bell-shaped (Fig. 7). Frontal carinae always well separated and covering antennal insertions; mandibles very long linear narrow and sharp pointed (Fig. 8)..... MYRMECINAE
- 11(14) Clypeus with a longitudinal suture with the margin reaching the anterior border; antennae 12-jointed, with 3-segmented club; epinotum unarmed; major and

- minor (1-2.5 mm) workers; color black or reddish....  
..... MONOMORIUM Mayr.
- 12(13) Occiput straight; first flagellar segment equal to  
the second and third segments.....  
..... Monomorium subopacum F. Smith.
- 13(12) Occiput not straight, first flagellar segment less  
than the second and third segments.....  
..... Monomorium salomonis (Linnaeus)
- 14(11) Not as above
- 15(16) Antennae 11-jointed; eyes normal; major and minor  
workers, less than 3.5 mm.....  
..... Tetramorium puniceum sahlbergi Forel
- 16(15) Antennae 12-segmented; eyes rounded or oval; workers  
more than 3.5 mm.
- 17(20) Antennal club 3-segmented; major worker characterized  
by big head strongly incised at the base; epinotum  
dentate; big hairs in workers; border of mandibles  
with 2 teeth at the base and 2 stronger teeth at  
the extremity, unarmed in the middle, promesonotum  
rounded in the workers and soldiers.....  
..... PHEIDOLE Westwood.
- 18(19) Head and occiput deeply incised medianly; head  
weakly striated...Pheidole pallidulla recticeps Forel.
- 19(18) Head and occiput not deeply incised medianly; head  
distinctly striated...Pheidole teneriffana Forel.
- 20(17) Antennal club little distinct, external borders of  
mandibles curved; workers (minor and major) with big

head; epinotum unarmed or slightly tuberculated;  
thoracic suture distinct; mandibles short and large.  
..... Messor structor (Latreille).

Subfamily: Ponerinae

Subfamily Ponerinae is the most primitive one, ants are active and rapid moving. Social habits very weak, castes similar in size. Radial and median cells closed in the fore wing. Nests subterranean.

Distribution: Widely distributed, but reaches its highest development in the tropics and especially in Australia.

This subfamily is represented by one genus and one species:

Genus: Pachycondyla Smith

Pachycondyla Smith (1858) Cat. Hymen. Brit. Mus., 6(7):105.

Pachycondyla sennaarensis (Mayr)

Euponera sennaarensis Mayr (1962) Verh. Zool. Bot. Ges. Wien, Vol. 12, P. 721.

Pachycondyla sennaarensis Smith in Arnold (1915-1924) Ann.S. Africa Mus., 14: 53.

♂ : Head more or less transverse. Ocelli large; eyes very large, occupying nearly the whole of the sides of the head. Antennae long, scape shorter than the second joint of the flagellum. Node of petiole compressed laterally and smaller than in the ♀. Wings very broad.

♀ and ♀ : Eyes situated in the anterior third of the sides of the head; promesonotal suture distinct; meso-epinotal suture obsolete above. Petiole generally with a thick,

squarish node. Claws simple.

Specimens examined: Kasseem (Brida); III, IV, 1985(22);  
Dwadmi, IV, 1985(17); Wadi Eldawaser, III, IV, 1985(14).

Subfamily: Myrmicinae

Mandibles simple or toothed; eyes usually present;  
Wings with one or two closed cubital cells; gaster short;  
cerci present; sting well developed.

Injurious species, they are phytophagous and carnivorous or house-hold pests.

Distribution: It is widely distributed throughout the entire world.

Genus: Messor Forel

Messor Forel (1890) Ann. Soc. Ent. Belg., 34: LXX

Messor structor (Latreille)

Formica structor Latreille (1798) Ess. Hist. Fourm. France, VI: 46.

Aphaenogaster structor Roger (1863) Verz. Formicid. Gatt. Art., Berlin.

Messor barbarus structor Latreille in Alfieri (1931) Bull. Soc. Ent. Egypte, XV: 42-48.

Messor Structor Latreille in Finzi (1936) Bull. Soc. Ent. Egypte, XI: 157.

Specimens examined: Wadi El Dawaser, III, IV, 1985 (8).

Genus: Monomorium Mayr

Monomorium Mayr (1855) Verh. Zool., Bot. Ges. Wien, V:452.

Monomorium salomonis (Linnaeus)

Formica salomonis Linnaeus (1758) Sys. Nat., I.

Monomorium Salomonis Roger (1862) Neut. Ent. Zeit. : 252.  
Specimens examined: Riyadh, II, 1985(12); Jeddah, III, 1985  
(12); Shagra, III, IV, 1985(17); Thadeg, IV, 1985(16); Wadi  
El Dawaser, III, IV, 1985(11); Kasseem (Brida), III, IV,  
1985(19); Skaka, IV, 1985(16).

Monomorium Subopacum F. Smith

Monomorium subopaca F. Smith (1858) Cat. Fyn. Brit. Mus. VI:  
127.

Monomorium subopacum mediterraneum Emery (1881) Ann. Mus.  
Civ. Storia. Nat. Genov. XVI: 525.

Specimens examined: Riyadh, II, 1985(12); Jeddah, III,  
1985 (19); Shagra, III, IV, 1985(22); Thadeg, IV, 1985(16);  
Wadi El Dawaser, III, IV, 1985(13); Kasseem (Brida), III, IV,  
1985(12); Skaka, IV, 1985(11).

Genus: Pheidole Westwood

Pheidole Westwood (1841) Ann. Mag. Nat. Hist., VI: 87.

Pheidole pallidula recticeps Forel

Pheidole pallidula recticeps Forel (1909) Bull. Soc. Vaud.  
Sc. Nat., 45: 391.

Specimens examined: Riyadh, II, 1985(17); Shagra, III, IV,  
1985(9); Thadeg, IV, 1985(11); Skaka, IV, 1985(7).

Pheidole teneriffana Forel

Pheidole teneriffana Forel (1892) Ann. Soc. Ent. Belg.;  
463.

Specimens examined: Riyadh, II, 1985(5); Shagra, III, IV,  
1985(9); Thadeg, IV, 1985(6); Skaka, IV, 1985(8).

Genus: Tetramorium Mayr

Tetramorium Mayr (1855) Verh. Zool. Bot. Ges. Wien, V:423.

Tetramorium punicum sahlbergi Forel

Tetramorium punicum sahlbergi Forel (1913) Rev. Suisse  
Zool., XXI: 431.

Specimens examined: Riyadh, II, 1985(7).

Subfamily: Formicinae

Mandibles broad and dentate or slender and pointed;  
clypeus separated by a suture in the frontal space; venation more or less reduced. Nests are constructed in diverse places, in the soil, in logs, in crevices of plants and even in houses.

Distribution: This subfamily is widely distributed and many genera are cosmopolitan.

Genus: Camponotus Mayr

Camponotus Mayr (1851) Europ. Formicid.: 35.

Camponotus compressus thoracicus Fabricius

Camponotus compressus thoracicus Fabricius (1804) Syst.  
Piez.: 397.

Specimens examined: Riyadh, II, 1985(27); Medina Munawara, III, 1985(15); Jeddah, III, 1985(12); Shagra, III, IV, 1985(16); Thadeg, IV, 1985(22); Wadi El Dawaser, III, IV, 1985(17).

Genus: Cataglyphis Foerster

Cataglyphis Foerster (1850) Verh. Naturh. Ver. Preuss.  
Rheinl., VII: 493.

Cataglyphis albicans livida (André)

Myrmecocystus albicans livida André (1881) Ann. Soc. Ent. Fr., 1:58.

Myrmecocystus albicans livida André (1882) Spec. Hym. Europe, 2:169.

Cataglyphis albicans livida Emery (1925) Gen. Insect. Formicidae: 262.

Specimens examined: Riyadh, II, 1985(12); Shagra, III, IV, 1985(9); Thadeg, IV, 1985(11); Kasseem (Brida), III, IV, 1985(16); Mekka, IV, 1985(7); Damman, IV, 1985(21); Dwadmi, IV, 1985(9); Wadi El Dawaser, III, IV, 1985(10).

Cataglyphis bicolor nodus (Brullé)

Formica nodus Brullé (1832) Exped. Sc. Morée Zool., II:326.

Myrmecocystus viaticus André (1881) Ann. Soc. Ent. Fr., 1:56.

Myrmecocystus viaticus orientalis Forel (1895) Mitt. Schweiz. Ent. Ges., IX: 288.

Cataglyphis bicolor nodus Emery (1926) Gen. Insect. Formicidae: 265.

Specimens examined: Riyadh, II, 1985(11); Abha, III, 1985(26); Shagra, III, IV, 1985(15); Thadeg, IV, 1985(9); Kasseem (Brida), III, IV, 1985(16); Mekka, IV, 1985(13); Dwadmi, IV, 1985(16); Wadi El Dawaser, III, IV, 1985(22); Skaka, IV, 1985(11).

Genus: Paratrechina Motschulsky

Paratrechina Motschulsky (1863) Spc. Nat. Moscow, Bull., 36:13.

Paratrechina longicornis (Latreille)

Formica longicornis Latreille (1802) Hist. Nat. Fourm.:  
113.

Formica vagans Jerdon (1851) Madras Jour. Litt. Sc.,  
17:124.

Prenolepis longicornis Roger (1863) erz. Formicid. :10

Paratrechina longicornis Emery (1925) Gen. Insect. For-  
micidae: 217.

Specimens examined: Riyadh, II, 1985(7).

DISCUSSION

It is obvious that zoogeographical studies of the Arabian peninsula and neighbouring regions will benefit from the results of this research. From this point of view, a knowledge of the fauna of Saudi Arabia is also of interest for zoologists studying the fauna of Africa, Europe and Asia.

The genera, species and subspecies reported in this work are confined to three zoogeographical regions, namely the Afrotropical (Ethiopian), Palaearctic and Oriental (Wittmer and Büttiker, 1979).

Specimens collected in this work from Saudi Arabia are more or less similar to those of Egypt (Hassanein, 1979), with the exception of Pachycondyla sennaarensis (Mayr) which is only represented in Saudi Arabia and not in Egypt.

REFERENCES

- Crawley, W.C. (1925) A revision of some old types of Formicidae. Trans. Ent. Soc. Lond. LXXIII: 593.
- Emery, C. (1906) Beiträge Zur Monographie der Formiciden des palaarktischen faunengebietes (Hym.) Deut. Ent. Zeit. 4:305-686.
- Id..... (1909) Ibid: 22
- Id..... (1912) Ibid: 662
- Id..... (1925) Subfamily Formicinae. General Insectorum, B. Bruxelles, 183, 302: 4.
- Finzi, B. (1930) Formiche in Hymenopteren aus Palestine Und Syrien. Sitz. Akad. Wiss, Wien: XLVII:22-24.
- Hassanein, A.H.M. (1979) Taxonomic studies of Family Formicidae (Hymenoptera) in A.R.Egypt. Ph. D.Thesis, Fac. Science, Ain Shams Univ. Cairo.
- Menozzi, C. (1930-1931) Formiche. Ann. Mus. Genova, 55: 451-456.
- Id..... (1931) Le Formiche della Palestina. Mem. Soc. Ent. Ital., 12:49-108.
- Santschi, F. (1915) Notes Bibliographiques. Bull. Soc. Ent. Egypte, 4:131.
- Shalaby, F. (1961) A preliminary survey of the insect fauna of Saudi Arabia. Bull. Soc. Ent. Egypte, XLV: 211.
- Wheeler, W.M. (1960) Ants, Their structure, development and behavior, Columbia University Press, New York.

- Wheeler, G.C. and Wheeler, J. (1972) The subfamilies of Formicidae. Proc. Ent. Soc. Wash., 74:35-45.
- Wilson, E.O. (1971) The insect Societies, Harvard Univ. Press, Cambridge, Mass.
- Wittmer, W. and Büttiker, W. (1979) Fauna of Saudi Arabia. Natural History Museum, Vol. I, Ciba-Geigy Ltd., Basle (Switzerland).

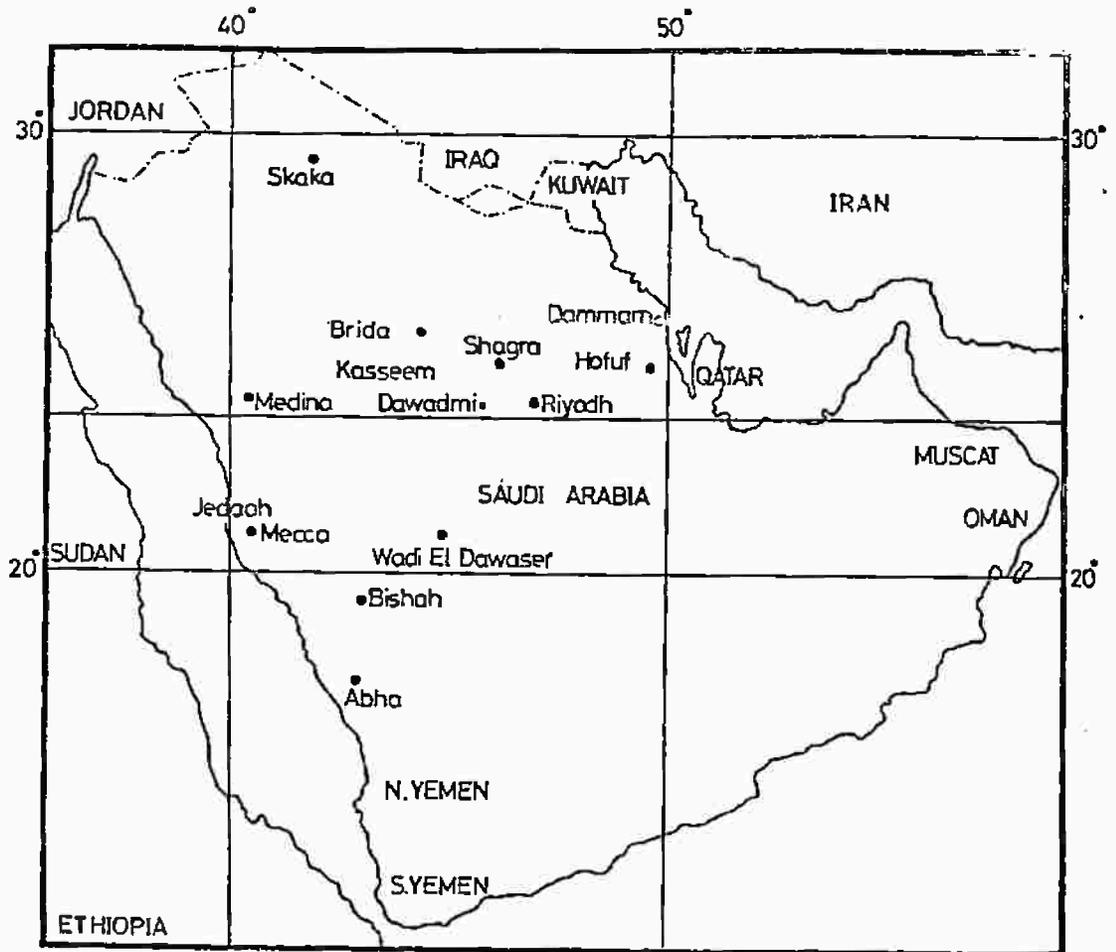


Fig.(1). Map of Saudi Arabia with main areas and locations of collecting activity

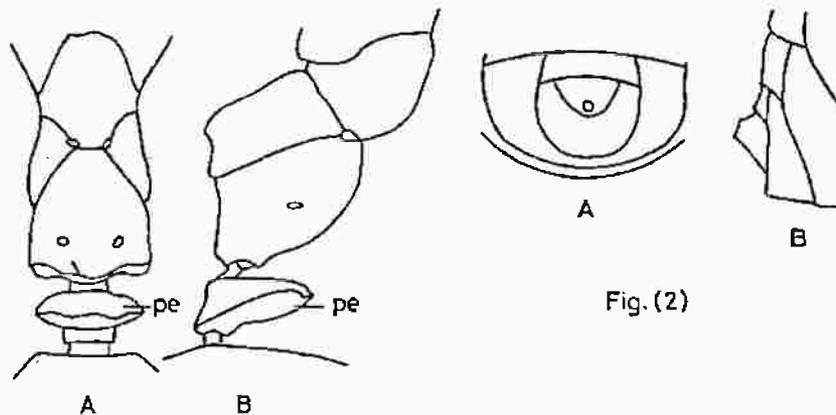


Fig. (3)

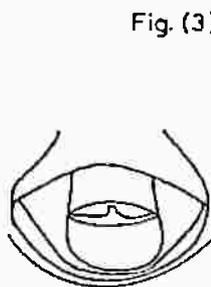


Fig ( 4 )

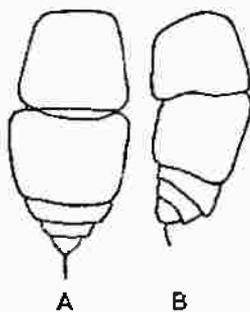


Fig ( 5 )

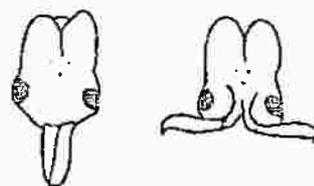


Fig. ( 6 )

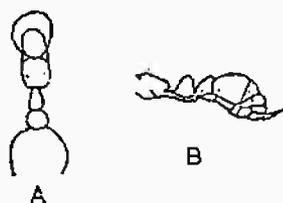


Fig.(7)



Fig ( 8 )

Fig. ( 2 ) Circular anal orifice, frontal(A) and side view(B).

Fig. ( 3 ) Abdominal pedicel (pe.), frontal(A) and side view(B).

Fig. ( 4 ) Slit-shaped anal orifice, frontal view.

Fig. ( 5 ) Gaster of Ponerinae, dorsal(A) and side view(B).

Fig. ( 6 ) Mandibles articulation in Ponerinae.

Fig. ( 7 ) Postpetiole of Myrmicinae, dorsal(A) and side view(B).

Fig. ( 8 ) Mandibles of Myrmicinae.

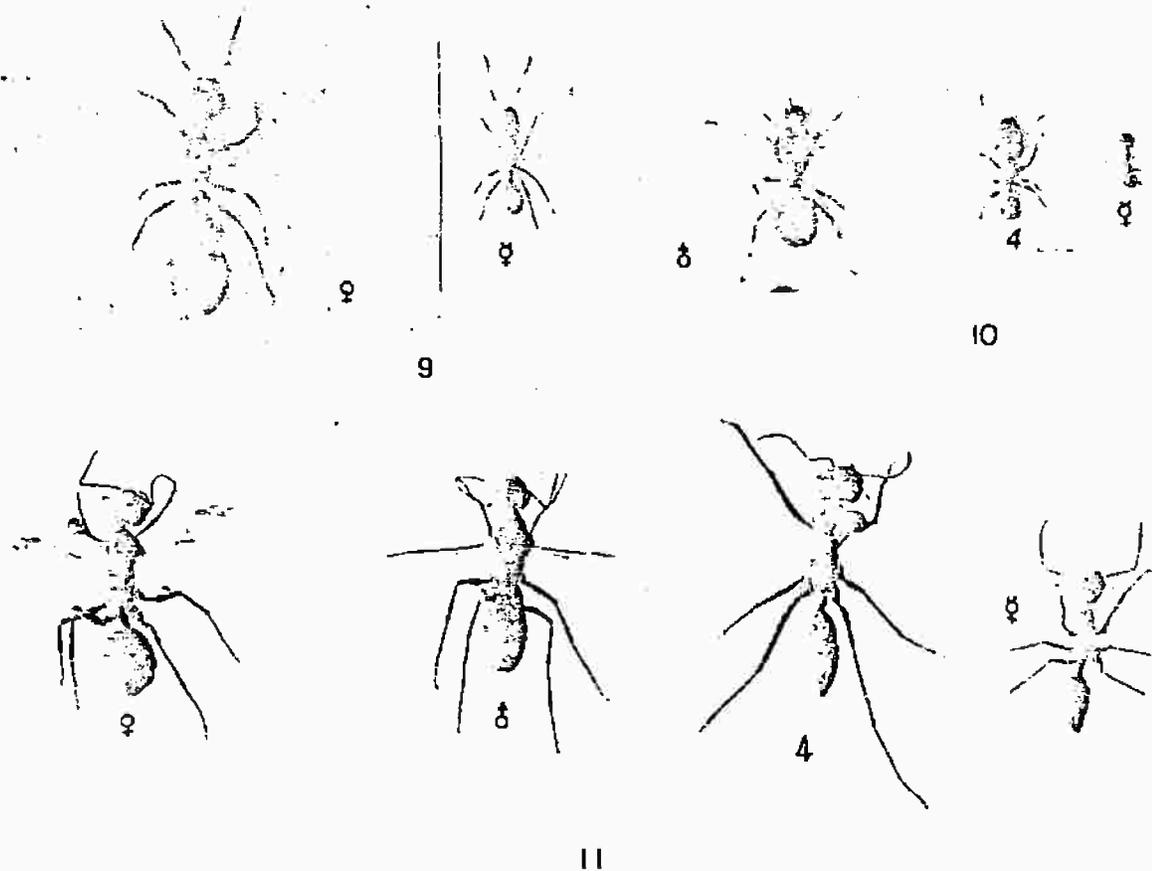


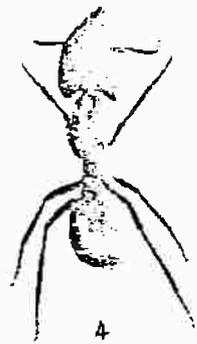
Fig. (9) Monomorium salomonis (Linnaeus)

Fig. (10) Pheidole pallidula recticeps Forel

Fig. (11) Cataglyphis bicolor nodus (Brullè)



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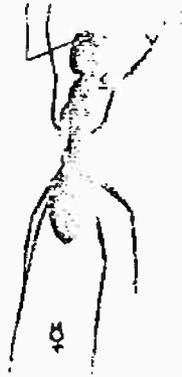
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Fig. (12) Camponotus compressus thoracicus Fabricius

Fig. (13) Cetaglyphis albicans livida (Andrè)

Fig. (14) Pheidole teneriffana Forel

Fig. (15) Tetramorium punicum sahlbergi Forel