

## On *Mauginiella scaettae*

J. A. von ARX

Centraalbureau voor Schimmelcultures, Baarn, Holland

J. P. van der WALT & N. V. D. W. LIEBENBERG

Microbiology Research Group, Council for Scientific and Industrial Research, Pretoria

**Abstract.** — TEM micrographs show that *Mauginiella scaettae* CAV. has cell walls and septa characteristic of Ascomycetes. The fungus may be related to *Monilia*. Some other genera with arthroconidia, earlier placed in synonymy with *Mauginiella*, are discussed.

### Introduction

*Mauginiella scaettae* CAV. causes a severe date palm disease in North Africa and the Middle East (RATTAN & AL-DBOON, 1980), rotting the spadix and inflorescence. The fungus was first described by CAVARA (1925) from Cyrenaica (Libya). The name has been chosen in honour of Dr. A. MAUGINI and Dr. H. SCAETTA, at that time working at the "Istituto Agricola Coloniale Italiano". MAIRE & WERNER (1937) rediscovered the species in Morocco and renamed it *Geotrichum*

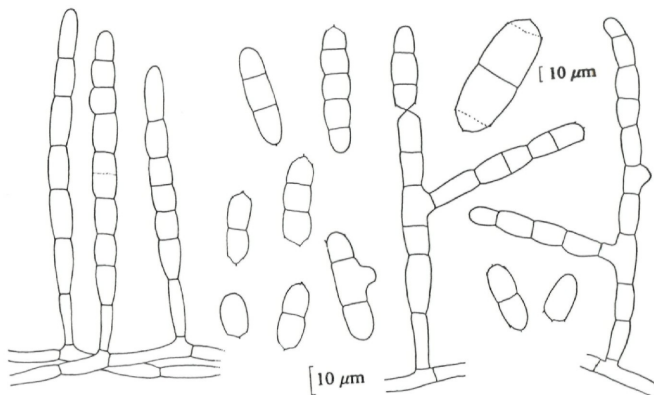


Fig. 1. *Mauginiella scaettae*: camera lucida drawings of conidiogenous structures

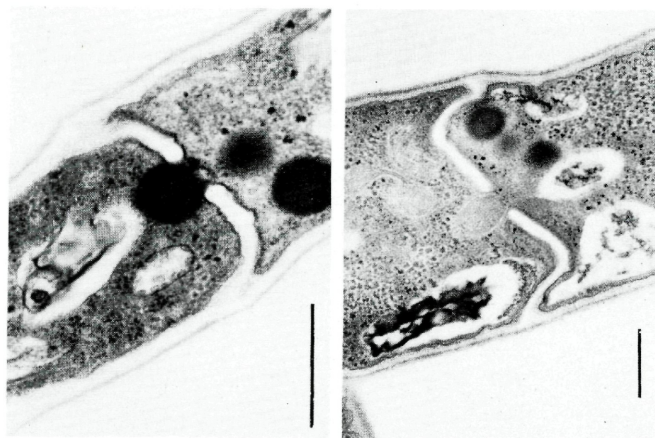


Fig. 2. (CBS 239.58) & 3. (CBS 932.73) *Mauginiella scaettae*: TEM micrographs of septate hyphae from cultures grown on YM agar for 4 days at 28° C, fixed in 5% glutaraldehyde, post fixed with 1% osmium tetroxide and stained with uranyl acetate and Reynolds lead citrate. Note the ascomycetous type of cell-wall consisting of a rather thin dark outer layer and a broader lighter inner layer. The bar represents 0.5 micron



*scaettiae* (CAVARA) MAIRE. CIFERRI (1958) incorrectly considered it to be identical with *Sporendonema epizoum* (CORDA) CIFERRI & REDAELLI (= *Wallemia sebi* (FR.) v. ARX).

Full descriptions of the fungus and the disease have been given by GOIDÁNICH (1937), AL-ANI et al. (1971), NICOT (1972) and SIGLER & CARMICHAEL (1976). CARMICHAEL et al. (1980) suggested that the genus is comparable to *Moniliophthora* EVANS et al. (1978). However, the affinity of *Mauginiella* to either the Ascomycetes, Basidiomycetes or Endomycetes (Dipodasaceae) has remained doubtful.

### Description

The CBS fungus collection has three strains of *Mauginiella scaettiae*, all isolated from *Phoenix dactylifera*. CBS 158.26 was received from J. CHRESTIAN, CBS 239.58 from J. SCHREURS. The following description is based on the most recent culture, CBS 932.73, isolated by R. KENNETH (Israel) from a spadix of the date palm in 1973:

Colonies on malt agar at 25° C with a daily growth rate of 1.8–2.3 mm, white, lanose due to aerial hyphae and conidiogenous cells; aerial hyphae 3–4 µm broad, regularly septate; immersed hyphae repeatedly branched, 1.5–2.5 µm broad; conidiogenous hyphae develop as lateral branches of aerial hyphae, occasionally (mainly in fresh isolates) in sporodochial tufts, are more or less erect, simple or with some branches, variable in length, 5–9 µm broad, become many-septate and disarticulate into arthroconidia; arthroconidia 1-, 2- or up to 6-celled, cylindrical or ellipsoidal, hyaline, 9–40 × 5–9 µm; with slightly conical or rounded ends, marginal rings of dehiscence and apical disjunctive tips; single cells 7–12 µm long, often swollen (Fig. 1).

TEM micrographs were made from ultrathin sections of aerial hyphae of CBS 239.58 and CBS 932.73. They show a rather thick cell wall with a thin, electron-opaque outer layer and a broader, translucent inner layer. The cross wall has a rather wide central pore which may be occluded with or surrounded by dark globules (WORONIN bodies, Fig. 2).

None of the strains of *Mauginiella scaettiae* is coloured with Diazonium Blue B salt in petri dish cultures on malt extract agar (van der WALT & HOPSU-HAVU, 1976).

### Conclusions

The ultrastructure of the cell wall and hyphal septa and the Diazonium Blue B test show that *Mauginiella scaettiae* represents an anamorph of an unknown ascomycete. The genus *Geotrichum* LINK is unrelated, has septa with numerous micropores (plasmodesmata) (e. g. COLE, 1975; COLE & SAMSON, 1979), represents anamorphs of

*Dipodascus* LAGERH. and should be classified in the Endomycetes (VON ARX, 1981).

*Moniliophthora roreri* (CIFERRI) EVANS et al. (= *Monilia roreri* CIFERRI) is also unrelated having septa with dolipores which indicate a basidiomycetous affinity (EVANS et al., 1978). This fungus is the causal agent of (frosty) pod rot of cocoa in South America, and in culture the colonies are much more restricted than those of *Mauginiella scaettae*.

*Wallemia sebi* also has septa with dolipores (TERRACINA, 1974; COLE & SAMSON, 1979), is highly osmophilic and forms red-brown restricted colonies on sugar-rich media. The genera *Trichosporonoides* HASKINS & SPENCER and *Moniliella* STOLK & DAKIN also form arthroconidia, have septa with dolipores (HASKINS, 1975; MARTÍNEZ, 1979) and are considered to be of basidiomycetous affinity. The two genera are close to each other and the ability to ferment sugars and to assimilate fatty compounds and other hydrocarbons distinguish them from other Basidiomycetes. These characters are also combined in a few Endomycetes (yeasts), e. g. *Yarrowia lipolytica* (WICKERHAM et al.) van der WALT & v. ARX, the teleomorph of *Candida lipolytica* (HARRISON) DIDDENS & LODDER. The characteristic species of the genus *Trichosporon* are morphologically similar to *Moniliella*, but show no fermentation and are not lipolytic.

The genus *Mauginiella* probably is close to *Monilia* PERS. The conidiogenesis is rather similar and the typical species of the latter genus also causes inflorescence decay (blossom blight). The genus *Monilia* differs from *Mauginiella* by having regularly constricted conidiogenous hyphae, 1-celled, usually barrel-shaped conidia with more distinct disjunctive structures and by the formation of dark stromata or pseudosclerotia, which may give rise to the *Monilinia* teleomorph following a resting period.

## References

- AL-ANI, H. Y. et al. (1971). Reaction of date palm cultivars to inflorescence rot and persistency and spreading of the disease. — *Phytopath. Medit.* **10**: 57—62 (and 82—85).
- ARX, J. A. von (1981). The genera of fungi sporulating in pure culture. — 3rd edition, J. Cramer, Braunschweig, 424 pp.
- CARMICHAEL, J. W., KENDRICK, W. B., CONNERS, I. L. & SIGLER, L. (1980). Genera of Hyphomycetes. — Univ. Alberta Press, Edmonton, 386 pp.
- CAVARA, F., 1924 (1925). Atrofia florale in *Phoenix dactylifera* di Cirenaica. — *Rend. R. Accad. Naz. Lincei*, ser. 6, 65—67.
- CIFERRI, R. (1958). *Mauginiella*, a synonym of *Sporendonema*. — *Atti Ist. Bot. Lab. Critt. Univ. Pavia*, ser. 5, **15**: 125—133.
- COLE, G. T. (1975). The thallic mode of conidiogenesis in the Fungi Imperfecti. — *Can. J. Bot.* **53**: 2982—3001.
- & SAMSON, R. A. (1979). Patterns of development in conidial fungi. — Pitman, London, 190 pp.

- EVANS, H. C., STALPERS, J. A., SAMSON, R. A. & BENNY, G. L. (1978). On the taxonomy of *Moniliella roreri*, a pathogen of *Theobroma cacao*. — *Can. J. Bot.* **56**: 2528—2532.
- GOIDÁNICH, G. (1937). Il marciume dell'infiorescenza della palma da dattero causata da *Mauginiella scaetiae*. — *Agric. Coloniale* **31**, 10: 3—9.
- HASKINS, R. H. (1975). Septal ultrastructure and hyphal branching in *Trichosporonoides oedocephalis*. — *Can. J. Bot.* **53**: 1139—1148.
- MAIRE, R. & WERNER, R. G. (1937). Fungi Maroccani. — *Mém. Sc. Nat. Maroc* **45**: 1—147.
- MARTÍNEZ, A. T. (1979). Ultrastructure of *Moniliella*, *Trichosporonoides* and *Hyalodendron*. — *Stud. Mycol. Baarn* **19**: 50—57.
- NICOT, J. (1972). *Mauginiella scaetiae*. — *Fiches Phytopath. Trop.* no. 24, 6 pp. (Suppl. *Rev. Mycol.* 37).
- RATTAN, S. S. & AL-DBOON, A. H. A. (1980). Notes on fungi associated with Date-Palm. I. — *Sydowia* **32**: 246—273.
- SIGLER, L. & CARMICHAEL, J. W. (1976). Taxonomy of *Malbranchea* and some other Hyphomycetes with arthroconidia. — *Mycotaxon* **4**: 349—488.
- TERRACINA, F. C. (1974). Fine structure of the septum in *Wallemia sebi*. — *Can. J. Bot.* **52**: 2587—2590.
- WALT, J. W. van der & HOPU-HAVU, V. K. (1976). A color reaction for the differentiation of ascomycetous and hemibasidiomycetous yeasts. — *Antonie van Leeuwenhoek* **42**: 157—163.

# ZOBODAT - [www.zobodat.at](http://www.zobodat.at)

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Sydowia](#)

Jahr/Year: 1981

Band/Volume: [34](#)

Autor(en)/Author(s): Arx Josef Adolf, von, Liebenberg N. V. D. W., Walt van der, J.P.

Artikel/Article: [On Mauginiella scaettae. 42-45](#)