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SOME NEW REPORTS ON KERATINOPHILIC FUNGI

NEETA NIGAM and R. K. S. KUSHWAHA
Department of Botany, Christ Church College, Kanpur 208 001, India

THE isolation of keratinophilic fungi and related dermatophytes by the hair baiting method has revealed their occurrence in the soil of various habitats of India and other locations[1-5]. Reports on the occurrence of keratinophilic fungi in stress habitats such as house dust are few. The present study provides information on the occurrence of keratinophilic fungi in house dust in India for the first time. The keratinophilic fungi and dermatophytes were isolated by hair baiting method[6, 7] and cultures were maintained on Sabouraud's dextrose agar at 30±2°C. Some of the fungi were also deposited at ITCC, New Delhi; IMI, Kew; and UAMH, Alberta.

Of the 91 house dust samples collected from 13 sites of Kanpur, India, 84.3% samples yielded 35 taxa, listed below in decreasing occurrence (%): *Chrysosporium carmichaeli* (100), *Chrysosporium farinicola* (100), *Myceliophthora* anamorph of *Corynascus novoguineensis* (100), *Chrysosporium tropicum* (100), *Arthroderma flavescens* (62.1), *Chrysosporium tuberculatum* (29.2), *Aphanoascus* species (19.5), *Chrysosporium* species (15.4), *Trichophyton flavescens* (14.4), *Chrysosporium keratinophilum* (14.2), *Chrysosporium merdarium* (14.2), *Chrysosporium queenslandicum* (14.2), *Microsporum* species (11.1), *Microsporum fulvum* (11.1), *Microsporum gypseum* (11.1), *Trichophyton vanbreuseghemii* (9.7), *Arthroderma gertleri* (7.3), *Arthroderma teereus* (7.3), *Chrysosporium crassitunicatum* (7.0), *Chrysosporium sulphureum* (4.8), *Chrysosporum indicum* (2.5), *Chrysosporium pannicola* (2.5), *Chrysosporium lucknowense* (2.4), *Myceliophthora* anamorph of *Arthroderma tuberculatum* (2.4), *Myxotrichum* (2.4), *Onygena* (2.4), *Ctenomyces serratus* (2.2), *Chrysosporium evolceanui* (1.0), *Acremonium obclavatum* (1.0).

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EPIDERMAL SURFACE PATTERNS OF ACHENE IN *ELEOCHARIS* R. BR. (CYPERACEAE)

S. K. VARMA, A. K. PANDEY and A. K. SINHA
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IN the Cyperaceae, scanning electron microscopic studies of achene surfaces provide criteria useful for the delimitation of taxa at various levels[1,2]. A perusal of the literature reveals that no work has been done on achene micromorphology in the genus *Eleocharis*. The present work was on *E. acutangula*. (Roxb.) Schult, *E. atropurpurea* (Retz.) Presl., *E. congesta* D. Don., *E. dulcis* (Burm. f.) Henschel, *E. palustris* (L.) R. & S. and *E. retroflexa* (Poir) Urb.

The genus *Eleocharis* of the tribe Cypereae (subfamily Cyperioideae, family Cyperaceae) inc-

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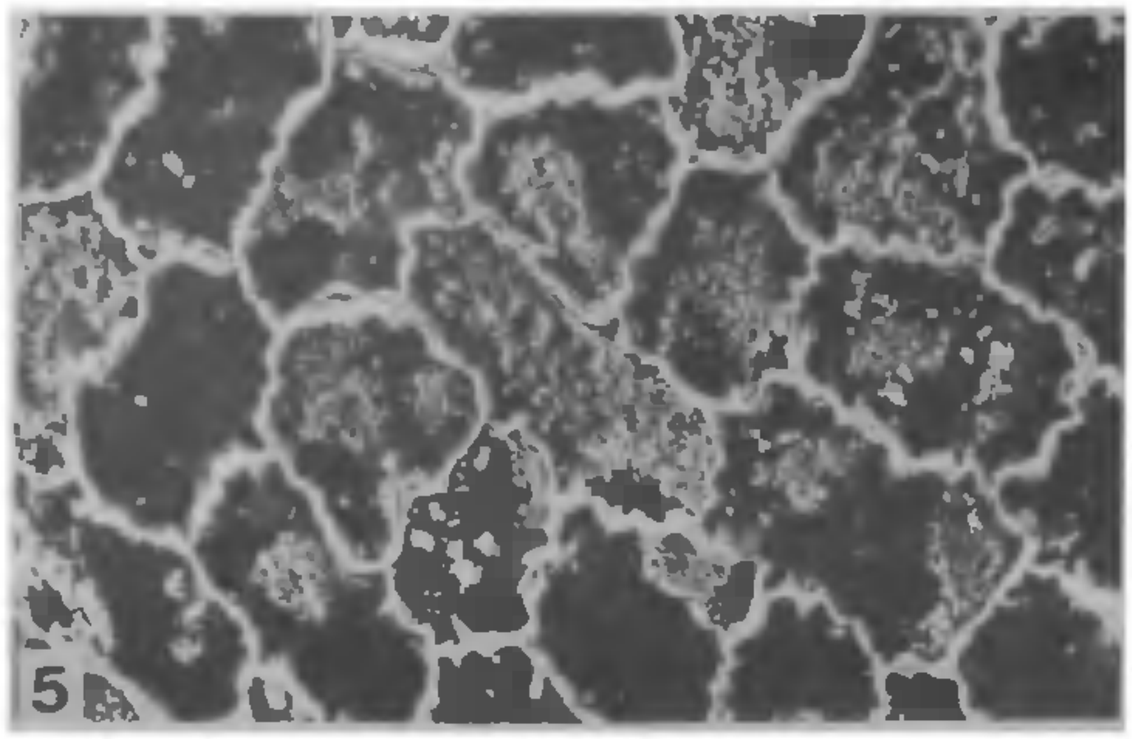

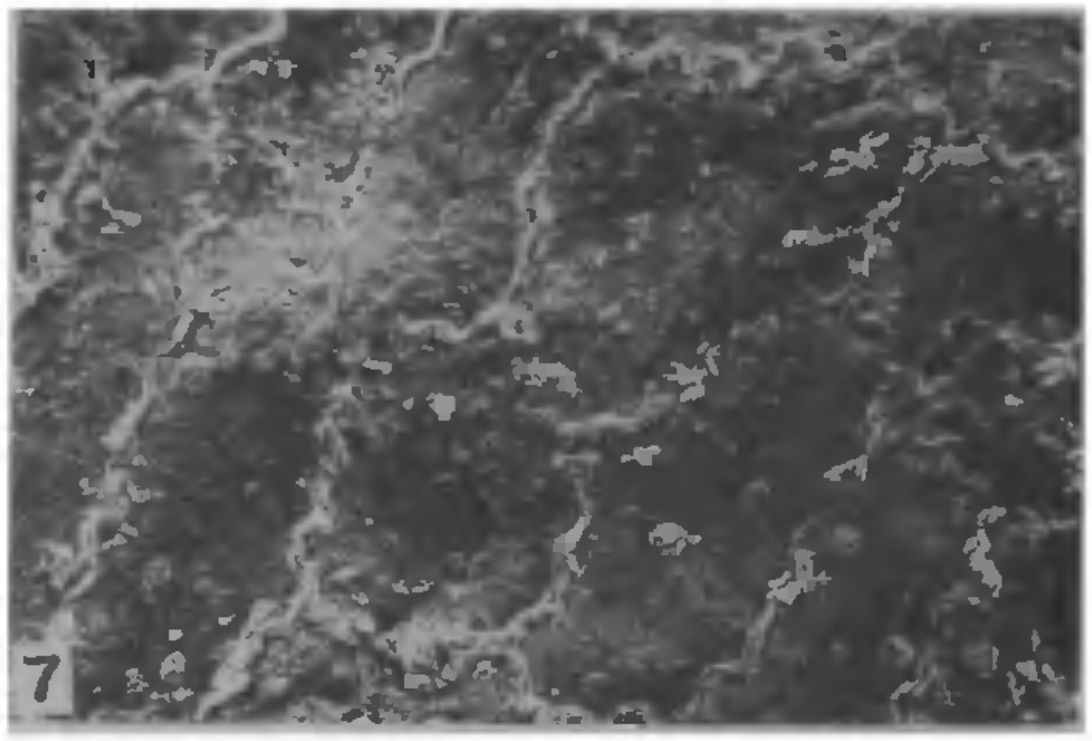

Figures 5–7. Scanning electron micrographs of achene epidermal cell surface of **5,** *E. palustris* (× 1000); **6,** *E. dulcis* (× 1000); and **7,** *E. congesta* (× 2000).

Both treated and untreated achenes were examined under a JEOL-JSM 35 C scanning electron microscope at the National Botanical Research Institute, Lucknow.

In *E. atropurpurea,* the epidermal cells of the achenes are small and show 4–8 anticlinal walls. The epidermal cells show polygonal outline and have more or less straight walls (figure 2). The epidermal cells in *E. retroflexa* are small and show broad anticlinal walls (figure 3). In *E. acutangula* epidermal cells are broader than long and are arranged in a parallel fashion (figure 4); the anticlinal walls are straight and thin. *E. palustris* shows epidermal cells with wavy and moderately thick anticlinal walls (figure 5). Epidermal cells in *E. dulcis* show polygonal outline (figure 6); the anticlinal walls are prominent and show characteristic perforations. *E. congesta* has epidermal cells with irregular outline (figure 7); the anticlinal walls are less prominent.

The epidermal patterns of *Eleocharis* achene surfaces can be used to distinguish the taxa as each species has its own characteristic ornamentation. Based on achene surface pattern, *E. palustris* (series Palustriformes) and *E. congesta* (series Multicaules) show close similarity. *E. acutangula* and *E. dulcis,* placed together in series Mutatae[6], show entirely different patterns (figures 4 and 6). *E. atropurpurea* (series Maculosae) and *E. retroflexa* (series Tenuissimae) remain distinctive from the other *Eleocharis* species studied presently. To elucidate the generic relationships of *Eleocharis,* a detailed study of achene micromorphological characters in other related genera is in progress.

The authors thank Shri V. K. Lall, NBRI, Lucknow, for help in SEM work and the Department of Environment, New Delhi, for financial assistance.

4 February 1989

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RELATIONSHIP BETWEEN PHOSPHATASE ACTIVITY AND SEX EXPRESSION IN *COCCINIA INDICA* W. & A.

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THE formation of stamen and ovary are the result of two different embryological events leading to the differentiation of male and female reproductive organs[1]. Plant growth regulators have been shown to regulate sex organ differentiations[2-4]. The activities of several enzymes seem to be affected by exogenous growth regulators[5,6]. Studies have been carried out to establish a correlation between enzyme activities and sex expression[6-8]. This report describes the patterns of acid and alkaline phosphatase distribution in vegetative and reproductive parts of male and female plants of *Coccinia indica*.

For enzyme analysis, vegetatively growing shoot tips, flower buds (5 mm in size) and mature flowers (at anthesis) were harvested from male and female plants of *C. indica* growing in the campus of the university. Known amounts of different tissues were homogenized in 0.1 M Tris–HCl buffer (pH 7.5) containing 5 mM 2-mercaptoethanol[9] using a chilled pestle and mortar. The homogenates were centrifuged at 12,000 rpm for 20 min at 0–4°C. The clear supernatants were used as enzyme source.

Acid and alkaline phosphatase activities were determined at pH 4.8 and 9.0 respectively disodium *p*-nitrophenylphosphate as substrate. The total and specific activity of each enzyme were expressed as units per gram fresh weight and units per milligram protein respectively. The units represent μg of *p*-nitrophenol produced per minute at 30°C. Protein was estimated colorimetrically by the procedure of Lowry *et al.*[10] using bovine serum albumin as standard. The experiments were repeated twice.

Acid phosphatase isoenzymes were separated electrophoretically on 7.5% polyacrylamide slab gels (1 mm thick). After electrophoresis, the gels were rinsed for about 30 min in sodium acetate buffer (pH 4.8). The buffer was changed every 10 min to lower the pH of the gel from 9.0 to 4.8. The gel was then transferred to a reaction mixture containing α-naphthyl phosphate and Fast Garnet GBC salt, and incubated at 30°C until brown bands appeared[11].

Changes in acid phosphatase and alkaline phosphatase activity in male and female plants/flowers were recorded (table 1). Marked differences in both total and specific acid phosphatase activity were observed between reproductive tissues of male and female plants. Male flower buds and mature flowers had significantly higher levels of acid phosphatase activity compared to female flowers. Total and specific activity of the enzyme increased in developing male reproductive organs. Specific acid phosphatase activity increased in developing female flowers also, but the total activity in female tissues was less than in vegetative tissues. Acid phosphatase activity in vegetative shoot tips of male and female plants were similar.

The highest alkaline phosphatase activity was recorded in male mature flowers and the lowest in female mature flowers (table 1). There was no marked difference in alkaline phosphatase activity between male and female vegetative tissues.

Three isoenzymes of acid phosphatase, designated A, B and C, were observed in vegetative shoot tips of

Table 1 *Acid and alkaline phosphatase activity in vegetative and reproductive tissues of male and female plants of Coccinia indica*

		Acid phosphatase		Alkaline phosphatase	
Sex	Developmental stage	(Units/g fr. wt)	(Units/mg protein)	(Units/g fr. wt)	(Units/mg protein)
Male	Vegetative shoot tips	41.0 ± 1.8	0.49 ± 0.02	10.0 ± 0.9	0.12 ± 0.01
	Flower buds	43.5 ± 1.8	0.91 ± 0.04	11.2 ± 0.2	0.23 ± 0.01
	Mature flowers	45.5 ± 4.2	1.20 ± 0.11	11.5 ± 0.7	0.29 ± 0.05
Female	Vegetative shoot tips	43.2 ± 1.3	0.48 ± 0.02	10.5 ± 1.1	0.12 ± 0.01
	Flower buds	33.0 ± 2.3	0.56 ± 0.04	3.3 ± 0.7	0.06 ± 0.01
	Mature flowers	33.3 ± 1.8	0.61 ± 0.03	2.8 ± 0.6	0.05 ± 0.01

Data represent mean of 3 replicates ± S.D.