

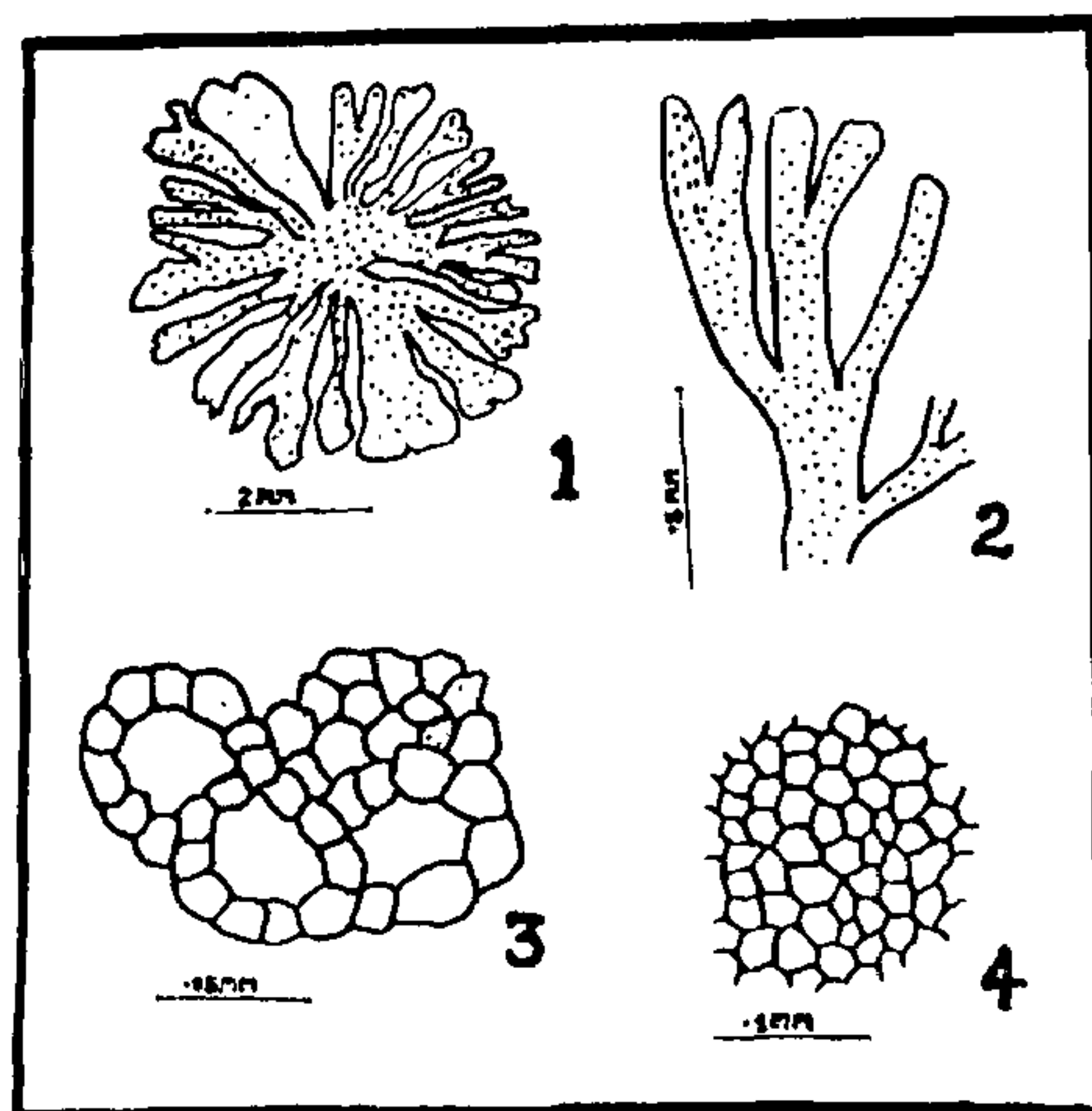
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### FIRST PETRIFIED FOSSIL *RICCIA* L. FROM INDIAN BEDS

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IN this note, a fossil bryophytic thallus resembling *Riccia*, is described from the Deccan Intertrappean beds of Mohgaon-Kalan, M. P. India, for the first time. The specimen is silicified and studied through horizontal and vertical planes. It is in circular rosette of thalli 6.5 × 6 mm in size (figure 1). Each thallus is 2-3 × 1-2 mm in size, dichotomously branched and with linear to obcordate parallel segments (figure 2). From the surface view, the thalli appear to be flat and spongy.



The dorsal surface anatomy shows numerous narrow air spaces 45-60 μ in diameters (figure 1). Each air space is encircled by layer of 7-8 parenchymatous, oval to angular cells (figure 3). These cells are full of brownish depositions possibly representing the fossilized chloroplasts. Moreover these are arranged in vertical columns as evident from its vertical view. This suggests an assimilatory zone of the thallus. The epidermis is not preserved. The lower ventral region of

### FLOWERS AS SOURCE MATERIAL IN CHROMATOGRAPHIC DETECTION OF CITRUS GREENING DISEASE

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GENTISOYL-B-D-Glucose is known to be present in the roots, leaves, twigs and fruits of greening infected citrus plants and has been used as 'marker' for the detection of greening disease<sup>1, 2, 3</sup>. However, so far no work has been reported regarding its distribution in different flower components of diseased citrus trees. In order to obtain this information, flowers were collected from greening infected and greening-free healthy blood red and musambi sweet orange trees. Different flower components, namely petals, sepals, pedicel, carpel and stamen were separated and extracted individually with 70% ethanol to detect greening marker substance (GMS). The GMS was estimated by thin layer chromatographic technique<sup>1</sup> using benzene: acetic acid: water (6:7:3 V/V/V) as solvent.

The results revealed that GMS was present in detectable amounts in all the flower parts of greening infected trees excepting stamen (filament + anther). The concentration was highest in carpels. The amount of GMS in complete flowers was as high as 2.5 mg/g fresh tissue in each cultivar. It was, however, absent in the flowers obtained from healthy virus-free trees. Since flowers from greening infected blood red and musambi contained detectable amount of GMS, these organs may also be used for chromatographic detection of greening.

the thallus is composed of compactly arranged parenchymatous cells devoid of intercellular spaces (figure 4). They are angular, thin walled and without any deposition in their lumen. This can be the storage zone of the thallus. The rhizoids, scales, sex organs and sporogonia are not found.

The morphological pattern of thalli; their dichotomous branching with linear to obcordate, paralleled segments; flat, dorsiventral spongy nature of the thallus; dorsal assimilatory zone with air spaces and ventral storage parenchyma, suggest an approach to the vegetative form of *Riccia frostii*, Aust. Hence it is named as *Riccia chitaleyii* sp. nov. after an eminent palaeobotanist Dr (Mrs) Chitaley.

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### EFFECT OF IRRADIATION AND CENTRIFUGATION ON SEEDLING ENANTIOMORPHISM IN GREEN GRAM AND BLACK GRAM

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ENANTIOMORPHIC structures in plants and plant organs have been reported by several workers in recent years. Interestingly a correlation exists between enantiomorphic structures and several morphological, anatomical and physiological characters and in turn on yield in crop plants.<sup>1,2</sup> However, the enantiomorphism with regard to the twisting of the plant and plant organs either to the left or to the right directions is non-Mendelian. The exact genetic basis that controls this phenomenon is not known.<sup>3</sup> During the course of our investigations on enantiomorphic seedlings of green gram and black gram and its possible influence on the yield, the plants developing from the left-handed seedlings gave nearly 20% higher yield as compared to the right-handed ones. In this communication we report the effect of X- and gamma irradiation and centrifugation to determine the influence of these on seedling enantiomorphism so as to fix the desired type of seedling.

Pre-soaked (3 hr) seeds were subjected to centrifugation and X- and gamma irradiation for 1, 3, 5, 7, 9, 10 and 15 dosages. A set of 1,600 pre-soaked seeds of green and black grams were centrifuged (refrigerated) at 15,000 rpm for 1 hr. The seeds were later sown in the earthen pots. The seedlings were

classified for their enantiomorphism and scored following the usual procedure.<sup>4</sup> The data were statistically analysed.

In the green gram, out of a total of 1193 seedlings scored following X-irradiation, the R-handed seedlings were significantly higher (57.7%) than the L-handed seedlings. Hence, X-irradiation seems to affect the L/R ratio of enantiomorphism of seedlings. If the effect of individual dosages is considered, there were no significant differences in lower doses. However, at 15 kR the normal ratios were much disturbed (L-handed seedlings were 58.1%). On the contrary, the effect of X-irradiation seems to be ineffective in black gram where out of 1024 seedlings only 321 (40%) were L-handed as in control. It is evident that X-irradiation drastically affects seedling enantiomorphism itself as the occurrence of the number of seedlings with no overlapping and neutral seedlings were substantial contrary to controls where the incidence of neutrals was negligible and seedlings with no overlapping were totally absent.

Data on the effect of gamma irradiation with the same doses on seedling enantiomorphism in green gram also gave higher value for L-handed seedlings (58.2%) as compared to R-handed ones (41.7%). In black gram, however, the effect of gamma rays was two-fold. There was significantly higher incidence of the L-handed seedlings contrary to higher number of the R-handed seedlings in controls and X-irradiated material. Secondly, a drastic reduction in the number of neutral seedlings was also observed. This shows that gamma rays are ideal for altering the ratio of the L- and R-handed seedlings in the desired direction in black gram. The studies on the effect of the X-irradiation on the seedlings and spikelet handedness in Einkorn wheats by Ono *et al.*,<sup>5</sup> showed changes in the ratio of the left and right-handed seedlings and spikelets and reduction of the mean concordance proportions and its transmission to subsequent generations. More work using higher doses of X- and gamma irradiation may give useful results.

Besides the effect of ionising radiations, the influence of centrifugation was also observed. Out of 1,500 seedlings in green gram scored, 756 were the L-handed and the rest were the R-handed. Seedlings<sup>3</sup> with no overlapping were not observed. Test of significance also shows the unity of the L- and R-handed seedlings in contrast to the ratios of controls where the R-handed seedlings were significantly high (64.5%). In black gram also equal ratios (L- 49% and R- 50.5%) were obtained after centrifugation. Reddy and Srinivasachar<sup>6</sup> opine that due to centrifugation a pseudo gravity sets in and this interferes with the cell division and hence the alterations in the ratios of the L- and R-handed seedlings presently studied could be due to this.

From the foregoing, it is clear that the external