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FIG WASPS FROM ISRAELI FICUS SYCOMORUS AND RELATED EAST AFRICAN SPECIES (HYMENOPTERA, CHALCIDOIDEA) 2. AGAONIDAE (CONCLUDED) AND SYCOPHAGINI

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With 22 text-figures and one plate

The study of many new samples of fig wasps collected in Africa by Dr. J. Galil of Tel-Aviv University, Israel, revealed the unexpected fact that *Ceratosolen arabicus* Mayr and *C. galili* Wiebes develop together in the same receptacles of *Ficus sycomorus* L.

Dr. Galil made experiments on the host relations of these species and other inhabitants of the Sycomore receptacles, the results of which will be published by him. The identification of the Agaonidae and the Torymidae Sycophagini from Dr. Galil's catches, and some notes on their distribution, are given in the present paper. Unless otherwise indicated, all samples here recorded were reared from *Ficus sycomorus* L. (det. Galil). The insect material is preserved in the Rijksmuseum van Natuurlijke Historie (abbreviated RMNH in the text). Other abbreviations used are: BM (British Museum, Natural History), NMW (Naturhistorisches Museum, Wien), OUM (Oxford University Museum, Hope Department of Entomology), and USNM (United States National Museum).

AGAONIDAE

Ceratosolen arabicus Mayr and **C. galili** Wiebes
(fig. 1)

Material. — *Ceratosolen arabicus* Mayr: Eritrea, Ghinda, ex *Ficus* spec., leg. G. Rossetti, 1914, ex coll. Grandi, 2 ♀ 1 ♂ (RMNH 693; fragments ♀ slide 693b). Kenya, Isiolo, ix.1964 (Galil, no. 14), 3 ♀ 1 ♂ (RMNH 901); Lake Magadi,

20.x.1964 (Galil, no. 7), 9 ♀ 2 ♂ (RMNH 899; 3 ♀ slide 899a); Lake Magadi, 20.x.1964 (Galil, no. 8), 4 ♀ (RMNH 900); Kibwezi, 20.x.1964 (Galil, no. 44), 1 ♀ (RMNH 879); Mombasa, 16.ii.1966 (Galil, no. 65B), 6 ♀ (RMNH 883). Tanganyika, Lake Manyara, 10.x.1964 (Galil, no. 32), 4 ♀ (RMNH 902); Usa, 11.x.1964 (Galil, no. 33), 1 ♀ 1 ♂ (RMNH 903).

Ceratosolen galili Wiebes: Eritrea, Ghinda, ex *Ficus* spec., leg. G. Rossetti, 1914, ex coll. Grandi, 1 ♂ (RMNH slide 693a). Ethiopia, Addis Ababa (Galil, nos. 1, 2), 23 ♀ 14 ♂ (RMNH 692; holotype ♂ slide 692a, ♂ slide 692b, 2 ♀ slides 692c, d). Kenya, Lake Baringo, 30.ix.1964 (Galil, no.17), 1 ♀ 2 ♂ (RMNH 829; ♀ slide 829a); Lake Baringo, 30.ix.1964 (Galil, no. 18), 5 ♀ 2 ♂ (RMNH 833); Lake Baringo, 30.ix.1964 (Galil, no. 19), 5 ♀ 4 ♂ (RMNH 836); Isiolo, ix.1964 (Galil, no. 14), 3 ♀ 1 ♂ (RMNH 826); Nairobi, ex *Ficus* spec., 3.x.1964 (Galil, no. 21), 7 ♀ (RMNH 841; 5 ♀ slide 841a); on way to Narok, ex *Ficus* spec., 4.x.1964 (Galil, no. 22), 3 ♂ (RMNH 843); Narok, 4.x.1964 (Galil, no. 23), 2 ♂ (RMNH 845); Lake Magadi, 20.x.1964 (Galil, no. 7), 2 ♀ 2 ♂ (RMNH 820; 1 ♀ 1 ♂ slide 820a); Lake Magadi, 20.x.1964 (Galil, no. 8), 3 ♀ 6 ♂ (RMNH 824); Voi, 16.x.1964 (Galil, no. 43), 3 ♀ (RMNH 870); Mombasa, ex *Ficus*? *malatocarpa*, 16.x.1964 (Galil, no. 41), 11 ♀ 4 ♂ (RMNH 861); Mombasa, 17.x.1964 (Galil, no. 42), 7 ♀ 7 ♂ (RMNH 865; 4 ♂ slide 865a, 3 ♀ slide 865b); Mombasa, 16.ii.1966 (Galil, no. 65A), 18 ♀ (RMNH 893). Tanganyika, Lake Manyara, x.1963 (Galil, no. 3), series immature ♀ 2 ♂ (RMNH 694; ♀ slide 694a, ♂ slide 694b); Lake Manyara, 10.x.1964 (Galil, no. 32) 39 ♀ 2 ♂ (RMNH 851); Usa, 11.x.1964 (Galil, no. 33), 4 ♂ (RMNH 854).

It is evident now, that *Ceratosolen arabicus* Mayr and *C. galili* Wiebes both develop in the receptacles of *Ficus sycomorus* L. Dr. Galil distinguished between the females of these species in the field, and quite appropriately indicated them as the "blond *Ceratosolen" (C. arabicus)* and the "dark" one (*C. galili*). The species may be differentiated by the following characters.

Female. — Colour, as mentioned above; the longitudinal diameter of the compound eye is twice as long as the cheek in *C. arabicus,* only slightly longer than the cheek in *C. galili*; the sixth antennal segment is about 1½ times as long as the seventh in *C. arabicus,* the two segments being subequal in length in *C. galili*; the ninth antennal segment is distinctly separate from the club in *C. arabicus* (funicle six-segmented), less distinctly separate, and shaped so as to form part of the club in *C. galili* (as if there were five funicular segments); the fore wing has dark striae in *C. arabicus,* such striae not being found in *C. galili*; the spurs on the hind tibiae are long and slender in *C. arabicus,* more robust in *C. galili.*

Male. — The third antennal segment is longer than wide in *C. arabicus,* distinctly anuliform in *C. galili*; the fourth antennal segment is shorter than the fifth in *C. arabicus,* longer than the fifth in *C. galili*; on the antiaxial disc of the hind tibia there are distinct spines in *C. arabicus,* while these are more hair-like or almost absent in *C. galili.*

Distribution. — All samples known to me are included in the lists above; the localities, including some records from literature (see Wiebes, 1964: 188

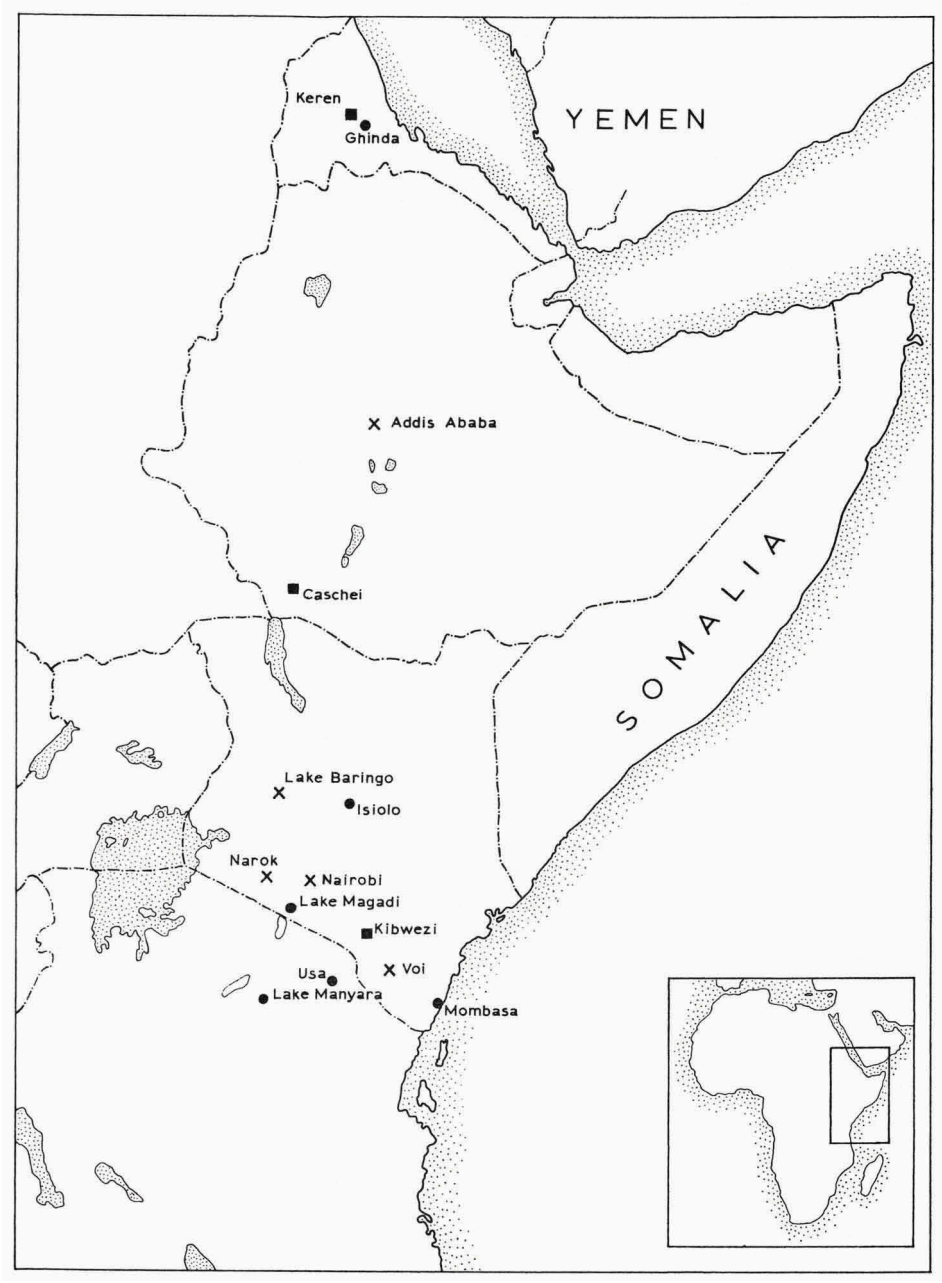


Fig. 1. Localities of *Ceratosolen arabicus* Mayr and *C. galili* Wiebes. Dots indicate localities of both species; full squares, localities from where only *C. arabicus* was collected or recorded (Keren, Grandi, 1917: 25; Caschei, Masi, 1951: 210); crosses, localities for *C. galili* only. Additional records for *C. arabicus* are "Gebel Bura", Yemen (Mayr, 1906: 154) and Somalia (Grandi, 1963: 304).

for a full synonymy), are mapped in fig. 1. The sample referred to *C.? galili* in 1964, does not belong here. It represents some related species, and will be reported upon elsewhere.

I cannot distinguish between the Agaonid from one of the samples indicated as *"Ficus? malatocarpa"*, and *C. galili*. Anticipating the next chapter it may be noted here that the *Sycophaga* from this sample is identical with *S. sycomori*. The host may have been misidentified; in another sample from *Ficus malatocarpa* (from Karura forest, Kenya) I find a *Ceratosolen* specifically distinct from either *C. galili* and *C. arabicus*.

TORYMIDAE, SYCOPHAGINI

In my classification of the Sycophaginae (Wiebes, 1966a) four genera were recognized in the Sycophagini viz. *Sycophaga* Westwood, 1840, *Idarnes* Walker, 1843, *Eukoebelea* Ashmead, 1904, and *Parakoebelea* Joseph, 1957. Recently Hill (1967: 424) added *Philotrypesopsis* Girault, 1919, unknown to me in nature and not recognizable from its original description.

Sycophaga is characterized in the female sex by several adaptations for entering the fig receptacle through the ostiole. Among its symbionts in the present samples from *Ficus sycomorus* are three other Sycophagini viz. females of *Eukoebelea, Parakoebelea,* and females belonging to a group usually identified with *Idarnes*. Structurally, all three are very similar, and I considered the possibility that they are actually forms of one species. Without rearing experiments, this possibility cannot be excluded. There is, however, no simple isometric or allometric relation between the dimensions of the three forms, although in some way the aberrant specimens mentioned below under *Eukoebelea* bridge the gap between *E. sycomori* spec. nov. and *Parakoebelea*. On the relative dimensions and the colour characters, any of the specimens can readily be assigned to *Eukoebelea, Parakoebelea,* or *"Idarnes"*, and it seems fully justified to maintain the three, for the time being, as separate genera.

There remains the question (cf. Wiebes, 1966a: 155) whether or not *Idarnes* Walker, 1843, should be used as a generic name for the African and Indo-Australian species. At present I cannot distinguish generically between the females of the Indo-Australian *Tetragonaspis testacea* Mayr, 1885 (referred to as *Eukoebelea testacea* (Mayr) by Mayr, 1906, Grandi, 1928, and Wiebes, 1966a), the African species of *"Idarnes"*, and the American *Idarnes* Walker. The male of *Tetragonaspis testacea,* the only Old World species of *Idarnes*-like wasps in which the association of the sexes is fairly certain, looks quite unlike the males of American *Idarnes* (*Ganosoma* Mayr, 1885).

The type species of *Tetragonaspis* Mayr is the American *T. gracilicornis* Mayr, 1885 (*Idarnes gracilicorne* (Mayr) Ashmead, 1904), and there is no other available name for the Old World species but *Idarnes*. Until the American species are revised, and the correlation of the sexes of the African species have been established, I use *Idarnes* as a generic name for both.

Sycophaga sycomori (L.)

(fig. 2-4)

Selected references (see Mayer, 1882, for an extensive review of the older literature):

Cynips Cycomori Linnaeus in Hasselquist, 1757, Iter. Palaest.: 426 (descr. ♀, ex Sycomore fig, Egypt).

Cynips Sycomori Linnaeus, 1758, Syst. Nat. **1**: 554-555 (redescr. ♀, ex *Ficus Sycomorus,* F. Hasselquist).

Sycophaga crassipes Westwood, 1840, Trans. ent. Soc. London **2**: 222-223, pl. xx fig. 5a-k (descr. ♀, "ex ficubus Aegypti", leg Klug); Saunders, 1878, Trans. ent. Soc. London **1878**: 317-319 (descr. ♀, ex *Ficus sycomorus,* Egypt; notes on caprification); Westwood, 1882, Trans. ent. Soc. London **1882**: 51-52, pl. ii-iii (descr. ♀, ♂, ex *Ficus Sycomorus,* Egypt, coll. S. S. Saunders).

Sycophaga sycomori; Loew, 1843, Ent. Ztg. Stettin **4**: 74-75, 77 (new comb., syn. *S. crassipes* Westw.); Mayer, 1882, Mitt. zool. Sta. Neapel **3**: 566-568, 581-583, pl. xxv fig. 6, pl. xxvi fig. 3, 4, 9, 11, 23 (descr. ♀, ♂, ex *Ficus antiquorum* Miq. [= *F. sycomorus* L.], Cairo, Egypt, leg. Schweinfurth; review of literature); Mayr, 1885, Verh. zool.-bot. Ges. Wien **35**: 192-193 (notes) [pro parte, as Mayr, 1906, Wien. ent. Ztg. **25**: 163, himself indicated for one of the samples]; Grandi, 1916, Boll. Lab. Zool. Portici **10**: 235, 236, fig. xxix-xxxii (key ♀, ♂; ill. ♀, ♂); Waterston, 1916, Bull. ent. Res. **7**: 128-129, fig. 4a (ill. ♀, "from various localities from Greece to Egypt"); Grandi, 1917, Bull. Soc. ent. Ital. **48**: 30-39, fig. x-xi (descr. ♀, ♂, ex *Ficus sycomorus* L., Syria, Egypt, Eritrea: (p. 35) Keren, Ghinda, Asmara); Carmin & Scheinkin, 1931, Bull. Soc. ent. Egypte (n.s.) **15**: 183-185, fig. 71-78, diagr. 2 (descr. ♀, ♂, ex *Ficus sycomorus* L., Tel-Aviv, Israel, 14-28.x, xii.1928 and 1929; biological notes); Wiebes, 1964, Ent. Ber. **24**: 188 (Israel).

Material. — Thanks to Drs. M. de V. Graham and B. D. Burks, I could study some specimens from the Hope Department of Entomology, Oxford University Museum and the United States National Museum, respectively. These include 5 ♀, evidently part of the syntype series of *Sycophaga crassipes* Westwood, 1840, "ex ficubus Aegypti, Dr. Klug; 62"; 2 ♀ 2 ♂ "*Sycophaga crassipes* Westw., ♂♀, Sir S. S. Saunders", presumably part of the material alluded to by Westwood (1882), all OUM; and 7 ♀ 4 ♂ "Tel Aviv, Palestine, J. Carmin, x-17-29; S 160" (USNM), possibly part of the material recorded by Carmin & Scheinkin (1931).

The data of the other specimens studied are:

Israel, Tel Aviv, leg. H. Bytinski-Salz, xii.1946, 6 ♀ 1 ♂ (RMNH 812); Tel Aviv, 4.x.1962 (Galil, without number), 48 ♀ 16 ♂ (RMNH 803; ♀ slide 803a, ♂ slide 803b). Egypt, Alexandria, leg. E. Aghion, x.1922, 7 ♀ 3 ♂ (USNM); Nubia,

near Abu Simbel, E. bank of Nile, ex *Ficus* spec., leg. L. D. Brongersma, 27.xii.1962, 7 ♀ 43 ♂ (RMNH 813). Kenya, Lake Baringo, 30.ix.1964 (Galil, no. 17), 10 ♀ (RMNH 830; 3 ♀ slide 830a); Nairobi, ex *Ficus* spec., 3.x.1964 (Galil, no. 21), 1 ♀ (RMNH slide 841a); Lake Magadi, 20.x.1964 (Galil, no. 7), 3 ♀ (RMNH 821); Lake Magadi, 20.x.1964 (Galil, no. 8), 1 ♂ (RMNH 825); Kibwezi, 20.x.1964 (Galil, no. 44), 11 ♀ 7 ♂ (RMNH 873); Voi, 18.x.1964 (Galil, no. 43), 17 ♀ 4 ♂ (RMNH 871); Mombasa, 16.x.1964 (Galil, no. 40), 85 ♀ (RMNH 858); Mombasa, ex *Ficus? malatocarpa*, 16.x.1964 (Galil, no. 41), 60 ♀ 38 ♂ (RMNH 862; ♂ slide 862a); Mombasa, 17.x.1964 (Galil, no. 42), 12 ♀ (RMNH 866; 5 ♀ slide 866a); Mombasa, 16.ii.1966 (Galil, no. 65C), 7 ♀ (RMNH 895). Tanganyika, Tangeru (Galil, nos. 2, 2a), 5 ♀ (RMNH 805) 1 ♀ 1 ♂ (RMNH 810).

Female. — There appears to be some variability in *Sycophaga sycomori*. The most obvious differences between the females recorded by Grandi (1917) and the present material are found in the number of spines on the hind leg (fig. 3).

The number of spines in the tibial comb (not counting the apical spurs) is seven, but one specimen from Lake Magadi, Kenya, has eight spines. A very small specimen from Israel (head, thorax and propodeum, 0.95 mm, against normal length 1.2-1.3 mm) has only five, another six.

Grandi described the number of spines on the metatarsus as two to four (including the apical) in females from Keren, Ghinda and Asmara. The present specimens are highly variable in this aspect, and they may have up to seven metatarsal spines.

Some females have two spines on the second segment of the hind tarsus, in some examples one on one leg and two on the other. Also the third segment occasionally has two spines.

I cannot distinguish between the samples from *Ficus sycomorus* and some from figs sent under the name of *Ficus? malatocarpa* (as indicated above I suspect this to be a misidentification of *Ficus sycomorus*).

Male. — Since males similar to those previously assigned to *Sycophaga* Westwood, were found in copula with females of *Eukoebelea* Ashmead (Grandi, 1923: 113, nota 1), there has been considerable confusion on the correlation of the sexes in the Sycophagini.

There can be no doubt that the males found in *Ficus sycomorus* in Israel, where *Eukoebelea* does not occur, are the partners of the *Sycophaga* females. Carmin & Scheinkin (1931: 185) recorded the copula of these insects; fig. 2 of the present paper illustrates an example found in the Saunders collection (BM) of a male and female (in copula?) in the same gall; and Galil (1966, in litt.) again described the act of copulation, much as Williams (1928: 15 [1]) did for *Eukoebelea nota* (Baker).

1) "The sexes mate within the gall, which the male of course, because of his structure must enter headfirst".

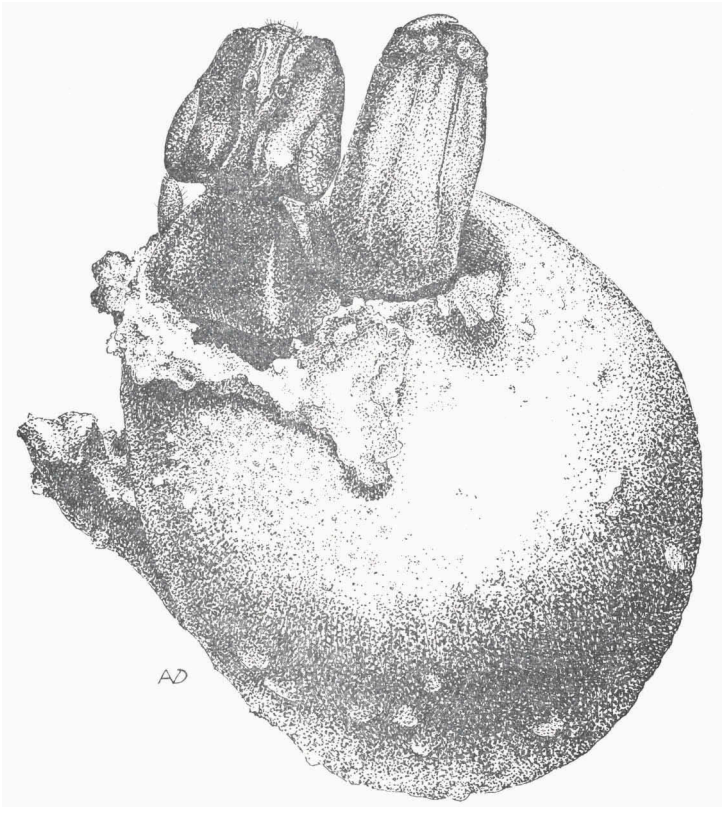


Fig. 2. *Sycophaga sycomori* (L.), pair in gall (BM. ex coll. S. Saunders. 84-31. S. Sycomori Löw). A. C. M. van Dijk del.

When the males from the various samples are compared with those from Israel, some differences are apparent in the relative length of the tarsal segments of the hind leg (fig. 4, 5). The choice between assigning some to the other Sycophagini, or regarding the differences as intraspecific variations of *Sycophaga sycomori*, is still ambiguous. The males (as well as the females, see above) are variable in some aspects, e.g. in the number of spines on the hind metatarsus (in one specimen, fig. 6, there is an additional, ventral spine in one of the legs; another, fig. 4, has an extra dorsal spine in one of the legs), while the specimen of fig. 6 also has a ventral spine on the second tarsal segment.

I recall that with some Indian fig wasps too, Joseph (1953: 61, fig. 24) and recently Ansari (1966: 79) encountered great difficulties in distinguishing between the males of various Sycophagini. Joseph (1953: 61-62) regarded the similarity of the male of *Eukoebelea testacea* (Mayr) and that of

Eukoebelea brevitarsis (Grandi) as an example of convergent evolution. As suggested before (Wiebes, 1961: 251-252), I am inclined to consider the similarity of the males to be an indication of very close relationship, and to look for a cause of the divergence of the females in their different life-habits. I am, moreover, not even convinced that all Sycophagini distinguished on differential characters of the females alone, are good species and not variations.

Distribution. — As indicated by Mayr (1906: 163), Grandi (1963: 366) and Wiebes (1966b: 32) many of the older records of *Sycophaga sycomori,* those from the Indo-Malayan region in particular, most probably are incorrect. This leaves only a few records to be discussed.

The northern-most locality, recorded by Waterston (1916), is Greece, where *Ficus sycomorus* was grown in ancient times (see Galil [1965]: map on inside of cover). Likewise Syria, mentioned by Grandi (1917: 39) as a locality for *Sycophaga sycomori* but not repeated in the later editions of his catalogue (e.g., 1963), is within the area where *Ficus sycomorus* was introduced. I did not see any specimens from Greece, nor from Syria.

Thus, the area of distribution, as inferred from the present samples and the records mentioned above, includes Greece (?), Syria (?), Israel, Egypt, Eritrea, Kenya, and Tanganyika, i.e. an area much larger than that occupied by the species of *Ceratosolen.* It would appear that the species of *Ceratosolen* are restricted to the area where *Ficus sycomorus* is indigenous. *Sycophaga sycomori* seems to be present wherever its host fig was introduced by man, although it is not yet known from north-western Africa.

Phenology. — Carmin & Scheinkin (1931: 185, diagr. 2) gave some phenological notes. They found single individuals of *Sycophaga sycomori* in the receptacles as late as the end of December, whereas the normal period of adult occurrence is October (in Israel); according to Saunders (1878: 318) it is November in Egypt. Most dates for the present samples fall in October (and one in the end of September), except for the one in February (Mombasa, Galil no. 65); the specimens from Nubia were collected in December.

Carmin & Scheinkin suggested that the insects might possibly pass the winter in fallen fruit, but this seems quite improbable. From the record by Saunders (1878: 317) of adult females (denuded of their wings) in September and October, one might conclude that the period of adult occurrence in Egypt begins in September.

Sycophagine ♂
(fig. 5-6)

In de following list of material, the males that differ considerably from the *Sycophaga* males from Israel (mainly in the shape of the hind tarsus, see fig. 6) are recorded as "Sycophagine ♂". Detailed observations on the correlation of the sexes are needed before these males can be assigned to either *Sycophaga* or to one of the other genera of the Sycophagini.

Ethiopia, Addis Ababa (Galil, no. 4), 1 ♂ (RMNH 798). Kenya, Lake Baringo, 30.ix.1964 (Galil, no. 18), 3 ♂ (RMNH 799); Isiolo, ix.1964 (Galil, no. 14), 1 ♂ (RMNH 797); Narok, 4.x.1964 (Galil, no. 23), 1 ♂ (RMNH 846); Lake Magadi, 20.x.1964 (Galil, no. 7) 1 ♂ (RMNH 796); Mombasa, 16.x.1964 (Galil, no. 40), 7 ♂ (RMNH 800); Mombasa, 17.x.1964 (Galil, no. 42), 4 ♂ (RMNH 906; 2 ♂ slide 906a); Mombasa, 16.ii.1966 (Galil, no. 65B), 1 ♂ (RMNH 884). Tanganyika, Usa, 11.x.1964 (Galil, no. 33), 4 ♂ (RMNH 795; 1 ♂ slide 795a).

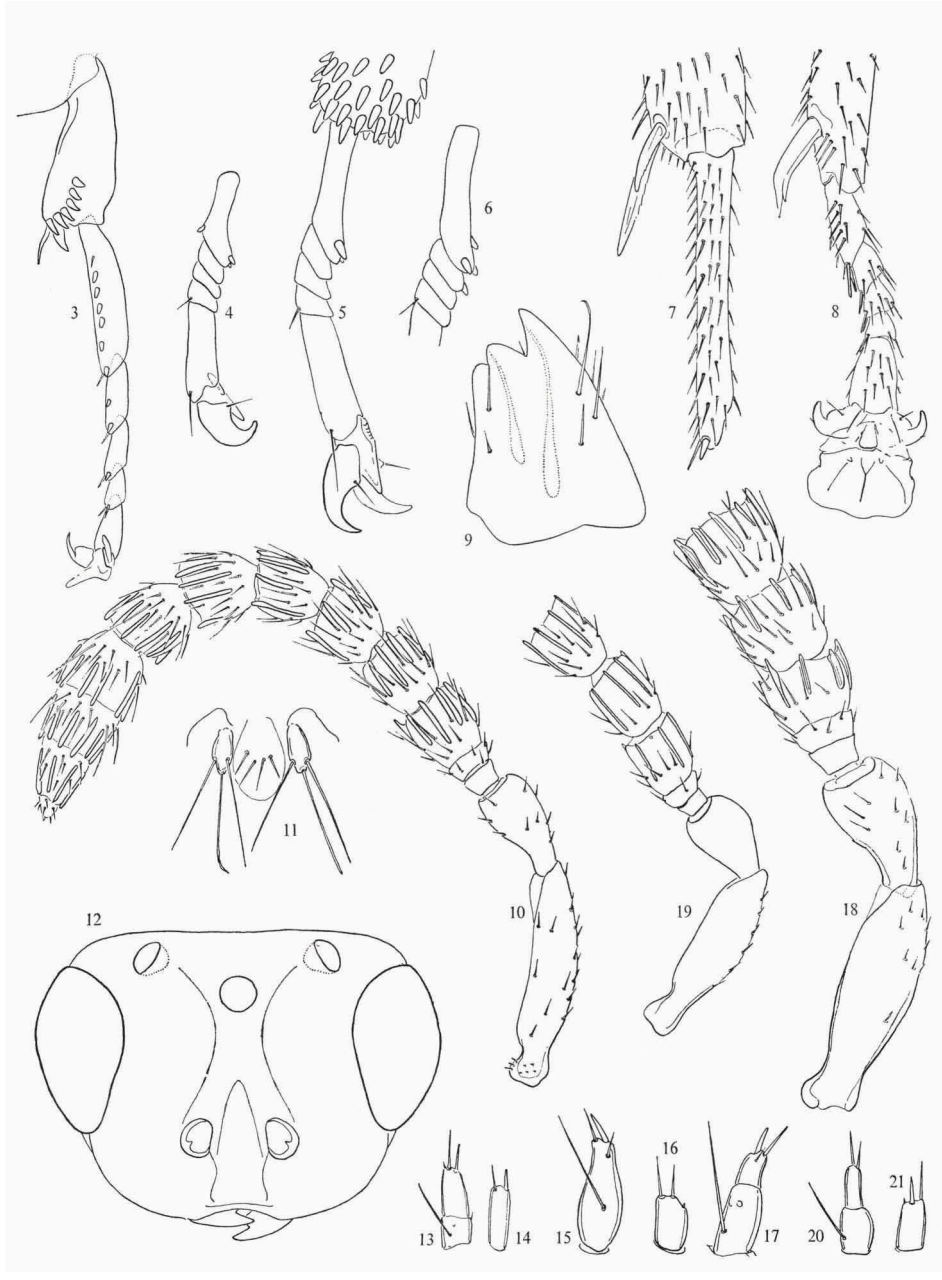
Eukoebelea sycomori spec. nov.
(fig. 7-14, 22; pl. 1 fig. 1)

Types. — 18 ♀, Tanganyika, Usa, ex *Ficus sycomorus* L., 11.x.1964, leg. J. Galil, no. 33; coll. RMNH no. 855, holotype and one paratype slide-mounted (RMNH 855a, b).

Further material: Kenya: Lake Baringo, 30.ix.1964 (Galil, no. 18), 1 ♀ (RMNH 834); Isiolo, ix.1964 (Galil, no. 14), 3 ♀ (RMNH 827; 907); Lake Magadi, 20.x.1964 (Galil, no. 7), 2 ♀ (RMNH 822); Lake Magadi, 11.ii.1966 (Galil, no. 56A), 1 ♀ (RMNH 882); Lake Magadi, 12.i.1966 (Galil, no. 57B), 4 ♀ (RMNH 885); Mombasa, 16.x.1964 (Galil, no. 40), 3 ♀ (RMNH 859); Mombasa, 17.x.1964 (Galil, no. 42), 3 ♀ (RMNH 867; 1 ♀ slide 908).

Description. — Female (pl. 1 fig. 1). Head (fig. 12), across the compound eyes, 1½ times as wide as long; with a faint median groove between the antennal sockets and the ocelli. Longitudinal diameter of the compound eye slightly over twice the length of the cheek. Toruli of the antennae separated for a distance about equal to their distance to the epistomal edge. Antenna (fig. 10) consisting of thirteen segments, the third and fourth of which are anuliform; the scape four times as long as wide; the pedicel half as long as the scape; the funicular segments subequal in size, with six to ten long sensilla, and scattered setae; the eleventh segment subequal to the tenth, forming a club with the smaller twelfth and thirteenth. Mandible (fig. 9) tridentate, with two glands. Labial palpus (fig. 13) consisting of two distinct segments (1:2); maxillary palpus (fig. 14), one single segment.

Thorax with faint reticulate sculpturation; the hairs on the scutellum are somewhat longer, those laterad of the propodeal spiracles longer still, than the scattered short hairs of the pronotum and scutum. Wings, fig. 22. Fore wing (7:3), ca. 1.6 mm long, pubescent over the greater part of its surface; the submarginal, marginal, stigmal and postmarginal veins approximately in ratio 19: 4: 3: 5, the submarginal vein with two pustules, the stig-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ma with three; the fringe of moderate length. Hind wing (5:2), ca. 1.0 mm long; the membrane with microtrichae, bare in the proximal third; the fringe longer than that of the fore wing. Fore leg with scattered setae; the femur as long as the coxa and trochanter combined, and slightly longer than the tibia; the tibia with one ventral spur (fig. 8); the tarsus pentamerous, its segments approximately in ratio 12: 6: 5: 4: 14, with pairs of stout spines at the ventro-apical edge of the first to fourth segments. Mid leg slender; the femur almost as long as the tibia, with sparse dorsal hairs; the tibia moderately pubescent, the setae stouter towards the apex, one ventral spur; the tarsus consisting of five segments approximately in ratio 37: 10: 7: 6: 11, all segments, including the fifth, with a pair of apical spines. Hind leg: the proximal segments (coxa, trochanter, femur) with sparse setae, the tibia and tarsus rather pubescent; the coxa nearly as long as the femur, and one-third shorter than the tibia; the tibia with two unequal ventral spurs (fig. 7); the five tarsal segments approximately in ratio 48: 12: 6: 5: 8, the first to third segments with a pair of apical spines, the antiaxial one of which is cone-shaped, the fourth segment with two subequal apical spines.

Gaster. The dorsal surface shows some blackish markings. The apex is of the usual Sycophagini-type, with the ninth urotergite divided into two plates, and the tenth (? proctiger) visible as a small lobe between the pygostyles (fig. 11). The pygostyles bear three long hairs. The valves and the ovipositor are six to seven times as long as the gaster.

Length (head, thorax and gaster), 1.8-2.0 mm; length of the ovipositor, 6.5-7.0 mm. Colour rather uniform yellowish brown, but for the darker gastral markings mentioned above.

Remarks. — Two specimens (RMNH 882, 907) are aberrant in having a rather dark thorax, and they are respectively smaller, and slightly longer than the other examples: length, 1.6 and 2.3 mm; ovipositor, 4.2 and 4.7 mm, i.e. 5 resp. 4 times the length of the gaster.

Fig. 3-4. *Sycophaga sycomori* (L.). 3, female hind tibia and tarsus (RMNH 803); 4, male hind tarsus (RMNH 873).

Fig. 5-6. Sycophagine male. 5, apex of hind tibia, and tarsus (RMNH 795); 6, detail of hind tarsus (RMNH 846).

Fig. 7-14. *Eukoebelea sycomori* spec. nov., female holotype (RMNH 855a). 7, apex of hind tibia, and metatarsus; 8, apex of fore tibia, and tarsus; 9, mandible; 10, antenna; 11, pygostyles and tenth urotergite (proctiger?); 12, head; 13, labial palpus; 14, maxillary palpus.

Fig. 15-18. *Parakoebelea gigas* (Mayr), female (RMNH 801a unless otherwise indicated). 15, labial palpus; 16, maxillary palpus; 17, labial palpus (RMNH 886); 18, detail of antenna.

Fig. 19-21. *Idarnes gracile* spec. nov., female paratype (RMNH 842b). 19, detail of antenna; 20, labial palpus; 21, maxillary palpus.

Parakoebelea gigas (Mayr) comb. nov.

(fig. 15-18; pl. 1 fig. 2)

Eukoebelea gigas Mayr, 1906, Wien. ent. Ztg. **25**: 164-165 (descr. ♀, Yemen, Gebel Bura, ex *Ficus* (*Sycomorus*) *antiquorum* D. C. Willd. [a synonym of *F. sycomorus* L.], leg. Hille, i.1889).

Types. — 2 ♀, "Jemen. Hille", "*Euk. gigas* G. Mayr, Type", "Collect. G. Mayr" (NMW), one of which is here designated lectotype, and is labelled as such.

Further material: Ethiopia, Addis Ababa (Galil, no. 3), 4 ♀ (RMNH 801; ♀ slide 801 a). Kenya, Lake Baringo, 30.ix.1964 (Galil, no. 17), 2 ♀ (RMNH slide 1132); on way to Narok, ex *Ficus* spec., 4.x.1964 (Galil, no. 22), 2 ♀ (RMNH 844); Lake Magadi, 12.i.1966 (Galil, no. 57B), 2 ♀ (RMNH 886); Kibwezi, 20.x.1964 (Galil, no. 44), 3 ♀ (RMNH 874); Mombasa, ex *Ficus*? *malatocarpa*, 16.x.1964 (Galil, no. 41), 1 ♀ (RMNH 863). Tanganyika, Usa, 11.x.1964 (Galil, no. 33), 2 ♀ (RMNH 795); Tangeru (Galil, nos. 2, 2a), 3 ♀ (RMNH 809).

Female (pl. 1 fig. 2). — Larger and more robust than *Eukoebelea sycomori* spec. nov., from which it differs in the following characters.

Head. The antennal sensilla shorter relative to the length of the segments (fig. 18). Labial and maxillary palpi, fig. 15-17; in one specimen the two segments of the labial palpus are fused (fig. 15).

Thorax. Fore wing (7 : 2), ca. 2.5 mm long; the submarginal, marginal, stigmal and postmarginal veins approximately in ratio 25:8:4:7. Hind wing (3 : 1), ca. 1.5 mm long. Fore leg: the tarsal segments approximately in ratio 9 : 4 : 3 : 3 : 9, the apical spines slender. Hind leg: the tarsal segments approximately in ratio 28 : 7 : 4 : 3 : 8.

Gaster. The valves and the ovipositor 2½ to 3 times as long as the gaster.

Length (head, thorax and gaster), 2.3-3.2 mm; length of the ovipositor, 3.0-4.0 mm. Colour dull yellow-brown, with darker markings on head and thorax, which may extend over almost the whole dorsal surface; dark patches on the mesonotum; the markings of the gaster as in *Eukoebelea sycomori* spec. nov., but sometimes covering almost the whole dorsum.

Remarks. — The identity of the present specimens and *Eukoebelea gigas* Mayr could be established by reference to the two syntypes of Mayr's species, kindly made available by Dr. M. Fischer of the Vienna Museum.

The genus *Parakoebelea* was erected by Joseph (1957:97) for *P. stratheni* Joseph; it also includes *P. thalakvadiensis* Joseph and *P. glomeratus* Ansari. Differential characters are mainly found in the dimensions (larger than *Eukoebelea* Ashmead; the ovipositor comparatively shorter).

Idarnes gracile spec. nov.

(fig. 19-21; pl. 1 fig. 3)

Types. — 7 ♀, Kenya, Nairobi, ex *Ficus* spec., 3.x.1964, leg. J. Galil, no. 21; coll. RMNH no. 842, holotype and two paratypes slide-mounted (RMNH 842a), one paratype dissected on slide 842b.

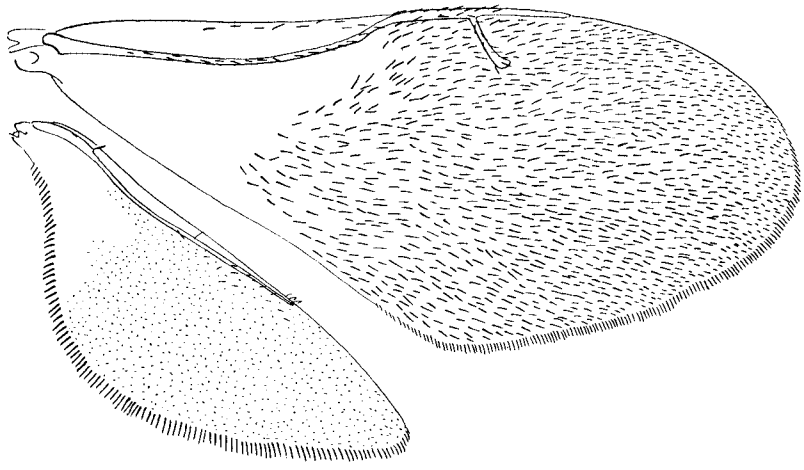

Fig. 22. *Eukoebelea sycomori* spec. nov., female paratype (RMNH 855b), wings.

Further material: Kenya, on way to Narok, ex *Ficus* spec., 4.x.1964 (Galil, no. 22), 2 ♀ (RMNH 878).

Description. — Female (pl. 1 fig. 3). Smaller and more slender than *Eukoebelea sycomori* spec. nov., from which it differs in the following characters.

Head. Detail of antenna, fig. 19; the scape rather short. Palpi of the mouth parts, fig. 20, 21.

Thorax. Fore wing (5 : 2), ca. 1.7 mm long; the submarginal, marginal, stigmal and postmarginal veins approximately in ratio 30 : 7 : 5 : 10. Hind wing (7 : 2), ca. 1.1 mm long. Fore leg: the tarsal segments approximately in ratio 12 : 5 : 6 : 5 : 13. Hind leg: the tarsal segments approximately in ratio 18 : 5 : 4 : 2 : 5.

Gaster. The valves and the ovipositor about eight times as long as the gaster.

Length (head, thorax and gaster), ca. 2.1 mm; length of the ovipositor, ca. 8 mm. Colour rather uniform brown, the legs yellowish.

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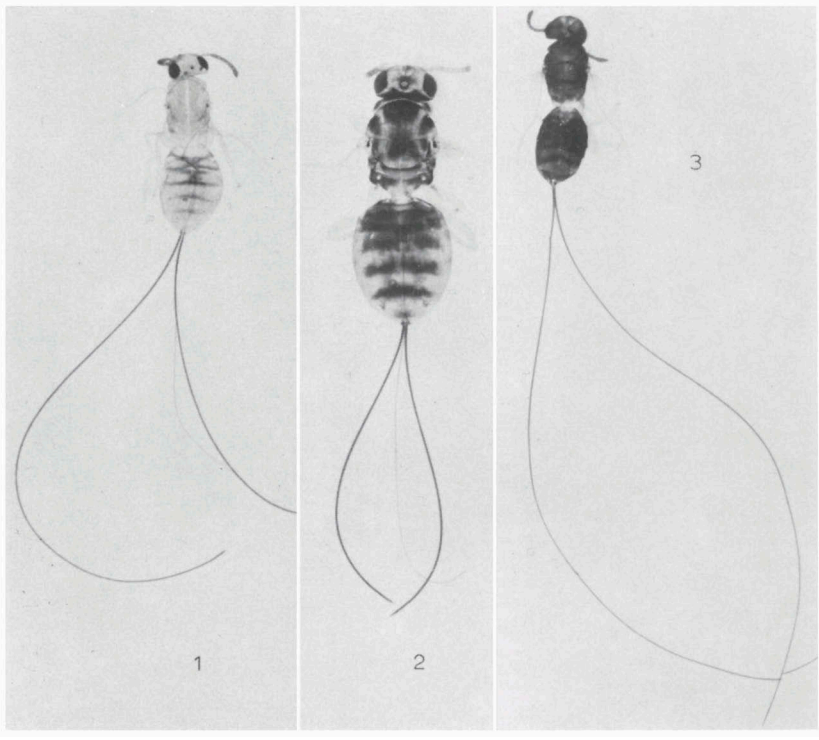

Fig. 1. *Eukoebelea sycomori* spec. nov., female (RMNH 908). Fig. 2. *Parakoebelea gigas* (Myer), female (RMNH 1132). Fig. 3. *Idarnes gracile* spec. nov., female holotype (RMNH 842a). Photo P. H. van Doesburg Jr.