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THE COCCIDAE OF SOUTH AFRICA—V.*

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(PLATES I–IV.)

CONTENTS.

Subfamily LECANIINAE.

This subfamily comprises a large number of genera, which are, as a rule, easily distinguished by the presence or absence of secretionary matter in one form or another. All agree, however, in having the anal ring with a number of hairs and, further, in having the hind margin cleft. The anal ring is covered above by a pair of more or less triangular plates which are usually densely chitinised. The eighteen genera known to be represented in South Africa are tabulated below :—

*For Part II, see Bull. Ent. Res. ix, p. 107; Part III, *op. cit.* ix, p. 197; Part IV, *op. cit.* x, p. 95.

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Key to South African Genera.

A. Female naked, or only covered by a very thin, inconspicuous film of secretion.

B. Adult ♀ with well-developed legs and antennae.

C. Adult ♀ with posterior extremity cleft.

(1) Female flat or slightly convex, derm not very hard when mature, without polygonal areas containing pits .. .. *Lecanium*, Burm., p. 3.

(2) Female becoming hard and convex at maturity, derm with ± oval or polygonal areas containing pits .. *Saissetia*, Deplan., p. 9.

CC. Adult ♀ with posterior extremity not cleft; female with four large groups of spinnerets .. .. *Hemilecanium*, Newst., p. 14.

BB. Adult ♀ without legs or antennae .. .. .. *Aclerda*, Sign., p. 15.

AA. Female secreting a greater or less amount of cottony or powdery matter.

B. Female naked above, secretion beneath or behind the insect.

C. Female with only a narrow fringe of secretion.

(1) Female very convex, dark red, abdominal segmentation very distinct *Allopulvinaria*, gen. nov., p. 16.

(2) Female flat or slightly convex, segmentation not pronounced, *Protopulvinaria*, Ckll., p. 16.

CC. Female secreting a definite protruding ovisac *Pulvinaria*, Targ., p. 17.

BB. Female partly covered with secretion.

(1) Adult ♀ covered above, except for the median area, with a thick coat of wavy threads which project beyond the margin in all directions *Ceronema*, Mask., p. 22.

(2) Adult ♀ enclosed in a felted sac, except the cephalic extremity which is ± exposed .. ..*Lichtensia*, Sign., p. 22.

BBB. Adult ♀ entirely enclosed.

C. Sac fitting closely to body of adult ♀ at maturity and later serving as ovisac; insect leaf-infesting .. .. *Filippia*, Targ., p. 23.

CC. Sac felted, stout, conical, insect root-infesting *Conofilippia*, gen. nov., p. 25.

AAA. Female secretion waxy, glassy or horny.

B. Covering of ♀ consisting of wax, generally soft and thick; no marginal fringe nor marginal processes; female with a ± conspicuous caudal process visible on removing the wax .. .. *Ceroplastes*, Gray, p. 26.

BB. Covering of ♀ glassy, or at least brittle, thin.

(1) Scale divided into plates and striated with rows of air-cells; not causing galls .. .. *Inglisia*, Mask., p. 36.

(2) As in *Inglisia* but causing galls on roots of host-plant *Cryptinglisia*, Ckll., p. 38.

(3) Scale divided into two halves not striated with air-cells, but with grooves radiating from apex .. .. .. *Parafairmairea*, Ckll., p. 39.

(4) Scale not divided into plates nor two halves, but rough and beset with protuberances, legs and antennae well-developed, anal cleft normal *Ceroplastodes*, Ckll., p. 40.

(5) Scale not divided into plates nor two halves, ± smooth, legs and antennae rudimentary, anal cleft lateral .. ..*Idiosaissetia*, gen. nov., p. 40.

(6) Similar to *Pulvinaria* but ovisac consisting of horny membrane instead of cottony matter .. ..*Membranaria*, gen. nov., p. 41.

Genus **Lecanium,** Burm.

Adult ♀ never hemispherical nor highly convex, derm remaining comparatively soft, without polygonal areas; usually light in colour and oval; legs and antennae present, well-developed.

191. **Lecanium hesperidum,** Linn.

Coccus hesperidum, Linn., Syst. Nat. Ed. x. 1, p. 455, 1758.
Chermes hesperidum, Geoff., Hist. Abr. Ins. i, p. 505, 1762.
Calypticus hesperidum, Costa, Faun. Reg. Nap. Cocc., p. 8, 1835.
Calypticus laevis, Costa, Faun. Reg. Nap. Cocc., p. 8, 1835.
Calymnatus hesperidum, Costa, Nuov. Osserv., p. 22, 1835.
Coccus patelliformis, Curt., Gard. Chron., p. 517, 1843.
Chermes lauri, Bdv., Ent. Hort., p. 340, 1867.
Lecanium platycerii, Pack., Rep. Mass. Bd. Agr., p. 260, 1870.
Lecanium angustatum, Sign., Ann. Soc. Ent. Fr. (5) iii, p. 398, 1873.
Lecanium maculatum, Sign., Ann. Soc. Ent. Fr. (5) iii, p. 400, 1873.
Lecanium alienum, Dougl., Ent. Mon. Mag., xxiii, p. 77, 1886.
Lecanium depressum var. *simulans*, Dougl., Ent. Mon. Mag. xxiv, p. 28, 1887.
Lecanium minimum, Newst., Ent. Mon. Mag., xxvii, p. 141, 1892.
Lecanium assimile var. *amaryllidis*, Ckll., Tr. Am. Ent. Soc. xx, p. 53, 1893.
Lecanium terminaliae, Ckll., Jl. Inst. Jamaica, i, p. 254, 1893.
Lecanium nanum, Ckll., Psyche, vii, Suppl., i, p. 19, 1896.
Lecanium flaveolum, Ckll., Psyche, viii, pp. 52, 53, 1897.
Lecanium minimum var. *pinicola*, Mask., N.Z. Trans. xxix, p. 310, 1897.
Lecanium ventrale, Ehrh., Can. Ent. xxx, p. 245, 1898.
Lecanium (*Calymnatus*) *hesperidum pacificum*, Kuw., Jl. N.Y. Ent. Soc. x, p. 30, 1902.
Lecanium signiferum, Green, Cocc. of Ceylon, pt. iii, p. 197, 1904.

"Adult female bright yellow or greenish-yellow, minutely speckled with red-brown, the specks sometimes agglomerated into transverse bars, especially on the median abdominal region; in other parts tending to form dotted lines radiating from centre to margin. In older examples the ground-colour may be ochreous or pale fulvous; and the maculation may form a broad median fascia. Under surface of older examples with a deep purple-brown or red patch covering the median abdominal area, becoming concave and forming a shelter for the young larvae. Dried specimens straw-coloured and much wrinkled. Form oblong-oval, often very irregular in outline; narrowest in front; more or less concave above according to age. In some individuals, generally on those protected by some shelter, I have noticed a double median longitudinal series of raised glassy points; but they appear to be very brittle and easily lost." (Green).

Length, 2·5–5 mm.; breadth, 1·5–3 mm.

The antennae are 7-jointed, with the 3rd, 4th and 7th joints subequal. The range of measurements from South African material is as follows:—(1) 27–35, (2) 30–37, (3) 51–61, (4) 54–65, (5) 20–24, (6) 17–27, (7) 44–51μ.

The anal plates are about 155μ long.

The hairs on the antennal joints are exceptionally thin and are distributed, 2 on joint I, 2 on II, 2 on IV, 1 on V and VI, 8 or 9 on VII.

The marginal spines are short, widely spaced, simple, and nearly always have their tips recurved. There are three stigmatic spines, laterals short, median about $3\frac{1}{2}$ times as long as laterals. The stigmatic clefts are but slightly recessed, with a few simple glands.

Habitat: On citrus and a large variety of cultivated plants common throughout the Union.

Collection Nos.: 110 and 136.

192. **Lecanium africanum,** Newstead.

Lecanium viride var. *africanum*, Newst., Ent. Mon. Mag. (2) ix, p. 95, 1898.
Lecanium viride (Green), Newst., Bull. Ent. Res. i, p. 187, 1910.
Lecanium africanum, Newst., Bull. Ent. Res. vii, p. 357, 1917.

" Female adult. Colour of dried specimens often yellowish green; others are bright ochraceous, straw-coloured or pale reddish-brown; eyes black. Dorsum, especially in the younger forms, with a series of black markings, often forming a narrow loop-like pattern; these markings are however rarely present in very old examples. Form oblong oval, but the outline is often irregular; narrowed in front and moderately convex, but the margins broadly flattened, especially the cephalic portion. Antennae of eight segments, rarely of seven; formula of the former: 3 (2, 4, 5, 8) 1 (6, 7); there is a very long hair on the 2nd and 5th segments, and several shorter ones on the 8th, 6th and 7th, each with a distinctly stouter hair. Legs normal, though the anterior tarsi sometimes exhibit a faint dorsal constriction. Anal lobes attenuated distally, inner margin longest; apices with a few fine short hairs. Anal cleft slightly less than one-third the length of the body. Stigmatic cleft very slight, sometimes scarcely visible; spines three in number, rather small, the central one being about three times the length of the laterals. Marginal spines small, generally slightly curved and faintly fringed distally. There are three to four hairs of varying length near the attachment of each of the antennae, and usually four rather longer and stouter ones just in advance of the anal lobes. Derm cells oval and markedly distinct in stained preparations, but scarcely visible in unstained specimens." (Newstead).

Habitat: On citrus, Pietermaritzburg, Natal, and Nelspruit, Transvaal. On coffee, Natal coast (Fuller).

Collection No.: 106.

193. **Lecanium ehretiae,** sp. n.

Adult ♀ somewhat similar to *L. hesperidum* but rather less convex and much darker in colour, dark brown to blackish, 3·6 mm. long by 1·8 mm. broad, regularly oval. A single fringe of very short hairs is noticeable around the margin when examined with a hand lens and the surface of the body then appears mottled greyish brown in colour; the anal plates are bright brown. The dorsal surface is slightly shiny, with very indistinct and indefinite ridges and depressions.

The antennae are 7 or 8-jointed, most often 7. The following range is obtained from a series of eight measurements :—7-jointed : (1) 24–34, (2) 54–61, (3) 54–61, (4) 68–75, (5) 24–31, (6) 14–24, (7) 34–41μ ; 8-jointed : (1) 34, (2) 51, (3) 65, (4) 51, (5) 30, (6) 20, (7) 21, (8) 41μ.

Leg I : coxa 68, femur + trochanter 170, tibia 126, tarsus 75, claw 20μ. Tarsal digitules very slender, hardly perceptibly clubbed. Trochanter with an apical spine about 85μ long.

Scattered over the integument, particularly around the antennae and anal plates, are numerous hairs, the longest of which may reach 80μ in length.

The marginal spines are comparatively long (80μ), slender, slightly curved, not truncate. They average approximately 54μ apart. The stigmatic cleft has two short spurs and a median longer one (40μ). The anal plates are comparatively short (142μ) and broad (170μ across the outer angles). The anal ring has six long hairs. The derm is apparently clear, without glands.

Habitat : On *Ehretia hottentottica*, Burch. ; collected by the writer at Brooklyn, Pretoria, October 1914.

Collection No. : 117.

194. **Lecanium pumilum,** sp. n.

Adult ♀ small, about 2 mm. long, and 1·5 mm. broad, moderately convex, dark reddish brown in colour, distinctly red when younger.

Antennae 7- or 8-jointed, more often 8. The following represents the range obtained from measuring the antennae of five insects :—7-jointed : (1) 20–24, (2) 34–37, (3) 51–54, (4) 27, (5) 24, (6) 17–20, (7) 41–54μ ; 8-jointed : (1) 24–27, (2) 27–44, (3) 48–51, (4) 17–24, (5) 24–34, (6) 17–20, (7) 17–20, (8) 37–44μ.

Leg I : coxa 51, femur + trochanter 153, tibia 95, tarsus 61, claw 17μ.

The anal plate is about 150μ long. The anal ring is produced on a delicate fluted tube ; it bears 8 long bristles and several shorter ones. The margin has the usual series of simple spines about 41μ long. Stigmatic cleft with 3 straight, moderately stout spines ; laterals about 24μ long, median about 71μ. Immediately within the margin are numerous scattered small simple gland pores, many with short sharp spines.

Habitat : On the stem of a native shrub, covered by a carton shelter constructed by ants ; collected by C. P. v.d.Merwe at Robertson, C.P., May 1915.

Collection No. : 125.

195. **Lecanium elongatum,** Sign. (Plate i, fig. 233.)

Lecanium elongatum, Sign., Ann. Soc. Ent. Fr. (5) iii, p. 404, 1873.
Lecanium longulum, Dougl., Ent. Mon. Mag. xxiv, p. 97, 1887.
Lecanium chirimoliae, Mask., N. Z. Trans. xxii, p. 137, 1889.
Lecanium ficus, Mask., Ent. Mon. Mag. xxxiii, p. 243, 1897.
Lecanium frontale, Green, Cocc. Ceylon, pt. iii, p. 192, 1904.

" Female dingy pale yellowish-grey ; elongate, narrow, ends broadly rounded, side margins slightly curved out, not recurved ; surface smooth, transversely arched, longitudinally level, semi-cylindric, not carinate, a band of fairly dark

reticulation along the sides, whence, in some examples, faint dark lines radiate to the margin ; the disc occupied with a long, pale, clear, oval spot ; or in some mature specimens the scale (female) is unicolorous yellow-brown, the dorsal pale spot partly or wholly covered, and on the sides minute pale dots in place of reticulation. Underside all pale, a broad space all round the insect, a conspicuous blackish eye-spot above each antenna." (Douglas).

Antennae long, of 8 segments, range in μ as follows :—(1) 34–40, (2) 51–58, (3) 68–82, (4) 54–58, (5) 41–54, (6) 24–31, (7) 20–31, (8) 34–41.

Anal plates longer than in *hesperidum* (170μ), with the outer angles more rounded. Marginal spines a little longer than in *hesperidum* (34μ), widely spaced, averaging 70–85μ apart. Usually simple, but some with apex broadened and slightly branched and recurved. Integument, when fully chitinised, with scattered, small, oval, clear spaces. Stigmatic spines (3) ; laterals longer, straighter and more pointed than in *hesperidum*, median about four times the length of laterals, broad at the base and tapering to an acute point.

Habitat : On *Acacia melanoxylon* ; collected by A. Kelly, Joubert Park, Johannesburg, May 1915.

Collection No. : 111.

196. **Lecanium pseudelongatum,** sp. n.

Adult ♀ similar to *elongatum* but slightly less convex and darker in colour. The antennae are 8-jointed as in *elongatum*, but joints 3 and 4 are longer and 5 shorter, giving the following range :—(1) 34–40, (2) 41–51, (3) 59–68, (4) 44–61, (5) 61–71, (6) 24–34, (7) 24–27, (8) 37–41.

The most striking difference, however, is found in the marginal spines which are long (58μ) and close together, averaging 34μ apart. Stigmatic spines (3) with the laterals relatively short and slender and the median long, curved and linear.

Habitat : On native thorn tree, *Acacia caffra* (?), Pretoria ; collected by the writer, September 1914.

Collection No. : 116.

197. **Lecanium filamentosum,** Newst.

Lecanium (*Eulecanium*) *filamentosum*, Newst., Bull. Ent. Res. iv, p. 74, 1913.

Adult ♀ about 6 mm. long and 4 mm. broad, flatly convex with a slight median ridge. The colour of dried material is pale brown, with median area white as though covered by a dense layer of white secretion, which gradually fades towards the margin where numerous black dots are evident. The margin is faintly indentate, this character being intensified by the lines of black dots running to the edge and the distinct marginal glassy fringe. Seen from below the insect is brown, with four conspicuous stigmatic bands.

The antennae are 8-jointed with joint 3 remarkably long. A series of ten measurements gave the following range in μ :—(1) 57–65, (2) 68–82, (3) 150–187, (4) 75–88, (5) 65–75, (6) 34–44, (7) 31–37, (8) 54–58.

The integument is characterised by a few scattered, short, conical spines and a number of small, indistinct, " rosette " gland openings. The anal plates are about 220μ long each, with a stout apical spine and several others on the disc.

The marginal spines are comparatively short (37μ), truncate, with the extremity slightly forked. They are set at an average distance of about 50μ apart. The stigmatic clefts are deeply indented but not recessed; each with about 8 spines, of which the laterals are comparatively long and stout (60μ); the middle spine is only a little longer, but stouter. The tarsal digitules are very long and slender; those of the claw are short and very broad.

Habitat: On fig, Cathcart, C. P.; collected by L. J. Botha, July 1918.

Collection No.: 314.

198. **Lecanium proteae,** sp. n.

Adult ♀ about 6 mm. long and 4·5 mm. broad (longest specimen seen reaches 8 mm. by 6 mm. broad); colour, when alive, asphodel green (Ridgway) with very narrow margin of pale dull green yellow. The dorsum is dull coriaceous, giving the insect the colour and appearance of the leaf, the green body corresponding with the blade and the yellowish margin with the midrib or edge of the leaf.

The anal plates are small, yellowish in colour, except in old specimens, in which they are tinged with brown.

In form the insect is uniformly oval, except when situated near the midrib or edge of a leaf, when the form is irregular. Above, the body is moderately convex. Below, the insect is uniform green in colour. In boiling KOH it turns to orange yellow then reddish brown. After treatment the derm is colourless.

Anal plates about 205μ long, outer angles rounded, apices attenuated, with two apical spines, one subapical and one on the disc at about one-third the length from the apex. Anal ring with 6 long hairs. On the dorsum, immediately behind the anal opening, are two scattered groups of "rosette" glands, and there is a further transverse series on the segments immediately anterior to the two groups. The integument is otherwise clear, but has scattered hairs of varying lengths.

Stigmatic clefts shallow, with short, varying, clubbed processes.

Antennae usually 7-jointed with the fourth showing a pseudarticulation; sometimes 8-jointed; 7-jointed form: (1) 27, (2) 37–41, (3) 51–58, (4) 44–48, (5) 20–24, (6) 20–24, (7) 41–54μ; 8-jointed form: (1) 27, (2) 41, (3) 61, (4) 34, (5) 31, (6) 20, (7) 20, (8) 51μ.

Leg II: coxa 54 by 65, femur + trochanter 127 by 37, tibia 95, tarsus 17, claw 20μ.

Marginal spines very short (17μ) at very wide intervals, averaging at least 80μ apart, simple, truncate.

Male scale of the usual type, 2·0 mm. long and 1·2 mm. broad. Head and body, without genital sheath, 1·6 mm. long. Head and prothorax rufous to nearly black, glistening; body reddish, tip of abdomen and spine lighter, yellowish; legs dark, slightly darker than antennae. Caudal filaments, two, white, about as long as the head and body without antennae. Wings whitish, 1·6 mm. long, mealy, with a subcostal reddish line running three-fourths of length of wing from the base. Antennae 1 mm. long, of ten joints.

Larva, newly emerged, 0·5 mm. long and 0·25 mm. broad, orange yellow, very active.

Habitat: On leaves of *Protea*, Pretoria; common.

Collection No.: 108.

199. **Lecanium wistariae,** sp. n.

Adult ♀, mounted specimens about 3·4 mm. long by 2 mm. broad, elongate, tapering to each end. The following description, taken from the Cape Journal, was made from fresh material :—

" Young appearing August 15th ; females apparently viviparous, since, while bodies are filled with eggs, only living young are seen under the scales.

" Female long oval, highly convex. Ground-colour yellow obscured by reticulations of black ; the black enclosing minute, almost round patches and bounding larger patches of irregular shape and size ; in a few specimens there is an obscure median stripe of yellow, but this is never well defined and generally altogether lacking. A tinge of red or rose is apparent about the whole margin of some specimens and this in a few extends as a flush over the whole dorsum."

Antennae 8-segmented ; range : (1) 30–34, (2) 36–42, (3) 54–62, (4) 34–44, (5) 48–52, (6) 26–30, (7) 20–24, (8) 34–38μ.

Leg I : coxa 54 by 70, femur + trochanter 170 by 40, tibia 130, tarsus 68, claw 20μ. The tarsal digitules are slender and clubbed.

Margin with a series of slender spines, 44μ long, not truncate. Stigmatic cleft spines similar but stouter. Anal plate 125μ long.

Habitat : On wistaria, Uitenhage, collected August 1901 ; Cape No. 1286. Thickly clustered on thin twigs of plant ; also said to be on rose and Australian myrtle.

Collection No. : 113.

200. **Lecanium durbanense,** sp. n.

Adult ♀ about 5 mm. long and 4 mm. wide, broad egg-shaped, with the extremities broadly rounded. The anterior end narrows perceptibly just in front of the middle. Body flat, mahogany-brown, with the margins and a faint median ridge somewhat darker, glossy.

When mounted, the most striking character under the low power is the chitinisation of the dorsum. In a specimen measuring 5 mm. in length a conspicuous chitinised line proceeded from the anal lobes along the middle of the dorsum to the level of the mouth-parts. A faint chitinised band was also noticeable around the margin.

The antennae are 7-or 8-jointed, with the following range in μ :—8-jointed series : (1) 27-34, (2) 34–41, (3) 37–51, (4) 34–48, (5) 41–44, (6) 27, (7) 27–31, (8) 44–51 ; 7-jointed series : (1) 27–34, (2) 37, (3) 37–51, (4) 37–41, (5) 41–44, (6) 37–51, (7) 48–51.

Leg I : coxa 88, femur + trochanter 187, tibia 119, tarsus 82, claw 20μ.

Anal plates about 156μ long, comparatively slender. The marginal zone appears more chitinous than the median area with the exception of the ridge previously mentioned. The chitin of the zone appears stippled ; that of the median ridge has numerous small oval transparent spots. The marginal spines are very wide apart (110μ), and comprise a single row of short conical spines. The stigmatic clefts are recessed in the form of narrow deep cups ; each contains two short (27μ) blunt spurs at the base.

Scattered over the integument are a few comparatively long hairs, which are particularly noticeable in the region of the antennae.

Habitat: On leaves of plant, species undetermined, Durban; collected by C. P. v. d. Merwe, April 1916.

Collection No.: 126.

Genus **Saissetia,** Deplan.

Adult ♀ usually very convex or hemispherical, and the integument very dense, dark in colour, and hard at maturity, with cell-like markings; legs and antennae well-developed.

201. **Saissetia hemisphaerica** (Targ.).

Lecanium hemisphaericum, Targ., Studii sul. Cocc. pp. 26, 27, etc., 1867.

Chermes anthurii, Bdv., Ent. Hort. p. 328, 1867.

Chermes filicum, Bdv., Ent. Hort. p. 325, 1867.

Chermes hibernaculorum, Bdv., Ent. Hort. p. 337, 1867.

Lecanium coffeae, Sign., Ann. Soc. Ent. Fr. (5) iii, p. 435, 1873.

Lecanium beaumontiae, Dougl., Ent. Mon. Mag. xxiv, p. 95, 1887.

Lecanium clypeatum, Dougl., Ent. Mon. Mag. xxv, p. 58, 1888.

Lecanium hemisphaericum var. *hibernaculorum*, Ckll., Bull. Bot. Dept. Jamaica, p. 71, 1894.

Lecanium hemisphaericum var. *filicum*, Green, Ent. Mon. Mag. xxxiii, pp. 70, 77, 1897.

Lecanium (*Saissetia*) *coffeae* var. *clypeatum*, Ckll. & Parr., The Industrialist, p. 164, 1899.

Saissetia hemisphaerica, Ckll., The Ent. Student, ii, p. 32, 1901.

Coccus coffeae, Kirkaldy, Fauna Haw. iii, pt. 2, p. 105, 1902.

Adult ♀ approaching hemispherical, ovate, with the margins somewhat flattened; dorsum smooth, shining, light to red-brown, about 2 to 4 mm. long, 1 to 2·5 mm. broad, and 1·5 to 2 mm. high. In the young forms an indistinct H is sometimes indicated on the dorsum, but this disappears in the adult, which is thus readily distinguished from *S. oleae*.

Integument with numerous clear, oval derm cells. Antennae 8-jointed, with the following range in μ: (1) 37–45, (2) 47-54, (3) 74–81, (4) 46–51, (5) 44–53, (6) 27–34, (7) 24–30, (8) 48–54.

Leg III: coxa 110, femur + trochanter 255, tibia 185, tarsus 88, claw 24μ.

Anal plates about 136μ long, triangular, with rounded corners. Marginal spines flattened at the ends, which are serrated in a variety of forms, some simple; stigmatic spines all strong and blunt; median longer than laterals.

Habitat: On pot-plants, Capetown, Grahamstown (C. P.), Durban and Pietermaritzburg (Natal), and Pretoria and Johannesburg (Transvaal).

Collection No.: 120.

202. **Saissetia oleae** (Bernard).

Chermes oleae, Bern., Mem. d'Hist. Nat. Ac. Marseille, p. 108, 1782.
Coccus olea, Oliv., Ency. Meth. vi, p. 95, 1791.
Coccus palmae, Haw., Tr. Ent. Soc. Lond. p. 307, 1812.
Coccus testudo, Curt., Gard. Chron. p. 444, 1843.
Coccus cycadis, Bdv., Ent. Hort. p. 323, 1867.
Lecanium cassiniae, Mask., N. Z. Trans. xxiii, p. 15, 1890.
Lecanium oleae var. *testudo*, Ckll., Check List, p. 331, 1896.
Lecanium oleae var. *mirandum*, Ckll. & Parr., Biol. Centr. Am. ii, pt. 2, p. 12, 1899.
Coccus oleae, Kirkaldy, Fauna Haw. iii, pt. 2, p. 106, 1902.

Adult ♀ short ovate, high convex to almost hemispherical, 2·5 to 4 mm. long, 1·5 to 3 mm. broad, and 1·5 to 2·5 mm. high. The dorsum has one longitudinal and two transverse ridges forming a distinct H, dark brown, often dotted with minute flecks of white wax. Derm with elongate cells, each enclosed in an irregular, polygonal tessellation.

Antennae 8-jointed, the segments measuring in μ: (1) 34, (2) 44–48, (3) 66–75, (4) 35–42, (5) 24–37, (6) 24–32, (7) 24–32, (8) 44–51.

Leg I: coxa 78, femur + trochanter 170, tarsus 85, claw 24μ

Anal plate about 176μ long. Marginal spines simple or flattened at apex.

Habitat: On a variety of plants, fairly common throughout the Union.

Collection Nos.: 122 and 122a.

A distinct variety of this scale, characterised by being larger and flat, without the dorsal H, is often found associated with typical *oleae* on oleander at Capetown. Its microscopic characters agree with *oleae* with the exception that antennal joints 2 and 4 are a little longer (*Coll. No.*: 122a).

203. **Saissetia nigra** (Nietn.).

Lecanium nigrum, Nietn., "Enemies of Coffee-tree," p. 9, 1861.
Lecanium depressum, Targ., Studii sul. Cocc., p. 29, 1867.
Lecanium begoniae, Dougl., Ent. Mon. Mag. xxviii, p. 209, 1892.
Lecanium nigrum var. *depressum*, Ckll., Check List, p. 332, 1896.
Saissetia depressa, King, Psyche, ix, p. 296, 1902.
Saissetia nigra, King, Psyche, ix, p. 296, 1902.
Saissetia nigrella, King, Psyche, ix, p. 296, 1902.
Coccus nigrum, Kirkaldy, Fauna Haw. iii, pt. 2, p. 106, 1902.

Adult ♀ long oval to broad ovate, low convex, shining black, 3 to 4 mm. long. Marginal spines scattered, simple, about 40μ long. Antennae of 7 or 8 segments, 7-jointed series with 4 longest, 8-jointed series with 3 longest; range in μ:— 8-jointed series: (1) 27, (2) 37-41, (3) 58–68, (4) 34–44, (5) 34–41, (6) 24, (7) 24, (8) 51–54; 7-jointed series: (1) 27, (2) 34, (3) 54, (4) 68, (5) 24, (6) 20, (7) 58.

Leg I: coxa 58, femur + trochanter 170, tibia 116, tarsus 68, claw 20μ.
Anal plate about 170μ long.

Habitat: On *Ficus* spp., Bayville, C. P., and Natal coast.

Collection No.: 123.

204. **Saissetia perseae,** sp. n.

Ova and larvae small, purplish red in colour, found beneath dry body of adult ♀ attached to mid-rib of leaf. Larvae about 0·35 mm. long and 0·18 mm. broad, almost oval, slightly broadest between the second and third pairs of legs, broadly rounded in front and regularly cleft behind, with two caudal spines equal in length to the greatest width of the body. The eyes are deeply pigmented.

The antennae are six-jointed; segment 2 a little shorter than 1; 3 is long (27–30μ), almost equal to 6; 4 and 5 are shorter and almost equal (13μ and 15μ). There is a distinct notch near the distal end of 3, and another at about the middle of 5, from which points long hairs arise. The terminal segment has a long apical spine, two others of about three-fourths its length, and several shorter hairs. Claws simple; upper digitules long, straight, with small globular knobs; lower digitules shorter, also with small clubs. Margin with thin short spines; at level of spiracles on each side there are two stout blunt spines, about 15μ long, pointing obliquely backwards. Anal bristles reaching level of hind-margin, or nearly so.

Adult ♀ 4·2 mm. long, 3 mm. broad, pointed at each end, but more so in front, with the dorsum quite flat. In colour it is blackish brown, and of a dull matt appearance, entirely without design or marginal appendages. The margin is entire, with a very slight notch at the two spiracles on each side. Seen from below the extreme margin is thin; the legs and antennae pale, and there are four faint lines, two on each side, representing stigmatic bands. There is no trace of an anal cleft when examined with a hand-lens. When crushed the body-contents are purple in colour. Placed in hot KOH solution the body becomes hard and curls so much that it is difficult to make a satisfactory mount.

The integument on the dorsum is extremely dense, hard and brittle when cleared; that of the venter is thin, hyaline, and very delicate. The legs and antennae are colourless. The anal cleft is entirely absent, with the exception of a very short space posterior to the anal plates. Beyond this it is merely indicated as a line between the polygonal "cells" of the dorsum. Polygonal cells with straight sides, each with a very small transparent spot appearing as a point under the microscope. The space occupied by the anal plates is clear, faintly yellow, a striking contrast to the deep brown of the remainder of the dorsum when cleared. The inner face of the plates is straight; the outer margin regularly curved to the tip giving them a broad heart-shape. (Fig. 243). The polygonal cells are fairly uniform in size to near the margin where they gradually disappear into the thin ± structureless marginal area. Eye-spots distinct.

The antennae are 8-jointed. Joints 2, 4, 6 and 7 sub-equal; 1 a little shorter, 3, 5 and 8 longer. Measurements in μ: (1) 30, (2) 37, (3) 47, (4) 30, (5) 50, (6) 30, (7) 27, (8) 47.

Habitat: On upper side of leaf of avocado pear (*Persea gratissima*), from Mrs. Godwin, Durban, May 1916.

Collection No.: 103.

This species is remarkable for the hardness of the integument at maturity and the fact that the anal cleft is obsolete in the later stages. It differs from *Hemilecanium*, however, in lacking the four perforate areas on the dorsum.

205. **Saissetia kellyi,** sp. n.

Adult ♀ almost circular, but rather wider than long (11·5 mm. by 13 mm.), flat, closely adherent to stem, deep chestnut in colour, with the dorsum matt, without ridges or lines of any kind, but flatly bounded to thin margin, often covered with dust, etc., so as to appear like a large flat blister on the bark. Younger specimens rather lighter in colour, with faint radiating ridges from the somewhat raised median area.

The following particulars concerning antennae, legs, and microscopic characters in general, refer to insects measuring approximately 7 mm. long, i.e., before chitinisation was fully complete.

Antenna 9-jointed, range in μ: (1) 48–54, (2) 85–102, (3) 129–153, (4) 75–85, (5) 58–65, (6) 105–116, (7) 44–51, (8) 34–48, (9) 74–79.

Leg I: coxa 153, femur + trochanter 357, tibia 245, tarsus 153, claw 31μ.

Anal plate about 320 μ long. The margin has a single row of short, stout, conical spines. Stigmatic cleft with 3 gradually tapering spines, laterals about 50μ, median about 136μ.

Around the body, just within the margin, is a series of complex, tubular glands, about 40 in number, distributed at almost regular intervals. Scattered over the integument, particularly near the margin, are numerous, short, stout, glandular hairs. The thin marginal area has the usual ± straight, sided polygonal cells; the median area has elongate oval cells much like those of *Hemilecanium theobromae*, Newstead.

Habitat: On thick stems of *Acacia melanoxylon*, Pietermaritzburg, Natal; collected by A. Kelly, June 1915.

Collection No.: 118.

The anal cleft is quite obsolete in mature specimens. This character, together with the two distinct types of cells on the dorsum and the 9-jointed antennae, reminds one of the type species of the genus *Hemilecanium*, Newst., but the absence of the four perforate areas preclude this species from that genus.

206. **Saissetia persimilis,** Newst. (Plate i., fig. 234).

Lecanium (*Saissetia*) *persimile*, Newst., Bull. Ent. Res. vii, p. 362, 1917.

"Female, adult. Not differing appreciably in its external form, colour, and density of chitin from *Lecanium* (*Saissetia*) *oleae* (Bernard), but in two examples the dorsum was covered with a fine dusky-white, mealy secretion. The median longitudinal and two transverse ridges, forming roughly the letter H, well marked in two specimens, but absent in another. Anal cleft completely fused. Anal lobes attenuated, outer angle broadly rounded, inner edge much the longest; apex bluntly pointed with one or two short spines. No stigmatic clefts; spines three, the central one slightly more than twice the length of the laterals. Antennae well developed, of eight segments. Legs rather slender; lower digitules very robust, incrassate proximally, dilated distally. Derm thickly studded with small, but well-defined, oval and translucent cells; these are much more crowded together at the margin and also larger." (Newstead).

Newstead states that *Lecanium* (*Saissetia*) *sylvestrii*, Leon., has some similarity to *persimile*, but the former has 7-jointed antennae and *three* transverse ridges across the dorsum.

Habitat: On *Combretum*, Muckleneuk, Pretoria; collected in October 1914.

Collection Nos.: 115 and 124.

207. **Saissetia subpatelliforme,** Newst. (Plate i., fig. 237).

Lecanium (*Saissetia*) *subpatelliforme*, Newst., Bull. Ent. Res. vii, p. 366, 1917.

Adult ♀ large, reaching 7 mm. long, 5 mm. broad at the base and 3·5 mm. high, very convex but ± conical, with the margin at the base slightly produced as a rounded ridge. The colour is dark castaneous to almost black, slightly shining, and without white flecks. There is no dorsal H, nor prominent ridges of any form (fig. 237).

Younger forms are lighter in colour, flat, disc-like, with the margins slightly raised and rounded and the median area wrinkled. The anal cleft is apparently obsolete and the anal lobes inconspicuous.

Antennae 8-jointed; range in μ: (1) 37–47, (2) 35–51, (3) 75–78, (4) 54–58, (5) 41–54, (6) 24–27, (7) 17–20, (8) 51–58.

Professor Newstead's description, omitting figure references, is as follows:

"Female, adult. Varying from broadly to narrowly ovate, centre generally highly gibbose; surface rather roughened or slightly rugose, often with widely separated patches of secretion, especially at the sides; dorsum (gibbosity) often shining. Derm cells of the median and sub-median areas small, ovate and widely separated, those near the margin much larger. Marginal spines of two kinds: (1) long and rather stout, dilated and divided on both sides; (2) similar, but only about half the length of the long ones. Stigmatic clefts practically obsolete; spines three, the laterals small, stout and pointed; central one missing in all the preparations. Eyes well defined. Antennae of seven or eight segments (both forms present in one ♀). Legs well developed; tarsus almost equal in length to the tibia; lower digitules stout, upper pair normal. Anal lobes with the base and outer edge of equal length, approximately. Anal ring of eight hairs. Anal cleft varying in length from a little less than a third to one-third the length of the body. Length, 3·8–5·2 mm."

Habitat: On stems of *Cedrela toona*, Salisbury, Southern Rhodesia; collected by Rupert Jack, June 1917. Also on stems of *Syringa*, Salisbury; collected by Rupert Jack, February, 1909 (119a).

Collection Nos.: 119 and 119a.

208. **Saissetia oculata,** sp. n.

Adult ♀ elongate, 8 to 9 mm. long by 4 mm. wide, moderately flat, dull, buff to brown in colour, with the eye-spots and anal plates darker, almost black; margin more chitin-brown, with a conspicuous fringe. Dorsum with rows (3) of hairs similar to fringe. Eyes distinct, almost circular, about 165μ in diameter, with darker central prominence. Integument with faint oval cells, widely scattered. In the specimens examined these are most conspicuous around the anal lobes,

the point from which the chitinisation of the integument appears to spread in the LECANIINAE. This suggests that, although the insects examined are adult, they may not be quite mature.

Antennae of 8 segments, range in μ: (1) 37–41, (2) 48–58, (3) 102–112, (4) 58–68, (5) 61–68, (6) 31–34, (7) 27–34, (8) 44–51.

Leg I: coxa 88, femur + trochanter 238, tibia 170, tarsus 102, claw 24μ.

Margin with conspicuous fringe of long spines (136μ) with tips saw-like or finger-like. Dorsum with three longitudinal rows of long (143μ) spines. Anal plates long, tapering (280μ). Stigmatic clefts inconspicuous with two very short spines and one longer (about half the length of marginal spines).

Habitat: On grapevine, Durban; collected by C. P. v. d. Merwe, May 1917.
Collection No.: 321.

Genus **Hemilecanium,** Newstead.

" Adult female with the posterior extremity not cleft. Anal orifice placed near the middle of the dorsum and closed above with a pair of hinged plates as in *Lecanium*. Larva and nymph with a distinct anal cleft as in *Lecanium*. Female in all stages with four large dorsal groups of compound spinnerets." (Newstead).

209. **Hemilecanium theobromae,** Newst. (Plate i., fig. 238).

Hemilecanium theobromae, Newst., Jl. Econ. Biol. iii, pt. 2, p. 39, 1908.

Professor Newstead's description, omitting figure references, is as follows:—

" Adult female broadly ovate or sub-circular; margins broadly flat, central area suddenly elevated, with strong irregular prominences. The whole of the dorsal area covered with a thin but dense layer of ochreous meal-like wax, but the prominences of the dorsum are generally denuded, apparently through abrasion, appearing through the secretion as shining, piceous, irregularities. Cuticle shining dark piceous on the central elevated area; dark castaneous and strongly rugose at the margins. Venter covered with a rather thick layer of white fibrous secretion. Anal cleft obsolete, but there is usually a faint emargination at the posterior extremity. Anal orifice placed just within the broad elevated dorsal zone at about one-third of the distance from the posterior margin. Derm cells of two distinct types; those of the dark central area narrowly elongate with an apical pore, those of the pale broad margin of the ordinary polygonal type. There are also four groups of spinnerets; two towards the anterior and two towards the posterior extremity, each group composed of several hundred spinnerets forming well-defined dark chitinised areas. Antenna of nine segments, of which the third is the longest; there are a few long hairs on the four terminal segments; formula 3, 4 (5, 2, 9) 6, 1 (7, 8). Legs highly chitinised; slender but small compared with the size of the insect; coxa almost equalling the length of the femur; digitules simple. Marginal spines with their broad bases suddenly contracted, each fitting into a well-defined socket, the latter being attached to a short subcutaneous tube. Stigmatic channels and spines absent.

" Length 13–15 mm.; width 12–13 mm.

" Second stage female broadly ovate, slightly narrowed posteriorly, marginal spines continuous, resembling those in the adult. Antennae of seven segments, the third being the longest, the rest of the segments subequal in length. Legs scarcely longer than the antennae; coxa rather broad. Mentum uniarticulate. Groups of spinnerets occupying relatively the same position as in the adult, but there are only about 60–70 individual spinnerets in each group; they are also larger and more distinctly separated than in the adult. Derm in the region of the anal cleft finely squamose, with a large subcutaneous tube; there is also a similar tube just within the margin opposite the anterior stigmata.

" Larva elongate; position of the compound spinnerets as in the adult and nymph. Mentum monomerous. Antennae of six joints, the third equalling the length of the fourth, fifth and sixth together. Marginal spines forming a continuous series."

Habitat: On tree euphorbia, East London, and stems of oleander, Capetown (Fuller, 1898).

Collection No.: 107.

Genus **Aclerda,** Sign.

Adult ♀ naked, a mere sac containing eggs at maturity, with normal mouth parts, but legs and antennae absent.

Larva greatly elongated, with parallel sides.

210. **Aclerda digitata** (Ckll.).

Pseudolecanium digitatum, Ckll., Ann. Mag. Nat. Hist. (7) ix, p. 24, 1902.

Aclerda digitata (Ckll.) Fernald, Catalogue, p. 210, 1903.

Professor Cockerell's description is as follows :—

" ♀, pyriform, with the hind end pointed; about $2\frac{1}{2}$ mm. long; dark ferruginous, shiny, producing some cottony material. End of abdomen strongly chitinized, with the form usual in the genus. The diagnostic characters, as in all species of the genus, are derived mainly from the larva, the female being a mere bag of eggs.

" Larva extremely long and narrow, length 600, breadth 160μ. Anterior extremity truncate, crenulate, with six short blunt, finger-tip-like spines; a row of fifteen blunt spines down each side of body; no dorsal spines; legs well developed, anterior tibia 60, its tarsus 30μ long; the tibia has a constriction about 27 from base, making it look almost 2-jointed, this being more or less apparent on all the legs; tarsal digitules long, with small knobs; claw-digitules shorter, filiform, knobbed. Antennae 24 apart at base and 30μ from anterior end of head; 6-jointed, joints measuring: (1) 18, (2) 12, (3) 27–33, (4) 20, (5) 21, (6) 30. Anal ring small, circular, without bristles on its margin, but posterior to it are set four bristles, of which the inner two are shortest; anterior to anal ring is a row of four finger-like blunt spines; on each side is a caudal bristle, about 190μ long, and beyond each of these a pair of finger-like spines; anterior to and a little laterad of each caudal bristle is a small round gland. The last two segments have each a pair of bristles on the ventral surface, those on the last being twice as long as those on the penultimate segment."

Habitat: On grass, Natal; collected by C. Fuller, 1901. This species has not been found again.

Collection No.: 134.

Genus **Allopulvinaria,** nov.

Adult ♀ naked above, very convex and distinctly segmented. Lower surface concave, filled with a compact powdery mass of wax which projects around the margins. Antennae somewhat rudimentary, of 4, 5 or 6 segments. Legs well developed. Anal ring with numerous (12?) hairs.

Larva elongate and narrow; anal tubercles produced, each with one long seta.

Type, *A. subterranea*, sp. n.

211. **Allopulvinaria subterranea,** sp. n. (Plate vi, fig. 246).

Larva active, pale pink, eyes pigmented, body elongate and narrow. Anal tubercles long, each with one long seta.

One-fourth grown ♀ with 4-jointed antennae, and marginal hairs as in *Lecanium*.

Adult ♀ viviparous, 7 mm. long, 4·5 mm. broad and 4 mm. high. Dorsum roundly arched; segmentation distinct, the segments roundly ridged.

The body is red, faintly flecked with white wax. Underside flatly concave, abdominal portion plainly segmented. Legs small, brown. Anal plates small, brown, from between which protrudes a double fine pencil of white wax. Lower concavity of body filled with cushion of white wax which extends slightly beyond the margin of the body; this is not cottony but compact. No eggs were seen, but larvae were present in the white waxy cushion and in the body of the ♀.

Antennae 4, 5, or 6-jointed, usually 5. Anal ring with numerous (12?) hairs.

Anal plates raised, appearing excavate so as more or less to enclose the anal tube from the sides as well as above. Anal groove closed. Integument with numerous simple glands and short acute spines scattered over the surface; the former especially noticeable in transverse series across the segments.

The following measurements may be useful for comparison.

Antennae: (*a*) 4-jointed type:—

	I	II	III	IV.
(a)	40	27	61	34μ
(b)	34	40	65	54μ

(*b*) 5-jointed series, range in μ:—(1) 34–45, (2) 34–40, (3) 51–68, (4) 15–34, (5) 23–40; (*c*) 6-jointed form, e.g. (1) 41, (2) 34, (3) 61, (4) 17, (5) 10, (6) 20.

Leg II: coxa 81 by 108, femur + trochanter 150, tibia 74, tarsus 74μ.

Habitat: On stems of "quick" grass, near bank of stream; collected by T. L. Watermeyer, Jonkershoek, Stellenbosch, C.P., July 1917.

Collection No.: 138.

Genus **Protopulvinaria,** Ckll.

The few species which have been described in this genus are similar to *Lecanium* in their early stages, but may be readily distinguished at maturity by the small white ovisac which is secreted beneath the adult ♀. In the normal condition this is but slightly larger than the body of the female and protrudes as a white ring around the margins of the body (fig. 248).

This genus is included in *Pulvinaria* by Mrs. Fernald in her Catalogue (p. 128), but it would appear that its correct position is between *Lecanium* and *Pulvinaria*.

212. **Protopulvinaria piriformis** (Ckll.), Lefroy. (Plate ii, fig. 244; iv, fig. 248.)

Pulvinaria (*Protopulvinaria*) *pyriformis*, Ckll., Jl. Trin. Nat. Club, i, p. 309, 1894.

Pulvinaria (*Protopulvinaria*) *pyriformis*, Ckll., Jl. Trin. Nat. Club, ii, p. 307, 1896.

Pulvinaria newsteadi, Leon., Riv. Pat. Veg. vi, p. 279, 1898.

Pulvinaria pyriformis, Ckll., Psyche, viii, p. 311, 1899.

Protopulvinaria pyriformis, Lefroy, Scale Ins. Lesser Antilles, p. 43, 1901.

Pulvinaria pyriformis, Fernald, Cat., p. 138, 1902.

Pulvinaria plana, Ldgr., Jahrb. Hamb. Wiss. Anst. xxxiii, p. 34, 1911.

Protopulvinaria piriformis, Ldgr., Die Schildläuse, p. 199, 1912.

Ovisac slightly larger than the body of the adult ♀, from which it extends as a uniform ring around the margins (fig. 348). Ova pale greenish white, regularly oval.

Adult ♀ about 3 mm. long and about as broad slightly behind the middle; broadly rounded behind, suddenly narrowing in front so as to be short pear-shaped or drop-shaped. The margins of the body are flat; the central part is flatly rounded. In living specimens the general body colour is yellowish or pinkish with the margins reddish brown. The subdorsal area is irregularly suffused with mauve or violet. The anal cleft is deep, extending almost to the centre of the body, but the sides are in close proximity, so that the posterior margin in most cases appears uniformly broadly rounded. The anal plates are very long and very narrow and are brownish in colour. Dead, dry specimens are pale to deep brown according to age. When stained, cleared and mounted the following characters may be noted:—

Antennae 7-jointed; range in μ: (1) 27–31, (2) 37–44, (3) 44–51, (4) 51–54, (5) 20–24, (6) 20–24, (7) 51–54.

Leg I: coxa 75, femur + trochanter 170, tibia 109, tarsus 54, claw 20μ.

Leg II: coxa 99, femur + trochanter 180, tibia 112, tarsus 68, claw 24μ.

Anal plates very long (470μ) and narrow (fig. 244).

Marginal spines short, thin, with ends deeply branched, or occasionally bifid from base, in a close-set series. Stigmatic spines 3, laterals short and acute, median two or three times as long. Young form, about 1·2 mm. long, oval, translucent, appearing faintly greenish yellow, with six deep purple lines radiating from median area to margin, the four posterior being nearer together than the anterior two.

Habitat: On undersides of leaves of avocado pear (*Persea gratissima*); collected by A. Kelly, Pietermaritzburg, April 1916.

Collection No.: 77.

Genus **Pulvinaria**, Targ.

"Adult female resembling *Lecanium* in the early stages and until the commencement of oviposition, when a loose cottony ovisac is secreted from below the posterior extremity of the insect, for the protection of the eggs. The body of the insect is tilted up during the formation of the ovisac, and often becomes much shrivelled and distorted, finally remaining as a small shapeless scale at the anterior extremity of the mass of ovisac. It is sometimes rendered still more inconspicuous by the partial overlapping of the secretionary matter, but is never completely enveloped. In all purely structural characters there is nothing to distinguish species of this genus

from those of *Lecanium*, so much so that, until the period of oviposition, it would be impossible to determine whether an individual should be placed in the one or the other genus." (Green).

213. **Pulvinaria aristolochiae,** Newstead. (Plate ii, fig. 242).

Pulvinaria aristolochiae, Newst., Bull. Ent. Res. viii, p. 19, 1917.

Adult ♀, immediately prior to forming the ovisac, about 8 mm. long and 4·5 mm. broad, with thin margins and the dorsum rising to a distinct central prominence : colour brown, with darker markings. The margin is supplied with a short fringe of thin pale hairs ; from this to the raised centre extend a number of dark lines.

Male puparium about 3 mm. long, moderately convex, dull white, not glassy, with a distinct transverse ridge about the middle. Two white filaments protrude from the posterior extremity some days prior to the emergence of the adult ♂. Adults were emerging in July 1916.

Antennae 8-jointed, range in μ :—(1) 57–75, (2) 68–75, (3) 187–190, (4) 95–102. (5) 78–85, (6) 34–47, (7) 24–34, (8) 41–44.

Leg I : coxa 185, femur + trochanter 400, tibia 262, tarsus 123, claw 34μ.

Anal plate about 250μ long. Marginal spines short (27–35μ), many appearing truncate.

As Professor Newstead did not have the opportunity of examining living material the above particulars are given to supplement his description which is as follows :—

" Female, adult. More or less cordate in outline and rather flattened ; dorsum almost completely covered with a well-defined layer of flake-like wax which varies in colour from dirty grey to greyish brown. Antennae of eight segments ; 3rd, 4th and 5th unusually long, the two first-named swollen distally ; 3rd about twice the length of the 4th ; three long hairs on 2nd, one of which lies (in three examples) close up to the succeeding segment ; there is also a long distal hair on the 3rd ; two on the 5th ; a single spine on the 6th, 7th and 8th, the last-named also with a few very short hairs. Legs stout, long ; tarsus relatively very short, less than one-third the length of the tibia ; lower digitules long and very broadly spathuliform. Marginal spines stout, pointed, and placed rather close together ; stigmatic spines broken away in all the specimens, their points of attachment being continuous with the marginal series. Submarginal pores very large, continuous, but rather widely separated. Anal lobes with four stout spines near the apex, on the inner edge. Anal cleft short, usually a little less than one-sixth the entire length of the body. Anal ring with eight hairs. No derm cells present ; but there are numerous circular spinnerets (? ventral), each having an inner concentric ring. Length 5·7–7·6 mm.

" Ovisac pure white and closely felted, long and generally tortuous. Length 10–20 mm."

This insect shows great similarity to *P. jacksoni*, Newstead. Both have remarkably long joint 3 to the antennae, which in *jacksoni* is almost 120μ, in *aristolochiae* about 180μ. Further both produce extremely long ovisacs.

Habitat: On stems of *Erythrina caffra* Thunb., (Kaffir-boom), Natal Coast.

Collection Nos. : 79 and 84.

214. **Pulvinaria floccifera** (Westw.).

Coccus floccifera, Westw., Gard. Chron., p. 308, 1870.

Pulvinaria brassicae, Ckll., Can. Ent. xxvii, p. 135, 1895.

Pulvinaria floccifera, Green, Ent. Mon. Mag. xxxiii, p. 72, 1897.

Pulvinaria phaiae, Lull, Ent. News, x, p. 237, 1899.

Pulvinaria floccosa, Newst., Jl. Roy. Hor. Soc. xxiii, p. 26, 1900.

Completed ovisac about 6 mm. long and 3 broad, with parallel sides and rounded extremity; pink in colour, from the numerous ova which are of that colour; the small amount of white cottony matter which is incorporated in the mass is inconspicuous owing to the large number of eggs.

♀, young stage: about 2 mm. long, translucent greenish yellow, with the median dorsal area suffused with a pinkish or brownish tint.

Adult ♀ about 3 mm. long and almost as broad, moderately convex. The margins are pale translucent greenish yellow, the median dorsal area is reddish brown and the whole dorsum is more or less wrinkled. The crests of the ridges, especially those running to the margin, blackish brown. Anal plates small, of the same colour as the dorsal area or slightly paler. When the ovisac is almost complete, the body of the ♀ has shrunken to such an extent that the brownish part of the dorsum is not conspicuous, while the black crests of the ridges are close together and thus give the insect a much darker appearance.

Antennae 8-jointed, range in μ: (1) 34–38, (2) 44–51, (3) 65–72, (4) 34–44, (5) 34–41, (6) 24–27, (7) 24, (8) 44.

Leg I: coxa 78, femur + trochanter 190, tibia 163, tarsus 102, claw 24μ.

Upper digitules very long, slender, with spherical knobs. Lower digitules stout, normal. Anal plate about 145μ long. Just in front of the anal plates there are a few scattered, "rosette" glands and two pairs of long (108μ) hairs. Marginal spines about 50μ long and 100μ apart, slender, often with finely divided tips, alternating with a submarginal row of similar hairs of about half the size. Stigmatic spines comparatively short and stout, with the outer ends tapering to blunt points. From these to the spiracles extends a double row of small rosette glands.

Puparium of ♂ of the usual type with the segments of the plates very distinct. The whole puparium is opaque white, appearing finely striate in a longitudinal direction.

Habitat: On a native plant (*Solanum* sp. ?) Durban; collected by C. P. v. d. Merwe, July 1916.

Collection No.: 82.

A very large percentage of the young forms (about 1·5 mm. long) are very convex and shiny black, obviously parasitized.

215. **Pulvinaria jacksoni,** Newst.

Pulvinaria jacksoni, Newstead, Jl. Econ. Biol. i, p. 155, 1908.

Professor Newstead's description is as follows:—

"Ovisac from two and a half to seven times the length of the female; breadth equal to the width of the insect; low convex, sides parallel; closely felted, tough and web-like in texture. Length 16·75–42 mm.

" Adult female—Dried examples sienna brown or dull ochreous; the pale examples with yellowish mottlings indicating the position of the derm-cells. Form normal. Antennae of eight segments, the third being much the longest; last four subequal; there is a very long hair on the third and fifth, the one on the former the longest. Legs stout; trochanter about one-third the length of the femur, with a very long apical hair; digitules to claws and tarsi normal. Derm with very small inconspicuous glands. Marginal spines short, closely set, truncate, the ends often notched. Stigmatic clefts with pointed spines and two large tubercles.

" Male puparium, much stained with brown, normal in shape, but thick and unusually wax-like in appearance; dorsal plate with one large central, white, wax-like felted spot and several brownish tubercles immediately beyond it. Length 2·25 mm."

The following measurements are added for comparison with the other South African species :—

Antennae 8-jointed; range in μ: (1) 48–54, (2) 54–68, (3) 102–116, (4) 68–75, (5) 61, (6) 31–34, (7) 31–34, (8) 37–41.

Leg I: coxa 139, femur + trochanter 354, tibia 230, tarsus 108, claw 27μ.

Anal plate about 240μ long.

Habitat: On *Trichilia* sp., Durban; collected by A. Kelly, May 1918.

Collection No.: 79a.

216. **Pulvinaria lepida,** sp. n.

Adult ♀♀ with ovisacs clustered on stems and leaves of grass.

Adult ♀ averaging 2 mm. long by 1·3 mm. broad, moderately arched, light brown in colour, dorsum with transverse wrinkles; marginal area flecked with white wax. Ovisac white, elevated, extending behind the insect for about the length of ♀ body, faintly fluted on upper surface.

Numerous ♀♀ parasitised. Mounted specimens contain numbers of well developed embryos.

Antennae variable, of 7 or 8 segments; terminal joint appearing truncate; range in μ :—7-jointed: (1) 34–37, (2) 37–48, (3) 54–65, (4) 70–82, (5) 24–27, (6) 24–27, (7) 37–41; 8-jointed: (1) 34–37, (2) 44–48, (3) 51–58, (4) 34–41, (5) 44–48, (6) 24–27, (7) 24–27, (8) 37–41.

Leg I: coxa 78, femur + trochanter 187, tibia 153, tarsus 102, claw 24μ.

Anal plate about 153μ long, with 5 comparatively short hairs at the apex. Marginal spines in a single row, simple, pointed, about 41μ long and 20–30μ apart, straight or only slightly curved. Stigmatic spines: laterals short, acute; median stouter, longer, blunt.

Habitat: On stems and leaves of common veld grass, Standerton and Pretoria (K. Munro).

Collection Nos.: 139 and 328.

217. **Pulvinaria mesembryanthemi** (Vallot), Sign. (Plate i, fig. 235).

Pulvinaria mesembryanthemi, Vall., Bull. de Ferussac, xxii, p. 469, 1830.

Calypticus mesembryanthemi, Costa, Ann. Acad. Asp. Naples, p. 273, 1844.

Pulvinaria biplicata, Targ., Catalogue, p. 34, 1869.

Pulvinaria mesembryanthemi, Sign., Ann. Soc. Ent. Fr. (5) iii, p. 39, 1873.

Adult ♀ to time of forming ovisac, and younger stages, green, of the same tint as the fleshy leaf of *Mesembryanthemum edule*, its most common food-plant; attaining a length of 5 mm. and an almost equal breadth, moderately convex, dorsum smooth.

As the ovisac is produced the body of the ♀ becomes yellowish and later yellowish brown, much shrunken, with four transverse ridges and, ultimately, contorted or bent backward (fig. 235).

Antennae 8-jointed; range in μ: (1) 48–55, (2) 48–54, (3) 75–85, (4) 44–58, (5) 27–37, (6) 24–34, (7) 27–31, (8) 46–51.

Leg I: coxa 122, femur + trochanter 290, tibia 211, tarsus 126, claw 34μ.

Anal lobes approximately 165μ long.

This insect is common throughout South Africa on *Mesembryanthemum* spp., especially *M. edule*, Linn. It becomes so numerous in some seasons that it kills patches of this plant when grown in parks, etc. This was the case at the Eastern Sports Grounds, Pretoria, in November 1914.

The ♂♂ emerged from the next generation about Christmas 1914 and the following particulars are given from fresh material obtained at that time :—

Male test, transparent, white, glassy, about 1·5 mm. long, margins depressed, central plate raised, slightly keeled.

Body, legs and antennae dark brown. Wings broadly rounded, iridescent, dorsal sclerites and eyes shiny black. Two caudal waxy filaments, white, as in *Pseudococcus*, length equal to head + body without antennae.

Length of head + body 1·17 mm. (without genital spike); length of wing 1·0 mm.; width of wing 0·5 mm.; length of antenna 0·84 mm.; length of genital spike 0·27 mm.; length of caudal setae 1·0 mm.

Antennae 10-jointed, the segments measuring: (1) 34, (2) 48, (3) 51, (4) 180, (5) 112, (6) 105, (7) 85, (8) 68, (9) 61, (10) 74μ.

Habitat: On *Mesembryanthemum* spp., chiefly *M. edule*, Linn., throughout the Union.

Collection No: 78.

218. **Pulvinaria psidii,** Mask.

Pulvinaria psidii, Mask., N.Z. Trans. xxv, p. 223, 1892.

Adult ♀ pale transparent yellow with irregular black markings; 2 mm. long and 1·7 mm. broad. The ovisac is white, as wide as the body, always *flat*, attaining twice the length of the body. Ova pale yellow.

Larvae pale yellow, hatching when received, 16th November 1914.

Adult ♀ flatly convex with slightly raised median keel. Anal plates pale brown.

Antennae 8-jointed; range in μ: (1) 24–34, (2) 37–44, (3) 51–58, (4) 27–34, (5) 27–34, (6) 20–24, (7) 14–20, (8) 41–44.

Leg I: coxa 68, femur + trochanter 190, tibia 145, tarsus 85, claw 27μ.

Anal plate about 130μ long. Margin with a row of thin spines about 34μ long, tips divided but not dilated. These spines are set much closer together on the anterior part of the body. Integument clear, with a few simple glands with short

spines and a few long hairs near the insertion of the antennae. Stigmatic spines; laterals short, conical; median longer (51μ).

Habitat: On guava, Botanic Gardens, Durban; collected by A. Kelly, November 1914.

Collection No.: 81.

Genus **Ceronema,** Mask.

Maskell's original diagnosis of this genus, as given in the Transactions of the New Zealand Institute, p. 55, 1894, is as follows:—

"Female insects in the adult stage covered wholly or partially by tests of threads more or less closely woven, neither glassy nor felted, never forming homogeneous plates. No fringe. Form of insect Lecanid, with normal cleft and lobes.

"Larva Lecanid, showing cleft and lobes.

"Male pupa covered by a glassy test of normal Lecanid form, composed of plates more or less homogeneous."

219. **Ceronema mobilis,** sp. n.

Adult ♀ about 3 mm. long, broad oval in outline, flat, with the dorsum almost entirely covered with long, white, waxy filaments. Around the margin the filaments are long and coarse, but those on the dorsum are short and fine and ± curly and densely matted and appear almost felted. The colour of the insect, beneath the secretion, is caramel brown.

When cleared and mounted the body is broad oval; integument thin and transparent with numerous scattered, small, simple gland openings. Margin very closely set with a very short fringe of marginal spines, which are only about 20μ long, thin, linear, two or three, usually two, arising from the same pore; they are unusually close together, averaging about 14μ apart. Stigmatic clefts shallow, but distinct because of their chitinised sides; each cleft with two or three curved, blunt processes which are about as long as the marginal spines.

Antennae 7-jointed; range in μ: (1) 27–37, (2) 41–51, (3) 34–54, (4) 68–78, (5) 27–31, (6) 17–27, (7) 41–44. Joints 2 and 4 each with two long setae, 5 with one, 6 with two and 7 with eight.

Leg I: coxa 75, femur + trochanter 187, tibia 105, tarsus 68, claw 24μ.

Anal plate about 140μ long with 1 apical and 3 subapical spines.

Habitat: On leaves of common native bush (*Celastrus cordata*, E.M.) (Celastrineae); collected by C. Fuller, Illovo River, Natal, August 1916.

Collection No.: 97.

The adult ♀ moves about quite readily. A number of mature specimens were put on one side when received with a view to photographing them, but next day, when the leaves had slightly dried, the insects had all crawled off and so disarranged the waxy filaments.

Genus **Lichtensia,** Sign.

Adult ♀ oval or suboval, like a *Pulvinaria*, except that the secretionary sac covers the whole body with the exception of the cephalic end, which is usually more or less exposed. Antennae 8-jointed.

220. **Lichtensia asparagi,** sp. n.

Female ovisac about 4·5 mm. long, elongate, narrow and very convex, sordid white in colour, thin but dense, with the anterior extremity open, exposing the front portion of the dry female.

Male puparium moderately large, elongate, very convex, with perpendicular sides, thin, semi-opaque, dorsum flatly rounded, entirely without median plate. There is a faint indication of sublateral lines, otherwise the surface is uniformly stippled.

Adult ♀, mounted, broad oval, about 4 mm. long, with the two extremities about equally rounded ; anterior extremity not produced.

The integument appears remarkably free from conspicuous glands or hairs. Margin with a single scattered row of short sharp curved spines. Stigmatic spines stout, somewhat curved, with rounded ends.

Antennae 8-jointed, in one antenna examined 9-jointed, with the following range in μ: (1) 35–48, (2) 57–60, (3) 68–78, (4) 51–71, (5) 40–61, (6) 30–37, (7) 25–34, (8) 30–38.

Leg I : coxa 88, femur + trochanter 228, tibia 190, tarsus 102, claw 24μ.

Anal plate about 185μ long, with longitudinal folds.

Habitat : On *Asparagus capensis*, L. (Liliaceae), Eastern Cape Province.

Collection No. : 131.

Genus **Filippia,** Targ.

Female flat, oval, legs and antennae normal. Side of body and dorsum with numerous tubular glands. Female, at maturity, entirely enclosed in a flat felted sac which, after oviposition, serves as an ovisac.

221. **Filippia chilianthi,** sp. n.

Adult ♀ entirely covered with a dense, closely felted layer of white secretion, about 6 mm. long and 3 mm. broad, ± regularly oval, with the dorsum moderately convex. This secretionary layer is secreted slowly from all the upper parts of the body, the glands concerned being scattered. This is not the case in the PSEUDOCOCCINAE, in which the ovisac is formed by secretionary glands in the posterior and marginal portion of the body only. Little or no secretion appears on the ventral surface, so that the leaf or twig forms the floor of the sac; the marginal secretion becomes attached and entirely encloses the ♀. As oviposition proceeds the body shrinks away from the posterior end of the sac which becomes almost filled with ova. At death the dry shrivelled body of the ♀ occupies a small portion at the anterior end.

Prior to secreting the ovisac the ♀ is from 4 to 5 mm. long, and rather more than half as wide. The sides are almost parallel for more than half the length of the body, the posterior end appearing broadly rounded, and the anterior end more pointed. In colour it appears greyish brown with a lighter median, flatly rounded, keel. When seen under a hand-lens, however, it is noticed that the ground-colour of the body is yellowish, and semi-transparent, speckled with black. The anal cleft is short, with the sides closely adjacent. The anal plates are small and brown. The lower surface is slightly concave, greasy-yellowish in colour, the black speckling of the dorsum only showing faintly through at the extreme margins. The stigmatic bands are represented by two short faint white lines on each side.

At a younger stage—when about 2·5 mm. long—the body is red-brown, rugose at the edges, with the median keel not prominent but smoother than the remainder of the body.

The antennae are 8-jointed; range in μ: (1) 31–45, (2) 50–62 (3) 95–108, (4) 54–65, (5) 32–44, (6) 27–34, (7) 27–34, (8) 31–37.

Leg I: coxa 102, femur + trochanter 245, tibia 165, tarsus 85, claw 20μ.

Tarsal digitules moderately long (70μ), slender hairs with their distal ends slightly clubbed. Lower digitules short, broad. Marginal spines short (27μ), truncate. Anal plate about 155μ long. Stigmatic cleft with three comparatively slender spines, laterals about 34μ, median similar but longer (51μ).

Male puparium about 2 mm. long and 1 mm. wide, dark red when containing the insect; white and glassy when empty. The divisions of the test are very prominent, opaque white; the remainder being ± wrinkled and almost hyaline.

Adult ♂♂ were emerging in large numbers when the material was received, 5th April 1916.

Copulation was observed in a number of cases, the ♀ in each case measuring about 4 mm. in length. The body of the male was curved downward admitting the sheath into the cleft of the ♀. During this process the two long waxy filaments of the ♂ stood erect.

The adult ♂ is about 1·0 mm. long, rich red-brown in colour, with two long waxy caudal filaments about half as long again as the head and body combined, without the antennae. The body, legs, and antennae are all red-brown. The head is slightly darker. The scutellum is polished at the edges, with a sunken, matt, central patch. The wings are hyaline, matt, extremely iridescent, with a strong sub-costal, cochineal red band.

When mounted, the following measurements may be taken as an average :—

Head and body, without antennae	1·3 mm.
Antennae	0·847 mm.
Genital spike	0·27 mm.
Wings: length 1·2 mm., width	0·6 mm.
Caudal filaments	2·0 mm.

Habitat: On a native shrub; collected by C. Fuller, Illovo River, Natal, April 1916. On leaves of *Chilianthus oleaceus*, Burch (Loganiaceae), Bloemfontein, O. F. S.; collected by J. C. Faure, April 1916.

Collection Nos.: 127 and 128.

This insect, with the ovisac completed, is similar in appearance to *F. oleae* (Costa) but, according to Signoret's description of that species, the adult has 6-jointed antennae.

222. **Filippia carissae,** sp. n. (Plate i, fig. 236).

This species differs from *F. africana* in the following respects :—

The ovisac is a little larger and generally less compact; often split around the edges (fig. 236). The antennae are more variable, 7 or 8-jointed, range in μ :—

(*a*) 8-jointed: (1) 41–54, (2) 51–54, (3) 102–119, (4) 68, (5) 37–44, (6) 34, (7) 24–27, (8) 34–37; (*b*) a specimen with 7-jointed antennae gave the following measurements :—

i.	54	68	105	122	34	27 .	41
ii.	41	68	109	68	51	37	68

Leg I : coxa 95, femur + trochanter 240, tibia 204, tarsus 88, claw 20μ.

Anal plate 176μ, rather elongate, with one or two long spines at apex. Margin with a single row of ± plate-like spines, narrow at the base and gradually broadening at the distal ends. Stigmatic clefts somewhat sunken, with three spurs of moderate length.

Habitat : On leaves of *Carissa grandiflora*, A. DC. (Apocynaceae), Natal Coast ; common.

Collection No. : 129.

Genus **Conofilippia,** nov.

Female Lecaniid, flat, with well developed legs and antennae ; dorsum with numerous sharp spines ; margin with slender spines and stigmatic cleft similar to *Lecanium*. At maturity the insect is entirely enclosed in a dense felted sac, which is elevated in the form of a high cowl. Antennae 7-jointed.

Type, *C. subterranea*, sp. n.

223. **Conofilippia subterranea,** sp. n. (Plate iii, fig. 245).

Adult ♀♀ enclosed in conical felted tests on the roots of a native shrub. Test about 6 mm. long, 5 mm. broad and 5 mm. high (figs. 245*a*, *b*).

Adult ♀ flat, about 5·5 mm. long, 4 mm. wide, smooth, glossy, pink to red in colour, brown and wrinkled when dry, on a thick mat of dense powdery material (the floor of the test) which is buff to yellow-brown in colour and dusted with white wax beneath the insect.

In one or two cases the top of the test shows a circular orifice, but this does not appear to be normal and looks as though it had been made for the exit of some Hymenopterous parasite.

Largest ♀, when mounted, about 6 mm. long, and 4·2 mm. wide. Integument clear, with a number of simple glands which are particularly abundant near the margin, and with numerous short (17μ) sharp spines. The margin is thickly set with a compound series of slender spines about 24μ long, which are somewhat curved near their tips. Stigmatic clefts with three blunt spurs, laterals about 27μ, median about 37μ.

Antennae 7-jointed ; range in μ: (1) 35–40, (2) 25–34, (3) 40–47, (4) 37–42, (5) 34–44, (6) 17–30, (7) 37–51. In one case joints 6 and 7 were united, forming a segment 64μ long.

Leg I : coxa 102, femur + trochanter 220, tibia 170, tarsus 100, claw 40μ. The junction of the tibia and tarsus is swollen and suddenly narrows towards the distal half of the tarsus.

The anal lobes are rounded, about 230μ long.

Habitat: On roots of native shrub with red stems; collected at De Wildt, Pretoria District, Transvaal, by Claude Fuller, May 1915. The drawings (figs. 245-b) were kindly made from living material by the collector.

Collection No.: 137.

Genus **Ceroplastes,** Gray.

Adult ♀ completely enveloped in a more or less dense covering of wax; no marginal fringe or radiating processes. Sometimes the waxy covering exhibits a variety of arrangement in the form of definite plates or plaques. In other species the covering is uniform in texture and is then most often soft, and contains a large percentage of watery fluid. On removing the wax a caudal prominence is generally visible. Legs and antennae present, well developed.

224. **Ceroplastes bipartitus,** Newst.

Ceroplastes bipartitus, Newst., Bull. Ent. Res. viii, 1, p. 25, 1917.

"Female test. Colour of dried specimens very like pale dirty beeswax. In the young adults the test is broadly oval, somewhat hemispherical and divided into nine plates: three bilateral, one cephalic, one anal and one dorsal, the last-named with a conspicuous dark brown or blackish oval spot, with a central elongated patch of pure white wax; the nuclear spots to the lateral plates are smaller and generally much less conspicuous than the dorsal one. Margin over the stigmatic areas with a pair of laterally compressed and somewhat disc-shaped extensions, each extension carrying on its edge a narrow strip of opaque white wax, the tip of which sometimes reaches the dark nuclear spot of the lateral thoracic plate. In very old examples the test has increased in thickness considerably, but this has been so much damaged in transit as to render it useless for descriptive purposes; however, one can trace the curious marginal extensions, which are somewhat like a narrow-waisted and distorted bobbin, or the toy used in the once popular game 'diabolo.' Average length of young adults, 3 mm.; height 1·6–2 mm.; average length of old adults, 6 mm.; height doubtful.

"Female adult. Denuded of wax, hemispherical; caudal process very long, varying in length from one-half to a little less than one-half the length of the remaining portion of the insect. Submarginal tubercles small, but generally clearly defined; one cephalic and three bilateral, the two over the stigmata slightly more pronounced than the rest. When examined under a high power lens, by transmitted light, these tubercles are seen to be traversed by clear cell-like tracts forming an irregular reticulated pattern. It is reasonable to assume, therefore, that these may be the special set of glands which secrete the nuclear spots in the centre of the plates in the test. Derm relatively thin, but strongly chitinised. Pores minute, separated over a large portion of the dorsum by slightly varying distances equalling the length of one of the short segments of the antennae or two of them together. Stigmatic clefts relatively shallow, but very clearly defined; spines short, obconical, those at the extreme margin very minute and stud-like. Marginal spines or hairs not traceable. Antennae of six segments, the 3rd longer than the last three together. Legs normal. Length of denuded female, inclusive of the caudal process, 4·5–4·6 mm.; length of caudal process, 1·3–1·5 mm.

" Male puparium. Consisting of two distinct parts ; the lower half boat-shaped, and of a glassy vesicular texture, as in those typical of the genus *Lecanium* ; the upper portion opaque, low, convex, and of a dirty beeswax colour, with nine narrowly rectangular, submarginal patches of snow-white secretion. Anal cleft apparently obsolete. On the emergence of the male the whole of the upper portion falls away, leaving the ventral half attached to the food-plant. The line of cleavage between the upper and lower portion is clearly defined in those puparia from which the imprisoned male has not escaped. Length 1·6 mm.

" South Africa, 1914 (de Charmoy)." (Newstead.)

This species is apparently not represented in the collection of this Division.

225. **Ceroplastes candela,** Ckll. & King.

Ceroplastes candela, Ckll. & King, The Entom. xxxv, p. 113, 1902.

" ♀. Long 2⅔, lat. 3½, alt. 4½ ; dark red-brown, elevated, with vertical sides. Caudal horn a prominent stout spine, hardly ½ mm. long, placed nearer the top of the scale than the base. Dorsum smooth and shining, with only a very small central raised line. Sides of insects with vertical stripes of dense secretion ; no wax, except that composing these stripes, between the insects, which are densely crowded together, their vertical sides contiguous. They rest on a thin substratum of wax, and are covered above with yellowish-white wax, about 1 mm. thick. The outlines of the insects are vaguely marked on the surface of the covering wax by a brownish stain. The wax, with the insects beneath, surrounds the twig as the wax does the wick of a candle; the whole mass is about 20 mm. diameter, that of the twig being about 5 mm.

" Mr. King found the antennae to measure thus in μ :—

Joints	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Length	56	68	56	60	28	32	40
Breadth.. ..	64	48	40	32	28	28	24

" Found by Mr. Fuller at Richmond, Natal. The nearest ally is an undescribed species from Paraguay, collected by Professor Bruner." (Ckll. & King).

This species is not represented in the collection.

226. **Ceroplastes combreti,** sp. n.

Test of ♀ about 3 mm. long, broad and high, conical, with the anterior side a little more precipitous than the posterior, which is somewhat excavate above. There are no plaques, but the whole body of wax is arranged in ± distinct columns, three on each side. The apex is blunt, bearing an opaque white ridge surrounded by six opaque white spots—the tops of the columns. Between the two most prominent lateral ridges are the distinct white stigmatic bands which extend from the base to the crown. The colour, when fresh, is bright rose-red with darker transverse marks.

The antennae are 8-jointed ; range in μ : (1) 37–44, (2) 56–61, (3) 34–48, (4) 27, (5) 37–41, (6) 20–24, (7) 17–24, (8) 37–41.

Leg I : coxa 75, femur + trochanter 180, tibia 129, tarsus 85, claw 20μ.

Anal plates ± semicircular, about 160μ long and 85μ broad. The derm is thin and transparent, with numerous small, scattered, simple glands, from some of which short, tubular projections arise. Stigmatic clefts with large numbers of very small, roundly conical, thimble-shaped spines.

The distinct, long, opaque white lines, the reddish colour, soft wax, etc., suggest *quadrilineatus* of Newstead, but this latter species has 6-jointed antennae and is obviously quite distinct by other characters of the test.

Habitat: On stems of *Combretum* sp., De Wildt, Pretoria District; collected by Claude Fuller, July 1918.

Collection No.: 317.

227. **Ceroplastes destructor,** Newst.

Ceroplastes ceriferus (Anderson) Newstead, Bull. Ent. Res. i, pp. 66, 195, 1910.

Ceroplastes destructor, Bull. Ent. Res. viii, p. 26, 1917.

" Female test. White, creamy white or dirty white; exceedingly soft and containing an excess of moisture. Form irregular, with large but ill-defined gibbose protuberances; sides usually with two narrow opaque lines of secretion from the stigmatic clefts. No trace of lateral plates. Length, 4–8 mm.

" Female, adult. More or less hemispherical, with the sides often slightly compressed; caudal process long; integument castaneous and highly chitinised, smooth and shining, and without fovea or lateral tubercles. Antennae of six segments, the 3rd being as long as the 4th, 5th, and 6th together; the last three segments with stiff and bluntly pointed, spinose hairs. Legs small; hind femora very short and often distinctly incrassate; hind tarsi equal in length to the tibiae, or sometimes slightly longer. Claw very short; lower digitules very long and stout; upper digitules normal. Stigmatic clefts well defined, but relatively small; stigmatic spines very small and pointed, bases not constricted; basal attachment (disc) very large. Caudal process (after maceration) transparent and somewhat flexible; sides with an irregular double row of short spinose hairs, and in addition to these there are two pairs of longer hairs (one pair of which is twice the length of the others) slightly ventral to the row of short ones and towards the distal extremity. Anal lobes short and highly chitinised. Dorsal pores very small, rather widely separated. Ventral integument opposite the caudal process, with rather extensive groups of circular pores, many of which, in well cleared specimens, are linked together with lines of dark chitin. Length 4–7 mm." (Newstead.)

Habitat: On custard apple and avocado, Nelspruit, Transvaal; collected by D. Gunn, September 1915 (Coll. No. 93). On syringa (*Melia azedarach*), Bechuanaland, October 1918 (*Coll. No.* 336).

Collection Nos.: 93 and 336.

228. **Ceroplastes egbarum,** Ckll.

Ceroplastes egbarum, Ckll. The Entom. xxxii, p. 127, 1899.

Ceroplastes cristatus, Green, Ann. Mag. N.H. (7) iv, p. 190, 1899.

Professor Cockerell's description is as follows :—

" Waxy female scales often crowded on the twigs, two or more coalescing; about 11 mm. long, 10 broad, and 6 high, the wax extremely thick, not at all divided into plates, snow-white, here and there with a suffused pinkish stain.

" ♀. Denuded of wax 5½–7 mm. long, 4 broad, 2½–3 high, very dark, with a dorsal hump but no lateral humps; anal horn a mere mammiform prominence. Boiled in caustic soda the denuded females give a purple colour, which on dilution with water appears pink, and soon forms a flocculent pink precipitate. On adding nitric acid a flocculent white precipitate appears, but the pink precipitate is not altered. Skin after boiling remains yellowish brown, chitinous, with scattered minute gland-dots. Stigmatic areas with numerous crowded gland-spots, and many short and rather thick simple spines, but no capitate spines. Legs dark brown, the parts measuring thus in μ: Coxa, 120; femur with trochanter, 180; tibia, 128; tarsus with claw, 96 to 114. Tarsal digitules 60μ, slender, with a small knob. Claw digitules with very large round knobs, extending about 15μ beyond tip of claw. Antennae apparently only 6-segmented, but the segmentation towards the end very obscure. The segments measure in μ: (1) 45; (2) 60–69; (3) 66–78; (4) 51; (5) 69; (6) 72. Segment 5 has a deep notch which makes it look as if divided into two.

" Young larvae under female about 430μ long and 230 broad, tinged with a warm reddish colour. Male scales small, elongate, and glassy."

In the description of *C. africanum* var. *cristatus* Green states that specimens from Natal differ from *africanum* (i.e., *mimosae*) only in the presence of a small dorsal crest corresponding to the position of the central scar. They were, however, larger, being 12 mm. in diameter. This would seem to indicate, moreover, that the antennae may be 6, 7, or 8–jointed.

Habitat: On *Acacia*, Natal.

Collection No.: 87.

229. **Ceroplastes egbarum fulleri,** T. & W. Ckll.

Ceroplastes egbarum subsp. *fulleri*, T. & W. Ckll., The Entom. xxxv, p. 113, 1902.

Adult ♀, with waxy covering about 14 mm. long, 12·5 mm. wide and 7 mm. high. Waxy covering regularly domed with a slight depression in centre. Margins widely crenulate, with usually two conical deflected waxy masses which clasp the stem. Stigmatic cleft waxy appendages conspicuous, snow-white, long and slender. There are two of these on each side, usually 3 to 4·5 mm. long, about 1 mm. thick at attachment to waxy covering, but gradually tapering to their extremities. They usually lie closely pressed to the stem of the host plant. The colour of the waxy covering is whitish to coral, pink, with distinct brown patches on the intermediate area and lighter zones around the dome.

Female, denuded of wax, 7 mm. long, 5·5 mm. broad and 4 mm. high. Colour coral pink, more yellowish than the darker coloured wax. The extreme frontal margin, the stigmatic clefts and the caudal projection are dark castaneous and shiny. In older specimens, after oviposition, the integument becomes brown.

The venter is flat or concave with the median zone sunken and segmented. The 4 white stigmatic bands extend inwards to this sunken area. The lateral margins are slightly excavate, the upper edge of the excavation being formed by seven depressed conical projections from the intermediate area. The anterior of these extends forward until nearly level with the front edge of the rounded anterior lobe.

The three lateral projections of each side are shorter and more bluntly pointed. The depressed area which separates the central cone from the intermediate area is coarsely punctate. The central cone is regular, elongate, oval at the base and roundly pointed at the apex. There is no sunken area in the centre.

The caudal projection is exceptionally short, bluntly conical, projecting at an angle of about 45° with the ventral surface.

Antennae 8-jointed; range in μ: (1) 44–51, (2) 48, (3) 58–68, (4) 34–37, (5) 27–34, (6) 20–24, (7) 20–24, (8) 37–48.

Integument clear, hyaline, except for the extreme margin, marginal expansions and caudal prominence, which are densely chitinised. The anterior margin is broadly rounded with a distinct parallel-sided chitinous band. Lateral margins with two almost circular expansions on each side. These are much larger than those found in *mimosae*.

Habitat: On "monkey rope," Natal coast, Umbilo and Equeefa Rivers.

Collection No.: 88a.

230. **Ceroplastes eucleae,** sp. n. (Plate ii, fig. 239).

Adult ♀ tests sometimes single on stem, often aggregated in dense masses. Test of adult ♀ about 6 mm. long, 5 mm. wide and 5·5 mm. high, without plaques but with the lower portion forming a wrinkled fold at the base of a highly conical dome. The colour is a delicate green, when alive, with the stigmatic bands conspicuous (fig. 239); when dry, it is semi-transparent, greenish yellow, with two white thin streaks on each side just above the stigmatic clefts. The central dome is pointed, without any central pit or depression, and is distinctly separated from the lower portion of the test by a groove. There is no indication of a caudal prominence on the test.

Female, denuded of wax, smooth, regularly domed, without caudal prominence, chitin pale brown and moderately thin; portion surrounding the anal plates deep castaneous. Caudal prominence rudimentary, indicated by deeper coloured chitin. When cleared, the derm is moderately chitinous. That of the dorsum is very finely rugose with very scattered small, transparent spots. The denser, marginal folds have in addition a few larger holes.

Antennae 6-jointed; range in μ: (1) 24–30, (2) 37–40, (3) 91, (4) 17–24, (5) 24–27, (6) 40.

The legs are moderately developed, normal.

Stigmatic clefts with a series of short, conical, thimble-shaped spines, which extend in a single row for some distance along the margin on either side of the cleft, where they compose a double row. About the middle of the group is a large spine, about twice as large as the others. Within the double row is a collection of small simple glands like the circumgenital glands of the DIASPINAE.

Habitat: On stems of several native shrubs, including *Euclea* sp., *Ochna* sp. ?, *Pavetta* sp. ?, etc., Pretoria; collected by Miss E. Impey, January 1915.

Collection Nos.: 90 and 342.

231. **Ceroplastes longicauda,** sp. n.

Adult ♀ covered with a very thick layer of soft, white wax forming a test like a large *ceriferus* specimen, i.e., a little more elevated than *egbarum*. Largest specimen seen measured 18 mm. long, 11 mm. wide and 12 mm. high; marginal area prominent, forming a wide fold at the base of the central dome. The waxy appendages from the stigmatic clefts only project slightly from the main mass of the fold.

Adult ♀, denuded of wax, bright brown in colour, about 5 mm. long without caudal process, which alone measures 3·5 mm. The body is ± star-shaped with three short, lateral pointed spurs and one anterior. These are sharper and more prominent than those of *ceriferus*. The dorsum is very convex, rising with straight sides to an acute point. The caudal process is exceedingly long, two thirds the length of body, piceous, slightly tapering, and extends in a horizontal direction, i.e., flat along the twig.

Cleared and mounted, the insect is remarkable for the broad oval, thin, transparent body with a very long dense black tail. The integument is uniformly hyaline, without chitinous marginal discs such as those found in *fulleri*, etc. In stained material the integument of the dorsum illustrates a strange segmentation ± in plates, 5 elongate transverse median ones and shorter laterals.

The antennae are 7 or 8-jointed, e.g., (1) 40, (2) 37, (3) 40, (4) 47, (5) 68, (6) 30, (7) 27, (8) 37μ; or (1) 23, (2) 34, (3) 40, (4) 88 (with pseudarticulation), (5) 27, (6) 27, (7) 37μ.

Stigmatic cleft thin, hyaline, with a patch of scattered, short, thimble-shaped spines and, within this, a large group of simple glands similar to the circumgenital glands of the DIASPINAE.

Legs comparatively short, otherwise normal.

Habitat: On stems of native shrub; collected by C. Fuller, Natal Coast, July 1915.

Collection No.: 334.

This species is very similar in many respects to *C. ceriferus* but may be readily separated by the larger size of the adult ♀ test, the comparatively longer caudal process and the 7 or 8-jointed antennae. *C. ceriferus* has antennae 5 or 6-jointed, usually 6.

232. **Ceroplastes mimosae,** Sign. (Plate ii, fig. 241).

Ceroplastes mimosae, Sign., Ann. Soc. Ent. Fr. (5) ii, p. 46, 1872.

Ceroplastes africanus, Green, Ann. Mag. N. H. (7) iv, p. 188, 1899.

"Insects crowded on the stems of the plant, so much so that the waxy covering of adjacent individuals becomes more or less confluent and the normal form of the test is difficult to determine. The tests appear as rounded masses of cream-coloured wax, each with a more or less distinct nipple-like prominence at the apex bearing a small spot of whiter substance.

"The usual opaque white bands from the spiracular regions are present, but very inconspicuous, scarcely extending beyond the margin. In some specimens a series

of impressed arches on the sides of the test marks the position of the marginal plates. The waxy coating being thinner on the impressed parts, the arches appear darker, the colour of the body of the insect showing through the covering-matter. An isolated test averages 7·75 mm. long, 6·50 mm. broad, 5·75 mm. high.

" Female, denuded of wax, reddish brown to dark brown, the whole surface strongly chitinised ; irregularly globose ; apex often with an oblong scar corresponding with the position of the early larval pellicle, but which becomes almost obliterated in the oldest examples. In the early adult the median is separated from the marginal area by a more or less distinct furrow, which is particularly marked where it meets the anal tubercle. In the older examples only this hinder part of the furrow remains. Cephalic area constricted off from the globose body, forming a trowel-shaped projection in front. Spiracular clefts deeply indented, thickly set with small conical spines, not constricted at the base. Marginal hairs very small, few and inconspicuous. Anal scales minute, inner edge straight, base and outer edge together forming a semicircle. Anal tubercle blackish, directed upwards. Derm with numerous glandular pores, which are more distinct on the darker marginal area. Antennae with either 7 or 8-joints. It is difficult to say which is the normal number, as the two varieties are about equally represented in the series under examination. With the 8-jointed form the formula runs :—3, (1, 2), 8, 4, 5, (6, 7). When there are seven joints only the formula is 3, (1, 2, 4), 7, (5, 6). In this latter case there is a tendency for the fourth joint to separate into two, and there is always a more or less distinct false joint in the terminal segment. Legs well developed ; tarsus more than half length of tibia. Foot with 4 digitules, the unguals broadly spatulate, the tarsals fine knobbed hairs.

" Length of fully developed female 5·50 mm., breadth 5·0 mm., height 4·25 mm.

" The male insect is unknown in any stage." (Green.)

The material I have examined has a characteristic odour and has uniformly 8-jointed antennae, with the following range in μ : (1) 27–34, (2) 41–48, (3) 58–68, (4) 27–41, (5) 17–37, (6) 17–24, (7) 20–24, (8) 34–37.

Habitat : On *Acacia karroo*, Cape Colony ; common but local.

Collection No. : 85.

233. **Ceroplastes myricae** (Linn.).

Coccus myricae, Linn., Syst. Nat. Ed. xii, i, p. 741, 1766.

Columnea myricae, Targ., Catalogue, p. 35, 1869.

Ceroplastes myricae, Sign., Ann. Soc. Ent. Fr. (5) ii, p. 39, 1872.

" Habitat ad Cap. B. Spei, in Myrica quercifolia.

" Magnitudo pisi minoris, semi-ovatus secundum perpendiculum, pallide incarnatus, vertice obtuse acuminatus cum poro tenuissimo, postice supra marginem etiam porus est, margo cartilagineus, crassior albus, utrinque circiter septem torutis protuberans.

" Dans Olivier, Encyclopédie, VI, 96, 8, nous trouvons une description presque identique : la femelle est presque de la grandeur d'un petit pois, le corps est d'une couleur rouge pale et de forme demi-ovale, le vertex est elevé et percé d'un petit point, tout le bord est cartilagineux, épais, blanchâtre, marqué de chaque côté de petits cordons élevés.

"Ce sont ces sept cordons élevés qui, spécifiant bien l'espèce, nous empêchent de l'attribuer aux nombreux individus que nous possédons et decrivons sous le nom de *C. Vinsonii*." (Sign.)

Myrica quercifolia, Linn. (Myricaceae) is a near relative of the waxberry plant which is common on the Cape Flats. Mr. C. W. Mally, the Entomologist for the Cape Province, has recently kindly examined a large number of plants in an endeavour to re-discover this species of *Ceroplastes*, but as yet without success.

234. **Ceroplastes pallidus,** sp. n.

Test of adult ♀ to 8·5 mm. long, 6 mm. broad and 4·5 mm. high; very much like a large *C. rusci* in form, with 8 lateral plaques and median dome. The lateral plaques, however, are without " nuclei " and are a little more perpendicular. In old specimens the waxy covering is pale, semi-transparent, yellowish, or having an indistinct greenish tint. The central dome is moderately elevated, somewhat tapering, slightly glossy, with longitudinal and concentric striae. The central " nucleus " is elongate, glossy and a little darker in colour. Stigmatic clefts indicated by small white dots.

When cleared and mounted the integument is all thin and hyaline, without anterior or marginal thickenings and with only a small area surrounding the anal lobes chitinised.

Stigmatic clefts shallow, not chitinised, with short, conical, pointed spines which are in a single row for a short distance on each side, but broaden out to form a small triangular patch opposite the spiracle; at no point, however, are there more than 5 rows. Within this series is a compact group of simple glands like the circumgenital glands of the DIASPINAE and also a few smaller glands and short simple hairs. The remainder of the margin has a scattered, single row of short, slender, sharply pointed spines.

The antennae are 8-jointed; range in μ: (1) 37–44, (2) 37–47, (3) 44–52, (4) 34–44, (5) 51–56, (6) 27–32, (7) 27–34, (8) 35–47.

Legs well developed, normal; tibia long, with a constriction at about the middle.

The caudal tubercle is comparatively small, a mere plate with the chitin appearing ± streaky and somewhat perforate.

Habitat: On fig, Church Square, Pretoria.

Collection No.: 102.

235. **Ceroplastes quadrilineatus,** Newst., var. **simplex,** nov.

Adult ♀♀ clustered in large masses on the twigs of the host plant. ♀ test about 5 mm. long, 4·5 mm. broad and 3 mm. high, very dark in colour, almost black, with the thinner parts of the wax appearing reddish. Marginal fold corrugated, lighter and more transparent in colour than the central dome, with two very distinct lines of opaque white on each side. The central portion is comparatively flat and truncate, separated from the marginal fold by a deep furrow in dry material, with the apex hollowed into a shallow cup containing an opaque white ridge. The ridge of this cup-like depression is not regular but consists of an anterior transverse ridge and two posterior lateral spurs, and the floor usually slopes gently forward. The

anal opening to the test is surrounded by a distinct circular ring which is itself sunken in a deep depression with broadly rounded sides. In dry specimens the whole waxy material is roughened, hard and very brittle. The pair of larger divergent pyriform bodies referred to in the description of *quadrilineatus* are not present.

When cleared of the waxy covering the insect is of a characteristic form, with the dorsum uniformly rounded and smooth and the marginal area produced in a series of broadly rounded bead-like lobes. The caudal prominence is extremely rudimentary, appearing as a flatly rounded hump, black in contrast with the deep red brown of the remainder of the insect. The integument, when cleared, is dense and is pitted like that of many species of *Saissetia*. The stigmatic spines are in an elongate row around the shallow cleft, the series becoming double in the centre.

The antennae are 6-jointed, three being very long and variable, e.g. :—(1) 27, (2) 37–40, (3) 88–119, (4) 20, (5) 27, (6) 44–51μ.

Legs long, normal. Chitin of caudal protuberance appears as though bossed with a honey-comb pattern.

Habitat: On stems of *Rhus* sp. (probably *R. viminalis*), Victoria West, C.P.; collected by Mr. van Heerden, October 1915.

Collection No.: 346.

236. **Ceroplastes rusci** (Linn.)

Coccus rusci, Linn., Syst. Nat. Ed. x, i, p. 456, 1758.

Coccus caricae, Bern., Mem. Acad. Marseille, p. 89, 1773.

Coccus artemisiae, Rossi, Mant. Ins. ii, pp. 56, 514, 1794.

Calypticus radiatus, Costa, Faun. Reg. Nap. Cocc., p. 12, 1835.

Calypticus testudineus, Costa, Faun. Reg. Nap. Cocc., p. 12, 1835.

Calypticus hydatis, Costa, Faun. Reg. Nap. Cocc., p. 14, 1835.

Columnea testudinata, Targ., Atti dei Georgofili, n.s. xiii, p. 31, 1866.

Coccus hydatis, Targ., Studii sul. Cocc., p. 12, 1857.

Columnea testudiniformis, Targ., Studii sul. Cocc., pp. 8, 11, 12, 1867.

Chermes caricae, Bdv., Ent. Hort., p. 320, 1867.

Ceroplastes rusci, Sign., Ann. Soc. Ent. Fr. (5) ii, p. 35, 1872.

Lecanium artemisiae, Sign., Ann. Soc. Ent. Fr. (5) ii, p. 37, 1872.

Adult ♀. Test about 7·5 mm. long, 5·2 mm. broad and 5 mm. high, regularly domed, rounded in front, rather excavate behind. Colour greasy white, suffused with purplish red. Dorsal dome and margins of plaques lined with greenish grey lines; anal pore and middles of plaques of same colour. Stigmatic bands, 2 on each side, pure white, broad at stem and tapering inwards. Middle of dorsum with a depression in which there is an elongate, glossy white prominence similar to those in centres of plaques, but longer.

Antennae 6-jointed; range in μ: (1) 34–40, (2) 37–40, (3) 114–120, (4) 17–24, (5) 20–27, (6) 44–57.

Leg II: coxa 102; femur + trochanter 170; tibia 120; tarsus 85; claw 20μ. Margin of sides of body with a single row of small thimble-like spines; amongst these are mixed a few simple spines. Stigmatic clefts very shallow, not chitinised,

with a few additional spines like those of the marginal series and a small group of simple glands like the circumgenital glands of the DIASPINAE. Anal plate heavily chitinised, with scattered perforations.

Habitat: On stems of quince, Stellenbosch, C.P.; collected by F. W. Pettey, July 1916.

Collection No.: 91.

237. **Ceroplastes tachardiaformis,** sp. n.

Adult ♀ tests aggregated in huge masses on stems of the host-plant, often completely covering the stems for a distance of several inches.

♀ test *Tachardia*-like, globular, slightly flattened above, hard, thin, brittle, almost transparent resinous brown, due to the colour of the insect within; without protuberances but with a slight apical depression containing the opaque white larval exuvia.

Adult ♀, denuded of wax, moderately dense, globular, smooth and shiny. Caudal protuberance short, very dense, surrounded by a coarsely perforated plate.

Antennae 6-jointed, e.g. (1) 34, (2) 27, (3) 74, (4) 20, (5) 17, (6) 30μ.

Legs short, e.g., coxa 50, femur + trochanter 110, tibia 78, tarsus 50μ.

Integument moderately dense, appearing, under the high power, finely rugose, with numerous, widely scattered, small, transparent pores. Stigmatic clefts almost obsolete, indicated by a small group (8 or 10) of short obconical spines and a few simple glands.

Habitat: On rhenosterbosch (*Elytropappus rhinocerotis*, Less.); collected by Messrs. Watermeyer Bros., Aberdeen, C.P., November 1915.

Collection No.: 94.

238. **Ceroplastes zonatus,** Newst.

Ceroplastes zonatus, Newstead, Bull. Ent. Res. viii, p. 32, 1917.

"Female test. Broadly ovate in outline, highly convex; marginal plates very faintly indicated, but apparently without nuclear spots; dorsal plate very large, with a central nuclear spot of white wax; cephalic margin slightly clypeate; lateral margins in very old examples with a pronounced foot-like extension from each of the stigmata, from which there extends a thick white waxen appendage. In the younger forms the foot-like extension is wanting, but the white waxen appendages are present and always porrected. Colour creamy white, suffused with very pale brown; dorsal plate surrounded by a shaded wavy zone of dark brown and brownish black, with here and there a suffused patch of dull flesh-colour. In very old examples the zone of colour extends to the margins and is of a shining madder-brown to piceous colour. On the removal of the outer surface of the test with chloroform, it is seen to be divided into seven areas by pale orange-coloured lines; a central polygonal area, corresponding to the area occupied by the dorsal plate, from the angles of which radiate to the margin single lines marking off the areas of the lateral and cephalic plates.

"Female adult (denuded of the test). Ovate; cephalic margin clypeate; dorsum low and wrinkled; two large, bilateral, submarginal extensions, both longitudinally striated; the space between these extensions of the body-wall and

the margin markedly constricted. Dorsum with a large keel-like process. Caudal process very short and conical. Stigmatic clefts deep. Antennae of eight segments; the articulations relatively very broad; 3rd about equal in length to the 7th and 8th together; a very long hair on the 2nd and 5th, and a slightly shorter one on the 8th; there are two spines on the 8th and one on the 7th. Legs normal. Stigmatic spines covering a large and somewhat pyriform area, the length of which is nearly equal to twice the length of the antennae; the spines, with the exception of a small group near the stigmata, are obconical and the space between them with bands of dark granular bodies, which collectively form a polygonal reticulation; the small proximal group of spines are longer than the others and pointed. No trace of marginal spines. Derm thin and transparent after maceration; rather thickly set with minute pores and minute scattered spines. Caudal process surrounded by a porose zone of brown chitin. Length 3·9–4·6 mm." (Newstead).

The above description does not refer to the mature female forms which attain, with the waxy test, 14 mm. long, 12 mm. broad and 8 mm. high. The colours remain the same except that the lighter parts become yellowish.

When mature the denuded female is densely chitinous, brownish black, with the dorsum smooth, shining. In boiling KOH it stains the liquid deep purplish brown. The antennae are sometimes 7-jointed with joint 4 very long, obviously 4 + 5 of the 8-jointed form.

Habitat: On *Acacia* sp., Pretoria, November 1914.

Collection No.: 344.

Genus **Inglisia,** Mask.

Adult female more or less conical, covered above by a glassy shield which is divided into plates and striated with rows of air cells. Legs and antennae well developed.

239. **Inglisia elytropappi,** sp. n.

Test of adult ♀ small, 1·6–2 mm. long, 1·2 mm. wide and high, like a small bivalve shell with its hinge uppermost standing on the stem. It is very like a small *zizyphi* test but paler in colour, with the upper angles of the two halves smooth instead of tuberculate. The colour is white to pale buff, shiny, often pearly, with the vertical striae conspicuous.

♀, with the test removed, shiny dark brown, of the same general shape as the test, with the apex depressed between two rounded lateral humps.

Cleared and mounted the body is hyaline. The margin has a close-set row of short conical spines with broad bases and moderately sharp points. The stigmatic clefts are obsolete, but their presence is indicated in the marginal row of spines by the addition of a single, slightly longer spine with a narrower base.

The antennae are rudimentary, appearing in varied forms with very indistinct segmentation ranging from 4 to 7-jointed. When 7-jointed the segments are generally very short—mere rings. The measurement of such an antenna gave the following in μ:—(1) 17, (2) 6, (3) 17, (4) 6, (5) 10, (6) 6, (7) 6.

Legs rudimentary, appearing as though composed of three, almost equal, cylindrical segments with a minute claw. The total length varies between 70 and 90μ.

Habitat: On the thinnest twigs of rhenosterbosch (*Elytropappus rhinocerotis*, Less.), Groot Drakenstein, Somerset West and Cape Flats, C.P. (Cape Coll. No. 1244). The stems of the host-plant are thickly covered with "sooty" fungus, apparently grown on secretion from the numerous specimens present.

Collection No.: 100.

240. **Inglisia geranii,** sp. n. (Plate iv, fig. 249).

Insects congregated on the main stems at or near the nodes. Adult insect, with test, about 2·5 mm. long and 1·3 mm. broad at the base, brown, with the air spaces of the test almost colourless and appearing as transverse lines radiating from the centre of each half of the test. The test is composed of two similar halves, each of which simulates a shell or tortoise-shell, with their apices widely separated. The median line at the point of union of the two is almost flat, very little depressed. The test easily flakes away from old specimens and is then white, almost hyaline.

The antennae are 7 or 8-jointed; range in μ:—7-jointed: (1) 24–31, (2) 14–20, (3) 41–48, (4) 17–20, (5) 14–20, (6) 14–17, (7) 20–24; 8-jointed: (1) 24, (2) 17, (3) 31–34, (4) 14, (5) 14–17, (6) 14–17, (7) 17, (8) 24.

Leg I: coxa 68; femur + trochanter 136; tibia 109; tarsus 85μ. The trochanter has a long (90μ) spine. The upper digitules are long and slender, hardly perceptibly clubbed; lower digitules comparatively short and slender.

Anal plate about 115μ long, with 2 or 3 stout spines. Margin with a single row of sharp pointed spines of varying lengths; these are all broad at the base and taper rapidly to the point. Stigmatic cleft with a single spine a little longer than the longest of the marginal series and a little less tapering.

Habitat: On geranium, King Williamstown, C.P.; collected by A. Kelly, March 1916. Fresh material sent by Mr. J. Hobson, King Williamstown, May 1916.

Collection No.: 99.

This species is remarkably close to *Inglisia theobromae*, Newst., which was described on cacao from Uganda, but it is smaller, and joint 3 of the antennae is apparently always longer than 4. It is also somewhat like *I. bivalvata*, Green, but the dorsal shield, formed by the inner sides of the two halves of the test, is wider and more oval.

241. **Inglisia zizyphi,** sp. n.

Test of adult ♀ shaped like a small bivalve shell, standing erect, with the two halves separated by a conspicuous furrow, and the hinge uppermost, represented by two small, rugose "crowns" of the two halves. The lower margins, which rest on the stem, are surrounded by a slight fringe of fine glassy filaments. The test is pale horn-colour, with the distinct vertical striae appearing slightly iridescent. Length 2 to 3 mm.; width 1·5 to 2 mm.; height about 2 mm.

Adult ♀, with the waxy test flaked off, red-brown, of the same shape as the test but with the dorsum shiny and wrinkled.

Cleared and mounted the integument is thin and hyaline. Margin with a dense series of stout conical spines, so closely set that the row appears, in places, double. The derm is clear except for a double row of large simple glands extending along the median line from the anal plates to the middle of the dorsum.

Antennae 5 or 6-jointed, the individual segments badly defined even in stained preparations; range in μ:—5-jointed: (1) 24, (2) 14, (3) 41–51, (4) 24–34, (5) 24–27; 6-jointed: (1) 20–24, (2) 10–14, (3) 48–51, (4) 10–17, (5) 14, (6) 20–24.

Legs short but normal, e.g., coxa 41; femur + trochanter 102; tibia 75; tarsus 58; claw 17μ. Anal plates about 90μ long, each with two fairly stout spines about 40μ long. Stigmatic clefts obsolete.

Larva about 390μ long; antennae 6-jointed; caudal setae very long (170μ).

Habitat: On *Zizyphus* sp., Pretoria; collected by the writer, December 1914.

Collection No.: 101.

This species is very close to *I. conchiformis*, Newstead, but is smaller and has an antennae of 5 or 6 segments instead of 7. I thought at first that I was dealing with young individuals of Newstead's species but mounted specimens contain well developed embryonic larvae.

Genus **Cryptinglisia,** Ckll.

"A Lecaniine Coccid having a glassy covering containing air-spaces, and retaining the legs and antennae (7 or 8 joints) in the adult. Living in galls on the roots of *Vitis*. Differs from *Inglisia* in its mode of life; in the glassy scale not being divided, tortoise-like, into plates; and in the air-cells running together, forming long air-spaces. Larva ordinary, with six large bristles on the cephalic margin. Male unknown." (Ckll.)

242. **Cryptinglisia lounsburyi,** Ckll.

Cryptinglisia lounsburyi, Ckll., The Entom. xxxiii, p. 173, 1900.

Cryptinglisia lounsburyi, Lounsb., Rep. Ent. Cape Good Hope, p. 54, 1900.

"Adult female about 2½ mm. long, soft, shiny, very dark brown, covered with a semi-transparent, brittle, glassy scale. Skin transparent and colourless on boiling in KOH; mouth-parts moderate, rostral loop not very long; margin with a row of simple spines, brownish, about 24μ long, placed close together; anal lobes ordinary, about 160μ long, yellowish brown, surrounded basally by a large, thick, dark brown, chitinous plate, more or less semilunar in form, with the ends produced; a row of small round glands in the middle line from one end of the body to the other, but best developed posteriorly; antennae and legs pale; legs ordinary, femur plus trochanter about 120, tibia about 96, tarsus about 78, claw about 20μ; claw-digitules about as long as claw, with large knobs; tarsal digitules long, with distinct knobs. Antennae 7 or 8-jointed, having three types, thus: (1) 7-jointed with a short 3, all the joints subequal, 21 to 30μ; (2) 7-jointed with a long 3, which is about 41μ long; (3) 8-jointed, with 2 quite short, and 3 and 4 each about 30μ long. The terminal joint is always short, 21 to 26μ.

"These insects occur underground on the roots of grape vines, living in galls which are more or less globular, 4 to 5 mm. diameter, dark, rough and often nodulose on the outside, often aggregated together in numbers, or even coalescing, so that the root presents a nodulose thickening 6 or 7 mm. in diameter and over 20 mm. long. On breaking open the galls, which are quite hard, one finds a cavity containing the Coccid. Small stones are frequently embedded in the sides of the galls.

"*Hab.* Constantia, Cape Colony, at the roots of Stein and Reisling grapes (*Vitis vinifera*). Mr. Chas. P. Lounsbury, sending the specimens, says; 'None were observed more than eight or nine inches from the surface, and all were on fibrous roots. As you will observe from the specimens, they are somewhat gregarious; ofttimes one or two rootlets will be quite covered, while all the others are free. Most of the infested vines were backward in growth—some almost dead; but their condition, I think, is due to other causes than the attack of the insect. Some apparently healthy vines were noticed to be affected." (Ckll.)

This species has not been re-discovered.

Collection No.: 105.

Genus **Parafairmairea,** Ckll.

Female scale divided by a longitudinal, median suture into two halves, each with minute grooves radiating from its apex but not striated with air cells. Legs and antennae well developed, the latter 7 or 8-jointed.

243. **Parafairmairea patellaeformis,** sp.n. (Plate iv, fig. 250).

Adult ♀ dull brown, 9 mm. long and 5 mm. broad, covered above by a stout shield which is divided longitudinally into two halves. This shield has the wavy lines and exact appearance of one of the common shells of the more elevated "Patella" type.

With the covering removed the insect is glossy brown with wrinkles and ridges radiating from a two-fold dorsal peak to the margin.

Antennae 7 or 8-jointed; range in μ:—

I.	II.	III.	IV.	V.	VI.	VII.	VIII.
20–31	20–24	41–68	34–41	20–27	14–24	20–34	–
20–31	20–24	44	17–34	27–34	17–20	14–20	24–34

Leg I: coxa 88–102; femur + trochanter 187–238; tibia 160; tarsus 90; claw approximately 20μ.

Anal plate about 160μ long. The integument is thin and hyaline, without conspicuous hairs or glands. The margin has a single row of short, conical spines of the *Inglisia* type, amongst which are intermingled, at intervals, smaller spines of a thinner type. The stigmatic clefts are obsolete, merely indicated by a scant series of small circular, simple glands extending inwards from the margin towards the spiracle.

Remarks: This is the third *Parafairmairea* to be described. The other two were described on grass, one from France and the other from Surrey, England.

Habitat: On stems of *Acacia karroo*; collected by A. E. Kelly at Port Alfred, C. P., March 1915.

Collection No.: 98.

Genus **Ceroplastodes,** Ckll.

Female scale convex, but not cone-shaped ; not divided into two halves, nor into distinct plates, but rough or beset with protuberances. ♀ with antennae 7- or 8-jointed.

244. **Ceroplastodes bituberculatus,** sp.n. (Plate iv, fig. 251).

Test of adult ♀ about 4·5 mm. long and 3 mm. broad and high, white, with two prominent humps, one at each end of the median ridge ; margin with a distinct white fringe. The test indicates the anal cleft and has a small prominence over the anal lobes.

Male scale dull white, with the median area denser, about 1·5 mm. long, divided into plates in the normal manner.

Adult ♀ with the waxy covering removed, dark brown, of similar shape to the test. Integument, when mounted, clear, hyaline, without glands or hairs. Margin with a single, close-set row of tubular spines somewhat of the *Inglisia* type but more linear and truncate. Stigmatic clefts obsolete but indicated in the marginal series of spines by the addition of three stigmatic spines ; laterals slender, a little longer than the marginal spines ; median stout, two and a quarter times as long as laterals (116μ).

Legs and antennae long, well developed. Antennae 8-jointed ; range in μ : (1) 27–34, (2) 20–34, (3) 63–68, (4) 31-34, (5) 37–48, (6) 17–20, (7) 17–20, (8) 34–41 (from 5 antennae).

Leg I : coxa 78 ; femur + trochanter 176 ; tibia 120 ; tarsus 90 ; claw 24μ. Tarsal digitules very long, slender, clubbed ; claw-digitules comparatively slender.

Anal plates about 145μ long, apex with 4 very stout blunt spurs.

Habitat : On stems of native shrub, Somerset West, C.P. ; collected by T. F. Dreyer, November 1906. Also at Stellenbosch (Fuller).

Collection No. : 327.

Genus **Idiosaissetia,** nov.

Adult ♀ secreting a thin brittle covering of waxy material not divided into plates or two halves, and without air cells. Legs and antennae present but rudimentary. Anal cleft not median but to one side.

Type, *I. peringueyi*, sp. n.

245. **Idiosaissetia peringueyi,** sp. n.

Adult ♀ about 2·6 mm. long and 1·3 mm. broad, elongate, very convex, with almost perpendicular sides and sloping abruptly in front and behind.

Female raised on a hollow waxy sheath which extends over the sides of the body, leaving the dorsum naked. The material is now ten years old and appears as though the waxy covering had once extended over the dorsum, but had become detached from it. If this were covered the insect would look like an *Inglisia*, except that the waxy covering is thin, pale buff-coloured and solid, i.e., without air-tubes.

Female, denuded of wax, densely chitinised, brown, shiny.

When cleared and mounted the integument of the dorsum is moderately dense, with numerous ± circular clear spaces as in *Saissetia* but of greatly varying size. The venter is thin and clear. The antennae are rudimentary, usually with about

three indistinct joints, always exhibiting pseudarticulations. In the longest antenna seen, after staining, one could observe 6 ill-defined joints measuring (1) 17, (2) 14, (3) 14, (4) 14, (5) 14,(6) 20μ.

Leg I: coxa 34; femur $\pm$ trochanter 85; tibia 85; tarsus 27; claw 17μ.

The margin has a scant series of short, curved, moderately stout spines, except near the anal cleft, where the spines are closer set, long (41μ), straight and very acute. The anal cleft is invariably thrown to one side and is not in the median line as in *Lecanium*. The anal ring has numerous (12?) hairs; anal plates about 120μ long. Embryo-larva large, about 420μ long, with 6-jointed antennae. Caudal extremity produced, with prominent caudal lobes, each with one long, stout seta (136μ) and several shorter spines.

Habitat: On grass or thin reed. Label in tube reads: "From Dr. Peringuey, S.A. Museum, Nov. 1908."

Collection No.: 140.

Genus **Membranaria,** nov.

Lecaniid, somewhat like *Pulvinaria* but with the cottony ovisac replaced by a membranous receptacle. Antennae and legs well developed, the former 7 or 8-jointed.

Type, *M. pretoriae*, sp. n.

246. **Membranaria pretoriae,** sp. n. (Plate iv, fig. 247).

Adult ♀ with ovi-receptacle about 5·5 mm. long, 2 mm. broad and 3 mm. high. Receptacle membranous, secreted from the margins, particularly the posterior margin, of the insect, so that, when completed, the insect, except the head end, is raised from the stem. The membrane consists of two coats, both thin, but which may be readily separated. The outer coat is pale, honey-comb yellow, not striated, and is produced from the upper margin of the insect. The inner coat is paler in colour and has longitudinal striae. The completed receptacle is hoof-shaped (fig. 247) with a distinct, dense, longitudinal, median keel. Its greatest length, along this keel, is about 3 mm.

The adult ♀ is deep caramel-brown, sometimes speckled with black, glossy, with a rounded, median ridge and marginal corrugations and depressions. Cleared and mounted the adult ♀ is moderately dense. Margin with a single row of simple, hair-like spines set wide apart. Submarginal area, except of anterior end, with a broad band of very numerous, small, gland pores, each with a curved, linear gland tube. Stigmatic cleft obsolete, but indicated by a pair of curious, short, broad, cup-like protuberances. Anal ring with 8 hairs; anal plates surrounded in front by a dense, rugose, chitinous plate.

Antennae 7 or 8-jointed; range in μ:—

I	II	III	IV	V	VI	VII	VIII
20–31	31–34	17–41	20–48	17–24	17–24	24–27	—
24–27	27–37	24–34	14–24	20–27	17–20	16–20	24–27

Leg I: coxa 102, femur + trochanter 238, tibia 153, tarsus 51, claw 20μ.

Habitat: On crowns of grass, in front of Union Buildings, Pretoria; collected by the writer, October 1914.

Collection No.: 83.