

The leaves are 1 in. or 2 in. long, lanceolate in shape, bright glossy green on the upper surface, and dotted with oil-glands beneath. Their anatomy shows a strong cuticle, an occasional row of water-containing cells beneath the upper epidermis, a 3-celled parenchyma for one-third of the leaf, then a fairly close layer of roundish cells, and the remainder of the leaf open pneumatic tissue. Above and below the main vascular bundles is a layer of stereome.

The roots of the trees do not usually go deeply into the ground, but spread laterally at no great distance below the surface. This is specially noticeable in a rimu which has been blown down.

(b.) *Small Forest-trees and Shrubs.*

Twenty-five plants belong to this class, seventeen of which are widely spread on the mainland, the remainder being usually mountain plants elsewhere.

Between low trees and tall shrubs it is hard to draw the line, the possession of a trunk, or the contrary, in one and the same species being largely a matter of environment. About fourteen species have frequently distinct trunks, and may be considered trees so far as their normal form goes. The remaining eleven are true shrubs.

Generally speaking, the plants under consideration are of a somewhat straggling and irregular habit, and rather sparsely branched, but everything depends upon their situation within the forest, and the light relation is here all-important. *Coprosma rotundifolia* and *C. areolata* are of the divaricating habit, and consequently more or less dense (see further on in section *re* different forms according to environment).

Regarding the adult leaves, one (*Schefflera digitata*) has compound, but all the rest have simple, though some have compound in the juvenile stage; sixteen have entire and nine toothed; one has fairly large, nine medium-sized, and fifteen small; ten have thin and fifteen coriaceous, some being especially thick (*Pseudopanax crassifolium*, *Griselinia littoralis*).

The leaf-anatomy in most of the species shows a distinct hygrophytic structure quite in harmony with the moist forest interior. Usually there is a very open pneumatic tissue (*Melicytus lanceolatus*, *Coprosma foetidissima*, *Nothopanax Edgerleyi*, *Carpodetus serratus*, *Griselinia littoralis*, *Plagianthus betulinus*, *Aristotelia racemosa*, &c.); there may be a weak development of palisade parenchyma (*Melicytus lanceolatus*, *Aristotelia racemosa*), but generally there are several rows (*Carpodetus serratus*, *Plagianthus betulinus*, *Coprosma foetidissima*); the epidermal walls are often quite thin, and the outer wall but little cuticularised or not at all (*Coprosma rotundifolia*, *Rapanea Urvillei*, *Aristotelia racemosa*, *Melicytus lanceolatus*, &c.). A certain amount of xerophytic structure is, however, frequently present—e.g., *Griselinia littoralis* has a strong cuticle on both surfaces; *Coprosma lucida*, *Nothopanax Edgerleyi*, *Carpodetus serratus* have a 2-layered epidermis; *Drimys colorata* has a strong cuticle and thickened outer wall of epidermal cells.

So far as any of the plants are intimately connected with Stewart Island conditions, only the following need brief mention: *Coprosma foetidissima*, *C. Colensoi*, *Dacrydium intermedium*, *Nothopanax Edgerleyi*.

The hupiro (*Coprosma foetidissima*) is a slender, graceful, twiggy bush, 10–15 ft. tall, or sometimes taller. There is usually a very short, stout main stem half a foot or more in diameter, from which are given off three or four, or more, stout secondary stems, semi-horizontal in direction, unbranched for some 10 ft. or so, but the apical 5 ft. branches profusely into many twigged branchlets, which bear numerous rather distant pale-green subcoriaceous leaves, more or less oblong in shape and one to two inches long. The weight of the final leafy twigs causes the boughs to curve towards the ground, and gives the characteristic appearance to the shrub or low tree, as it frequently is.

*Coprosma Colensoi* is a quite small, slender shrub, with an erect main stem, 2 ft. or 3 ft. tall, or more, which gives off rather small lateral branches almost at a right angle, these branching more or less in a similar manner, and being furnished with more or less oblong, moderately thick, rather shining green leaves, which vary much in size, some being as much as 1½ in. long.

Edgerley's ivy-tree (*Nothopanax Edgerleyi*) and the yellow-pine (*Dacrydium intermedium*) are dealt with under the heading "prolonged juvenile forms."

(c.) *Low Trees and Shrubs of the Scrubs and Heaths.*

Twenty-nine species belong to this class, seven of which (*Dacrydium Bidwillii*, *Dracophyllum longifolium*, *Olearia angustifolia*, *O. Traillii*, *O. Colensoi*, *Senecio Stewartiae*, and *S. rotundifolius*) are sometimes trees, and ten (*Aristotelia fruticosa*, *Hymenanthera dentata* var. *alpina*, *Nothopanax anomalum*, *Suttonia divaricata*, *Coprosma parviflora*, *C. ciliata*, *C. propinqua*, *Olearia virgata* (the two vars.), and *O. divaricata*) are divaricatingly branched shrubs. This life-form is exhibited to its greatest perfection in the *Hymenanthera*, a very high degree of xerophily being reached in its low, rounded, somewhat flattened form, stout, twisted, inflexible, almost leafless branches, bearing at their extremities short, stout, rigid, branchlets, which are virtually spines. The mingi-mingi (*Styphelia acerosa*) is also of dense habit, and might almost be included with the above. *Nothopanax Colensoi* has stout, erect, straight, terete, naked stems, marked with old leaf-scars, which branch near their extremities into short branches bearing the leathery, dark-green, digitate leaves. The *Veronicas* are of the usual habit of that class, the branches being numerous, opposite, decussate, and at an acute angle, which leads finally to rounded bushes; but in *V. elliptica* exposure to wind conduces to much irregularity of form. *V. buxifolia* var. *odora* is smaller and of a looser habit than usual, and the var. *prostrata* is quite prostrate and but little branched.

*Dracophyllum Menziesii* (see Photo No. 7), under favourable conditions, may be 3 ft. tall, but is often less than 2 ft. The stems are slender, straight, rigid, and each crowned at its apex with a rosette