

COCCIDÆ, OR SCALE INSECTS.—II.

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It will be my endeavour, in this and subsequent papers, to so describe the West Indian Coccidæ that they may be recognised by any-one who is willing to take a little trouble in examining them, without having any particular knowledge of Entomology. For this reason, all technical terms and microscopical details will be avoided as much as possible; although in certain cases the use of the microscope is absolutely necessary to determine the identity of a species, and therefore microscopical characters must be cited. Strictly Entomological articles, describing the characters of the species in detail, will be published elsewhere.

It is proper to state that although all the known West Indian Coccidæ will be described in these papers, new species, and even new genera, are frequently being found, rendering any list which might be published incomplete in a short time. For this reason, nobody need be much surprised if he should come across a scale not resembling anything I have described. In the event of such a discovery it will be necessary to send specimens to the present writer or some other student of Coccidæ, in order that they may be properly classified.

Before describing the species, it is desirable to give an account of the 23 genera in which they are included. These are comprised in four sub-families, known as the *Monophlebinae*, *Coccinae*, *Lecaniinae*, and *Diaspinae*. This arrangement is derived from Mr. Ashmead's generic synopsis (*Trans. Amer. Ent. Soc.*, 1891), and although it appears to require revision, it may be adopted in the present instance.

(I.) *Monophlebinae*.

The adult females are active or stationary, segmented, with no scale, but frequently more or less covered with a mealy, cottony or waxy secretion. The antennæ have 10 or 11 joints (rarely 9). The males have faceted eyes.

(1.) *Icerya*, Signoret. The adult females have eleven joints to the antennæ, a character which should be observed, in order to distinguish them from similar-looking species of the next sub-family, in which the joints are fewer. *I. rosea*, the only species yet observed in Jamaica, is a plump greyish insect, about the size of a half-pea, and more or less covered with mealy secretion. The larvæ are red. This is found on rose, *Amherstia*, and other plants. Mrs. Swainson found it in some plenty under the bark of *lignum-vitæ* in Kingston. Another species, *I. montserratensis*, is found in Montserrat and Trinidad.

(II.) *Coccinae*.

These resemble the last family a good deal, but the antennæ of the adult female have from 6 to 9 joints; and there is usually a pair of distinct caudal filaments at the hind end of the body. The posterior cleft, which is so noticeable in the next family, is wanting.

(2.) *Dactylopius*, Signoret. The species of this genus are commonly known as "mealy bugs". The antennæ of the adult females have eight (rarely seven) joints. These insects, which abound on various trees and shrubs, are small, soft, and more or less oval in shape, with the segmentation distinct and the body partly covered with a mealy secretion. Some of the species have a fringe of cottony or mealy appendages all round the body, and a pair of very distinct caudal filaments; while others lack these ornaments. Two species are common in Kingston; and a little pink species may be found inside the cavities of pine apples. A curious new species has been found by Dr. Strachan at the Caicos Is., Bahamas.

(3.) *Coccus*, Linné. This genus comprises the cochineal insect, which may be found on *Opuntia* in the Parade Garden, Kingston. It occurs in masses covered by white secretion, but if this is scraped away with a knife the true cochineal colour will be observed. The antennæ of the female have seven joints.

(4.) *Margarodes*, Guilding. Consists of one species, a curious insect found in Antigua and the Bahamas, living in the ground associated with ants. It has some resemblance to a pearl, and is accordingly known as the "ground pearl." The adult female has antennæ of seven joints, and is said to lack a rostrum.

(III.) *Lecaniinae*.

The distinguishing character of this group is the presence of a distinct cleft at the posterior end of the body, above which is a pair of more or less triangular plates. The sub-family, according to Ashmead's arrangement, includes some very little related genera, which ought not, in my opinion, to be referred to it. These I shall provisionally class below as aberrant genera.

(5.) *Lecanium*, Illiger. A genus with many species differing very much in appearance. They have no scale, properly speaking, but the back of the female is so constructed that it represents a scale. The adult females have antennæ of from 6 to 8 joints. The shape of these insects is sometimes flat and oval in outline, sometimes high and elongated, like a flat-bottomed boat turned upside down, and sometimes hemispherical. The colour of the flat species may be green or brown, that of the convex ones brown or black. Some are viviparous, others produce eggs. A subgenus, *Bernardia*, Ashmead, is hemispherical, brown or black, with some indication of ridges, at least in the young, and eight-jointed antennæ. It is a member of this subgenus, the "brown scale," that is so injurious to creepers and other plants in Kingston.

(6.) *Ceroplastes*, Gray. Scratch a *Ceroplastes*, and you have a *Lecanium*. That is to say, the wax-scales, *Ceroplastes*, are like the hemispherical brown *Lecaniums* except that they are covered with a layer of wax. Sometimes this wax forms distinct plates, but in other species this is not the case. In a

new species found by Dr. Strachan at the Island of Grand Turk, the wax is so abundant that that from the several scales runs together, covering the scales and surrounding the twig on which they grow, almost as the wax of a candle surrounds the wick.

(7.) *Vinsonia*, Signoret. There is only one species, which is something like a small *Ceroplastes*, but round the margin are seven waxy rays, making the insect look like a little star. They are fairly common on mango leaves in Jamaica, and are also found on orchids.

(8.) *Pulvinaria*, Targioni-Tozzetti. These, when immature, are just like the flat oval Lecaniums, but the adult female produces a large cottony sac, in which she lays her eggs. As this sac is produced, she shrivels up, so as to appear like a little dark scale at one end of it. The white cottony ovisacs are very conspicuous; those of *P. cupania* must often have been observed on the leaves of Akee trees in Kingston.

Aberrant genera.

(9.) *Orthezia*, Bosc. These are curious looking creatures, the females small, broadly oval, with eight-jointed antennæ and well-developed legs. They are more or less ornamented with a waxy covering, and produce long white ovisacs which project posteriorly. They have a sort of superficial resemblance to little spiders. There is a species, *C. insignis*, found on low plants in gardens in Jamaica, particularly on violets and chrysanthemums. This genus is placed by Maskell in the same subdivision as *Dactylopius*.

(10.) *Tachardia*, Signoret. This consists of the lac insects, which cover themselves with a hard coating of lac, strong but brittle, melting at a moderately high temperature. There is a species in Jamaica, infesting the coco plum, and appearing as subglobular lumps rather smaller than a pea, with a crimson knob on the back. Maskell, in a paper published 1891, refers this genus to the group *Brachyscelida*. The genus is usually called *Carteria* but the name was altered on account of preoccupation.

(11.) *Planchonia*, Signoret. Small scales, hardly bigger than the head of a pin, nearly circular and slightly convex. They look like members of the next sub-family, but with a lens it is easily seen that they have a delicate waxy fringe all round the margin, which distinguishes them. *P. pustulans* is common on twigs of Akee in Kingston, producing a pustular appearance; *P. oncidii* is very similar, but bright yellow in colour, it is found on orchids, and was discovered by Dr. Henderson.

(12.) *Asterolecanium*, Targioni-Tozzetti. These are very much like *Planchonia*, and have the fringe, but from their more elongated shape they might be taken, on hasty examination, for species of *Lecanium*. Of course they are really very different from any *Lecanium*, being enclosed in a true scale, and having a very different structure in many ways. There is a species, *A. bambusæ*, found on bamboo stems at Montego; and also a very small and narrow species, *A. palmæ*, found on leaves of cocoanut palm near St. Andrew from near Montego Bay.

These are the true scales, and are distinguished from the others by their size, which on the average about the size of a pin's head, and are found abundantly on a great variety of plants. The scales may be any shape from circular to linear, and flat to hemispherical, and any colour from white to reddish, brown, or black. They have this peculiarity, that the exuviae of the younger stages are retained on the back of the scale. The female scales show the minute shield-shaped transversely ribbed "first skin," and this is situated either in the middle or to one side of a larger second skin, below which is the larger scale proper. In the species of *Diaspis*, which have white scales, these first and second skins stand out prominently as a dark spot. In the subgenus *Targionia* of *Aspidiotus*, the exuviae are covered by secretion, so that only a nipple-like prominence is left. The male scales show only the first skin and the scale proper: they are, in several of the genera, totally unlike those of the female in form. Thus, in *Diaspis* the female scale is oval or rounded; that of the male cylindrical with parallel sides, and much smaller.

(13.) *Aspidiotus*, Bouché. Very numerous in species. The female scales are circular or slightly oval, flat or convex; the male scales are either like them but smaller, or (as in the case of a species found on orchids) narrow and elongated. When the male scales are elongated, they are not cylindrical, white, with terminal exuviae, like *Diaspis*. *Aspidiotus* proper has the female scales white or whitish, and the exuviae uncovered. The subgenus *Targionia* Signoret (I here use the name in a wider sense than was originally intended) contains species with covered exuviae, and the scales generally dark-coloured.

(14.) *Diaspis*, Costa. The female scales are white, with the exuviae conspicuous from their darker colour; the male scales are small, cylindrical, with terminal exuviae, and a single median keel. A species of this genus, *D. lanatus*, is very destructive to *Capsicum* plants in Kingston.

(15.) *Aulacaspis*, Cockerell. Female scale nearly circular in outline, waxy-white or pale greyish; male scale like that of *Diaspis*, but with three strong keels. *A. rosæ* is found on roses; *A. boisduvalii* on cocoanut palm.

(16.) *Parlatoria*, Signoret. The female scale is brownish, nearly circular, or elongate-oval, with the exuviae to one side, and the second skin quite large. The male scale is small, elongate, dark in colour, with parallel sides and the exuviae at one end. A species is common in Kingston on leaves of croton.

(17.) *Pseudoparlatoria*, Cockerell. The only West Indian species is found commonly in Kingston usually on *Acalypha*. The female scales, which infest the twigs, are blackish, and resemble those of *Aspidiotus*. The male scales, found more usually along the midribs of the leaves, resemble the female scales of *Parlatoria* and are pale in colour.

(18.) *Mytilaspis*, Signoret. The female scales, as the name indicates, are mussel-shaped, usually brown in colour. The male scales are similar but smaller and narrower. A species of this genus, *M. citricola*, may very often be observed on oranges.

(19.) *Pinnaspis*, Cockerell. The scales are brown or whitish and like *Mytilaspis* in shape, though rather broader. The distinguishing character is afforded by the second skin, which is very large, and covered by secretion. Species occur in Jamaica on cocoanut palm and bamboo.

(20.) *Chionaspis*, Signoret. The female scale is elongate or broadly mussel-shaped, in nearly all the species white, with darker exuviae. The male scale is white and keeled, like that of *Aulacaspis*. In one American species the male scale is not keeled, but this should probably be removed from the genus.

(21.) *Fiorinia*, Targioni-Tozzetti. A species of this genus is found on cocoanut palm. The scale resembles *Parlatoria* but is more elongate, and the second skin, which is keeled, is so large as to leave nothing but a sort of fringe round the margin to represent the true scale. The first skin is placed at one end, and very evident.

(22.) *Ischnaspis*, Douglas. The one species of this genus is common on palms, and may be easily recognised by its shape, being linear and black in colour.

Aberrant genus.

(23.) *Conchaspis*, new genus. I found this on a Madagascan orchid, *Angraecum eburneum* var *virens*, at Hope Gardens. The scale is about 1 millim. diameter, white, high conical, very much like the shell *Calyptrea chinensis* in miniature. The apex is a little to one side of the centre. The insect under the scale is something like a *Diaspis* superficially, but the structure, examined with a microscope, is very peculiar, and there are legs, which is never the case with adults of *Diaspinae*, so far as yet known.

Mr. L. O. Howard kindly gave me his opinion about it as follows:—

“Your *Conchaspis* does not seem to belong to the *Diaspinae*. The characters of the last segment as well as the presence of antennæ and legs would place it in the *Coccinae*, and possibly in the *Acanthococcini*, in which it would form a new genus. The scale resembles that of *Inglisia* although the anal characters remove it from the *Lecaniinae*, the antennæ being apparently five-jointed.” (*in litt.*, Aug. 6, 1892.)

The species will be described as *Conchaspis angraeci*.

Jan. 12, 1893.

FERNS: SYNOPTICAL LIST.—XV.

Synoptical List, with Descriptions of the Ferns and Fern-Allies of Jamaica, by G. S. Jenman, Superintendent Botanical Gardens, Demerara, (continued from Bulletin, No. 38.)

Genus XIV. *Pellaea*. Link.

Sori terminal on the veins, at first round and distinct, but soon becoming confluent, linear and continuous, surrounding the margin; involucre continuous, membranous or coriaceous, plain or undulate; fronds generally small, veins free.

This genus differs chiefly from the preceding by the less divided fronds, the confluent sori making a continuous line around the margin as in *Pteris*; the ends of the veins, which are the receptacles, being distinct, and not transversely connected as in the latter genus.

1. *P. geraniifolia*, Fée.—Rootstock upright, fibrous, scaly; stipites tufted, channelled, slender, naked or the base slightly scaly, polished dark brown; fronds chartaceous, naked, bright green, subdeltoid, palmatifid, subtripartite, 2-4 in. each way, upper part simply pinnatifid, rachis and costæ obscure above, prominent beneath but evanescent, polished blackish; 1-2 or 3 central pinnae lobed or pinnatifid, narrowed at the base and decurrent, lowest pair much the largest, with the lower side the deeper and freely developed with subentire lobed or pinnatifid basal pinnulae that vary from $\frac{1}{2}$ -1 $\frac{3}{4}$ in. l. and 2-6 li. w.; final segments connected at the base, acutely pointed, 2-3 li. l. 1 $\frac{1}{2}$ -2 li. w.; veins free, forked, evident in fresh fronds, rather obscure in dry: sori at first distinct, at length confluent forming a continuous marginal line, which barely falls short of the very tips of the segments; involucre continuous, narrow, membranous, undulate, turned back and concealed eventually by the matured sori.—*Pteris geraniifolia*, Radd. Hook. Icon. Pl. t. 915. *Pteris concolor*, Langs & Fisch. Ic. Fil. t. 21.

Infrequent or rare; gathered by Sloane in 1688 “between the town of Savanna and Twomile Wood,” and rediscovered in 1877 at the old mines, between Hope and Gordon Town, St. Andrew. A widely spread species over the tropical and sub-tropical regions of the world, and long constantly referred to *Pteris* owing to the confluence of the sori and obscurity of venation in dried specimens. It has a general resemblance to *Pteris pedata*, but is distinguished by the more copiously lobed parts, free veins, and, at first, punctiform sori. The barren fronds are small with rounded lobes, and short slender stipites.

Genus XV. *Plagiogyria*, Kunze.

Sori terminal on the forked horseshoe-shaped thickened ends of the veins, laterally confluent, forming a linear, continuous marginal band; involucre continuous, involute and connivent over the sori and costæ, ultimately open; sterile and fertile fronds distinct, pinnae of the latter contracted; veins free; stipites dilated, fleshy and triquetrous at the base, possessing spongy glands.

In the fertile fronds the veins are forked from the base, the branches diverging, and at their apices they are again shortly forked with a pair of soriferous venules, which together are horseshoe-shaped. The sori are at first roundish, but from their contiguity are early confluent, and form a continuous line, which at maturity fills the space between the margin and costæ. Occasionally a vein-branch occurs not again branched at the soriferous summit mixed with those that are, and in some instances the fertile venules seem to form a nearly complete circle by convergence. These particulars show that the genus is well founded, and, in spite of habit and apparent superficial affinity, belongs undoubtedly to this tribe, to which Moore ascribed it in his *Index Filicum*, rather than to the next to which it is generally referred and merged in *Lomaria*.