

The podocarp *Afrocarpus falcatus* (Podocarpaceae) newly recorded as a casual alien in New Zealand

Leon R. Perrie

Museum of New Zealand Te Papa Tongarewa, PO Box 467, Wellington, New Zealand (leonp@tepapa.govt.nz)

ABSTRACT: The African podocarp *Afrocarpus falcatus* (Thunb.) C.N.Page is newly recorded as reproducing within New Zealand. Numerous seedlings were found directly beneath a mature female tree in Palmerston North. Within New Zealand, *A. falcatus* clearly fits the ‘Cultivation Escape’ subcategory of the Casual Record list, and it is easily distinguished from other podocarps by the yellow-orange colour and large size of its mature seed cones, its relatively thin, flaky bark, and details of the leaves.

KEYWORDS: *Afrocarpus falcatus*, Podocarpaceae, new record, casual, naturalised, exotic.

Introduction

Seventeen species of the conifer family Podocarpaceae (*sensu lato*, subsuming the Phyllocladaceae) are presently recognised as indigenous to New Zealand (Eagle 2006). Although more than 2000 exotic vascular plant species are regarded as reproducing autonomously in New Zealand (Wilton & Breitwieser 2000), only a single exotic Podocarpaceae species has been reported as doing so: *Podocarpus elatus* Endl., brown pine, from Australia (Gardner 2010; New Zealand Plant Conservation Network 2010). Evidence is here reported for the autonomous reproduction within New Zealand of a second exotic podocarp, the African *Afrocarpus falcatus* (Thunb.) C.N.Page, or Outeniqua yellowwood.

Eckenwalder (2009) accepted only two species in *Afrocarpus* (J.Buchholz et N.E.Gray) C.N.Page: *A. mannii* (Hook.f.) C.N.Page and *A. falcatus*. *Afrocarpus mannii* is distinguished by its longer, wider leaves and bigger seeds, and is endemic to São Tomé Island (off Africa’s central west coast). The natural distribution of *A. falcatus sensu lato* is eastern Africa, from northern Ethiopia discontinuously to the Cape region of South Africa. In contrast, Farjon (2010) recognised four species within the broadly circumscribed *A. falcatus* of Eckenwalder (2009), to give five species for the genus. The natural distribution of *A. falcatus sensu* Farjon (2010) is from Malawi and Mozambique to South Africa.



Fig. 1 Adult foliage and seed cones of *Afrocarpus falcatus* (source of WELT SP088055).



Fig. 2 Immature seed cone of *Afrocarpus falcatus* (source of WELT SP088055).

Collection data and identification

On 4 January 2010, numerous seedlings were found directly beneath a mature female of *Afrocarpus falcatus* in Palmerston North, between Massey University's College of Education campus and the Manawatu River. The female parent (Figs 1–3) and seedlings (Fig. 4) are vouchered by specimens in the herbarium of the Museum of New Zealand Te Papa Tongarewa (WELT SP088055 and SP088056, respectively; see Museum of New Zealand Te Papa Tongarewa 2010). The adult was part of a stopbank shelterbelt consisting largely of *Pittosporum eugenioides*, with surrounding grass lawn. At least another three, smaller trees of *A. falcatus* occur nearby (c. 500 m), within the Esplanade Gardens. Two of these are females (*Afrocarpus* being dioecious), while no cones were seen on the third. Seedlings were not observed at this second site.

The fruiting female above the seedlings was identified as *Afrocarpus falcatus sensu stricto* using the key in Farjon (2010). Of particular note amongst the characters used by Farjon (2010), the surface of the seed proper inside the fleshy epimatium is verrucose in the Palmerston North material (not shown).

Successful reproduction of *Afrocarpus falcatus* (*sensu stricto*; C. Ecroyd, pers. comm. November 2010) in New Zealand is also indicated by a specimen held by Scion's herbarium. NZFRI 26519 is a specimen of an adult tree collected on 6 May 2007 by T.R. Pellett from Napier's Hospital Hill. The collection notes record 'There are a number of seedlings under and close to both trees'. However, vouchers of the seedlings themselves were not collected.

Discussion

In the parlance of Heenan *et al.* (2008: 257), *Afrocarpus falcatus* in New Zealand is regarded as a Casual (Alien, or Non-native) Record, rather than a Naturalised Record, because there is no evidence (yet) that its 'populations are self-maintained by seed or vegetative reproduction, or they occur repeatedly in natural or semi-natural habitats or [outside cultivation] in urban environments' (emphasis added). Furthermore, it clearly fits the Cultivation Escape subcategory of the Casual Record list, in that it is 'regenerating only in the immediate vicinity of the cultivated parent plant' (Heenan *et al.* 2008: 258). *Afrocarpus falcatus* has also been



Fig. 3 Bark of *Afrocarpus falcatus* (source of WELT SP088055).



Fig. 4 Some of the *Afrocarpus falcatus* seedlings (source of WELT SP088056) under the adult in Figs 1–3. Note the fallen seeds.

recorded as naturalised in Australia, near Sydney (Hill 1998).

Afrocarpus falcatus is widely cultivated in New Zealand. The New Zealand Virtual Herbarium (2010; drawing on collections in the herbaria of Auckland Museum, Landcare Research, Massey University and Scion) records presumably cultivated specimens from Northland, Auckland, Coromandel, Bay of Plenty, Taranaki, Central Plateau, Hawke's Bay, Manawatu and Canterbury. *Afrocarpus falcatus* may have a relatively long history of cultivation in New Zealand. For instance, the label on the Scion specimen referred to above (NZFRI 26519) states 'Growing close to graves from 1893–1897 and likely to have been planted around this time'. *Afrocarpus gracilior* (Pilg.) C.N.Page, which was synonymised with *A. falcatus* by Eckenwalder (2009) but retained by Farjon (2010), is also cultivated in New Zealand, but only sparingly so (C. Ecroyd, pers. comm. November 2010); it has a smooth surface to the seed coat inside the epimatium (Farjon 2010).

Within the context of New Zealand's podocarps, *Afrocarpus falcatus* is superficially similar to *Prumnopitys taxifolia* (or even *Podocarpus totara*) in leaf architecture, and to *Prumnopitys ferruginea* in the size of the mature seed cone. However, the yellow-orange colour of the mature seed cone (Fig. 1) readily distinguishes *A. falcatus*, especially when considered in combination with the relatively thin, flaky bark (Fig. 3; rather than being pockmarked or furrowed), the large size of the mature seed cone, and details of the leaves.

Eckenwalder (2009) suggests that the major natural seed disperser of *Afrocarpus falcatus* may be fruit-eating bats. With this vector unavailable in New Zealand, it will be interesting to observe to what extent *A. falcatus* will naturalise.

Acknowledgements

Thanks to Ewen Cameron (Auckland Museum, Auckland, New Zealand), Peter de Lange (Department of Conservation, Auckland, New Zealand), Colin Ogle (Wanganui, New Zealand) and, especially, Chris Ecroyd (Scion, Rotorua, New Zealand) for discussions on identification, herbarium records and/or naturalisation.

References

- Eagle, A. (2006). *Eagle's Complete Trees and Shrubs of New Zealand. Vols 1 and 2*. Wellington: Te Papa Press. 1114 pp.
- Eckenwalder, J.E. (2009). *Conifers of the World*. Portland, OR: Timber Press. 720 pp.
- Farjon, A. (2010). *A Handbook of the World's Conifers. Vols 1 and 2*. Leiden and Boston: Brill. 1112 pp.
- Gardner, R. (2010). *Podocarpus elatus* and *P. macrophyllus* (Podocarpaceae) distinguished. *Auckland Botanical Society Journal* 65: 77–78.
- Heenan, P.B., de Lange, P.J., Cameron, E.K. and Parris, B.S. (2008). Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 2004–06. *New Zealand Journal of Botany* 46: 257–283.
- Hill, K.D. (1998). Pinophyta. *Flora of Australia* 48: 545–562.
- Museum of New Zealand Te Papa Tongarewa (2010). *Afrocarpus falcatus*. *Collections Online – Museum of New Zealand Te Papa Tongarewa* [online database], <http://collections.tepapa.govt.nz/Taxon.aspx?irn=58488>. Accessed 11 October 2010.
- New Zealand Plant Conservation Network (2010). *Podocarpus elatus*. *New Zealand Plant Conservation Network* [online database], www.nzpcn.org.nz/flora_details.asp?ID=4195. Accessed 11 October 2010.
- New Zealand Virtual Herbarium (2010). *Afrocarpus*. *New Zealand Virtual Herbarium* [online database], www.virtualherbarium.org.nz. Accessed 15 October 2010.
- Wilton, A.D. and Breitwieser, I. (2000). Composition of the New Zealand seed plant flora. *New Zealand Journal of Botany* 38: 547–549.