

# REDESCRIPTION OF AJREKARELLA KAMAT & KALANI<sup>1)</sup>

by

B. C. SUTTON

*Department of Forestry, Manitoba-Saskatchewan Region, Winnipeg  
Manitoba, Canada*

(with 1 fig.)

(6.VI.1966)

A trend in the taxonomy of the fungi imperfecti, which has gained increasing support in recent years is the emphasis placed on developmental characters of the conidiophores and conidia. This approach was first initiated for the Hyphomycetes by HUGHES (1953) and later adapted to the Coelomycetes by SUTTON (1961, 1963, 1964). Although characters of the fructifications are regarded of secondary value in defining generic and sometimes specific limits, in modern treatments they cannot be completely discarded. In many cases peculiarities in the type or ontogeny of pycnidia and acervuli are of particular value in sorting out taxonomic relationships. The correlation of precise information concerning the development of fructifications, conidia and conidiophores is essential if these fungi are to be identified and adequately classified in genera and supragenera later.

A current taxonomic study of *Dinemasporium* LÉV. and related genera has included an investigation of *Ajrekarella* KAMAT & KALANI (1964), type species *A. polychaetriae* described from twigs of *Jasminum calophyllum*. It is considered that a redescription is necessary to clarify its relationships.

Two specimens were examined and considered to be conspecific.

- 1) On dead twigs of *Jasminum calophyllum*, Poona, India. Coll. I. KALANI, Feb. 1961. MACS 200 (IMI 101970). Type of *Ajrekarella polychaetriae* KAMAT & KALANI.
- 2) On dead twigs of *Wigandia urens*, N. Rhodesia, Coll. A. ANGUS, 11 April, 1962. (IMI 93916e).

Fructifications (Fig. 1C).

---

<sup>1)</sup> Part of a thesis presented to the University of London, England, in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

KAMAT & KALANI reported the subepidermal fructifications to be glabrous stromata with one or more pycnidial cavities which dehisced by a common irregular slit; stromata were well-developed and made up of 3 to 4 tiers of cells. In this present study the fructifications were found to be initially immersed, later becoming erumpent and finally appearing superficial as the outer layers of bark

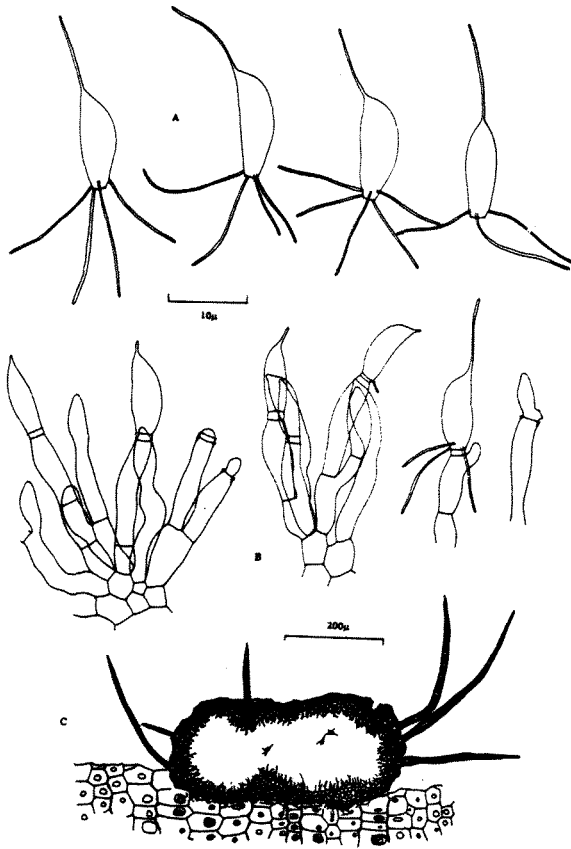


Fig. 1. *Ajrekarella polychaetriae*. A, conidia; B, conidiophores; C, vertical section of fructification at right angle to line of dehiscence.

become sloughed-off. They are mostly navicular and elongated, but rarely discoid, a feature which led KAMAT & KALANI to place the genus in the Discellaceae (as "Discillaceae"). They measure 650—950  $\mu$  long  $\times$  500  $\mu$  wide. The wall is pseudoparenchymatic and composed of several layers of cells, which become less sclerotoid towards the inner, hyaline, thin-walled tissue which bears conidiophores. In neither collection is evidence of a multilocular condition,

although the inner wall of the fructification is irregular in form. The hysterioid line of dehiscence is only evident late in development.

The type collection is sparsely setose, but when present, setae are restricted to the lower part of the fructification as in *Dinemasporium cytosporoides* (SACC.) SUTTON (1965). The collection on *Wigandia urens*, however, shows abundant setae from the basal, lateral and upper parts of the fructifications. These are filiform, curved in towards the central line of dehiscence, 3—7 septate, thick-walled, dark brown, smooth-walled, irregularly tapered towards acute apices, 175—385 × 4—7  $\mu$ .

*Conidiophores and conidia* (Fig. 1B and A)

The information given by KAMAT & KALANI about the conidiophores is meagre. They were described as simple, hyaline, slender, non-septate and arising over the entire inner surface of the locule. No details were given of the way in which spores were produced, but from their illustrations it is deduced that development is simply blastic and that a single conidium is produced by each conidiophore.

It was possible to confirm that the conidiophores are produced all over the inner surface of the fructification, even from the upper part of the cavity prior to dehiscence. They are filiform, hyaline, septate, smooth-walled, frequently branched immediately below the septa and measure 12—19.5 × 2—3  $\mu$ . The way in which conidia are produced is particularly interesting, because of the similarities with *Seimatosporium kriegeianum* (BRES.) MORGAN-JONES & SUTTON apud SUTTON (1964). The first formed conidium is produced as a simple blown-out apex of the conidiophore. At maturity it is demarcated from the conidiophore by two thin closely adjacent transverse septa. There is some slight elongation of the peripheral wall between the septa to produce a separating cell. The conidium finally becomes detached by the rupture of the interseptal separating cell. The conidiophore elongates from the thin meristematic tip and another apical spore is formed in the same blastic manner but at a higher level. Occasionally, instead of forming successive conidia, lateral growth occurs immediately below the apical region. In a similar way lateral growth may occur from the percurrent conidiophore after the first spore has become detached. Such restricted sympodial growth, in combination with the annellophore, is also typical of *S. kriegeianum*.

In the paper by KAMAT & KALANI the orientation of the conidia on the conidiophores is not described. The only conidium shown attached to a conidiophore is depicted with a single basal appendage and three apical appendages and the truncate end of the conidium is shown to be apical. A careful study of the conidia developing from conidiophores shows that there is normally a single apical appendage, more rarely two, and two to six basal appendages. The apical end of the spore merging into the appendage is almost acute

but the base is distinctly truncate with the remains of the separating cell persisting as a marginal frill. The way in which KAMAT & KALANI inverted the conidia in *Ajrekarella* is quite comparable with the example noted by SUTTON (1963) for *Neobarclaya primaria* (ELL. & EV.) O. KUNTZE and *N. congesta* (BERK. & BR.) PETCH (*Mycophyallage congesta* (BERK. & BR.) SUTTON). The conidia may therefore be described as hyaline, unicellular, smooth-walled, broadly navicular,  $12-14.5 \times 4-5 \mu$ , with a single, unicellular, unbranched, hyaline apical appendage (rarely 2), and 2-6 basal unbranched, cellular, hyaline, exogenous appendages.

As a result of the preceding observations the following revised description of *Ajrekarella* is proposed:

*Ajrekarella* KAMAT & KALANI (1964) emend. SUTTON  
Fungi Imperfecti, Sphaeropsidales.

Fructifications immersed, erumpent, hysteroïd with a longitudinal line of dehiscence, unilocular, setose, wall several cells thick. Conidiophores formed from the inner cells of the pycnidial wall, filiform, hyaline, septate, branched, forming successive conidia from sympodulae and annellophores. Conidia navicular, hyaline, aseptate, with 1 (rarely 2) cellular apical appendages and 2-6 cellular exogenous basal appendages, apex acute, base truncate with a marginal frill.

Type species *A. polychaetriae* KAMAT & KALANI

#### *Generic Relationships*

A few genera of the Sphaeropsidales have thick-walled sclerotoid pycnidia with a hysteroïd line of dehiscence, and these have been placed in the Leptostromataceae and Discellaceae depending on the presence or absence of a radiate scutellum. In these particular families the genera remotely related to *Ajrekarella* have little in common with one another, when all diagnostic characters are taken into account. In *Chaetomella* FCKL, STOLK (1963) showed that the setose globose thin-walled pycnidia have a longitudinal raphe or line of dehiscence, but here the small glabrous conidia are produced from minute apical phialides on filiform verticillate conidiophores. *Tetranacrium* HUDSON & SUTTON (1964) is characterized by elongate navicular fructifications dehiscing longitudinally as in *Ajrekarella*, but setae are absent and the conidia are tetra-radiate.

Genera related to *Ajrekarella* combining similar types of conidium morphology and fructifications with setae include *Stauronema* (SACC.) SYD. & BUTL., *Polynema* LÉV. and *Neobarclaya* SACC. In all three genera, however, the conidia are phialidic in origin rather than blastic, and the fructifications are excipuliform with a fully exposed conidiophore bearing region, evident from the earliest stages of development. Fructifications in *Ajrekarella* are navicular and hysteroïd. In *Stauronema* the disposition of the conidial

appendages is different from that in *Ajrekarella*, *Polynema* and *Neobarclaya*. There is a singly apical and a single basal appendage with several lateral appendages distributed over the spore, whereas in the other genera there is normally a single apical appendage and two or more lateral appendages produced at the base of the spore. In both *Polynema* and *Neobarclaya* the conidia eventually become septate, pale brown and rough-walled. The relationships between *Polynema* and *Neobarclaya* will be the subject of a subsequent paper.

### References

- HUDSON, H. J. & SUTTON, B. C. (1964). *Trisulcosporium* and *Tetranacrium*, two new genera of fungi imperfecti. *Trans. Brit. mycol. Soc.* **47**: 197—203.
- HUGHES, S. J. (1953). Conidiophores, conidia and classification. *Canad. J. Bot.* **31**: 577—659.
- KAMAT, M. N. & KALANI, I. K. (1964). *Ajrekarella*, a new member of the Sphaeropsidales. *Mycopath. Mycol. Appl.* **24**: 297—301.
- STOLK, A. (1963). The genus *Chaetomella* FÜCKEL. *Trans. Brit. mycol. Soc.* **46**: 409—425.
- SUTTON, B. C. (1961). Coelomycetes. I. *Mycol. Pap.* **80**: 1—16.
- SUTTON, B. C. (1963). Coelomycetes. II. *Neobarclaya*, *Mycohypallage*, *Bleptosporium*, and *Cryptostictis*. *Mycol. Pap.* **88**: 1—50.
- SUTTON, B. C. (1964). Coelomycetes III. *Annellolacinia* gen. nov., *Aristastoma*, *Phaeocytostroma*, *Seimatosporium*, etc. *Mycol. Pap.* **97**: 1—42.
- SUTTON, B. C. (1965). Typification of *Dendrophoma* and a reassessment of *D. obscurans*. *Trans. Brit. mycol. Soc.* **48**: 611—616.