

MORPHOLOGICAL VARIABILITY IN HEVEA BENTHAMIANA MUELL. ARG.

By

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Abstract

Investigations on the floral morphology of *Hevea Benthamiana* Muell. Arg. have revealed that the species exhibits wide variation in the number of stamens, the range being five to eight with the maximum number of male flowers (37%) possessing six. *Hevea* species, except *H. guianensis* Aubl are reported to have ten stamens. This is the first report on the variation in floral characteristics of the species. Studies on the inter-specific hybrids involving *Hevea benthamiana* have confirmed that variations in the number of stamens is a genetically controlled trait.

The genus *Hevea*, belonging to the family Euphorbiaceae is a native of South America and exhibits much morphological variability and thrives on a wide range of ecological sites. The genus has nine species, viz., *Hevea brasiliensis* Muell. Arg., *H. benthamiana* Muell. Arg. *H. camporum* Ducke, *H. guianensis* Aubl, *H. microphylla* Ule, *H. nitida* Mart. ex Muell. Arg, *H. pauciflora* Muell. Arg., *H. rigidifolia* Muell. Arg. and *H. spruceana* Muell. Arg. (Schultes 1977).

The trees belonging to the species, *H. benthamiana* are of medium size, 20-24 m in height. The trunk is swollen at the base. Branches are average. Leaflets are soft reddish pubescent beneath, papyraceous lanceolate and horizontal. The specific leaf weight is comparatively more than that of *H. brasiliensis*.

Wintering is often partial. The tree shows profuse flowering soon after the leaves are shed during wintering. However, flowers are also occasionally noted during other seasons on newly formed flushes of the trees. Preliminary observations have indicated that anthesis of both male and female flowers in *H. benthamiana* is early compared to that of *H. brasiliensis* growing in the same locality. Usually the anthesis of male flowers takes place between 11.00 and 11.30 hours on sunny days and that of the female between 11.30 and 12.00 hr. Flowers are yellowish in colour, small in size and monoecious with the female flowers situated at the tip of the inflorescence branches. Both the male and female flowers have five perianth lobes. The filaments of stamens are united into a staminal column and the anthers are sessile as in *H. brasiliensis*. The genus

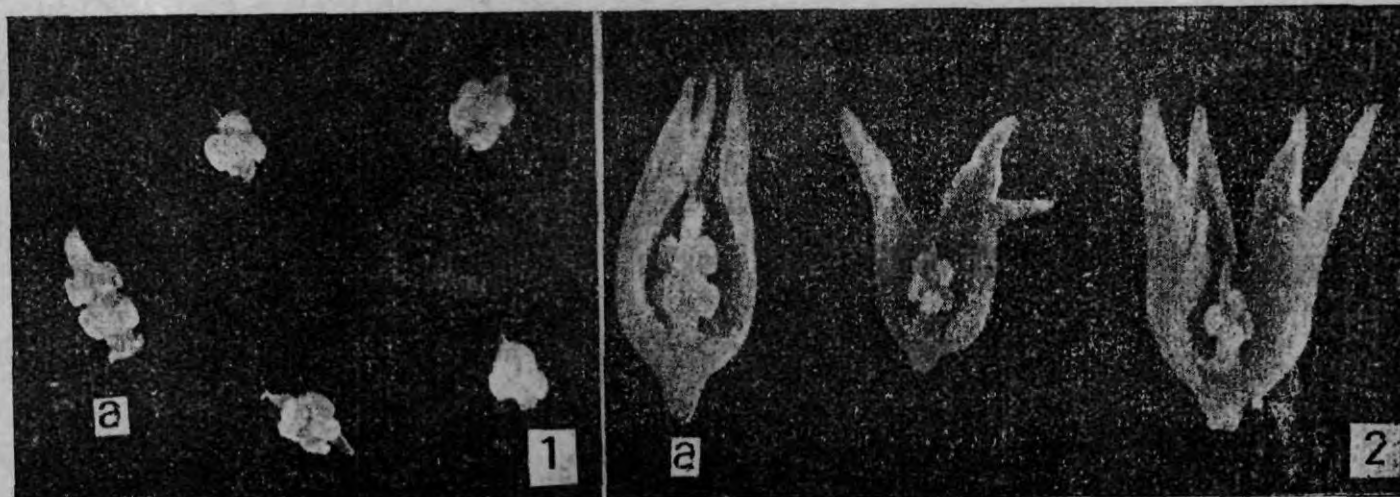
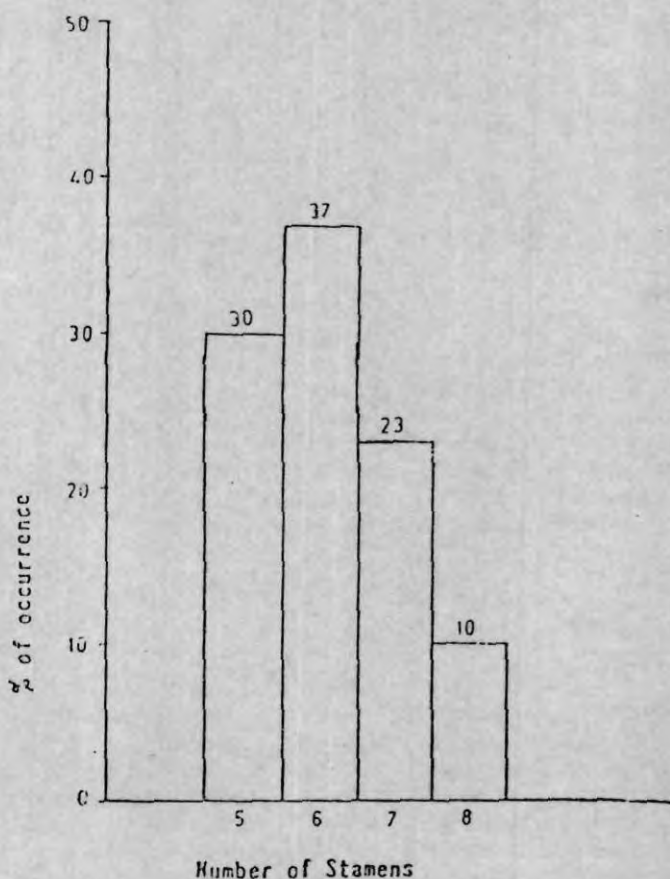


Fig. 1 (Left) : Staminal Columns in *Hevea* : a — *H. brasiliensis*, Others *H. benthamiana*.

Fig. 2 (Right) : Male flowers of *Hevea* : a — *H. brasiliensis*, Others *H. benthamiana*; perianth partly removed to show the staminal columns.

Fig.3. Distribution of stamens in *Hevea benthamiana*



Hevea is characterised by ten sessile anthers arranged in two whorls of five each on a slender column formed by the union of filaments (Dijkman 1951, Purseglove 1968). Variation from this was noted only in *H. guianensis*, in which 5-7 anthers had been reported (Schultes 1977).

During the course of investigation on the floral biology of *Hevea* spp. wide variation in the number of stamens has been noted in *H. benthamiana*, a feature which has not been reported hitherto. Observing this variation, 300 male flowers randomly collected from ten trees of the species, clone F4542 planted in 1959 at the experiment station of the Rubber Research Institute of India, were collected and examined. It was found that the number of anthers varied from five to eight (Figs. 1 & 2). Thirty seven per cent of the flowers observed had six anthers which was the highest. The lowest frequency was for eight, the percentage of its occurrence in the flowers examined being ten. The frequency of occurrence is given in Fig. 3.

Studies on the interspecific hybrids involving *Hevea benthamiana* as one of the parents have elucidated that the male flowers show variation in the number of stamens, the range being 8 — 10. There are male flowers showing the reduced number of stamens from the normal ten anthers seen in *Hevea brasiliensis*. Since the interspecific hybrids show this variation, the reduction in the number of stamens is a genetically controlled trait in *Hevea benthamiana*. Reduction in the number of floral parts is considered to be an advanced systematic character Hecht *et al.* 1976)

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