PESTALOTIOPSIS FROM THE GOLD COAST AND TOGOLAND

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(With 3 Text-figures)

The following species and variety of Pestalotiopsis from the Gold Coast and Togoland are described: P. dichaeta, P. adusta, P. neglecta, P. disseminata, P. guepini, P. guepini var. major n.var., P. hughesii n.sp., P. mangiferae, P. palmarum, P. theae var. minor, P. maculiformans, P. angusta n.sp., P. aquatica. The two new species and the new variety are illustrated.

Mr S. J. Hughes, of the Commonwealth Mycological Institute, Kew, was very fortunate in his collections of Pestalotiopsis during April, May and June of 1949; twenty-four collections include thirteen species and varieties, which are relatively high numbers considering the short collection period. It can be concluded that Pestalotiopsis spp. are rather frequent plant contaminants, but the lack of host specificity is indicative more of saprophytism than parasitism. They are frequently observed associated with other fungi.

I feel indebted to Mr Hughes for having submitted his collections to me and I am glad to dedicate to him a rather outstanding species to perpetuate his short but very fruitful field work in the Gold Coast and Togoland.

In studying these collections the same procedure has been followed as in my previous studies with this genus (Bull. Jard. bot. Brux. 9, 285-354, 1949; Trans. Brit. mycol. Soc. 36, 81-89, 1953). The localities are indicated precisely in the map on p. 2 in 'Fungi from the Gold Coast and Togoland, I'—Mycol. Pap., no. 48, 1952, by S. J. Hughes.

Section: BISETULATAE


Macules indefinite. Acervuli epiphyllous, scattered, round or elongated. Conidia fusoid, more or less constricted at septa, 19-21·7-23(25) µ x (5)6-6·4-7(8) µ; 3 middle cells (12)13-14·5-16(17) µ long, concolorous, sepia or the two upper cells slightly darker; end cells hyaline, the upper conoid bearing 3 or 2 fine spreading setulae, (7)8-10·9-13(16) µ long, basal conoid with a pedicel 0-2·5-4 µ long.

Presence of abnormal 3-septate conidia with only 2 coloured middle cells. Setulae 1-3, sometimes ramified.

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On dead leaves of *Phoenix reclinata* Jacq.: Elmina, Gold Coast (Colony); 7 May 1949 (BR.) (I.M.I. 38502f).

The position of this species in the Bisetulatae is doubtful but it is best kept here until the genus is thoroughly revised.

Section: TRISETULATAE. Subsection: CONCOLORES
Group: Fusiformes. Subgroup: non-spathulatae


*Macules* large, marginal or involving up to more than half of the leaf, usually at the tip, greyish brown with a well-defined sinuate brown edge. *Acervuli* amphigenous, round, exuding black masses of conidia spreading on the leaf surface. *Conidia* fusiform, 16-19.1-21 μ x 6-6.4-7 μ; 3 middle cells concolorous, reddish brown, slightly constricted at the septa, 10-12.6-14 μ long; end cells hyaline, the upper short conoid bearing 3, rarely 2, spreading setulae 5-10.5-16 μ long, basal cell conoid with a pedicel 0-2-4 μ long.

On living leaves of *Hippocratea* sp.: Takoradi, Gold Coast (Colony); 10 April 1949 (BR.) (I.M.I. 45095).


*Pestalotia neglecta* Thuem., in Instituto, Coimbra, **27**, 326, 1880.

*Macules* centrifugal, elongated along leaf costa, straw coloured, margined by a thin brown zone. *Acervuli* hypophyllous, round or elongated, scattered. *Conidia* fusoid, 17-21.4-24 μ x (5)6-6.3-7(8) μ; coloured cells slightly constricted at the septa, with thin walls, finely guttulate, the lower cinnamon, the upper slightly darker, mainly the central one, 11-13.9-16 μ long; apical cell long conoid bearing 3 fine, divergent setulae 7-11.1-15 μ long, basal cell conoid with a short pedicel (0)2-3.3-6 μ long.

On leaves of *Borassus aethiopum*, Mart.; Esiama, Gold Coast (Colony); 14 May 1949 (BR.) (I.M.I. 37943b) (Gold Coast Myc. Herb. 164b).


(a) *Macules* indefinite, associated with other fungi. *Acervuli* in irregular scattered colonies. *Conidia* fusiform, straight, 20-23.8-28 μ x 5-6.5-8 μ; coloured cells light buff, concolorous, slightly constricted at the septa, 12-13.7-19 μ long; end cells hyaline, the apical conoid bearing 3, sometimes 2, thin spreading setulae, 9-15.5-22 μ long; the basal long conoid with a pedicel 3-4.7-8 μ long.

On dead leaves of *Caffea arabica* L.; Aburi, Gold Coast (Colony); 25 April 1949 (BR.) (I.M.I. 38055b) (Gold Coast Myc. Herb. 187b).
Pestalotiopsis from Gold Coast. R. L. Steyaert

(b) Macules of discoloured areas merging gradually into healthy tissue. Acervuli gregarious, more or less in line with leaf nervules, producing minute, dense globular heads of conidia. Conidia as above, (19)22-24:5-30(33) μ x 6-6:8-8 μ; coloured cells 13-15:5-19 μ; 3, sometimes 2, setulae (7)10-17:6-30 μ long; pedicel 2-4:7-8 μ long. Some coloured cells inconspicuously guttulate.

On dead leaves of Elaeis guineensis Jacq.; Apremdo (near Takoradi), Gold Coast (Colony); 11 May 1949 (BR.) (I.M.I. 38616a) (Gold Coast Myc. Herb. 290); Asuansi, Gold Coast (Colony); 9 June 1949 (BR.) (I.M.I. 38625b) (Gold Coast Myc. Herb. 298b).


(a) Macules large, irregular, grey on upper surface, cigar brown on the under surface. Acervuli amphigenous but mostly hypophyllous, round, exuding black masses of conidia around the acervuli. Conidia long fusiform, 21-25:5-30 μ x 5-6-7 μ; 3 middle cells concolorous, brown olivaceous, guttulate, 14-16:4-19 μ long; end cells hyaline, the apical subcylindric, bearing 3 thin setulae 18-24:75-34 μ long; the basal conoid with a pedicel 4-6:2-9 μ long.


(b) Macules irregular, more or less round, 0:5-1:5 cm. in diameter, cigar brown, scattered. Acervuli scattered. Conidia as above, 23-25:8-29 μ x 6-6:7-7 μ; 3 middle cells 15-16:8-19 μ long; 3 setulae (15)18-23:2-29 μ long, sometimes with a more or less conspicuous lumen; pedicel 3-5:1-7 μ long.

On living leaves of Jatropha curcas L.; Amanase, Gold Coast (Colony); 28 April 1949 (BR.) (I.M.I. 45130b).

Both specimens have narrower conidia with slightly shorter pedicels than in holotype.

**Pestalotiopsis guepini** (Desm.) Steyaert var. major Steyaert var. nov.

Conidia majora quam ea typi, 28-32-36(39) μ x 7-8-9 μ; setulae 3, interdum 1-2-4, rectae, patulae, (13)20-30-45(54) μ longe; pedicel (0)3-7:2-13 μ longe. (Fig. 1).

On dead leaves of Encephalartos barteri Carruth. ex Miq.; Aburi, Gold Coast (Colony); 3 May 1949 (BR., holotype) (I.M.I. 42315a, isotype) (Gold Coast Myc. Herb. 600a).

**Pestalotiopsis hughesii** Steyaert sp.nov.

Maculae indefinitae. Acervuli circulares vel ovaliformes, 250-500 μ diam. Conidia fusoidae, recta vel leniter curva, 4-septata, 34-38:7-45 μ x 7-9:7-11 μ: cellulae 3 mediae brunneofulvae, concolorae, guttatae, 18-26-7-32 μ longe, cellulae extima hyalinae, apicalis longe conoides, 2-3 setulas crassas, lumine definite visibili, 9-17-29 μ longe gerens, cellula basalis conoides in pedicello (0)3-4:2-8 μ desinens (Fig. 2).
Pestalotiopsis from Gold Coast. R. L. Steyaert

On dead stems of *Cyperus articulatus* L. det. Mr E. Nelmes; Big Ada, Gold Coast (Colony); 30 April 1949 (BR., holotype) (I.M.I. 44237a, isotype) (Gold Coast Myc. Herb. 830a).

A very characteristic species. The coloured cells each contain a big refringent mass that stains deeply with cotton blue. The setulae are very thick at the base with a thick membrane that thins out suddenly towards the middle of the setula. This feature gives them a more or less bulbous appearance at the base. A wide lumen is visible the whole length. The setulae are sometimes ramified towards the base.

Fig. 1. *P. guelpini* (Desm.) Steyaert var. *major* (Steyaert) Steyaert: conidia on *Encephalartos barteri* (I.M.I. 41315a); × 1000.

Fig. 2. *P. hughesii* Steyaert: conidia on *Cyperus articulatus* (I.M.I. 44237a); × 1000.
**Pestalotiopsis from Gold Coast. R. L. Steyaert**

Subgroup: Spathulatae


*Pestalotia mangiferae* P. Henn. apud De Wild., in *Ann. Mus. Congo belge, Bot. Ser.*, v. 2, 102, 1907

(a) *Macules* marginal and centripetal, involving a large leaf area, light brown with a sharply defined, dark brown margin. *Acervuli* amphigenous, regularly spaced but restricted to certain areas of the macules, erumpent, flat, producing a dark greyish mass of conidia. *Conidia* fusoid, straight, 19-20.3-22 μ × 5-5.5-6 μ; coloured cells brownish cinnamon, slightly constricted at the septa, with rather thick walls, 12-13-14 μ long; apical cell conoid bearing 3, sometimes 2, setulae 5-10-8-14 μ long; basal cell conoid with a pedicel 2-3-5 μ long.

On leaves of *Mangifera indica* L.; Techiman, Gold Coast (Ashanti); 16 April 1949 (BR.) (I.M.I. 37133).

(b) *Macules* indefinite, associated with other fungi. *Acervuli* elliptical, circa 300 μ in diameter, regularly dispersed on parts of the macules. *Conidia* as above, 16-18·8-21 μ × 5-5·8-7 μ; coloured cells 10-12·2-14 μ long; setulae 3, sometimes 2, (5)8-10·7-18(24) μ long; pedicel 1·47-5(7) μ long.

On dead leaves of *Elaeis guineensis* Jacq.; Ada, Gold Coast (Colony); 30 April 1949 (BR.) (I.M.I. 38789) (Gold Coast Myc. Herb. 313).

(c) *Macules* elongated along mid-rib, grey-brown with deep brown well-defined margin. *Acervuli* amphigenous, small, circular, about 150 μ diameter, spreading its conidia over leaf surface. *Conidia* fusoid, straight, 18-19·7-21 μ × 5-6-7 μ; coloured cells brownish cinnamon, 11-12·6-14 μ long, the middle cells sometimes a little darker; end cells hyaline, the upper conoid bearing 3, rarely 2, spreading setulae, sometimes slightly spathulate, 7-11·25-16 μ long, basal cell conoid with a pedicel 2-3·5-6 μ long.

On living leaves of *Hyphaene thebaica* Mart.; Achimota, Gold Coast (Colony); 27 June 1949 (BR.) (I.M.I. 45083e).


*Pestalotia palmarum* Cooke, in *Grevillea*, 5, 101, 1877

(a) *Macules* circular or affecting up to half the leaf surface, deep red-brown, greyish at the edge and surrounded by a blackish brown margin on the under leaf surface, grey reddish brown on the upper surface. *Acervuli* mostly epiphyllous, superficial under the epidermis of which a small disk soon falls out liberating the conidia. *Conidia* fusoid, 18-21·5-25 μ × 5-6-7 μ; coloured cells cinnamon brown, constricted at the septa, 11-13·75-17 μ long; end cells hyaline, the upper conoid, bearing 2 or 3 rarely spathulate setulae, basal cell conoid with a pedicel 0-3·6-5 μ long.

On living leaves of *Diospyros* sp.; Weija, Gold Coast (Colony); 24 April 1949; (BR.) (I.M.I. 43715a).
(b) Macules irregular, affecting large leaf areas, often marginal, with a sharply defined margin but surrounded by a diffuse yellowish colour. Acervuli amphigenous, scattered, or more or less aggregated. Conidia fusoid, 18-22.5-26 µ x 5-6.4-8 µ; coloured cells often guttate, 12-15.1-18 µ long; end cells hyaline, conoid, the upper bearing 3, sometimes 2, occasionally ramified, spreading, spathulate setulae, 8-14-21 µ long, the basal with a pedicel 0.3-8-8 µ long.

On living leaves of Desplatzia lutea; Anomabu, Gold Coast (Colony); 15 May 1949 (BR.) (I.M.I. 43938a) (Gold Coast Myc. Herb. 795a).

(c) Macules marginal, diffuse at the edge. Acervuli small, circular, erumpent. Conidia fusoid, 19-21.6-24(30) µ x 5-6.2-7 µ; coloured cells 13-15-16 µ long, the middle cell often the smallest; end cells hyaline, the upper bearing 3, sometimes spathulate, setulae 11-16-24 µ long, the basal with a pedicel 2-3.5-5 µ long.

On living leaves of unknown host; Abe, Gold Coast (Colony); S. J. Hughes 640, 15 May 1949 (BR.) (I.M.I. 44583c).


(a) Macules indefinite. Acervuli round, erumpent, producing black masses of conidia. Conidia fusoid, straight, 24-25.5-28 µ x 7.7-6-8(9) µ; coloured cells umber, the 2 upper a shade darker, guttulate, 16-17.6-19 µ long; apical cell conoid or long conoid, bearing 3, rarely 2, rather stout, divergent spathulate setulae 13-21.7-27(28) µ long; basal cell conoid with a short pedicel 3-4.1-7 µ long.

On leaves of Borassus aethiopum Mart., Gold Coast (Colony); 2 June 1949 (BR.) (I.M.I. 37942b) (Gold Coast Myc. Herb. 123b).

(b) Macules indefinite. Acervuli very small, punctiform, producing globular masses of black conidia. Conidia fusoid, 25-27.1-31 µ x 5-6-7 µ; coloured cells umber with a greenish tinge, guttulate, the middle cell sometimes the smallest; end cells hyaline, the upper long conoid, bearing 3, sometimes 2, spreading spathulate setulae 14-22.1-32 µ long, the basal conoid with a pedicel 3.5-8-10 µ long.

On senescent leaves of ? Dioscorea sp.; Tafo, Gold Coast (Colony); 16 June 1949 (BR.) (I.M.I. 45126).

Subsection: Versicolores.

Group: Fusiformes. Subgroup: Non-spathulatae


Pestalotia maculiformans Guba & Zeller, in Mycologia, 24, 370, 1932

Macules round or irregular, 0.25-2.5 cm. diameter, light brown. Acervuli hypophyllous, circular, scattered, producing black conidia adhering to
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leaf surface. Conidia fusoid, 19–23:75–28μ x 6–7:8–9μ; 3 middle cells 13–15:8–19μ long, the 2 upper translucent fuliginous-brown, the lower yellowish brown; end cells hyaline, the upper conoid bearing 3, sometimes 2 or 4 spreading setulae 7–16:6–22μ long, the basal with a pedicel 2–4:3–7μ long.


Fig. 3. P. angusta Steyaert: conidia; a, on Borassus aethiopum (I.M.I. 37920b); b, on Bridelia ferruginea (I.M.I. 42257); x 1000.

**Pestalotiopsis angusta** Steyaert sp. nov.

(a) Maculae diffusae. Acervuli hypophylli, rotundati vel elongati, minuti, primo epidermide tecti demum rotunditer fissi, plus minusve in lineam dispositi. Conidia fusoidae, recta, 4-septata, (20)21–24:2–27μ x 6–8:5–9μ; cellulae 3 mediae (13)14–15:9–17μ longe, ad septa leniter constriictae, versicolores, 2 superiore umbrinae, inferior olivacea; cellulae extimae hyalinae, apicalis conoides 3, interdum 2 vel 4, setulas patulas (g)12–17:5–24 gerens, basalis conoides in pedicello 3–4:2–5μ desinens. (Fig. 3a).

On living leaves of Borassus aethiopum Mart.; Techiman, Gold Coast (Ashanti); 6 April 1949 (BR., holotype) (I.M.I. 37920b, isotype).

(b) Macules diffuse, affecting large surfaces of leaf or internervular, greyish above, brown below. Acervuli amphigenous, circular, conical, small, sporulating more abundantly on the underside of leaf. Conidia fusoid, straight, 22–24:6–27μ x 6–7:2–8μ; middle cells 15–15:9–17μ long, slightly constricted at the septa, versicolores, the 2 upper umber, the lower olivaceous; end cells hyaline, the apical conoid bearing 3, some-
times 2, divergent straight setulae 15–20–22(28) μ long, basal cell with a pedicel 3–4.2–5(6) μ long. (Fig. 3b).


This species is close to P. foedans (Sacc. & Ell.) Steyaert but the conidia are longer with longer setulae and the two upper of the middle cells darker.


*Pestalotia aquatica* Ell. & Ev., in *J. Mycol.* **5**, 157, 1889

*(a) Macules* irregular with greyish edge, otherwise brown above and below. *Acervuli* mostly epiphyllous, circular, flat, c. 300 μ in diameter, producing adpressed masses of black conidia. *Conidia* fusoid, 20–23–26 μ × 6–6.8–8 μ; middle cells 14–15.1–17 μ long, the 2 upper umber-fuliginous, the lowest olivaceous, end cells hyaline, the apical short conoid, sometimes subcylindrical, bearing 3, sometimes 2 or 4, widely divergent setulae 8–12.5–18 μ long; basal cell conoid, sometimes subspherical with a pedicel 2–3.2–5 μ long.

On living leaves of Drypetes sp.; Elmina, Gold Coast (Colony); 7 May 1949 (BR.) (I.M.I. 42111b).

*(b) Macules* brown, irregular, with a sharply defined edge thinly marginated in dark brown. *Acervuli* amphigenous, very small, punctiform. *Conidia* fusoid-clavate, 18–21.1–25 μ × 6.7–9–9 μ; coloured cells 12–14.3–16 μ long the 2 upper translucent fuliginous brown, the lowest fulvous; end cells hyaline, the apical conoid bearing 3, or sometimes 2, spreading setulae (8)13–17.2–24 μ long, basal cell conoid with a pedicel 0–3.1–4 μ long.

On living leaves of *Harungana paniculata* Lam.; near Nsuaem, Gold Coast (Colony); 8 May 1949 (BR.) (I.M.I. 45096).

*(c) Macules* very irregular, reddish with a well-defined margin maroon-brown. *Acervuli* amphigenous, circular, about 100–150 μ in diameter, producing globular masses of conidia. *Conidia* fusoid-clavate 18–19.5–22 μ × 7.7–8–8 μ; coloured cells versicoloured, somewhat constricted at the septa, 12–13–17 μ long, the 2 upper fuliginous brown; end cells hyaline, the upper conoid bearing 3, sometimes 2 setulae, 9–13.2–21 μ long, the basal conoid to short conoid with a pedicel 0–1.8–4 μ long.

On living leaves of *Trachylobium verrucosum* (Gaertn.) Oliv. (Mr J. P. M. Brenan states: 'I think this is *T. verrucosum* (Gaertn.) Oliv. an introduced tree from East Africa'. Mr Hughes stated that this tree was growing in the Botanic Gardens at Aburi which would explain its presence in West Africa); Aburi, Gold Coast (Colony) 3 May 1949 (BR.) (I.M.I. 45097) (Gold Coast Myc. Herb. 928).

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