

A NOTE ON *OVATICOCCUS AGAVIUM* (DOUGLAS) (HOMOPTERA :  
COCCOIDEA : ERIOCOCCIDAE) AND ON THE GENUS *OVATI-*  
*COCCUS* GENERALLY

By K. BORATYŃSKI

SPECIMENS of *Ovaticoccus agavium* (Douglas, 1888) were recently obtained from the hothouses of the Royal Botanic Gardens at Kew and identified by comparison with the specimens from the type material preserved in the British Museum (Natural History). It appears that the existing descriptions of the species are somewhat inaccurate and incomplete, leaving room for doubt as to the exact identity of the specimens; moreover, the modern descriptions are based on material other than the type. The opportunity is therefore taken to illustrate and describe in detail the species on the basis of the type material supplemented by the other specimens at hand. The present record of *O. agavium* at Kew Gardens is the first since its original discovery there in 1888.

I wish to acknowledge with thanks the permission of the Curator of the Royal Botanic Gardens to collect the specimens there; and of the Trustees of the British Museum (Natural History) and the Director of the Commonwealth Institute of Entomology to examine the specimens in their respective collections.

*Ovaticoccus* Kloet, 1944

A few words seem to be necessary regarding the genus and the generic name. Describing *Coccus agavium* sp. n. in 1888, Douglas remarked as follows: "At one time I thought it might constitute the type of a new genus, under the name of *Gymnococcus*, but in consideration of the important and leading characters of the antennae I have concluded (for the present at least) that it is better to regard all the other characters as specific, and to refer the species to Signoret's genus *Coccus*." (*Ent. mon. Mag.* 25 : 150-1.) Subsequently it has been recognised that *agavium* represents a distinct genus, and, although by modern standards of zoological nomenclature Douglas's remark has no formal validity, the name *Gymnococcus* and Douglas's responsibility for it was generally accepted and used. In 1896 Cockerell, in his *Checklist of the Coccidae*, listed on p. 323 the genus "*Gymnococcus*, Dougl." with a single species "63. *agavium* Dougl." and later (1899) included the genus in *Tables for determination of the genera of Coccidae*. In 1897 Newstead described some additional important characters of the species, referring to it as *Coccus (Gymnococcus) agavium* Douglas, thus apparently indicating a subgeneric status for *Gymnococcus*, though he suggested that the species should be included in the genus *Ripersia* Signoret; later (1903), however, he recognised the genus *Gymnococcus* Douglas. Except Parrott (1900), who ascribed the authority for the name *Gymnococcus* to Newstead, all the other authors, *i.e.* Fernald (1903), Leonardi (1911), Lawson (1918), MacGillivray (1921), Borkhsenius (1949, 1950), and Ferris (1955),

referred to it as *Gymnococcus* Douglas.<sup>1</sup> Ferris (*l.c.*: 178–9) discussed the generic name for *agavium* and other species at present included in the genus, and after rejecting the two other names involved, i.e. *Fonscolombia* Lichtenstein and *Pseudochermes* Nitsche as of doubtful identity, adopted “the genus *Gymnococcus* Douglas the type of which was adequately described”.

The fact that the name *Gymnococcus* Douglas, 1888 was preoccupied by *Gymnococcus* Zopf, 1887 (Mycetozoa, Protozoa) had, however, been overlooked, although this was already noticed by Kloet, who in 1944 (*Ent. mon. Mag.* 80: 86) formally introduced a new generic name *Ovaticoccus* for *Gymnococcus agavium* Douglas. Professor Ferris's attention was drawn to this and in his recent paper (Ferris, 1957) *Ovaticoccus* Kloet was substituted for the pre-occupied *Gymnococcus* Douglas.

The composition of the genus is at present somewhat provisional. Ferris (1955) thus included in it the seven North American species originally referred either to *Gymnococcus* or to *Fonscolombia*; two other species, one from Argentina and one from Spain, were referred to *Gymnococcus* in original descriptions. The species involved are :

1. *Coccus agavium* Douglas, 1888—Britain, France, Eritrea, U.S.A., U.S.S.R.
2. *Gymnococcus adoxus* Ferris, 1955—U.S.A. (Texas).
3. *Gymnococcus (Parrottia) agenjoi* Gomez-Menor Ortega, 1954—Spain.
4. *Fonscolombia braggi* Cockerell and Robinson, 1915—U.S.A. (Colorado).
5. *Gymnococcus lahillei* Leonardi, 1911—Argentina.
6. *Gymnococcus nativus* Parrott, 1900—U.S.A. (Kansas).
7. *Fonscolombia peninsularis* Ferris, 1921—U.S.A. (New Mexico).
8. *Gymnococcus ruber* Parrott and Cockerell, 1899—U.S.A. (New Mexico).
9. *Fonscolombia yuccae* Ferris, 1919—U.S.A. (New Mexico, Texas).

Dr. D. J. Williams, of the Commonwealth Institute of Entomology, kindly drew my attention to mounted specimens of *Pseudantonia agaves* Chiaromonte, 1929, which after examination proved to be identical with *C. agavium* Douglas. These specimens, in the Collection of the British Museum (Natural History) (Green's Collection, B.M. 1940, 180), no doubt represent a part of Chiaromonte's original material submitted to Green for identification (Chiaromonte, 1929: 22), and agree very well with the original description. Thus *Pseudantonia agaves* Chiaromonte, 1929, becomes a junior synonym of *Coccus agavium* Douglas, 1888.

Apart from *O. agavium*, of which samples from several localities were examined, only one other species, *G. ruber*, represented by a slide with some (!) type material (British Museum (Natural History) Collection), was available for examination; unfortunately this preparation is in such an unsatisfactory condition that only a few details can be seen. The nine species listed above appear, however, to form a somewhat heterogeneous group, and, as Ferris (1955: 179) remarked, further studies and information are needed for their definite disposition. The heterogeneous character of the group is also reflected in the fact that Gomez-Menor Ortega suggested a new subgenus *Parrottia*

<sup>1</sup> In S. A. Neave, 1939, *Nomenclator Zoologicus* 2: 529 there is the following entry: “*Gymnococcus* Douglas 1888, *Ent. mon. Mag.* 25: 151.—Hem.” “*Gymnococcus* Cockerell (non Douglas, 1888) 1896, *Bull. Illinois Laborat.* 4: 323.—Hem.” which is to indicate that “Cockerell in the *Bull. Illinois Laborat.* 4 is the first reference to *Gymnococcus agavium*”. (*In litt.*, G. B. Stratton, Librarian and Clerk of Publications, Zool. Soc. Lond., 18.ix.1957).

for his species *agenjoi*. It should be noted, however, that the name *Parrotia* is preoccupied by *Parrotia* MacGillivray (1921 : 394 and 458) for *Aspidiotus moorei* Green.

#### GENERIC DIAGNOSIS

The provisional composition of the genus makes the problem of generic diagnosis a difficult one. The earlier descriptions (Parrott, 1900; Newstead, 1903) are inadequate by modern standards. Borkhsenius (1950) defined the genus in some detail on the basis of specimens of *agavium* from Russia, and Ferris (1955) gave a separate diagnosis based on American specimens of the type species and then enlarged it "to permit the inclusion of the other species here assigned" (*l.c.* : 178); this procedure would appear to be the only one appropriate at present. Detailed study of various specimens of *O. agavium*, including the type material, showed that the existing diagnoses of the genus as based on the type species are somewhat incomplete. In particular the following characters have been overlooked: the presence of the tubular ducts characteristic of the family, the presence of the tooth on the claw, and the presence of characteristic oval monocular pores on the ventral side of the abdomen. Consequently the diagnosis should be amended as follows:

Referable to the family Eriococcidae as defined by Ferris (1957 : 82-83). *Adult female* with well developed legs and antennae, the latter 7-segmented; claw of the legs with tooth. Anal opening more or less displaced to ventral side of body, with well developed subanal plate; anal ring without pores, small, thin and incomplete, divided longitudinally into 2 slender crescent-shaped pieces, each with 3 small setae. Anal lobes obsolete, indicated by a group of setae. Body throughout with small unmodified setae; dorsally also with enlarged, short, somewhat acorn-shaped spines. Tubular ducts and quinquelocular pores present; ventral side, especially of the abdomen, with small oval monocular pores arranged in bands and groups. Both spiracles with a group of quinquelocular pores near the opening.

*First instar* nymph with 6-segmented antennae, the unmodified setae and dorsal acorn-shaped spines present, and with a few quinquelocular and oval pores; *second instar* nymph similar to the first, with 6-segmented antennae and with more setae, dorsal spines, quinquelocular and oval pores; *third instar male* nymph with 7-segmented antennae and with considerably more tubular ducts, but with the acorn-shaped spines normally entirely absent.

At oviposition the female enclosed in copious but poorly defined and loosely felted mass of waxy secretion. Male puparia small, oval, closely felted and well defined.

The genus, as defined above, appears to be nearest to *Onceropyga* Ferris and *Eriococcus* Signoret, but is well characterised by the condition of the anal lobes and of the anal ring, and by the presence of the ventral oval derm pores and of the dorsal acorn-shaped short spines.

#### *Ovaticoccus agavium* (Douglas, 1888)

*Coccus agaviam* Douglas, 1888.

*Gymnococcus agavium* Douglas: Cockerell (1896); Parrott (1900); Newstead (1903); Fernald (1903); Vayssière (1914); MacGillivray (1921); Borkhsenius (1949, 1950); Ferris (1955).

*Coccus (Gymnococcus) agavium* Douglas: Newstead (1897).

*Ovaticoccus agavium* (Douglas): Kloet (1944); Ferris (1957).

*Pseudantonina agaves* Chiaromonte, 1929, *syn. n.*

*Distribution and records.*—Described by Douglas in 1888 from specimens found on *Agave* sp. in the Royal Botanic Gardens, Kew, imported three years

previously from one of the Southern States of North America; information given by Newstead and Parrott refers to the same specimens, and the references by Cockerell, Fernald, MacGillivray and Kloet are purely nominal to the species. Vayssière recorded it on *Agave* sp. from France (La Mortola, près de Vintimille, Coll. A. Vuillest); Chiaromonte (as *Pseudantonina agaves* sp. n.) on *Agave sisalana* Perrine from East Africa (Eritrea); Borkhsenius on *Agave* and *Dracaena* from U.S.S.R. in hothouses of Leningrad (Russia), Odessa (Ukraine) and Chernovtse (Bukovina); and Ferris from U.S.A.: on *Agave* sp. in the New York Botanical Gardens; *Agave lecheguilla* Torr. at Mt. Franklin, El Paso, Texas; *Agave* sp. at Peach Spring, Arizona; and *Agave nevadensis* (Engelm. ex Greenm. and Roush) Hester from Ivanpah Mountains, Nevada.

*Material examined.*—The following were available for the present study: Specimens of the type material preserved in the British Museum (Natural History), supplemented by specimens collected at Kew in 1956 and 1957 on *Agave* sp., *A. scheuermanni* Trelease, *A. decipiens* Baker, *A. parryi* Engelm., *A. lecheguilla* Torr. Also mounted specimens in the British Museum (Natural History) from: France on *Agave* sp., ex coll. Vayssière, and on *Agave* sp. from Antibes (A.M.), 8.viii.1929 (*A. Balachowsky*); East Africa (Eritrea) labelled *Pseudantonina agaves* Chiaromonte, on *Agave sisalana*, xii.1926 (*Paoli*).

*Adult female.*—*Shape and size* of body varies according to age. Immediately after first moult young adult female elongated, almost parallel-sided, with both ends rounded, and segmentation of body distinct; when mounted, about 1155  $\mu$  long and 450  $\mu$  wide, with anal opening ventral but near posterior apex, and the setae marking the anal lobes marginal. During following growing period size gradually increases because of considerable expansion especially of dorsal derm, the fully grown ovipositing female becoming globular, with segmentation of body obscure; when mounted (fig. 1A) broadly oval, up to 2250  $\mu$  long and 1680  $\mu$  wide, with anal opening and anal lobe setae ventral, at some distance from margin. Old individuals relatively much broader than young ones, but the increase in both dimensions, although not the same, quite regular; relation between length ( $x$ ) and width ( $y$ ) of mounted specimens well expressed by the regression line formula ( $x$  and  $y$  in  $\mu$ ):  $y = 1.18x - 58$ . *Derm* membranous throughout, dense and rugose in young individuals, thin and transparent in old. *Antennae* (fig. 1B) 7-segmented, inserted near median line at anterior end of body, short, 178–199  $\mu$  long (average 189), tapering gradually from about 29  $\mu$  wide at level of second segment, to 17.5  $\mu$  at apex. Length of segments 1 to 7 in  $\mu$  (averages in brackets): 31.5–38.5 (35.1); 28.0–31.5 (29.8); 28.0–35.0 (29.9); 21.0–28.0 (24.1); 21.0–24.5 (21.3); 17.5–24.5 (21.0); 28.0–31.5 (29.2); first segment about 48  $\mu$  wide at base, second, fourth, fifth and sixth almost quadrate, and third and fifth longer than wide. Distribution of setae shown on figure (1B); presence of one stout finger-like seta on fifth segment, sixth and seventh segments each with one of the setae thicker than the others, and third with no setae at all, appear to be characteristic. *Eyes* small, simple, about 26  $\mu$  in diameter, situated laterally, at some distance from base of antennae. *Rostrum* short and wide, apparently 3-segmented. *Legs* small, short and stout anterior (fig. 1C) somewhat shorter and stouter than posterior (fig. 1D); total length of legs in  $\mu$ : anterior 262–287 (average 274.5); middle 269–301 (280.8); posterior 283–311 (296.0). Segments of legs well developed: *coxa* of usual subtriangular shape, hinged laterally to the small but distinct forked rudiment of coxal process (?) of pleuron; *coxa* of hind legs with a few irregular transparent loculi; *trochanter* triangular with 2 oval sensoria on each side at base, and 2 setae, one long and one short, at apex; *femur* broad, about 81  $\mu$  long in anterior and middle legs and 84  $\mu$  long in posterior legs, well sclerotised dorsally but membranous ventrally; *tibia* somewhat imperfectly sclerotised distally,

broader and shorter than *tarsus* which is slender, tapering distally and with 2 apically enlarged tarsal digitules; average length of tibia + tarsus of anterior, middle and posterior legs in  $\mu$ : 53.7 + 61.6; 55.4 + 60.0; 57.2 + 69.4, respectively. *Claw* about 20  $\mu$  long, slender, with small but distinct tooth near apex, and with 2, about 30  $\mu$  long, apically

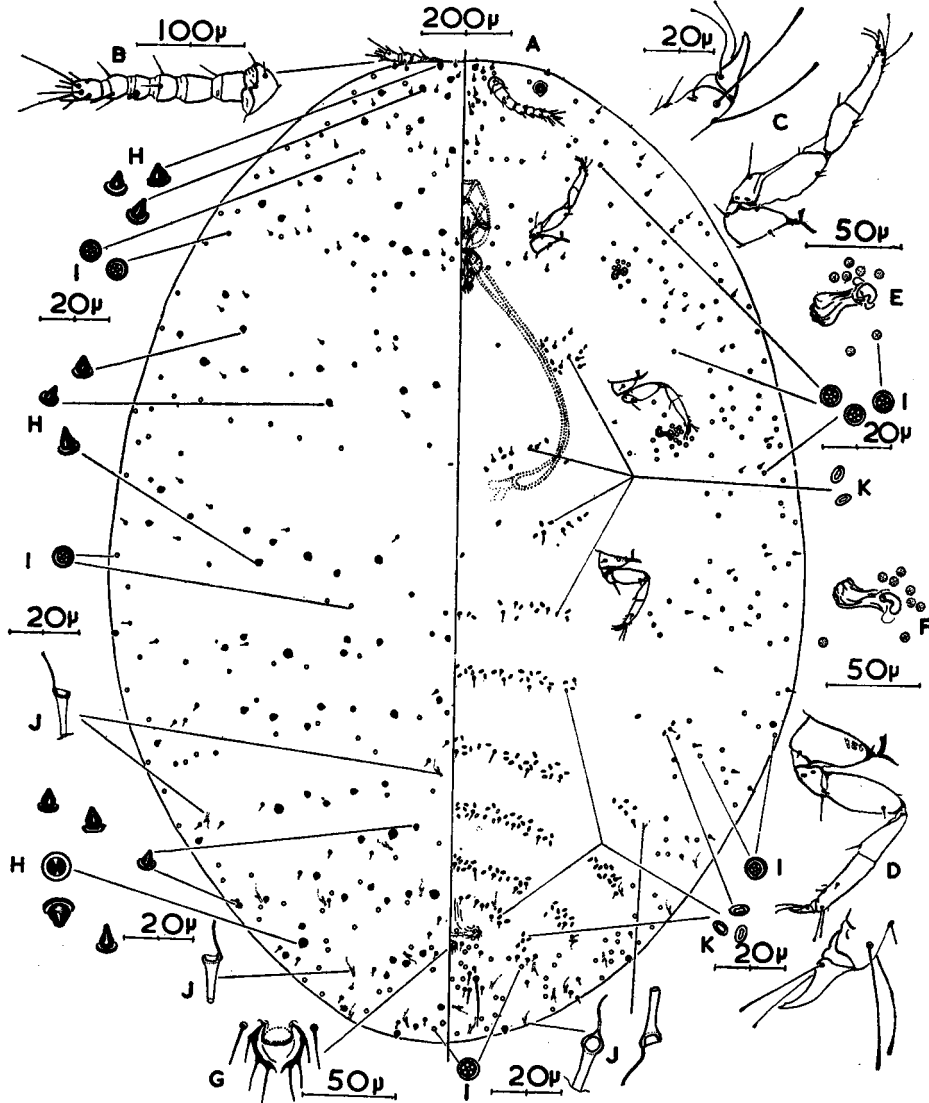


FIG. 1.—*Ovaticoccus agavium* (Douglas) on *Agave* sp. from Royal Botanic Gardens, Kew. (A) Adult female; (B) antenna; (C) and (D) anterior and posterior legs respectively; (E) and (F) anterior and posterior spiracles respectively; (G) anal ring; (H) dorsal spines; (I) quinquelocular pores; (J) tubular ducts; (K) oval pores. The scale lines marked 20 $\mu$  refer to figs. H, I, J, K, and to detail of the claw in figs. C and D; those marked 50 $\mu$  to figs. E, F, G, and to the whole legs in figs. C and D; 100 $\mu$  to fig. B; and 200 $\mu$  to fig. A.

enlarged digitules. Both *spiracles* (fig. 1E, F) with a wide and short bar supporting a small opening and with a group of several quinquelocular derm pores in front of spiracular opening. *Anal opening* (fig. 1G) ventral, more or less removed from posterior apex, small, with the subanal plate well developed and overlapping about one-third to one-half of anal opening. *Anal ring*, small, thin and without pores, incomplete, composed of 2 separate lateral crescent-shaped pieces, each with 3 very fine, 15–24  $\mu$  long setae; laterally, near anterior end of each piece, one stouter, 21–27  $\mu$  long, para-anal seta. *Vulvar opening* transverse, not well defined, situated immediately in front of anal opening. *Anal lobes* indicated by a group of 4 setae: one large, 112–129.5  $\mu$  long, and 3 smaller, 17.5–31.5, 24.5–42.0, 35.0–52.5  $\mu$  long, respectively. *Derm vestiture* composed of short enlarged spines, unmodified setae, quinquelocular pores, tubular ducts, and oval monolocular pores. *Spines* (fig. 1H) narrowed at base, enlarged in the middle and rapidly tapering apically, with apex obtuse; each inserted within a well developed basal ring, or collar. Size of spines varies considerably: length from 4.5 to 9.0  $\mu$ ; width from 3.0 to 7.5  $\mu$ ; diameter of collar from 4.5 to 10.5  $\mu$ . Distributed on dorsum in a pattern composed of: a scattered group on the head, 3 transverse bands on thorax and 7 transverse irregular rows on abdomen (segments 1–7); the bands and rows occupying middle of segments. Posterior abdominal rows composed of comparatively few spines, the number increasing in anterior rows and bands, but actual number present varying considerably in different individuals; e.g. in last abdominal row from 5 to 9, in first from 9 to 19, and in mesothoracic band from 13 to 23; consequently total number of spines shows a considerable range of individual variation, from 120 to 182. Actual number of spines in different rows and in different individuals appears to be inversely correlated with size of spines; thus the posterior rows are composed of fewer but larger spines, while the anterior bands are composed of numerous but smaller ones; and in individuals with a low total number large and conspicuous spines predominate, while in those with a high number they are smaller and less conspicuous. *Unmodified setae* distributed throughout body in usual segmental rows and groups; setae on dorsum and margins small, 7.5–15.0  $\mu$  long, but on venter of variable size, some reaching 45.0  $\mu$ . Quinquelocular pores (fig. 1I), about 5  $\mu$  in diameter, scattered and numerous on whole marginal area of body including head and posterior end of abdomen, and on dorsum in transverse rows composed of a few widely separated pores occupying posterior part of tergites. Single quinquelocular pores occur also on ventral side of thorax and occasionally on anterior abdominal sternites. Tubular ducts (fig. 1J) 13.0–15.0  $\mu$  long, with inner cup 3.0–3.5  $\mu$  deep and 6.0  $\mu$  in diameter; distributed in very variable numbers on abdomen, forming there transverse median dorsal rows occupying anterior part of fourth to eighth abdominal tergites, and irregularly scattered on marginal area of first to eighth abdominal segments; very occasionally single ducts present on tergites of anterior abdominal segments and on thorax. On fifth, sixth, seventh and eighth segment, ducts numerous, 8–15, 8–16, 7–15 and 4–7, respectively, and the dorsal rows more or less complete; dorsal row on fourth segment often incomplete, and marginal ducts on first and second abdominal segment often entirely absent. Total number of ducts varies individually from 35 to 73. *Oval monolocular derm pores* (apparently not previously observed): oval, about 6  $\mu$  by 4  $\mu$ , with poorly defined rim and centre elongated, somewhat constricted in middle (fig. 1K); confined to ventral side of body and arranged on abdomen in median transverse bands on first to sixth segments, and submarginal groups on second to sixth, and on thorax in anteromedian groups at base of middle and posterior legs, and a group near median line at level of second spiracles. Here again number of pores varies considerably; thus, median abdominal bands on first, second, third, fourth, fifth and sixth segments composed of 4–20, 13–28, 18–41, 9–31 and 0–8 pores, respectively; submarginal groups on second, third, fourth, fifth and sixth segments of 0–2, 0–8, 2–16, and 0–5 pores, respectively; number in the 3 thoracic groups varies from 1–10 pores. Submarginal groups quite characteristic, the oval pores being accompanied by 1–3 unmodified setae and 1 or 2 tubular ducts. No correlation whatsoever apparent between numbers of spines, tubular ducts and oval derm pores.

This description is based on a detailed study of 20 specimens from Kew Gardens, including two specimens from the type material.

*Immature stages.*—First and second instar nymphs generally resemble the young adult female in shape of body, conditions of anal opening, anal ring, anal lobes, and presence of antennae, legs, eyes and dorsal spines; both have 6-segmented antennae, with finger-like setae on fourth segment. No obvious sexual differentiation apparent in these instars. *First instar* nymph small, about 450  $\mu$  long and 195  $\mu$  wide on hatching, and up to 600  $\mu$  long and 285  $\mu$  wide when fully grown at time of first moult. Legs short and stout, with tooth on claw hardly visible, probably absent. Dorsal spines in 6 longitudinal rows, well defined and regular on abdomen and thorax, but somewhat confused on head. The unmodified setae in reduced number, arranged in usual segmental transverse rows on venter. Oval derm pores arranged in a single subventral longitudinal row on each side of body, extending from third to sixth abdominal segments, each segment with a single pore in the row except the sixth which often carries 2. First and second abdominal segments each with one quinquelocular pore on each side, situated somewhat nearer median line than the oval pores. Ventral side of thorax with 2 longitudinal rows of pores roughly in line with inner margin of base of antennae, each row composed of 4 pores, one each medially at base of each coxa, and one behind base of antennae; structure of these pores difficult to see, but at least postantennal ones definitely trilocular. One quinquelocular pore also present near opening of each spiracle. *Second instar* nymph about 675  $\mu$  long and 300  $\mu$  wide immediately after first moult, and up to 975  $\mu$  long and 450  $\mu$  wide when fully grown (at time of second moult). Legs longer and more slender than in first instar, and claw with small but distinct tooth. Second and especially third segment of antennae relatively longer than in first instar. Dorsal spines considerably more numerous, in about 8 to 10 longitudinal rows, the new, smaller setae being added and irregularly interpolated between the 6 rows of larger spines already present in first instar. The unmodified setae quite numerous and differentiated into longer and shorter ones on venter. Submarginal longitudinal rows of oval pores on 3–6 abdominal segments now composed of 1–2 pores on each segment in the row, and single pores occur irregularly on sternites of abdomen. Quinquelocular pores fairly numerous, scattered along whole of marginal area of body; a few occur also on ventral side of thorax and on posterior parts of tergites, forming there rudiments of the transverse rows which are fully developed in the adult female; 1 or 2 of these pores present near opening of each spiracle.

In female series second instar nymphs moult (second moult) directly into the young adult female; in male series into the *third instar male nymph*, the structural detail of which is represented in figure 2. It has 7-segmented antennae, with the 3 apical segments distinctly narrower than the others; fifth segment carries the finger-like stout seta. The acorn-shaped spines absent, except for rare occurrence of a single spine here and there; instead, dorsum beset with rather strong pointed unmodified setae. Tubular ducts slightly smaller than those in adult female, about 12  $\mu$  long with the cup 3  $\mu$  deep and 4.5  $\mu$  in diameter; very numerous, scattered all over dorsum. Distribution of oval pores, quinquelocular pores, and unmodified setae very similar to that of second instar nymph. The most interesting feature, however, is the presence in front of the anal opening of a transverse, slit-like structure with the appearance of the female genital opening, the vulva. This caused some confusion at first, because the presence of the vulvar opening is generally considered to be a reliable recognition character of the young adult female (before the eggs are formed). Careful observation of this, and of the following 2 instars (prepupa and pupa), has shown that it is a transverse pocket-like invagination of the derm with the margins (lips) well sclerotised, and from which, by a series of invaginations and evaginations in prepupal and pupal stages, the external male genitalia are formed.

*Adult male.*—No detailed study has been made of the adult males. They are dark red, robust insects, about 1115  $\mu$  long from tip of head to end of genital organs, about 375  $\mu$  wide at level of mesothorax, and the wing span 1770  $\mu$ . External genital organs at end of

abdomen broadly conical, about 150  $\mu$  long. Head with two pairs of simple eyes and 10-segmented antennae, the apical segments of which are globular (apparently characteristic for the Eriococcid male as opposed to elongated apical segments in the Pseudococcid male).

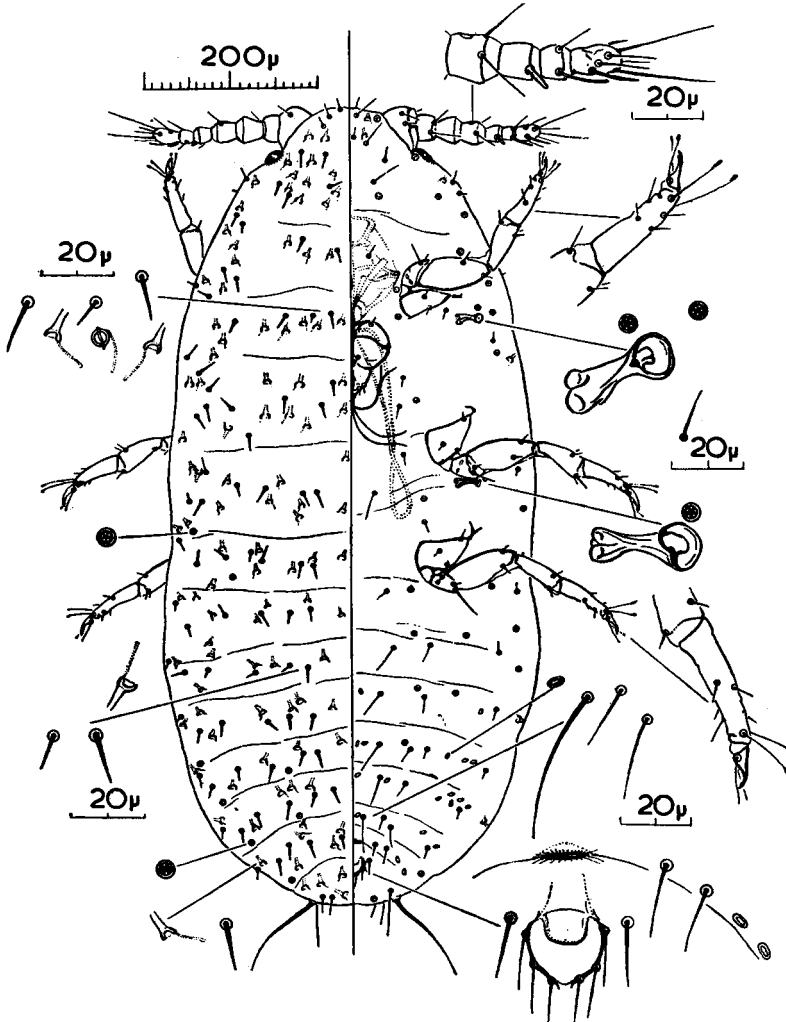


FIG. 2.—*Ovaticoccus agavium* (Douglas) on *Agave* sp. from Royal Botanic Gardens, Kew. Third instar male nymph.

*Habitat.*—On various species of *Agave*; the immature stages and the young adult females occur at the base of the leaves of the host plant, producing a small amount of waxy secretion; at oviposition the female is enclosed within a copious, loosely felted, irregular mass of waxy secretion. The ovipositing females appear to have developed a gregarious habit, with the result that the individual waxy secretions coalesce, forming a continuous mass of loosely felted wax in the narrow spaces at the base of leaves, concealing numerous females



with their young progeny. The male puparia occur mainly on the lower surface of the leaves, apparently at any distance from the base; they are small, well defined, oval and closely felted. At the time of my visit to Kew Gardens in June, 1957, all stages were present. The insects were particularly numerous on a large old *Agave* sp., which—I was told—may well be the same specimen of *Agave* sp. from which Douglas obtained his insects.

One of the slides with the specimens of the type material in the British Museum (Natural History) was selected and marked as the lectotype. Part of the material on which the present study was based, including adult females and immature stages, will also be deposited in the British Museum.

#### SUMMARY

*Ovaticoccus agavium* (Douglas, 1888) has been rediscovered in the hothouses of the Royal Botanic Gardens at Kew. The generic name and the composition of the genus, which at present provisionally includes nine species, is discussed. The amended definition of the genus as based on the type species is given, and the adult female redescribed and illustrated in detail on the basis of material which includes the type specimens; a lectotype is designated. The first and second instar nymphs are briefly described, and the third instar male nymph described and illustrated in detail. *Pseudantonina agaves* Chiaromonte, 1929 is conspecific and becomes a junior synonym of *C. agavium* Douglas, 1888.

#### REFERENCES

- BORKHSENIUS, N. S., 1949, *Fauna SSSR*. 7, *Pseudococcidae*. 382 pp. Akad. Nauk., Moskva-Leningrad.
- 1950, Tchervetsi i Shchitovki SSSR. [Mealy-bugs and scales of USSR (Coccoidea).] *Keys to Fauna of SSSR*. No. 32, 250 pp. [In Russian.]
- COCKERELL, T. D. A., 1896, A check list of the Coccidae. *Bull. Ill. Lab. nat. Hist.* 4 : 318–39.
- 1899, Tables for determination of the genera of Coccidae. *Canad. Ent.* 31 : 273–9.
- and PARROTT, P. J., 1899, Contributions to the knowledge of the Coccidae. *Industrialist* 1899 : 159–65.
- and ROBINSON, E., 1915, Descriptions and records of Coccidae. *Bull. Amer. Mus. nat. Hist.* 34 : 105–13.
- CHIAROMONTE, A., 1929, Nota preliminare su una nuova specie di *Pseudantonina* dannosa all'*Agave sisalana* nella Colonia Eritrea. *Boll. Soc. ent. ital.* 61 : 18–24.
- DOUGLAS, J. W., 1888, Notes on some British and exotic Coccidae (No. 12). *Ent. mon. Mag.* 25 : 150–1.
- FERNALD, M. E., 1903, A catalogue of the Coccidae of the World. *Bull. Hatch agric. Exp. Sta.* 88 : 79.
- FERRIS, G. F., 1919, A contribution to the knowledge of the Coccidae of South-western United States. (*Leland Stanf. Univ. Publ. Univ. Ser.*). 68 pp.
- 1921, Report upon a collection of Coccidae from Lower California. *Stanf. Univ. Publ. Biol. Sci.* 1 : 59–132.
- 1955, *Atlas of the scale insects of North America* 7 : 182–3.
- 1957, A review of the family Eriococcidae (Insecta : Coccoidea). *Micro-entomology* 22 : 81–89.

182 K. Boratyński on *Ovaticoccus agavium* (Douglas) (Homoptera : Coccoidea)

- KLOET, G. S., 1944, A new generic name in the Coccidae (Hemiptera). *Ent. mon. Mag.* **80** : 86.
- LAWSON, P. B., 1918, Scale Insects injurious to fruit and shade trees. The Coccidae of Kansas. *Bull. Kansas Univ., Biol. Ser.* **18** : 161-275.
- LEONARDI, G., 1911, Contributo alla conoscenza delle Cocciniglie della Repubblica Argentina. *Boll. Lab. Zool. Portici* **5** : 237-84.
- MACGILLIVRAY, A. D., 1921, *The Coccidae*. Urbana, Illinois.
- NEWSTEAD, R., 1897, On *Coccus agavium*, Douglas. *Ent. mon. Mag.* **33** : 12-13.
- 1903, *Monograph of the Coccidae of the British Islands* **2**. Ray Society : London.
- GOMEZ-MENOR ORTEGA, J., 1954, Adiciones a los "Cóccidos de España" (tercera nota). *Eos, Madr.* **30** : 119-48.
- PARROTT, P. J., 1900, Scale Insects from Kansas grasses. *Bull. Kansas agric. Exp. Sta.* **98** : 133-46.
- VAYSSIÈRE, P., 1914, Note sur quelques Coccides nouveaux ou peu connus (Hem.). *Bull. Soc. ent. Fr.* **1914** : 206-8.
- ZOPF, W., 1887, Mycetozoa. In A. Schenk, *Handbuch der Botanik* **3** (2). Breslau. [*Gymnococcus*, p. 162.]