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EFFECT OF QUINONE EXTRACTED FROM *PYXINE PEFRICOLA* NYL. ON MITOSIS IN *ALLIUM CEPA* L. ROOT MERISTEMS

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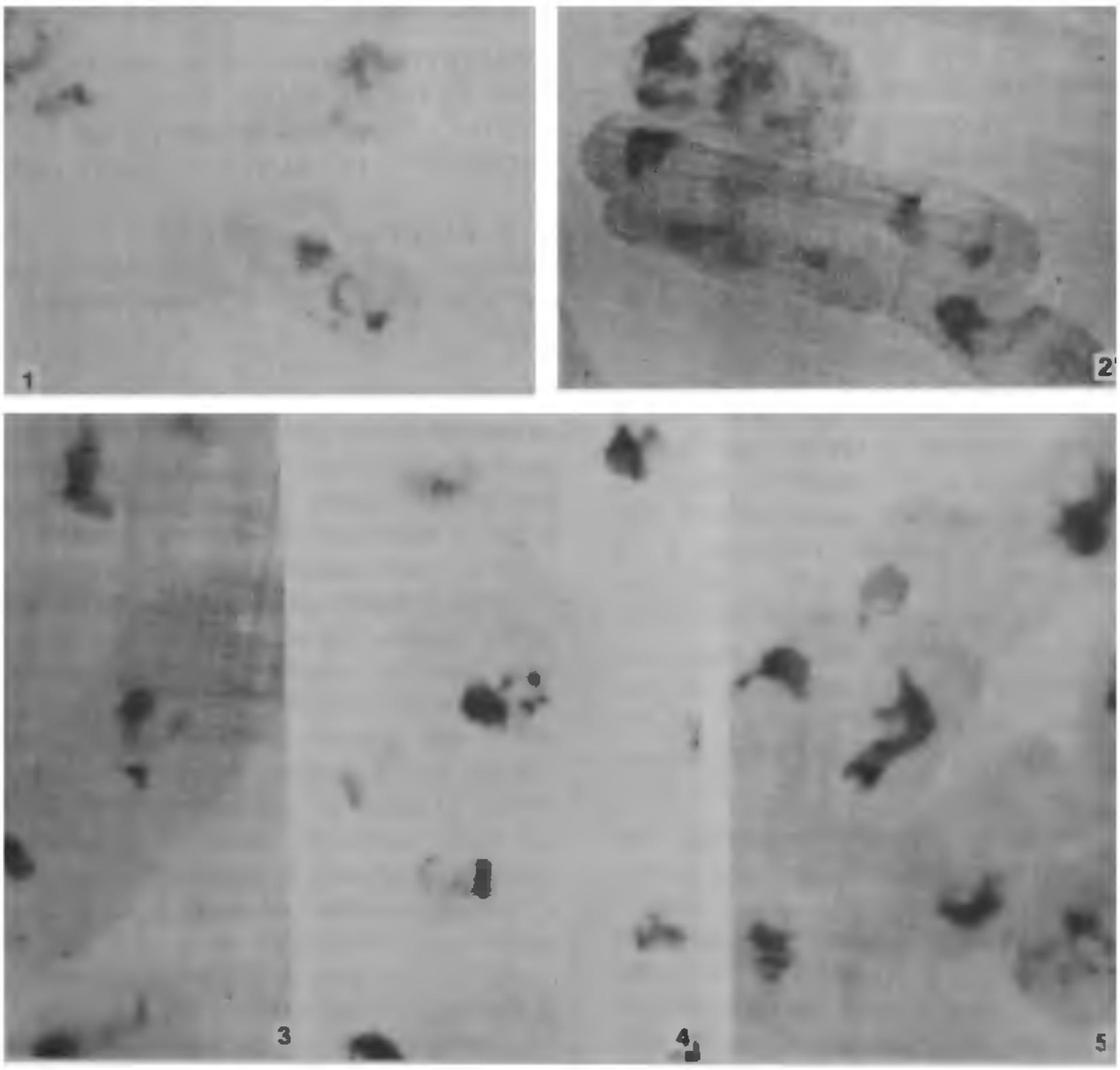
EXTRACTS of lichens are known to exhibit antibiotic[1], fungistatic[2] and mitosis-inhibitory[3–5] properties. In the present work an attempt has been made to study mutagenic effects of a newly synthesized and



Figures 1–5. Chromosome aberrations induced by quinone compound extracted from *Pyxine pefricola* Nyl. in root tip cells of *Allium cepa* L. (×675). **1,** Laggards and sticky chromosomes at telophase; **2,** bipolar unequal nuclei; **3,** tripolar unequal nucleus; **4,** stickiness and clumped chromosomes; **5,** nuclear stickiness causing deformation in nuclei.

identified quinone compound, extracted for the first time from the lichen species *Pyxine pefricola* Nyl., following the method described earlier[1,5,6]. In squash preparations the authors noticed some chromosomal aberrations and mitosis-inhibitory action of the compound.

Germinating bulbs of *Allium cepa* L. with 2–3-cm-long roots were kept in 0.01, 0.02, 0.05 and 0.1% of the compound in 1% aqueous NaOH (cytological study was made in alkaline medium as the compound was insoluble in water) for 6 h at 28 ± 2°C. Controls, in 1% NaOH solution, were also kept. After the treatment the root tips were fixed in a mixture of absolute alcohol and acetic acid (3:1), hydrolysed in N HCl at 60°C for 3–5 min, and squashed in haematoxylin. Nearly 10,000 cells (dividing and non-dividing) were screened in each experiment. In every slide the numbers of cells in prophase, metaphase, anaphase and telophase, and aberrant phases were counted. Mitotic index (MI) was calculated on the basis of number of dividing cells per 100 observed, while phase indices were calculated on the basis of ratio of number of cells observed in a given phase to total number of dividing cells. The χ^2 test was employed to find the significance of differences between control and treated plants.

The effect of the compound on cell division can be recognized by its reduction of MI and inhibition of anaphase. The decline in MI (except at 0.02%) is concentration-dependent (MI values: control (1% NaOH), 7.837; 0.01% quinone compound, 6.793; 0.02%, 7.228; 0.05%, 4.174 and 0.1%, 2.685). The proportions of cells in various phases were determined and the data suggest that the compound causes concentration-dependent inhibition of anaphase (anaphase index values: control, 162.116; 0.01%, 121.321; 0.02%, 91.425; 0.05%, 27.227 and 0.1%, 4.978).

Laggards and sticky chromosomes, bipolar and tripolar unequal sister nuclei, stickiness and clumping of nuclei and chromosomes (figures 1–5), bridges, split spindles, and c-mitotic cells and binucleate cells were also noticed. Root tips treated with 1% NaOH solution (control) showed very few aberrations. However, total per cent aberrations varied with concentration of the compound (per cent chromosome aberration: control, 0.910; 0.01%, 3.117; 0.02%, 4.959; 0.05%, 6.538 and 0.1%, 5.255). MI and per cent chromosome aberrations at 0.05 and 0.1% concentrations were significantly different.

6 February 1989

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COMPETITIVENESS OF HOMOLOGOUS AND HETEROLOGOUS *RHIZOBIUM* FOR NODULATION AND GROWTH OF PIGEONPEA [*CAJANUS CAJAN* (L.) MILLSP]

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CULTIVATED soils in many parts of India are known to contain diverse groups of rhizobia that infect and produce nodules on a large number of species of the family Leguminosae. Thus a legume growing in such a soil is nodulated by all those rhizobia that can infect the host regardless of their effectiveness, unless the host is highly specific in its *Rhizobium* requirements. Besides, high competitive ability of *Rhizobium* is an important criterion for strain selection[1].

Failure of inoculation response could be due to either the presence of adequate population of efficient native rhizobia capable of nodulating the legume or failure of the inoculant strain to compete out native inefficient strains[2]. The present experiment was conducted to study the competitiveness of a homologous (effective) strain in the presence of a heterologous (ineffective) strain and the effect on nodulation and growth of pigeonpea [*Cajanus cajan* (L.) Millsp], an important pulse crop.

Competitiveness of homologous *Rhizobium* strain UASB 722 in the presence of heterologous strain UASB 11 was studied using Leonard jar technique[3]. The experiment involved inoculating host plants with the two strains in various proportions: (i) Control (uninoculated), (ii) UASB 722 only, (iii)