

## New and Interesting Records of South African Fungi, Part VIII

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### ABSTRACT

Descriptions of the following eight fungi isolated from various habitats are given: *Achaetomium strumarium* Rai, Tewari & Mukerji, from a leaf of *Protea* sp.; *Phoma glomerata* (Corda) Wollenw. & Hochapf. from wheat debris; *Phoma glumarum* Ell. & Tracy and *Phoma capitulum* Pawar, Mathur & Thirumalachar from leaf litter of *Acacia karroo* Hayne; *Phoma jolyana* Pirozynski & Morgan-Jones from contaminated agar plate; *Veronaea botryosa* Cifferi & Montemartini, *Scytalidium lignicolum* Pesante and *Rhinochloidiella mansonii* (Castell.) Schol-Schwarz from deteriorated canvas; *Cerebella andropogonis* Ces. from *Lolium multiflorum* Lam. spikelets.

Eight fungal species isolated from various habitats are described and discussed below. The descriptions are based on agar cultures incubated at 25 °C. Live cultures of these have been deposited in the Potchefstroom University Culture Collection and dried down cultures in the Mycological Herbarium (PREM) at 590 Vermeulen Street, Pretoria.

*Achaetomium strumarium* Rai, Tewari & Mukerji in Can. J. Bot. 42: 693–697 (1964).

#### Figure 4.

Colonies develop fairly rapidly on potato-dextrose agar reaching a diameter of 9 cm within 10 days, closely appressed to the medium, buff to dull grey-brown, reverse rosaceous with pigment diffusing into the agar. Hyphae hyaline to light golden-brown, branched, septate, 2.0–5.0 µm diam. Ascospores mostly superficial, single or aggregated, subglobose to ovoid, ostiolate, without distinct neck, dull golden-brown to nearly black when mature, 30.0–160.0 × 30.0–90.0 µm; peridium delicate and consisting of loosely woven hyphae, tawny, usually adorned with delicate, hyaline to subhyaline radiating hairs up to 300 µm long and 2.0–4.0 µm diam. Asci evanescent, fascicled, cylindrical, aporate, octosporous, 45.0–85.0 × 6.0–8.0 µm; ascospores uniseriate, olivaceous to dark olive-brown, greenish-grey in mass at maturity, ellipsoidal with slightly pointed ends, single basal germ pore, 9.0–13.0 × 6.0–8.0 µm.

*Specimen examined*: P.U. Culture Collection, No 1175, isolated from leaf of *Protea* sp., Kempton Park, Transvaal, March 1972. PREM 44860 dried culture on 1.5% malt extract agar.

The genus *Achaetomium* was erected by Rai et al. (loc. cit.) with *A. globosum* as type species. The genus resembles members of the Chaetomiales and is, according to the original description, characterized by ostiolate ascospores with evanescent asci, dark one-celled ascospores and a delicate, light coloured peridium devoid of hairy outgrowths. With the exception of the very obvious hairs on the perithecia the features of this specimen agree closely with those of *A. strumarium* and there are only minor differences in the size of the ascospores, asci and ascospores. Evaluating the relative importance of perithecial hairs of certain Ascomycetes Dr von Arx commented, in a personal communication, that this feature should not be over-emphasized and often has only limited taxonomic value. More important characters are the nature of the germ pore and the colour of the perithecium and ascospores. According to him *Achaetomium* is characterized mainly by dark ascospores with a single basal germ pore and a perithecium without a terminal tuft of hairs surrounding the ostiole.

This is the first record of the occurrence of this genus in South Africa. —M.C.P.

*Phoma glomerata* (Corda) Wollenw. & Hochapf. in Z. Parasit Kde. 8: 592 (1936).

*Coniothyrium glomeratum* Corda, Ic. Fung. 4, 39 (1940).

*Peyronellaea glomerata* (Corda) Goidánich in Rc. Accad. Lincei 1, 445; 658 (1946).

*Phoma alternariaceum* Brooks & Searle in Trans. Br. mycol. Soc. 7, 193 (1921).

#### Figure 2.

Colonies on malt agar attain a diameter of 8 cm in 7 days, closely appressed to the medium with little aerial mycelium, brown to olivaceous. Hyphae septate, branched, brown-olivaceous, 3.0–8.0 µm diam. Chlamydospores brown to dark brown; growing from the aerial mycelium, prostrate hyphae and mature pycnidia in simple or branched chains consisting of 2–10 units; shape variable, but mostly irregularly ovate, obpyriform or fusiform-ellipsoidal with 3–8 transverse and occasional longitudinal or oblique septa, 15.0–30.0 × 15.0–20.0 µm. Pycnidia superficial or immersed in medium, brown, subglobose to obpyriform, up to 160 µm diam., often laterally compressed and oval from above, 20.0 × 150.0 µm; ostiole single or occasionally 2–3; spore mass opaque, rosaceous. Pycnidiospores hyaline to subhyaline, olive when mature, guttulate; shape variable, ellipsoidal, ovoid, oblong-ellipsoid or irregular; very rarely 1-septate, 4.0–10.0 × 2.0–6.0 µm.

*Specimen examined*: P.U. Culture Collection, No. 1187, isolated from wheat debris, Heilbron, O.F.S., December 1971. PREM 44861 dried culture on 1.5% malt extract agar.

The identity of this specimen was verified by Dr H. A. van der Aa, Baarn, Netherlands. The characters of this isolate agree closely with the description given by Boerema et al. (Persoonia 4: 53–54, 1965) and Morgan-Jones (C.M.I. Descriptions of Pathogenic Fungi and Bacteria, No. 134). Boerema (loc. cit.) pointed out that this species is strongly influenced by cultural conditions and displays wide variation in its main features, but that it is easily recognised by the characteristic chlamydospores produced in chains and resembling the conidia of *Alternaria*. It should be noted that typical chlamydospores are not readily observed in very young cultures and that these should not be used for identification purposes (Leudemann, Mycologia 51, 772–780, 1959). The full synonymy of this species is listed by Boerema (loc. cit.).

This is the first record of the occurrence of this species in South Africa. —M.C.P.

*Phoma capitulum* Pawar, Mathur & Thirumalachar in Trans. Br. mycol. Soc. 50: 261 (1967).

*Phoma ostiolata* Pawar, Mathur & Thirumalachar, in Trans. Br. mycol. Soc. 50: 262 (1967).

*Phoma ostiolata* var. *brunnea* Pawar, Mathur & Thirumalachar, in Trans. Br. mycol. Soc. 50: 263 (1967).

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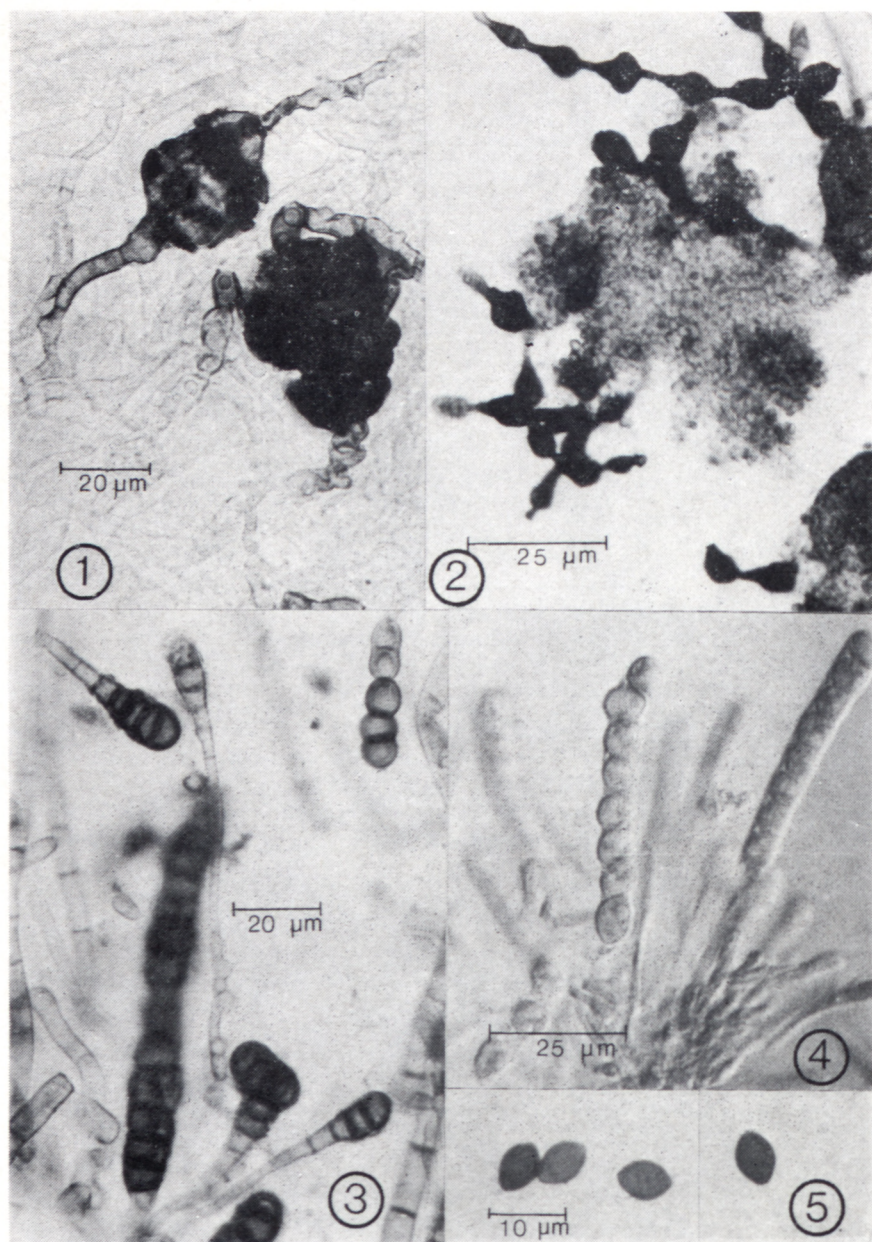


FIG. 1-5.—Fig. 1, *Phoma glumarum* intercalary chlamydospores. Fig. 2, *Phoma glomerata* catenate chlamydospores. Fig. 3, *Phoma jolyana* chlamydospores. Fig. 4 and 5, *Achaetomium strumarium* asci and ascospores.

Colonies on potato-dextrose agar slow growing and reaching a diameter of 3,5 cm in 10 days, eventually compact and spongy; aerial mycelium cottony, pure white; reverse colourless or faintly rosaceous. Hyphae hyaline, branched, up to 3,0 μm diam. Pycnidia tardily produced in small numbers, superficial or immersed in the medium, subglobose, at first light brown becoming brown to nearly black, neck inconspicuous or absent, mostly with a single ostiole, variable in size and up to 250 μm diam. Pycnidiospores hyaline, mainly ovoid, smooth, discharged in greyish-white opaque mass, 2,5–7,0 × 2,0–4,0 μm.

*Specimen examined*: P.U. Culture Collection, No. 71, isolated from leaf litter of *Acacia karroo*, Potchefstroom, Transvaal, Jan. 1964. PREM 44862 dried culture on 1,5% malt extract agar.

The identity of this specimen was confirmed by Dr G. H. Boerema, Wageningen, Netherlands.

In its main features this isolate agrees closely with the description of the type (Pawar *et al.*, loc. cit.). It differs in having darker pycnidia, slightly larger spores and a grey-white discharged spore mass. The fact that *P. ostiolata* and *P. ostiolata* var. *brunnea*, described by Pawar *et al.* (loc. cit.) as distinct types on the grounds of slight morphological variations, were reduced to synonymy with *P. capitulum* (Boerema & Dorenbosch, Trans. Br. mycol. Soc. 51: 145–146,

1968), indicates some variability in the characters of this species.

This is the first record of the occurrence of this species in South Africa. —M.C.P.

*Phoma jolyana* Pirozynski & Morgan-Jones in Trans. Br. mycol. Soc. 51: 200 (1968).

*Phoma musae* (Joly) Boerema, Dorenb. & Kest. in Persoonia 4: 47–68 (1965).

*Peyronellaea musae* Joly in Rev. Mycol. 26, 97 (1961).

*Peyronellaea nainensis* Tandon & Bilgrami in Curr. Sci. 30, 344 (1961).

Figure 3.

Colonies grow fairly rapidly on malt agar attaining a diameter of 7 cm in 7 days, appressed, with little aerial mycelium, olive-brown becoming dark olivaceous to nearly black. Hyphae olivaceous-buff, branched, septate, 2,0–7,0 μm diam. Chlamydospores brown, lateral or terminal on hyphae, sometimes intercalary, simple or branched, shape variable but mostly more or less clavate or obovoid, 1–20 septate with occasional longitudinal or oblique septa, 12,0–75,0 × 5,0–87,0 μm. Pycnidia abundant, scattered, superficial or immersed in the medium, small pycnidia often develop on aerial mycelium, subglobose to obpyriform, normally with a single ostiole, brown to nearly black, 50–210 μm diam. Pycnidiospores hyaline to light olivaceous, shape variable, usually ovoid,

oblong or irregular, continuous, guttulate, 4,0–8,5 × 2,0–4,5  $\mu\text{m}$ .

*Specimen examined*: P.U. Culture Collection, No. 1059 isolated from contaminated agar plate, Potchefstroom, Transvaal, 1966. PREM 44863 dried culture on 1,5% malt extract agar.

The identity of this specimen was verified by Dr G. H. Boerema, Wageningen, Netherlands.

According to Boerema *et al.* (loc. cit.) this species is easily recognised by the single, more or less clavate dictyochlamydo-spores developing terminally or laterally on the hyphae. It is further pointed out that the size and pigmentation of the pycnidia, pycnidiospores and chlamydo-spores are markedly affected by the age of the cultures and by the C/N ratio of the medium. These variations have caused considerable confusion in the taxonomy of this group of fungi and should therefore be taken into account in the identification of species.

This is the first record of the occurrence of this species in South Africa. —M.C.P.

**Phoma glumarum** Ell. & Tracy in J. Mycol. 4: 123 (1888).

Figure 1.

Colonies on malt agar develop fairly rapidly reaching a diameter of 6,5 cm in 5 days, appressed to the medium with scanty aerial mycelium, distinct red pigment diffusing into agar. Mycelium brownish to olivaceous; hyphae septate, branched, 3,0–10,0  $\mu\text{m}$  diam. Chlamydo-spores usually intercalary, varying from unicellular to dictyochlamydo-spores, brown to brown-olivaceous; unicellular chlamydo-spores solitary or in short chains, 7–18  $\mu\text{m}$  diam; dictyochlamydo-spores irregular in shape but mostly fusiform-ellipsoid or ovoid to globose, 15,0–55,0 × 8,0–32,0  $\mu\text{m}$ , individual cells up to 22,0  $\mu\text{m}$  diam. Pycnidia superficial or partly immersed in agar, brown to black, variably pyriform or subglobose, diameter 40–200  $\mu\text{m}$  mostly with distinct neck and ostiole, ostiole often lined with dark cells. Pycnidiospores hyaline to light olivaceous, usually guttulate, ellipsoid to ovoid or globose, continuous or rarely 1-septate, 3,0–7,0 × 2,0–4,0  $\mu\text{m}$ .

*Specimen examined*: P.U. Culture Collection, No. 280, isolated from leaf litter of *Acacia karroo*, Potchefstroom, Transvaal, Jan. 1964. PREM 44864 dried culture on 1,5% malt extract agar.

The identity of this specimen was confirmed by Dr G. H. Boerema, Wageningen, Netherlands.

The full synonymy of this species is listed by Boerema (Persoonia 6: 174–175, 1971).

According to Boerema (Persoonia 5: 203, 1968) the characters of this species *in vitro* show wide variation but the fungus is, nevertheless, easily recognized by the dark, beaked pycnidia, the intercalary dictyochlamydo-spores and the production of a distinct reddish (orange to red-purple) pigment. The C/N ratio of the medium affects the production of pycnidia and chlamydo-spores—a high ratio favouring chlamydo-spore production and a low ratio the formation of pycnidia (Boerema, Persoonia 5: 203, 1968). —M.C.P.

**Veronaea botryosa** Cifferi & Montemartini in Atti. Ist. bot. Univ. Lab. crittogam Pavia Ser. 5, 15: 67–72 (1958); Ellis in Dematiaceous Hyphomycetes, Commonwealth Mycological Institute, Kew, p. 245 (1971).

*Sympodina coprophila* Subramanian & Lodha in Antonie van Leeuwenhoek 30: 317–330 (1964).

Figures 6, 7.

Colonies on malt agar slow growing, reaching a diameter of 27 mm in 12 days, velvety-granular, dark grey-olivaceous, reverse similar, no pigment diffusing into the agar. Hyphae smooth, septate, branched, with branches often at right angles and with a septum in the main axis close to the point of branching, slightly wavy with cell walls often irregular and slightly bulging, rarely straight, 2–3  $\mu\text{m}$  diam., olivaceous-grey. Conidiophores macronematous, mononematous, smooth-walled, septate, slightly wavy, olivaceous-grey, branched or unbranched, arising at right angles on trailing hyphae, often basally septate and constricted at this septum, variable in length, 55,0–300,0 × 2,0–3,0  $\mu\text{m}$ . Conidiogenous cells integrated, polyblastic, restrictedly sympodial, rarely geniculate, scars small and flat, mostly determinate but rarely resumes normal growth resulting in an intercalary conidiogenous area. Conidia solitary, dry, acropleurogenous, oblong-ellipsoid to ellipsoid, rounded apically, rarely fusiform, slightly tapering basally, mostly with a definite hilum, 0–1-septate often constricted at the septa, smooth, thin-walled, olivaceous-buff, 5,0–12,0 × 2,0–5,0  $\mu\text{m}$ .

*Specimen examined*: P.U. Culture Collection, No. 1165. Isolated from deteriorated canvas, by M. C. Papendorf, Potchefstroom, Sept. 1970. PREM 44865 dried culture on 1,5% malt extract agar.

At present only two species of *Veronaea* are known viz. *V. botryosa* and *V. simplex* Papendorf (Trans. Br. mycol. Soc. 52: 483–498, 1969). Papendorf (loc. cit.) considered *Sympodina* congeneric with *Veronaea* and Dr J. A. von Arx (personal communication) considers *S. coprophila*, the only species of *Sympodina*, to be identical with *V. botryosa*. The latter as described by Cifferi & Montemartini (loc. cit.) differs from the isolate described here as well as from *S. coprophila*, in having club-shaped conidiophores with small sterigmata and conidia with pointed ends and no constrictions at the septa. Von Arx (personal communication) found the present isolate to differ only slightly from the type of *V. botryosa*. It appears that Subramanian & Lodha's (loc. cit.) diagnosis for *S. coprophila* is actually more acceptable for *V. botryosa* than the original description by Cifferi & Montemartini (loc. cit.).

Although the conidia of *V. botryosa* are similar to those of *V. simplex*, the latter species is distinguished by its less elaborate, shorter, geniculate conidiophores with prominent protruding scars.

This is the first record of the occurrence of this species in South Africa. —W.J.J.

**Scytalidium lignicolum** Pesante in Annali Sper. agr. N.S. 11: 249–266; Ellis in Dematiaceous Hyphomycetes, Commonwealth Mycological Institute, Kew, p. 28 (1971).

Figure 8.

Colonies on malt agar growing rapidly reaching a diameter of 90 mm in 5 days at 25 °C, mycelium effuse flocculose, initially rosy buff (Rayner, 1970) but darkening rapidly to olivaceous-grey to dark olivaceous (Rayner, 1970). Hyphae smooth, septate, branched, hyaline and thin-walled, 1,5–12,0  $\mu\text{m}$  diam., sections of the hyphae developing into intercalary, thick-walled, olivaceous cells (not arthro- or chlamydo-spores), very narrow hyphae generally appearing after repeated branching of the wider hyphae. Conidiophores micronematous, determinate, variable in length but occasionally short, mainly when bearing type II conidia, or very long and slender when bearing both types of conidia. Conidiogenous cells thallic, integrated, intercalary or terminal, smooth or verruculose, hyaline, fragmenting to form two types of

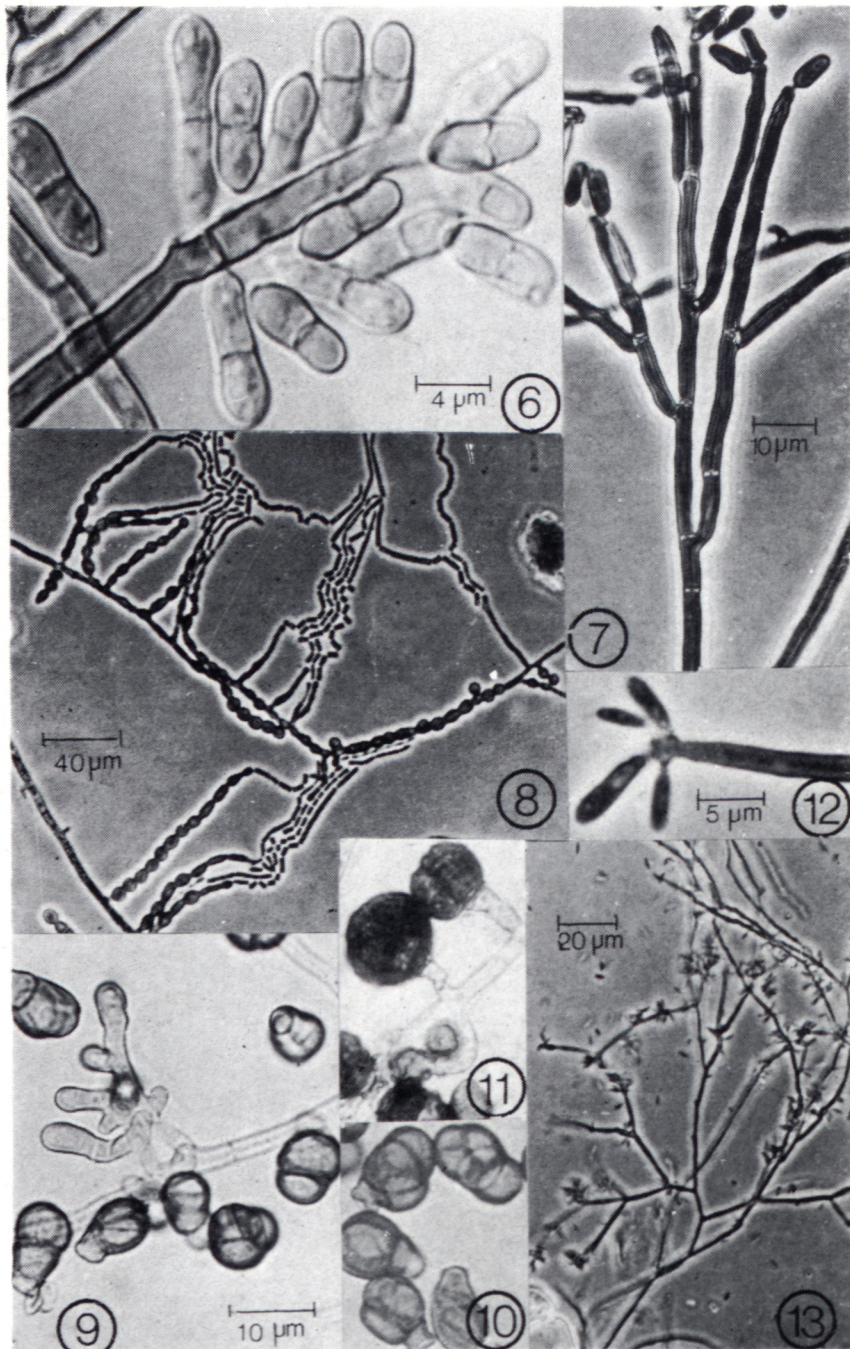


FIG. 6-13.—Fig. 6, *Veronea botryosa* conidiophore and conidia (interference contrast). Fig. 7, *V. botryosa* branched conidiophore (phase contrast). Fig. 8, *Scytalidium lignicolum* Type I and Type II arthroconidia (phase contrast). Fig. 9 and 10, *Cerebella andropogonis* conidiophores and conidia. Fig. 11, *Epicoccum purpurascens* conidiophores and conidia. Fig. 12 and 13, *Rhinocladiella mansonii* conidia and multiple branched conidiophores (phase contrast).

arthroconidia. Conidia type I terminal, often arising from slender conidiogenous cells on slender conidiophores, catenate, hyaline, thin-walled, dry, cylindrical to oblong-cylindrical and truncate at each end,  $4,0-8,0 \times 1,5-3,0 \mu\text{m}$ ; these conidia also occur on roughened, terminal, phialide-like, conidiogenous cells at the ends of chains of type II conidia. Conidia type II terminal or intercalary, variable in shape, mostly sub-globose or oblong-elliptical to doliiform, moderately thick walled, 0-1-septate with septa prominent, often constricted at the septa, cells equal or unequal, smooth, olivaceous,  $6,0-15,0 \times 5,0-6,0 \mu\text{m}$ .

*Specimen examined:* P.U. Culture Collection, No. 1161, isolated from deteriorated canvas, by M. C. Papendorf, Potchefstroom, Sept. 1970. PREM 44866 dried culture on 1,5% malt extract agar.

The isolate described here is essentially similar to the type according to the description of Pesante (loc. cit.). Slight variations in the dimensions were noted but no microsclerotia were observed. The identity of this fungus was confirmed by Dr W. Gams, Centraalbureau voor Schimmelcultures, Baarn.

This is the first record of the occurrence of this genus in South Africa. —W.J.J.

*Rhinocladiella mansonii* (Castell.) Schol-Schwarz in Antonie van Leeuwenhoek 34: 119-152 (1968).

Figures 12, 13.

Colonies on malt agar slow growing at  $25^\circ\text{C}$ , reaching a diameter of 25 mm in 12 days; mycelium slightly raised, velvety, granular, grey-olivaceous, reverse olivaceous-black, (Rayner, 1970). Hyphae smooth with slight bulges, slightly wavy, septate, honey-buff,  $1,5-2,5 \mu\text{m}$  diam., adjacent hyphae frequently anastomosing. Conidiophores macronematous, mononematous, septate, unbranched or branched, length variable, mostly  $20-60 \mu\text{m}$ , bright, honey-buff, arising singly as side branches of the hyphae or branched with each branch ending in a conidiogenous cell, branches rarely of similar length. Conidiogenous cells polyblastic, integrated, terminal, elongating, denticulate with small flat scars, often resuming growth resulting in intercalary conidiogenous areas. Conidia hayline, smooth, thin-walled, oblong-ellipsoidal to fusiform-ellipsoidal, tapering

slightly to a truncate base, continuous,  $3,0-8,0 \times 1,5-2,0 \mu\text{m}$ ; when separated from the conidiophore the conidia often become thick-walled and swollen to produce large numbers of secondary blastoconidia of various shapes and sizes, mainly obovoid and basally truncate; older conidia frequently anastomose to form irregular clusters.

*Specimen examined:* P.U. Culture Collection, No. 1160, isolated from deteriorated canvas by M. C. Papendorf, Potchefstroom, Sept. 1970. PREM 44867 dried culture on 1,5% malt extract agar.

This isolate differs in some aspects from the description given by Schol-Schwarz (loc. cit.). The colony is not slimy, neither were the various spore types, viz *Phialophora* annellate-type and *Cladosporium*-type observed. The conidia are also larger than the  $2,0-3,0 (5,5) \times 1,0-1,5 (2,0) \mu\text{m}$  reported by Schol-Schwarz (loc. cit.). However, other characteristics such as proliferation of secondary conidia and the anastomosing of older conidia agree well with those of *R. mansonii*.

The identity of this isolate was confirmed by Dr S. de Hoog, Centraalbureau voor Schimmelcultures, Baarn.

This is the first record of the occurrence of this species in South Africa. —W.J.J.

***Cerebella andropogonis*** *Ces. apud Rabenhorst* in Bot. Ztg. 9: 669 (1851); Langdon in Mycol. Papers 61 (1955); Ellis in Dematiaceous Hyphomycetes, Commonwealth Mycological Institute, Kew, p. 246 (1971).

*Epicoccum andropogonis* (Ces.) Schol-Schwarz in Trans. Br. mycol. Soc. 42, 149-173 (1959).

Figure 9, 10.

Colonies on malt agar growing moderately fast and reaching a diameter of 35 mm in 5 days at 25 °C. Mycelium at first light cream, mainly submerged, becoming delicately floccose, often funiculose and producing a characteristic sienna-umber (Rayner, 1970) pigment in the agar. Hyphae smooth to finely verruculose, septate, branched, hyaline. Conidiophores semi-macronematous, mononematous, short, up to  $10,0 \mu\text{m}$  long and  $5,0 \mu\text{m}$  diam., light brown, sometimes branched, smooth to finely verruculose, septate, forming dense clusters resembling sporodochia. Conidogenous cells integrated, holoblastic, monoblastic and determinate. Conidia single, dry, light to dark brown, shape variable but mainly subglobose; 2 to many-celled, mostly 5-6; relatively

thin-walled with longitudinal, transverse or oblique septa, constricted at the septa, with protuberant truncate basal stalk cell, smooth to verruculose, variable in size,  $13,0-20,0 \times 10,0-20,0 \mu\text{m}$ . The fungus forms a much convoluted cerebriform stroma on the host.

*Specimen examined:* P.U. Culture Collection, No. 1186, isolated from spikelets of *Lolium multiflorum* Lam. infected with *Claviceps purpurea* (Fr.) Tul., collected at Underberg, Natal, by Dr W. F. O. Marasas, Feb. 1972. PREM 44868 dried culture on 1,5% malt extract agar.

In an extensive study of the genus *Cerebella*, Langdon (loc. cit.) maintained it as a separate genus with *C. andropogonis* as the only species and listed 32 synonyms. Schol-Schwarz (loc. cit.), however, placed *C. andropogonis* in the genus *Epicoccum* as *E. andropogonis* because of similarities in conidial ontogeny. Ellis (loc. cit.) did not accept this and maintained *C. andropogonis* on account of its distinctive conidial morphology and the production of the cerebriform stroma *in vivo*.

The isolate described here has conidial dimensions which agree with the lower limits given by Langdon (loc. cit.). Considering the variability of this genus as indicated by Langdon (loc. cit.), there should be no doubt about the identity of the isolate. It is readily distinguished from *E. purpurascens* (fig. 11) by the marked constrictions at the septa, the relatively smooth conidial surface and the smaller and lighter-coloured conidia.

This species has been recorded in South Africa before. According to the synonyms given by Langdon (loc. cit.), Doidge in Bothalia 5, (1950) listed it as *Sorosporium africanum* Syd. (p. 378), *Stigmella graminicola* Linder (p. 704) and *Cerebella cynodontis* Syd. (p. 730). —W.J.J.

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