

infection. Twigs of country varieties are highly resistant.

Similar inoculation experiments were made with mango fruits which were slightly wounded near the stalk-end. Young inoculum was applied to these wounds, which were subsequently covered with paraffin or wet cotton wool. The inoculated fruits were incubated at 27° C. Typical black rot developed in the inoculated fruits within 72 hours. Inoculation experiments on wounded fruits further showed that infection develops more rapidly in *Pairi* than in *Alphonso* or other varieties of mango.

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On the Occurrence of *Apus* in Gujarat, Western India

Apus is an ancient genus of fresh-water Phyllozoa which occurs practically all over the world. It has been reported from some parts of India also¹; but our knowledge of its distribution in this country is far from being complete. This is largely due to the fact that *Apus* with its archaic form is ill suited for migration from isolated muddy ponds in which it occurs during the monsoons. No sooner it appears than it disappears; it seldom lives for more than three weeks. Its distribution is, therefore, often erratic.

In the last August, while looking for plants of *Marsilea minuta* in some small sheets of water collected during rains in the vicinity of the Gujarat College, Ahmedabad, and some other places, I was able to collect a large number of fresh-water Crustacea which contained, *inter alia*, many specimens of *Apus*—presumably *cancriformis*—similar to those from Kashmir.² This was rather surprising as the only form of *Apus* known so far from peninsular India was *Apus asiaticus* reported by Gurney³ from the famous Panchgani locality in the Bombay Presidency. The occurrence of another form of *Apus* in this Presidency, therefore, is a matter

of considerable interest. Possibly, this is another piece of evidence in support of the belief in the African element in the fresh-water fauna of Western India. The reasons for such a view are obvious: *Apus cancriformis*, not distantly related to *Apus asiaticus*, occurs in Morocco, Cyrenaica, North Africa, Eritrea, Asia Minor, Kashmir, United Provinces⁴ and some other places. It is unlikely, therefore, that it occurs in Gujarat (Western India) by mere chance.

A detailed statement in elucidation of this view based on a comparative study of *Apus asiaticus* and *Apus cancriformis* will be published elsewhere.

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¹ Kemp, *Rec. Ind. Mus.*, 1911, 6, 353; Gurney, *Ibid.*, 1925, 27, 439.

² Gurney, *loc. cit.*, p. 439.

³ ———, *Ann. Mag. Nat. Hist.*, 1924, 14, (9), 566
see also *loc. cit.*, p. 440.

⁴ Walton, *Rec. Ind. Mus.*, 1911, 6, 351.

A Note on the Development of the Female Gametophyte in Some Indian Compositæ

LITERATURE on the gametogenesis of the members of Compositæ is very extensive. Very little work in this direction has, however, been done in India. The investigations of Bhargava¹ on *Eclipta erecta* and Banerji² on *Carthamus tinctorius* could be mentioned only in this connection.

A comparative study of the development of the flower, pollen grains and embryology in *Mikania cordifolia*, *Launea asplenifolia* and *Blumea laciniata* is in progress since 1938. This note gives a general account of the development of the female gametophyte in the above-mentioned plants. A full account of the investigation will be published shortly elsewhere.

The archesporial cell is hypodermal in origin in all the three plants. It functions directly as the megaspore-mother cell. After the completion of the reduction division a linear tetrad

of megaspores is noted in every case. In no case was a "T-shaped" tetrad observed. The megaspores become deep-seated on account of the division of the 'cover' cells. The upper three megaspores degenerate and the chalazal one becomes functional. By three successive divisions it produces an eight-nucleate embryo-sac. The mature gametophyte is of the normal angiospermous type. The synergids have pointed ends and the polar fusion nucleus lies close to the egg. In *Mikania cordifolia* and *Blumea laciniata* the antipodal cells are each binucleate, whereas in *Launea asplenifolia* the antipodal cells are uni-nucleate.

The author expresses his thanks to Mr. I. Banerji under whose guidance the work is being carried out.

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¹ Bhargava, *Proc. Ind. Acad. Sci.*, 1935, 1, No. 7.

² Banerji, Paper read at the 25th session, *Ind. Sci. Cong.*, (in the press).

Teratological Notes

ABNORMALITIES have been recorded in the following plants:—

- (1) *Melia azedarach* Linn.
- (2) *Elettaria cardamomum* Maton.
- (3) *Musa sapientum* Linn.

(1) In normal flowers of *Melia azedarach* Linn., the staminal tube is dark purple, a little shorter than the petals, cylindrical, slightly dilated and lacinate at the mouth; anthers 10, within the tube at the apex. But the specimen investigated shows that the staminal tube has gone a step further in dilatation and a major part of it has actually expanded and assumed the shape and colour of a petal, but much longer than it (Figs. 1 and 2). It is interesting because it serves as a good example of petalody.

(2) Normal flowers of *Elettaria cardamomum* Maton contain only one perfect stamen, that is, the dorsal stamen of the inner whorl is perfect,

the other two combine in a petaliferous lip usually embracing the fertile stamen. The outer whorl is represented by two teeth-like staminodes. But the specimen under report, which is collected from the Botanic Garden, Osmania University, contains two perfect stamens instead of one which is characteristic of the Zingiberaceæ (Fig. 3). In this specimen the dorsal perfect stamen has bifurcated during

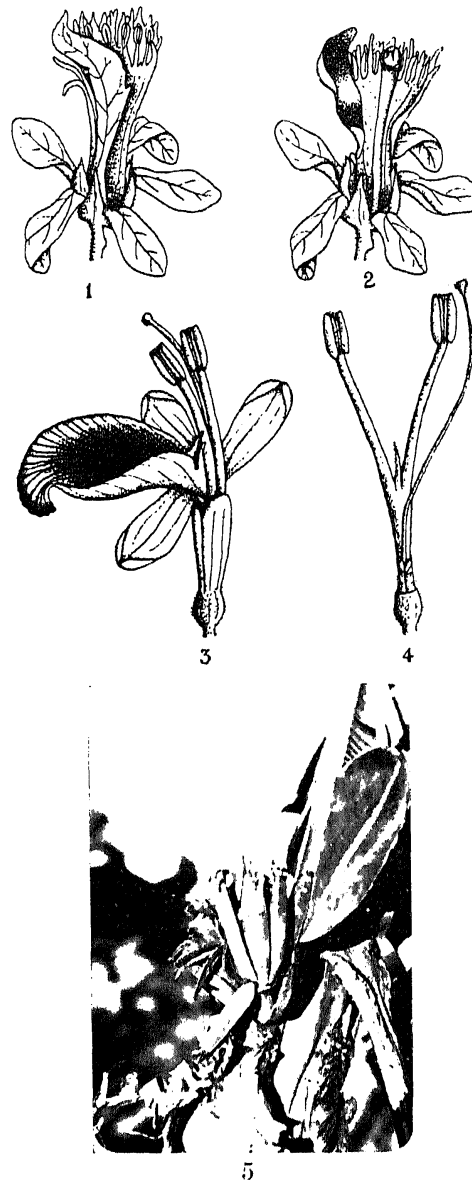


FIG. 1.—Flower of *Melia azedarach* Linn., showing the petaliferous staminal tube—dorsal view.

FIG. 2.—The same in ventral view.

FIG. 3.—Flower of *Elettaria cardamomum* Maton, with two stamens.

FIG. 4.—Bifurcated stamen with two arms bearing perfect anthers.

FIG. 5.—Photograph of *Musa sapientum* Linn., showing the abnormal inflorescence with female flowers only.