

## NOTES ON THE TERATOLOGY OF CERTAIN INDIAN PLANTS—VII

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The present communication is devoted wholly to the teratology of the fruits of Angiospermous plants belonging to five different families including the following five genera. They are all of economic importance.

MUSACEAE: *Musa paradisiaca* var. *sapientum* L.

ANACARDIACEAE: *Mangifera indica* L.

PUNICACEAE: *Punica Granatum* L.

EBENACEAE: *Diospyros Kaki* L.

SOLANACEAE: *Solanum Melongena* L.

Some of the abnormalities recorded herein seem to be already known, of course with differences of details. But since an extensive study of the plant teratology of Indian plants has been undertaken by the author and Mr. T. C. N. Singh, it is but fit to describe them, because they happen to be reported—as far as known to me—for the first time from India.

### *Musa paradisiaca* var. *sapientum* L.

It is largely grown throughout India for its fruit, commonly known as banana (var. *kala*) which is taken raw when ripe or cooked when unripe.

Several syncarpous specimens of this fruit were obtained from different sources (viz, Hajipur, Calcutta, Nainital, Bhowali and Chapra) through the courtesy of my father. In these, two or four fruits were found to be involved in the syncarpy.

Fig. 4 is a photograph of the *malbhog* type of banana. This represents a double fruit in which the fusion is quite complete. In my collection of this type, different stages in partial fusion of the two fruits are also included.

Fig. 5 represents the *chinia*-type of banana with three fruits fused together. In this case, however, the fusion is rather incomplete. It extends only up to two-thirds of the length from the top. Double fruits with partial fusion were met with in this type also.

An interesting specimen of the *malbhog* type is illustrated in Fig. 6. In this case, four fruits are concerned in the syncarpy, but however, the degree of fusion is not the same between pairs. The left-side pair is fused throughout its whole length, while the right-side one shows a fusion of about three-fourths of its length. And the fusion of the two middle fruits has taken place to just about half their length.

Transverse sections of all these syncarpous fruits have been examined. Each of the fruits appear anatomically quite complete in itself, thus giving an impression that it has developed from a normal gynoecium. So, it appears that the abnormalities described here are resultant of fasciated flowers (homologue of two to four flowers) which likely occur in nature.

It may, here, be noted that Costerus and Smith,<sup>1</sup> and Phillips<sup>2</sup> have also recorded syncarpy of fruits in *Musa paradisiaca* but there are differences in details and in the Indian types (*malbhog* and *chinia*), as far as I am aware, syncarpy is being reported for the first time, although it is such an exceedingly common phenomenon.

### *Mangifera indica* L.

The plant is cultivated for its delicious fruit which is popularly known as mango (ver. *am.*). The fruit is a drupe with one stone. In the normal course it develops from a monocarpellary gynoecium,<sup>3</sup> but the case described here is that of a double-drupe, two mango fruits having fused to each other edge-wise with respect to their long axes (Fig. 8).<sup>4</sup> On examination two separate stones have been found to be present one in each portion, encased inside a common skin (epicarp). This double fruit has also at the same time a common stalk-attachment at the top-junction of the two fruits.

A somewhat similar case has been described by Masters<sup>4</sup> but in his specimen the two seeds were found united together.

In January last, while at Indore, I observed quite a large number of abnormal flowers of *Mangifera indica* in the Residency Gardens. The abnormality was of the nature of fasciation, two flowers being

<sup>1</sup> Costerus and Smith (1910) pp. 97-119.

<sup>2</sup> Phillips, F. J. (1910) pp. 227-9.

<sup>3</sup> Willis, J. C. (1929) p. 408.

<sup>4</sup> Several years back I had an occasion to notice an abnormal mango fruit in which three drupes were fused together (one of them being of the size of a plum). Each of them had a separate stone although they were enclosed in a common skin. This specimen, unfortunately, could not then be preserved, hence it is not figured in this paper.

<sup>4</sup> Masters, ( ) p. 24.

involved in the process. These abnormal flowers had nearly double the number of floral parts but the interesting thing was that in all such flowers I found that the gynoecia had fused together by their sides, the stigmas being free. So it is plain that the double drupes result from the fertilization of such fasciated flowers.

### *Punica granatum* L.

A double fruit of pomegranate (ver. *anar* or *bedana*) was obtained from a fruit-seller at Bhowali (Nainital Hills). This specimen shows a partial fusion of two fruits near the top. They have, however, a common stalk. Internally both the fruits have normal structure. This fruit appears to have developed from a double-fasciated flower, with their ovaries confluent only at the base, somewhat as in *Mangifera indica*.

### *Diospyros kaki* L.

*Diospyros Kaki* is a Chinese fruit tree. Its fruit is a herry and is commonly known in the hills as *kaku* (Chinese date palm or persimmon). It is grown abundantly in gardens in the hills of Northern India for its beautiful fruit which is very sweet when ripe. When dried this fruit is said to be used as sweetmeat.<sup>1</sup>

The specimen described is a double one (Fig. 7) with hardly any fusion; but they are included in the same calyx cup. In normal flowers the number of sepals is five but in this case the calyx cup is composed of exactly double the number of sepals. So it is evident that this abnormality is a resultant of a double flower having the two gynoecia in close proximity to each other situated in the same flower. The calyx cup is pressed in a doubled up manner between the two fruits.

### *Solanum melongena* L.

Abnormalities of flowers and fruits in this species have been described by Costerus and Smith<sup>2</sup> and Mottetereale<sup>3</sup> but the specimens (Figs. 1-3) figured here are of interest, so they are very briefly dealt with.

Fig. 2 is a photograph of a specimen (common variety) of the same nature as the one already described for *Diospyros Kaki*, namely, that the two fruits are situated inside a common calyx cup. Peculiarly enough one of the fruits is coiled.

Fig. 1 (common variety) shows almost complete fusion of the two fruits.

<sup>1</sup> Willis, J. C. (1929) p. 219.

<sup>2</sup> Costerus and Smith (1914).

<sup>3</sup> Mottetereale, G. (1904).

Fig. 3 (white variety) represents an interesting specimen kindly given to me by Mr. T. C. N. Singh. This shows a syncarpy of five fruits, all almost completely fused except at the tips. A somewhat similar but triple fruit of *S. Melongena* (of the common variety) was reported in 1889.<sup>1</sup>

It is interesting to note that in all the three specimens the calyx is composed of five sepals only and each portion of the syncarpic fruit is normal, as judged from anatomical considerations.

### Summary.

Abnormalities, all of the nature of syncarpy, have been described in the following species:—

*Musa paradisiaca* var. *sapientum* L.

*Mangifera indica* L.

*Punica Granatum* L.

*Diospyros Kaki* L.

*Solanum Melongena* L.

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BHOWALI (NAINITAL HILLS),

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<sup>1</sup> D. M. (1889) pp. 55-6.



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### Explanation of the Plate.

Figs. 1-3. Syncarpic fruits of *Solanum Melongena*  $\times 3/8$ .

Fig. 4. *Musa paradisiaci* var. *sapientum* (malbhog type): Shows complete fusion of two fruits.  $\times 1/4$ .

Fig. 5. *Ibid* (chinna type): Shows three fruits fasciated together  $\times 3/8$ .

Fig. 6. *Ibid* (malbhog type): Shows fasciation of four fruits.  $\times 1/4$ .

Fig. 7. *Diospyros Kaki*: A double fruit showing the calyx cup doubled up in between the two fruits.  $\times 1/2$ .

Fig. 8. *Mangifera indica*: A double fruit.  $\times 1/2$ .



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