

NOTES ON TWO NEW ORIENTAL PARASITES OF THE COFFEE
MEALY-BUG (*PSEUDOCOCCUS LILACINUS*).

By CH. FERRIÈRE, D.Sc.

In connection with his biological researches for the control of the coffee mealy-bugs in Africa, Mr. R. H. Le Pelley recently made a trip to the Far East in order to try to find some Oriental parasites of *Pseudococcus lilacinus* which could be introduced into Kenya Colony.

In the Philippine Islands he was able to breed two species, both belonging to the ENCYRTIDAE. One, specially important, a new species of the genus *Pseudaphycus*, Clausen, has been sent for acclimatisation to Kenya; the other, an *Anagyrs*, Howard, belonging to a group most species of which attack mealy-bugs in different countries, proved to be also a new species. The types of the two species described here are deposited in the British Museum.

***Pseudaphycus orientalis*, sp. nov.**

♀♂. Head orange-yellow, the cheeks and mouth pale yellow, almost white, the ocelli and tip of mandibles reddish brown, the eyes black. Thorax with the mesonotum, axillae and scutellum orange-yellow, the scutellum with a brown transverse stripe behind the middle; posterior margin of pronotum, the tegulae and the lower part of the thorax whitish; anterior part of pronotum and the propodeum brownish. Abdomen yellowish with transverse brown stripes, and the tip of the ovipositor broadly brown. Antennae with the scape yellow below, brown above, the pedicel and funicle more or less brown, the 5th joint (except a line below) and the club white. Legs whitish, the middle and hind tibiae with two brown annelli more or less well marked, the tarsi yellowish. Wings with a faint dusky cloud below the stigmal vein beyond the oblique hairless streak.

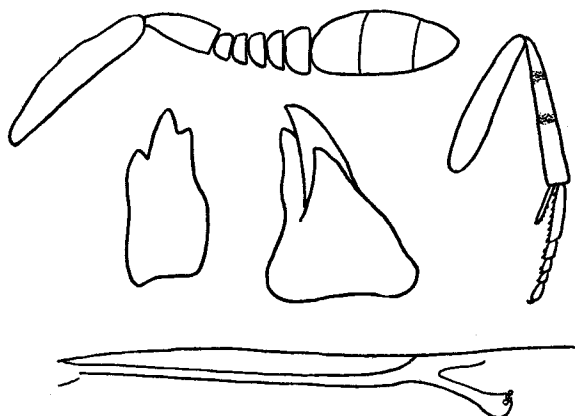


Fig. 1. *Pseudaphycus orientalis*, sp. n. ♀: antenna, mandible from the side and from below, middle leg and wing nervature.

♀. Head rounded in front, the face inflexed; fronto-vertex shagreened, about twice as long as wide, the inner margin of the eyes parallel; ocelli forming an acute-angled triangle, the hind ocelli half as far from each other as from the front

ocellus and close to the eye margin. Mandibles with three teeth, the middle one the longest, curved, the upper tooth distinctly shorter and the lower tooth the shortest. Antennae inserted at the base of the face near the sides of the clypeus; scape slightly broadened, reaching little above the antennal furrows; pedicel narrow, a little more than twice as long as wide and as long as the first four funicle joints united; funicle with 5 joints, the 1st rounded, the following increasing in width, transverse, the 5th larger than the 4th; club large, with 3 joints, longer than the funicle. Thorax finely shagreened, dull, covered with white ciliae; mesonotum transverse, about two and a-half times as broad as long; axillae triangular, meeting in the middle; scutellum strongly narrowed behind; propodeon very short in the middle, where it is hidden below the tip of the scutellum, broadened on the sides. Wings normal; marginal vein punctiform, stigmal vein rounded at tip and about twice as long as the postmarginal. Wings closely ciliated; the oblique hairless streak interrupted below the middle and not quite reaching the posterior margin of the wing. Legs normal, the metatarsi as long as the following tarsal joints together. Abdomen triangular, shorter than the thorax. Ovipositor protruding by about 1/5 of the length of the abdomen.

♂. Similar, slightly smaller, the antennae with the pedicel narrower, the funicle joints shorter and more transverse, the 5 joints together scarcely longer than the pedicel; club not divided, large, almost twice as long as the funicle.

Length: ♀♂, 0.50–0.75 mm.

PHILIPPINE IS.: Los Baños, ix.1936.

Described from 8♀ and 4♂ mounted dry and 28♀ and 9♂ in microscopical preparations.

This is the first species of *Pseudaphycus* found in the Oriental region. Of the other seven known species, four are from the United States, one has been bred in Mexico and introduced into Hawaii, and two have been found in Europe. All are parasites in DACTYLOPIINAE, mainly *Pseudococcus* spp.

We have compared the descriptions of all these species and have drawn from them, with the aid of a small key of American species given by Timberlake (1916), a table of all the known species, from which the position of the new Oriental species will best be seen.

- | | |
|---|------------------------------|
| 1.—Wings entirely hyaline..... | 2 |
| Wings more or less (sometimes only slightly) infuscated..... | 3 |
| 2.—Face and cheeks normal. Coloration bright yellow. Pubescence of mesonotum dark. Size 1.08–1.44 mm..... | <i>utilis</i> , Timb. |
| Face and cheeks shortened. Coloration pale yellow. Pubescence of mesonotum white. Size 0.6–0.9 mm..... | <i>graminicola</i> , Timb. |
| 3.—Ovipositor barely protruding. Fifth funicle joint and club white..... | <i>prosopidis</i> , Timb. |
| Ovipositor protruding at least 1/5 the length of the abdomen..... | 4 |
| 4.—Wings with two distinct transverse clouds, widely separated..... | <i>maculipennis</i> , Mercet |
| Wings with a faint brownish cloud beyond the oblique hairless streak, sometimes interrupted by a narrow hyaline line..... | 5 |
| 5.—Fronto-vertex as long as wide; ocelli in an equilateral triangle..... | <i>austracus</i> , Mercet |
| Fronto-vertex two or three times as long as wide; ocelli in an acute-angled triangle..... | 6 |

- 6.—Oblique hairless streak of forewings not interrupted.....*websteri*, Timb.
 Oblique hairless streak interrupted a little beyond middle and not quite reaching the posterior margin of wing.....7
- 7.—Fronto-vertex nearly three times as long as wide, the dorsal orbits of eyes diverging anteriorly. Pedicel little longer than the first three funicle joints combined.....*angelicus*, Howard
 Fronto-vertex only twice as long as wide, the dorsal orbits of eyes parallel.
 Pedicel as long as the first four funicle joints combined.....*orientalis*, sp. n.
- The genus *Pseudaphycus*, Clausen, is very closely related to the genus *Acerophagus*, Smith. Timberlake (1916) in his key to the genera separates them only by the form of the mandibles, thus :

- “ 4.—Two upper teeth of mandibles nearly equal, lower tooth more basal and smaller*Acerophagus* Smith
 Upper and lower teeth of mandibles equal, middle tooth larger and very sharp*Pseudaphycus* Clausen.”

Judging only by this character, the species described here should come under *Acerophagus*, especially as Timberlake has drawn figures of mandibles of this genus in which the middle tooth is larger than the upper tooth. In his description of *Acerophagus debilis*, Timb. 1924, from Hawaii, he says : “ Mandibles of the usual type, with the outer tooth far basad and the middle tooth considerably larger than the inner tooth.” This does not agree with the character given in the key, and his drawing is very much the same as our figure of the mandible of *Pseudaphycus orientalis*. This last species is, however, certainly a *Pseudaphycus*, more closely related to *P. angelicus*, How., than to any other species.

After comparison of the generic characters given by Timberlake and of the description of all the species of both genera, we believe that these genera can best be distinguished by the following characters :

- Fronto-vertex generally broad, as long as wide or at least less than twice as long as wide, the ocelli more frequently arranged in a right or obtuse-angled triangle. Body entirely yellow, antennae and legs more or less concolorous, the club not white.....*Acerophagus*, Smith
 Fronto-vertex generally narrower, twice (or more) as long as wide, the ocelli in an equilateral or acute-angled triangle. Body yellow or orange, more or less dusky, the underside paler yellow ; antennae more or less brownish, the club whitish.....*Pseudaphycus*, Claus.

Anagyrus lilacini, sp. nov.

♀. Head orange, slightly darkened at the base of the cheeks, occiput black except at sides. Thorax black above, slightly reddish on the sides of pro- and mesonotum and near the tip of the scutellum ; mesopleurae entirely orange-yellow, propleurae whitish ; tegulae white. Abdomen black. Antennae pale orange-yellow, the club more white ; scape black with an oblique yellow stripe before the tip, pedicel black at base, yellow at tip, 1st funicle joint black except at apex. Legs whitish, with black lines or spots at end of femora and at base of tibiae ; tarsi orange-yellow. Wings hyaline.

Head dull, finely granulated, face and cheeks covered with short white ciliae ; eyes large, converging slightly above, finely and densely ciliate ; fronto-vertex about 1.5 times as long as wide in the middle, ocelli in an obtuse-angled triangle, the posterior ocelli as far from the eye margin and from the hind margin of head as their own diameter. Cheeks short, about as long as half the breadth of an eye. Antennae inserted near the mouth ; scape moderately broad, a little more than twice as long as broad ; pedicel slightly more than twice as long as broad ; 1st funicle joint as long as

the pedicel, but narrower, the following joints slightly shorter, the 6th still almost twice as long as broad; club narrow, longer than the two preceding joints together. Thorax normal, not depressed. Mesonotum and scutellum dull, finely punctate, densely covered by a short white pubescence; mesonotum about twice as broad as long; scutellum triangular, its apex extending over the middle of the postscutellum and reaching the base of the propodeon. Axillae meeting in the middle. Propodeon narrow in the middle, broader on the sides, the spiracles small and rounded. Wings moderately broad, reaching beyond the end of the abdomen; marginal vein very short, not or scarcely longer than broad; postmarginal vein absent; stigmal vein narrow, only slightly broadened apically and almost three times as long as the marginal. Disk of wing entirely covered with short ciliae, except for the oblique hairless line, which is broadly interrupted below the middle. Abdomen triangular, as long as head and thorax together, compressed and pointed at apex. Ovipositor scarcely or very slightly protruding, the sheaths compressed. Hypopygium reaching a little beyond the tip of the last tergite.

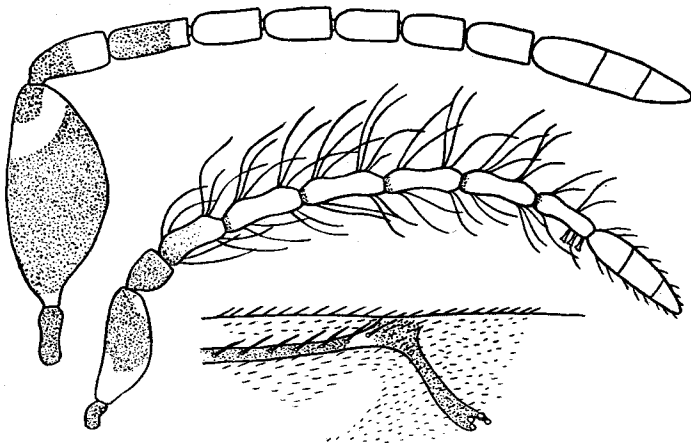


Fig. 2. *Anagyrus lilacini*, sp. n.: antennae of female and male; wing nervature.

♂. Body black, mandibles reddish, sides of pronotum whitish, anterior part of mesopleurae slightly orange. Antennae white, the scape with a broad black oblique stripe behind the middle, the pedicel black, the 1st funicle joint brown and the base of the other funicle joints with a small black spot.

Head, seen from in front, rounded or slightly longer than broad, fronto-vertex broader than long, the ocelli forming a right-angled triangle, the hind ocelli near the margin of the head. Antennae inserted near the mouth; scape short, about twice as long as broad and as long as the pedicel and 1st funicle joint together; pedicel not longer than broad; 1st funicle joint about 1.5 times as long as the pedicel but narrower, all the other funicle joints sub-equal in length, except the last which is a little shorter; each has two irregular whorls of long curved hairs; club not quite as long as the two preceding joints together, with shorter hairs; there is a row of three conidium-like setae near the end of the 6th funicle joint, but none at the base of the club. Thorax and abdomen smaller than in the female, the abdomen shorter than the thorax. Wings shorter and broader, the discal ciliation fine and white, not easily seen; marginal vein punctiform, as long as broad; postmarginal vein almost absent; stigmal vein somewhat shorter and broader at apex than in female.

Length: ♀ 1.75 mm.; ♂ 1 mm.

PHILIPPINE IS.: Los Baños, ix.1936.

Described from 5 ♀ and 3 ♂.

This species belongs to a group of *Anagyrus*-species which are closely related in the coloration of the body and antennae. It is with some reluctance that we add a new species to this group, several species of which may be only varieties or geographical races of a widely distributed species. But it differs sufficiently from all other known species to require a new name, and systematically, with our present knowledge, it is of no great importance if this form is considered a distinct species or a race.

It is specially related to *Anagyrus greeni*, Howard, from Ceylon and to *A. pseudococci*, Girault, from South Europe.

From *A. greeni*, Howard 1896, it differs in having the dorsum of the thorax blackish and the legs with dark spots and lines. Moreover the fronto-vertex is distinctly longer than broad, whereas Timberlake (1932) says for this species: "Fronto-vertex broader than long." Also the ovipositor is not "distinctly protruded."

From *A. pseudococci*, Girault 1915, of which we have examined specimens from Algeria, it differs specially by the relative length of the antennal joints. In *pseudococci* the scape is broader and larger, the pedicel about 1.5 times as long as the 1st funicle joint and the 6th joint is less than 1.5 times as long as broad. The vertex is also narrower and the thorax is more yellowish.

A. bohemani, Westwood, as redescribed by Mercet (1921), should also belong to this group. But according to Westwood the antennae are brown with only the last joint white, and an old specimen in the British Museum under that name agrees with Westwood's description. We believe therefore that the *bohemani* of Mercet is a synonym of *pseudococci*, Girault. The specimens received from Algeria, parasites of *Pseudococcus vitis*, agree as well with Mercet's description of *A. bohemani* from Spain as with Girault's description of *A. pseudococci* from Sicily.

Anagyrus saccharicola, Timberlake 1932, found in the Philippine Is. on *Trionymus sacchari*, Cock., differs by the strongly depressed form of the body of the female, the thorax being "scarcely one half as thick dorso-ventrally as the greatest width" and the apex of the four-sided scutellum being "not at all elevated above level of propodeum and fitting into a depression in the middle of the latter." Moreover the head and thorax are much more orange-yellow.

A. dactylopii, Howard, a parasite of *Pseudococcus filamentosus* in China, introduced into Hawaii, has, according to Timberlake (1932), the head and thorax almost entirely orange-yellow, the eyes almost bare (whereas in most other species they are distinctly and coarsely ciliated), the pedicel clearly longer than the 1st funicle joint and the postmarginal vein distinct, a little shorter than the marginal.

A. aurantifrons, Compere 1926, bred from *Pseudococcus* spp. in Africa, of which we have series of specimens obtained from the coffee mealybugs in Kenya, differs especially by the much broader scape, the longer pedicel, which is longer than the 1st funicle joint, the narrow funicle, the last joint of which is almost quadrate, and the longer marginal vein, which is about twice as long as broad.

References.

- COMPERE, H. (1926). Univ. Calif. Publ. Ent. **4**, p. 15.
 GIRAULT, A. A. (1915). Entomologist **48**, p. 185.
 HOWARD, L. O. (1896). Proc. U.S. Nat. Mus. **18**, p. 639.
 MERCET, R. G. (1921). Fauna Iberica, Encirtidos, p. 136.
 —. (1923). Bol. Soc. esp. Hist. nat. **23**, p. 140.
 —. (1925). Eos **1**, p. 10.

- TIMBERLAKE, P. H. (1916.) Proc. U.S. Nat. Mus. **50**, p. 569.
- . (1918). Univ. Calif. Publ. Ent. **1**, p. 347.
- . (1922). Proc. Haw. Ent. Soc. **5**, p. 323.
- . (1924). Univ. Calif. Publ. Ent. **3**, p. 223.
- . (1924). Proc. Haw. Ent. Soc. **5**, p. 395.
- . (1932). Proc. Haw. Ent. Soc. **8**, p. 159.

Reprinted from the BULLETIN OF ENTOMOLOGICAL RESEARCH, VOL. 28, Part 2,
July, 1937.