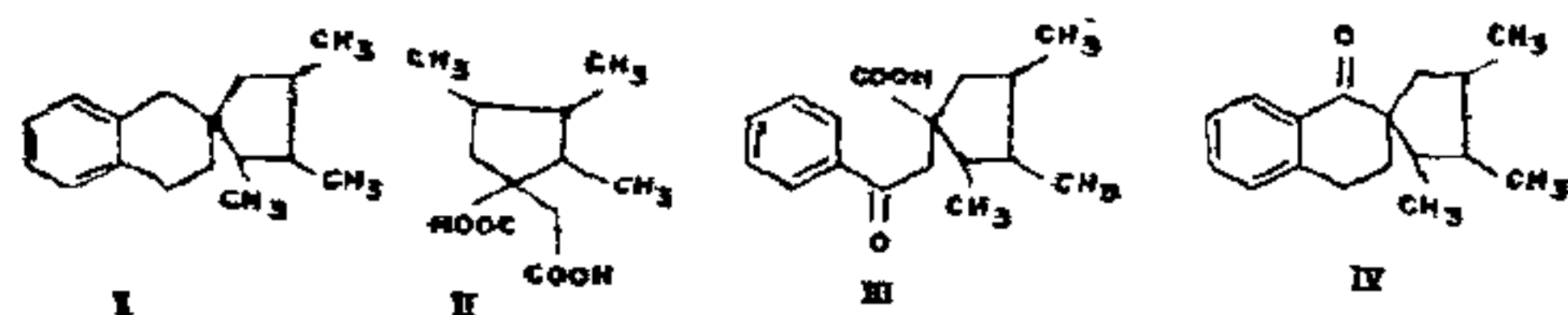


resulting  $\beta$ -iodo butyric acid in the presence of copper powder<sup>3</sup>. The resulting  $\beta\gamma$ -dimethyl adipic acid through esterification, Dieckmann cyclisation followed by alkylation in acetone solution in the presence of anhydrous  $K_2CO_3$  and subsequent hydrolysis afforded 2,3,4-trimethyl cyclopentanone b.p. 170-175°, semi carbazone m.p. 175°. Condensation of this ketone with ethyl cyano acetate followed by addition of KCN in aqueous alcoholic solution and subsequent hydrolysis of the dicyano ester by 6N HCl furnished 2,3,4-trimethyl cyclopentane-1-carboxy-1-acetic acid (II) m.p. 153°, anhydride b.p. 153°/3 mm, anilic acid m.p. 176° in 85% overall yield.



The anhydride of the acid (II) on Friedel-Crafts condensation with benzene in the presence of  $AlCl_3$  gave  $\alpha\alpha$ -(2,3,4-trimethyl cyclopentane)- $\beta$ -benzoyl propionic acid (III) m.p. 118°, D.N.P. derivative m.p. 207° which on catalytic reduction in a Paar apparatus at 60° in ethanolic solution furnished  $\alpha\alpha$ -(2,3,4-trimethyl cyclopentane)- $\gamma$ -phenyl butyric acid, b.p. 180°/0.8 mm. This was cyclised in quantitative yield by PPA to 3',4'-dihydro spiro-[2,3,4-trimethyl cyclopentane 1,2'-(1'-H)-naphthalene]-1'-one (IV), b.p. 140°/1 mm (carbonyl stretching at  $5.95\mu$ ), which on Clemmensen reduction gave the desired spirane (I) b.p. 120-122°/1 mm.

The hydrocarbon underwent smooth rearrangement on heating with 10% Pd-C catalyst at 330° by fission of the spiro cyclopentane away from the substituents followed by angular cyclisation and dehydrogenation yielding 1,2,3-trimethyl phenanthrene<sup>4</sup>, m.p. 63°, picrate m.p. 185°. T.N.B. complex m.p. 198°.

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## A NOTE ON THE NEWLY DISCOVERED COLUMBITE-TANTALITE, BERYL AND CASSITERITE BEARING PEGMATITES IN KATEKALYAN AREA, BASTAR DISTRICT, MADHYA PRADESH

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OCCURRENCE of columbite-tantalite, beryl and cassiterite in the pegmatites of Tongpal valley of south Bastar has come to limelight in recent years. The general trend of the pegmatite belt in this area is NW-SE. Intensive surveys carried out around Katekalyan, helped in not only establishing the north western continuity of the pegmatite belt, but also in proving that the pegmatites in this region are richer in columbite-tantalite and beryl than in the south eastern region. Katekalyan village ( $18^\circ 48' 10''$ ;  $81^\circ 37' 50''$ ) is located about 20 km north-west of Tongpal in top-sheet No. 65F/9. The area is approachable by fair weather roads from Darbha and Dantewara.

The rock units exposed in the area are andalusite schist, quartz-muscovite schist and quartzite belonging to the Bengal group of metasediments (Archean) intruded by basic sills. These are later intruded by granite, pegmatite, quartz vein and basic dykes. Kurnool(?) sedimentaries (upper pre-cambrian) comprising of conglomerate, quartzite, ferruginous shale and limestone unconformably overlie these rocks.

Columbite-tantalite, beryl and cassiterite bearing pegmatites have been discovered near Parcheli, Katekalyan, Metapal, Bodenar and Jamair. These pegmatites are emplaced along fractures in basic rock near its contact with quartz-muscovite schist or granite. In general the pegmatites are lensoid and sheet like bodies varying from 10 m to 150 m in length and 1 m to 20 m in width.

The rare metal bearing pegmatites in this area are mostly of asymmetrically zoned type with prominent quartz core, perthite and quartz-perthite, muscovite intergrowth zones. Replacement zones with cleavelandite and interlocked green muscovite replacing perthite are noticed in some pegmatites. Samples of columbite-tantalite from the above pegmatites have analysed from 31.4% to 51.42%  $Ta_2O_5$ , 11.1% to 44.0%  $Nb_2O_5$  and less than 0.1% to 9.27%  $SnO_2$ . Beryl samples from these pegmatites have analysed up to 9.2%  $BeO$ . The cassiterite occurring in a pegmatite analyses 86.3%  $SnO_2$ , 2.8%  $Ta_2O_5$  and 1.3%  $Nb_2O_5$ .

The studies so far carried out in Bastar-Koraput pegmatite belt indicate that incidence of cassiterite is more than that of columbite-tantalite in pegmatites

like those of Govindpal, Kudripal, Mundval, Mundaguda and Domaguda in the south eastern region of the belt (with Tongpal as the centre of the belt) and columbite-tantalite predominates over cassiterite in pegmatites of the north-western region of the pegmatite belt.

Detailed surveys, estimation of ore reserves and recovery of columbite-tantalite by physical beneficiation methods have already been taken up in the area by Atomic Minerals Division of Department of Atomic Energy.

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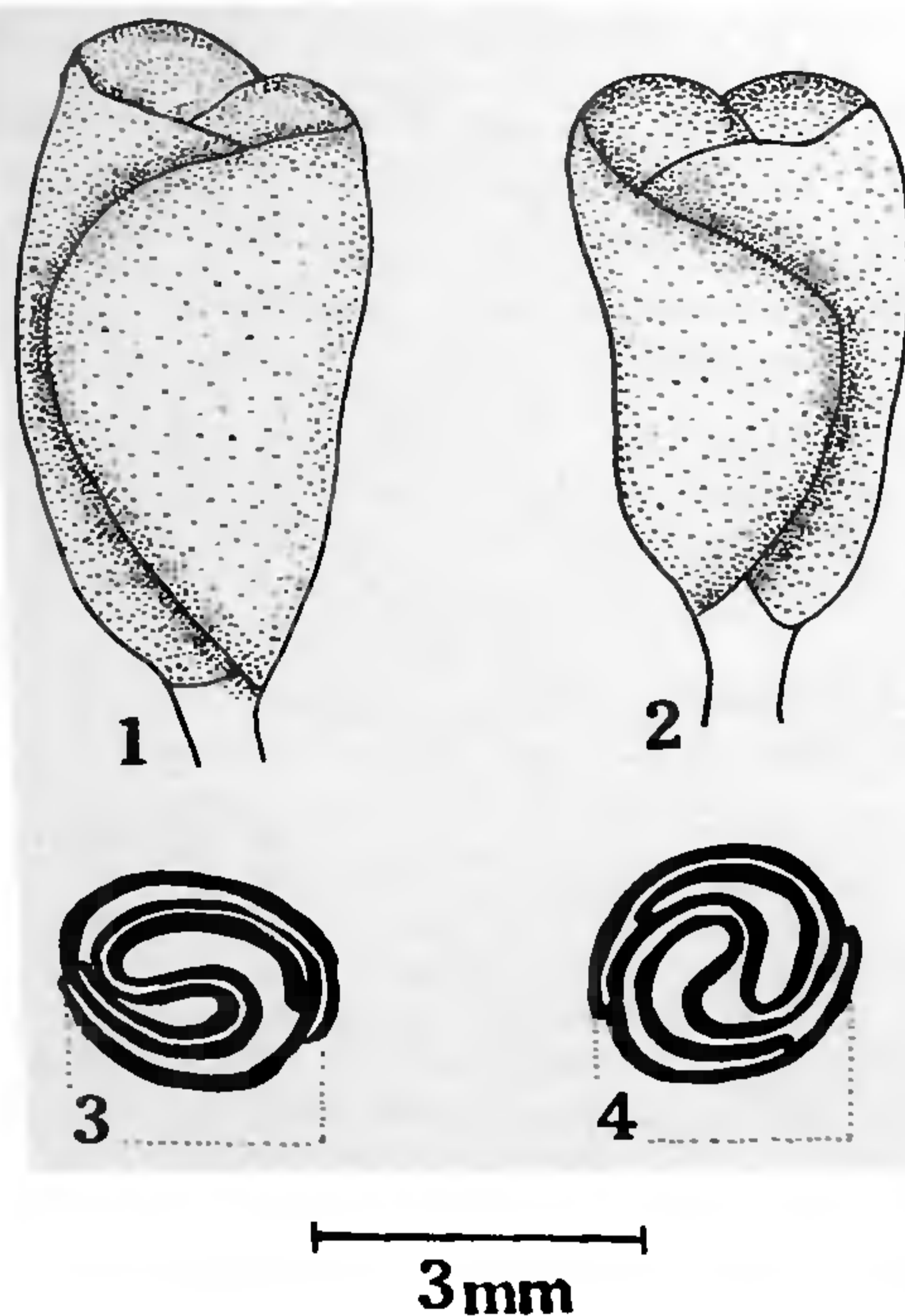
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### SEEDLING ENANTIOMORPHISM IN BUCKWHEAT (POLYGONACEAE)

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ENANTIOMORPHISM or handedness in plants is based on the twisting of plant or organs forming mirror images and has been defined as stereobotany<sup>1</sup>. Handedness with regard to leaf arrangements in clockwise or counter clockwise or manner has been studied in several plants<sup>2-5</sup>. The usefulness of seedling handedness in taxonomy has not been fully explored. Recently, Bahadur and Rao<sup>1</sup> and Bahadur *et al.*<sup>6</sup>, have shown the importance of seedling handedness in the taxonomy of Fabaceae and Gramineae, these are the only record in dicotyledons. The present report described seedling handedness in *Fagopyrum* Mill. (Buckwheat) Polygonaceae.

*Fagopyrum esculentum* Moench. (4 cvs.), *F. tataricum* (L.) Gaertn. (6 cvs.), *F. sagittatum* Gilibert. and *F. kashmirianum* have been investigated. Seeds of *F. esculentum* and *F. tataricum* were obtained from National Bureau of Plant Genetic Resources, New Delhi, and Botany Department, Kashmir University. Seeds were sown in petridishes on moistened filter paper. After germination the first pair of seedling leaves were carefully observed and on the basis of the vernalion the seedlings were scored as left and right



Figures 1-4. 1 & 2. Left and right handed seedlings of *Fagopyrum esculentum* showing overlapping of the first pair of leaves towards the left and right hand respectively. 3 & 4. The same shown in cross section showing vernalion in clockwise and counter clockwise direction.

handed following the procedure of Bahadur and Rao<sup>1</sup>.

For the distribution of left and right handed seedlings in different species and cultivars of *Fagopyrum* (table 1), 730 seedlings were examined. Of these 358 (49%) were left and 372 (51%) right handed. Statistically significant differences among the left and right handed forms of seedlings were evident. However, the deviation from equality was observed when the various cultivars under each species were considered. A significant difference from equality in left and right handed seedlings was observed in *F. esculentum*, IC 16555 in which an excess was observed in left handed seedlings ( $L/R = 2.2$ ). *F. kashmirianum* also showed similar feature ( $L/R = 1.75$ ); so has been the one in *Psophocarpus tetragonolobus* and *Erythrina stricta*<sup>1</sup>. In general, the various cultivars of *F. tataricum* exhibited more R-handed than L-handed see-