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Hyphomycetes of Iraq — The Genus *Stachybotrys*

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Summary. — Four species of *Stachybotrys* have been described and illustrated from material collected in Iraq. Out of these two are new records for the area while *S. guttulispora* is described as new.

Introduction

Stachybotrys belongs to the Dematiaceae with about 15 good species. It is mostly saprophytic and grows on dead plant debris in soil (Subramanian, 1957; Ellis, 1971, 1976; Matsushima, 1975). Traditionally, *Stachybotrys* included only dark-spored forms but some species in which dematiaceous character was lacking, were also included because of other morphological similarities. Srinivasan (1958) proposed *Hyalostachybotrys* for all forms with hyaline or colourless conidial forms. Barron (1964) and Rifai (1964), however recommended the merger of these two genera on the basis of morphological and developmental considerations. They pointed out that the colour of conidia or conidiophores is not an important feature at generic level.

This paper records the description of four species collected from Southern Iraq. The methods of study followed are the same as discussed by El-Dohlob & Al-Helfi (1979). The material of all isolates has been deposited at the Herbarium, College of Education, University of Basrah while duplicates have been sent to IMI (Kew, England).

Stachybotrys Corda 1837

Icon. Fung. 1: 21

Colonies effuse, usually pale brown or dark brown or rarely colourless. Mycelium superficial, sometimes immersed. Stroma and setae absent. Conidiophores mononematous or macronematous, mostly unbranched, straight or rarely flexuous, hyaline to brown or olivaceous, smooth or verrucose, sometimes covered in part by dark granules, with clusters of phialides (3—8) at their apices. Phialides monophialidic, discrete, clavate, ellipsoid, cylindrical or subfusiform, straight or slightly curved in some species, hyaline to greenish-brown, light brown or dark brown. Conidia occurring in slimy heads, usually

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pale brown, blackish brown, olivaceous or hyaline, smooth to verrucose, ellipsoid or cylindrical with rounded ends, non-septate.

Type species: *Stachybotrys atra* CORDA 1837 (l. c.).

The chief generic features are erect conidiophores with apical slimy clusters of 3—8 swollen phialides bearing coloured or hyaline conidia.

Key to the species recorded from Iraq

1. Conidia verrucose, 8—12×5—8 μm, brown, ellipsoid; conidiophores rough especially towards the apices..... 1. *St. atra*
1*. Conidia smooth; conidiophores smooth or rough..... 2
2. Conidiophores up to 200 μm long (60—200×4.5—7 μm), smooth; conidia 7—10×3.5—6 μm ..... 2. *Stachybotrys* State of *M. pomiformis*
2*. Conidiophores less than 100 μm long, rough all over or partly but never smooth 3
3. Conidia 9—12×3.5—5 μm, biguttulate with two distinct polar oil globules; conidiophores rough all over; phialides subsfusiform or cylindrical ..... 3. *St. guttulispora*
3*. Conidia 7.5—12×4—7 μm, aguttulate; conidiophores rough partly; phialides clavate or subclavate..... 4. *Stachybotrys* sp.

1. *Stachybotrys atra* CORDA, Icon. Fung. 1: 21. 1837 — Figs. 1—2
= *S. chartarum* (EHRENB. ex LINK) HUGHES, Can. J. Bot. 36: 812. 1958.

Colonies effuse, dark brown, mycelium superficial. Conidiophores 35—100×2.5—4.5 μm, straight or rarely flexuous, occasionally branched, 1—2 septate, walls rough especially in the upper part, pale brown turning dark brown at maturity especially in the upper part. Phialides occurring in clusters of 3—5, clavate or subclavate, 7—13×5—6 μm, smooth, pale brown or dark brown with age. Conidia 8—12×5—8 μm, ellipsoid to oval, yellow-brown when young but turn dark brown at maturity, verrucose.

Isolates examined: In soil, Al-SHAFI (Basrah), April 1978, Al-HELFI, 210; in soil, Al-KEBAIESH (Basrah), April 1978, Al-HELFI, 211; in soil, ABUL-KHASIB (Basrah), Oct. 1979, MUHSIN & Al-HELFI 213, 214.

This species is distinguished by the verrucose conidia and rough-walled (especially in the upper half) conidiophores.

2. *Stachybotrys* state of *Melanopsamma pomiformis* (PERS. ex FR.) SACC., Michelia 1: 347. 1878 — Figs. 3, 4
= *Chaetosphaeria pomiformis* (PERS. ex FR.) E. MÜLLER ap. MÜLLER & v. ARX 1962, Beitr. Kryptog. Flora Schweiz 11 (2): 588.

Colonies effuse, pale brown, mycelium superficial. Conidiophores 60—200×4.5—7 μm, straight, unbranched, with more than

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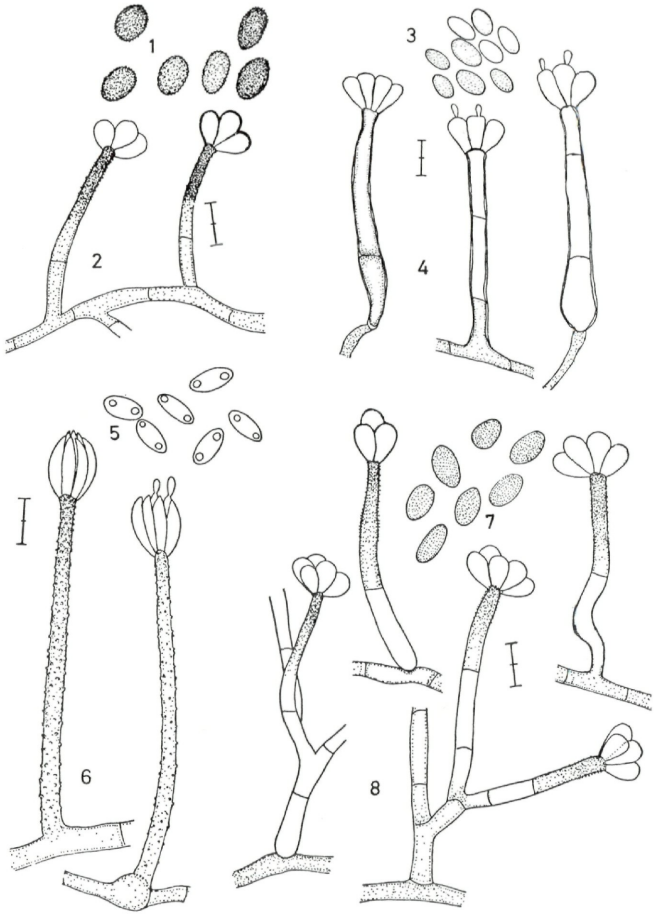

Figs. 1—8. *Stachybotrys atra* (1—2): 1. verrucose conidia. — 2. rough-walled conidiophores. — *Stachybotrys* state of *Melanopsamma pomiformis* (3—4): 3. smooth walled conidia. — 4. smooth and thick-walled conidiophores. — *Stachybotrys guttulispora* (5—6): 5. smooth-walled conidia with two distinct polar oil globules. — 6. rough-walled conidiophores. — *Strachybotrys* sp. (7—8): 7. smooth-walled conidia. — 8. conidiophores showing septa, branching and roughness near the apices. — Scale of magnification: bar = 10 μm

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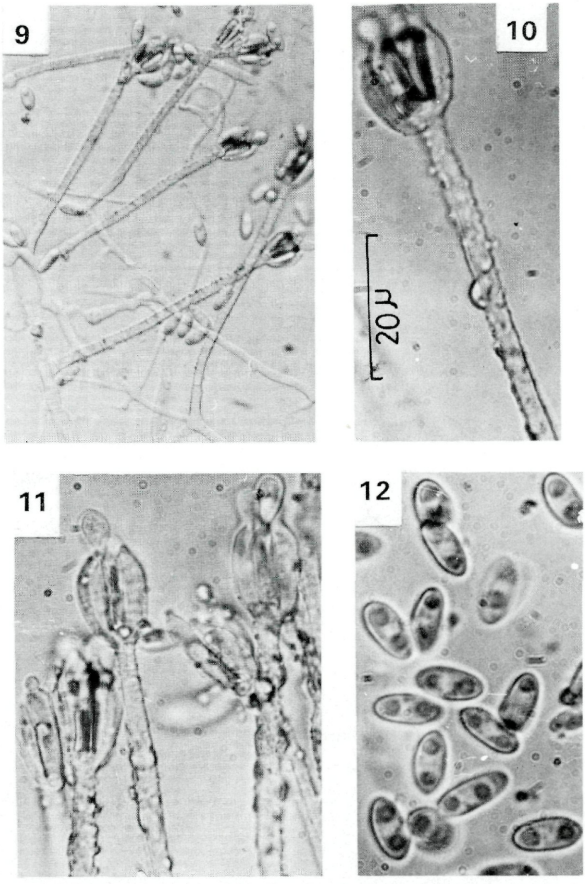

Figs. 9—12. *Stachybotrys guttulispora*: 9. showing erect, rough-walled conidiophores with apical cluster of phialides and conidia. — 10, 11; rough-walled conidiophores with phialides. — 12. biguttulate conidia. — Scale of magnification: bar = 20 µm

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one septum, walls irregularly thickened (1—2 μm), pale brown, smooth, apices capitate or rarely flattened terminally, sometimes bulbous at the base (up to 10 μm across). Phialides occurring in groups of 3—6, clavate to cylindrical, 9—13×3—6 μm, subhyaline, smooth. Conidia 7—10×3.5—6 μm, ellipsoid, greenish brown becoming brown to dark brown with age, smooth.

Isolates examined: In soil, ABUL-KHASIB (Basrah), Oct. 1979, MUHSIN and Al-HELFI, 215; in soil, Al-SHAFI (Basrah), Oct. 1979, MUHSIN and Al-HELFI, 216.

The chief features of this species are smooth, thick-walled, long conidiophores and ellipsoid, smooth conidia. *S. bambusicola* RIFAI seems similar but possesses pink and suboval conidia.

3. *Stachybotrys guttulispora* MUHSIN & Al-HELFI, sp. nov. — Figs. 5, 6

Conidiophora usque ad 60—90 μm longa, 3—5 μm crassa, erecta, non-ramosa, verrucosa, aseptata vel 1-septata. Conidia 9—12×3.5—5 μm, ellipsoidea, laevia, olivacea, biguttulata. Habitat in foliis emortuis deiectis, Shatt Al-Arab (Basrah), Iraq, Dec. 10, 1979, T. M. MUHSIN 300 (IMI), typus.

Colonies effuse, hyaline, mycelium superficial. Conidiophores 60—90×3—5 μm, straight, unbranched, aseptate or rarely with a septum near the base, arising from swollen cells or slightly bulbous at the base but gradually tapering towards the apices, the walls thin, pale olivaceous, verrucose or rough over whole surface. Phialides occurring in groups of 5—8, subfusiform to cylindrical, 10—15×3—4.5 μm, sub-hyaline, smooth, often curved and aggregated forming a compact head or rarely straight and discrete. Conidia 9—12×3.5—5 μm, ellipsoid, olivaceous or greenish-brown, smooth, biguttulate with two distinct (polar) oil globules.

Isolates examined: Isolated from water (apparently growing on dead, decaying leaves), Shatt Al-Arab (Basrah), Dec. 10, 1979, MUHSIN 300 (IMI) type; isolated from water, Shatt Al-Arab (Basrah), Feb. 2, 1980, MUHSIN 301; March 9, 1980, MUHSIN 305, 306; March 18, 1980, MUHSIN 307, 308.

This species is distinctive because of its biguttulate, ellipsoid, smooth and olivaceous conidia. The surface of the conidiophores is verrucose all over and the phialides are subfusiform and curved. This species comes close to *Stachybotrys* state of *Melanopsamma pomiformis* but differences have already been pointed out in the key to the species.

4. *Stachybotrys* sp.

Colonies effuse, pale brown, mycelium immersed. Conidiophores 30—75×3.5—5 μm, straight or slightly flexuous, unbranched or occasionally branched once or twice, 1—2 septate, not or sometimes bulbous at the base, walls thin, roughened or verrucose in the upper

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half, subhyaline in the basal part but light brown to olivaceous in the upper part. Phialides occurring in groups of 3—5, clavate to subclavate, 9—12 × 4—6.8 μm, smooth, pale brown to olivaceous. Conidia 7.5—12 × 4—7 μ ellipsoid to ovoid, dark green or brown when mature, smooth.

Isolates examined: Isolated from water, Shatt Al-Arab (Basrah), Feb. 2, 1980, MUHSIN 302; March 9, 1980, MUHSIN 303, 304; March 30, 1980, MUHSIN 310, 311, 312.

The main features of this species are smooth, ellipsoid, dark green to brown conidia. The conidiophores are verrucose and pigmented in the apical part but smooth and subhyaline in the basal part. It comes very close to *S. atra* but it differs in having smooth conidia. If conidial markings are not to be emphasised at specific level then this taxon can be filed as "smooth-spored" form of *S. atra*. It has not been possible to name this species from available literature. Under the circumstances we prefer not to give any name to this taxon till the specific limits of *S. atra* — a variable species — are studied in detail.

Thanks are due to the authorities of Basrah University (College of Education) for supporting this investigation and to Dr. S. S. RATTAN (Al-Faateh University, Tripoli, Libya) for valuable suggestions.

References

BARRON, G. L. (1964). A note on the relationship between *Stachybotrys* and *Hyalostachybotrys*. — Mycologia 56: 313—316.

El-DOHLOB, S. M. & Al-HELFI, M. A. (1979). Soil fungi of Southern Iraq. — Bull. Nat. Hist. Mus. Basrah Univ. Iraq. (in press).

ELLIS, M. B. (1971). Dematiaceous Hyphomycetes. — Commonwealth Agri. Bureaux. 608 pp.

— (1976). More Dematiaceous Hyphomycetes. — Commonwealth Agri. Bureaux. 507 pp.

MATSUSHIMA, T. (1975). Icones Microfungorum a Matsushima Lectorum. — The Nippon Printing & Publishing Co. Ltd. Fukushima-Ku, Cska, Japan. 209 pp.

RIFAI, M. A. (1964). *Strachybotrys bambusicola* sp. nov. — Trans. Brit. Mycol. Soc. 47: 269—272.

SRINIVASAN, K. V. (1958). Fungi of rhizosphere of sugarcane and allied plants. I. *Hyalostachybotrys* gen. nov. — Journ. Ind. Bot. Soc. 37: 334—342.

SUBRAMANIAN, C. V. (1957). Hyphomycetes. — IV. Proc. Ind. Acad. Sci. 46: 324—335.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: Sydowia

Jahr/Year: 1981

Band/Volume: 34

Autor(en)/Author(s): Muhsin Tawfik M., Al-Helfi M. A.

Artikel/Article: Hyphomycetes of Iraq -The Genus Stachybotrys. 130-134