

Floral phenology of *Quercus baloot* Griff. in temperate regions of Jammu province.

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Quercus baloot Griff. commonly called as Holy oak or Holm oak is an evergreen endemic tree species restricted to Afghanistan, Pakistan and India (International Oak society, Report from the oak ICAR checklist). The tree is widely used as a source of fuel wood, for making agricultural implements and for carpentry work. Species forms dense stands in some regions of Jammu and Kashmir State including the site of present study. (Bhaderwah, District Doda, 1604 msl (N 33°06.048' E075°35.919')). This area experiences wide temperature fluctuations ranging from a minimum of 1°C during the winter month of December- January to a maximum of 30°C during June – July. Plants in the area also remain snow covered for few days (15-30) each year.

Quercus baloot is monoecious with buds initiating in the 2nd-3rd week of April, when the day temperature in the area fluctuates between 20-24°C. Male flowers initiate first the plant, species is thus protandrous. They are borne in catkins, with number of flowers /catkin averaging 30.96. Catkins differentiate in clusters of 5-6 on old branches of tree. Mature male flowers are light yellow to green in color, bear 5-6 tepals and variable no. of stamens (8-12). All the flowers of catkin do not open and dehisce simultaneously; they take 2-3 days to do so with the opening following a basipetal or an acropetal succession. Peak dehiscence is observed during noon hours between 11:30 am to 2 pm.

Female flowers arise on newly formed shoots that emerge in the axil of the older branches (Fig. 1A). They appear in groups of 2-5, 14-16 days after the appearance

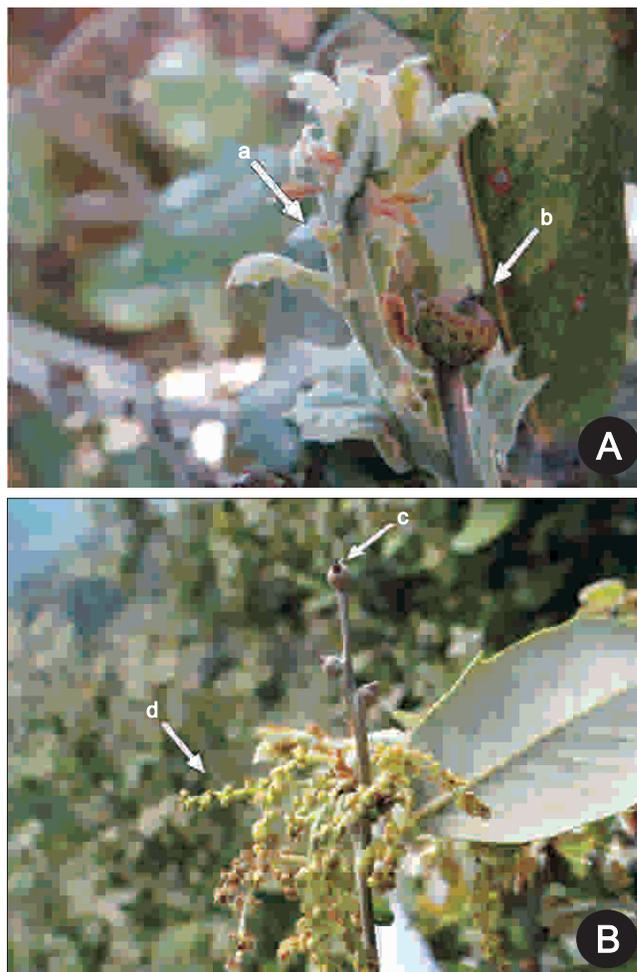


Fig. 1 — **A.** Female flowers (a) developing on new shoots arising in axil of older branch bearing a fruit of preceding year (b). **B.** Male catkins developing on an older shoot (d) bearing the underdeveloped fruit of last year (c).

of first male buds on older shoots. Each female flower consists of small cupule, short style and tri to tetrafid stigma having a light shiny appearance. After coming out of the cupules, stigma spreads out its lobes and keeps them so for 3-4 days. This marks its receptive phase. Expansion normally occurs during morning hours between 8 am to 11 am. Maximum pollen load and germination is observed on stigma during afternoon on 2nd and 3rd day of expansion. After the pollination is accomplished, stigma turns brownish showing end of receptivity period. Ovary shows slight swelling and remains in a suspended growth thereafter till the next

year of bloom. In next flowering season, the shoots having underdeveloped fruit start bearing male catkins. New female flowers of current season later arise on the new shoots differentiating in the axils of these old shoots. The underdeveloped fruit of preceding year completes its development this season, attaining an average size of 2.6 cm (Fig. 1B). It is an acorn now.

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