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Floral biology of *Hibiscus furcatus* in relation to pollination

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Hibiscus furcatus (Malvaceae) is an important medicinal plant used in Ayurvedic medicine. Due to paucity of reproductive biological information, the present study was aimed to investigate the floral biology of *H. furcatus* in relation to pollination and to identify the breeding system, to facilitate future breeding and crop improvement programs. Floral level phenological changes were observed from initial flower bud stage to final wilting of the flowers. Timing and duration of anther dehiscence and stigmatic receptivity were studied. Floral biological changes in relation to symmetry of flowers were determined. Flowers were visualized under the UV light to investigate importance of colour as an attractant. Floral visitors were collected and they were identified. Pollen carbohydrate and lipid were analyzed. Pollen: ovule ratio and Out Crossing Index (OCI) were calculated.

Large (average diameter of 7.5 ± 0.08 cm) and funnel shaped *H. furcatus* flowers and demarcations of the petals which are arranged towards the staminal column were identified as an important pollinator attractants. Pollen grains were zoophilous and are rich in carbohydrates and lipids. They are characterized by large diameter (125 μm) and spiny tecta. The spines in pollen and highly concentrated epidermal hairs in five stigmatic lobes enhance the effectiveness of pollination. When the flower is fully opened at around 6.00 a.m., all the anthers have dehisced and from 6.00 a.m. to 3.00 p.m., pistillate phase prevailed. The flexistyly condition which prevents selfing was identified. But, as there was an overlapping between staminate phase and pistillate phase, it facilitates a chance for the accidental autogamy.

The percentage of left-handed flowers was higher than the right-handed flowers and floral symmetry did not influence its pollination. Species of bees, ants, beetles and flower fly were identified as the effective pollinators of *H. furcatus* flowers. Pollen: ovule ratio (328.28±10.37) and OCI value (5) indicates that *H. furcatus* possess a partially self-compatible breeding system having very high out crossing demand for pollinators. While the present study strengthens the knowledge of breeding systems of Malvaceae family, the results would help to plan breeding strategies and conservation of *H. furcatus*.