Fungi of Mysore-IV

By T. R. Nag Raj*) & H. C. Govindu**)

With 2 Fig. in the Text

The accompanying accounts of some interesting fungi forms the fourth paper in the series of which the first three papers appeared under the title: 'New records of fungi of Mysore'. It has now been felt desirable to widen the scope of this series of papers to include detailed accounts of such fungi information concerning which has been scant from a few earlier gatherings from this country or where our collections are at variance from those recorded earlier. The title of this series is, therefore, now changed to fulfil this objective. Unless otherwise stated, the herbarium specimens and/or cultures of the fungi mentioned herein are deposited in the Mycological Herbarium of Agricultural College, University of Agricultural Sciences, Hebbal, Bangalore (Herb. MYSP) and in the Herbarium of the Commonwealth Mycological Institute, England (Herb. IMI).

1. *Amphichaetella echinata* (Kleb.) Höhnel, in S. B. Akad. Wiss. Wien, 125, 92, 1916. — Fig. 1.

On rotting leaves of *Artocarpus integrifolia* L., Coffee Research Station, Balehonnur, 22. 11. 1959, leg. T. R. Nag Raj, Herb. MYSP ≒ 822; Herb. IMI ≒ 95827 & 95828.

Sporodochia amphigenous, superficial, scattered, pulvinate, white or cream white when moist and brownish yellow when dry, up to 430 μ high and 590 μ in diam. Conidiophores hyaline, septate, cylindrical; conidia acrogenous and solitary, hyaline, continuous, elliptic, elliptic-fusiform, sometimes irregular, 14—24 × 5—9 μ in size, with bullate, thin-walled and smooth vesicles at both ends 2—3 μ in diam., spore wall thickened at the middle and strongly echinulate or denticulate, with appendages arising from the vesicles at both ends. Appendages, 2—4, mostly 3, at each end, filiform, flexuous or straight, terminating in a slight swelling, hyaline, 11—24 μ long.

The fungus is prevalent during the incessant rainy days of August-September. The conidia are violently scattered when dry sporodochia are brought in contact with a drop of water.

*) Commonwealth Institute of Biological Control, Indian Station, Bangalore 6.

**) Professor of Plant Pathology, University of Agricultural Sciences, Hebbal, Bangalore 24.

2. *Chaetomella terricola Rama* Rao var. **mysorensis** var. nov. Nag Raj & Govindu. Fig. 2.

Pycnidia superficial, amber brown to dark brown, stipitate, oval, triangular to irregular with a well-defined raphe, setose, 205—304 μ long, 142—204 μ wide and 75—209 μ high. Long setae brown to dark brown and thick-walled at base, hyaline to subhyaline with 1—2 circinate coils at tip, up to 4-septate, 114—161 μ long, 3.5—8.5 μ wide at base and 3.5—4.5 μ wide at tip. Short setae erect, brown and thick-walled at base, subhyaline to hyaline and sligthly dilated at apex, up to 2-septate, 33—56 μ long, 3.5—4.5 μ wide at base and 2.5—4.5 μ wide at tip. Conidiophores branched, up to 48 μ long and 1.5—2.5 μ wide, terminating in sterile filament up to 98 μ long. Conidia hyaline, continuous, fusiform, slightly curved or naviculate, 5.5—7.5 × 2—2.5 μ in size, bearing mucus caps at each end.

Pycnidia superficialia, pallide vel obscure brunnea, distincte ovoidea, triangularia vel irregularia, distincte sulcata, 205—305 μ longa, 142—204 μ lata, 75—209 μ alta; setae longiores brunneae, inferne crasse tunicatae, in apice hyalinae vel subhyalinae, usque ad 4-septatae, 114—161 μ longae, inferne 3.5—8.5 μ, in apice 3.5—4.5 latae; setae breviores erectae, inferne crasse tunicatae et brunneae superne subhyalinae vel hyalinae, in apice leniter dilatatae, usque ad 2-septatae, 35—57 μ longae, inferne 3.5—4.5 μ, superne 2.5—4.5 μ latae; conidiophora ramulosa, usque ad 48 μ longa, 1.5—2.5 μ lata; conidia hyalina, continua leniter allantoidea vel navicularia, 5.5—7.5 × 2—2.5 μ, utrinque mucoso-papillatae.

Isolated in pure culture from contaminant in plate cultures made during attempts to culture aquatic Hyphomycetes, July 1963, Coffee Research Station, Balehonnur. Type consisting of dried agar culture in Herb. MYSP ≠ 1022.

Colonies on potato-dextrose agar grow fairly rapidly manifesting as moist appressed growth devoid of aerial mycelium. The submerged mycelium is composed of hyaline, septate, much branched 2.5 μ wide hyphae. In the early stages of growth, the fruiting bodies are cream coloured, excipulate, covered by slimy mass of spores. Setae are always present on these pycnidia and are mostly of the short type described above. Typical pycnidia are produced as the culture ages. The stipes of pycnidia are 33—70.5 × 47.5—95 μ and composed of hyaline, parenchymatous cells. The apices are somewhat dilated in the short setae while up to 2 coils are present in the long setae. The short setae decribed may well represent the development stages of the long setae. The conidiophores are irregularly verticillately branched and bear conidia at the tips of the branches and terminate in a long sterile filament. The conidia are released by the rupture or dissulution of the pycnidial wall along the raphe and aggregate in a cream coloured slimy mass, the slimy character of which may be attributed to the presence of mucus

caps at each end of the spore. The mucus caps are easily discernible when the spores are stained with dilute aqueous solution of methylene blue.

This fungus is closely similar to *Chaetomella terricola* Rama Rao (Mycopath. et Mycol. appl. 19: 255—256, 1963), but differs from it in possessing apically circinately coiled, septate, long setae, with as many as 4-septa, short setae with fewer septa and somewhat wider conidia. It is, therefore, desirable to treat this isolate as a variety of *C. terricola*.

3. *Nectria flavo-lanata* Berk. & Br. in Journ. Linn. Soc. Bot. (Lond.), 1873, 114.

On dead twigs of *Coffea arabica* L., Coffee Research Station, Balehonnur, leg. T. R. Nag Raj. Herb. IMI 89194—89196.

The fungus occurs on dead twigs and is most predominant during the wet spells of South-West monsoon. Besides coffee twigs, it was also noticed to occur on lopped and fallen branches of *Albizzia lebbek* Benth., on dead branches of *Citrus* sp., and *Erythrina* sp. The fungus was easily brought into culture, wherein it developed either solely as a conidial form followed by the ascigerous stage. The conidial stage of this fungus is identical with *Kutilakesiopsis macalpineae* Agnih. & Barua (Journ. Ind. Bot. Soc. XXXVI, 306—311, 1957). The fungus was first described from Ceylon and is of widespread occurrence in several parts of the world. It is being recorded here for the first time from India.

4. **Penicilliopsis bambusae** sp. nov. Nag Raj & Govindu — Fig. 3.

Synnemata erect or variously curled, coralloid, at first white later turning buff brown, pulverulent over the entire surface, up to 10 mm. long and 2 mm. in diam., composed of a network of branched, hyaline to subhyaline, septate hyphae, 2—2.5 μ in diam. giving rise to a palisade layer of phialides over the entire surface of the synnemata. Phialides hyaline to ubhyaline, obclavate, thickened at the apex and terminating in a papilla or beak, 16—32 × 3.5—5 μ (average: 25.3 × 4.4 μ). Conidia acrogenous, catenate, continuous, elliptic, elliptic-fusiform, hyaline to subhyaline, with polar scars denoting the point of attachment, 5.5—10.5 × 3.5—5 μ (average: 7.7 × 4.2 μ) in size. Ascigerous stage not known.

Synnemata erecta vel varie curvula, coralloidea, primum albida, postea obscure brunnea, in superficie pulverulenta, usque ad 10 mm longa et ad 2 mm crassa, ex hyphis reticulato-ramosis, hyalinis vel subhyalinis, septatis 2—2.5 μ crassis superne in phialides transeuntibus composita; phialides hyalinae vel subhyalinae, obclavatae, superne incrassatae et papillatae vel rostro brevi, 16—32 × 3.5—5 μ, plerumque 25.3 × 4.4 μ metiente terminatae; conidia acrogena, catenata, continua, ellipsoidea vel crasse fusoidea, hyalina vel subhyalina, cicatricibus ornata, 5.5—10.5 × 3.5—5 μ, plerumque 7.7 × 4.2 μ metienta; status ascophorus ignotus.

On living shoots of *Bambusa* sp. in association with Sphacelial stage of an unknown fungus (*Claviceps* ?), Balehonnur, 18. 5. 1961, leg. T. R. Nag Raj. Type in Herb. IMI ≠ 89197. Similar collection made on 14. 9. 1960 in Herb. MYSP ≠ 821.

The fungus is usually seen after the appearance of the Sphacelial stage of an unknowm fungus (*Claviceps* ?) on young shoots of bamboo, normally growing on the galls incited by the latter. Such 'galls', bearing *Penicilliopsis bambusae*, when cut open, are found to contain viable spores of *'Claviceps* ? sp.'. No attempt has been made by us to ascertain the nature of the association between the two fungi. The ascigerous stage has not been encountered in spite of intensive search.

5. *Scolecobasidium constrictum* Abbott in Mycologia 19: 29—31, 1927 — Fig. 4.

Isolated in pure culture from contaminant in plate cultures during attempts at culturing aquatic Hyphomycetes, July 1963 at Coffee Research Station, Balehonnur. Culture deposited in Herb. MYSP.

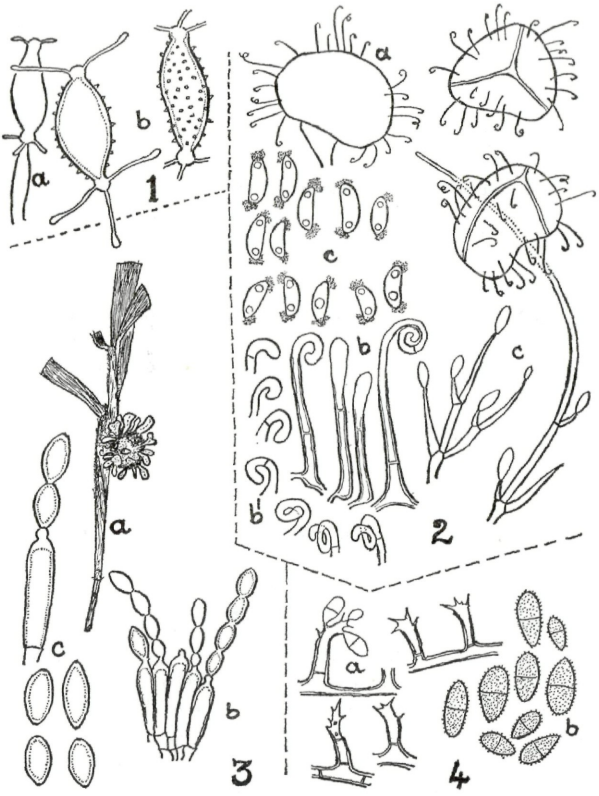
Hyphae brown, slightly thick-walled, septate, 2—2.5 μ wide bearing conidiophores. Conidiophores simple very rarely branched, continuous to few-septate, brown and thick-walled at the basal part, pale brown to subhyaline and thin-walled at the apex, cylindrical to irregular, straight or twisted, 7.5—16.5 × 2—3 μ. Conidia borne singly or in clusters on short connectives on the conidiophores, verrucose, obovate to elliptic, continuous, more often two-celled with occasional constrictions at the septa, light brown, 4.5—10.5 × 2.5—4 μ. Occasional phragmospores are seen in very old cultures. Chlamydiospores are absent.

Dwivedi (Curr. Sci. 28: 374—375, 1959) has described this fungus previously based on an isolate obtained from grassland soils in Varanasi. His isolate is different from ours having shorter (3.6—7.2 × 2—2.7 μ), rounded as well as angular conidiophores and smooth, olivaceous to almost hyaline conidia 5.4—14.4 × 2.7—3.6 μ in size.

6. *S. terreum* Abbott in Mycologia 19: 29—31, 1927. — Fig. 5.

Isolated in pure culture from contaminant in plate cultures during attempts at culturing aquatic Hyphomycetes, July 1963 at Coffee Research Station, Balehonnur. Culture in Herb. MYSP.

This fungus has previously been known from Varanasi in this country (Dwivedi, loc. cit.). The Varanasi isolate had mostly two-celled and occasionally three-celled conidia which measured 4.8—12.6 × 2.4—3.2 μ. Chlamydospores were not reported. Our isolate differs from the above in having both conidia and chlamydospores. The dimensions of the various structures are as follows: Conidiophores: 3.5—9.5 × 2—2.5 μ; Conidia: 7.5—11 μ long, 1.5—2.5 μ wide at the basal end and ut to 7.4 μ wide between the arms at the apex; Chlamydospores: 3.5—7.5 μ in diam. The Chlamydospores are formed abundantly in old cultures, terminally on the conidiophores or on short lateral branches.



Occasional intercalary chlamydospores are also seen. They are globose, subglobose, obovate to oblong elliptic, brown and thick-walled.

7. *S. variabile* Barron & Busch in Canad. J. Bot. 40: 77—84, 1962. — Fig. 6.

Isolated in pure culture from contaminant in plate cultures during attempts at culturing aquatic Hyphomycetes, July 1963 at Coffee Research Station, Balehonnur. Culture in Herb. MYSP.

Hyphae septate, branched olivaceous green, about 1.86 μ wide. Conidiophores are simple or branched, obovate or irregular, twisted or bent, continuous to 1-septate, at first hyaline later olivaceous green,

10—16.5 × 2—3 μ, bearing conidia on short connectives. Conidia acrogenous, solitary or in groups, olivaceous green, 1- to 3-septate, occassionally constricted at the septa, walls verrucose, 10—15 × 3—4 μ in size.

Proliferations may occur originating from the connectives on the conidiophores or from conidia still remaining attached to the conidiophores, resulting in the formation of secondary conidiophores and conidia. No chlamydospores were seen.

This is a new record for India.

8. **Sphaerulina trapae-bispinosae** sp. nov. Nag Raj & Govindu. — Fig. 7.

Foliicolous, inciting necrotic leaf spots. Perithecia epiphyllous, subepidermal, innate - erumpent, subglobose to oval, brown with a dark coloured region at the neck, ostiolate, aparaphysate, 80.5—109 × 76—114.5 μ. Asci hyaline clavate with a short basal stalk, bitunicate, octosporous, 44.5—78 × 13—16.5 μ. Ascospores fusiform-elliptic to naviculate, with slightly rounded ends, 3-septate, slightly constricted at the septa, subhyaline to brown, 22.5—28 × 5.5—7.5 μ, distichous to irregularly arranged in the ascus.

Maculae irregulares, indistincte marginatae, usque ad 15 mm diam., interdum confluentes et tunc plus minusve majores; perithecia epiphylla, numerosa, subepidermalia, innato-erumpentia, subglobosa vel ovoidea, ostiolata, brunnea, in vertice obscure brunnea, 80.5—109 × 76—114.5 μ; asci clavati, breviter stipitati, crasse tunicati, octospori 44.5—78 × 13—16.5 μ; sporae distichae vel irregulariter conglobatae, ovoideo-ellipsoideae, utrinque rotundatae, triseptatae, ad septa leniter constrictae, subhyalinae, postea brunneae, 20.5—28 × 5—7.5 μ.

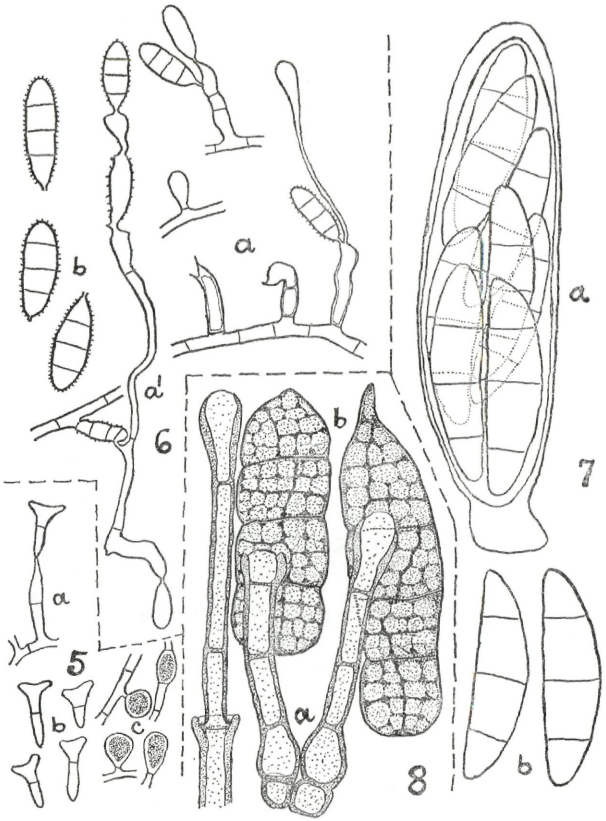
On living leaves of *Trapa bispinosa*, Lalbagh Gardens, Bangalore, 24. 12. 1965, T. R. Nag Raj. Type in Herb. MYSP ≠ 824.

The fungus incites necrotis leafspots which are irregulare in shape with indistinct margins, up to 15 mm. in diam., studded with numerous, minute, black fruiting bodies on the upper surface. Several spots may coalesce to form a large irregular patch. Due to decay of the necrosed tissues, shot-hole symptoms are common. This fungus is described here as a new species, since it differs from other members of the genus so far known to science. There has been no prior record of the fungus on *Trapa*.

9. *Stemphylium floridanum* Hanon & Weber var. **euphorbiae** var. nov. Nag Raj & Govindu. — Fig. 8.

Foliclous, associated with small leaf spots. Hyphae hyaline to subhyaline, septate branched. Fruiting effuse, greyish brown. Conidiophores solitary or in groups of 2—4, erect or slightly curved, cylindrical with nodular swellings at base, frequently along the length and at the apex (about 5.5—9.5 μ in diam.), olivaceous brown, septate, 41—122.5 × 3.5—5.5 μ, with only a single proliferation through the apex in the older conidiophores. Conidia formed singly through a wide pore at the apex

of each conidiophore, pale to olivaceous brown, oblong, cylindrical or subangular, rounded or acutely pointed at the apex, often with a beak, base truncate or rounded with a prominant basal scar, 3—4 major horizontal septa at which the walls are constricted and many secondary septa,



walls verrucose, 41—69 × 14—19 μ in size, usually three times longer than broad. Ascigerous stage not seen.

Maculae minutae; hyphae hyalinae vel subhyalinae, septatae, ramulosae; caespituli effusi, griseo-brunnei; conidiophora solitaria vel 2—4 congesta, erecta vel parum curvula, cylindracea, inferne nodosa, olivaceo-

brunnea, septata 41—122.5 × 3.5—5.5 μ; conidia singulatim evoluta, pallide vel obscure olivacea, oblonga, cylindracea vel subangularia, in apice rotundata vel acuminata, ad basim truncata vel rotundata, transverse 2—4-septata, plus minusve constricta et nonnullis septis secundariis praedita 41—69 × 14—19 μ; status ascigerus ignotus.

On living leaf of *Euphorbia* sp., Hebbal, Bangalore, 2. 5. 1966, T. R. Nag Raj. Type in Herb. MYSP ≠ 823. Culture derived from type also deposited in Herb. MYSP.

The fungus could be readily grown in pure culture on potato-dextrose agar on which it produces a good amount of sporulation. In young cultures a faint yellow pigment diffuses into the medium from the margins of the fungal colony. Gradually the colour of the pigment darkens and in 12—15 days turns red.

In the shape of the conidia, marked constrictions of the conidial wall at all the major transverse septa, verrucose wall of the conidia and growth with pigment production on potato-dextrose agar, the fungus resembles very closely *Stemphylium floridanum* Hanon & Weber (Phytopath. 45: 11—16, 1955), from which it differs in the shorter conidiophores with fewer nodular swellings and bigger conidia. *Deightoniella jabalpurensis* Agarwal & Hasija described on *Euphorbia geniculata* (J. Ind. Bot. Soc. XL: 542—547, 1961) is distinct from our collection. Hence we are disposing this fungus as a new variety of *S. floridanum*.

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Explanation of figures

Fig. 1. *Amphichaetella echinata*. a. Developing conidium; b. Two conidia (setae in one of the conidia are not shown completely) × 1450.
Fig. 2. *Chaetomella terricola* var. *mysorensis*. a. Pycnidia × 130; b. Setae, b¹. Developmental stages of coils on the long setae × 560; c. Conidiophores and conidia × 1450
Fig. 3. *Penicilliopsis bambusae*. a. Habit; b. Arrangement of the conidial apparatus. × 1100; c. Phialide and conidia × 1800.
Fig. 4. *Scolecobasidium constrictum;* Fig. 5: *S. terreum;* Fig. 6. *S. variabile*. a. Conidiophore; a¹. Proliferating conidiophore; b. Conidia; c. Chlamydospores. All × 1500
Fig. 7. *Sphaerulina trapae-bispinosae*. a. Ascus; b. Ascospores. both × 2100.
Fig. 8. *Stemphylium floridanum* var. *euphorbiae*. a. Conidiophores; b. Conidia. both × 1500