borne in each of the placental tufts since the fruit was opened when it was dry and seeds were already detached.

Bailey[1] states that fruit of the genus is seldom seen in conservatories.

IARI Regional Station & All India Co-ordinated Sorghum Improvement Project, Rajendranagar, Hyderabad 500 030, *October* 19, 1977.

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VASCULAR ANATOMY OF *PITTOSPORUM FLORIBUNDUM* WIGHT AND ARN. (PITTOSPORACEAE)

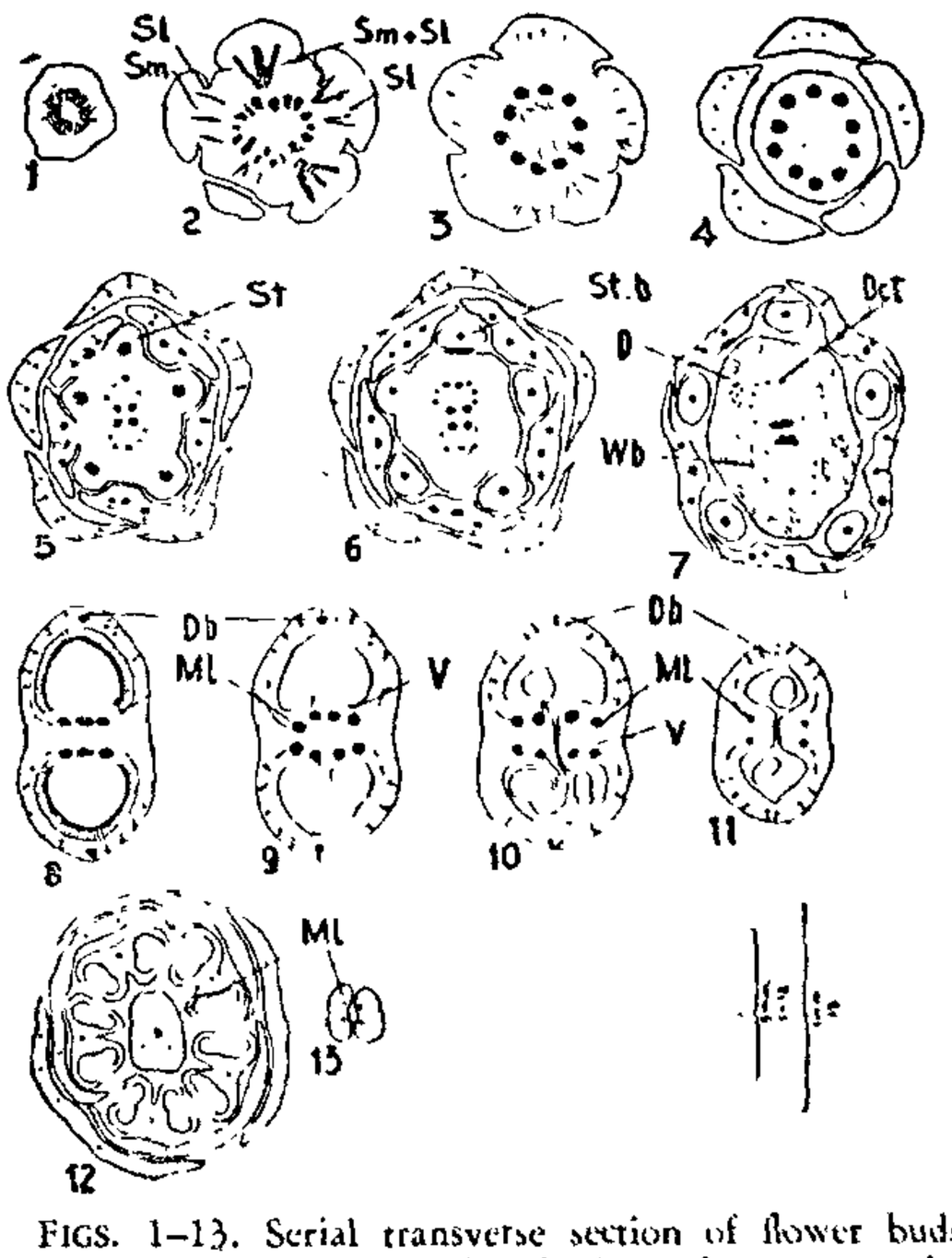
PITTOSPORACEAE have received little attention from the point of view of floral anatomy. Saunders[3], Schaeppi[4] and Narayana and Radhakrishnaiah[1] studied a few taxa of this family. The present account deals with the vascular anatomy of the flower of *Pittosporum floribundcm* Wight and Arn.

The flower is pedicellate, actinomorphic, bisexual, hypogynous, tetracyclic and pentamerous except the gynoecium. The two whorled perianth shows quincuncial aestivation (Figs. 4–7, 12). The androecium consists of five free stamens (Figs. 7, 12). The gynoecium is bicarpellary syncarpous, bilocular at the base and apex and imperfectly bilocular in the middle ovule-bearing region (Figs. 1–11). The style is single and solid and the stigma is biloded (Figs. 12, 13).

The pedicel shows a ring of vascular tissue (Fig. 1). The sepals are three-traced and the origin of the sepal traces is interesting. For two of the sepals, the lateral traces arise conjointly with the midribs; for two other sepals, one lateral trace arises independently, while the other lateral trace arises conjointly with the midrib and for the fifth sepal, the midrib as well as lateral traces arise independently (Fig. 2).

After the demarcation of the sepal traces, the main stele organises into ten prominent bundles and these give off branches towards inside (Figs. 3, 4). Some of these branches converge at he centre and organise into two pairs of ventral bundles, while the remaining branches into two arcs of bundles and these constitute the supply to the wall of the ovary (Figs. 5–7).

From among the bundles of the wall of the ovary two bundles become distinguishable as dorsal bundles at about the level where loculi appear and at about the middle of the ovary they undergo splitting (Figs. 8–10). The bundles of the wall of the ovary nearest to the ventral bundles function as median lateral bundles and these give off branches into the ovary wall (Figs. 8–11). The median lateral bundles extend to the top of the style while the remaining bundles fade away towards the top of the ovary (Figs. 11, 12). There is homocarpellary fusion of ventral bundles and the fused ventral bundles lie opposite the loculi (Figs. 7, 8). At about the level, where ovules arise, the fused ventral bundles divide and the ventral bundles of the two carpels stand in pairs and lie in the septum (Fig. 9). The ventral bundles remain free and are completely utilized in the ovular supply. Thus the carpels are five-traced and judging from the position of ventral bundles in the different ovule-bearing regions of the ovary the placentation can be described as axile below and anatomically parietal above (Puri[2]).



FIGS. 1–13. Serial transverse section of flower buds showing the origin and distribution of traces to the different floral parts.

D — "Disc"; Db = Dorsal bundle; Dct = Dorsal carpellary trace; Ml = Median lateral bundle; Sl = Sepal lateral trace; Sm = Sepal median trace; Sm + Sl = Sepal median + sepal lateral; St = Staminal trace; St.b = Staminal bundle; V = Ventral bundle.

After giving off branches towards the centre, five of the ten bundles on the sepal radii function as

staminal bundles and the alternating five as petal bundles (Figs. 5, 6). The bundles supplying the perianth parts divide to form smaller bundles in the respective organs (Figs. 4–7, 12).

The basal peripheral portion of the ovary is 'disc-like'. It is non-vascularised and the cells show deep staining vacuolated cytoplasm (Fig. 7).

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INFLUENCE OF AGE OF HOST PLANT ON THE EXPRESSION OF ACQUIRED LOCAL AND SYSTEMIC ANTIVIRAL RESISTANCE INDUCED BY TREATMENT WITH TRICHOTHECIUM POLYSACCHARIDE IN *N. GLUTINOSA*

IT has already been reported[2,3,1,6] that fungus *Trichothecium roseum* produces in culture a complex polysaccharide that inhibits a number of unrelated virus infection in plants by exerting action primarily directed against the host while possessing no virucidal activity *in vitro*. The extent of inhibition of virus infection depends not only on the dosage of the inhibitor employed but also on the identity of the host plant and the interval of time it remains in contact with the host.

A method for the laboratory production of the polysaccharide from the homogenised fungus culture was described by Gupta and co-workers[4]. The antibiotic, designated as T-poly, was shown to induce local as well as systemic antiviral resistance in treated *N. glutinosa* plants and these responses could be partially reversed by timely application of actinomycin-D, suggesting that DNA–dependant–RNA synthesis is required for the expression of antiviral activity in plants treated with T–poly. Recently[5], T–poly (250 ppm) sprayed 24–48 hours before inoculation was shown to be effective to the tune of about 50% in preventing PVY transmission by aphids on *D. metel*, *N. tabacum* cvs white Burley and Samsun but not on *N. glutinosa*.

We have now seen that the antiviral resistance to TMV infection induced by T–poly in *N. glutinosa* is greatly influenced by the age of the host and the manner in which it is administered.

The fungus *T. roseum* ex Fries (Himachal strain) was maintained and produced T–poly in a medium containing magnesium sulphate, sodium nitrate, peptone and yeast extract. The samples of T–poly always contained traces of nitrogen (0·9–2·4%).

The *N. glutinosa* plants were raised in glass house as described earlier. *N. glutinosa* seedlings were transplanted at 2 leaf stage and raised in garden soil in 22·5 cm pots in glass house. At intervals following 13 to 70 days after transplantation, very young immature upper leaves and the matured old basal leaves were removed and only the five middle order leaves in a plant were retained for investigations reported here.

TMV was maintained by regular passage in *N. tabacum* cv NP31; whenever needed 1·0 gm of the infected leaf sample showing obvious mosaic symptoms were crushed to a pulp in 10 ml distilled water. The infected juice was squeezed out through cheese cloth, centrifuged at 3000 rpm and the supernatant fluid diluted 10 fold with water. Extract prepared in this way constituted the standard challenge inoculum.

In the first experiment two basal leaves per plant (*N. glutinosa* of varying age groups) were treated by *rubbing* either with T–poly or water, and the upper leaves were left untreated. Fortyeight hours later, all leaves of the test plants were washed and challenge inoculated with standard infectious TMV leaf extract. Results (Table I) show, firstly, the per cent reduction in lesion count due to treatment is more significant in 35 day (86%) and in 50 day old (97%) plants, than in any other age group. Apparently, the younger (13–15 days) and the older (65 to 70 days) plants are weakly sensitive to the action of T–poly.

The experiment was repeated with 35 and 50 day old plants treated with T–poly, applied either by *rubbing* or by *spraying*. The reduction in lesions obtained in the *basal treated leaves* of the 50 day old plants was 96 and 60% respectively and in the *upper untreated leaves* the corresponding figures being 82 and 50%. In the case of 35 day old plants, however; the resistance develops at remote site as strongly as it does locally at the site of treatment regardless how T–poly was applied. This is interpreted to mean that an antiviral factor (inter-