Bothalia, 10, 3: 411—416

New and Interesting Records of South African Fungi, Part VII

by

W. F. O. Marasas* and G. C. A. van der Westhuizen*

ABSTRACT

Four species of fungi recorded for the first time in South Africa, are described and illustrated. These are: *Acremoniella verrucosa* Togn. from roots of *Medicago sativa; Coniella pulchella* Höhn. from roots of pine-apple; *Periconia igniaria* Mason & Ellis from seed of *Medicago sativa*; and *Stachybotrys subsimplex* Cooke from the cocoon of *Parastizopus armaticeps*.

Four species are described and discussed below. Dried down cultures of all these have been deposited in the mycological collection of the National Herbarium (PRE) at 590 Vermeulen Street, Pretoria.

Acremoniella verrucosa *Togn.*, Rend. Inst. Lombardo Sci. Lett., 2 ser., 29: 864 (1896); Horne & Williamson in Ann. Bot. 37: 393 (1923); Horne & Jones in Ann. Bot. 38: 354 (1924); Mason, C.M.I. Mycol. Papers 3: 34 (1933); Groves & Skolko in Can. J. Res. C. 24: 77 (1946).

Eidamia tuberculata Horne & Jones in Ann. Bot. 38: 334 (1924).

Figures: 1, 2.

On corn meal, potato carrot and 1½% malt extract agars at 25°C colonies grow rapidly and reach a diameter of 85 mm in 7 days. On potato dextrose agar the growth is slower (25 mm) while no visible growth occurs on Czapek-Dox agar. *Vegetative mycelium* is thinly effused, hyaline and consists of repeatedly branched, septate, hyaline hyphae 5—7.5μ in diameter. Colonies appear brown because of the macroconidia. *Macroconidia* are aleuriospores which are borne singly either on straight to procumbent conidiophores which develop laterally on the main hyphae, or, on conidiophores which proliferate sympodially from a point behind the apex to produce one or more secondary sporogenous cells. *Conidiophores* are hyaline, simple or sparingly branched but the sporogenous cells may branch repeatedly in a sympodial manner to give rise to complex masses, non-septate or up to 8-septate, 10—110μ long, 5—7.5μ in diameter at the base, terminating in sharply tapered sporogenous cells, 2—5μ in diameter at the rounded apex. *Macroconidia* solitary, terminal one-celled, brown, globose, thick-walled, tuberculate, 19—27.5μ in diameter (mostly 22.5μ). *Microconidia* not seen.

Specimen examined: PRE 44334 (Mycological Herbarium), dried culture, isolated from *Medicago sativa* L. roots, Grootrivier, Knysna District, Cape Province, October 1969.

The South African isolate of *A. verrucosa* described here agrees well with the descriptions by Mason (l.c.) and Groves and Skolko (l.c.), except that aspergilliform phialophores and microconidia were not produced by cultures on corn meal agar incubated at 25°C for 4 weeks. This isolate also failed to grow on Czapek-Dox agar in pure culture but grew normally in mixed culture with other fungi such as *Fusarium oxysporum* (Schlecht.) Snyd. et Hans. This confirms

* Plant Protection Research Institute, Private Bag 134, Pretoria.

the findings by Mason (l.c.) and Groves & Skolko (l.c.) that *A. verrucosa* also exhibits the so-called Heald-Pool reaction on Czapek-Dox agar.

This is the first record of the occurrence of this species in South Africa. — W.F.O.M.

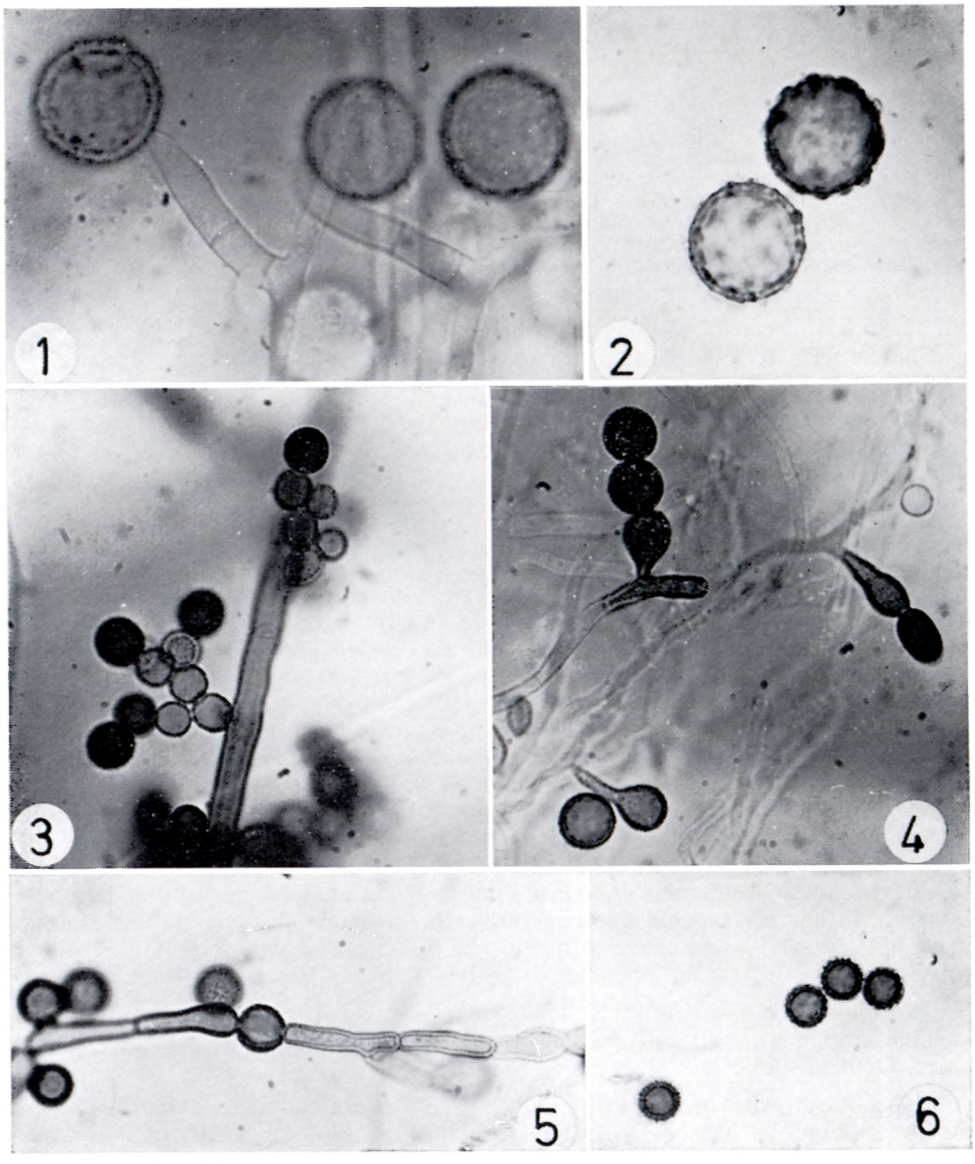

FIG. 1—2. — **Acremoniella verrucosa.** Fig. 1, septate conidiophores bearing terminal macroconidia (× 1,000). Fig. 2, verrucose macroconidia (× 1,000).

FIG. 3—6. — **Periconia igniaria.** Fig. 3, macronematous conidiophore showing branched chains of conidia developing from a sporogenous cell (× 1,000). Fig. 4. micronematous conidiophores (× 1,000). Fig. 5, intercalary spore (× 1,000). Fig. 6, conidia (× 1,000).

Coniella pulchella *Höhnel* in Ber. Dt. Bot. Ges. 36: 316 (1918); Sydow & Petrak in Repert. Nov. Spec. Regn. Veg. Beih. 42: 459 (1927) (repr. 1969); Sutton in Can. J. Bot. 47: 603-603 (1969).

Figures: 7, 8 9.

On potato dextrose agar, mycelium thin, white, floccose or cobwebby, or submerged, covering the plate after 8—17 days at 25°C. *Pycnidia* scattered, single or gregarious, subglobose to more or less rounded conical, blabrous, seated on a thin white subiculum, 0.05—0.5 mm in diameter, at first hyaline, translucent then darkening with maturation of conidia; pycnidial wall hyaline to sub-hyaline internally, 12—20μ thick and composed of several layers of pseudoparenchymatous cells, ostiolate at maturity. *Conidiophores* hyaline, short, unbranched or branched at the base, tapering apically, arizing from a basal sporodochium-like dome of tissue, 15—20 x 2—3μ, tapering to 1μ in diameter apically. *Conidia* olivaceous-brown, flattened on one side, with a paler, raphe-like longitudinal mark, apex conical or subapiculate and with the base truncate, 8—11 x 5.5—6.5μ.

Specimen examined: PRE 44310, dried down culture, isolated from roots of pine-apple, *Ananas* sp., East London, C.P., February 1968.

The fungus described here has many features in common with *Cyclodomella nigra* Mathur, Bhatt & Thirumalachar (Sydowia 13, 143-147, 1959), a species regarded by Sutton (l.c.) as a synonym of *Coniella diplodiella* (Speg.) Petrak & Sydow (l.c.). The conidia of the specimen described here have their apices conical rather than obtuse, and, because this feature distinguishes *C. pulchella* from *C. diplodiella* (Sutton, l.c.) this fungus is assigned to the former species.

This specimen was isolated from decaying roots of pine-apple plants and was observed in culture only. Although freshly formed conidia were examined even from pycnidia which had not developed to the ostiolate stage, neither the gelatinous "raphe-like structures" nor the "small stalk cell" of the conidia, as described in *Cyclodomella nigra* by Mathur *et al* (l.c.) were ever seen. Also, the pycnidial wall in this isolate remained hyaline with the innermost cells becoming pale olivaceous with age. The mature pycnidia, however, remain essentially hyaline. The dark coloured inner layers reported in pycnidia of *Cyclodomella nigra* by Mathur *et al* (l.c.), were not seen in pycnidia of this isolate. This difference may be of generic importance or may be a variable character. This isolate agrees so well in other respects with the genus *Coniella* Höhnel, however, that it's segregation from that genus does not appear to be justifiable.

This is the first record of this genus in South Africa. — G. C. A. v.d. W.

Periconia igniaria *Mason & M. B. Ellis*, C.M.I. Mycol. Papers 56: 104 (1953); Booth in Brit. Mycol. Soc. Trans. 51: 803 (1968).

Figures: 3, 4, 5, 6.

Considerable variation in cultural appearance occurs on different culture media (Table 1), but colonies are generally woolly and always produce a typical rose-madder or vinaceous pigment. *Vegetative mycelium* is composed of hyaline, thin-walled, smooth or verruculose, branched, septate hyphae approximately 3μ in diameter. At the base of macronematous conidiophores the hyphae are swollen, brownish and very coarsely warted or encrusted. *Conidia* (blastospores) are borne on micronematous and macronematous conidiophores but on some media only micronematously (Table 1). *Micronematous conidiophores* are formed by enlargement of the vegetative hyphal cells to become cylindrical, brown, thick-walled, smooth or verruculose sporogenous cells, 9—20 x 4—6μ. The sporogenous cells give rise to straight or branched chains of conidia which developed in acropetal succession but mature basipetally (Fig. 4). The cells of

micronematous conidiophores apparently also have the ability to round off and form intercalary chlamydospores which are morphologically indistinguisable from the blastospores (Fig. 5). *Macronematous conidiophores* arise singly, in small groups or in dense clusters on the vegetative mycelium (Fig. 3). Stipes are erect, stout, unbranched, brown, smooth or verruculose, 4—8-septate, 225—540µ long, 5—7.5µ in diameter at the base and 5µ in diameter at the obtuse apex. The cells of macronematous conidiophores give rise to conidia directly or to distinguishable sporogenous cells which are light brown, ovoid, smooth or verruculose, 8—10 x 6—7µ (Fig. 3). Branching chains of conidia which form loose heads are borne apically and laterally on the stipes. *Conidia* are blastospores which develop acropetally but mature basipetally, spherical, dark-brown, one-celled, 7—11 (mostly 8µ) in diameter, thick-walled, spinose with spines approximately 1µ long (Fig. 6).

Specimen examined: PRE 43738 (Mycological Herbarium), dried culture, isolated from *Medicago sativa* L. seed, Upington, Cape Province, July 1969.

The isolate from *Medicago sativa* seed described here agrees very well with the description by Mason & Ellis (*l.c.*). No reference could be found in the literature to the apparent "intercalary chlamydospores" frequently observed in our culture. These structures may develop in two different ways: (1) A cell of the micronematous conidiophore rounds up to form an intercalary chlamydospore. (2) A sporogenous cell of the micronematous conidiophore gives rise to

TABLE 1. — Cultural characteristics of *Periconia igniaria*[a]

Culture media[b]	Growth rate (mm/day)	Sporulation (21 days)	Colony colour after 21 days	
			Surface	Reverse
CMA	3.9	Micro- and Macronematous	Centre Rose-madder Margin Buff	Brown tinged with Rose-madder
OMA	4.6	Micro- and Macronematous	Centre Rose-madder Margin Buff	Greenish-grey tinged with Rose-madder
1½ MA	4.8	Micro- and Macronematous	Centre Smoky-grey Margin white tinged with Rose-madder	Brown tinged with Rose-madder
PCA	4.7	Micronematous	Centre Rose-madder Margin white	White tinged with Rose-madder
PDA	4.7	None	Centre Smoky-grey Margin white tinged with Rose-madder	Brown tinged with Rose-madder

[a] Based on five single spore isolates of PRE 43738 on each of five culture media incubated at 25°C for 21 days.
[b] CMA = corn meal agar.
OMA = Oat meal agar.
1½ MA = 1½% Malt extract agar.
PCA = Potato carrot agar.
PDA = Potato dextrose agar.

a blastospore which in turn gives rise to another sporogenous cell in stead of a successive blastospore with the result that the blastospore appears to be an intercalary chlamydospore. Somewhat analogous heavy-walled cells giving rise to a further conidiophore have been described in *Acremoniella velata* by Onions & Jones (Brit. Mycol. Soc. Trans. 51: 151-152. 1968). They referred to these cells as "rudimentary conidia". This question will have to be resolved by a developmental study in slide culture to determine the exact method of formation of these spores.

Booth (*l.c.*) described the perithecial state of *P. igniaria* as *Didymosphaeria igniaria*. He reported that the species is homothallic and that uniloculate ascostromata are produced when cultures are grown on potato dextrose agar with pieces of wheat straw and subjected to near ultraviolet light.

Mason & Ellis (*l.c.*) found *P. igniaria* on plants which have been scorched or prematurely killed by burning. They recorded this species on eight different host plants in England and on *Borassus flabellifer* var. *aethiopica* in Ghana. *P. igniaria* has also been isolated from soil by Stenton at Wicken Fen, Cambridgeshire (Mason & Ellis, *l.c.*) and from the surface layer of a sand dune at Sandwich, Kent by Brown (J. Ecol. 46: 641-664, 1958). The South African isolate was obtained from lucerne seed surface sterilized with Nance solution (1 g $HgCl_2$, 10 ml 0.1N HCl, 12 ml Teepol, diluted to 1 litre) for 90 seconds, washed five times with distilled water and plated on potato dextrose agar. One hundred seeds were treated in this way and only two yielded fungal colonies, both of which proved to be *P. igniaria*. These findings suggest that the spores of *P. igniaria* are very resistant to heat and chemical treatment, probably because of the thick epispore.

This is a new host record for *P. igniaria*, the first record of the occurrence of this species on seed and the first record of the occurrence of this species in South. Africa. — W.F.O.M.

Stachybotrys subsimplex *Cooke* in Grevillea 12:33 (1883); Bisby in Trans. Brit. Mycol. Soc. 26: 133-143 (1943).

Figures: 10, 11, 12.

Colonies on potato-malt-filter paper agar, slow growing, reaching a diameter of 30 mm in two weeks, black, woolly-funiculose with trailing ropes of hyphae bearing conidiophores which terminate in black, glistening, slimy spore masses. *Hyphae* hyaline at first becoming fuliginous, branching, septate, 2—4μ in diameter. *Conidiophores* arizing from funicles of aerial hyphae, hyaline at first later fuliginous to dark olivaceous brown in age, simple or occasionally branched, tapering gradually from the base to the tip, smooth or finely roughened, 0—3 septate and bearing a whorl of 3—7 sporogenous cells terminally, 30—55 x 2.5—5.0μ. *Sporogenous cells* hyaline at first, later fuliginous oblong-ovoid often somewhat flattened on one side and curving, 7.0—12.0 x 3.0—5.0μ. *Conidia* dark olivaceous, thick-walled, finely verrucose, subglobose 5.0—7.0μ in diameter or ellipsoidal and somewhat pointed, 5.5—7.0 x 5.0—6.0μ, borne in globules of slime.

Specimen examined: PRE 44311 (Mycological Herbarium) on potato-malt-filter paper agar, isolated from cocoon of *Parastizopus armaticeps*, Twee Rivieren, Kalahari Gemsbok Park, May 1969.

The fungus described here agrees very well with the description of this species in culture by Bisby (*l.c.*). He thought that this species is a saprophyte of the warmer regions and that the genera *Gliobotrys* Höhnel and *Memnoniella* Höhnel are based on this species. In the South African isolate it was noticed that the young conidia were somewhat ellipsoidal smooth-walled and pale coloured

but that older conidia are sub-globose, dark and roughened. The conidia were always produced in slime balls, however. No chains of conidia which may suggest a "*Memnoniella* stage" were ever seen in this isolate.

This is the first record of this species in South Africa. — G.C.A. v.d. W.

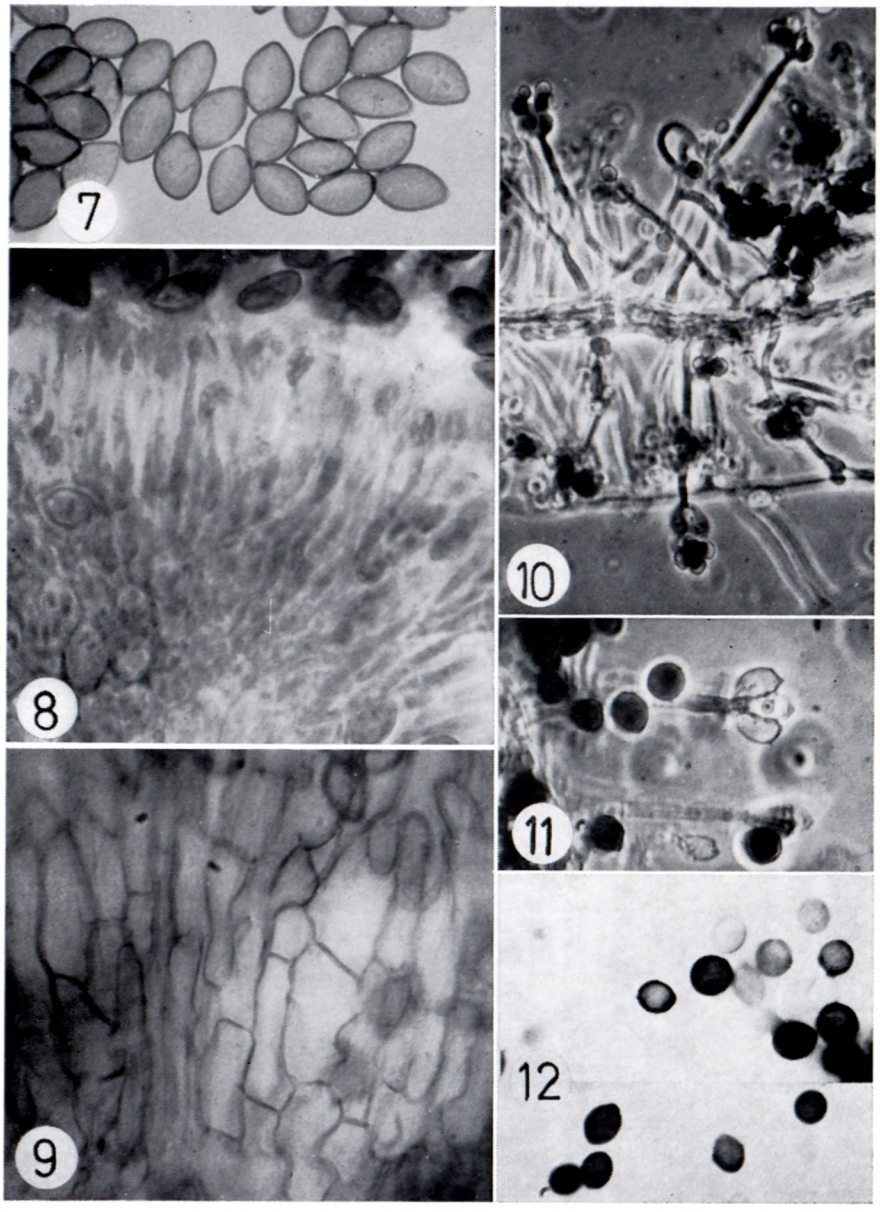

Fig. 7—9. — **Coniella pulchella.** Fig. 7, conidia (× 1,000). Fig. 8, conidiophores with young conidia and part of sporodochium-like dome (× 1,000). Fig. 9, part of pycnidium wall (× 1.000).

Fig. 10—12. — **Stachybotrys subsimplex.** Fig. 10, conidiophores arising from hyphal strand (× 400 phase contrast). Fig. 11, sporogenous cells on conidiophores (× 1,000 phase contrast). Fig. 12, conidia at various stages of maturity (× 1,000).