Microtis unifolia	x	
**Modiola carolineana*	x	
Myrsine australis	x	
Oplismenus hirtellus	x	
**Physalis peruviana*	x	
Podocarpus totara	x	x
Ranunculus reflexus	x	
Ranunculus urvilleanus	x	
**Ricinis communis*		x
Solanum americanum		x
**Sonchus asper*	x	x
**Verbena littoralis*	x	x

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Misunderstood – our native parapara (*Pisonia brunoniana*)

Bec Stanley & Peter de Lange

If you have heard of this plant, it is probably not because it is uncommon or threatened, but because its sticky seeds can snare birds. Many people are at once fascinated and appalled by this plant perhaps because it seems to embody how cruel nature can be. There's a common misconception that parapara is not native to New Zealand. Indeed this species is a subtropical and warm temperate species native to entire Pacific Basin including the Hawaiian Islands, Norfolk Island, Australia, Kermadec Islands, Lord Howe and northern New Zealand. So it is very much one of our own and is a valued member of our flora as our only indigenous representative of the Nyctaginaceae.

In New Zealand parapara is a shrub or small tree up to 3.5(-6)m tall with large (up to 300 × 150mm) opposite to slightly whorled, dark green leaves. The leaf margins are usually entire but some island populations, e.g., Cuvier (Repanga) and Three Kings Islands have distinctly wavy (sinuate) leaf margins. It has small, tubular pale green to cream flowers, which are beautifully scented at night time. By far the most obvious feature is the five-ribbed, very sticky fruit which is 250mm long. On offshore islands especially those without rats it grows in coastal forest with karaka (*Corynocarpus laevigatus*), puriri (*Vitex lucens*), kohekohe (*Dysoxylum spectabile*) and nikau (*Rhopalostylis baueri* (Kermadecs) and *R. sapida*.)

Historically parapara was recorded sparingly from the northern third of the North Island, New Zealand. However, by the early 1980s the only mainland populations left were scattered trees near the head of the remote Whangape Harbour, north of the Hokianga, a few trees near Mangawhai, and just south of East Cape. At East Cape a single, 6m tall tree was recorded by Heginbotham (1985), somewhat posthumously as it turns out, because the tree, which was on private land, was deliberately destroyed sometime around the early summer of 1984 by the landowner, who disliked the notion that the tree could potentially trap birds. While it is seriously at risk of extinction within the mainland part of its New Zealand range it is thankfully sparsely distributed, and at times locally common on some northern offshore islands (including the Kermadec Is, Three Kings Is, Hen & Chickens, Little Barrier Is, Mokohinau Is, Mercury Is, & Karewa Is off the Bay of Plenty).

In the Auckland region, parapara used to grow in coastal forest on the "shores of the Waitemata Harbour" where a specimen was collected during the

1840's by colonial secretary to Governor Fitzroy, Dr Andrew Sinclair (BM!). That specimen, the type of *Pisonia sinclairii*, is the sole proof that it was indigenous to the mainland part of the region.

Nationally the reduction in range and abundance has lead parapara to being assessed as "At Risk/Sparse" category (de Lange *et al.* 2004). Parapara is also threatened or uncommon on Lord Howe, Guam, Tonga, the Cook Islands, New South Wales (Sykes 1987) and on some of the Hawaiian Islands (G. Carr pers. comm.). On Norfolk Island, its type locality, only seven trees were left when one of us (PdL) visited that island group in 1998.

Threats to Parapara

It is difficult for us to imagine much of New Zealand (especially coastal areas) being sea-bird dominated however it was in that time, prior to human colonisation of the archipelago, that parapara flourished. The start of its demise began when kiore (*Rattus exulans*) were introduced and continued and would have worsened with the introduction of other rat species and predators such as cats. These predators would have removed most of the bird colonies and with them went the habitat of parapara. In addition research proves that rats eat seeds and seedlings of parapara which may have resulted in its low numbers on the mainland and islands with rats (e.g. Little Barrier) (Campbell and Atkinson 1999a; Campbell and Atkinson 1999b). Rats also predate seabirds which, as the plants main seed dispersal vector, further threatens the plant.

Unique seed dispersal mechanism

The geographic distribution of this species is indicative of its effective dispersal mechanism. The sticky seed is designed to be carried by seabirds away from the parent tree by attaching onto the feathers of seabirds (boobies, gannets, petrels, mollymawks and shearwaters). From an ecological perspective it does not make much sense for the Parapara to kill the bird (its primary disperser) because then its seeds wouldn't travel very far. As natural dispersers seabirds are large enough not to be compromised by the sticky seeds. There is no doubt that parapara can affect smaller forest birds, and this can result in their death, however this is not the usual course of events. We have observed that most native birds, in a natural setting, are not trapped by the sticky seeds. New Zealand's native smaller birds have evolved with parapara – it has not affected their persistence in the country to date, and we expect it won't in the future. However, exotic urban birds we suspect are less familiar with parapara fruits and so are more likely to be caught by them. Nevertheless bigger threats exist in the urban environment to small birds including predation by rats, cats and habitat destruction. Nevertheless some people have elected to publicise that parapara is a carnivorous plant which deliberately catches birds to sustain itself or its propagules. This is pure fiction, parapara in contrast to carnivorous plants, which catch and absorb their prey, has evolved viscid fruits merely as a means of propagule dispersal.

Use by Mäori?

As well as 'parapara' this plant is also known as püwhäureroa by Maori. Although indigenous Hawaiians used the parapara (which they call 'Papala kepau') seeds to catch birds to harvest feathers for capes and other decorated objects (Medeiros et al. 1998) we are unaware of any evidence to indicate a similar use by Maori here.

Parapara in the urban garden

Published, peer-reviewed, and so objective evidence on the toll exacted by parapara on urban birds is not huge, e.g. 6 birds were taken to bird rescue in Whakatane over 10 years because they had been snared by parapara and 4 of these birds were released unharmed after being washed (Tully 2004). However, finding a bird caught in this plants fruit can be upsetting. If you have a parapara in your garden, and you are concerned about the safely of small urban birds, you should remove the plant, or remove its flowers or seeds. Cats, kept as pets, or rats are likely to be a far bigger predator of urban birds than parapara but often people are not witness to this and can more easily ignore it. Ultimately though, we believe the issue is about being well informed. If nurseries wish to stock this plant, then the onus should be on them to appropriately label specimens with suitable warnings that the fruits of this tree might catch birds.

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