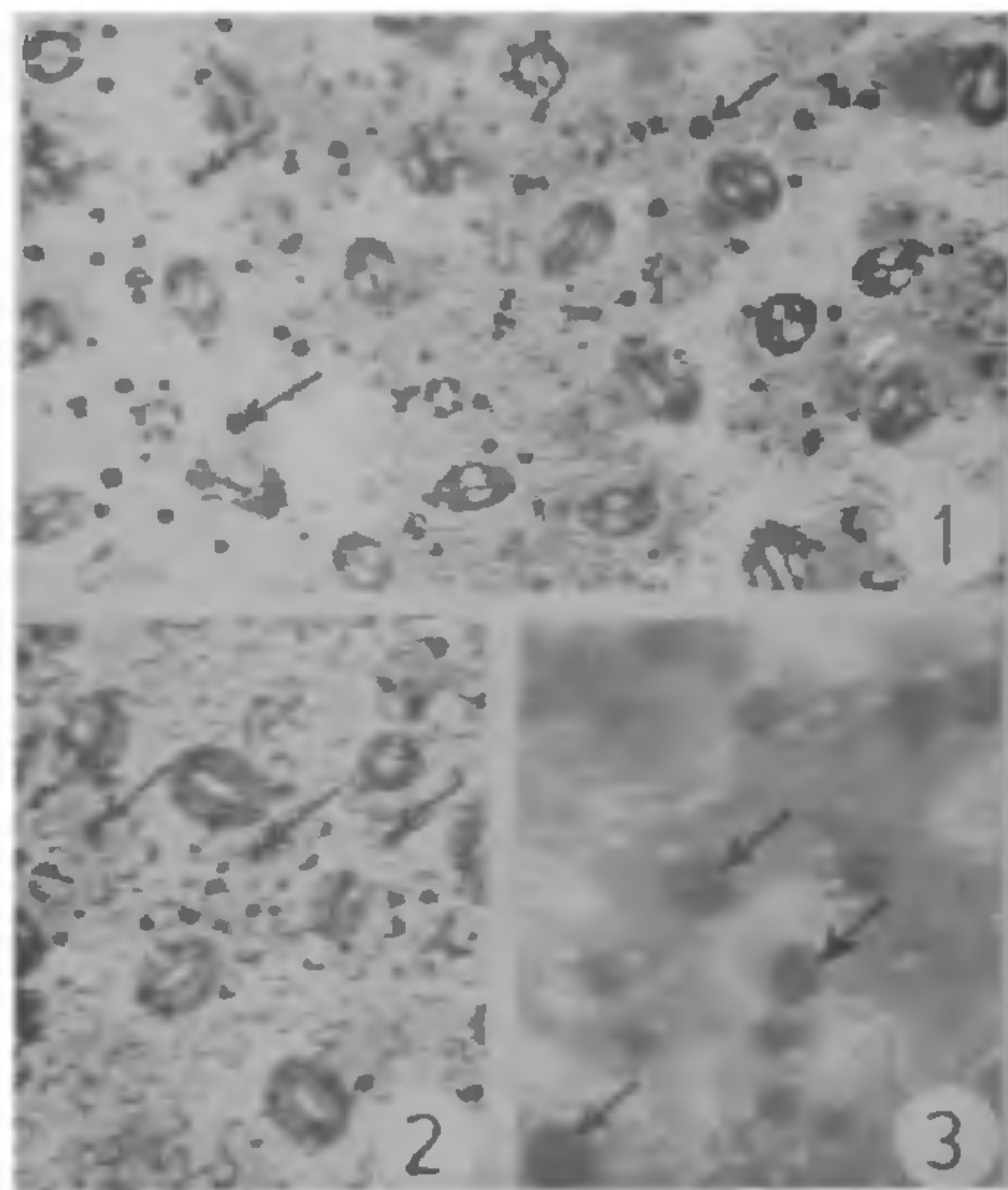


animal lysosomes<sup>9</sup> and plant vacuoles<sup>10</sup>, it was postulated that plant vacuoles are structurally analogous to animal lysosomes<sup>11, 12</sup>. The accumulation of neutral red<sup>10</sup> and acridine orange<sup>6</sup> in plant vacuoles has established the functional analogy of vacuole with animal lysosome.



**Figures 1-3.** Red cytoplasmic particles (RCPs) (arrows) in potato (*Solanum tuberosum* L.). 1. in cv. Kufri Chandramukhi ( $\times 550$ ) 2. in cv. Kufri Jyoti ( $\times 550$ ) 3. in cv. Kufri Khasigaro ( $\times 2500$ )

The red cytoplasmic particles of the present study are similar to lysosome-like particles of Wilson<sup>6</sup> and Pitt<sup>13</sup> and hence these may also be called as lysosome-like particles. The disruption of lysosome-like particles in potato during infection of *Phytophthora erythroseptica* has been reported<sup>14</sup> but their role is not clearly understood. The presence or absence of lysosome, their number, size and rate of appearance in different tissues of potato and their relationship, if any, with susceptibility and resistance to diseases is being investigated.

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### THREE NEW RECORDS OF *HELVELLA* FROM INDIA

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LLOYD<sup>1</sup> was the first mycologist to report 2 species of *Helvella* from India viz., *H. crispa* (Scop.) Fr. and *H. fragesii* Pat. In India, many species of *Helvella* were collected<sup>2-6</sup> from hilly areas of Kashmir, Panjab, U. P. and West Bengal, and a total of 18 species have so far been described.

In the present paper 3 more species of *Helvella* viz., *H. costifera* Nannf., *H. lacunosa* Afzel., and *H. macropus* Karst. (figure 1) have been described. The materials have been deposited in the herbarium, Botany Department, Kumaun University, Nainital.

#### 1. *Helvella costifera* Nannf.

Pileus globose and cup-shaped at first, becoming almost plane or arched near the margin and the extreme edge; margin free; hymenium greyish brown with a purple tinge, irregularly wrinkled or nodulose with more or less prominent ribs spreading from the base; pileus narrowed below into a stem like base; stipe solid, ribbed, 1.5-3.5  $\times$  0.2-0.8 cm; hypothecium and excipulum formed of stout, interwoven hyphae which become compact to form the cortex; hymenium 250-350  $\mu$ m broad, asci cylindrical with slightly trun-

cate apex, 8-spored; ascospores obliquely 1-seriate, smooth, continuous, elliptical with a prominent apiculus at each end, usually 3-guttulate,  $27-35 \times 11-14 \mu\text{m}$ ; paraphyses brown, stout and clavate, septate,  $7-9 \mu\text{m}$  broad.



**Figure 1.** *Helvella costifera* 2. *H. lacunosa* and 3. *H. macropus*.

**Habit and Habitat:** Terricolous, fruiting gregariously in shady places, collected near Botany Department, D. S. B. College, Nainital, N 522, September 17, 1981.

### 2. *Helvella lacunosa* Afzel.

Pileus irregular, more or less irregularly inflated, irregularly lobed, lobes drooping and attached to the stem, dark grey or blackish grey; margin free; hymenium greyish-black to black; stem creamish white, solid,  $2.5-10.5 \times 0.5-1.5 \text{ cm}$ , variously ribbed or lacunose, pallid; excipulum composed of densely interwoven hyphae, hyphae septate, running out at the periphery,  $10-20 \mu\text{m}$  broad at the tip; hymenium  $200-325 \mu\text{m}$  broad; asci cylindrical, 8-spored; ascospores smooth, hyaline, obliquely 1-seriate, broadly ellipsoidal, ends obtuse with a large oil globule,  $18-20 \times 10-12 \mu\text{m}$ ; paraphyses brownish, septate becoming gradually clavate,  $6-10 \mu\text{m}$  broad at the tip.

**Habit and Habitat:** Solitary to gregarious under hardwood forests, Collected from D. S. B. College, Nainital, N 531, September 21, 1981, and Chaubattia Garden Road, Ranikhet, Almora N 537, September 27, 1981.

### 3. *Helvella macropus* Karst.

Pileus subglobose, margin incurved at first, expanding with age; Hymenium brown, externally greyish to black, minutely rough with small irregular warts formed by the outgrowth of hyphae; stipe clavate, more or less lacunose, imperfectly hollow with age,

greyish, covered with very minute velvety warts, stem in some cases paler towards the base,  $3-7 \times 0.2-0.5 \text{ cm}$ ; excipulum consists of densely interwoven hyphae which become pseudo-parenchymatous in the cortex; hymenium  $250-300 \mu\text{m}$  broad; asci 8-spored; ascospores 1-seriate, smooth, hyaline, elliptical,  $27-34 \mu\text{m}$ ; paraphyses brown, clavate and straight,  $8-10 \mu\text{m}$  broad at the tip.

**Habit and Habitat:** Solitary on the ground in shady places, collected near the Canteen, D. S. B. College, Nainital, N 523, September 17, 1981.

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## COWPEA TOP NECROSIS - CAUSED BY *FUSARIUM EQUISETI* (CORDA) SACC.

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DURING the course of a survey of cowpea crop for seed-borne virus diseases, certain cowpea plants were observed to be stunted in growth due to necrosis of apical buds. The axillary buds proliferated giving the plants a bushy appearance. Leaves of such plants were shrivelled with petioles drying and drooping. Water-soaked areas on stem developed into brown lesions which were most prominent at the collar region. Roots were also not fully developed. Whenever such plants flowered, no pods were formed (figures 1-3).

A similar disease on cowpea-cowpea top necrosis-causing necrosis of apical buds was described earlier<sup>1</sup>; wherein the association of a spherical virus was reported. Therefore, at first the sap from diseased plants was rub inoculated on various hosts used for virus work. Axillary sprouts from infected plants were