

## Check-list of novel fungi from the Middle East described mainly from soil since 1930

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A critical check-list of fungi described as new from living material originating from the Middle East states is presented. The year 1930 was selected as a starting point for *in-vitro* mycological studies conducted in this region on mostly soil-borne fungi, followed by Sabet's publication on such mycobiota in Egypt. Except for Basidiomycetous forms, almost sixty taxa can be regarded as still valid. These are in equal proportion either Ascomycetes or Hyphomycetes. The former include a majority of cleistothecial fungi, most of them thermophilic or thermotolerant. Numerically, the genus *Thielavia* ranks first. Among described Hyphomycetes, dematiaceous forms outnumber mucedinaceous ones. *Aspergillus*, however, is the best represented genus and would be even dominant if its teleomorphic *Emericella* and *Eurotium* are also considered. Based on type material, *Cryptomella acutispora* was reidentified as *Myrothecium verrucaria*. The final check-list comprises type species of five genera still monospecific.

Keywords: soil-borne fungi, Ascomycetes, Basidiomycetes, Deuteromycetes.

The Middle East is part of the great North African Arabian desert belt that extends eastward from the Atlantic Moroccan coast to the Indian subcontinent. Apart from Turkey & Libya, it comprises 13 political states with a total surface area of around five million km<sup>2</sup>. Serious interest in the study of soil-borne fungi in this area has only recently developed and much progress has been achieved. The best example is provided by the recent publication by Moubasher (1993). This document provides a taxonomic and ecological account for over 200 common or less common taxa encountered in studies largely made by the author and his colleagues. From the over 25 pages long bibliography it is evident that not all Middle East states have been equally investigated. More information is available about fungi inhabiting Egyptian soils than elsewhere in this region.

Research on fungal soil communities conducted in the Middle East has resulted in the description of taxa that proved to be new to science. The nomenclature of some, however, has undergone changes as more generic revisions were undertaken. Thus, the pioneer work on Egyptian soil fungi done by Sabet in 1935 led to the description of

three new taxa by van Beyma (1933a, 1933b); two were later transferred to other genera and informations on the third proved to be very scarce. Sabet's publication, however, is now considered the starting point of work done in this field on the regional level.

An annotated list of fungi for each state of the Middle East is not yet available. Partial lists dealing with more specialized forms of micro-organisms have been prepared in the past. These essentially concern plant pathogenic fungi (Johnston & Booth, 1983). Such publications, however, now require a thorough revision and update. Apart from the former, few efforts have been made to produce exhaustive local flora of known unspecialized fungi. Moustafa (1975, 1978) attempted to collate information on fungi of Kuwait. The recent contribution on soil fungi made by Moubasher (1993) represents the first step to summarise information at the regional level.

The present publication aims to provide a critical check-list of novel taxa, the descriptions of which are based on selected living material originating from states of the Middle East. These isolates were mainly obtained in the course of mycological studies of soil samples. Selected representative strains for proposed taxa have currently been deposited in one of the leading culture collections, such as CBS, IMI or LPC. The list includes material accumulated by the author since he became interested in the soil mycobiota of this large arid region, it is by no means exhaustive and as with such type of work omissions must be expected.

### List of described taxa

#### Zygomycetes

***Absidia aegyptiaca*** Sartory, Meyer & Tawfik as «*egyptiacum*», Comptes rendus hebdomad. Séances Acad. Sciences, Paris 208: 1842. 1939, nom. inval.

No living or other type of authentic material is apparently preserved. Further, the name was not validly published as no latin diagnosis was provided (Art. 36, I.C.B.N.).

#### Ascomycetes

***Ascobolus egyptiacus*** Mouchacca, In "Travaux dédiés à G. Viennot-Bourgin", Soc. Franç. Phytopathol., Paris: 266. 1977.

The original selected living strains were isolated from desert soil, Kharga Oasis, Western Desert, Egypt.

***Chaetomidium khodense*** Cano, Guarro & ElShafie, Mycotaxon 49: 399. 1993.

The description is based on material developing in moist chamber on cow dung collected in the small town of Al-Khod, Sultanate of Oman.

***Chaetomiopsis dinae*** Moustafa & A. Wahid, Mycologia 82: 129. 1990.

Type species of the recently described genus *Chaetomiopsis* Moustafa & A. Wahid (1990). Reported original locality is agricultural soil close to Ismailia City, lower Egypt.

***Chaetomium mareoticum*** Besada & Yusef, Trans. Br. Mycol. Soc. 52: 502. 1969.

As the specific epithet implies, representative strain originates from soil collected at the locality of Ikingi Mariut, just west of Alexandria City, lower Egypt. The authentic selected isolate (IMI 78435) seems to be no longer available.

***Chaetomium mesopotamicum*** Abdullah & Zora, Cryptogamic Bot. 3: 387. 1993.

The original isolate derives from soil of a date palm plantation in Basrah, Iraq.

***Chaetomium subcurvisporum*** Abdullah & Al-Bader, Intern. J. Mycol. Lichenol. 4: 84. 1989.

A selected living strain was isolated by the authors from forest soil in the north of Iraq.

***Emericella desertorum*** Samson & Mouchacca, Antonie van Leeuwenhoek 40: 121. 1975.

Representative cultures of this ascomycete developed no *Aspergillus* anamorph. The original locality is grey soil 32 km S Kharga City, Kharga Oasis, Western Desert, Egypt.

***Emericella purpurea*** Samson & Mouchacca, Antonie van Leeuwenhoek 41: 350. 1975.

Anamorph: *Aspergillus purpureus* Samson & Mouchacca, Antonie van Leeuwenhoek 41: 350. 1975.

The original locality of this soil-borne fungus is Kharga Oasis, Western Desert, Egypt.

***Emericella similis*** Horie, Udagawa, Abdullah & Al-Bader, Trans. Mycol. Soc. Japan 31: 425. 1990.

The type locality is a date palm plantation close to Basrah City, Iraq.

***Eupenicillium egyptiacum*** (van Beyma) Stolk & Scott, Persoonia 4: 401. 1967; Moubasher, Soil Fungi of Qatar and other Arab Countries : 202. 1993.

Bas.: *Penicillium egyptiacum* van Beyma, Zentralblatt für Bakteriologie, Parasitkunde, Infektionskrankheiten und Hygiene (Abt. II) 88: 137. 1933.

Anamorph: *Penicillium nilense* Pitt, The genus *Penicillium* and its teleomorphic states *Eupenicillium* and *Talaromyces* : 145. 1979.

Misapplied name : *Eupenicillium crustaceum* Ludwig, Lehrbuch der niederen Kryptogamen: 263. 1892; *sensu* Stolk & Samson (1983).

This ascomycete was first isolated by Sabet (1935) from sandy soil at the locality of Burg El-Arab, west of Alexandria City, Egypt, and sent to van Beyma for examination.

***Eupenicillium sinaicum*** Udagawa & Ueda, Mycotaxon 14: 266. 1982; Moubasher, Soil fungi in Qatar and other Arab Countries : 209. 1993.

Anamorph: *Penicillium sinaicum* Udagawa & Ueda, Mycotaxon 14: 246. 1982.

The original isolate was obtained in Japan from a sample of marine sludge collected at 30 km east of Port Saïd City in the Sinai peninsula, Egypt, hence the specific epithet.

***Eurotium xerophilicum*** Samson & Mouchacca as «*xerophilus*», Antonie van Leeuwenhoek 41: 348. 1975.

Anamorph: *Aspergillus xerophilicus* Samson & Mouchacca as «*xerophilus*», Antonie van Leeuwenhoek 41: 348. 1975; Kozakiewicz, Mycol. Papers 161: 88. 1989.

The authentic material originates from soil, Kharga Oasis, Western Desert, Egypt.



***Gelasinospora hippopotama*** Krug, Khan & Jeng, Mycologia 86 (2): 250. 1994.

The selected type material developed in the laboratory from a soil sample maintained in a damp chamber and covered with humidified filter papers. The sample examined was collected near an irrigation canal at «Ein Birbiyeat» in the Oasis of Dakhla, Wadi El Gedid governorate, Western Desert, Egypt.

***Gymnoascus desertorum*** (Moustafa) von Arx, Persoonia 13: 178. 1986.

Bas.: *Arachniotus desertorum* Moustafa, Trans. Brit. Mycol. Soc. 61: 392. 1973.  
= *Pseudoarachniotus desertorum* (Moustafa) Orr, Ghosh & Roy, Mycologia 69: 158. 1977.

Misapplied name: *Gymnascella confluens* (Sartory & Bainier) Currah, Mycotaxon 24: 75. 1985.

Bas.: *Gymnoascus confluens* Sartory & Bainier, Comptes Rendus Soc. Biol. Paris 4: 498-500. 1913; Bull. Soc. mycol. France 29: 261-262. 1913.

= *Arachniotus confluens* (Sartory & Bainier) Apinis, Mycol. Papers 96: 37-39. 1964; fide Currah, 1985.

The type locality of *Arachniotus desertorum* Moustafa is a salt-marsh soil, Kuwait.

***Podospora aegyptiaca*** Lundqvist, Svensk Bot. Tidskr. 64: 409. 1970.

The description is based on material developing in moist chamber on sheep dung collected on the shore of Lake Omm Risha, Wadi El-Natrun, Liberation Province, lower Egypt.

***Pseudoallescheria desertorum*** (von Arx & Moustafa) Mac Ginnis & al., Mycotaxon 14: 98. 1982.

Bas.: *Petriellidium desertorum* v. Arx & Moustafa, Persoonia 7: 371. 1973.

The only available strain was isolated by Moustafa from a Kuwaiti salt-marsh soil.

***Pseudeurotium desertorum*** Mouchacca (as *Pseudoeurotium desertorum*), Rev. Mycol. 36: 125. 1971.

The type locality is a reclaimed desert soil cultivated with wheat in the Dakhla Oasis, Western Desert, Egypt.

***Rhexothecium globosum*** Samson & Mouchacca, Can. J. Bot. 53: 1637. 1975.

This is the type species of the genus *Rhexothecium* Samson & Mouchacca (1975). The type strain was isolated from soil at km 32 on the Kharga-Beris road, Kharga Oasis, Western Desert, Egypt.

***Strattonia mesopotamica*** Abdullah, Trans. Brit. Mycol. Soc. 81: 393. 1983.

The description is based on material developing in a moist chamber on donkey dung collected at Rumalia, southern desert of Iraq.

***Talaromyces trachyspermus*** (Shear) Stolk & Samson var. ***assiutensis*** (Samson & Abdel-Fattah) Yaguchi & Udagawa apud Yaguchi & al., Mycoscience 35 (1): 65. 1994.

Bas.: *Talaromyces assiutensis* Samson & Abdel-Fattah, Persoonia 9: 501. 1978; Moubasher, Soil Fungi of Qatar and other Arab Countries : 465. 1993.

= *Talaromyces gossypii* Pitt, The genus *Penicillium* and its teleomorphic states *Eupenicillium* and *Talaromyces* : 500. 1979; fide Yaguchi et al. (1994).

Anamorph: *Penicillium lehmanii* Pitt *pro parte*.

= *Penicillium assiutense* Samson & Abdel-Fattah, Persoonia 9: 501. 1978.

= *Penicillium gossypii* Pitt, The genus *Penicillium* and its teleomorphic states *Eupenicillium* and *Talaromyces* : 500. 1979; fide Yaguchi & al. (1994).

The original living strain of *Talaromyces assiutensis* was isolated from soil amended with crushed buffalo hooves and incubated for 5 months; the site sampled was the experimental farm of Assiut University, Assiut, higher Egypt.

***Thermoascus aegyptiacus*** Ueda & Udagawa, Trans. Mycol. Soc. Japan 24: 135. 1983.

Isolated for the first time from a sample of marine sludge collected at the Suez Canal border, Port Saïd City, lower Egypt.

***Thielavia aegyptiaca*** Moustafa & A. Wahid, Persoonia 14: 173. 1990.

Authentic living material originating from a cultivated soil in Ismailia Governorate, lower Egypt.

***Thielavia arenaria*** Mouchacca, Bull. trim. Soc. Mycol. France 89: 308. 1973; von Arx, Studies Mycol. 8: 12. 1975.

Type and additional living strains were isolated from a sand dune located 45 Km S Kharga City, Kharga Oasis, Western Desert, Egypt.

***Thielavia coactilis*** Nicot *apud* Nicot & Longis, Comptes rendus hebdomad. Séances Acad. Sciences, Paris 253: 304. 1961; Mouchacca, Persoonia 12: 442. 1985.

= *Thielavia kuwaitensis* Moustafa, Trans. Brit. Mycol. Soc. 66: 336. 1976; *fide* Mouchacca (1985).

The original strain of *Thielavia kuwaitensis* was isolated from a Kuwaiti salt-marsh soil. It later proved to be identical to authentic material of *T. coactilis* obtained from a soil sample of a beach close to Beirut City, Lebanon.

***Thielavia microspora*** Mouchacca, Bull. trim. Soc. Mycol. France, 89: 308. 1973; von Arx, Studies Mycol. 8: 9. 1975.

The type strain originated from a sand dune on the Kharga-Beris road, Kharga Oasis, Western Desert, Egypt.

***Thielavia minuta*** (Cain) Malloch & Cain var. ***thermophila*** Abdullah & Al-Bader, Basrah J. Agric. Res. 5: 116. 1992.

The cited type locality is a forest soil in the north of Iraq. Further studies indicate the fungus represents a species of *Melanocarpus* (von Arx, 1975; Abdullah, pers. comm.).

***Thielavia subthermophila*** Mouchacca, Bull. trim. Soc. Mycol. France 89: 310. 1973; von Arx, Studies Mycol. 8: 12. 1975.

The authentic material was isolated from grey soil, on the Kharga-Beris road, Western Desert, Kharga Oasis, Egypt.

***Zopfiella karachiensis*** (Ahmed & Asad) Guarro *apud* Guarro & Cano, Trans. Brit. Mycol. Soc. 91: 589. 1988.

Bas.: *Strattonia karachiensis* Ahmed & Asad, Sydowia 21: 281. 1967.

= *Triangularia karachiensis* (Ahmed & Asad) Udagawa, Trans. Mycol. Soc. Japan 20: 362. 1979.

= *Podospora faurelii* Mouchacca, Rev. Mycol. 38: 109. 1973; *fide* Guarro & Cano (1988).

The Egyptian strain of the ascomycete described as *Podospora faurelii* is from arid soil, Kharga Oasis, Egypt.

***Zygopleurage faiyumensis*** Lundqvist, Bot. Notiser 122: 354. 1969.

The description is based on material which developed in a moist chamber on cow dung collected close to Lake Qarun in the Egyptian Province and Oasis of Fayum, higher Egypt.

#### Hyphomycetes

***Acremonium egyptiacum*** (van Beyma) W. Gams, *Cephalosporium*-artige Schimmelpilze: 64. 1971.

Bas.: *Oospora egyptiaca* van Beyma, Zentralbl. Bakteriol. Parasitenkde, Infektionskrank. Hygiene (Abt. II) 89: 242. 1933.

The fungus was first isolated by Sabet (1935) from a loamy soil at Giza close to Cairo and sent to van Beyma for identification.

***Alternaria chlamydospora*** Mouchacca, Mycopathol. Mycol. Appl. 50: 217-222. 1973; Simmons, Mycotaxon 13: 22. 1981; Moubasher, Soil Fungi of Qatar and other Arab Countries : 34. 1993.

The type locality of this unusual species of *Alternaria* is Kharga Oasis, Western Desert, Egypt.

***Alternaria mouchaccae*** Simmons, Mycotaxon 13: 18. 1981; *nom. nov.*

Bas.: *Ulocladium chlamydosporum* Mouchacca, Rev. Mycol. 36: 120. 1971; non *Alternaria chlamydospora* Mouchacca (1973).

Several strains of this fungus including the selected type material were isolated from an abandoned field supporting a weed vegetation at 17 Km NW of Mut village, Dakhla Oasis, Western Desert, Egypt. It was also observed in a sample taken from a close by reclaimed desert soil cultivated with wheat.

***Aspergillus egyptiacus*** Moubasher & Moustafa, Egypt. J. Bot. 15: 153. 1972; Samson & Mouchacca, Antonie van Leeuwenhoek 40: 126. 1974; Moubasher, Soil Fungi of Qatar and other Arab Countries: 83. 1993.

The fungus was isolated for the first time from an olive tree plantation at Ras El-Hekma on the Western Mediterranean coast of Egypt.



***Aspergillus peyronelii*** Sappa, Boll. Istituto Orto Botanico Univ. Torino 2: 248. 1955.

= *Aspergillus floriformis* Samson & Mouchacca, Antonie van Leeuwenhoek 41: 343. 1975; *vide* Kozakiewicz (1989).

The original locality of *Aspergillus peyronelii* Sappa is soil close to the city of Goluin in Somalia and that of *A. floriformis* is from a rather similar habitat: desert soil in Kharga Oasis, Egypt.

***Aspergillus subsessilis*** Raper & Fennell, The genus *Aspergillus*: 530. 1965.

= *Aspergillus kassunensis* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 1968: 113. 1968; *vide* Samson & Mouchacca (1974).

The representative strain of *Aspergillus subsessilis* originates from desert soil in the Mojave Desert, Los Angeles (USA) while the type locality of *A. kassunensis* is an arid soil in Syria.

***Aspergillus ustus* var. *pseudodeflectus*** (Samson & Mouchacca) Kozakiewicz, Mycol. Papers 161: 131. 1989.

= *Aspergillus pseudodeflectus* Samson & Mouchacca, Antonie van Leeuwenhoek 41: 345. 1975.

The type culture of *Aspergillus pseudodeflectus* originates from soil collected in Kharga Oasis, one of the large depressions of the Egyptian Western Desert.

***Bipolaris subpapendorfii*** (Mouchacca) J. L. Alcorn, Mycotaxon 17: 69. 1983; Moubasher, Soil Fungi of Qatar and other Arab Countries: 118. 1993.

= *Drechslera subpapendorfii* Mouchacca, Rev. Mycol. 38: 107. 1973.

Several strains including the type were isolated from a grey soil, south of Kharga City (km 32), Kharga Oasis, Western Desert, Egypt.

***Cladorrhinum bulbillosum*** W. Gams & Mouchacca *apud* Mouchacca & Gams, Mycotaxon 68: 425. 1993.

Selected type material derives from soil of an abandoned field in Dakhla Oasis, Western Desert, Egypt. Also recorded from other localities and habitats (Mouchacca & Gams, 1993).

***Cladorrhinum phialophoroides*** Mouchacca & W. Gams, Mycotaxon  
68: 428. 1993.

The type locality of this hyphomycete is a reclaimed desert soil cultivated with wheat close to Mut village, Dakhla Oasis, Western Desert, Egypt.

***Desertella globulifera*** Mouchacca, Rev. Mycol. 43: 73. 1979.

This is the type species of the genus *Desertella* Mouchacca (1979). This mucedinaceous hyphomycete is apparently known only from its type locality: ferruginous soil, south of Kharga city, Kharga Oasis, Western Desert, Egypt.

***Embellisia didymospora*** Muntanjola-Cvetkovic *apud* Muntanjola-Cvetkovic & Ristanovic, Mycologia 68: 49. 1976; Moubasher, Soil Fungi of Qatar and other Arab Countries : 181. 1993.

= *Ulocladium microsporum* Moubasher & Abdel-Hafez, Trans. Brit. Mycol. Soc. 69: 164. 1977; *vide* Simmons (1983).

The original strain of *Ulocladium microsporum* was isolated from soil in Egypt. Later it was found to match the type material of *Embellisia didymospora*.

***Exserohilum curvisporum*** Sivanesan, Abdullah & Abbas, Mycol. Res. 97: 1486. 1993.

The fungus was isolated from surface sediments consisting of a mixture of decomposed leaf fragments and sand in the Shatt Al-Arab river in Basrah, Iraq.

***Fusariella aegyptiaca*** Mouchacca *apud* Mouchacca & Nicot as „*aegyptiacum*“, Rev. Mycol. 37: 181. 1973; Moubasher, Soil Fungi of Qatar and other Arab Countries : 224. 1993.

The type locality of this hyphomycete with striking chains of conidia is a desert soil on the Kharga-Beris road, Kharga Oasis, Western Desert, Egypt.

***Gilmaniella macrospora*** Moustafa, Persoonia 8: 332. 1975.

The fungus was first reported as an inhabitant of salt-marsh soils of Kuwait.

***Humicola hyalothermophila*** Moubasher, Mazen & Abdel-Hafez, Trans. Brit. Mycol. Soc. 72: 509. 1979; Moubasher, Soil Fungi of Qatar and other Arab Countries : 269. 1993.

This soil-borne fungus was first observed in several cultivated areas in Jordan.

***Hyalocladium moubasherii*** Moustafa, Trans. Brit. Mycol. Soc. 67: 537. 1976.

This is the type species of *Hyalocladium* Moustafa (1976). The authentic strain was isolated during an investigation of the fungal air spora of Kuwait.

***Idriella desertorum*** Mouchacca, Rev. Mycol. 36: 192. 1972.

Isolated from desert soil collected in the Western Desert large depressions of Egypt.

***Myrothecium verrucaria*** (Albertini & Schweinitz) Ditmar : Fries, Systema mycologicum 3: 217. 1829; Tulloch, Mycol. Papers 130: 27. 1972.

= *Cryptomela acutispora* van Beyma, Zentralbl. Bakteriol., Parasitkde, Infektionskrankh. Hygiene (Abt. II) 89: 240. 1933.

The authentic material of *Cryptomela acutispora* was isolated by Sabet (1935) from a loamy soil at Giza, Cairo, Egypt. Re-examination of the living culture preserved as CBS 157.33 proved it represents a strain of *Myrothecium verrucaria*.

***Penicillium chrysogenum*** Thom, Bull. Bureau Animal Ind., US Department of Agriculture 118: 58. 1910; Pitt, The genus *Penicillium* and its teleomorphic states *Eupenicillium* and *Talaromyces*: 328. 1979.

= *Penicillium harmonense* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 102. 1968; *fide* Pitt (1979).

Re-examination of the original strain of *Penicillium harmonense* isolated from soil at Irma, Damascus, Syria, showed that this is conspecific with *P. chrysogenum*.

***Penicillium cremeogriseum*** Chalabuda, Botanicheskie materialy Otdela sporovykh rastenii 6: 168. 1950.

= *Penicillium yarmokense* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 99. 1968; *vide* Frisvad & Filtenborg (1990).

Misapplied name: *Penicillium canescens* Sopp, Skrifter udgivne af videnskabs-selskabet i Christiania 11: 181. 1912; *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

Pitt (1979) regarded *Penicillium yarmokense* isolated from soil at Es-Suveida, Syria, as a synonym of *P. canescens*. According to Frisvad & Filtenborg (1990), however, the Baghdadi strain should rather be considered identical to *Penicillium cremeogriseum*, as Pitt misinterpreted the original protologue of Sopp's fungus.

***Penicillium decumbens*** Thom, Bull. Bureau Animal Ind., US Department of Agriculture 118: 71. 1910; Pitt, The genus *Penicillium* and its teleomorphic states *Eupenicillium* and *Talaromyces*: 228. 1979.

= *Penicillium arabicum* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 105. 1968; *vide* Pitt (1979).

The fungus described by Baghdadi as *Penicillium arabicum* originates from a Syrian soil. It was later found to match *Penicillium decumbens*.

***Penicillium dierckxii*** Biourge, Cellule 33: 133. 1923.

= *Penicillium eben-bitarianum* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 106. 1968; *vide* Pitt (1979).

Misapplied name: *Penicillium fellutanum* Biourge, Cellule 33: 262. 1923; *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

The single strain available for *Penicillium eben-bitaricum* Baghdadi was isolated from soil at Irma, Damascus, Syria. It was first considered identical to *Penicillium fellutanum* Biourge by Pitt (1979). According to Frisvad & Filtenborg (1990), however, Pitt widely interpreted the original protologue provided by Biourge for this *Penicillium* and accordingly the Baghdadi strain should be conspecific with *Penicillium dierckxii*.

***Penicillium manginii*** Duché & Heim, Travaux Cryptogamiques dédiés à Louis Mangin: 45. 1931.

= *Penicillium syriacum* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 111. 1968; *vide* Frisvad & Filtenborg (1990).

Misapplied name: *Penicillium miczynskii* Zaleski, Bull. Internat. Académie Pol. Sci. Lettres. Classe des sciences mathématiques et naturelle, Série B, Sciences naturelles 1927 : 482. 1927; *sensu* Pitt (1979).



The original locality of *Penicillium syriacum* is soil in Syria; hence the specific epithet. Pitt (1979) regarded this fungus and *Penicillium manginii* to be conspecific with *P. miczynskii* which predates the latter. Such proposal was partially refuted by Frisvad & Filtenborg (1990), who considered *Penicillium manginii* to be distinct from *P. miczynskii*.

***Penicillium moldavicum*** Milko & Beliakova, *Novosti sistematiki vysshikh i nizshikh rastenii* 4: 255. 1967.

= *Penicillium kabunicum* Baghdadi, *Novosti sistematiki vysshikh i nizshikh rastenii* 5: 98. 1968; *vide* Pitt (1979).

Misapplied name: *Penicillium janthinellum* Biourge, *Cellule* 33: 258. 1923; *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

*Penicillium kabunicum* was isolated from soil at Damascus, Syria. It was considered identical to *Penicillium moldavicum* regarded by Pitt (1979) as a later synonym of *P. janthinellum*. Frisvad & Filtenborg (1990) are of the opinion that *Penicillium janthinellum* is distinct from *P. moldavicum*.

***Penicillium quercetorum*** Baghdadi, *Novosti sistematiki vysshikh i nizshikh rastenii* 5: 110. 1968; Pitt, *The genus Penicillium and its teleomorphic states Eupenicillium and Talaromyces*: 196. 1979.

Misapplied name: *Penicillium lividum* Westling, *Arkiv för botanik utgivet av k. svenska vetenskapsakademien, Stockholm* 11(1): 134. 1911; *sensu* Stolk & Samson (1983); *vide* Frisvad & Filtenborg (1990).

The only authentic strain available for *Penicillium quercetorum* is from soil at Es-Suveida, Syria. Frisvad & Filtenborg (1990) came to the conclusion that this *Penicillium* is distinct from *P. lividum sensu* Stolk & Samson (1983).

***Penicillium simplicissimum*** (Oudem.) Thom, *The Penicillia*: 335. 1930; Pitt, *The genus Penicillium and its teleomorphic states Eupenicillium and Talaromyces*: 276. 1979.

= *Penicillium es-suveidense* Baghdadi, *Novosti sistematiki vysshikh i nizshikh rastenii* 5: 108. 1968; *vide* Pitt (1979).

The type strain of the Baghdadi species is apparently lost but the provided description fits the current concept of *Penicillium simplicissimum*.

***Penicillium sizovae*** Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 103. 1968.

Misapplied name: *Penicillium fellutanum* Biourge, Cellule 33: 262. 1923; *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

The species originates from a Syrian soil; this is the only information reported. According to Frisvad & Filtenborg (1990), *Penicillium sizovae* does not fit the description of *P. fellutanum sensu* Pitt (1979).

***Penicillium steckii*** Zaleski, Bull. Internat. Académie Polon. Scie. Lettres. Classe des sciences mathématiques et naturelles, Série B, Sciences naturelles 1927: 469. 1927.

= *Penicillium baradicum* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 107. 1968; *vide* Pitt (1979).

Misapplied name: *Penicillium citrinum* Thom, Bull. Bureau Animal Ind. US Department of Agriculture 118: 61. 1910; *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

The type locality of *Penicillium baradicum* Baghdadi is soil at Irma, Damascus, Syria. Pitt (1979) came to the conclusion that this species is conspecific with *Penicillium steckii*, an earlier name for *P. citrinum*. This last synonymy is not admitted by Frisvad & Filtenborg (1990) who regards *Penicillium steckii* as distinct from *P. citrinum*.

***Penicillium westlingii*** Zaleski, Bull. Intern. Académie Polon. Sci. Lettres. Classe des sciences mathématiques et naturelles, Série B, Sciences naturelles 1927: 473. 1927.

= *Penicillium gorlenkoanum* Baghdadi, Novosti sistematiki vysshikh i nizshikh rastenii 5: 97. 1968; *vide* Frisvad & Filtenborg (1990).

= *Penicillium damascenum* Baghdadi, op. cit. 5: 101. 1968; *vide* Frisvad & Filtenborg (1990).

Misapplied name: *Penicillium melinii* Thom, The Penicillia : 273. 1930. *sensu* Pitt (1979); *vide* Frisvad & Filtenborg (1990).

The type locality of *Penicillium gorlenkoanum* is soil at Nabi-Barade, Damascus. That of *P. damascenum* is also soil but at Irma, Damascus, Syria. Both species are regarded by Frisvad & Filtenborg (1990) to be conspecific with *P. westlingii*. Contrarily to Pitt (1979), however, these authors consider the latter distinct from *Penicillium melinii* Thom.

***Scopulariopsis hanii*** Moustafa & A. Wahid, Nova Hedwigia 51: 476. 1990.

This annellidic hyphomycete was isolated from a cultivated soil close to Ismailia City, lower Egypt.

***Sporothrix ranii*** Moustafa, Persoonia 11: 392-394. 1981.

The type locality is tidal salt-marsh, Kuwait.

***Thermophymatospora fibuligera*** Udagawa, Awao & Abdullah, Mycotaxon 37: 100-101.1986.

This is the type species of the genus *Thermophymatospora* Udagawa & al. (1986). The reported type locality is soil, Iraqi date palm plantation.

***Trichocladium ismailiense*** Moustafa & Ezz-El-Din, Nova Hedwigia 50: 255. 1990.

Living strains of this dematiaceous hyphomycete originate from a salt-marsh soil in north Sinai, Egypt.

***Trichurus dendrocephalus*** Udagawa, Horie & Abdullah, Mycotaxon 23: 253. 1985.

Observed among other species during a floristic survey of soil samples from a date palm plantation at the vicinity of Basrah city, Iraq.

## Discussion

The check-list includes the names of about sixty taxa; only eight were documented by Moubasher (1993) in his recent book on soil fungi in the Middle East. The species listed proved to be equally distributed among two major taxonomic groups, the Ascomycetes and the Hyphomycetes. The type strains of two genera, *Rhexothecium* and *Chaetomiopsis*, are included in the Ascomycetes. Apart from the only discomycete representative, the majority of the 18 ascomycetous genera are cleistothecial. *Thielavia* Zopf ranks first with six species. It is followed by *Emericella* Berk. & Br. (3 taxa) and *Chaetomium* Kunze : Fr. (3 species). Based on ecological characteristics, three ascomycetes proved to be thermophilic: *Chaetomium mesopotamicum*, *Thermoascus aegyptiacus* and *Thielavia minuta* var. *thermophila*. Also several ascomycetes were thermotolerant. Such observations suggest that prominence of cleistothecial ascomycetes in the Middle East soils is to be correlated with the overall arid stress conditions prevailing in the area.

The Hyphomycete assemblage comprises more dematiaceous than mucedinaceous forms; no coelomycete was apparently described as new from the area. Three genera still monospecific are represented: *Thermophymatospora* is peculiar by having basidiomycetous affinities as evidenced by the regular presence of septal clamp connections and the remaining *Hyalocladium* Moustafa and *Desertella* Mouchacca are mucedinaceous taxa. Based on the number of species, *Penicillium* Link : Gray should rank first. Only two of the ten species proposed by Baghdadi (1968) from Syrian soils, however, could be kept after further taxonomic work. The genus *Aspergillus* Micheli : Fr. is allocated four species. *Aspergillus* would even be globally the most important entity if the teleomorphic taxa would be considered. Soils of arid regions are definitely a good reservoir of elements of this large xerothermic genus. *Alternaria* Nees : Fr. and *Cladorrhinum* Sacc. & Marchal come next with 2 species each. *Humicola hyalothermophila* and *Thermophymatospora fibuligera* are thermophilic. Thermotolerant abilities are observed in few other hyphomycetes as the described *Aspergillia* and *Cladorrhinum bulbillosum*.

Protologues of the taxa originating from the Middle East were mainly proposed after 1960. Their authentic strains are the outcome of studies conducted particularly in Egypt. Judging from the volume of research undertaken on soil-borne fungi and fungi of other habitats in the area (Moubasher, 1993), a negative correlation is evident when the limited number of taxa proposed as new to science are considered. Lack of local interest in conducting pure taxonomic work is behind such an unbalanced relationship.

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