and browse by mammals – particularly this is blamed on possums.

On Motukino there are plenty of host maire, no botanists (most of the time!) and no possums. Kiore, which were once present on the island, would have reduced the number and densities of pollinating insects and fruit dispersing birds of the *Tupeia*. However – is this all that reduced this species to almost nothing on Motukino?

Rats – another mammalian browser of *Tupeia*?

I believe *Tupeia* has only recently been a visible element of the Motukino flora since kiore removal in 1997. Motukino was visited previously by several botanists (Esler 1978 , Wright 1980, Cameron & Wright 1990, and de Lange et al. 1995) who did not record *Tupeia* on the island. This is surprising considering the calibre of botanists, length of their stays and the close proximity of the campsite used in one trip to the *Tupeia* (de Lange *et al*. 1995). In fact Ewen Cameron (pers. comm.) and Peter de Lange climbed up many coastal maire trees while on the island looking for bryophytes. I believe that kiore directly ate *Tupeia* shoots reducing the mistletoe each year to its haustoria inside the trunks of the host. There are reports of *Tupeia* existing in a leafless state for decades (Sweetapple et al. 2002). Leafy mistletoes are regarded as semi-parasites i.e. they make their own food by photosynthesis, but take water (and some minerals) from their host. So how would *Tupeia* survive like this? There seems to be little research on this, however, *Tupeia* may have chlorophyll in its haustoria (Fineran cited in Sweetapple *et al.* 2002) which may enable it to remain alive despite having its leafy shoots browsed continually.

Based on these observations on Motukino it will be interesting to monitor forests which once had *Tupeia* that are now under rat control, and islands where rats are eradicated in the future, to see if *Tupeia* can re-appear again.

Acknowledgements
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References

Buchanan, J. 1875. On the Botany of Kawau Island: Physical Features and causes influencing distribution of Species. *Transactions and Proceedings of the New Zealand Institute, 9*, 503-527.

Cameron, E. K., & Wright, A. E. 1990. Additional Vascular Plant Records for Fanal Island, Mokohinau Islands. *Tane*, *32*: 133-135.

Cameron, E.K. 2000. An update on the distribution and discovery of *Ileostylus micranthus* in the Auckland Region. *Auckland Botanical Society 55 (1)*: 39-44.

Cheeseman, T. F. 1871. On the Botany of the Titirangi District of the Province of Auckland. Transactions and Proceedings of the New Zealand Institute, *4*: 270-284.

Cranwell, L. M. 1981. The Botany of Auckland: Auckland Institute and Museum.

de Lange, P. J., McFadden, I., & Cameron, E. K. 1995. Preliminary report of the flora and fauna of Fanal, Mokohinau Islands Nature Reserve. Science and Research Series, 94.

de Lange, P.J.; Norton, D.A. & Molloy, B.P.J. An annotated checklist of New Zealand mistletoe (Loranthaceae) hosts. pp 83-104 in: de Lange, P.J.; Norton, D.A. (eds). 1997. New Zealand's loranthaceous mistletoes. Proceedings of a workshop hosted by the threatened species unit, DOC, Cass, 17 – 20 July 1995.

de Lange, P.J. Status of loranthaceous mistletoes in the Auckland Conservancy. pp. 27-30 in : de Lange, P.J.; Norton, D.A. (eds). 1997. New Zealand's loranthaceous mistletoes. Proceedings of a workshop hosted by the threatened species unit, DOC, Cass, 17 – 20 July 1995.

Esler, A. E. 1978. Botanical features of the Mokohinau Islands. *Tane*, *24*: 187-197.

Stanley, R. 1998. Excerpts from Thomas Cheesman's Field notebooks. *Auckland Botanical Society Journal 53 (2)*: 70-71.

Sweetapple, P.J., Nugent, G., Whitford, J. and Knightbridge, P.I. 2002. Mistletoe (*Tupeia antarctica*) recovery and decline following possum control in a New Zealand forest. *New Zealand Journal of* Ecology *26(1)*: 61-71.

Wright, A. E. 1980. Vegetation and Flora of Fanal Island, Mokohinau Group. *Tane*, *26*: 25-43.

Bischofia javanica (Euphorbiaceae) – A tropical forest tree recorded in Auckland

Mike Wilcox

Auckland has a rich flora of urban trees drawn from many different countries. New ones are regularly being recorded, the latest being *Bischofia javanica* Blume of the Phyllanthaceae. Examples of this tree have so far been located in Auckland – in Stack Street, Herne Bay (Figure 1); at HortResearch, Mt Albert; and in Glenvar Road, Long Bay.

Bischofia javanica is very widely distributed in the Pacific Islands, Malesia, SE Asia, southern China including Taiwan, southern Japan, Myanmar, and India. It is well-known in New Caledonia, Tonga, Rarotonga, Niue, Fiji (Smith 1981), Vanuatu, and Samoa and is a particularly dominant tree in some forests in Rarotonga, Cook Islands (W. R. Sykes, pers. comm.). The local name *koka* is widely used in Polynesia. Other names are *bishop wood*, *Java cedar*, *tuai* (Philippines), and *'o'a* (Samoa). It is thought that the plant is probably an aboriginal introduction in

Rarotonga and possibly also in Tonga and Samoa (Whistler 1991).

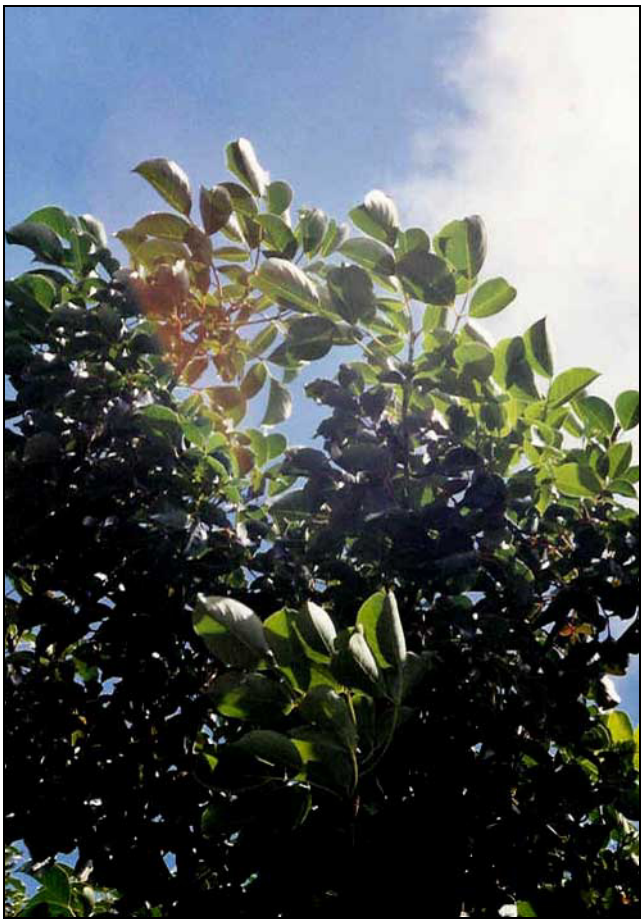

Figure 1. Crown foliage of the 14 m tree in Stack Street, Herne Bay.

It grows into a fairly big evergreen forest tree to 35 m tall, both in primary and secondary forests, and is used for timber. The heartwood is red to dark reddish-brown in colour, and the sapwood pinkish. In Fiji it is rated as a minor heavy timber suitable for posts, poles, decking, and interior work (Alston 1982). A red dye obtained by scraping off and squeezing the bark is used for staining rattan baskets (e.g. in the Philippines) and tapa cloth in Tonga and Samoa (Parham 1972; Whistler 1992). In southern China the fruits are reported to be used for distilling liquor, and the seeds yield 30-54 per cent oil, used for lubrication. In Taiwan the fruits are reported to be eaten (Wang 1995). The roots have been used as in China for herbal medicine to treat rheumatism and malaria, and various parts of the tree are widely used in the Pacific region for traditional herbal medicine (Cambie & Ash 1994; Whistler 1996). The tree is used for environmental regreening in southern China, and as a street tree (e.g. in Florida, USA).

Distinctive features of *Bischofia javanica* are its alternate, trifoliolate, rather leathery leaves with broad, serrulate or crenate, long-petiolate leaflets with acuminate tips (Figure 2); its tiny apetalous, unisexual flowers in axillary dioecious panicles (Figure 3); the small, roundish brown fruits which have persistent styles (Figure 3); and the flaky pinkish brownish bark. Five-foliolate pinnate leaves may sometimes be produced (Airy Shaw 1967). It is commonly evergreen, whereas the only other species in the genus, *Bischofia polycarpa* (H.Léveillé) Airy Shaw from China, is deciduous.

Bischofia is currently placed in the family Phyllanthaceae – now split off from Euphorbiaceae and containing *Phyllanthus*, *Antidesma*, *Bischofia*, *Glochidion*, *Bridelia*, *Cleistanthus* etc. Phyllanthaceae have a variety of growth forms, but can be recognised by their often finely-cracking bark, absence of latex, often 2-ranked and pinnately-veined leaves lacking glands, and explosively dehiscent fruit that have a persistent columella; there are two ovules in each carpel.

Trees at the Glenvar Road, Long Bay, property of John Crowe had ripe fruit in February 2003 (John Crowe has observed fruit from early-mid summer), but no fruiting (or flowering) has been observed on the Herne Bay (14 m tall) or Mt Albert trees (12 m tall x 20 cm dbh). All these trees are healthy and well grown. As to the origin of the Auckland bishop wood trees, John Whitehead, who used to run a rare plants nursery (Miraflores Garden Centre) in Glenvar Road, introduced *Bischofia javanica* and distributed several plants. There are ten or so trees still growing on the property, the biggest being 15 m x 64 cm dbh. The provenance is not known but the seed was supplied by an American seed company.

Figure 2. The compound trifoliolate leaf of *Bischofia javanica*, HortResearch, Mt Albert Auckland.

These examples show *Bischofia javanica* to be a good-looking, tidy evergreen that could become a desirable

new street tree in Auckland. (NB *Bischofia javanica* is an invasive weed in Hawaii and Florida – *Ed*)

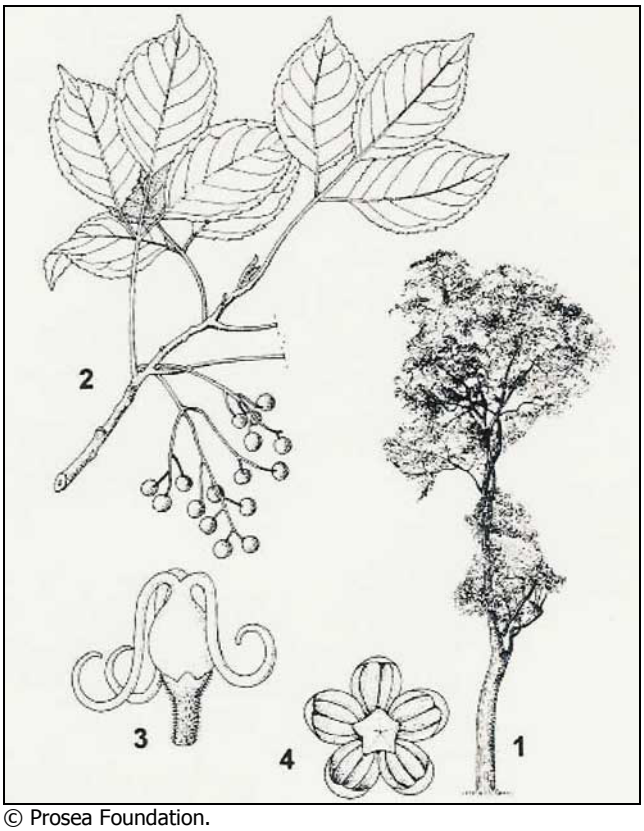

Figure 3. 1- habit, 2- foliage and fruit, 3- female flower with three styles, 4- male flower with five stamens (from Lemmens *et al*. 1995).

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References

Airy Shaw, H.K. 1967. Notes on the genus *Bischofia* Bl. (Bischofiaceae). *Kew Bulletin 21*: 327-329.

Alston, A. S. 1982. *Timbers of Fiji. Properties and potential uses*. Department of Forestry, Suva.

Cambie RC, Ash J, 1994. *Fijian medicinal plants*. Commonwealth Scientific and Industrial Research Organisation, Australia.

Lemmens, R.H.M.J.; Soerianegara, I.; Wong, W.C. 1995. *Plant resources of South-East Asia* No. 5 (2). Timber trees: minor commercial timbers. Prosea Foundation, Bogor, Indonesia.

Parham, B. E. V. 1972. *Plants of Samoa*. NZ DSIR Information Series No. 85.

Smith, A. C. 1981. *Flora Vitiensis Nova*. Vol. 2. Pacific Tropical Botanical Gardens, Lawai, Kauai, Hawaii.

Wang, S-H. 1995. *The ethnobotany of Sheting Village, Hengchun*. Taiwan Forestry Research Institute.

Whistler, W. A. 1991. Polynesian plant introduction. *In* Cox, P. A.; Banack, S. A. (eds.), *Islands, plants and Polynesians. An introduction to Polynesian ethnobotany*. Dioscorides Press, Portland, Oregon: pp. 41-66.

Whistler, W. A. 1992. *Polynesian herbal medicine*. National Tropical Botanical Garden, Lawai, Kauai, Hawaii.

Whistler WA, 1996. *Samoa Herbal Medicine*. O le Siosiomaga Society Inc. of Western Samoa. Isle Botanica, Hawaii, USA.

Needle- grasses and nasellas (sic) a comment

Henry E Connor

Should carpologist "Bal Fader" be in the need of another pseudonym, one could suggest "Analphabetos". In the June 2003 issue of the Auckland Botanical Society Journal 58(1) (pp.35-37) the generic name *Nassella* is spelled analphabetically, and consistently, as *Nasella* (Gardner 2003). The etymology is: nassa (f.), a wicker-basket with narrow neck; the gibbons floret of *N. trichotoma* comes to mind. II. Trop., of a dangerous place, A snare, net; should not apply. Nasus (m.) is The nose.

One might refer to illustrations already published for five of the ten taxa where the florets are complete (Jacobs et al. 1989). The illustration of Chilean needle grass, *N. neesiana* is, appropriately, of the Auckland provenance and not of the common form of var.