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Impatiens johnii* E. Barnes and *Impatiens platyadena* C.E.C. Fisch (Balsaminaceae): The Extinction Risk as Revealed by Reproductive Ecology*Sreekala A.K.**

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Abstract

Impatiens is a sub-cosmopolitan genus belonging to the family Balsaminaceae comprising more than 1000 species worldwide. Most of them occur in mountains of tropical and subtropical regions of Africa, India and other parts of South-East Asia. In India, the genus is represented by 210 species and is mainly distributed in the major three centres of diversity *i.e.*, Eastern Himalayas, hills of North Eastern States and the Western Ghats. Ninety two *Impatiens* species have so far been recorded from peninsular India, of which more than 86 are endemic and confirmed to the Western Ghats with 30 species already in the threatened category. Their populations are rapidly declining due to habitat degradation, fragmentation of population, anthropogenic pressures and reproductive constraints. A comparative study on reproductive ecology of endangered balsams has not so far been made due to their high altitude habitat, delicate structure and explosive fruits. Against this background, two endangered balsams namely *Impatiens johnii* and *Impatiens platyadena* has been selected for the present investigation to find out the possible reasons for its limited distribution and endangerment. *Impatiens johnii* and *Impatiens platyadena* are endemic to Southern Western Ghats, which are in the brink of extinction and listed as critically endangered species due to its narrow distribution. The plants flower in the night time between 0130-0530 h. However, the anther dehisced one day before anthesis, which confirmed the protandrous condition of the flower. Pollen viability by Fluorochromatic Reaction (FCR) Test of both the species confirmed that 76-82% pollen grains are viable on the day of anthesis. Stigma was receptive only on the third day of anthesis. Hawk moths, honey bees, flies and butterflies are the major visitors of selected species of *Impatiens* but honeybees and butterflies served as efficient pollinators. The fruit set rate in natural pollination in both cases were below 28% but artificial cross pollination through xenogamy enhanced the fruit set up to 46-50%. Thus it is concluded that the plant is an obligate out-croser and self incompatible. The dehisced seeds germinate after dehiscence from capsule in a favourable place, but only a small percentage establishes into seedlings. Therefore, the study suggests that dependence of specialised habitats, fragmentation of populations, protandry, delayed stigma receptivity, scarcity of pollinators, low insect visitation rate, low percentage of seed germination and poor seedling recruitment and other environmental factors could be the reasons for narrow distribution and endangerment in the Western Ghats.

Keywords: Honeybees, *Impatiens*, Pollination, Reproductive ecology, Western Ghats