

### Fruit Characters of *Pittosporum dallii* Cheesem.

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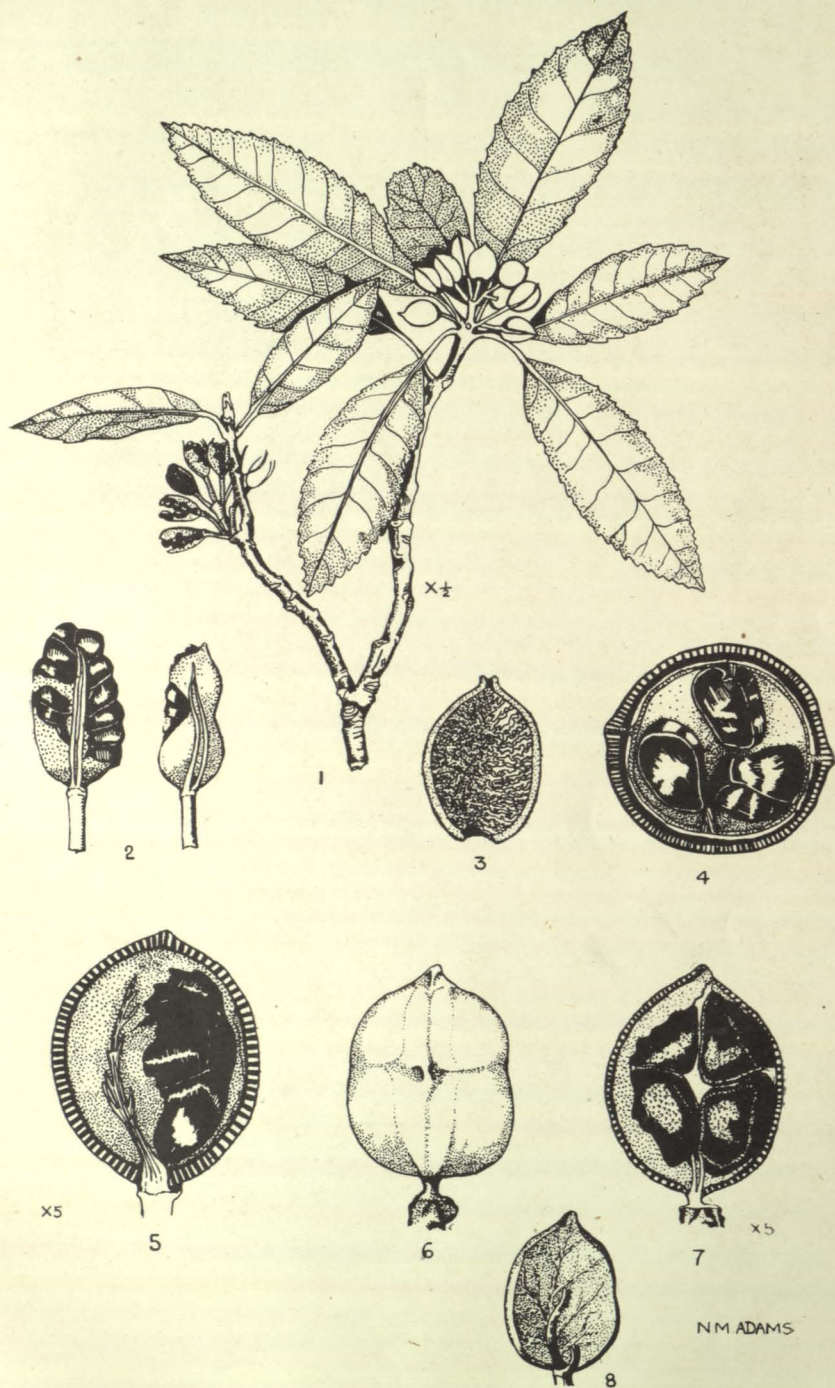
*Pittosporum dallii*, a species first collected in 1905 and published by Cheeseman in the Appendix of the 1906 edition of the *Manual of the New Zealand Flora* (p. 1134), has as yet been found only in the immediate vicinity of the type locality at Specimen Creek and Snow's Valley near Boulder Lake, North-West Nelson. To get to Snow's River takes about twelve hours travelling on foot over very rugged country after leaving the road near Bainham. Very few botanists, therefore, have seen *P. dallii* in its native haunts, and even herbarium specimens from the wild are rare, apart from those collected by Mr. F. G. Gibbs in 1913. Because of its attractive foliage the plant is suitable for gardens, and has been propagated by grafting on to *P. buchanani* stock. Flowers and fruit are rare, if not unknown, in cultivation.

In January, 1947, Mr. N. Potts, of Opotiki, went to Snow's River to investigate the present state of the plants of *P. dallii* there. He saw in all eleven trees and states that others are reputed to occur in the valley. No young plants could be found other than a few seedlings in the cotyledon stage under a fruiting tree. This tree "bore immature fruit, and the remains of the previous year's fruit, in the form of cone-shaped masses of seed from which the valves had fallen (Fig. 1). The seeds were closely packed despite very scanty mucilage."

The fruit of *P. dallii* has not been figured, and the current description is incomplete. Specimens presented to the Botany Division by Mr. Potts show a peculiar method of dehiscence which is not mentioned for the genus in any of the literature available to the writers, although Cheeseman (1914, 1925) says of *P. dallii*, "seeds . . . often persistent after the fall of the valves as a viscid ball at the top of the pedicel."

In the genus *Pittosporum* the fruit is a capsule, usually one-celled, with 2-4 hard woody valves each bearing a parietal placenta on its mid-line. Dehiscence is loculicidal, and the widely opened valves, each carrying a mass of dark, sticky seeds, persist throughout the winter in many species.

Laing and Gourlay (1935), in describing *P. anomalum*, mention that the fruit "contains usually only one seed, more rarely two, enclosed in a papery integument," but make no further comment on this "integument." No mention has been found of the fact that in the much larger and more common *P. eugenoides* the numerous seeds are not carried out with the spreading valves, but remain



*Pittosporum* Fruits.

FIGS. 1-4—*P. dallii* Cheesem. FIG. 5—*P. eugenioides* A. Cunn.

FIGS. 6-8—*P. anomalum* Lg. et Gy.

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enclosed within a papery membrane after the valves fall. In *P. dallii* the "cone-shaped mass" or "viscid ball" of seeds so long persistent on the pedicel is also more or less covered by a thin membrane representing the innermost layer of the pericarp. In these three species the capsule is two-valved.

Fig. 4 shows a transverse section of a fully grown but still-green fruit of *P. dallii*. At this stage the junction between woody mesocarp and membranous endocarp is already distinguishable. Fig. 2 shows the remains of fruit of the previous season with the dark seeds still packed into a tight mass, partly covered by the torn remnants of the endocarp. The two fibrous vascular strands associated with the placenta are clearly seen in each case. In Fig. 1 these vascular strands are seen persisting after the seeds have dropped. Fig. 3 is a view of the inner face of the caducous valve, with strongly rugose surface and little if any sign of superficial vascular strands.

Fig. 5 shows for comparison a capsule of *P. eugenioides* from which only one valve had fallen naturally. The rather strong endocarp has been partly torn away to expose the seed mass it covers. The arrangement is seen to be similar to that in *P. dallii*, except that the vascular strand to each placenta is more compact and more obviously pinnately divided to supply the seeds. As in *P. dallii* two pale-coloured fibrous "horns" persist after the seed has fallen.

In *P. anomalum* the endocarp also remains intact when the valves separate from it, as shown in Fig. 6. Here the maximum number of seeds is four (Fig. 7), a pair on each placenta, though often one or more aborts. The capsules examined and here figured are from Waiho-honu, Volcanic Plateau, and show usually more than one seed, and frequently four, in contrast to those described by Laing and Gourlay from Arthur's Pass. In the ripe capsule a vascular strand lies almost free between the mesocarp and the endocarp, its two halves passing through the endocarp immediately opposite the funicles of the seeds. The outer pericarp, here scarcely woody, has its own vascular strand, with pinnate branches very obvious on the inner face of the detached valve (Fig. 8).

The splitting of the pericarp depends rather closely on the details of its vascular supply. In *P. anomalum* alone of those examined the valve and the placenta have separate vascular strands, and there is no fibrous cross connection between endocarp and mesocarp. In *P. tenuifolium*, examined as an example of the species where the pericarp does not split, the strand supplying the placenta gives off numerous strong branches to the mesocarp, where vessels appear in transverse section within almost every radial sclerenchyma group. In *P. dallii*, where the mesocarp is less strongly lignified, many of the sclerenchyma groups are without vascular cores, and the fibrous connections between endo- and mesocarp are few and slender. In *P. eugenioides* the mesocarp, although almost continuously lignified, is very narrow, and has only very fine vascular bundles. In these last two species when the valves are ready to bend outwards and the seeds are rather strongly held together by the viscid matter between them, the line of greatest weakness lies between meso- and endocarp, and here splitting occurs.

Although in *P. dallii* and *P. eugenioides* the capsule has something in common with that of *P. anomalum*, the lack of "mucilage" surrounding the seeds and the reticulately marked testa distinguish the last-mentioned species from all others in New Zealand; the distinct vascular supplies to placenta and to outer pericarp are probably also of fundamental significance.

A separating endocarp is not seen in any other New Zealand species, but there is little information about the dehiscence in exotic representatives of the genus. A similar divisible pericarp might be expected to occur elsewhere, both in some species with well-developed inflorescences like *P. eugenioides* and *P. dallii*, and in some with solitary flowers like *P. anomalum*.

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