Peraxilla tetrapetala (Pikirangi, red beech mistletoe): January's Plant Profile.

By Professor Peter Bannister

To me the presence of red flowers in our native bush is one of the signs of the holiday season. In the South Island, although these are often rata flowers they may also be mistletoe flowers - particularly in beech forest. There are three beech mistletoes to be found in the Otago Region, the red-flowered *Peraxilla tetrapetala* and *P. colensoi* and the yellow-flowered *Alepis flavida* (all three were formerly considered to be species of *Elytranthe*). *P. tetrapetala* is probably the least common of the three in eastern parts of Otago but is more frequent in western Otago and the Queenstown Lakes District. It is relatively common around Lake Hawea (where there has been a monitoring programme in the Dingle Valley) and has been recorded in the Dart Valley and Eyre Mountains. Nearer to Dunedin, there are records from Waipori and Herbert Forest and Tapanui (Black Gully).

It is not easy to separate the various mistletoes from each other by vegetative characters. Although *Alepis flavida* (yellow mistletoe) tends to colonise the outer canopy of its hosts, the *Peraxilla* spp. tend to colonise the inner canopy and even the trunk. However, all three species produce haustorial runners or "roots" which tend to grow distally from the point of infection and thus provide a means of colonising the inner branches and trunk. Infections of both *P. tetrapetala* and *P. colensoi* can produce large bushes (2-3 m across) whereas those of *A. flavida* are smaller (up to 1m) and more lax. *P. tetrapetala* often has the most compact growth form of the three beech mistletoes and is the one most likely to be found on trunks.

In terms of leaf characteristics *P. tetrapetala* may be seen as intermediate between *P. colensoi* and *Alepis flavida*. Mature leaves of *P. colensoi* are relatively large (4 -7 cm) often a dark, almost blackish, green and broadly oblong to almost orbicular,

whereas leaves of *Alepis flavida* are usually smaller (2-6 cm long), linear oblong, often a much lighter yellowish-green. Leaves of *P. tetrapetala* tend to be smaller still (1-3 cm), and shortly ovate, oblong and often a lighter green (like *A. flavida*) but can be dark green and larger in shaded plants.

When flowering, the red-flowered *Peraxilla* spp. are readily separated from *A. flavida* (although yellow-flowered specimens of *P. colensoi* do occur). Typically, *P. tetrapetala* has fewer (1-3) flowers per cluster than *P. colensoi* (3-10) and has flowers that tend to be orange rather than the scarlet of *P. colensoi*. The flowers of both *Peraxilla* spp. are bird-pollinated and open by an explosive mechanism, which is triggered by native birds (Tui and Bellbird).

Very little work has been done on the physiology of the beech mistletoes. Graham Strong and I have looked (briefly) at carbon discrimination and electron transport rates in *P. tetrapetala* and the other beech mistletoes.

All three beech mistletoes are considered to be in decline. Possum browsing is usually cited as the main cause (in the Dingle Valley Survey the only plants of *P. tetrapetala* that flowered were on trees collared against possums) but absence of suitable bird species as pollinators and dispersers of fruit could also be important. The impact of environmental factors such as the recent droughts in Otago may also accelerate their decline, as mistletoes have to extract water from their hosts and could suffer when water is in short supply.

The status of mistletoes is always precarious, as they have not only to survive the rigours of existing on their hosts but their host must also survive. Their conservation therefore involves protecting both host and mistletoe. In Otago we are privileged to have seven species of mistletoe (Europe has only two!). Long may it remain so!