

### CLEISTOGAMY IN SOME OF THE FLOWERS OF *CAJANUS INDICUS* L.

CLEISTOGAMY is a common phenomenon among the different families of angiosperms and is chiefly characterised by autogamous type of pollination and seed production. The development of cleistogamic flowers in an otherwise normally developing chasmogamic form due to certain environmental change caused by drought, excess of moisture, shade, surrounding soil, etc., is separately grouped by Uphof<sup>2</sup> as "ecological cleistogamy". The exact edaphic factor concerned in inducing the production of cleistogamous flowers are in many cases difficult to determine.

In the course of the breeding work in *Cajanus indicus*, many cases of cleistogamic tendency was noticed in the majority of the flowers. The flowers of *Cajanus* are considered to become chasmogamic having insect visitors like *Megachile lanata* and *Apis florea*. Examination of the flower buds at various stages indicated that the pollen grains mature early and anthesis takes place 34 hours before the actual opening of the flower. The stigmatic surface gets profusely dusted with the pollen which begin to germinate and form pollen tubes, thus resulting in autogamy. Mehta and Dave<sup>1</sup> also observed a similar condition in their studies in *Cajanus indicus* and state that anthesis takes place at least 24 hours before the opening of the flowers. They do not attribute any significance to this interesting feature. Pollen grains were found to spontaneously germinate soon after anthesis on any surface of the flower such as petal, filaments, etc.; the stimulus of the stigma was not, therefore, necessary for initial germination, a character reminiscent of cleistogamous flowers. This feature is similar to Warming's<sup>3</sup> observation in *Campanula uniflora* from Greenland. In this plant the pollen grains get deposited on the stigmatic surface in the bud condition itself developing pollen tubes and when further pollination is no longer possible the flowers become chasmogamic. In *Cajanus indicus* the author's observations indicate that the percentage of such ecological cleistogamic flowers goes up to 80 per cent. in the months of September to November. The exact edaphic factors responsible for such a feature have not been determined.

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January 10, 1945.

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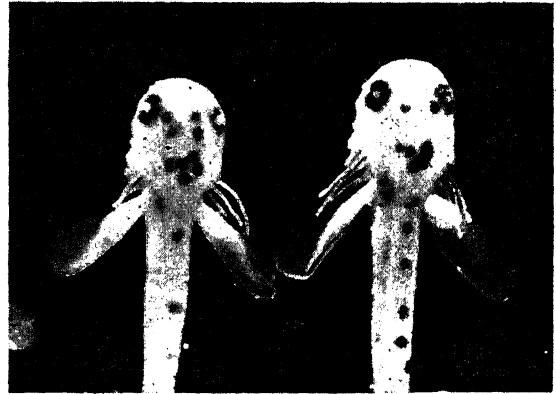
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### ON THE OCCURRENCE OF 'EXTERNAL' GILLS IN THE LOACH—*LEPIDO- CEPHALUS THERMALIS* (C.V.)

TRUE external gills of ectodermal origin occur only in Crossopterygii, Dipnoi and Amphibia. The embryos of elasmobranchs possess long filamentous gill lamellæ projecting out of the

gill clefts. Such endodermal gill filaments have been noticed in the larvæ of *Gymnarchus* and *Heterotis* by Budget and *Misgurnus* by Gotte.

The occurrence of 'external' gill filaments in Teleosts is a rare feature. While studying the early development of the loach—*Lepidocephalus thermalis* (C.V.) it was noticed that the larvæ possessed long gill filaments projecting out of the opercular opening. Second day after hatching the larva was observed to develop a filamentous vascular loop projecting out



5 days old larva of *Lepidocephalus thermalis* (C.V.)  
showing 'external' gill filaments

of the opercular opening. The loop gradually elongated in size. About the fifth day four such filaments were noticed on either side. During the third and the fourth weeks the filaments branched considerably. They were kept in constant movement by the opercular flaps. These filaments were gradually absorbed giving place to normal internal gills between the fourth and the fifth weeks. A microscopical examination of the sections of the head of the larva revealed that the 'external' gill filaments are derived from the endoderm covering the branchial bars.

It is well known that both *Misgurnus* and *Lepidocephalus* perform intestinal respiration taking air directly by the mouth and passing it out of the anus and that they are well adapted for living in muddy waters deficient in oxygen. The development of larval 'external' gills in these two loaches is probably intended to provide a greater respiratory surface to surmount the adverse conditions prevailing in such muddy waters.

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February 8, 1945.

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### THE CHROMOSOME NUMBERS IN THE FAMILY ANONACEÆ

THE family Anonaceæ is one of the little known families in respect of its chromosome numbers. In 1936, Locke<sup>1</sup> noted that the haploid number of chromosomes in *Asimina triloba* was probably nine. One of us (R. D. A.), in 1937,