

- X. *Contributions to the Lichenographia of New Zealand; being an account, with figures, of some new species of Graphideæ and allied Lichens.* By CHAS. KNIGHT, Esq., F.L.S., Auditor-General of New Zealand; and W. MITTEN, Esq., A.L.S.

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THE following enumeration of the species of *Graphideæ*, additional to the Flora of New Zealand, includes some very curious tropical forms, as well as a proposed new genus for the reception of two nearly allied Lichens which do not appear to correspond with any of the numerous genera with which this group seems overburdened. Great difficulty, however, attends the investigation of these obscure plants; and much more seems yet required to be known of the tropical forms, before the genera, as at present constituted, can be considered as more than arbitrary divisions.

OPEGRAPHIA, Ach.

O. VARIA, Pers.

Hab. On trees, Auckland.

The following forms have been observed:—

1. Thallus olive-brown; apothecia superficial, slender; rima a mere chink; spores 5–9-septate, measuring from 0·0003 to 0·00115 of an inch.

PL. XI. fig. 15. *a.* sections of the apothecium; *b.* thecæ; *c.* spores.

2. Thallus olive-brown tending to grey; apothecia more or less immersed when moist, the margin separating in the middle; spores 4–5-septate, measuring from 0·00024 to 0·0009 of an inch.

PL. XI. fig. 16. *a.* section of thallus and apothecium; *b.* theca; *c.* spores.

3. Thallus dusky-grey; apothecia immersed when moistened, oblong, open; spores 3–4-septate, measuring from 0·00025 to 0·0007 of an inch.

PL. XI. fig. 17. *a.* section of thallus and apothecium; *b.* spores.

The form 2 closely resembles the *O. varia* var. *tridens*, Schær. Lich. Helv. Exsic. No. 98. In all essential particulars the New Zealand forms agree with the European.

O. CINEREA, Knight & Mitten. Thallus ashy-grey, pulverulent, sometimes obsolete; apothecia superficial, simple, oblong, straight or curved, closed; spores brown, 3-septate, sometimes 1-septate, and then contracted in the middle, frequently mural, measuring from 0·00025 to 0·00075 of an inch.

Hab. On trees, Auckland.

The short thick closed apothecia readily distinguish this species from the preceding.

PL. XI. fig. 18. *a.* sections of apothecia; *b.* thecæ; *c.* spores, in which the different degrees of septation are seen.

O. PROMINULA, K. & M. Thallus white, uneven or minutely warty, moderately thick, its substance containing extensive patches of green round gonidia; apothecia superficial, crowded, subparallel or disposed in all directions, straight or sometimes curved, closed; spores elliptical or oblong, 7-septate, measuring from 0·00015 to 0·0008 of an inch.

Hab. On trees, Auckland.

This species resembles *O. varia*; but the crust is more even and whiter, and the apothecia for the most part entirely closed by the more prominent border of the perithecium.

PL. XI. fig. 19. *a.* section of thallus and apothecia; *b.* theca; *c.* spores.

GRAPHIS, Ach.

G. CONFINIS, K. & M. Thallus cream-coloured or grey; apothecia immersed, elongate, wavy, sometimes branched or forked, the ends acute, closed by the inflexed perithecial margin; perithecium entire below, or dimidiate; spores 6–8-septate, intermediate spaces transversely oval, measuring from 0·00034 to 0·0011 of an inch.

Hab. On the bark of trees, Auckland.

The paler thallus and narrower and thicker border of the perithecium easily distinguish this from the *Graphis scripta*, Ach., with which it most nearly agrees in the form of its spores, but from which it differs in the generally entire perithecium (which is also closed above), and, as it would appear, in the smaller size of the entire plant.

PL. XI. fig. 20. *a.* section of the thallus and apothecia; *b.* theca containing spores.

FISSURINA, Fée.

F. INSIDIOSA, K. & M. Thallus thick, uneven, warty, dull green, brownish when dry; apothecia crowded, simple or branched, deeply immersed in the thallocal warts, closed, their lips slightly paler; spores in a single series, oval or obovate, yellow, before maturity with a broad hyaline margin, measuring from 0·00035 to 0·0007 of an inch.

Hab. On the bark of trees, Auckland.

In the dried state the thallus is of a dull brownish colour, and it appears to be surrounded by a narrow black border. The apothecia, which are quite undistinguishable from the thallus by the naked eye, appear, when magnified, to be but fissures; in the more perfectly developed ones there is seen to be a slightly paler margin, sunk below the surface of the thallus, representing the lips of the lirella; a transverse section shows no trace of a perithecium, beyond a dark spot in the interior of the substance of the margin of the fissure. The thalamium is opaline, the perithecium brown.

PL. XII. fig. 21. *a.* section of thallus and apothecium; *b.* thecæ; *c.* spores.

F. INQUINATA, K. & M. Thallus cartilaginous, polished, ashy-grey or brown, uneven; apothecia deeply immersed, elongate, wandering, variously branched and wavy, narrow, almost covered by the darkened border of the thallus; spores oblong or obovate, yellow, 3–4-septate, with a narrow hyaline margin, measuring from 0·00040 to 0·00084 of an inch.

PL. XII. fig. 22. *a.* section of thallus and apothecium; *b.* thecæ; *c.* spore.

A browner-coloured species than the last, the thallus less warty, and the apothecia indistinctly marked out to the naked eye by a stained line; when magnified, there is nothing, beyond the fissure, to be seen of the epithecium; on making a transverse section, it becomes evident that the stained appearance surrounding the fissure is due to the almost black traces of the sides of the perithecium imbedded in the thallus, more evident in some examples than in others. The thalamium is opaline, considerably dilated below, and the epithecium deep brown. This species very closely resembles *F. nitida*, Mont., and may be a form of that species; but the spores could not be found in an authentic specimen.

PLATYGRAPHA, Nyl.

P. MICROSTICTA, K. & M. Thallus dusky grey; apothecia round or oblong, flexuose, simple or branched, broader at one end, ends rounded; epithecium dark brown; hypothecium black; spores fastigiate, fusiform, 3-septate, measuring from 0·00010 to 0·00140 of an inch.

Hab. On bark, Auckland.

Thallus everywhere covered at equal distances by the apothecia, which to the naked eye resemble minute black specks.

PL. XII. fig. 23. *a.* section of thallus and apothecium; *b.* theca; *c.* spores; *d.* apothecium as seen from above.

P. INCONSPICUA, K. & M. Thallus brown, with a slight lilac tinge when dry; apothecia very minute, roundish or oblong, with one end acuminate, immersed; hypothecium black; epithecium contracted, blackish-brown; spores fastigiate, not? septate, fusiform, measuring from 0·00120 to 0·00175 of an inch.

Hab. On bark, Auckland.

This species seems remarkable for a dull lilac-brown colour. The apothecia are quite invisible to the naked eye, and when magnified resemble black dots. The spores appear to be without any trace of septa.

PL. XII. fig. 24. *a.* section of thallus and apothecia; *b.* theca; *c.* spore.

P. TUMIDULA, K. & M. Thallus dark yellowish-brown, somewhat swollen around the elongate curved or short apothecia; epithecium flat, irregular, bistre, defined by a very narrow dark line; hypothecium brownish-black; spores fastigiate, fusiform, measuring from 0·0001 to 0·0014 of an inch.

Hab. On bark, Auckland.

The colour of the thallus in the dried state resembles that of *Lecidea parasema*. The apothecia are conspicuous to the naked eye, and are very irregular in their form and size. The spores, like those of the preceding species, have no septa.

PL. XII. fig. 25. *a.* section of thallus and apothecium; *b.* theca; *c.* spores; *d.* apothecia as seen from above.

P. OCCULTA, K. & M. Thallus reddish-brown, obscure, apothecia irregularly branched, subradiate, angular, edges torn; thalldal margin raised, powdery white; epithecium flat, blackish-brown; hypothecium black; spores fastigiate, fusiform, 4[?]-septate, measuring from 0·00005 to 0·00160 of an inch.

Hab. On bark, Auckland.

Thallus very obscure, scarcely evident, and apothecia quite imperceptible to the naked eye. This species agrees with the preceding ones in the arrangement of its spores.

PL. XII, fig. 26. *a.* section of thallus and apothecium; *b.* theca; *c.* spore; *d.* apothecium as seen from above.

PLAGIOGRAPHIS, new genus.

Thallus very thin, obscure (hypophleode?); apothecia elongate rimæform, surrounded by a perithecium which is covered by the thallus, connivent above, and divaricated and oblique below; hypothecium free; thecæ pyriform; spores bilocular.

P. DEVIA, K. & M. Thallus smooth, thin, yellow or grey; apothecia blackish brown, elongate, flexuose or branched, here and there contracted, thalldal margin very thin, at length erect; epithecium nearly covered by the walls of the perithecium; dark-coloured; spores contracted in the middle, 1-septate, upper cell the larger, measuring from 0·00030 to 0·00065 of an inch.

Hab. On smooth bark, Auckland.

Apothecia externally like small black specks; when magnified, they appear as long or short almost closed lirellæ; on making a vertical section, they are seen to have on each side a black wall of perithecium immediately beneath the surface of the thallus, extending a considerable distance in its substance away from the epithecium, and leaving the lower part of the thalamium and its base entirely free. At first sight, the appearance of this species is entirely that of an *Arthonia*.

PL. XII, fig. 27. *a.* section of thallus and apothecia; *b.* thecæ; *c.* spores.

P. RUBRICA, K. & M. Thallus corneous, polished, red or reddish brown; apothecium round, oblong, or elongate and curved, without any thalldal margin, blackish-brown, slightly prominent, open; perithecium extending far under the thallus; spores 1-septate, measuring from 0·00020 to 0·00053 of an inch.

Hab. On smooth bark, Auckland.

Similar to the preceding species, but with a differently coloured thallus and open apothecia, which in a vertical section exhibit the dark-brown perithecial walls extending far under the thallus on each side, and, as in the other species, leaving the lower part of the thalamium entirely free.

PL. XII, fig. 28. *a.* section of the thallus and apothecium, with a portion of the bark beneath; *b.* thecæ and spores; *c.* apothecium as seen from above.

ARTHONIA, Ach.

A. LOBULATA, K. & M. Thallus ochreous or grey; apothecia angular, lobed or subradiate,

plane, margin defined by a narrow line, deep-brown, almost black; spores 1-septate, oblong, light yellow, measuring from 0·0002 to 0·0006 of an inch.

Hab. On bark, Auckland.

PL. XII. fig. 29. *a.* section of the thallus and apothecium; *b.* theca; *c.* apothecia as seen from above.

This species differs from the following in its clavate thecæ. In the other New Zealand species they are turbinate or pyriform, and the spores disarranged. In *A. lurida* Ach., the spores are one-septate, measuring from 0·00018 to 0·00050 of an inch; but the apothecium is roundish and convex above.

A. INDISTINCTA, K. & M. Thallus grey, thin; apothecia irregularly elongato-oblong, simple or branched, margin ragged and obscure; epithecium greyish-black, convex; spores 3-septate, oblong, constricted in the middle, terminal cells much the smallest, light yellow, measuring from 0·0004 to 0·0010 of an inch.

Hab. On bark, Auckland.

The apothecia to the naked eye resemble small black specks; when magnified, they appear at their margins to fade into the thallus.

PL. XII. fig. 30. *a.* section of thallus and apothecium; *b.* theca; *c.* spores; *d.* apothecium as seen from above.

A. ALBIDA, K. & M. Thallus white or dull white, smooth; apothecia prominent, irregularly lobed or angular, with a thin erect thallocal margin; epithecium lilac-brown, pulverulent; hypothecium pale, but a black spot sometimes present at its sides; spores 3-septate, obovate, yellow, upper cell the largest.

Hab. On smooth bark, Auckland.

Thallus nearly white, fading away at the margin like the mycelium of a fungus; apothecia evenly dispersed over the thallus, of a dull lilac-brown. In general appearance this species resembles *A. cinnabarina*, Wallr.; but the apothecia are smaller, and there is no trace of the red exudation. *A. cinereo-pruinosa*, Schaer. (*A. biformis*), Lich. Helv. Exsic. No. 251, has roundish or irregularly oblong, not angular apothecia, and the spores reddish-brown, measuring from 0·00020 to 0·00052 of an inch.

PL. XII. fig. 31. *a.* section of the thallus and apothecium; *b.* theca; *c.* spores; *d.* outline of the apothecium as seen from above.

A. RAMULOSA, K. & M. Thallus dull white, very thin; apothecia superficial, black, with a dark-brown base and sides, much branched, bordered by a narrow undulating line; spores 3-septate, oblong or obovate, brown, upper cell the largest, measuring from 0·00020 to 0·00045 of an inch.

Hab. On wood, Auckland.

Apothecia more branched than those of *A. astroidea*, Ach., and more prominent.

PL. XII. fig. 32. *a.* section of the thallus and apothecium; *b.* theca; *c.* outline of the apothecium as seen from above.

A. AMPLIATA, K. & M. Thallus grey, apothecia scattered or arranged in a somewhat parallel manner, roundish or oblong, partially veiled by the ruptured thallus, blackish-brown; spores brown, 5-6-septate, the upper cell much the largest, the adjoining and sometimes all the other cells divided by a longitudinal septum, measuring from 0·0005 to 0·0013 of an inch.

Hab. On bark, Auckland.

Thallus an inch or more in diameter, thickly covered with the black-looking rather large apothecia. *Opegrapha atra*, γ . *obscura*, Schær. Lich. Helv. No. 517, which has also 5-6-septate spores, is distinguished by its ochreous thallus and small yellow spores, measuring from 0·00025 to 0·00065 of an inch, having their upper cell of the same size as the lower.

PL. XII. fig. 33. *a.* section of thallus and apothecium; *b.* theca; *c.* spore.

A. NIGRO-CINCTA, K. & M. Thallus moderately thick, light brown or dull white, edged by a dark line; apothecia superficial, simple, irregular, roundish, oblong, bent or curved, one end larger, blackish-brown; spores obovate, 4-septate, light yellow, measuring from 0·00030 to 0·00084 of an inch.

Hab. On bark, Auckland.

In a dried state, the thallus is of a whitish-brown colour with a tinge of lilac, the dark margin wide and very evident; it appears to form patches of an inch or more in diameter. The apothecia are thinly scattered, their internal substance brown; there is no dark marginal line as in most of the allied species.

PL. XII. fig. 34. *a.* section of thallus and apothecium; *b.* spores.

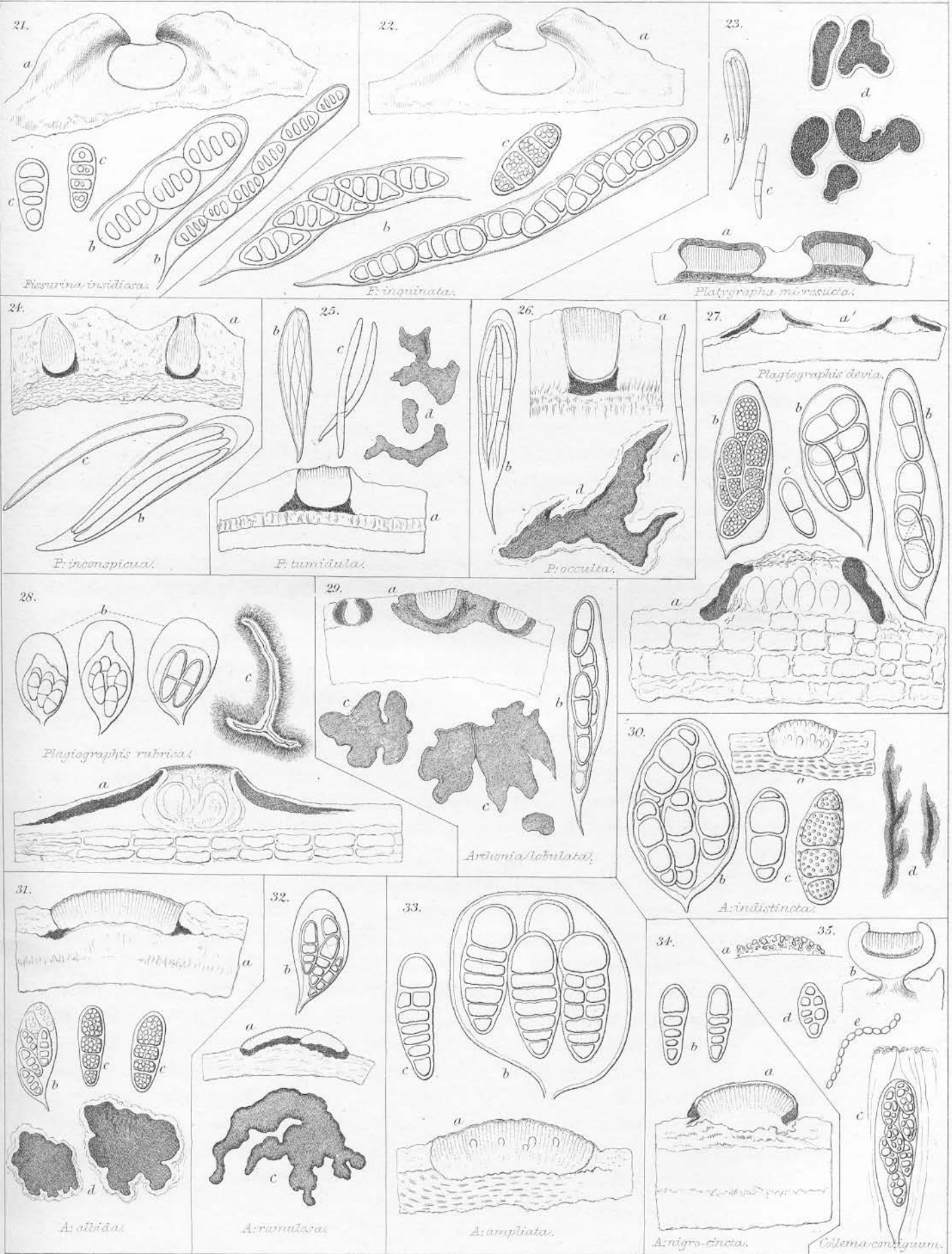
COLLEMA, Ach.

C. CONTIGUUM, K. & M. Thallus obscure green (when dry, black), consisting of tufted complicate lobes containing moniliform green filaments; apothecia small, close together, arising just within the margin of the thallus, and projecting beyond it, pale brown; spores ellipsoid, multilocular, measuring from 0·0003 to 0·0008 of an inch.

Hab. On wood, New Zealand.

The aspect of this species in the dried state is at first sight very similar to that of *Synalyssa symphoria*, De Cand.; but on being moistened, it immediately becomes evident that the numerous small apothecia arise from just within the edge of the erect or ascending entire lobes of a complicate thallus. In size, too, it resembles *Collema microphyllum*, Ach., but is distinct from that species in its differently lobed thallus.

PL. XII. fig. 35. *a.* thallus (natural size); *b.* portion of thallus with apothecium in section; *c.* theca and paraphyses; *d.* spore; *e.* moniliform filament from the substance of the thallus.



Fissurina visidiosa.

F. inquinata.

Platygrapha microscopica.

F. inconspicua.

F. tumidula.

P. occulta.

Platygrapha devia.

Platygrapha rubricola.

Artionia lobulata.

A. indistincta.

A. albida.

A. ramulosa.

A. ampliata.

A. nigro-cincta.

Colema conyguum.