NEWS

Browsing of native forest by emus suggested - *ODT 14.05.01, from Landcare Media Release*

The debate on the origin of New Zealand's unusual divaricating plants has gone public with this NZPA article describing the browsing experiments carried out recently in Dunedin by Prof William Bond and Dr Bill Lee.

'About ten percent of our native shrubs and trees are divaricate - a rare form in all other countries. These plants, like some Coprosmas, have small, widely spaced leaves on wiry interlaced branches that grow in zig-zag directions. The strength of these thin branches is unique to New Zealand. Some divaricate plants like lowland ribbonwood and kowhai change form as they mature, starting life with tough, shrubby divaricate growth, and then swapping to straighter branches and bigger leaves from about two and a half metres high'.

Some scientists, (like Dr Matt McGlone), believe these forms are adaptations to extreme climate conditions. But Landcare Research scientist Dr Bill Lee and Professor William Bond from Cape Town University say that the very strong branches and small leaves are defences against browsing moa. They believe the birds fed by plucking or stripping leaves and clamping and tugging shoots. The thin convoluted branches also create a zig-zag pattern that produce a spring-like recoil when tugged. All of these features reduce the moa's ability to remove plant material.

Dr Lee and Professor Bond say most moa beaks did not have a secateur action, and therefore could not cut through branches and shoots. The larger leaves and easier-to-snap branches only appear from about 2.5 metres up the tree, above the reach of most browsing moa. They fed the emus and ostriches typical juvenile shoots from wiry divaricate plants, as well as adult-phase material from high in the canopy. The juvenile foliage survived the ravages of the emus and ostriches relatively unscathed, whereas the adult foliage and branches were stripped bare.

The same plants were fed to a goat. These animals with their strong biting action, large muscular tongue and flexible lips demolished the divaricate plants, which withstood the attempted ravages by emus and ostriches.

The theory that some native woody plants have developed anti-moa defences is not new. In 1977, Michael Greenwood and Ian Atkinson developed the idea that the characteristic cage-like structure of divaricates limited the impact of moa foraging. Their views were controversial and disputed by some scientists who claimed that divaricates' small leaves within a dense twiggy canopy were a defence against frost and wind, and that trees that change shape half way up do so in response to climatic changes.

But Professor Bond thinks otherwise. "We believe that although weather patterns are a factor, these plants evolved primarily as protection against moa feeding. Back in the seventies, Atkinson and Greenwood did not have access to emu and ostrich farms, so they were not able to demonstrate the link and mechanism as thoroughly as we have". Dr Lee says as well as shedding new light on the moa's role in the environment, the findings have important conservation implications for today. "If plants in New Zealand have adapted to protect themselves against tugging rather than cutting, they will be especially vulnerable to mammalian browsers, like deer and goats".

"Another question this study raises is whether moa feeding performed useful functions that we should look at restoring, if we want to return these wiry plants to native ecosystems. For example, should we introduce emus and ostriches to some protected natural forest or scrubland areas to restore important biotic processes?"

Professor Bond has other reasons as well for finding interest in this study. "The moa is the most recent large-animal extinction in the world: it only died out three or four hundred years ago. The last large-animal extinctions before that happened three to four thousand years ago. New Zealand's plant life is unique, and is still adapting to life without the moa"

Five new species of kowhai named - *ODT 18.05.01; Landcare Media Release*

Scientists Peter Heenan (Landcare) and Peter de Lange (Department of Conservation) have just published the names of 5 new species of kowhai in the New Zealand Journal of Botany.

Until this, only 3 species were recognised here; *Sophora tetraptera*, a large-leaved, North Island tree, *Sophora prostrata*, a sprawling , small-leaved South Island tree, and, *Sophora microphylla*, which covered everything else in between.

The new species are:

- ***Sophora longicarinata***, which grows on limestone and marble in NW Nelson;
- ***Sophora godleyi***, found growing on sandstone, siltstone and mudstone in areas like Rangitikei, Wanganui, Taihape and eastern Taranaki;
- ***Sophora molloyi***, which grows on dry, exposed headlands around Cook Strait, Kapiti Island, and parts of the lower North Island. Like its namesake, Dr Brian Molloy, it is 'tough as old boots and hardy in all extremes of weather;
- ***Sophora fulvida***, which grows on basalt and other volcanic outcrops from Marlborough to Waikato, and has particularly hairy leaves;
- ***Sophora chatamica***, which grows mainly in western coastal areas of the northern North Island, and also around Wellington and on the Chatham Islands. Dr Heenan speculates that this species does not occur naturally in Wellington and the Chathams, but was moved there around 300 years ago by the Waikato and Taranaki Maori, who regard it as a taonga, a treasure.