

NO. XII.—NOTES ON THE COCCIDÆ COLLECTED BY THE PERCY SLADEN TRUST EXPEDITION TO THE INDIAN OCEAN: SUPPLEMENTED BY A COLLECTION RECEIVED FROM MR. R. DUPONT, DIRECTOR OF AGRICULTURE, SEYCHELLES.

By E. ERNEST GREEN, *F.E.S., F.Z.S., Government Entomologist, Ceylon.*

(Communicated by J. STANLEY GARDINER, *M.A., F.L.S.*)

(Plate 21 and Text-figure 47.)

Read 20th June, 1907.

THE most noticeable feature of the collections is the comparatively cosmopolitan character of the species. Not a single peculiar species was found amongst the collection made by the Gardiner expedition, while—with the exception of *Ceroplastes tenuitectus*, which appears to be very distinct—the new species described from the Dupont collection are all closely allied to well-known and widely distributed forms. *Mytilaspis auriculata* belongs to the group of which *M. pomorum* may be recognized as the type, the species of which are very difficult to separate. *Pulvinaria antigoni* differs from *psidii* principally in a modification of the marginal hairs. Another species, *Lecanium frontale*, is so far recorded elsewhere from Ceylon only; but it must be remembered that our knowledge of the Coccidæ of the tropical regions is still very incomplete. The long series of *Lecanium tessellatum* in Mr. Gardiner's collection provides a very complete chain of links connecting Signoret's type with *L. perforatum* of Newstead and *L. subtessellatum*, mihi, proving—what I have for some time suspected—that these reputed species are specifically inseparable.

In the following catalogue of species, those marked with an * are represented in the Gardiner collection, while the mark † indicates the species collected by Mr. Dupont. The remaining (unmarked) species have been previously recorded from the area under consideration.

The generic names employed are those that have been in general use to within the last few years. A number of very radical changes in the nomenclature have been put forward (principally by American entomologists) and brought together in Mrs. Fernald's 'Catalogue of the Coccidæ of the World' (1903); but, as there will probably be still further and (I hope) final changes in the 'Genera Insectorum' (now in course of publication), I prefer to retain for the present the well-known names with which we have become familiarized.

CATALOGUE OF COCCIDÆ FROM THE REGION OF THE EXPEDITION.

1. *†*Icerya seychellarum* (Westwood).

On "Bois Malgache," Darros I., Amirantes, 13.x.05.

„ *Casuarina*, Desroches, 15.x.05; Darros I., Amirantes, 12.x.05.

„ undetermined plant, Desroches, 15.x.05; Mahé, Seychelles (2000 ft.).

„ *Musa*, Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

„ *Citrus*, Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

„ "Star apple," Cascade (800 ft.), Mahé, Seychelles.

„ *Scævola Kænigii*, Poivre Is., 10.x.05, and Darros I., Amirantes, 12.x.05.

„ "Bois de feu," Poivre Is., Amirantes, 10 x.05.

„ *Cocos nucifera*, Darros I., Amirantes, 12.x.05.

„ *Pithecolobium*, *Casuarina*, *Bæhmeria*, *Bixa*, *Wormia ferruginea*, *Punica*, Seychelles.

Other localities:—Mauritius; Madeira; China; New Zealand; Formosa; Ceylon.

2. *Orthezia insignis*, Douglas.

Mauritius; S. Africa; Ceylon; China; Java; Brazil; British Guiana; Trinidad; Jamaica; Mexico; U.S. America; England (under glass).

3. †*Asterolecanium epidendri* (Bouché).

On *Ficus indica* and *Bæhmeria nivea*, Seychelles.

Other localities:—Europe; Jamaica; Trinidad.

4. *Asterolecanium bambusæ*, Boisduval.

Mauritius; Algeria; Ceylon; Brazil; Grenada; W. Indies; Mexico; England (under glass).

5. *Asterolecanium miliaris*, Boisduval.

Mauritius; Algeria; Brazil; Jamaica; Trinidad; Ceylon.

6. *Asterolecanium quercicola* (Bouché).

Mauritius; Europe; Australia; Jamaica; U.S. America.

7. *Phenacoccus nivalis* (Maskell).

Mauritius; Australia.

8. *†*Dactylopius citri* (Risso).

On *Scævola Kænigii*, Farquhar Atoll, 1.x.05.

„ *Ficus* sp., Diego Garcia, Chagos Is., 12.vi.05.

„ fruit of "Bois tortue," Desroches Atoll, 5.x.05.

„ undetermined plants, Chagos Is., 12.vi.05; Coetivy, 10.ix.05.

„ *Desmanthus*, Aldabra.

Other localities:—Mauritius; Europe; Sandwich Islands; Brazil; Jamaica; Ceylon; India; Canada; U.S. America.

9. *†*Dactylopius virgatus*, Cockerell.

On *Tournefortia argentea*, Farquhar Atoll, 29.ix.05.

„ “Takamaka,” Coetivy, 10.ix.05.

„ “Cotton,” Establishment Island, Cargados Carajos, 28.viii.05.

„ undetermined plant, Darros I., Amirantes, 12.x.05.

„ *Asparagus*, Seychelles, and “Cotton,” Aldabras.

Other localities:—Mauritius; Jamaica; Sandwich Islands; Mexico; Texas; Ceylon; India; Java.

10. *Dactylopius calceolariae minor*, Maskell.

Mauritius.

11. *Dactylopius filamentosus*, Cockerell.

Mauritius; S. Caicos Islands; Jamaica; Sandwich Islands; Japan.

12. *Dactylopius longispinus* (Targioni-Tozzetti).

Mauritius; Europe; New Zealand; Chili; Jamaica; Ceylon; U.S. America.

13. *Dactylopius sacchari*, Cockerell.

Mauritius; Trinidad; Barbados; Porto Rico; Mexico; India.

14. *Antonina* (*Chaetococcus*) *bambusæ* (Maskell).

Mauritius; Sandwich Islands; Ceylon; Brazil.

15. *†*Pulvinaria psidii*, Maskell.

On “Mapou,” Farquhar Atoll, 29.ix.05.

„ “Star Apple,” Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

„ *Pisonia cuspidata*, Eagle I., Amirantes, 17.x.05.

„ “Tomato,” Astove I.

„ *Pisonia macrophylla*, St. Pierre I., Providence.

Other localities:—New Zealand; Hawaiian Islands; Formosa; Ceylon; India; China; Japan; Java; California.

16. **Pulvinaria floccifera* (Westwood).

On “Bois Malgache,” Farquhar Atoll, 30.ix.05.

Other localities:—England (under glass); India; Trinidad; Canada; U.S. America.

17. †*Pulvinaria antighoni*, sp. nov.

On *Antighonon*, Seychelles.

18. *Pulvinaria cariei*, de Charmoy.

Mauritius.

19. *Pulvinaria iceryi*, Guérin-Ménéville.

Mauritius; Réunion Island.

20. **Ceroplastes floridensis*, Comstock.

On undetermined plant, St. Anne I. (600 ft.), Seychelles.

Other localities :—U.S. America; W. Indies; Hawaiian Islands; Ceylon; India; Brazil; Japan; Australia; Java.

21. †*Ceroplastes tenuitectus*, sp. nov.

On "Bois la fumée," Aldebra.

22. *Ceroplastes vinsonii*, Signoret.

Mauritius; Réunion Island.

23. *†*Vinsonia stellifera* (Westwood).

On "Star Apple," Mahé (800 ft.), Seychelles, 18.ix.05.

„ Sapodilla Plum," Mahé (800 ft.), Seychelles, 18.ix.05.

„ *Palaquium*, Seychelles.

Other localities :—Trinidad; Jamaica; Antigua; Barbados; Demerara; Grenada; Brazil; Central America; California; Ceylon.

24. *†*Lecanium oleæ* (Bernard).

On "Figuier des Banians," Peros Banhos Atoll, Chagos Is.

„ *Schmidelia*, Aldabra.

Other localities :—Mauritius; Europe; New Zealand; Australia; China; Japan; Java; Hawaiian Islands; S. Africa; Ceylon; Brazil; W. Indies; Mexico; U.S. America.

25. *†*Lecanium nigrum*, Nietner.

On *Jacaranda mimosæfolia*.

„ *Hibiscus*, Seychelles.

Other localities :—Mauritius; Ceylon; India; W. Indies; Porto Rico; Br. Guiana; Australia; New Zealand; Java.

26. †*Lecanium hesperidum*, Linnæus.

On *Cassia siamea*, Seychelles.

„ Rubiaceæ, Aldabra.

Other localities :—Europe; Australia; New Zealand; S. Africa; Hawaiian Islands; Japan; Chili; Algeria; W. Indies; Mexico; U.S. America; Canada; Ceylon.

27. **Lecanium tessellatum*, Signoret.

On *Scævola Kænigii*, Farquhar Atoll, 1.x.05.

„ "Sapodilla Plum," Mahé (800 ft.), Seychelles, 18.ix.05.

„ "Coffee," Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

„ "Star Apple," Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

„ *Cocos nucifera*, Farquhar Atoll, 30.ix.05.

Other localities :—France; England (under glass); Mauritius; Hawaiian Islands; Ceylon; Jamaica; Java.

28. †*Lecanium longulum*, Douglas.

On *Anona squamosa*, Seychelles.

Other localities :—Mauritius ; Hawaiian Islands ; New Zealand ; Fiji ; Ceylon ; India ; China ; Mexico ; U.S. America ; W. Indies ; England (under glass).

29. †*Lecanium frontale*, Green.

On *Casuarina*, Seychelles.

Other localities :—Ceylon.

30. *Lecanium viride*, Green.

Mauritius ; India ; Ceylon ; Brazil ; W. Indies.

31. *Lecanium hemisphæricum*, Targioni-Tozzetti.

Mauritius ; Europe ; New Zealand ; Australia ; Hawaiian Islands ; Galapagos Islands ; Brazil ; W. Indies ; U.S. America ; Mexico ; India ; Ceylon ; Java.

32. *Lecanium guerinii*, Signoret.

Mauritius.

33. *†*Chionaspis inday*, Banks.

On "Areca-nut," Cascade, Mahé, Seychelles.

„ *Cocos nucifera*, Seychelles.

Other localities :—Philippine Islands.

34. *Chionaspis quercus*, Comstock.

Mauritius ; California ; New Mexico.

35. *Chionaspis tegalensis*, Zehntner.

Mauritius ; Java.

36. *†*Hemichionaspis minor*, Maskell.

On "Cotton," Establishment Island, Cargados Carajos, 28.viii.05.

„ *Hibiscus* and "Cotton," Seychelles.

Other localities :—Ceylon ; New Zealand ; Japan ; Brazil ; W. Indies ; Panama ; Florida.

37. †*Hemichionaspis aspidistræ*, Signoret.

On *Heliconia*, Seychelles.

Other localities :—India ; Ceylon ; Formosa ; Japan ; Australia ; Brazil ; Trinidad ; Java ; Europe ; Canada and U.S. America (under glass).

38. *Howardia biclavis* (Comstock).

Mauritius ; U.S. America ; Mexico ; W. Indies ; Tahiti ; Ceylon ; Japan ; Hawaiian Islands ; Great Britain (under glass).

39. †*Diaspis pentagona*, Targioni-Tozzetti.

On *Carica Papaya* and "Pigeon-pea," Seychelles.

Other localities:—Mauritius; Europe; New Zealand; Ceylon; Australia; Japan; Java; China; Hawaiian Islands; S. Africa; Brazil; W. Indies; U.S. America.

40. *Diaspis echinocacti* (Bouché).

Mauritius; Brazil; India; Europe; Algeria; Mexico; U.S. America.

41. *Diaspis euphoriae*, de Charmoy.

Mauritius.

42. *Fiorinia ælæodendri* (?*ælæodendri*), de Charmoy.

Mauritius.

(Note.—This species is catalogued by Mrs. Fernald as *ælæodendri*. In de Charmoy's original description it is given as *ælæodendri*, and is said to have been collected upon a species of *Ælæodendron*. I can find no such names as *Ælæodendron* or *Elæodendron* in the 'Index Kewensis'; but *Elæodendron* is a well-known genus, of which at least one species occurs in Mauritius.)

43. *Fiorinia fioriniæ* (Targioni-Tozzetti).

Mauritius; Europe; Australia; Ceylon; Hawaiian Islands; China; Brazil; W. Indies; Mexico; U.S. America.

44. *Leucaspis cockerelli* (de Charmoy).

Mauritius; Ceylon.

45. †*Aspidiotus camelliæ*, Signoret.

On *Indigofera*, Seychelles.

Other localities:—U.S. America; W. Indies; Brazil; Europe; Hawaiian Islands; New Zealand; Australia; S. Africa; India; Ceylon.

46. *†*Aspidiotus ficus*, Ashmead.

On *Citrus* and Rose, Cascade (800 ft.), Mahé, Seychelles, 18.ix.05.

Other localities:—Europe; Egypt; India; Ceylon; Mauritius; Java; Natal; Australia; Japan; Brazil; W. Indies; U.S. America; Mexico.

47. †*Aspidiotus lataniæ*, Signoret.

On *Vitis* and *Ficus indica*, Seychelles.

Other localities:—Mauritius; Ceylon; Galapagos Islands; Brazil; Europe (under glass).

48. **Aspidiotus trilobitiformis darutyi*, de Charmoy.

On the "Banyans," Port Louis, Mauritius, 6.viii.05.

Other localities:—Seychelles; Liberia.

Localities for typical *trilobitiformis*:—India; Ceylon; Japan; Brazil.

49. *Aspidiotus cyanophylli*, Signoret.

Mauritius; Ceylon; Java; Brazil; Mexico; France; England (under glass); U.S. America (under glass).

50. *Aspidiotus destructor*, Signoret.

Mauritius; W. Indies; Mexico; China; Formosa; India; Laccadive Islands; Bourbon Island; Java.

51. *Aspidiotus hederæ simplex*, de Charmoy.

Mauritius.

Localities for typical *hederæ*:—Europe; S. Africa; New Zealand; Australia; Algeria; Madagascar; Hawaiian Islands; Bermuda; Chili; W. Indies; Mexico; U.S. America; Canada.

52. *Aspidiotus longispina*, Morgan.

Mauritius; Hawaiian Islands; Brazil; Demerara; Ceylon.

53. *Aspidiotus tesserata*, de Charmoy.

Mauritius; Mexico; Antigua.

54. *Aspidiotus articulatus simplex*, de Charmoy.

Mauritius.

Localities for typical *articulatus*:—W. Africa; W. Indies; Costa Rica; Panama; Mexico; England (under glass).

55. *Aspidiotus aurantii*, Maskell.

Mauritius; Ceylon; India; S. Europe; Syria; Natal; Cape Colony; China; Japan; Australia; New Zealand; Java; New Caledonia; Samoa; Fiji; Hawaiian Islands; W. Indies; U.S. America.

56. *Aspidiotus cladii*, Maskell.

Mauritius; Australia; Japan.

57. *Aonidia allaudi* (de Charmoy).

Mauritius.

58. *†*Mytilaspis citricola* (Packard).

On "Orange," Cascade (800 ft.), Mahé, Seychelles, 18.ix.05; "Lime" and "Shaddock," Seychelles.

Other localities:—Mauritius; India; Ceylon; Japan; Australia; Tasmania; New Zealand; Fiji; Hawaiian Islands; Java; W. Indies; U.S. America; Madeira; Africa; Europe.

59. *Mytilaspis gloverii* (Packard).

Mauritius; Ceylon; India; China; Japan; Hawaiian Islands; S. Africa; S. America; Mexico; U.S. America.

60. *Mytilaspis greeni*, de Charmoy.

Mauritius.

61. *Mytilaspis hibisci*, de Charmoy.

Mauritius.

62. †*Mytilaspis auriculata*, sp. nov.

On "*Croton*," Seychelles.

The following new species are here formally described for the first time, and a note is added on the relationship of *Lec. tessellatum*, *subtessellatum*, and *perforatum*.

Pulvinaria antigoni, sp. nov. (Plate 21. figs. 1-3.)

Ovisac white; apparently similar to that of *P. psidii*, but the specimens are crushed and the ovisacs flattened.

Dried female ochreous brown; flattish; wrinkled. Antenna either 7- or 8-jointed (figs. 1, 2), the two forms occurring in equal numbers. In the 7-jointed form the division between the 6th and 7th is often very indistinct, giving the appearance of a 6-jointed antenna. The 3rd joint is in every case the longest; the 2nd and apical are equal and next longest. In the 7-jointed form, the formula (excluding 1st joint, which is always much distorted by pressure) is 3, (2, 7), (4, 5, 6)—(fig. 2). In the 8-jointed form, it is 3, (2, 8), (4, 5), (6, 7)—(fig. 1). Legs normal; claw strong and curved; tarsal digitules long knobbed hairs; ungual digitules broadly dilated, extending far beyond tip of claw. Valves of anal operculum broad; roundly pointed at apex; base about equal to outer edge. Derm-cells obsolete. Marginal hairs not dilated, but slightly frayed at tips. Length 1.75 to 2.0 mm.; breadth 1.25 to 1.50 mm.

Male puparium glassy; hyaline; slightly rugose; median dorsal area elevated, with some glassy tubercles along median line; divided into 7 plates only (fig. 3). Length 1.50 mm.

On *Antigonon*, Seychelles. Coll. R. Dupont.

Very near *P. psidii*, but distinguished by the undilated marginal hairs and absence of dermal cells.

Ceroplastes tenuitectus, sp. nov. (Plate 21. figs. 4-8.)

Adult female (fig. 4) hemispherical; thinly coated with transparent wax, through which the pale ochreous body of the insect is plainly visible. The waxy test thicker and slightly recurved on the marginal area. There is a small median dorsal pad of opaque white wax, and similar patches on the anal operculum, at the stigmatic areas and at intervals just within the margin. Cephalic lobe densely chitinous and pierced below by numerous small circular translucent pores. Antenna (figs. 5, 6) 6- or 7-jointed, the former condition being the more common. The 7-jointed form is brought about by the division of the long 3rd joint. The terminal is equal in length to the 2nd joint. Legs normal; tarsus a little shorter than tibia; ungual digitules broadly dilated; tarsal digitules in the form of stout knobbed hairs, extending considerably beyond the unguals. Margin with fine simple hairs, replaced on the stigmatic areas by stout conical spines,

which are crowded in the actual stigmatic cleft and extend—in a single row—for some distance on each side of it (fig. 7). Anal operculum elevated, surrounded by a strongly chitinous area of a deeper colour. Valves of operculum with broadly rounded outer margin. Length of test 3.0 to 3.50 mm. Length of denuded insect 2.0 to 2.50 mm.

On "Bois la fumée," Aldabra. Coll. R. Dupont.

Lecanium tessellatum, Sign. (Plate 21. figs. 9–13.)

Ann. Soc. Ent. Fr. (5) iii. p. 401 (1873).

As stated in my introductory note, the long series of this species provides material showing a complete chain connecting typical *tessellatum* with *perforatum*, Newst., and *subtessellatum*, mihi. Though Signoret's name must, by priority, be accepted as the type, the form *perforatum* is probably the normal one, being by far the more abundant. As can be seen by the accompanying figures (9 to 12), the minor details of the tessellation show considerable variation. In fact, the only constant part of the pattern is the marginal series of cells, which, when present (fig. 12 is undoubtedly an abnormality), show a constant number of 46, viz.:—3 on each side, anterior to the eye-spot; 3 between eye-spot and anterior stigmatic cleft; 4 between the two stigmatic clefts; and 13 between posterior stigmatic and anal cleft. As regards the tessellation, the forms *tessellatum* and *subtessellatum* are distinguished by the greater or less obscuration (through thickening of the chitin) of the median divisions. The variation in the number of antennal joints (normally 8) is due to suppression of the 3rd, or 3rd and 4th joints, resulting—in the 6-jointed form—in a greatly elongated 3rd joint (*vide* fig. 13, in which the dotted lines indicate the position of suppressed joints). These variations, both in tessellation and antennal joints, are not dependent upon different food-plants, but may be found in individuals of the same brood. In some examples, one antenna may have 6 or 7 joints, while the other has the full complement of 8.

Mytilaspis auriculata, sp. nov. (Plate 21. figs. 14–16.)

Puparium of female entirely white, semidiaphanous (older examples sometimes tinged with pale fulvous); exuviae colourless or very pale stramineous; elongate, narrow, subparallel, moderately convex, straight or (in crowded assemblages) more or less distorted. Length 2 to 2.50 mm.; greatest breadth averaging 0.75 mm.

Male puparium not observed. The insects are densely massed upon the twigs of the plant, but the assemblage consists solely of female individuals.

Adult female (fig. 14) narrowest in front, broadening rapidly to the abdominal area. Lateral margins of abdominal segments scarcely expanded. An ear-like lateral lobe on each side at base of cephalic area. Rudimentary antennae at some distance from margin, close to base of clypeus. Anterior spiracles on a level with the mentum. Posterior spiracles beyond the middle of the body. Lateral margins of hinder thoracic and abdominal segments sparsely dotted with glandular pores. Two or three stout spiniform squames on lateral margins of each abdominal segment. Pygidium (fig. 14) broad; margin with a few small but stout spiniform squames. Pygidial lobes small

and inconspicuous, scarcely prominent; the median pair separate by about their own width, broadly conical, their outer margins smooth or inconspicuously excised; second pair duplex, the inner lobule largest, the outer lobule with a large oval pore on its dorsal face. Circumgenital glands in five groups; median 4 to 7; upper laterals 6 to 7; lower laterals 4. Length of body 0·60 to 0·65 mm.

Near *Mytilaspis pomorum*, but differing in colour of puparium and in the presence of ear-like lobes at base of head.

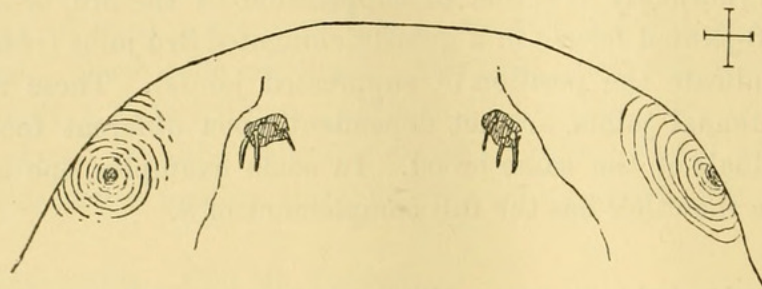
[Note received 27th September, 1907.]

Mytilaspis ocellata, sp. nov.

Female puparium elongate, narrow, approximately straight, moderately convex above, with or without a narrow flattened border. Colour pale fulvous; larval pellicle ochreous yellow. Surface usually with fine transverse corrugations, occasionally smooth. Length 2 to 2·50 mm.; breadth averaging 0·50 mm.

Male puparium similar, but much smaller. Length 1·25 mm.

Fig. 47.



Mytilaspis ocellata.

Cephalic extremity, showing rudimentary eyes and antennæ.

Adult ♀ of normal form: broadest across the median abdominal segments. There are well-defined eye-spots on the lateral margins of the cephalic segment, on a level with the rudimentary antennæ. These spots take the fuchsin stain somewhat deeply, and are further defined by a surrounding area of fine concentric lines (see fig. 47). Anterior spiracles with a small group of parastigmatic glands. Lobes of pygidium arranged as in *citricola*; lateral lobes very small, each lobule less than half the width of one of the median lobes. Circumgenital glands in five groups, median group with from 2 to 4 orifices; anterior laterals 9 or 10; posterior laterals 7 or 8. Length 0·75 mm.; greatest breadth 0·35 mm.

Habitat. On fronds of *Davallia* sp., Seychelles: "in mountain forest, 3000 feet." Collected by Mr. R. Dupont.

This species bears a very close resemblance, in form and colour of puparium, to



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