

SOME SOUTH AFRICAN PESTALOTIA SPECIES.

By Elaine M. Laughton.

Fungi belonging to the genus Pestalotia, occurring on indigenous South African host plants, have received slight attention, largely because, thus far, they are not known to be of any great economic importance. On the other hand, some well-known parasitic species of Pestalotia, which have been introduced with their hosts, occur wherever the host plant is present abundantly. These fungi may cause extensive damage, particularly in nurseries.

Most of the Pestalotia species, of which material is to be found in the Cryptogamic Herbarium at Pretoria, occur on forest trees and shrubs, although some have been collected in coastal scrub or in the open country. The acervuli of these fungi occur on dry leaf areas which are grey, brown or almost white and usually have a well-defined margin. Not infrequently the fungus is associated with other fungi or with injury caused by leaf miners.

On the following pages, species of Pestalotia recognised on cultivated and on indigenous plants in South Africa are listed in alphabetical order; descriptions are given of those occurring on indigenous plants.

Pestalotia Aloës Trinch.

Trinchieri, Rend. Accad. Sc., Napoli XLVIII, fasc. 8-12, Extr. p. 8.

Sacc. Syll. Fung. XXII; 1227. du Plessis, S. Afric. Journ. Sci. XXX (1933), 209.

Acervuli rather large, gregarious, veiled by the torn epidermis, sublenticular, black, 171-245 μ diam., 61-122 μ high. Conidia very numerous, fusoid or subpyriform, sometimes curved, 4-septate, not constricted at the septa or very slightly so, 19.5-24.5 \times 4.5-7 μ . The three median cells thicker, fuscous; terminal cells minute, the apical cell bearing three rather long, filiform, divaricate setae, 17-24.5 μ long and 1 μ thick, acute at the apex; basal cell produced into a hyaline pedicel, 4.5-9.5 \times 1 μ .

on *Aloe* spp., leaves, Stellenbosch, *du Plessis* (Stell. 813), and *Dippenaar* (Stell. 900).

The above species was recorded by *du Plessis* (l.c.) on leaves of *Aloe* spp.; unfortunately the specimens quoted are not to be found in the herbarium of the Stellenbosch-Elsenburg College of Agriculture, and it has not been possible to study the fungus nor to make drawings of the spores. The description, taken from the *Sylloge Fungorum* (l.c.) is included for the sake of completeness. The species was originally described by Trinchieri on dry scapes of *Aloe virens* in southern Italy.

Pestalotia Burchelliae Laughton sp. nov.

Maculae amphigenae, parvae, rotundatae v. majusculae, irregulares, avellaneae, linea brunnea limitatae. Acervuli epiphylli, sparsi, punctiformes, pusilli, 75-150 μ diam., epidermide convexa tecti dein erumpentes. Conidia fusoidea v. clavato-fusoidea, recta v. curvata, 4-septata, vix ad septa constricta, 22-25 μ longa, cellulis tribus mediis 15-17.5 μ longis, 7.5-8 μ latis, infinis olivaceis, duabus superioribus obscurioribus; cellulis extimis hyalinis, apicali obtuse conoidea, 4-5 μ longa, setis 3, raro 4, divergentibus, nonnunquam ramosis, 20-30 μ longis ornata, basali conoidea, 4-5 μ longa, in pedicellum 5-7 μ longum hyalinum abeunte.

Hab. in foliis viventis *Burchelliae bubalinae*, Knysna, leg. F. S. Laughton, 34912.

Leaf spots small, more or less circular, or larger, spreading, avellanous to wood brown with snuff brown border. Acervuli epiphyllous, minute, black, punctiform, scattered irregularly, 75-150 μ diam., formed under the epidermis which becomes convex over the developing acervulus, ca. 50 μ high, becoming conical when ruptured in the centre.

Conidia fusoid or clavate-fusoid, tapering to the base, straight or curved, 5-celled, 22–25 μ long, very slightly constricted at the septa. The three coloured median cells 15–17·5 \times 7·5–8 μ , rarely 6–7 μ or 8·5–9 μ broad, the two upper buffy-brown to olive brown, the lowest, deep to dark olive buff; the central cell is sometimes the darkest. Basal cell subhyaline, conical, 4–5 μ long, tapering to the pedicel, which is slender, hyaline, straight, 5–7 μ long. Apical cell obtusely conical, 4–5 μ long, hyaline, bearing three, rarely four, widely divergent setae, 20–30 μ long, mostly about 25 μ long, occasionally branched.

on *Burchellia bubalina* (Linn. f.) Sims, common on living leaves at the edge of the forest, Garden of Eden Nature Reserve, Knysna, 6th May, 1945, F. S. Laughton, 34912.

This fungus is often associated with insect injury, apparently caused by a "leaf miner."

Pestalotia caffra Syd.

H. and P. Sydow, Ann. Myc. 12 (1914) 266. Guba, Mycologia 24 (1932) 362.

Acervuli amphigenous, mostly epiphyllous, irregularly distributed on rather large, dry leaf spots, which are irregular in outline and greyish white in the centre with a raised snuff-brown border. Acervuli circular in outline, subepidermal, pushing up the epidermis in the form of a cone; then becoming erumpent, surrounded by the torn epidermis, which collapses, the spores being distributed over the matrix in a sooty-looking mass.

Conidia broadly clavate, five-celled, not constricted at the septa, 22–28 μ long; the three central coloured cells 16–19 \times 8–11 μ , the two upper warm sepia, the lowest pale, avellanous; basal cell subhyaline, conical, 5–6 μ long, tapering to the pedicel, which is erect, 2–7 μ long; apical cell rather short, obtusely conical, bearing three, widely divergent, rather strong setae, 20–26 μ long, 1 μ thick at the point of divergence and tapering to the tips.

on leaves of *Mimusops caffra* E. Mey., Isipingo, Doidge, 6630.

Pestalotia Cassinis Laughton sp. nov.

Maculae amphigenae parvae vel majusculae usque 1·5 cm. diam., in pagina folii superiore cinerascentes, linea atro-brunnea cinctae, in inferiore dilute brunneae margine rufo-brunneo limitatae. Acervuli amphigeni, plerumque epiphylli, sparsi, atri, punctiformes, primo epidermide conico-elevante tecti dein erumpentes, lenticulares, 250–300 μ diam. Conidia fusoidea, 4-septata, recta, rarius leniter curvata, ad septa haud vel leniter constricta, 20–25 μ longa, cellulis tribus mediis primo pallide olivaceo-brunneis, deinde duabus superioribus paulum obscurioribus, 12·5–15 \times 5·5–7 μ , plerumque 6 μ rare usque 7·5 μ latis, cellula basali conoidea, 3–4 μ longa, in pedicellum brevem 2–8 μ longum abeunte, apicali conoidea setis 3 plus minus divergentibus, 10–20 μ longis coronata.

Hab. in foliis vivis *Cassinis sphaerophyllae*, Brenton, Knysna, leg. E. M. Laughton, 34916.

Leaf spots irregular in outline, small or up to 1·5 cm. diam., often marginal; on the upper side of the leaf smoke-grey or pale smoke-grey, with very narrow blackish brown border, with age the epidermis often becomes wrinkled and papery and breaks away; on the lower side cinnamon drab, with a broader zone of warm sepia at the margin.

Acervuli epiphyllous, occasionally also hypophyllous, scattered, black, punctiform, developing under the epidermis which becomes raised and conical, then ruptures and remains partly veiling the spores. Acervuli lenticular, 250–300 μ diam., 100–200 μ high in the centre.

Conidia fusoid, five-celled, straight, very rarely somewhat curved and inequilateral, not constricted at the septa or very slightly so, 22–25 μ long. The three central coloured cells at first pale to deep olive-buff, concolorous; later the two upper cells are darker, buffy-brown, or the central cell, which is the broadest is also the darkest, buffy-brown, and the uppermost dark olive; coloured cells 12·5–17 \times 5·5–7 μ , mostly 15 \times 6 μ , rarely up to 7·5 μ broad; basal cell hyaline, conical, 3–4 μ long, tapering to the short pedicel, which is 2–8 μ long; apical cell narrow-conical, hyaline, with a crest of three slender setae, 10–20 μ long, mostly ca. 15 μ long, which may be ascending or more or less divergent.

on *Cassine sphaerophylla* O. Ktze., fairly common on living leaves, usually in coastal scrub, Brenton, Knysna, E. M. Laughton, 34916; Buffalo Bay Forest, E. M. Laughton, 34914.

Pterocelastrus tricuspidatus Sond., Knysna, E. M. Laughton, 34915.

Pestalotia disseminata Thuem.

v. Thuemen, Inst. Rev. Sci. Coimbra 28 (1880) 501; Guba, Mycologia 24 (1932) 365.

on *Eucalyptus diversicolor* F. Muell., stems of seedlings, Kruisfontein, E. M. Laughton, 34911.

Eucalyptus Lehmanni Preiss., dead leaves, Fort Cunynghamme, D.F.O., 23701.

Eucalyptus sp., dead leaves, Blauwkrantz, Storms River, D.F.O., 11388.

Pestalotia Encephalartos Laughton sp. nov.

Maculae pallide olivaceae ex apice foliorum late extensae et saepe magnam folioli partem occupantes, margine prominule castaneo- vel atrobrunneo limitatae. Aceruli epiphylli, gregarii, densiusculi dispersi, oblongi, usque $500\ \mu$ longi, nonnunquam coalescentes, epidermide elevata diu tecta, demum erumpentes et ea lacerata cincti. Conidia clavata, recta v. leniter curvata, $18\text{--}25\ \mu$ longa, 4-septata, ad septa leniter constricta; cellulis tribus mediis $12\cdot5\text{--}17\ \times\ 6\text{--}9\ \mu$, olivaceo-brunneis quarum duabus superioribus obscurioribus vel cellula media tantum obscuriore, cellula basali hyalina conoidea, $4\text{--}5\ \mu$ longa ad pedicellum rectum v. curvatum $6\text{--}7\ \mu$ longum attenuata, apicali hyalina obtuse conoidea, breviuscula, setis 3, rarius 2, crassiulus divaricatis, $17\text{--}25\ \mu$ longis instructa.

Hab. in foliis *Encephalartos villosi*, Malvern, 861.

Aceruli in rather dense groups on discoloured leaf areas, which usually spread from the tip of the leaflet, extending downwards until the greater part of the whole of the leaflet is involved. These areas are dark olive buff to isabella colour, with a raised border which is snuff-brown or chestnut-brown to blackish-brown.

Aceruli elongated, long covered by the raised epidermis, then erumpent, surrounded and partly veiled by the torn epidermis, oblong, up to $500\ \mu$ long, often becoming coalescent.

Conidia straight or slightly curved, $18\text{--}25\ \mu$ long, 4-septate, slightly constricted at the septa; the three median coloured cells $12\cdot5\text{--}17\ \times\ 6\text{--}9\ \mu$, the two upper darker, snuff-brown to bister, the lowest avellanous to deep olive-buff, or only the central cell darker; basal cell conical, $4\text{--}5\ \mu$ long, tapering to the pedicel which is short, straight or curved, ca. $6\text{--}7\ \mu$ long; apical cell bluntly conical, rather short, delicate, bearing three, rarely two, divergent setae, $17\text{--}25\ \mu$ long.

on *Encephalartos villosus* (Gaertn.) Lem., leaves, Malvern, 861; Durban, Pole Evans, 2131.

Stangeria eriopus Nash, leaves, Mountain Rise, Pietermaritzburg, Doidge, 864.

In collections 2031 and 864 most of the conidia appear to be immature; they are uniformly paler and more slender, $5\text{--}6\ \mu$ broad; only a few typical, mature conidia were seen.

Pestalotia funerea Desm.

Desm., Ann. Sc. Nat. Bot. II, 19 (1843) 335-336. Guba, Phytopath. 19 (1929) 202.

on *Cedrus Deodara* Loud., Cedara, 5172.

Cupressus arizonica Greenl., Ermelo, District Forest Officer, 28790.

Cupressus torulosa Don., Estcourt, Erxleben, 28535.

Juniperus virginiana Linn., Cedara, 2246.

Juniperus sp., Richmond, Gordon, 29920.

Pinus halepensis Mill., without locality, 23216; Fort Cunynghamme, 700.

Pestalotia Gossypii Hori.

ex Thuruda, Journ. Plant Protection (1917) 27; Tanaka, Mycologia XI (1919) 154; Sacc. Syll. Fung. XXV; 603.

on *Gossypium* sp., stems, Mbabane, Swaziland, Gov. Vet. Officer, 14646.

Pestalotia Guelpini Desm.

Desm. Ann. Sci. Nat. Bot. II, 13 (1840) 182-184.

Coryneum Camelliae Massee, Grev. 20 (1891) 8; Kew Bull. 1898, 106-109.

Pestalotia Karstenii Sacc. & Syd., Sacc. Syll. Fung. XIV: 1030.

Pestalotia inquinans Karst., Hedwigia 30 (1891) 301; Sacc. Syll. Fung. X: 487; not Cooke and Harkness, Grev. 12 (1884) 94.

on *Camellia japonica* Linn., leaves, Paarl, S. J. du Plessis (Stell. 618), 34585.

Pestalotia Laughtonae Doidge sp. nov.

Maculae amphigenae irregulares, 1-2 cm. diam. v. majusculae, in pagina folii superiore avellaneae margine brunnea limitatae, in inferiore obscuriores. Acervuli numerosi, epiphylli, gregariorum, atri, punctiformes, subepidermici, lenticulares, 300-550 μ rarius 400-450 μ diam., 100-150 μ alto, epidermidem centro perforatam convexulo elevantes. Conidea ovoidea, recta v. valde inaequilatera seu gibbosa, 4-septata, ad septa haud constricta, 22.5-25 μ longa; cellulis tribus mediis 15-17 \times 9-11 μ plerumque 15 \times 10 μ , infimis dilute brunneis duabus superioribus valde obscurioribus demum opacis, sub-atris; cellula apicali hyalina subcylindracea, setis tribus divergentibus, 20-25 μ longis ornata; basali subhyalina turbinata, pedicello hyalino 5-10 μ longo suffulta.

Hab. in foliis *Cassinis sphaerophyllae*, Knysna, leg. E. M. Laughton, 35145.

Leaf spots irregular in outline, 1-2 cm. diam. or larger, often spreading from the leaf margin; on upper leaf surface avellanous with raised line at margin, which is Natal brown; on the underside wood-brown, usually without darker margin. Acervuli closely and evenly set over the whole leaf spot, discrete, not coalescent, black, punctiform, erumpent by means of a central pore, which may be more or less round, or become radiating through the formation of three or more cracks, running out from the central pore.

Acervuli epiphyllous, subepidermal, the epidermis becoming raised and slightly conical over the acervulus, later becoming ruptured in the centre. Acervuli lenticular, usually 300-350 μ diam., occasionally 400-450 μ , about 100 μ or up to 150 μ high in the centre.

Conidia ovoid, straight or inaequilateral and gibbous, 4-septate, not constricted at the septa, 22.5-25 μ long. The three central coloured cells 15-17.5 \times 9-11 μ , mostly 15 \times 10 μ ; the two upper olive-brown to clove-brown, later opaque and almost black; the lowest drab in colour. Apical cell hyaline, cylindrical, bearing three, rarely two, rigid, widely divergent setae; most commonly these are horizontal and almost at right-angles to the axis of the conidium. Basal cell subhyaline, turbinate. Pedicel hyaline, slender, 4-6 μ long.

on *Cassine sphaerophylla* O. Ktze. Brenton, Knysna, in coastal scrub forest, E. M. Laughton, 35145; often associated with *Pestalotia Cassinii* Laught.

Pterocelastrus tricuspidatus Sond., Knysna, E. M. Laughton, 35146.

Pestalotia Laurophylli Laughton sp. nov.

Maculae amphigenae, majusculae, irregulares, usque 1.5 cm. diam., in pagina folii superiore cinerascentes linea brunnea limitatae, in inferiore dilute brunneae. Acervuli sparsi, amphigeni, plerumque epiphylli, atri, punctiformes, 175-300 μ diam., primo epidermide tecti, demum erumpentes. Conidia fusoidea, 4-septata, recta, interdum patululo inaequilatera, ad septa haud constricta, 20-25 μ longa; cellulis tribus mediis 14-17.5 μ longis,

$7\cdot5-9\ \mu$ latis, rarius usque $10\ \mu$ latis, infimis olivaceis, duabus superioribus obscurioribus, subopacis; cellulis extimis hyalinis, apicali sub-cylindracea in setis 2-3, divergentibus, $17\cdot5-25\ \mu$ longis abeunte, basali conoidea in pedicellum brevem, $2-10\ \mu$ longum desinente.

Hab. in foliis viventis *Laurophyllo capensis*, Knysna, leg. E. M. Laughton, 34913.

Leaf spots large, up to $1\cdot5$ cm. diam., irregular in outline, on the upper leaf surface pale smoke-grey bordered with clove-brown, on the under-surface Natal brown to olive-brown.

Acervuli scattered, amphigenous, mostly epiphyllous, black, punctiform, $175-300\ \mu$ diam., $70-100\ \mu$ high in the centre, developing under the epidermis, then erumpent.

Conidia ovoid or broadly ellipsoid, erect, rarely somewhat asymmetrical, 4-septate not constricted at the septa, $20-25\ \mu$ long. The three median coloured cells $14-17\cdot5\ \mu$ long, $7\cdot5-9\ \mu$, rarely up to $10\ \mu$ broad, the two upper blunter, thick-walled, semi-opaque, the lowest dark olive-buff. Apical cell hyaline, short, sub-cylindrical, often indistinct, bearing at its extremity 2-3 setae, $17\cdot5-25\ \mu$ long, rather stout, ca. $1\ \mu$ thick at the base and tapering somewhat upwards, two setae oppositely divergent, the third, when present, often vertical. Basal cell subhyaline, tapering downwards to the hyaline pedicel, which is $2-10\ \mu$ long, usually ca. $7\ \mu$ long.

on *Laurophyllo capensis* Thunb., common on living leaves at the edge of the forest or in the "fynbos", Garden of Eden Nature Reserve, Knysna, 6th May, 1945, E. M. Laughton, 34913.

Pestalotia macrochaeta (Speg.) Guba.

Guba, Mycologia 24 (1932) 369.

Pestalotia funerea Desm. var. *macrochaeta* Speg. Anal. Mus. Nac. Buenos Aires III (1911), 412. Sacc. Syll. Fung. XXII : 1226.

on *Pinus caribaea* Morelet, Dukuduku, District Forest Officer, 27660.

Pinus patula Schiede, Spitzkop, Cape, District Forest Officer, 30447, 32073.

Pinus pinaster Ait., Cedara, Fisher, 2100.

Pinus radiata Don., Zwartkop, Hayter, 7767.

Pinus spp. undet., Komgha, Crewe, 27812; Maritzburg, Kelly, 11868.

Pestalotia Mangiferae P. Henn.

P. Hennings, Ann. Mus. Congo Belge V, Fasc. 11 (1907) 120.

Sacc. Syll. Fung. 22 : 1223; Mundkur and Kheswalla, Mycologia 34 (1942), 309.

Pestalotia funerea Desm. forma *Mangiferae* Saccardo, Atti Istit. Veneto Sci. VI, c (1884) 461.

Pestalotia virgatula Kleb., Mykol. Zentralblatt 4 (1914) 13; Guba, Phytopath. 19 (1929), 222.

Pestalotia pauciseta Syd. (nec. Sacc.) Ann. Myc. 15 (1917), 262.

on living leaves of *Mangifera indica* Linn., Barberton, 1911.

Pestalotia Micheneri Guba.

Guba, Mycologia 24 (1932), 371.

on leaves of *Araucaria Cunninghamii* Sweet, Eshowe, District Forest Officer, 15461.

Pestalotia Milletiae Laughton sp. nov.

Maculae utrinque conspicuae, rotundatae sparsae, quoad magnitudinem variabiles vel e margine vel ex apice foliolorum late extensae et saepe dimidiata folioli partem occupantes, albescentes, margine atrobrunneo limitatae. Acervuli epiphylli irregulariter sparsi, puncti-

formes, rotundati v. elliptici, primo epidermide et hypodermide tecti dein erumpentes, 200–400 μ diam. Conidia ellipsoidea, 19–22 μ longa, 4-septata, haud vel vix constricta, recta v. leniter curvata, cellulis tribus mediis 14–17·5 \times 7–8 μ , olivaceo-brunneis quarum duabus superioribus obscurioribus; cellula basali conoidea, subhyalina 2–3 μ longa in pedicellum tenuem erectum 4–5 μ longum attenuata; apicali hyalina obtuse conoidea, setis 2–3 tenuibus 10–15 μ longis ornata.

Hab. in foliis viventis *Milletiae* sp., in sylvis, Eshowe, Zululand, leg. E. M. Laughton, 33437.

On leaf spots, visible on both sides of the leaf, whitish-brown (nearest pale olive-buff) with clove-brown to black margin; the leaf spots may be scattered, more or less circular in outline, and variable in size, or, spreading from the margin or apex of the leaflet, cover larger areas, involving up to half the surface of the leaflet.

Acervuli epiphyllous, irregularly scattered, punctiform, round to elliptical in outline, 200–400 μ diam., developing under epidermis and hypodermis, then erumpent, or pseudo-pycnidial and up to 300 μ deep.

Conidia ellipsoid, straight or slightly curved, 19–22 μ long, 4-septate, not constricted at the septa, or barely so; the three median coloured cells 14–17·5 \times 7–8 μ , the two upper rather darker than the lowest, or frequently the central cell, which is the broadest, is also the darkest in colour (olive-brown), the uppermost slightly paler and the lowest the palest (buffy-brown to deep olive-buff). Basal cell conical, subhyaline, 2–3 μ long, tapering into a slender, erect pedicel 4–5 μ long. Apical cell bluntly conical, hyaline, bearing 2–3 slender, delicate setae, 10–15 μ long.

on *Milletiae* sp., probably *Milletia Sutherlandi* Harv., living leaves, Eshowe Forest, Zululand, E. M. Laughton, 33437.

Pestalotia neglecta Thuem.

v. Thuem, Inst. Rev. Sci. Coimbra II, 27 (1880), 386.

Sacc. Syll. Fung. III : 788. Guba, Mycologia 24 (1932), 375.

Pestalotia funerea Desm. var. *Euonymi-japonici* Thuem Myc. Univ. 884 (1887) nom. nud.

on leaf spots on green leaves of *Euonymus japonica* Linn. f., Johannesburg, Walter Webber, 34922. Associated with other fungi.

Pestalotia Ocoteae Laughton sp. nov.

Maculae fructicolae, sparsae, luteo-brunneae, margine atro limitatae vel effusae saepe totam fructus superficiem occupantes. Acervuli sparsi, minuti, primitus epidermide conico-elevata tecti, denum erumpentes et ea fissa cincti, rotundati v. elongati, 240–275 μ diam. Conidia fusoidea, recta v. leniter curvata, 4-septata, ad septa haud vel vix constricta, 22·5–27·5 μ longa, cellulis tribus mediis 15–18 μ longis, olivaceis, duabus superioribus leniter obscurioribus; cellulis extimis hyalinis conoideis, apicali setulis 2–3 divaricatis tenuibus 15–25 μ longis ornata, basali 3–4 μ longa in pedicellum brevem rectum v. curvatum 5–7 μ longum desinente.

Hab. in fructibus immaturis *Ocoteae bullata*, in sylvis, Deepwalls, Knysna, leg. J. F. V. Phillips, 17824.

Acervuli developing on discoloured areas on the fruit, which are either few, scattered, buffy-brown with dark brown or black border, or effuse, the whole epicarp becoming discoloured buffy-brown.

Acervuli scattered, subepidermal, then erumpent, round or somewhat elongated, 240–275 μ diam., up to 100 μ high in the centre. The epicarp of the fruit has a thick cuticle, 10–15 μ thick, and below the epidermis a layer of sclerenchyma. Acervuli develop between the sclerenchyma and the epidermis, causing a conical elevation of the latter. The increasing pressure of the developing spores ruptures the epidermis, which remains surrounding and partly veiling the acervuli.

Conidia fusoid, straight or slightly curved, 4-septate, $22\cdot5-27\cdot5\ \mu$ long, not constricted at the septa or slightly so, but older spores may be more deeply constricted. The three central coloured cells are $15-18 \times 6-7\cdot5\ \mu$, the two upper buffy-brown, the lowest somewhat paler. Terminal cells hyaline, conical, the apical cell bearing 2-3, usually 3, slender, hyaline, divaricate setae $15-25\ \mu$ long; basal cell $3-4\ \mu$ long, tapering into a short pedicel, which is straight or curved, $5-7\ \mu$ long.

on immature fruits of *Ocotea bullata* E. Mey. (Stinkwood) Deepwalls Forest, Knysna, J. F. V. Phillips, 17824.

Pestalotia palmarum Cooke.

Cooke, Grevillea 3 (1875), 115 and 4 (1876), 102.

Guba, Phytopath., 19 (1929), 210.

on *Cocos nucifera* Linn., leaves, Lourenco Marques, Hardenburg, 22559; on fruit, Inhaci Is., Mogg, 34154.

Phoenix reclinata Jacq., Lourenco Marques, Howard, 487.

Pestalotia Pelargonii Laughton sp. nov.

Maculae sparsae, rotundatae, usque 5 mm. diam., in pagina folii superiore cinerascentes, margine avellaneo limitatae, inferiore tomentosa obscurae. Acervuli hypophylli, sparsi, punctiformes, aterrimi, usque $250\ \mu$ diam., primum epidermide tecti dein erumpentes. Conidia ellipsoidea v. ovoidea, 4-septata, recta raro inaequilatera, ad septa haud constricta, $20-25\ \mu$ longa; cellulis tribus mediis $14-17\cdot5 \times 7\cdot5-9\cdot5\ \mu$, infimis olivaceis, duabus superioribus obscurioribus, semiopacis; cellula apicali hyalina conoidea, setis 2-4 plerumque 3 divergentibus ornata, basali brevi in pedicellum $5-7\ \mu$ longum abeunte.

Hab. in foliis viventis *Pelargonii cordati*, Knysna, leg. E. M. Laughton, 34918.

Leaf spots scattered, more or less circular in outline, often small, up to 5 mm. diam.; on the upper surface of the leaf smoke-grey with avellanous border, indistinct on the underside where they are obscured by the thick tomentum on the leaf surface.

Acervuli hypophyllous, irregularly scattered, punctiform, subepidermal, lenticular, up to $250\ \mu$ diam.; spores developing in great numbers push up the epidermis in the form of a cone, $90-125\ \mu$ high in the centre; the epidermis ruptures over the centre of the acervulus and the masses of dark conidia which emerge lodge amongst the long curved hairs which form the tomentum on the lower leaf surface.

Conidia ellipsoid to ovoid, 4-septate, straight, rarely inaequilateral, not constricted at the septa, $20-25\ \mu$ long. The three median coloured cells cask-shaped, $14-17\cdot5 \times 7\cdot5-9\cdot5\ \mu$, the two upper olive-brown, semi-opaque, the lowest dark olive-buff. Apical cell hyaline, conical, bearing two to four, usually three, divergent setae, $15-25\ \mu$ long. Basal cell rather short, tapering to a straight pedicel $5-7\ \mu$ long.

on *Pelargonium cordatum* L'Hérit., on living leaves at the edge of the forest or in the "fynbos", Garden of Eden Nature Reserve, Knysna, 14th May, 945, E. M. Laughton, 34918.

Pestalotia Podocarpi Laughton sp. nov.

Maculae albescentes vel avellaneae ex apice foliorum late extensa usque 5 cm. longae, margine prominulo infuscato limitatae. Acervuli epiphylli sparsi v. gregarii nonnunquam coalescentes, majusculi, rotundati v. elliptici, $250-500\ \mu$ diam., primo epidermide tecti convexi, usque $170\ \mu$ alti, demum erumpentes epidermide fissa cincti. Conidea ovoidea v. late fusideo-ellipsoidea, saepe inaequilatera seu gibbosa, $20-23\ \mu$ longa rarius usque $25\ \mu$ longa, ad septa haud vel vix constricta, cellulis tribus mediis 15 (rare 16) $\times 7\cdot5-10\ \mu$, infimis olivaceis duabus superioribus obscurioribus subopacis, cellulis extimus hyalinis, basali late conoidea, $2\cdot5-4\ \mu$ longa, in pedicellum $3\cdot5-7\ \mu$ longum producta, apicali obtuse conoidea, setis 3-4, raro 5, $20-30\ \mu$ longis divergentibus coronata.

Hab. in foliis vivis *Podocarpi latifolii*, Knysna, leg. E. M. Laughton, 34917.

Acervuli seated on dead areas of leaves, almost white to avellanoous on the upper surface, darker on the underside, with a border of mummy-brown separating them from the living green tissues. These dead areas usually spread from the tips of the leaves and are up to 5 cm. long; marginal lesions also occur.

Acervuli epiphyllous, scattered or rather closely set and sometimes coalescing, rather large, circular or elliptic in outline, subepidermal, finally erumpent by a longitudinal slit in the epidermis; in the centre the ruptured epidermis shows white against the dark brown of the covered spore masses. Acervuli 250–500 μ diam., shallow, at first covered by the epidermis, which becomes raised and convex, ca. 75–100 μ high in the centre.

Conidia ovoid or broadly fusoid-ellipsoid, often asymmetrical and distinctly dorsiventral, 20–23 μ long, rarely up to 25 μ long, four-septate, not constricted at the septa, or very slightly so. The three median coloured cells 15 (rarely 16) \times 7·5–10 μ , the two upper blunter, rather thick-walled, subopaque, the lowest deep olive-buff. Basal cell conical, 2·5–4 μ long, tapering to the pedicel, which is slender, hyaline, straight, 3·5–7 μ long. Apical cell hyaline, obtusely conical, 4–5 μ long, crowned with 3–4, rarely 5, fairly stout, divergent setae, 20–30 μ long, ca. 1 μ thick at the point of divergence.

on *Podocarpus latifolius* R. Br., on living leaves, common, Garden of Eden Nature Reserve, Knysna, E. M. Laughton, 34917.

Pestalotia Psidii Pat.

Patouillard in Bull. Soc. Myc. Fr. 8 (1892), 136, nom. nud.; Bull. Soc. Myc. Fr. 11 (1895), 232.

Sacc. Syll. Fung. XIV : 1025. Guba, Mycologia 24 (1932), 379.

on fruits of *Psidium Guajava* Linn., Mataffin, Hall and Sons, 34090.

Pestalotia Pterocelastri Laughton sp. nov.

Maculae amphigenae, rotundatae vel irregulares, 5–10 mm. diam., interdum majores, in pagina folii superiore cinerascentes margine olivaceo-brunneo limitatae, in inferiore olivaceo-brunneae. Acervuli epiphylli, numerosi, gregariorum lenticulares, 200–350 μ diam., 120–165 μ alti, epidermidem centro perforatam convexule elevantes. Conidea fusoidea, 4-septata, basim versus attenuata, interdum curvula v. inaequilatera, ad septa haud vel vix constricta, 25–37·5 μ longa; cellulis tribus mediis 20–25 \times 9–10 μ , infimis pallide olivaceis, duabus superioribus paulum obscurioribus, cellulis extremis prominentibus, basali anguste conoidea, subhyalina, 6–7·5 μ longa in pedicellum hyalinum 5–10 μ longum desinente, apicali cylindracea, ca. 5 μ longa, setis tribus hyalinis basi crassiusculis sursum attenuatis flexuosis 20–44 μ plerumque ca. 30 μ longis coronata.

Hab. in foliis *Pterocelastri tricuspidati*, Knysna, leg. E. M. Laughton, 35143.

Leaf spots round to irregular, 5–10 mm. diam. or larger, smoke-grey on the upper side of the leaf, with raised margin which is buffy-brown to olive-brown; wood-brown on the under side.

Acervuli epiphyllous, numerous, gregarious, lenticular, at first covered by the slightly convex epidermis, sometimes small, but usually larger when mature, 200–350 μ diam., 120–165 μ high in the centre; the epidermis ruptures in the centre, forming a pore which is usually round but sometimes elongated or angular; black, sooty masses of spores emerging spread over the matrix.

Conidia 4-septate, long fusoid, tapering to the base, straight or slightly curved and inequilateral, not constricted at the septa or slightly so, 25–37·5 μ long, often 30–34 μ long. Median cells guttulate, the two upper buffy-brown, the lowest olivaceous, 20–25 \times 9–10 μ . End cells rather large; the apical cell cylindrical ca. 5 μ long, bearing a crest of three or sometimes two, long, flexuous setae 20–44 μ long, mostly ca. 30 μ long, ca. 1·5 μ thick at the base and tapering upwards; basal cell subhyaline, narrow conical, 6–7·5 μ long, tapering into a slender pedicel 5–10 μ long.

on leaves of *Pterocelastrus tricuspidatus* Sond., on young trees in the "fynbos" on the southern slope of the town hill, Knysna, E. M. Laughton, 35146.

This species is often associated on the same leaves, and even on the same leaf spots with *Leptosphaeria Pterocelastrii* Doidge; *Pestalotia Cassinis* Laughton and *P. Laughtonae* Doidge are also to be found on leaves of *Pterocelastrus tricuspidatus* in the same collection.

Pestalotia Pterocelastrii is very similar to *P. Planimi* Vize, which occurs, associated with other fungi, on weathered leaves of another plant belonging to the Celastraceae, *Euonymus japonicus* Linn., in California and in Portugal [Guba, Mycologia 24 (1932) p. 377.]

It differs in the form of the acervuli, which are lenticular and not subglobose and in the frequently slightly curved and asymmetrical conidia. Conidia of *P. Planimi* are described and figured as straight, erect. Setae in *P. Planimi* are figured as thick throughout, slightly distended at the tips; those of *P. Pterocelastrii* are thick at the base, tapering upwards and becoming slender near the tips.

Pestalotia quercina Guba.

Guba, Mycologia, 24 (1932), 379.

on *Quercus* sp., on old weathered leaves of seedlings, Irene, Doidge, 2270, 2271.

Pestalotia Rapaneae Laughton sp. nov.

Maculae sparsae, usque 1·5 cm. diam., rotundatae v. irregulares, cinerascentes, margine olivaceo-brunneo limitatae. Acervuli epiphylli, sparsa, subepidermici, rotundati, 175–210 μ diam., Conidia ovoidea v. late fusoideo-ellipsoidea, saepe inaequilatera, 22–27·5 μ longa, 4-septata, ad septa haud constricta; cellulis tribus mediis 15–19 \times 9–10 μ , brunneis, subopacis, quarum 2 superioribus obscurioribus et majusculis, extimis hyalinis, basali conoidea ca. 4 μ longa, in pedicellum rectum v. leniter curvatum 4–5 μ longum producta, apicali brevi cylindracea v. obtuse conoidea, setis 2–3, plerumque 3, rectis, divergentibus, 15–26·5 μ longis ornata.

Hab. in foliis viventis *Rapaneae melanophleos*, Storms River, leg. Doidge, 17171.

Acervuli on dead, discoloured areas of the leaf, which are often near leaf margins, smoke-grey to light drab in the centre with olive-brown border, more or less circular except near the margin of the leaf, where they are irregular, up to 1·5 cm. diam.

Acervuli epiphyllous, scattered, more or less circular in outline, subepidermal, 175–210 μ diam.

Conidia ovoid or broadly fusoid-ellipsoid, often asymmetrical with one side almost straight and the other convex, 22–27·5 μ long, 4-septate, not constricted at the septa. Central coloured cells 15–19 \times 9–10 μ ; the two upper larger, clove-brown, subopaque, the lowest paler, buffy-brown. Extreme cells hyaline; apical cell short, often rather indistinct, cylindrical or truncate conical, bearing at its extremity 2–3, mostly 3, usually straight, divergent setae, 15–26·5 μ long, two of which often form a very wide angle; basal cell conical, about 4 μ long, tapering to a short pedicel, which is hyaline, straight or slightly curved, 4–5 μ long.

on living leaves of *Rapanea melanophleos* Mez., Storms River, Humansdorp District, Doidge, 17171; Garden of Eden, Knysna, E. M. Laughton, 34433, 34911.

Pestalotia Trichocladi Laughton sp. nov.

Maculae effusae, fuscae, indeterminatae. Acervuli epiphylli, minuti, sparsi, rotundati v. leniter elongatae, primum epidermide tecti dein erumpentes epidermide fissa cincti et subvelati, 175–250 μ diam., centro 75–85 μ alti. Conidia fusoidea, recta v. subcurvata, 4-septata, ad septa leniter constricta, 30–37·5 μ longa, cellulis tribus mediis brunneis, aequaliter coloratis vel duabus superioribus leniter obscurioribus, 20–25 \times 7·5–9 μ , cellula basali conoidea v. turbinata, subhyalina 4–6 μ longa in pedicellum hyalinum 6–12 μ longum attenuata, apicali hyalina cylindracea, 5–7·5 μ longa, setis 2–4, plerumque 3, 45–60 μ longis, late divergentibus ornata.

Hab. in foliis viventis *Trichocladi criniti*, in sylvis, Storms River, leg. Doidge, 17169.

Acervuli epiphyllous, on large, indeterminate, discoloured areas, which are usually marginal or along the midrib of the leaf. Acervuli minute, scattered, circular to elliptic in outline, developing under the epidermis, which ruptures and remains surrounding and partly veiling the mass of spores, $175-250 \mu$ diam., $75-85 \mu$ high in the centre.

Conidia fusoid, straight or slightly curved, tapering towards the base, 4-septate, $32-37.5 \mu$ long, slightly constricted at the septa. The three median coloured cells buffy-brown, rather thick-walled, equally coloured, or the lowest slightly paler, $20-25 \times 7.5-9 \mu$. Basal cell conical or turbinate, straight or curved, $4-6 \mu$ long, slightly tinted, olive-buff, tapering downwards into the erect pedicel, which is hyaline, $6-12 \mu$ long. Apical cell hyaline, cylindrical, $5-7.5 \mu$ long, bearing 2-4, usually 3, rather stout, widely divergent setae, $45-60 \mu$ long, ca. 1.25μ thick at the point of divergence and tapering towards the tips.

on living leaves of *Trichocladus crinitus* Pers., Storms River, Doidge, 17169 and *D. J le Roux*, 34307.

Pestalotia Watsoniae Verw. et Dipp.

Verwoerd and Dippenaar, S. Afric. Journ. Sci. 27 (1930), 327.

Leaf spots round to elliptic in outline, 4-7 mm. diam. or spreading irregularly, especially along the leaf margins, vinaceous buff in the centre, becoming paler with age, margin darker, army-brown to sorghum-brown.

Acervuli amphigenous, black, punctiform, scattered, deeply immersed in the mesophyll of the leaf, then erumpent, cupulate, $120-150 \mu$ diam., $120-200 \mu$ deep, the more shallow acervuli being situate over a vein.

Conidia ellipsoid or ovoid, occasionally asymmetrical, $17.5-22.5 \mu$ long, 3-septate, not constricted at the septa or slightly so. The two median coloured cells at first dark olive-buff then buffy-brown, $12.5-16 \times 7.5-9 \mu$, thick-walled, wall $1-1.5 \mu$ thick, equally coloured, and approximately equal in size. Basal cell subhyaline, conical, $2.5-4 \mu$ long, tapering into a pedicel which is deciduous, hyaline, delicate, ca. 1.5μ thick and up to 30μ long. Apical cell hyaline, delicate, obtusely conical; setae usually 4-5, occasionally 3, rarely 2, hyaline, widely divergent, sometimes branched, $15-30 \mu$ long.

on leaves of *Watsonia rosea* Ker. var. *alba*, Bot. Gard., University of Stellenbosch, Verwoerd (Stell. 931), 34586.

Pestalotia Zahlbrückneriana P. Henn.

in A. Zahlbrückner, Plantae Pentheriana, Ann. K. K. Naturhist. Hofmus. Wien 15 (1900) 3. Sacc. Syll. Fung. XVI : 1017.

Acervuli epiphyllous, scattered or sub-gregarious, at first pulvinate, covered by the pale or greyish epidermis, then erumpent, black, $0.5-1$ mm. diam.

Conidia clavate-fusoid, straight or curved, 4-septate, $17-20 \mu$ long, $6-8 \mu$ broad. The three median, coloured cells olivaceous or fusco-olivaceous. Extreme cells hyaline, papilliform, the apical cell bearing 3 setae, which are hyaline, $15-21 \mu$ long and 0.5μ thick. Pedicel hyaline, $8-15 \mu$ long and $1-1.5 \mu$ thick.

on the inflorescence of *Strelitzia parvifolia* Dryand, Port Alfred (Kowie), Penther 1610.

The type of this species has not been seen and there is no other record of a Pestalotia occurring on *Strelitzia* in South Africa; the above description has been taken from that of Hennings in the Plantae Pentheriana. He states that *Pestalotia Zahlbrückneriana* is closely related to *P. palmarum* Cooke, but is quite distinct from that species.

SPECIES EXCLUDENDA.

Pestalotia Evansii P. Henn.

P. Hennings, Engl. bot. Jahrb. 41 (1908) 273. Sacc. Syll. Fung. XXII : 1222.

The type of this fungus was collected on *Syzygium cordatum* Hochst. at Barberton by Dr. Pole Evans (No. 234); it has 2-celled, brown spores with 2-4 hyaline, flexuose cilia

at the apex, and is identical with *Neobarclaya natalensis* Syd., on the same host (Durban, *Medley Wood* 6446, 374).

To Mr. E. W. Mason, of the Imperial Mycological Institute, I am indebted for comparing the type of the latter fungus with that of *Neobarclaya congesta* (Berk. & Br.) Petch, which occurs on *Eugenia Jambolana* in Ceylon. He states that there can be no doubt that they are the same. The spores are very variable, from narrow clavate to broadly oval, and show a total variation of 18–30 × 7–12 μ .

The synonymy is as follows :—

Neobarclaya congesta (Berk & Br.) Petch.

Petch, Ann. Roy. Bot. Gard. Peradeniya IX (1924) 165.

Pestalotia congesta Berk & Broome, Journ. Linn. Soc. Lond. XIV (1875), 89.

Neobarclaya natalensis Did, Hedwigia 38 (1899) p. (134).

Pestalotia Evansii P. Henn., Engl. Bot. Jahrb. 41 (1908), 273.

on *Syzygium cordatum* Hochst. (= *Eugenia cordata* Laws.) Durban, *Medley Wood* 6446, 374, 9476 ; Barberton, *Pole Evans*, 234, 1152, *Doidge*, 2009 ; Nelspruit, *Pole Evans*, 11024 ; Eshowe, *McClean*, 33092.

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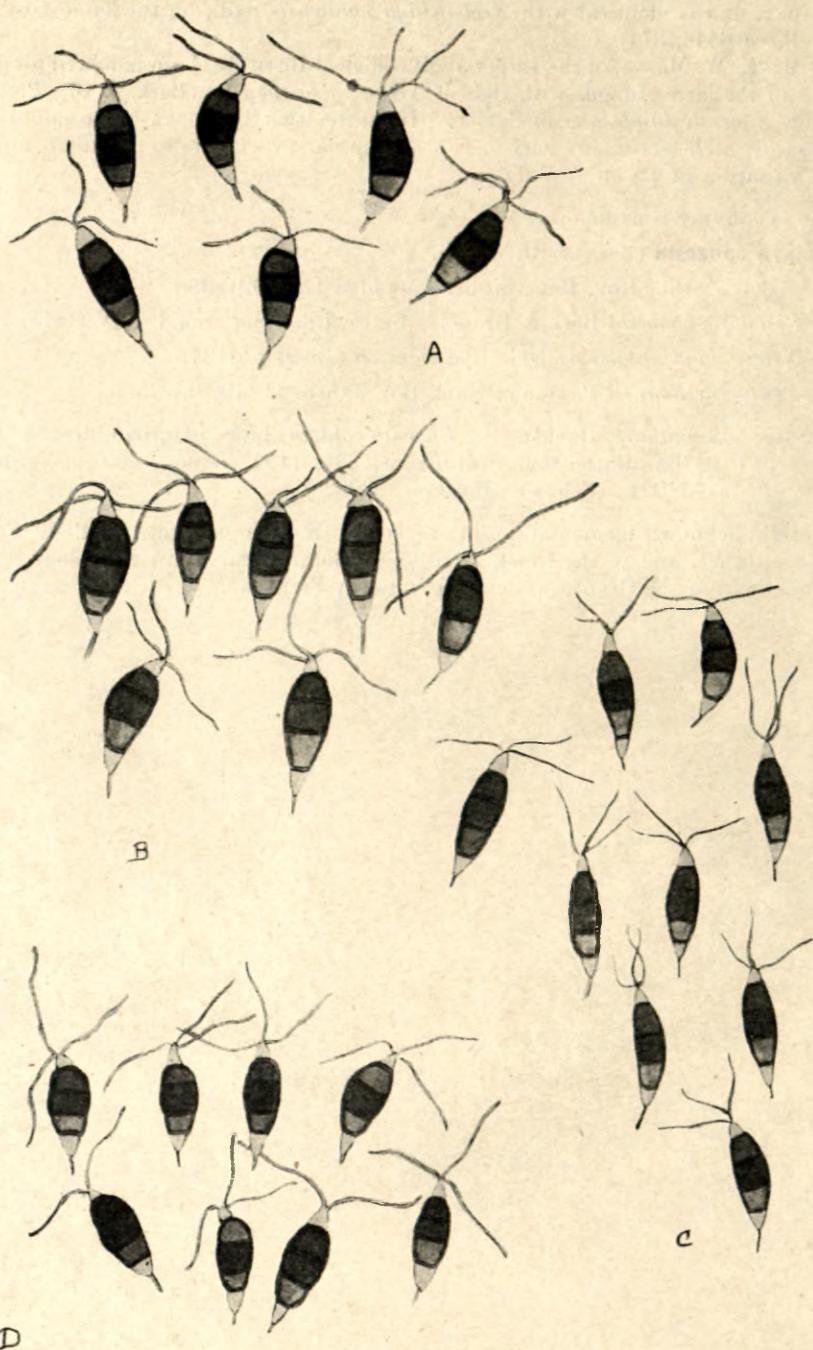


Plate I.—Conidia of: (a) *Pestalotia Burchelliae*; (b) *P. caffra*; (c) *P. Cassinis* on *Cassine*; (d) *P. Encalyptos*.

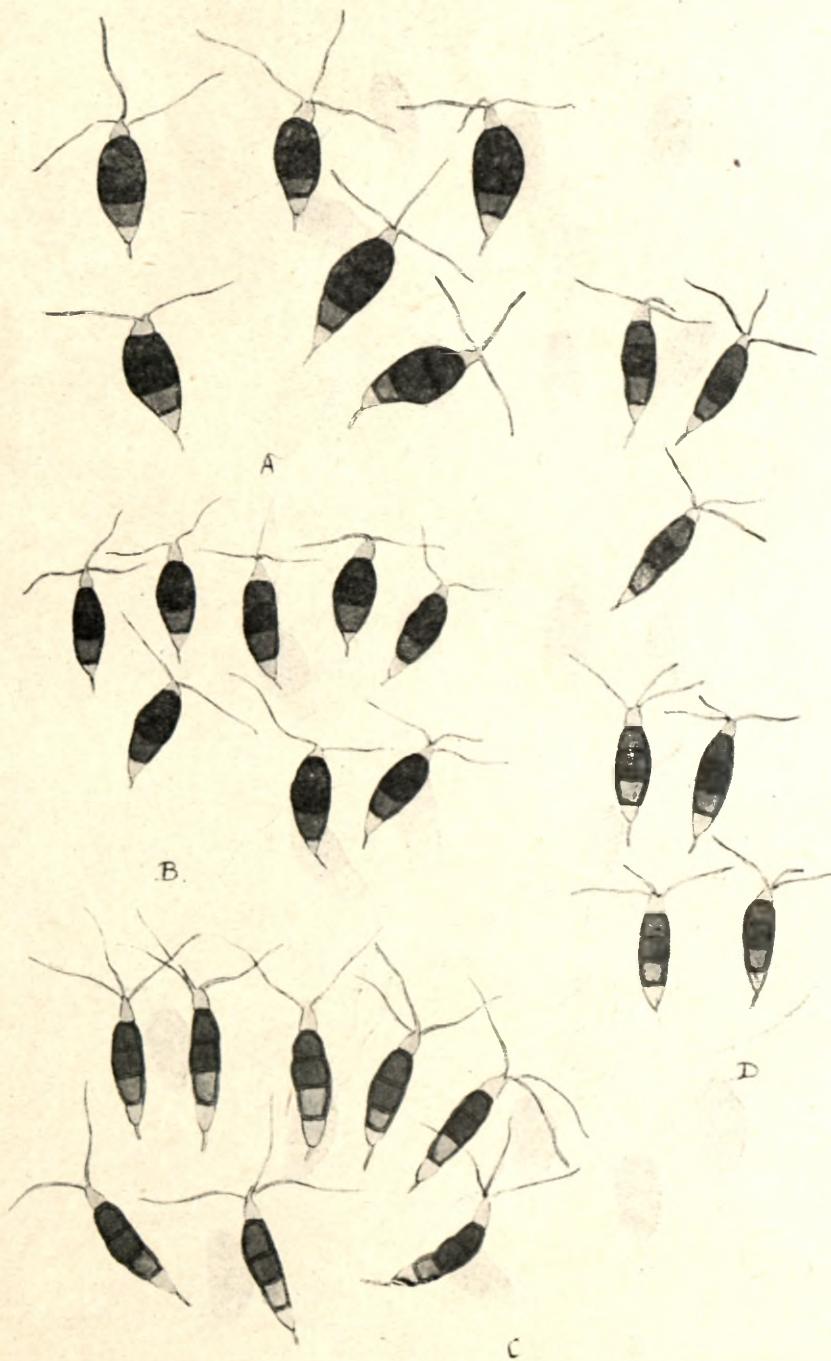


Plate II.—Conidia of: (a) *Pestalotia Laurophyllo*; (b) *P. Milletiae*; (c) *P. Ocoteae*; (d) *P. Cassinis* on *Pterocelastrus*.

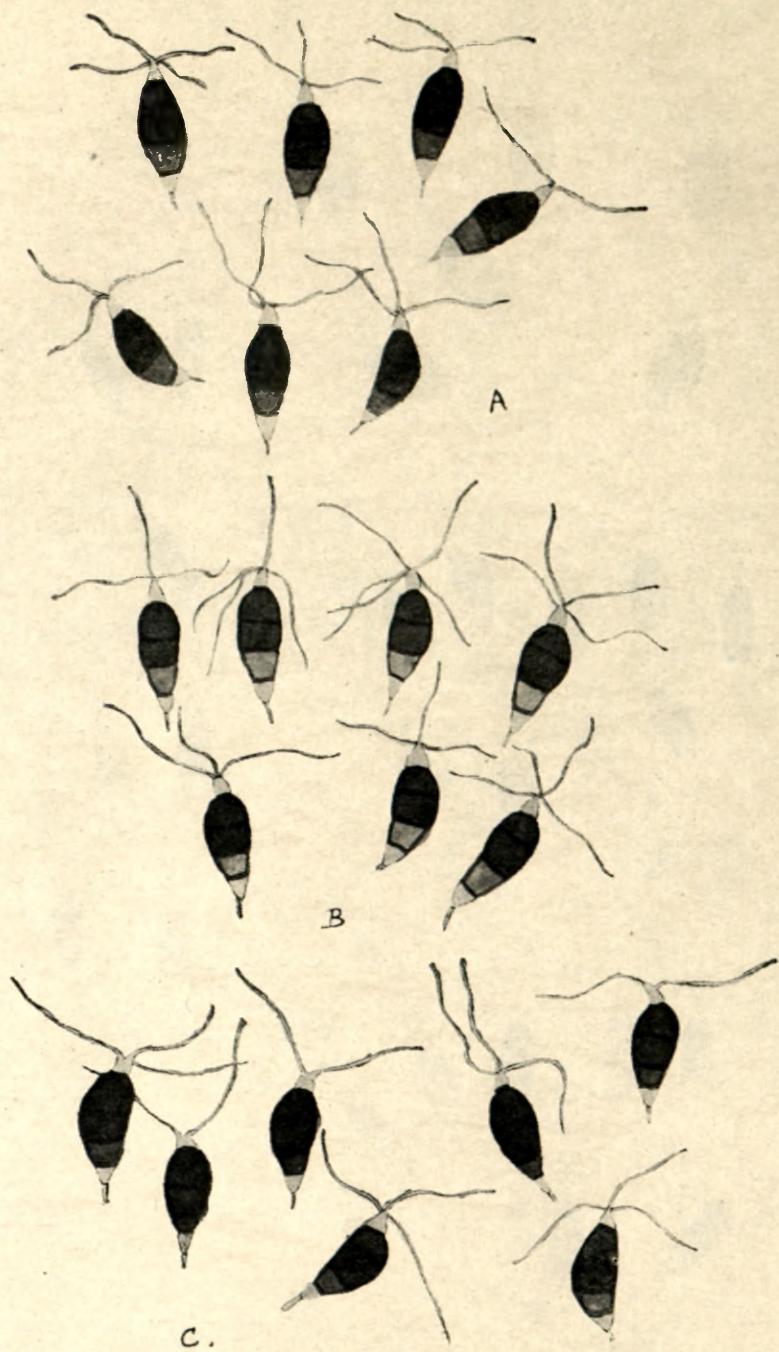
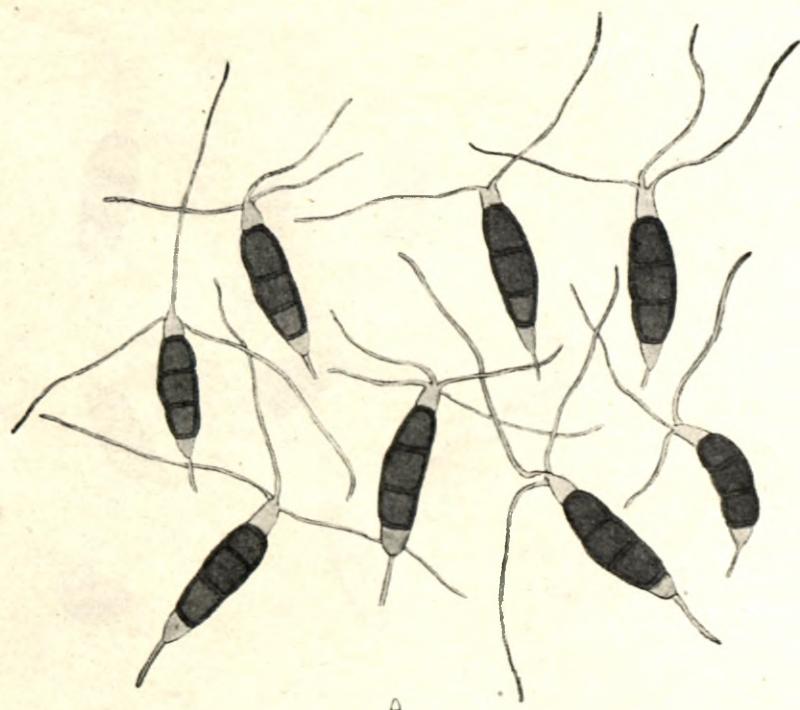
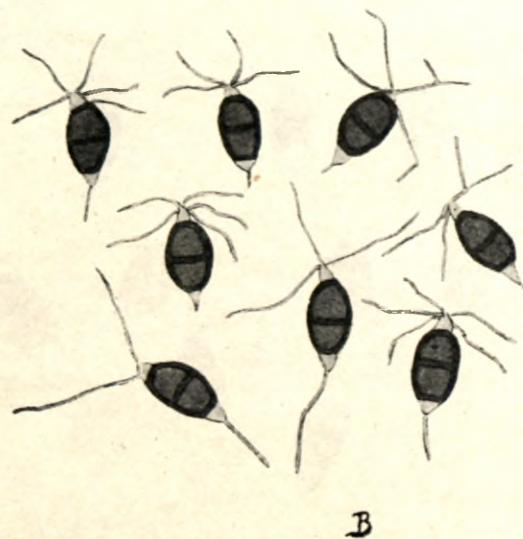


Plate III.—Conidia of: (a) *Pestalotia Pelargonii*; (b) *P. Podocarpi*; (c) *P. Rapunaeæ*.



A



B

Plate IV.—Conidia of : (a) *Pestalotiopsis Trichocladi*; (b) *P. Watsoniae*.

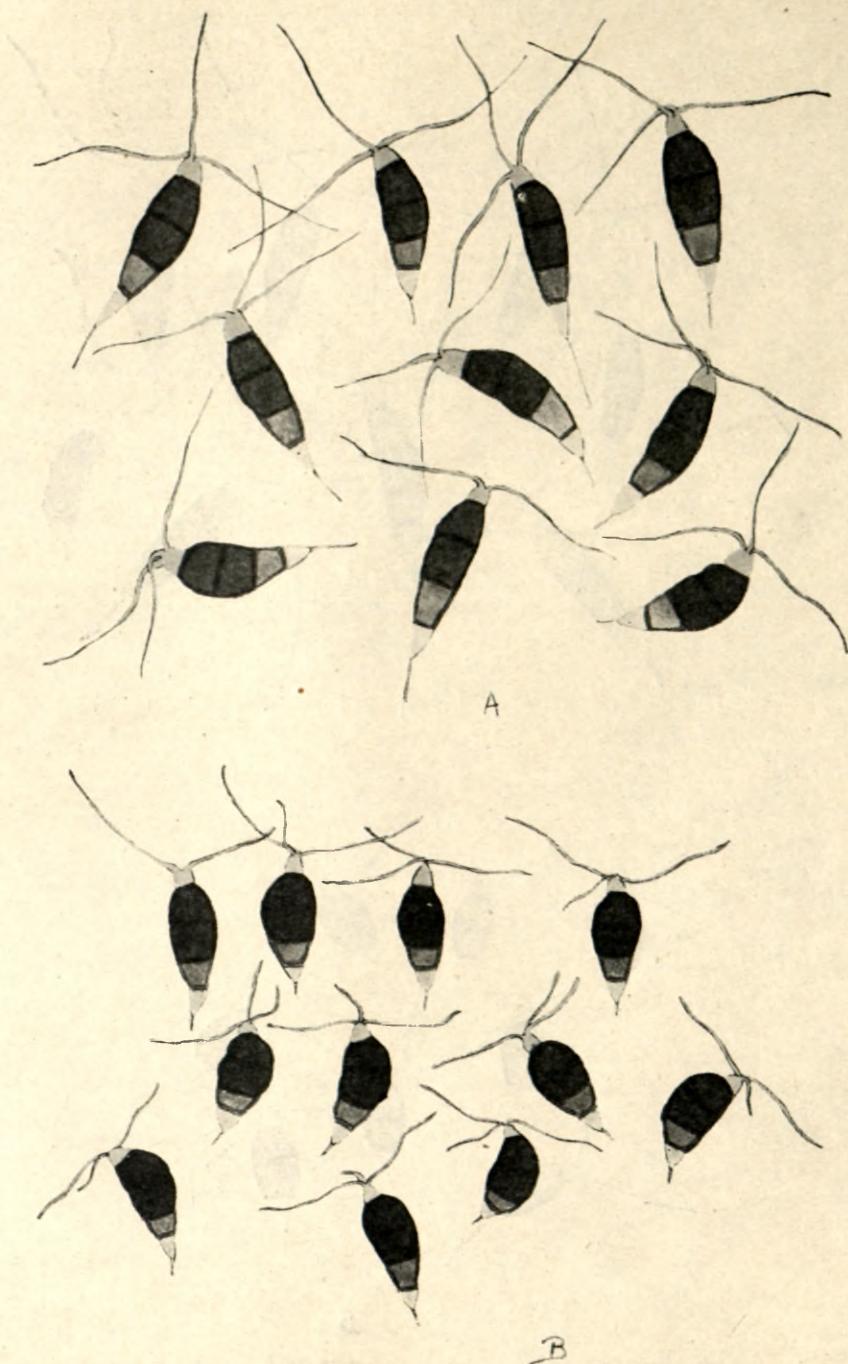


Plate V.—Conidia of: (a) *Pestalotia Pterocelastrii*; (b) *P. Laughtonae*.