

Excerpts from Canadian Entomologist, May, 1928.

OBSERVATIONS ON THE CHERMIDAE (HEMIPTERA: HOMOPTERA). PART IV.¹

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Genus **Synozia** Enderlein.

1918. Enderlein, Zool. Jahrb., Abt. f. Syst. 41: 479.

This genus was named by Enderlein for the reception of a single species, *S. cornutiventris* Enderlein, from Peru. No indication was given as to the systematic position of the genus, but the generic characters were clearly indicated and it is evident that it belongs—on the basis of Crawford's system, at least—in the subfamily Chermiinae, which is Crawford's subfamily Carsidarinae. In fact, on the basis of Crawford's keys it would apparently run to *Chermes* (= *Homotoma*). On the basis of the very brief characterization of this genus elsewhere given by Enderlein it would appear that the genus *Synozia* is sufficiently distinct by reason of the curious venation of the wings alone.

In addition to the characters peculiar to the subfamily, the genus is marked by the fusion of media and radius in the forewing, the practically complete absence of veins in the posterior wings and the presence of two curious processes on the postscutellum or pseudonotum of the metathorax (Fig. 1D). Enderlein has referred these structures to the first tergite of the abdomen but—accepting Crawford's interpretation of the parts—this is clearly incorrect.

There are at hand specimens representing a species that is clearly congeneric with *S. cornutiventris*. They may even represent that species, but the specific description given by Enderlein is so very incomplete that it is impossible to decide. In view of the rather wide geographic separation and an apparent difference in general color I am naming the species at hand as new.

***Synozia floccosa* n. sp.**

Fig. 1.

MATERIAL EXAMINED. Adults of both sexes and nymphs from *Ficus* sp., near Colima, Mexico, Dec. 1925 (G. F. Ferris).

ADULT. In life of a generally pale green color. General form very slender. Length on slide 4.5-5 mm. Antennae (Fig. 1H) about as long as the body, strongly hairy throughout, borne upon pronounced prominences which give the head (Fig. 1G) the characteristic appearance of the subfamily. The head is without the slightest indication of genal cones, but there is a small epiphysis at the antennal base.

Thorax of the general type seen in the Psyllinae as figured by Crawford in his monograph of the new world species, the pleural suture of the prothorax not attaining the extremity of the pronotum. The pair of curious prominences on the postscutellum of the metathorax (Fig. 1Dx) are prominent features. Pos-

1.—Continued from Canadian Entomologist 58:13. (1926).

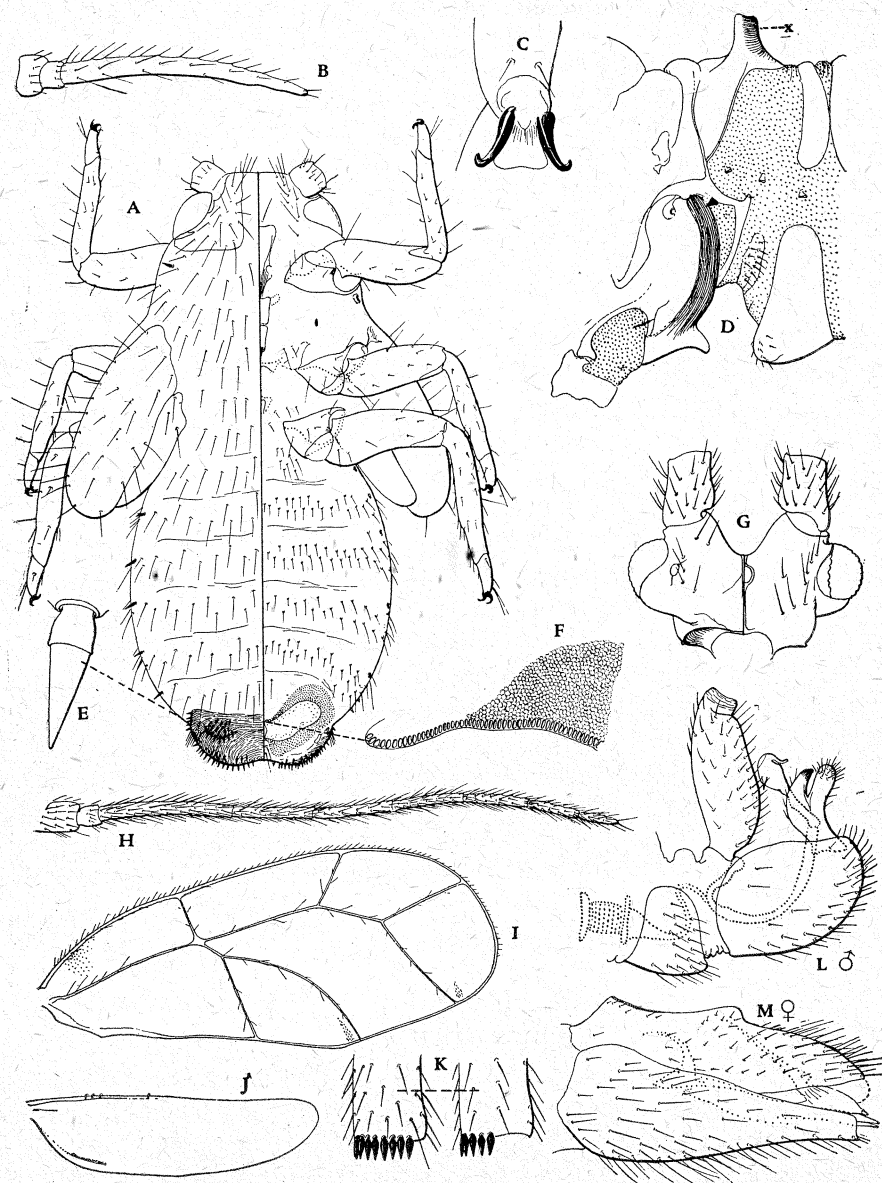


Fig. 1. *Synoza floccosa* n. sp. A.—Fifth stage of nymph; B.—Antenna of nymph; C.—Apex of tarsus of nymph; D.—Junction of thorax and abdomen of adult; E.—Sectaseta; F.—Portion of circum-anal pore ring; G.—Head of adult, left side dorsal, right side ventral; H.—Antenna of adult; I.—Fore wing; J.—Posterior wing; K.—Apex of posterior tibia of adult; L.—Genitalia of male; M.—Genitalia of female.

terior tibiae without a basal spur and with a comb of stout black setae at the apex (Fig. 1K). Posterior tarsi with a pair of claw-like spines on the basal segment.

Anterior wings (Fig. 1I) hyaline, the veins quite dark. Media is united with radius throughout a great part of the length of both, thus giving to the wing a curious venational pattern. The veins are sparsely beset with small, fine setae. Hind wings (Fig. 1J) very small, venation practically entirely lacking.

Abdomen with the tergal and sternal plates moderately sclerotic, without sculpture. Genital segment of the female (Fig. 1M) relatively small, the anal opening relatively very large and surrounded by an apparently simple pore ring. Genitalia of male (Fig. 1L) with the claspers quite deeply bifid, the anterior branch sharply pointed.

NYMPH (Fig. 1A). In life occurring on the under surfaces of the leaves and enveloped in masses of flocculent secretion. Length on slide 3 mm. The body is of the general psylline type, that is with the wing pads not produced forward and partially enclosing the head. The derm is membranous throughout except for an ocular patch, the wingpads and a small dorsal caudal area, and rather sparsely beset with slender setae. The caudal area bears at its margins and in a pair of clusters on the dorsal side numbers of small, sharply pointed sectasetae (Fig. 1E) and a single sectaseta appears at the lateral margin of each abdominal segment. There are apparently no dorsal pores to account for the enormous masses of wax that are secreted. The circum-anal pore ring is entirely on the ventral side and is considerably expanded (Fig. 1F). Antennae (Fig. 1B) short, consisting of three segments, of which the third is very long. Legs without trochanters. Tarsi with a very small empodium (Fig. 1C).

Notes: The knowledge of the nymphs of this family is still too fragmentary to permit any conclusions concerning the evidence they may afford as to relationships. I would merely call attention to the fact that this nymph bears extremely little resemblance to that next to be described, although on the basis of the existing classification the two species are referred to the same subfamily.

Genus *Freysuila* Aleman.

There are at hand specimens representing a single species of this genus. I can not force these into any existing species and am consequently describing them as new. As far as I am aware the nymph has not been described in any species of this genus. All the species thus far recorded have been taken from trees of the genus *Cedrela* but specimens at hand indicate that the group is not actually thus limited.

Freysuila cohahuayanae n. sp.

Fig. 2.

MATERIAL EXAMINED. A single mature female and many nymphs from *Cedrela* sp. near Cohahuayana, Michoacan, Mexico and a single teneral male and numerous nymphs from *Ficus* sp. near Colima (G. F. Ferris).

ADULT. According to the key given by Crawford in his monograph of the new world species, this differs from the other species of the genus, with the exception of *F. ernstii* Schwarz, in having the third and fourth antennal segments equal. From *ernstii*, which was recorded from Venezuela, it appears to differ in the paler wing veins.

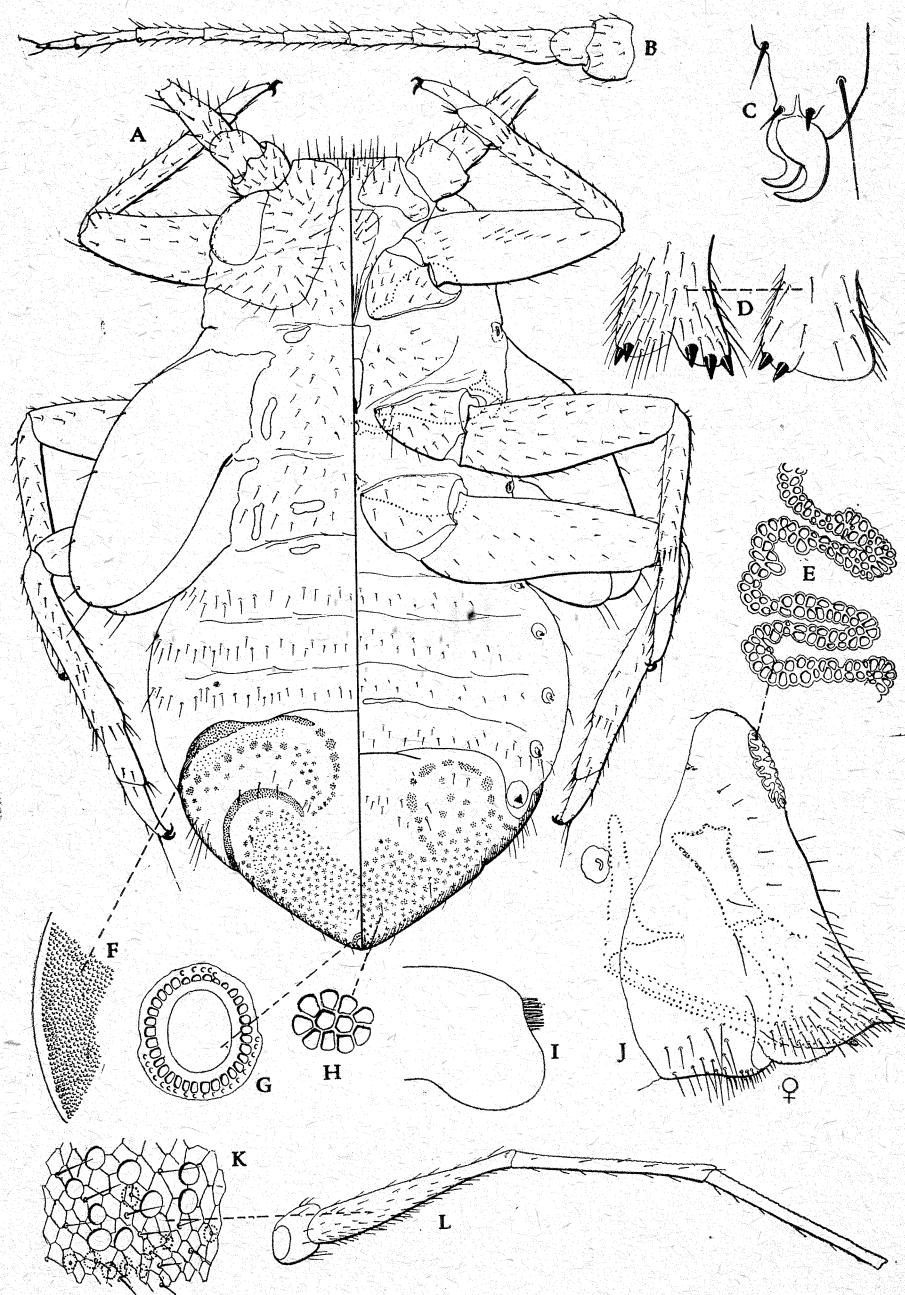


Fig. 2. *Freysuila cohahuayanae* n. sp. A.—Nymph of fifth stage; B.—Antenna of nymph; C.—Apex of tarsus of nymph; D.—Apex of posterior tibia of adult; E.—Portion of circum-anal pore ring of adult; F.—Portion of pore area of nymph; G.—Circum-anal pore ring of nymph; H.—Pore cluster of nymph; I.—Apex of posterior femur of adult; J.—Genitalia of female; K.—Markings of third antennal segment of adult; L.—Second to fifth antennal segments of adult.

Antennae (Fig. 2L) broken in the single available specimen, the terminal segments lacking. The third segment is swollen, as is common in the genus. The entire antenna is closely imbricate or reticulate and the third segment (Fig. 2K) bears numerous small, circular areas that are apparently sensoria and that are of two kinds, one an open pit, the other a pit that opens only by a minute pore.

The head is of the common type of the genus, the genae being produced into very slight prominences. Wings of the common type, $M+Cu$ equal to R . Posterior femora with a cluster of small, fleshy setae at the apex (Fig. 2I). Apex of posterior tibia with five stout black setae on one side and two on the other (Fig. 2D).

Genitalia (Fig. 2J) quite short, the dorsal valve descending sharply and much exceeding the ventral valve. The pore ring surrounding the anal opening is peculiar in that it is much convoluted and is composed of an irregular double row of pores (Fig. 2E).

The single available male was dissected from a nymph and is consequently too broken and too incompletely formed to permit description. It is placed with this species because of the identical character of the nymphs.

NYPH. (Fig. 2A). In life covered with masses of cottony secretion. Length on slide 3 mm. Of the psylline type, the wing pads not produced forward. The derm is for the most part membranous except for the usual ocular patch, small areas on the dorsum of the thorax and the very large caudal area which occupies nearly half the abdomen.

Antennae (Fig. 2B) ten-segmented, slender, clothed with small setae. Legs without trochanter and apparently without empodium (Fig. 2C). Body bearing numerous fine setae but entirely without sectasetae or setae of any other modified form.

Anal opening at the extreme tip of the body, enclosed within a very small pore ring (Fig. 2G). The caudal sclerotic area is thickly beset both dorsally and ventrally with simple pores which are arranged in bands and in small clusters (Fig. 2F and 2H).

Notes: I have already called attention to the very great difference between the nymph of this species and that of *Synosa floccosa*, although under the existing classification the two would be referred to the same subfamily. Conversely I would call attention to the close resemblance between this nymph of *Freysuila cohahuayanae* and that of the two species still to be described, which would be placed in a different subfamily.

I am unable to understand Crawford's statement² that the members of this subfamily, with the exception of *Chermes* (= *Homotoma*) have but one black claw-like spine on the basal segment of the posterior tarsi, for in this species there are clearly two.

Genus *Euphalerus* Schwarz.

Four species have been described in this genus from the new world and several from the old world tropics. The type of the genus, *E. nidifex* Schwarz, in its larval stages forms a waxen cell but the nymph itself has not been described. Specimens of the nymph of this species are available, but represent only early stages. They are sufficient, however, to show that the species here to be described agrees with the generic type quite closely in its nymphal characters as well as in those of the adult.

2.—Crawford, D. L. Philippine Jn. Sci. 15:156. (1919).

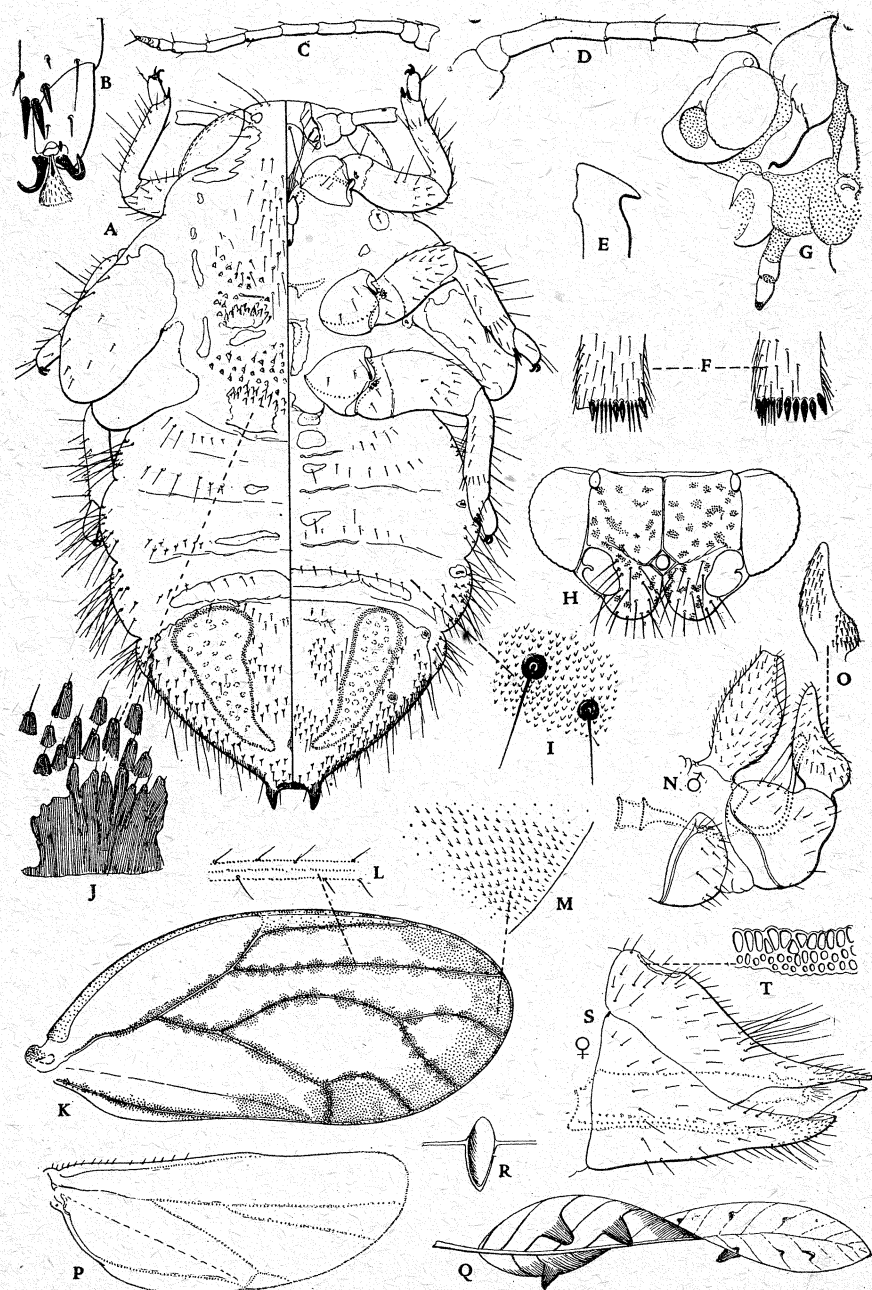


Fig. 3. *Euphalerus gallicola* n. sp. A.—Fifth stage nymph; B.—Apex of tarsus of nymph; C.—Antenna of nymph; D.—Antenna of third (?) stage of nymph; E.—Base of posterior tibia of adult; F.—Apex of posterior tibia of adult; G.—Head and prothorax of adult; H.—Head of adult; I.—Portion of derm of nymph; J.—Dermal ornamentation of nymph; K.—Fore wing; L.—Portion of vein of fore wing; M.—Portion of marginal area of wing; N.—Genitalia of male; O.—Inner face of clasper; P.—Posterior wing; Q.—Leaf with galls; R.—Section of gall; S.—Genitalia of female; T.—Portion of circum-anal pore ring of female.

Euphalerus gallicola n. sp.

Fig. 3.

MATERIAL EXAMINED. Adults and nymphs from a tree of the family Rhamnaceae, possibly *Karwinskia humboldtiana*, at Manzanillo, and nymphs only from some plant, possibly of the same family, from near the mouth of the Balsas River, Mexico (*G. F. Ferris*).

ADULT. In life of a pale brown color, quite uniformly maculated with small dark spots, the wings (Fig. 3K) with small maculations along the veins and with a terminal border of darker color.

Antennae about half as long as the body. Head (Fig. 3) with the typical form of the genus, the genal cones short, broad and rounded and bearing numerous rather large setae. The outline of head and prothorax is shown in Fig. 3G.

Wings hyaline except for the maculations, broadly rounded at the apex, the veins (Fig. 3L) bearing numerous very small setae. At the wing margin in each cell is a cluster of small, dark points (Fig. 3M). Hind wings (Fig. 3P) comparatively large, uniformly beset with minute black dots, the veins, although weak being clearly defined. The venation is apparently complete except for the absence of the radius.

Posterior tibiae with a very pronounced spur at the base (Fig. 3E) and with several short, black setae at the apex on both sides (Fig. 3F). Genital segment of female (Fig. 3G) acutely pointed, the apices bearing numerous extremely small setae; circumanal pore ring composed of an irregular band of pores (Fig. 3I). Genitalia of the male (Fig. 3N) with the claspers pointed and swollen at the base, their inner face (Fig. 3O) with numerous small, stout setae.

NYMPH (Fig. 3A). Living within galls formed upon the leaves of the host. These galls (Fig. 3Q) are always formed on a vein, there being a conical portion on the lower side of the leaf and a low prominence on the upper side which forms two lips that open to allow of the escape of the nymph. A section of a gall is shown in Fig. 3R. Within the gall the nymphs are enclosed in a mass of cottony wax. They leave the gall before the time of the last molt and this is performed upon the surface of the leaf.

Nymph of the fifth stage about 3 mm. long on the slide. The antennae (Fig. 3C) are quite short but slender and ten-segmented, practically bare of setae. The derm of the body is apparently quite thick and, except in the sclerotic areas, is beset with minute points (Fig. 3I). The dorsum of the thorax is marked by numerous small, sclerotic areas, the tips of which form free points and are usually armed with a small seta. These areas are partially united into larger plates (Fig. 3J), the whole giving a very characteristic appearance. The caudal sclerotic area is large, occupying more than a third of the abdomen and is deeply pigmented. The abdomen terminates in a pair of short processes, between which is the anal opening. This opening is more or less concealed by the deep pigmentation and by the fact that it is slightly retracted into the body, but in a favorable specimen it is possible to determine that it is surrounded by a simple pore ring as is the case in the previously described *Freysuila cohahuayanae*, although I am not able to give a figure.

The caudal sclerotic area bears both dorsally and ventrally a large ring composed of crowded, minute, simple pores and enclosing a smooth region.

The body is beset rather sparingly with small slender setae, these becoming more numerous and longer along the margins of the abdomen.

The legs are quite short and stout, showing a fairly distinct trochanter. The tibia bears at the inner apex two or three short, stout setae, the tarsus is very short and bears a small empodium (Fig. 3B).

Notes: This species is apparently closest to *E. nidifex*, from which it may be separated by the different arrangement of the maculations of the wing.

There occurred upon the same host at Manzanillo nymphs of what is almost certainly another species of *Euphalerus*, perhaps *nidifex* itself, forming the characteristic waxen cells. It is possible that the adult here described belongs with this other nymph, but I think not, for an adult was dissected from one of the gall inhabiting nymphs and this adult agrees entirely with fully developed individuals in all the characters that could be compared.

Genus *Euphyllura* Forster.

I have in an earlier paper dealt with the nymph of *Euphyllura arbuti* Schwarz but I do not now regard that treatment as adequate and shall here

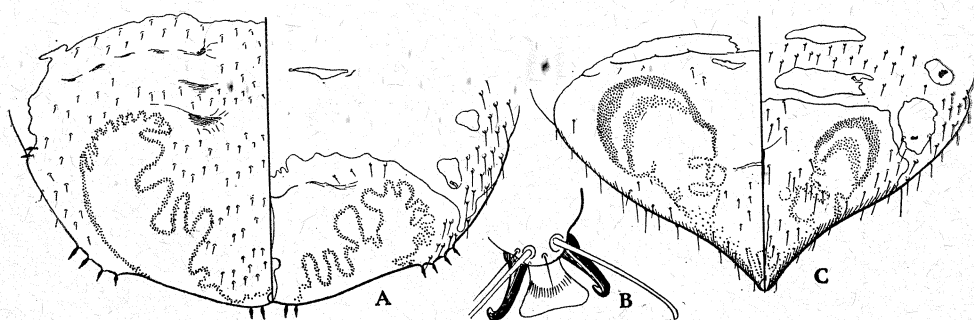


Fig. 4. *Euphyllura arctostaphyli* Schwarz. A.—Apex of abdomen of nymph. *Euphyllura arguti* Schwarz. B.—Apex of tarsus; C.—Apex of abdomen of nymph.

present further notes. This is done partly in order to permit a closer comparison of the nymphs of this genus with others which are here dealt with.

Euphyllura arbuti Schwarz.

Fig. 4A, 4B.

1923. *Euphyllura arbuti* Schwarz, Ferris and Hyatt, Can. Ent. 55:88-92.

The figures previously given do not show with sufficient clarity the details of the circum-anal pore ring. The anal opening is at the extreme tip of the body and the pore ring has become enormously enlarged, forming a sinuate and narrow band on both dorsal and ventral sides as indicated in the figure.

The tarsi bear a very small empodium (Fig. 4B).

Euphyllura arctostaphyli Schwarz.

Fig. 4C.

Nymphs are at hand, taken from *Arctostaphylos* on Mt. Hamilton and near Stanford University, California, which in all probability represent this species, although adults are not available with which to confirm the identification.

In life this species is covered with cottony secretion and does not form a cell as does *E. arbuti*. The nymph is very similar to that of *arbuti* in its general character, differing chiefly in the form of the posterior portion of the abdomen (Fig. 4C) which is almost truncate. The circum-anal pore ring is expanded as in *arbuti*, but is even more sinuate and in general is narrower.

THE HOMOLOGIES OF THE ANAL PORE RING.

Enough nymphs of this family have been described in this series to make possible the formulation of some statements concerning certain of their structures.

One of the peculiar features of this group is the circum-anal pore ring which is present in the nymphs of apparently the greater number of species. This ring occurs also in the adult female, but apparently not in the male. In some groups, such as the genus *Pachypsylla*, it appears to be lacking in the nymphs. Whether or not it is also lacking in the adult female I cannot determine from the scanty material of this group that is available to me for examination. Apparently no use has been made of this ring in the description of the adults, but it evidently has some value and needs to be taken into consideration.

In the nymphs, this ring, when present, occurs in all the stages. It varies greatly in its size, form and make-up, as can be seen by reference to the figures that have thus far been presented. Typically, one may say, the anal opening in the nymph is on the ventral side of the body, somewhat removed from the apex, and the ring is also ventral. In some forms, however, the anal opening is at the extreme apex of the body and the pore ring is partially on the dorsum and partially on the venter.

In addition to this shift in position, and apparently frequently coincident with it, the character of the ring changes. From a simple ring of pores it becomes expanded into a large zone that may even lose much of its obvious resemblance to the simple ring. Such is the case in the species of *Euphyllura* here figured. Nevertheless, I am convinced that here the homology is still clear.

In the case of the species of *Freyssula* and *Euphalerus* here figured I am not so sure that the conspicuous bands of pores are really homologous with this ring, although I am disposed to think that they are. It may be noted that in both these species the anal opening is surrounded by a very small ring which is in addition to the other pore areas. It is not impossible that this is the true circum-anal ring and that the other pore areas are additional structures. Especially would this seem to be possible in the case of the nymph of *Euphalerus gallicola* where the pore areas are entirely dissociated from the anal ring.

It would seem reasonable to suppose that a structure such as this should be of considerable systematic importance and doubtless it is. But it is evident that care must be taken in its use to establish the actual homologies and only the study of a much longer series of forms can permit of this.