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STUDIES ON INDIAN COPROPHILOUS FUNGI. III. THE GENUS ARACHNOMYCES

By

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This paper describes three species of *Arachnomyces* Massee and Salmon. Of these *A. sulphureus* is a maiden report from India and the other two, *A. minutus* ann *A. validus* are new to science.

During our studies on coprophilous fungi four species of the genus *Arachnomyces* Massee and Salmon have been isolated. Of these two are described here as new species. The other two are already known, viz, *A. nitidus* Massee & Salmon and *A. sulphureus* Massee and Salmon. *A. nitidus* is the only species which is already known from India (Lodha, 1971; Singh & Mukerji, 1978). The isolations were made by using moist chamber technique.

Arachnomyces sulphureus Massee and Salmon. 1902. Ann. Bot. *16* : 68. Malloch, D. and Cain, R.F. 1970. Can. J. Bot. *48* : 844.

Cleistothecia scattered or aggregated in groups of 4-5, sulphur yellow in reflected light, orangish-light brown in transmitted light, globose, 300-400 μm, in diameter, covered by a thin covering of ramified, yellow hyphae 2.5 μm, having several long hair-like appendages. Peridium brittle, smooth, outer dark-layer, 2-3 cells thick, inner hyaline layer several cells thick, pseudo parenchymatous in surface view. Appendages originating mainly from the outer cells of

the peridium at the lower part of the fruiting body, where it is in contact with the substrate, long flexuous, curved at the apex, thick walled, septate, 5-6.25 μm of even diameter throughout, except at the base where it is 7.5 ηm wide, yellowish-brown by reflected light and orangish-brown by transmitted light, 800-850 μm in length, sometimes more longer. Asci 8-spored globose to sub-globose, evanescent, 7.5-10 ηm in diameter (Plate I, Fig 1). Ascospores oblate, smooth, yellowish-orange singly in transmitted light, light reddish-brown in mass, 2.5-5x2.5-3.5 μm.

The fungus was isolated from ox dung collected from Khera Khurd village, Delhi on 19.11.76. The dried specimens of this have been placed in the Mycological Herbarium of Botany Department, University of Delhi, under reference number DU/KS-475.

It shows rasemblance with the type description in most of its characters but differs in having smaller ascocarp and ascocarp appendages.

Arachnomyces minutus Singh & Mukerji sp.n.

Cleistotheciis sparsis vel aggregatis, atro-brunneis, globosis, 70-90 (100) μm in diam., setulosae ; setulae atro-brunneis vel nigris, semi regidulis, septatis, attenuatis, 700-850x1.5-2.5 μm, 3-3.5 μm ad basim Ascis globosis vel sub-globosis, octosporis, evanescentis, 5 μm in diam. Ascosporis oblatis, hyalinis in luce transmissa, incanis in massa, 2.5-3.25x1.5-2.5 μm.

In fimo *Macropus robustus*, Delhi 18.6.75. Leg. N. Singh Typus positus in Herbario Mycologico, Universitatis Delhi under sub-numero DU/KS-447.

Cleistothecia scattered to grouped on the substrate, brownish-black in reflected light, dark-brownish in transmitted light, opaque when mature, globose, 70-90(-100) μm in diam. (Plate I, Figs. 2, 3), having several long appendages ; peridium brittle, outer-layer somewhat darker than the inner-layer, pseudoparenchymatous, cells measuring 6.25 × 5 μm ; appendages originate from the outer cells of the peridium, dark brown to black in reflected light, semi-rigid, thick walled, septate, of uneven diameter, 700-850x1.5-2.5 μm,

broad at the base 3-3.5 μm wide tapering towards apex, tip straight (Plate I, Fig. 4).Asci 8-spored, globose to sub-globose, evanescent, 5μm in diam. Ascospores, oblate, hyaline by transmitted light, greyish in mass 2.5-3.25x1.5-2.5 μm (Plate I, Fig. 4).

The fungus was isolated from euros and nilgai dung, collected from Delhi Zoo on 18.6.75 and 23.6.77 respectively. The dried specimens of the type and isotype have been deposited in Mycological Herbarium of Botany Department, University of Delhi, under reference number DU/KS-447 and 447a.

The fungus differs from already known species of *Arachnomyces* in having dark brown to black very small ascocarps, semi-rigid, long and tapering appendages. The specific epithet is based on the small size of its ascocarps.

Arachnomyces validus Singh & Mukerji sp. n.

Cleistotheciis sparsis vel aggregatis, rufescentis, cinnamomeus in luce transmissa, globosis, 210-230(-550) μm in diam., setulosae. Satulae atro-rufescentis, validus, levis, septatis, attenuatis, generaliter 130-350x5-6.25μm, 6.25-7.25 μm in diam. ad basim, apice circinatis, aliquando obtusoscaber ad extremis. Ascis octosporis, globosis vel subglobosis, nonstipitati, evanescentibus, 75-11.25x6.5-7.5 μm. Ascosporis oblatis, levis. cinnamomeus in luce transmissa, rubrobrunneis in massa, 4.5-6x2.5–3.5 μm. Statis conidis haud visiae.

In fimo *Macropus robustus*. Delhi, 18.6.1975. Leg. N. Singh. Typus positus in Herbario Mycologico Universitatis Delhi under sub-numero DU/KS-446.

Cleistothecia scattered or aggregated in groups of 4-5, superficial, globose, shining, reddish-brown in reflected light, orangish-brown in transmitted light, generally 210-230 μm sometimes upto -550 μm in diam. (Plate II, Fig. 5), provided with several long, stout appendages (Plate II, Fig. 6) peridium brittle, smooth, made up of an outer dark layer, parenchymatous in surface view, several cells thick and a hyaline inner layer of several thin-walled cells 5-7.5 μm. Ascocarp appendages originating mainly from the outer cells of the peridium, dark reddish-brown in reflected light, orangish-brown in transmitted light, stout,

smooth, thick walled, septate generally 130-350x5 6.25 μm, swollen at base upto 6.25-7.25 μm, tip characteristically circinate (Plate II, Fig. 7), sometimes bluntly rough at extreme. Asci-8-spored, globose to sub-globose, 7.5-11.25x 6.5-7.5 μm (Plate II, Fig. 8). Ascospores oblate, smooth, yellowish-orange by transmitted light, reddish-brown in mass 4.5-6x2.5-3.5 μm, Conidial stage not seen.

This fungus was isolated from euros dung collected from Delhi Zoo on 18.6,1975, later this was found on ox dung collected from Khera Khurd village, Delhi on 19.11.76. The dried specimens of the type DU/KS–446 and the isotype DU/KS-448 have been deposited in the Mycological Herbarium of Botany Department, University of Delhi.

This species is characteristic in possessing circinate stout, appendages on the basis of which the species have been named.

The key of the genus *Arachnomyces* which is an amendment to Malloch and Cain (1970), will now be as follows :

1. Ascocarp with characteristic appendages ..... 2.
1. Ascocarps without appendages ..... *A. peruvianus*
2. Ascocarps covered with a yellow hyphal mat, dull over 500μm in diameter, ascocarp appendages 6-7 μm broad ..... *A. sulphureus.*
2. Ascocarps glabrous at maturity except for the appendages, shinning, less than 500 μm in diameter, appendages 1.5-6.0 μm wide. ..... 3.
3. Ascocarp never more than 150 μm in diameter, appendages 1.5-2.5 μm broad. ascospores 2.5-3.5 x 1.5-2.5 μm ..... *A. minutus.*
3. Ascocarp upto 500 um in diameter ..... 4.
4. Ascocarp appendage, 2. 5-5.5 μm broad ; ascospores 2.8-3.5 x 1.5-2.0 μm ..... *A. minimus*
4. Ascocarp appendage, of even diameter or tapering ..... 5.
5. Ascocarp appendges of even diameter, 3.5-6.0 μm broad; ascospores 3.5-5.0 x 2.0-3.0 μm ..... *A. nitidus*

5. Ascocarp appendages tapering 5-6.25 μm broad, ascospores 3.5-6.0x2.5-3.5 μm ... *A. validus*

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EXPLANATION OF PLATES :

PLATE I

Fig, 1. 1. *Arachnomyces sulphurens*. Asci. and ascospores x 800.

Fig, 2. *Arachnomyces minutus*, Cleistothecium x 70 ;

Fig, 3. Ruptured cleistothecium x 400 ;

Fig, 4. Part of a appendage originating from outer cells of peridium and ascospores x 800.

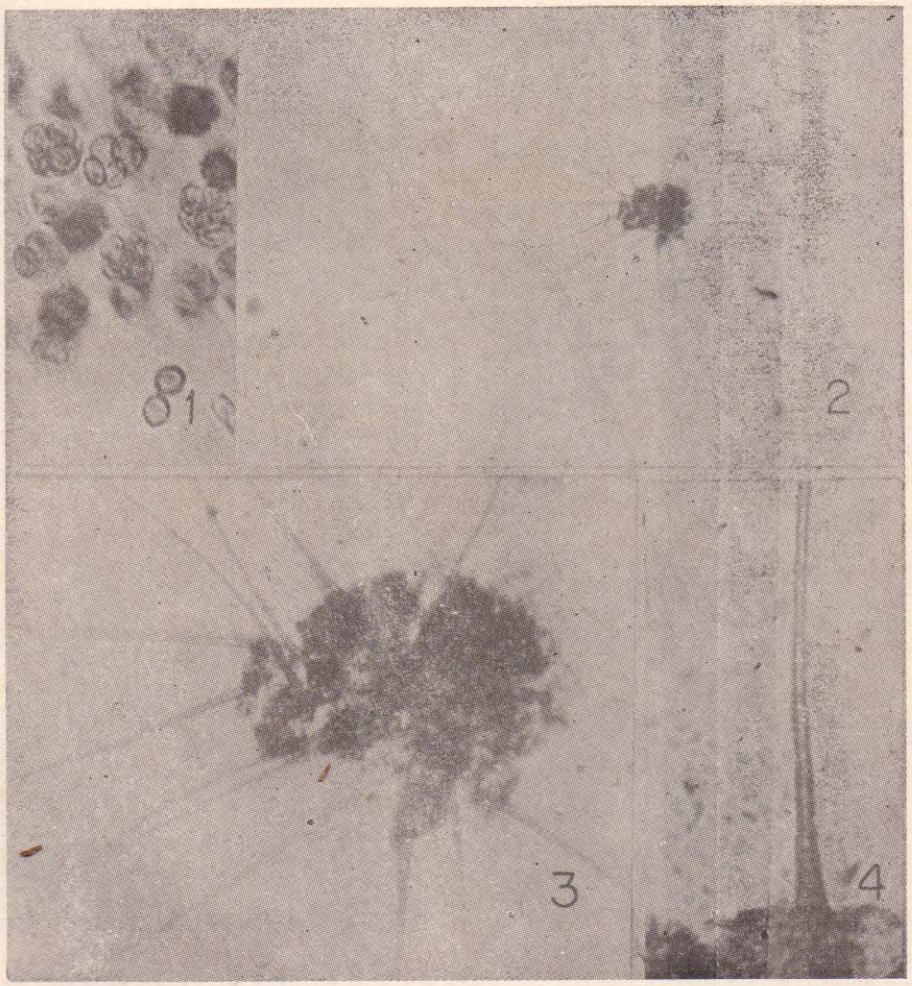
PLATE II

Fig. 5. *Arachnomyces validus*, Cleistothecium x 60 ;

Fig, 6. Rudtured cleistothecium showing peridium and appendages x 60 ;

Fig, 7. Terminal end of appendages showing circination x 360 ;

Fig, 8. Asci x 36 5.



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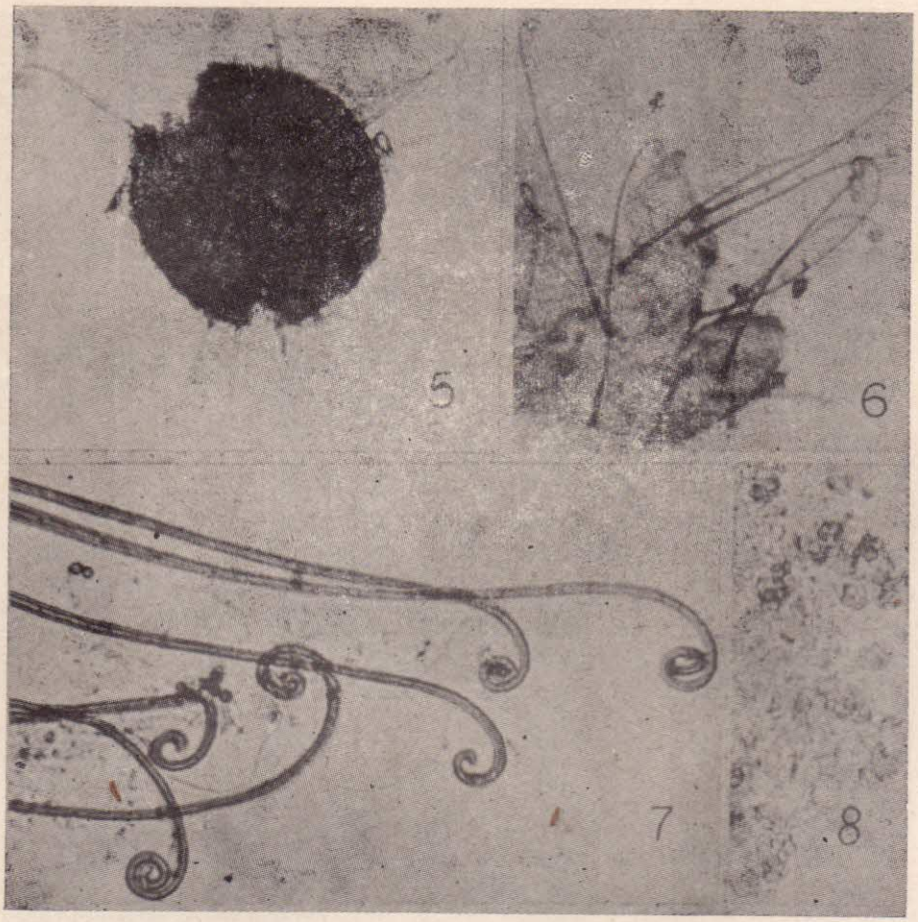
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