

Table 1 Effect of alternate exposure of *Pythium aphanidermatum* to aluminium ethyl phosphite (AEP) and other fungicides on agar plates

Fungicides alternate to AEP(3000 µg/ml)	Passage number				
	1	2	3	4	5
Copper oxychloride (1500 µg/ml)	31*	15.0	26.1	23.8	20.2 ^a
Ziram(10 µg/ml)	31	10.5	24.0	20.7	18.5 ^a
Mancozeb (1500 µg/ml)	31	20.0	28.5	26.2	22.5 ^a
Continuous treatment with AEP (3000 µg/ml)	31	36.8	40.1	45.4	50.2 ^b

*Linear growth (mm), ^aSignificant decrease, and ^bSignificant increase over first passage by Wilcoxon's sum rank test ($P = 0.01$).

tance kept increasing at every successive passage and was maximum at the fifth passage. Alternate treatment with fungicides significantly reduced the resistance from passage to passage^{4,5}. Maximum reduction was observed with ziram followed by copper oxychloride and mancozeb (table 1). As is evident from table 2, treatment with a mixture of fungicides resulted in the increase in resistance of the pathogen up to five successive passages and this increase was maximum in mancozeb followed by copper oxychloride and ziram but was still significantly less when compared with the passage on only aluminium ethyl phosphite. Combination of different fungicides has been suggested for managing the level of fungicide resistance in pathogens by earlier workers⁶. Hence, aluminium ethyl phosphite resistance in *P. aphanidermatum* may be managed

Table 2 Effect of exposure of *Pythium aphanidermatum* to the mixture of aluminium ethyl phosphite (AEP) and other fungicides on agar plates

AEP(3000 µg/ml) + other fungicides	Passage number				
	1	2	3	4	5
Copper oxychloride (1500 µg/ml)	10*	12.2	14.5	17.2	20.0*
Ziram(10 µg/ml)	9	11.5	13.8	16.5	18.1**
Mancozeb(1500 µg/ml)	15	16.3	18.0	20.2	23.2**
AEP alone	31	36.8	40.1	45.4	50.2**

*Linear growth (mm), **Significant increase over first passage by Wilcoxon's sum rank test ($P = 0.01$).

to a certain extent by the alternate and combined use of the above mentioned conventional fungicides.

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A NEW SPECIES OF LICHEN GENUS *PHYLLISCUM* FROM INDIA

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INVESTIGATIONS on lichens collected from the environs of Lucknow have led to the discovery of many interesting taxa. The lime plaster of the walls of old building, of which Lucknow has in plenty, provide the suitable niche for lichens belonging mainly to the families Dermatocarpaceae, Lichinaceae and Hepciaceae. Singh and Upreti¹ described six species of *Endocarpon* among which 4 are new species collected from the same substratum. Many more taxa of lichens from this niche await descriptions. This note deals with one of them which happens to be a new species.

Phylliscum indicum Upreti sp. nov.

Thallus calcicola, atrofuscus, squamulosus; 0.5–1.5 mm latus. Apothecia immersa vel leviter emergentia, 0.5–0.7 mm lata; margine thalino, disco concavo. Asci cylindranei, 8-spore, sporae simplices, ecoloratae, ovoideae vel ellipsoideae, 17–25 × 9–11 µm. Paraphyses simplices vel ramoso-connexae. Phycobiont ad chroococcaceas pertinens.

Type: Singh 74615 (LWG). India: Uttar Pradesh; Rae Bareli district, Pithan village, on lime plaster of old wall, figures 1-4.

Thallus calcicolous, dark brown to black, squamulose, squamules compactly aggregated, with minute lobules attached centrally umbilicus. Thallus homoiomerous; alga a member of chroococcaceae (*chroococcus?*), algal cells spherical, 5-9 μ m in diameter; with thick gelatinous sheath.

Apothecia brown, immersed in the squamules or slightly emergent, 0.5-1 mm in diameter, disc brown-black, concave, epruinose; margin thalline; epithecium brown, 10-15 μ m thick, K-; hymenium hyaline, 80-150 μ m high, I+ blue, K-; hypothecium hyaline, 25-35 μ m thick; asci cylindrical, 8-spored, 60-85 \times 16-23 μ m; spores simple, colourless, oval to ellipsoid, 17-25 \times 9-11 μ m; paraphyses simple to branched, septate, apically slightly thick end.

Remarks: Henssen² mentioned six species in the genus *Phylliscum*. Awasthi and Singh³ added the seventh by describing *P. abuense* Awas. & S. Singh,

a new species from Mt. Abu, Rajasthan. Earlier, Awasthi and Singh⁴ reported the occurrence of *P. testudineum* Henssen, from Palni Hills, Tamil Nadu. *P. indicum* raises the strength of the number of species in this genus to eight and the number of species occurring in India to three.

P. indicum shows affinity to *P. testudineum*, *P. abuense* and *P. macrosporum* Henssen, in general appearance and nature of lobes. *P. abuense* has, however 16-spored asci and the remaining two species are characterized by much smaller spores (i.e. 8-9 μ m long) in *P. testudineum* and 13-15 μ m in *P. macrosporum*.

Additional specimens examined: Uttar Pradesh: Rae Bareli district; Pithan village, on lime plaster of old wall, 17.9.1963, Singh 74608, 74611 (LWG).

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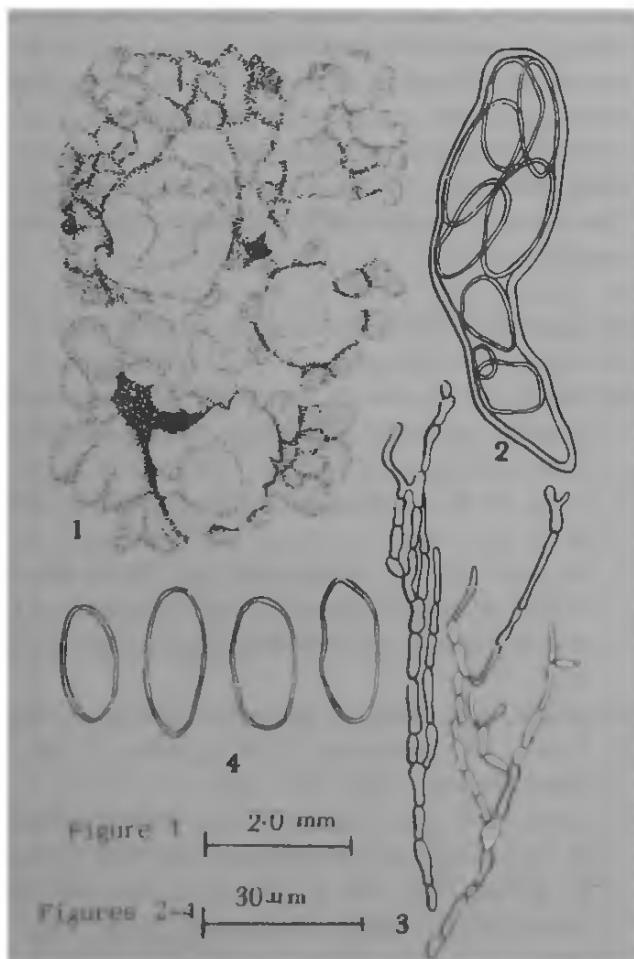
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FUSARIUM SOLANI CAUSING WILT OF EUCALYPTUS

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EUCALYPTUS tree is extensively planted in India for its rapid growth, timber and industrial wood, particularly for the paper industry¹. A large number of 2 to 3-year-old plants of *Eucalyptus camaldulensis* Dehnh were observed affected by wilt at a large plantation at Bilara near Pali. *Fusarium* was isolated from the roots of such wilted plants on potato dextrose agar (PDA) medium. Wilting plants showed yellowing and death of leaves in acropetal succession. The wilting plants defoliated and eventually collapsed. On the basal portion of infected plants, brown and black streaks representing discoloration of the vascular tissues, were visible under the bark. Certain infected plants showed only yellowing



Figures 1-4. 1. *Phylliscum indicum* Upreti Habit; 2. Asci with 8 spores; 3. Paraphyses, and 4. Spores.