A NOVEL MECHANISM OF POLLINATION IN WRIGHTIA TINCTORIA R. Br.

Pollination is understood as the transference of pollen from anthers to stigmas. The agents effecting the process are either biotic or abiotic. The available literature shows that biotic agents effect pollination (be itself or cross) by the contact of its body with both the pollen and the stigma while foraging. In the course of our studies on pollination ecology, we encountered a situation where biotic agents bring about pollination without contacting either pollen or stigma. This mechanism has not so far been reported and hence, is described as an interesting case.

The above situation is seen in Wrightia tinctoria R. Br., a deciduous tree of Apocynaceae. The white, fragrant, melliferous flowers borne on relatively long flexible pedicels are arranged in lax terminal, slender, spreading, dichotomous cymes. Numerous linear scales, some inserted with the staminal filaments and some on the corolla lobes, constitute the corona. The flowers are complete, hermaphrodite, and homogamous. Stamens are 5, dilated, sagittate and are inserted on the mouth of the corolla tube, each alternating with a petal. They form a cone-like structure encircling and enclosing the style and stigma (Fig. 1A). Gaps are present between the adjoining filaments; they are relatively widened below and narrowed upwards. As the stamens are alternating with the petals, each gap is opposite a petal. The style is shorter than the stamens and, as already mentioned, is covered by the conical androecium. The rattle-shaped stigma has a collar at its base (Fig. 1B) and is highly viscid; the anthers are adherent to this collared structure and are intorse. The stigma and the pollen sacs are separated by a little distance, the sacs being stationed slightly above the level of stigma. Further they are concealed.

Flowers are open from 03:00 h and remain fully open up to 05:00 h. When the pollen sacs dehisce intorsely, one naturally expects pollen to drop down on to the stigma, the so-called gravity pollination. In reality this does not happen. For the sticky pollen to descend on to the stigma, it is necessary that the anthers proper should be disturbed. Again one can expect that wind can disturb these anthers. But wind can make the flowers only to swing because the flowers are borne on the highly pliable pedicels.

In nature, honeybees, carpenter bees, wasps, flies, butterflies, etc., visit these flowers. The food available for these visitors is the nectar contained in the short corolla tube around the ovary and the corona hairs. The visitors have no access to the pollen as the anthers are concealed. Insects desirous of possessing the nectar which is concealed, alight on the corolla lobes and insert their probosciuses through the space between the bases of the filaments (Fig. 1C and D). The insect does not meddle either with the style or stamens while inserting the proboscis and collecting the nectar. It is only while leaving, it disturbs the stamens. The insects usually take an upright flight. As the space is narrowed up, the proboscis becomes held up between the adjoining filaments. It can only be freed by the exercise of considerable force. So during wriggling movement, the insects disturb the anthers with the result the pollen fall down on the stigma. Sometimes, failing to take out their probosciuses, a few insects (especially honeybees) are found dead.

![Fig. 1. Floral structure and floral visitors of Wrightia tinctoria. A. Flowers with perianth lobes removed, showing the conical androecium encircling and enclosing gyroecium; note the gaps at the base of androecium between the adjoining staminal filaments. B. Flowers showing the relative lengths of gyroecium and androecium. C. Honeybee (Apis cerana indica) and D. Fly (Sarcophaga dux) foraging on nectar contained in the corolla tube around the ovary; the insects insert their probosciuses through the spaces at the base between the adjoining staminal filaments.](image)

To make sure that the pollen grains actually descended, the stigmas of the flowers visited by the insects were examined for pollen with an affirmative answer.

To ascertain the role of the biotic agent in effecting the pollen transfer, some of the branches bearing the inflorescences were covered with nylon nets with fine meshes and left as such till the end of the flowering and fruiting season. In such inflorescences there was no fruit set. Further, the stigmas of flowers enclosed by the nets when examined bore no pollen.

The uniqueness of this mechanism lies in the fact that pollen-transfer is effected resulting in self pollination or autogamy through the mediation of a biotic agent with no bodily contact either with pollen or stigma.
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THE HISTOPATHOLOGY OF THE STOMACH WALL OF THE FISH CHANA GACHUA (HAM.) (CHANNIDAE) ATTRIBUTABLE TO THE DIGENETIC TREMATODE GENARCHOPSIS GOPPO (OZAKI) (HEMIURIDAE)

The histopathology of Chana gachua (Ham.) infected by the fluke Genarchopsis goppo (Ozaki) has been studied. It is seen that the fluke is localized in the lower half of stomach of the fish. G. goppo is attached with plug-like projections in the stomach wall of the host by oral or ventral sucker (Fig. 1). Attachments by both oral and ventral suckers have also been seen. The plug-like projections of the mucosa are possibly formed by the suction of fluke. Pronounced desquamation and ulceration of the epithelium have been seen at the site of attachment of the fluke. This is possibly due to strangulation and subsequent necrosis of plug-like projections of the host stomach wall by the fluke. The surface epithelium has been flattened at the site of contact with the fluke as a result of physical compression. The cells have become flattened or cuboidal without any definite boundary. The nuclei have been shifted to the centre or upper half of the cells.

G. goppo has entered in the stomach wall through the space between the two ridges. At this place the surface epithelium and lamina propria are completely damaged. The submucosa is completely damaged and vacuolated and portions of the body of the fluke are lying in these spaces (Figs. 2 and 3). In some places they are seen to be surrounded by a large number of eosinophils and lymphocytes whereas at other places they are completely encapsulated. The

Figs. 1–3. Histopathology of Chana gachua (Ham.), infected by Genarchopsis goppo (Ozaki). Fig. 1. Showing the ventral sucker of the fluke attached to the stomach wall of fish, × 50. Fig. 2. Showing portion of the body of the fluke in the submucosa of stomach wall of fish. Note the capsule formation around the portion of the body of fluke, × 100. Fig. 3. Showing the completely vacuolated, disorganized and damaged submucosa of the stomach wall of fish. Note the presence of portions of the fluke in these areas, × 100,