Mosses recorded on Ponui Island, Hauraki Gulf

Jessica Beever

Thirty-seven mosses, listed below, were recorded during the brief visit to Ponui by the Auckland Botanical Society on 20th November 1999 (for vascular plants and adventures in transit see account by Ewen Cameron, this issue). Many of these are mosses of disturbed habitats, indicative of the degraded nature of the forest we visited. *Fissidens taxifolius* and *Pseudoscleropodium purum* are both introduced species. The former was found along the track in highly disturbed cattle-pugged forest, while the latter formed extensive deep mats in high light areas under regenerating tea-tree on an exposed ridge. Nevertheless a modest range of indigenous forest taxa were found, such as *Ctenidium pubescens*, *Hypnodendron colensoi*, *Calomnion complanatum*, *Pendulothecium punctatum* and *Dicranoloma menziesii*, indicating that, with protection, a diverse forest flora can be retained. The exposed coast provides natural habitat for species requiring high light, such as *Bryum campylothecium* and the Pottiaceae, *Didymodon australasiae* and *D. torquatus*.

Specimens marked * have a voucher placed in AK. The others are field records by the author. No previous records of mosses from Ponui were found in database searches at Auckland Museum (AK) or the Museum of New Zealand (WELT).

Breutelia pendula
**Bryum billardierei* var. *platyloma*
**Bryum campylothecium*
**Bryum rubens*
**Bryum sauteri*
Calomnion complanatum
Camptochaete sp.
Campylopus clavatus
Campylopus introflexus
Campylopus pallidus
**Ctenidium pubescens*
Dicranoloma menziesii
**Didymodon australasiae*
**Didymodon torquatus*
Fissidens asplenioides
**Fissidens curvatus* var. *curvatus*
**Fissidens leptocladus*
Fissidens pallidus
**Fissidens taxifolius*
**Fissidens tenellus* var. *tenellus*
Hypnodendron arcuatum
**Hypnodendron colensoi*
**Hypnum cupressiforme*
Leptostomum macrocarpum
Leucobryum candidum
Macromitrium sp.
**Pendulothecium punctatum*
Pseudoscleropodium purum
Ptychomnion aciculare
**Rhaphidorrhynchium amoenum*
Stokesiella praelonga
**Syntrichia princeps*
Thuidium furfurosum
**Tortula muralis*
**Triquetrella papillata*
**Weissia patula*
Wijkia extenuata

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Cameron, E. K. 2000: Field trip to southern Ponui Island, Hauraki Gulf, *Auckland, Auckland Botanical Society 55(1):* 34-38.

Acknowledgements:
Thanks to Barbara Polly, Doug Rogan and Ewen Cameron for database searches.

An update of the distribution and discovery of *Ileostylus micranthus* in the Auckland Region

E.K. Cameron

Introduction

Although green mistletoe (*Ileostylus micranthus*) is the most widespread mistletoe in New Zealand (see de Lange et al. 1997) it appears to have never been common over the last 140 years in the Auckland region. It is currently listed as a Nationally threatened species as `Declining' (de Lange et al. 1999a) and Regionally as `Critically threatened' (de Lange et al. 1999b).

This article updates and expands the 1995 work by Peter de Lange (1997) and lists the different host species. It also attempts to list and map all the known records of green mistletoe recorded or collected in the Auckland region (boundary as for Auckland Conservancy, Department of Conservation (DoC), see de Lange & Cameron 1997: fig. 1). Note - Paparoa (north Kaipara) is just outside the Auckland boundary but is included here because of its close proximity. The records are based on published accounts, records on Auckland DoC's threatened plant database, and 39 herbarium specimens (excluding duplicates) at AK, AKU, CHR, NZFRI, WAIK and WELT. It is good to see how many published records (6) came from Auckland Botanical Society's *Newsletter/Journal*.

19th century records of green mistletoe in the Auckland Region

The first collection of green mistletoe in the Auckland region was by T. Kirk in August 1864 from Great Omaha (WELT 31448). Next are four specimens from T. Kirk's herbarium from Kaipara, two of them specify Paparoa (north Kaipara), and only one is dated (24 October 1867). I have assumed that all four sheets were collected at the same place and at the same time. The only other 19th century collection appears to be by Ball in 1886 from Rewiti (AKU 2383). The next collection from Auckland region was in 1940 (see below under "Historical Sites"). Two early published Auckland records were for the Auckland isthmus by Kirk (1871: 154) and Kawau Island by Buchanan (1877: 512).

From the 1980s onwards

During most of the 1980s green mistletoe was only known for certain between Kaiaua and Miranda, on the Firth of Thames. Some of the earlier sites (Hunua Ranges & north of Puhoi) had been forgotten or were known to very few people. It was locally common at Kaiaua-Miranda in a remnant saltmarsh mainly along the side of Kaiaua Beach Road for c.1 km, parasitising shrubs of *Coprosma propinqua* and a few *Plagianthus divaricatus* (Smith Dodsworth 1988, pers ob., & 16 herbarium sheets). It was first collected here on 9 April 1966 by H. R. (Ross) McKenzie and the following day by R. W. Jackson. Peter de Lange (1997) records c.50 green mistletoes at this site.

Harry Beacham around 1988 discovered a single green mistletoe at the end of a low branch on a Hall's totara (*Podocarpus hallii*), by the margin of the walk down to the Waitakere Dam (B. H. Beacham *pers. comm.*, May 2000) (the mistletoe disappeared in June 1990). In April 1989 Stephen King discovered a few plants on two trees of Hall's totara in the Waitakere Ranges by "Frog Rock" on the Piha Road (Cameron 1992). In September 1995 Tom Stein and Alastair Jamieson (*pers. comm.*) banded 2 Hall's totara with three mistletoes a few hundred metres west of "Frog Rock". In Februaury 1999 both sites were revisited (A. Jamieson *pers. comm.*) and 7 mistletoes were recorded by "Frog Rock" and 6 west of "Frog Rock". There were 3 earlier Waitakere records: Laingholm (1946), upper Huia Dam area (1951), Parau Stream (1940s-1950s) (see below "Historical Sites").

In May 1996 Peter de Lange rediscovered green mistletoe on private land near Ararimu, Hunua (*NZ Hearld* 16 May 1996: 1). It was first observed there by Terry Hatch in the early 1970s (de Lange 1997: 30). After the July 1998 ABS (Auckland Botanical Society) trip led by Bec Stanley to the Ararimu property, Bec documented at least 43 plants present, all on Hall's totara (Stanley 1998), and totara hybrids (P. J. de Lange *pers. comm.*). Note - Peter's (de Lange 1997; and annotation on AK 231862) initial estimates were too high.

In the same year Maureen Young (1996) documented the largest Auckland population mainly parasitising totara on both sides of State Highway 1 by the turnoff to Mahurangi Regional Park. An ABS trip there in April 1996 led by Maureen counted at least 300 plants on 55 totara, and totara hybrids, and one hawthorn (*Crataegus monogyna*). It had been collected from this locality in 1940 by Ross McKenzie and possibly Frank Warren ("upper Waiwera Valley") in 1960 (see below "Current Sites"). Last year Maureen found another totara, some 500 m further south of here, with four more mistletoes attached (AK 246737).

In December 1999 I was informed by Don Armitage that Peter and Helga Speck had a small green-flowered mistletoe on their southern Great Barrier Island property at Rosalie Bay near Windy Hill. I said that I was keen to have a herbarium specimen because it almost certainly was green mistletoe, a new record for the island. Don arranged a specimen in mid January 2000 that confirmed green mistletoe. There was only a single mistletoe known (1 m across), 3 m "up" a kanuka (*Kunzea ericoides*) trunk which was bent 90 degrees 1.5 m up from the ground. The host was isolated in a paddock by a watercourse and the landowner intends to fence the kanuka to exclude stock (P. Speck *pers. comm.*, Apr 2000). I visited the site in April 2000. Then in January Don told me that I should talk to another Great Barrier resident, Jeremy Warden, who was aware of a mistletoe on the Forestry Road, north of Whangaparapara. The result being a second green mistletoe site confirmed for Great Barrier, 14 km distant from the previous site. Jeremy (pers comm., Feb 2000) first saw three mistletoes here 3-4 years ago, two on kanuka and the other on mapou (*Myrsine australis*). Now only a large (1.5 m across) mistletoe is obvious on an 8 m tall kanuka, attached on an outer branch 6 m up. The voucher specimen had a bad attack of thrips.

These two Great Barrier records of green mistletoe are important for several reasons. They are only the second record of green mistletoe for any of the Hauraki Gulf islands. Note - Buchanan (1877) recorded it for Kawau Island. It is rather surprising that it hasn't been seen on Great Barrier before or on any of the other large Hauraki Gulf islands that have an abundance of apparently suitable hosts (e.g. Little Barrier and Waiheke Islands). These fifth

and sixth extant Auckland localities are quite separate from all other Auckland sites (historical or recent) and are actually closer to sites on the north-eastern Coromandel Peninsula (e.g. Taiaruru Bay, *J. Smith-Dodsworth*, AK 159065). The source of the Great Barrier plants is most likely to be fairly recent and from the Coromandel Peninsula. This would explain why it has first been discovered in southern Great Barrier and hasn't been seen on previous botanical surveys of the island. The fleshy fruit containing a single seed is eaten by birds (tui, bellbird, silvereye) and later defecated (Ladley 1997). The fruit is also eaten by blackbirds, thrush, starling, etc. (P. J. de Lange & B. Molloy *pers. comm.*). The sticky surface of the seeds enables them to adhere to a branch where they can germinate. There may be pollination difficulties with small populations of green mistletoe because it is subdioecious (populations contain plants with male, female or hermaphroditic flowers) (Ladley 1997). Although on 11 April fruit appeared to be well formed (though not ripe) on the single plant at Rosalie Bay (pers. ob.). Two of the Great Barrier hosts, kanuka and mapou, appear to be new hosts for this species in the Auckland region and kanuka is the most common tree on the island. Over 60% of Great Barrier is reserve land managed by DoC, and possums, a known threat to mistletoes, are absent from the island. This gives plenty of scope for green mistletoe to spread (or be more widespread) on Great Barrier Island.

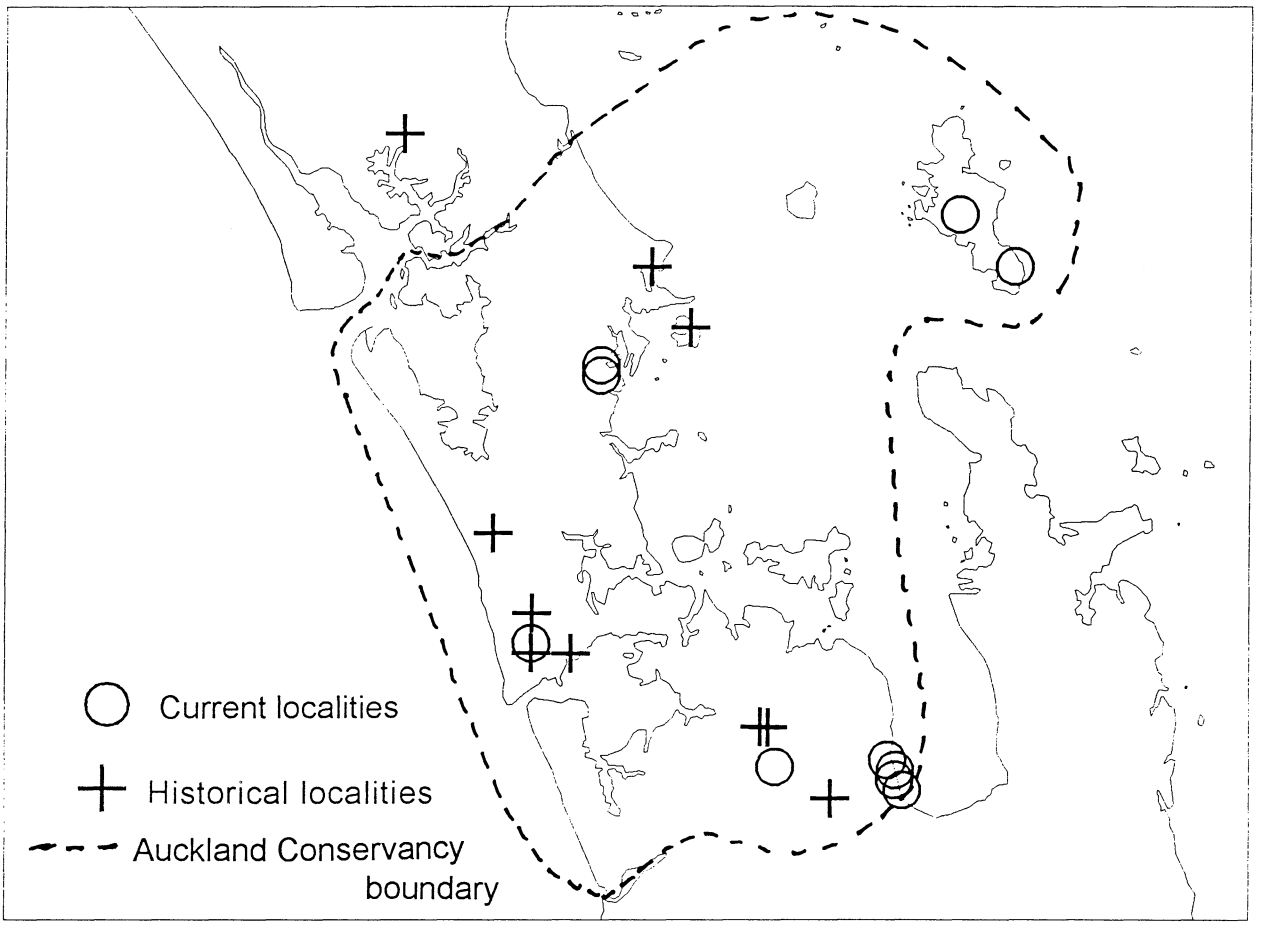

Fig. 1. Distribution of *Ileostylus micranthus* in the Auckland region based on published records, Auckland DoC's threatened plant database and 39 herbarium specimens.

Auckland green mistletoe hosts

Although green mistletoe is known to parasitise > 220 different host species (native and exotic species) throughout New Zealand (P. J. de Lange *pers. comm.,* Feb 2000), based on herbarium specimens, (with and without sample of host) and a few published records, only 15 different hosts and a hybrid swarm, have been recorded for the Auckland region. * denotes verified host sample on herbarium sheet:

Coprosma aff. *macrocarpa* Kaiaua-Miranda, 1994 (AK 222214*).
Coprosma propinqua - Kaiaua-Miranda, 1976 (AK 208767); 1981 (AK 153654); 1984 (AKU 15653); 1990 (AK 199657); 1994 (AK 221698).
Crataegus monogyna (hawthorn) - north Puhoi, 1996 (Young 1996).

Cupressus macrocarpa (macrocarpa) - Kaiaua-Miranda, 1994 (AK 221696*).
Elaeagnus x *reflexa* (elaeagnus) - north Puhoi, 1995 (AK 223802*).
Euonymus japonicus (evergreen spindle) north Puhoi, 1995 (AK 223735*).
Kunzea ericoides (kanuka) - Great Barrier Id, 1997-2000 (244174*, 244185, 244251*).
Leptospermum (kanuka/manuka?) - Great Omaha, 1864 (WELT 31448).
Leptospermum scoparium (manuka) - Kaipara, [1867] (WELT 31055).
Ligustrum sinense (Chinese privet) - north Puhoi, 1995 (AK 223734*);
Muehlenbeckia australis (pohuehue) - Kaiaua-Miranda, 1994 (AK 221697*, 221701*).
Myrsine australis (mapou) – Great Barrier Id, c.1997 (J. Warden *pers. comm.*, Feb 2000).
Plagianthus divaricatus - Kaiaua-Miranda, 1985 (AK 174344); 1990 (AK 199657); 1994 (AK 221700*).
Podocarpus "totara" (including *P. hallii, P. totara, P. hallii* x *P. totara*). Most of the Auckland hosts are hybrids (P. J. de Lange *pers. comm.* May 2000) -
North Puhoi, 1940 (AK 211616); 1960 (AK 69471); 1995 (AK 223733*); 2000 (AK 246737*).
Waitakere Dam, 1988 (B. H. Beacham *pers. comm.*, May 2000).
Piha Rd, 1989 (Cameron 1992); 1995 (AK 222379*).
Laingholm, 1946 (E. D. Hatch *pers. comm.*, Mar 2000).
Parau Stream, 1940s-1950s (B. Segedin to P. J. de Lange, 1995).
Ararimu, 1996 (AK 231862*).
Hohneck's Bush, 1952 (Given 1952).
Middleton's farm, 1969 (AK 211615).
Hunua Rd, 1963 (AK 213021), 1970 (AK 208769-71).
Ulex europea (gorse) - Kaiaua-Miranda, 1994 (AK 221699*).

Distribution of green mistletoe in the Auckland region (see Fig. 1)

Current Sites
Rodney Ecological District –
North Puhoi: near SH1/Muhurangi West Rd junction, Nov 1940 (*H. R. McKenzie*, AK 211616); (upper Waiwera Valley), Jul 1960 (*F. M. Warren*, AK 69471); Aug 1995 (*P. J. de Lange & G. M. Crowcroft*, AK 223733-35, 223802, dups CHR); May 2000, on totara (*M. E. Young*, AK 246737).
Waitakere Ecological District -
Piha Rd: "Frog Rock" Apr 1989 (Cameron 1992: 57); Apr 1995 (*P. J. de Lange*, AK 222379; de Lange (1997); 6 plants just west of "Frog Rock" (A. Jamieson & T. Stein *pers. comm.*).
Hunua Ecological District (note – a small part of Hauraki Ecological District, from Kaiaua south to Miranda, is also included) –
Kaiaua-Miranda: 9 Apr 1966, Nov 1969 (*H. R. McKenzie*, AK 211613-4); 10 Apr 1966 (*R. W. Jackson*, NZFRI 5508); Feb 1976 (*A. J. Dakin*, AK 208767); May 1981 (*A. E. Wright 3868*, AK 153654); Apr 1984 (*R. M. Bellingham*, AKU 15653); Oct 1985 (*R. O. Gardner 4607*, CHR 432175 ex MO; *R. O. Gardner 4608*, AK 174344); Jun 1990 (*P. J. de Lange 288*, AK 199657, dups CHR, WAIK, WELT); Jul 1994, Rangipo (*P. J. de Lange*, AK 222214, dup CHR); Jul 1994 (*P. J. de Lange 2958-2963 & G. M. Crowcroft*, AK 221696-701, dups CHR).
Ararimu: Markham Rd, May 1996 (*P. J. de Lange*, AK 231862, dup CHR); Stanley (1998).

Great Barrier Ecological District -
Rosalie Bay: Jan 2000 (*P. Speck & D. Armitage*, AK 244174, 244185).
Forestry Rd: Feb 2000 (*J. Warden*, AK 244251).

Historical Sites
Kaipara Ecological District (southern part only, except for Paparoa) –
Rewiti: 1886 (*Ball*, AKU 2383).
Paparoa: Oct 1867 (*G. Kirk*, WELT 31291); undated (*T. Kirk Herb.*, AK 11264); undated, Kaipara (*T. Kirk*, WELT 31054; *T. Kirk Herb.*, WELT 31055) – all these Paparoa records are just north of the Auckland regional boundary.

Rodney Ecological District –
Omaha: Aug 1864, on *Leptospermum* (*T. Kirk*, WELT 31448); undated (c.1930s-1940s) (*R. K. Ward*, WAIK 9811), there is some doubt about the *Ward* locality because it was on a mixed herbarium sheet with an apparent 2nd locality (illegible) in pencil (P. J. de Lange *pers. comm.*, Mar 2000).

Waitakere Ecological District –

Laingholm: bottom of School Track near Parau pumphouse on totara, Joe Beveridge, 1946 (Hatch 1994: 52; E. D. Hatch *pers. comm.*, Mar 2000). Note - the School Track at Laingholm, one of Laing's logging tracks, ran from 51 Victory Rd down to the pumphouse; the mistletoe was growing on the upper branches of a young *Podocarpus totara* c.30 cm dbh, subsequently the totara died (E. D. Hatch *pers. comm.*, Mar 2000).

Upper Huia Dam: Nov 1951, this specimen was collected by Ken (`Nugget') Thompson and passed onto K. Wood during a Bot Soc trip to Huia Dam area (*K. Wood*, AK 29714; K. Mays *pers. comm.*, Apr 2000).

Parau Stream (east side) 1940-50s on totara (B. Segedin *pers. comm.* to P.J. de Lange, 1995; this may be from the same site as the previous record).

Waitakere Dam (on access road just above the house, east side): on Hall's totara, c.1988, (B. H. Beacham *pers. comm.* to R.J. Stanley, Aug 1998).

Hauraki Gulf Islands Ecological District -

Kawau Island: 1875 (Buchanan 1877).

Hunua Ecological District –

Hohneck's Bush: on totara, 1952 (Given 1952; locality from A. Dakin & I. L. Barton *pers. comm.*, Mar 2000).

Hunua Rd (north side): opposite Middleton Rd, Feb 1963, Nov 1969, Jan 1970, Apr 1970, a single small totara right beside the road which died 10-15 years ago (*I. L. Barton*, AK 213021, 208769-70; I. L. Barton *pers. comm.*, Feb 2000).

Middleton's farm: Middleton Rd (south side of Hunua Rd), Jan 1969 (*J. Player*, AK 211615).

Based on the list above, the preferred mistletoe host in the Auckland region is the *Podocarpus* "totara" complex, which is what Norton and de Lange (1999) found for Northland and Auckland. *Coprosma propinqua* is the next most preferred host which Norton & de Lange (op. cit.) found was the main host for the west coast of the South Island. Kanuka from two, possibly three, sites may be on the increase as a preferred host. Most of the other hosts have been recorded or collected because they were unusual.

Conclusions

Hopefully this present account shows that green mistletoe has been, and is, more frequent and widespread in the Auckland region than was generally thought. Although presently it numbers only some 412 individuals at six sites. The small recorded host range in the Auckland region is slowly increasing. The two largest Auckland populations are both on roadsides (i.e. Mahurangi and Kaiaua) and are threatened with adverse roadside activity (de Lange 1997). DoC is about to start planting c.900 host species for green mistletoe at Kaiaua-Miranda to make this site is more secure (R. J. Stanley *pers. comm.*, Apr 2000).

I think we can be optimistic that other populations of green mistletoe will be found on Great Barrier Island, especially in the southern part where it appears to be establishing. It may also be establishing in other areas within the region. Therefore keep your eyes open for this rather cryptic species, you never know where it might be found next. Please send any additional records or host information to Bec Stanley or myself.

Acknowledgements:

Bec Stanley (DoC) for additional green mistletoe sites from her Auckland threatened plant database and for commenting on a draft of this article; Peter de Lange for his comments on the Omaha Ward specimen and for comments on a draft of this article; Ian Barton and Andrew Dakin for clarifying the locations of some Hunua collections/records; Harry Beacham, Dan Hatch, Katie (nee Wood) Mays and Maureen Young for their additional comments on their records/collections; Alastair Jamieson and Tom Stein for comments on the mistletoe population in the "Frog Rock" area; the herbarium staff of AKU, CHR, NZFRI, WAIK & WELT for copying label information; all the collectors of the Auckland green mistletoe vouchers; the Great Barrier residents who brought the green mistletoe plants to light – Don Armitage, Peter and Helga Speck, and Jeremy Warden; and Doug Rogan for producing the distribution map (Fig. 1).

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There's Ptyxis at the bottom of the garden:
leaf-folding and its taxonomic value

Rhys Gardner

The new leaves of flowering plants are arranged in the bud in various ways. The term 'ptyxis' refers to the rolling or folding of the individual leaves, and 'vernation' (not further mentioned here) to the way in which the leaves are packed together.

Ptyxis, like other vegetative features such the presence of stipules, tomentum or exudates, is best observed in living plants, just as the buds expand, and can very helpful in suggesting what family or even genus an unknown plant might belong to. A *Pittosporum* in bud, for example, might be mistaken for a *Myrsine, Pouteria* or *Pseudowintera* but never for an *Alseuosmia,* and *Mida salicifolia* for *Nestegis lanceolata* but never for *Beilschmiedia tawa.*

Cullen (1978) surveyed ptyxis across the angiosperms, the most extensive such investigation since that of Linnaeus in his "Principia Botanica". Cullen notes that the different modes may not be clear-cut (in which case one can hyphenate them), since leaves may go through intermediate modes when expanding. Those of *Pittosporum,* for example, often go from supervolute to revolute. Nor is it uncommon for the upper part of the blade to be rolled or folded slightly differently to the basal part.

Cullen refers to some New Zealand taxa: *Celmisia* has both conduplicate- and revolute-leaved species; *Hoheria,* unusually for Malvaceae, has involute leaves. Of particular interest to us is the use of ptyxis as basis for what was the earliest subdivision of *Nothofagus*; this is further discussed by Philipson & Philipson (1979) in a well-illustrated article.

The main kinds of ptyxis (terms mostly after Cullen; see also Stearn (1973), and Bell (1991)) are shown in Figure 1.

Examples from our dicot flora are:
flat *(Avicennia, Brachyglottis repanda),*
curved *(Beilschmiedia tarairi, Nothofagus menziesii),*
conduplicate *(Carpodetus, Sophora, Vitex* leaflets),
involute *(Alseuosmia, Ixerba, Macropiper),*
revolute *(Brachyglottis perdicioides, Muehlenbeckia, Nothofagus fusca, N. solandri),*
supervolute *(Myrsine, Pittosporum, Plagianthus regius),*
circinate *(Drosera).*

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