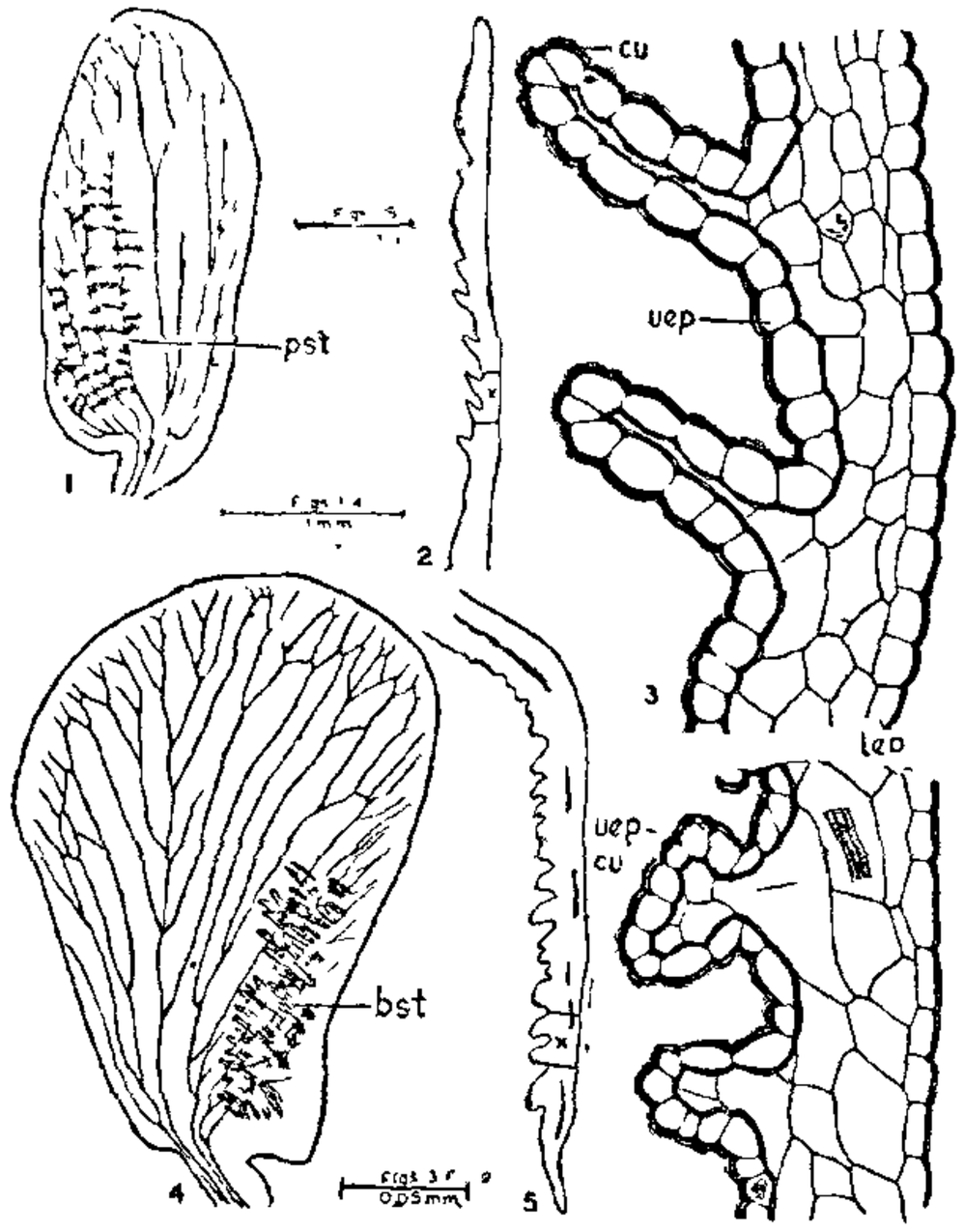
In *Tephrosia* species, in a longitudinal section, these structures appear as ridges. The cells of upper epidermis are small and thick-walled. Outer tangential walls are thicker in comparison with inner tangential walls. The cells of lower epidermis are tangentially elongated with the thickenings on outer tangential walls only. Both the epidermal layers are lined by smooth cuticles. In the region of a band the upper epidermis along with the parenchymatous tissue forms a ridge-like structure (Figs. 5, 6).



FIGS. 1–6. Figs. 1–3. *C. burhia*. Fig. 1. Pocket-shaped structures on the wing petal. Fig. 2 Outline of the same, in l.s. Fig. 3. Portion marked 'X' in Fig. 2, cellular details. Figs. 4–6. *T. hamiltonii*. Fig. 4. Band-like structures on wing petal. Fig. 5. Outline of the same, in l.s. Fig. 6. Portion marked 'X' in Fig. 5, cellular details.

(*bst*, band-like structures; *cu*, cuticle; *lep*, lower epidermis; *pst*, pocket-shaped structures; *uep*, upper epidermis.)

It is difficult to attribute any function to these structures. Faegri and Pijl[1] mentioned some folds on the wing petals of Leguminosae, while discussing the pollination ecology of the family. They described that these structures are meant for connation between wing and keel petals. However, no connation is observed in these petals and since they are present along the outer face of the wing petals only, such a connation is not possible.

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Jaipur, *August* 27, 1976.

1. Faegri, K. and Pijil, L. V., *The Principles of Pollination Ecology*, II ed., Pergamon Press, Oxford, 1971.

PARTHENIN—A PRETREATMENT REAGENT FOR CHROMOSOMES

Parthenium hysterophorus L., a troublesome weed in several parts of India, is found to contain growth toxins. Parthenin, which is the principal component of the inhibitors, constitutes 0·32% by dry weight of the leaves and causes inhibition of linear growth in seedlings of wheat and other crop plants. Hence, a study of the effects of this sesquiterpene lactone on different aspects of cell division in relation to inhibition of root growth was made. It was also examined whether this toxic principle could serve as a pretreatment reagent in the preparation of root tip squashes for karyotype analysis.

Parthenin was obtained in crystalline form from the aqueous leachate of the aerial parts of the weed following the method of Sukhada[1], with slight modification discussed later. Root tips of *Zephyranthes rosea* Herb., *Chlorophytum elatum* R. Brown and *Parthenium hysterophorus* L., 2 mm long were excised from healthy plants, washed with tap water followed by distilled water and treated with 0·5% solution of parthenin for 1 hr. Controls were treated similarly with distilled water. Roots from onion bulbs, growing actively in water, were also treated with the test solution for 1 hr, 24 hr and 48 hr. After the treatment, the root tips were fixed in Carnoy's fluid at room temperature. Using root tips of 1 mm length, 20 aceto-orcein squashes were prepared for each treatment. In each, the number of metaphase plates in 200 cells was scored in the region showing maximum cell division. Percentage of cells showing abnormalities was recorded, as also the qualitative nature of the affected cells.

In all the four species tested, 1 hr treatment caused mitotic arrest resulting in high frequency of metaphase plates. Chromosomes were well spread and condensed compared to those in preparations following distilled water treatment (Figs. 1, 2 and 3). In onion, 24 hr and 48 hr treatment caused cessation of root growth and several abnormalities like anaphase inhibition, chromosomal laggards, stickiness, vacuolisation (Fig. 4), irregularly shaped nuclei and binucleate cells. The treatment for 24 hr caused abnormality in 46% of the cells and with 48 hr treatment it increased to 85%.

Thus, pretreatment of the roots with 0·05% aqueous solution of parthenin for 1 hr is beneficial in

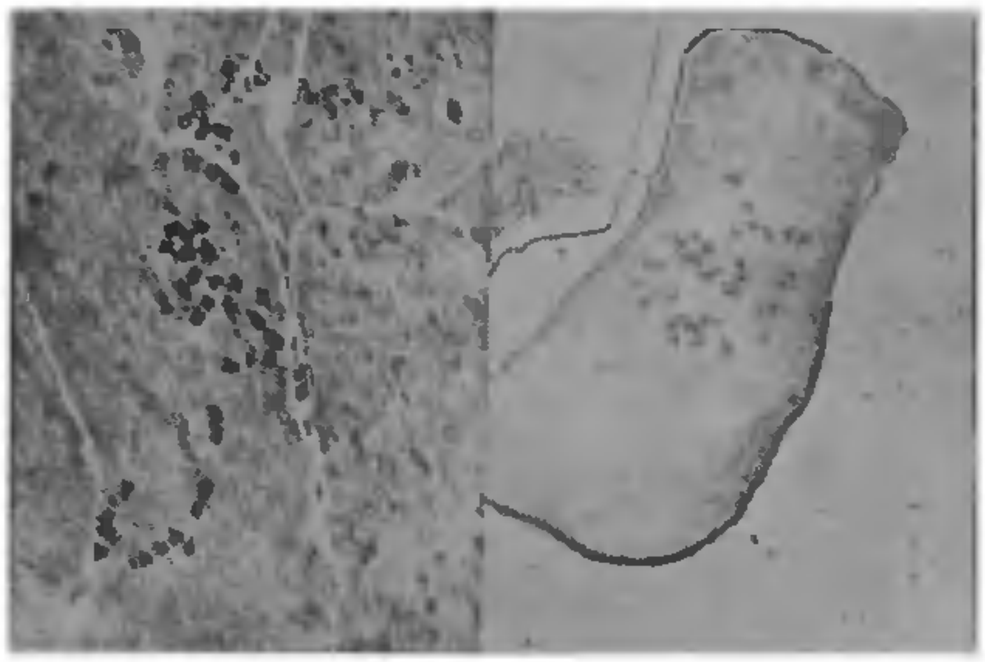

FIG. 1. Root tip cells of *B. hysterophorus* ($2n = 32$) pretreated for 1 hr with 0·05% parthenin showing better condensation of chromosomes. Control on the left.

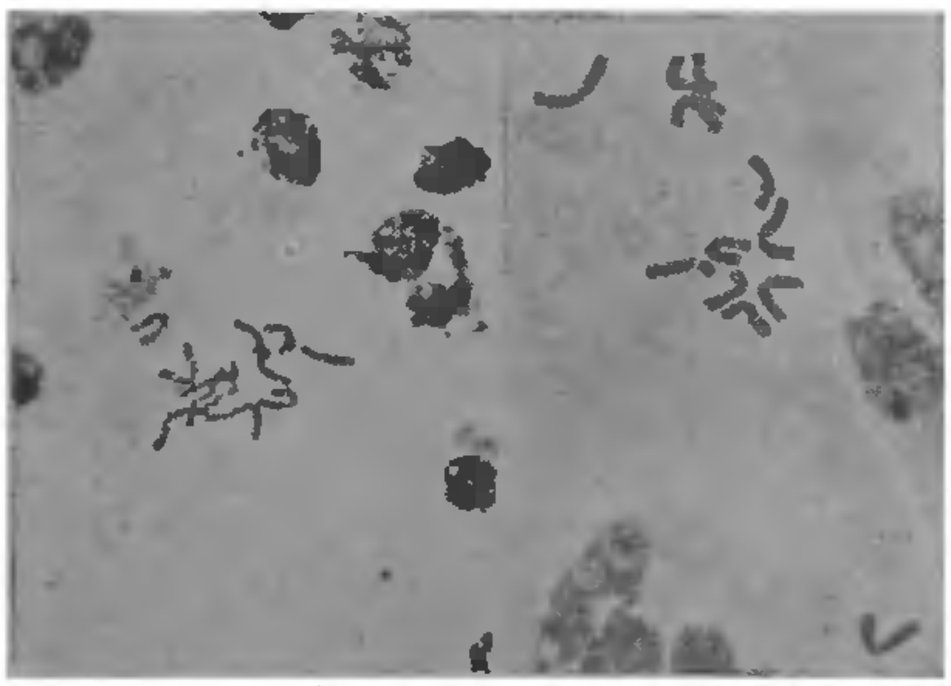

FIG. 2. Root tip cells of *Zephyranthes rosea* ($2n = 12$) pretreated for 1 hr with 0·05% parthenin showing better condensation of chromosomes. Control on the left.

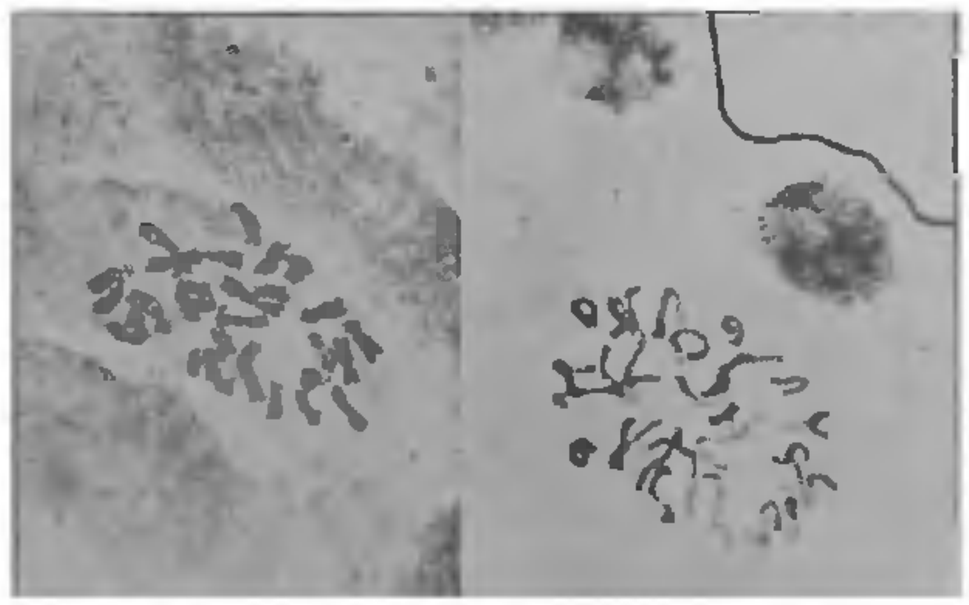

FIG. 3. Root tip cells of *Cholorophytum elatum* ($2n = 28$) pretreated for 1 hr with parthenin showing better condensation of chromosemes. Control on the right.

realisation of proper condensation of the chromosemes and high frequency of metaphase plates for karyotype analysis, the effect of the chemical being comparable to that of colchicine and hydroxyquinoline. Parthenin content in leaves and inflorescence is as high as 0·32%. Yield of parthenin will be considerably higher if extracted with either hot water or 80% methanol (as followed in the present investigation) than with

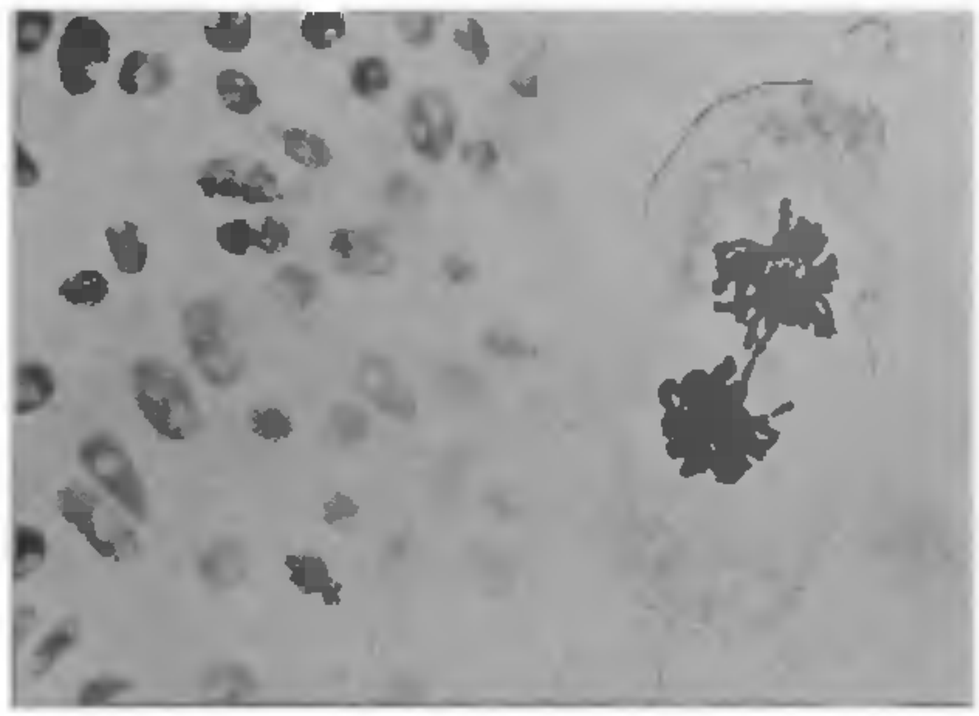

FIG. 4. Onion root tip cells pretreated with 0·05% parthenin for 48 hr showing chromosomal laggard (right), stickiness of chromosomes and increased vacuosation in the nuclei.

cold water as reported in the original procedure[1]. *Parthenium hysterophorus* can be exploited commercially for the production of parthenin in view of its high concentration and the ease with which it can be extracted.

Table showing the increased number of metaphse plates due to parthenin treatment

Species tested	Number of cells showing metaphase plates in 200 cells*	
	Distilled water	Parthenin 0·05% **
Chlorophytum elatum	2	8
Zephyranthes rosea	3	9
Parthenium hysterophorus	9	15
Allium cepa	4	9

* Average of 20 preparations; ** Significant at 5% level.

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1. Sukhada D. Kanchan, *Curr. Sci.*, 1975, 44 (10), 258.

RADICULAR PROLIFERATION IN THE SEEDLINGS OF *PHASEOLUS RADIATUS* LINN. BY COUMARIN

THE role of coumarin in germination inhibition has already been envisaged (Sigmund, 1914[5]). Mayer and Evenari[3] (1952) studied the relation between the structure of coumarin and its derivatives and their activity as germination inhibitors monograph by Maye,