VEGETATIVE PROPAGATION OF MANGO FROM GOOTES (MARCOTTE) AND CUTTINGS BY TREATMENT WITH HIGH CONCENTRATION AUXIN

In a previous communication[1] the result of the preliminary experiment on the root formation in mango goctes, by application of 1 per cent. indole acetic acid, was reported. The experiment was further continued and it has been possible to successfully raise plants, by the above method, from 80 per cent. of the gootes taken from young plants of two and three years old.

Experiments were also undertaken to propagate plants from cuttings of mango and it has been possible to do so from cuttings of two- and three-year old plants by treatment with 3 per cent. indole acetic acid. In the present experiment the ring of bark from the twig, from which the cutting was to be made, was removed and treated with lanoline sclution of auxin, quite similarly as the gootes were treated. After twenty-four hours of such treatment the twig was severed from the mother plant at the lower end of the ring and planted in soil in a slanting position. Photograph of one such cutting taken cut of the soil, after seven months of treatment, is given in Fig. 1, to show the induced root formation. There was no root formation in the untreated ones which died after a certain time. One per cent. indole acetic acid induced slight root formation in some of the cuttings, whereas, 1 per cent. and 3 per cent. naphthalene acetic acid were ineffective in producing roots.

When the mother plants were aged, propagation by the above methods was not successful. Though Auxin treatment induced root formation in the gootes of such plants, the time taken for root formation was comparatively much longer and the number of roots produced much fewer, being quite insufficient for the independent existence of the goote in the soil. In the cuttings of the aged tree auxin treatment induced no root formation.

It has been concluded that the age of the mother plant has some influence on the root formation in gootes and cuttings of mango by treatment with auxin. Further attempts will, however, be made to investigate means of overcoming the difficulty of such propagation from old plants.

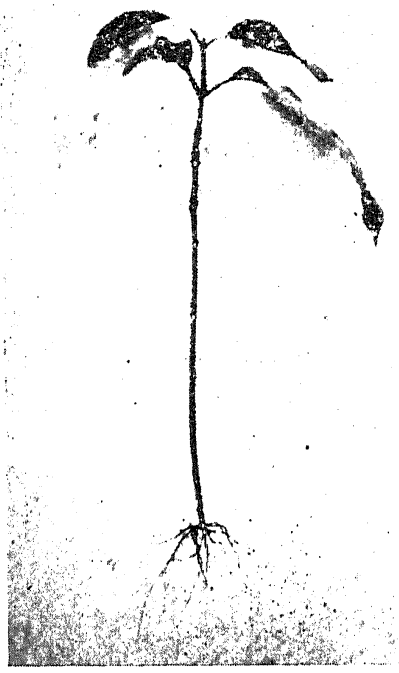

Fig. 1

Photograph of mango cutting, showing root formation by treatment with lanoline solution of 3% indole acetic acid.

Photograph taken after 7 months of treatment.

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Calcutta,
May 5, 1941.

[1] Guha Thakurta, A., and B. K. Datt, *Curr. Sci.*, 1940, **9**, 77.

A NOTE ON THE EMBRYOLOGY OF *SCOPARIA DULCIS* LINN. AND *ANGELONIA GRANDIFLORA* C. MORR.

Srinivasan[1] has recently published a paper on the embryology of *Angelonia grandiflora* and some other plants of the Scrophulariaceæ, in which he makes the fcllowing statement regarding *Angelonia*: "The antipodals are ephemeral and degenerate soon after fertilisation. The

behaviour of the synergids after fertilisation is interesting. They do not degenerate after fertilisation, as in the case of the other members of the family, but persist till comparatively late stages in the development of the embryo. The synergids are seen clearly in post-fertilisation ovules, which have increased in size considerably." Further, on pp. 216–7 of the same paper, the author writes that "so far as is known, the only other genus of this family, where haustoria do not occur is *Scoparia*.[2]" On looking up the paper of Schertz one finds that he has worked on *Scrophularia marylandica* but incidentally mentions that in *Scoparia* no haustoria are "noticeable".

Raghavan and Srinivasan[3] think that the statement made by Schertz is justifiable on the basis of Srinivasan's work on *Angelonia* and add the suggestion: "It is quite likely that in such of those few forms, where true endospermal haustoria do not occur, the synergids come forward and take up the role."

The presence of persistent synergids and the lack of endosperm haustoria in a member of the Scrophulariaceæ seemed so unlikely that immediately on reading the above, we decided to investigate the point ourselves. Material of *Scoparia dulcis*, fixed several years ago at Agra and Allahabad and imbedded in paraffin, was available in abundance and about a hundred ovaries of different stages of development were sectioned. In no case did we find any haustorial synergids. They are certainly quite prominent in pre-fertilisation stages but begin to degenerate soon afterwards and disappear long before any divisions have taken place in the zygote. Endosperm haustoria, both chalazal and micropylar, are present as usual. A detailed report will be published elsewhere.

Unfortunately, the material of *Angelonia* that was available to us showed only prefertilisation stages which go through normally. The flowers fall off soon after opening and although the ovaries sometimes showed a little swelling, sections revealed only degenerated embryo-sacs. It may be noted that at Dacca this plant is propagated entirely by cuttings.

A study of Srinivasan's figures shows that not only are the synergids persistent (Figs. 20–23) but the endosperm consists of a single row of about half a dozen cells (Fig. 20) which later divide in all planes to form an irregular mass (Figs. 21–23). It is disappointing that Srinivasan does not figure the first and second divisions of the primary endosperm nucleus in *Angelonia*, although he regards his study of this plant as the main contribution of the paper. A much closer series of figures is given in the case of *Dopatorium*, *Stemodia* and *Vandellia*, although they are essentially normal and, judging from the title, form only a subsidiary part of his work.

We believe that *Angelonia* should be re-investigated, preferably with the help of material obtained from its native habitat. If the abnormalities reported by Srinivasan are substantiated, it will certainly have to be regarded as a *very* aberrant member of the Scrophulariaceæ.

Incidentally it may be mentioned that Srinivasan's method of grouping his figures and giving their legends puts the reader to the maximum amount of inconvenience. For example, the explanation for Fig. 28 follows that of Fig. 33, while this in turn is followed by Fig. 35. Fig. 34 follows Fig. 36, while no legend whatever could be found for Fig. 38.

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P.S.—After this had been written out, we received the April number of *Proc. Ind. Acad. Sci.*, 1941, 13, containing a paper by Raghavan and Srinivasan on *Scoparia*. This confirms our own observations on the plant and we hope that the authors will now re-investigate *Angelonia*.

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[1] *J. Ind. Bot. Soc.*, 1940, **19.**
[2] Schertz, *Bot. Gaz.*, 1919, **68.**
[3] *Proc. Ind. Acad. Sci.*, 1941, **B 13.**