Legend

Habitats			Abundance
CL	=	cliff/bank	a = abundance
FR	=	freshwater	c = common
RO	=	rock (breakwater)	o = occasional
SA	=	salt (marine)	l = local
*	=	adventive species	r = rare (< 5 plants seen)

AK = herbarium voucher specimen in the Auckland Museum

Some seeds in *Melicytus* (Violaceae)

R.O. Gardner

The Seed Atlas for our native flora currently being compiled by Landcare NZ botanists will no doubt help solve various outstanding taxonomic problems. In some groups though, an unsuspected amount of variability may well be revealed, and comparative work using extra-New Zealand species (e.g., Webb & Simpson, 1991), painstaking studies of development, and investigation of the seed with respect to its dispersers and predators, will all be required for a proper understanding of evolutionary relationships. *Melicytus* would seem to present such a complex case, and all I want to do here is to note a number of features of its seeds that have mostly been overlooked.

At pollination, *Melicytus* ovules are orientated with their micropyle upwards. The ovary stalk, or funicle, comes from an ascending vascular strand in the middle tissue of the ovary wall. It enters the ovule just below the micropyle and passes down to the ovule's lower end (chalaza), where it may break into a number of smaller strands that reascend for some way. The line of the vascular strand between its entry and the chalaza is known as the raphe. The ovule has two coats (integuments), and the various cell layers of these differentiate characteristically as the seed matures. In the seed, the outer integument (testa) is mostly fleshy but its innermost layer or layers also contain deeply coloured cells; the inner integument (tegmen) is largely composed of spiralling thick-walled fibres (cf. the account of other genera of Violaceae in Corner, 1976).

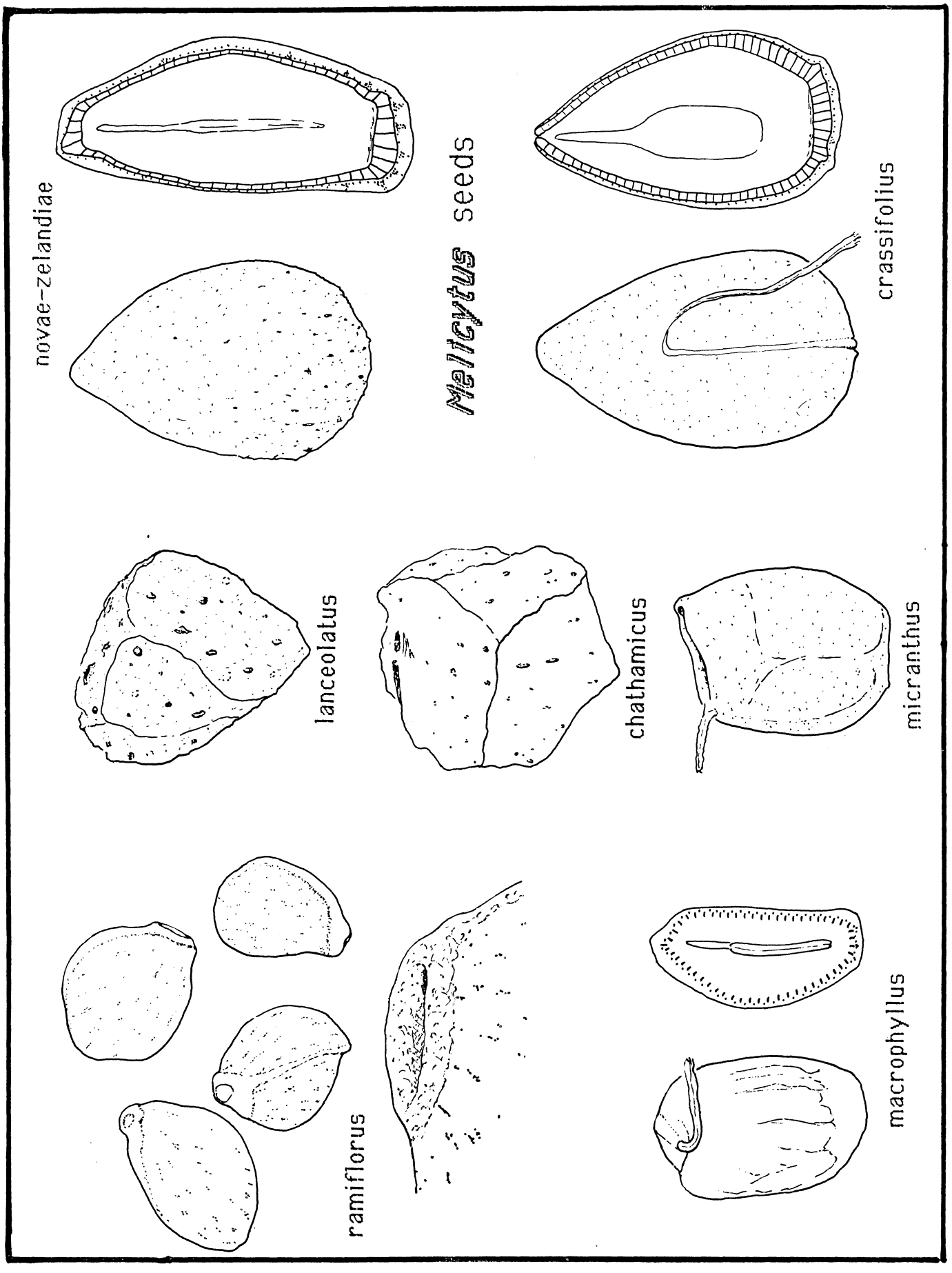
Figure 1.

A. *M. ramiflorus*. Fresh seeds lying at various angles, purplish in colour except around micropyle and raphe, where the testa is swollen to form respectively a collar and a ridge. The enlargement of the micropylar region shows the dark base of the broken-off funicle; in this species, a ripe fruit always yields its seed cleanly.

B. *M. macrophyllus*. The seed lacks testal colour-cells and is less swollen at the micropyle and raphe. Vascular strands ascending from the chalaza are often conspicuous. As shown, the funicle is (sometimes) relatively strongly attached to the seed, so when a ripe fruit is squeezed or bitten the seeds often emerge all attached to the inner pellicular layer of the fruit wall and with fleshy mesophyll adhering to this. Perhaps this is relevant to some feature of bird-feeding. The flesh of the fruit is sweet-scented, like the drying leaves of this plant.

C. *M. lanceolatus*. Seed (fresh) is dark purple, almost entirely so except for the paler and only slightly swollen raphe, which runs down the edge of the curved dorsal face. There is only a minute collar around the micropyle, and the seed usually detaches cleanly from its funicle. A fruit has up to 11 seeds (cf. us. 5-7 for *M. ramiflorus* and 2-4 for *M. macrophyllus*), so it is understandable that its close-packed seeds should be faceted ventrally. But most notable are the numerous tubercules; these are very evident in dried seeds, and are formed by aggregations of lignified cells in the inner part of the testa (or outer tegmen?).

Figure 1: Seeds of some *Melicytus* species (x 12). Cross sections more or less schematic.



D. *M. chathamicus.* I have only examined dried seeds, which are straw-coloured. There are perhaps usually 3 or 4 per fruit. They are faceted ventrally and somewhat sculptured, especially on the dorsal curved faced which carries the raphe. Elongate tubercules are numerous especially on the dorsal face. The micropylar collar is inconspicuous.

E. *M. novae-zelandiae.* Seeds are maroon-coloured, us. 2 per fruit, the dorsal side curved and the ventral side plane. The micropyle is apical but its position is not evident. Low elongate tubercules are obscure in fresh seeds but are very evident on drying. The sectioned seed shows the inner layer of the testa (dots) forming tubercules especially at the chalaza. It seems that the tubercules and colouring develop after fertilisation; a specimen I examined (AK100123) had pale non-tuberculate seeds, which though full-sized were without endosperm and embryo.

F. *M. micranthus.* Seeds are purplish grey, large, ovoid and usually solitary (sometimes there is a second dwarfed seed). The testa is not swollen over the raphe or at the micropyle (this is apical and sometimes has the straw-coloured tegmen exposed). There are sometimes a few tubercules on the chalaza. The seed is quite strongly connected by its funicle to the middle and inner parts of the fruit wall. Peter de Lange has suggested to me that the pendent white fruits of *M. crassifolius* and the other small-leaved species (and *M. novae-zelandiae* too?) may be taken mainly by nocturnally-feeding lizards.

References

Corner, E. J. H. 1976: *The Seeds of Dicotyledons.* C.U.P., Cambridge.
Webb, C. J. & Simpson, M.J.A. 1991: Seed morphology in relation to taxonomy in New Zealand species of *Weinmannia, Ackama* and the related South American *Caldcluvia paniculata* (Cunoniaceae) *N.Z. J Botany 29*: 451-3

Astelia grandis (swamp astelia) in the Waitakere Ranges

Sandra Jones

Astelia grandis is uncommon in the Waitakere Ranges, but not quite so uncommon as we once thought. It was first added to the species list in October 1984 when Rhys Gardner identified half a dozen large clumps on the Kakamatua Inlet Track. Then in late 1984, Geoff Davidson rescued some from the soon-to-become balefill site in Kay Road, Swanson. (Its habitat there has apparently gone for good now). I came across a couple of clumps not far from the first recorded site in November 1986, just off the Panto Track at Cornwallis. Those of us who were on the Bot. Soc. field trip in the Water Catchment on 15.8.92 will recall the attractive specimens in the swampy ground beside the Upper Nihotupu Track.

Harry Beacham has again added to the record. Just off the Cutty Grass Track (which is not too far from the Upper Nihotupu Track swamp), he found three clumps of eleven plants. He was searching (successfully) for *Pittosporum kirkii* at the time.

Footnote: It might not be common in the Waitakere Ranges, but its type locality is Ponsonby Road, Auckland!

(It was thought to be extinct in the Tamaki Ecological District, until Waitakere City staff found several plants in a wetland in Moires Park last year, while carrying out a PNA-type survey in the city. A subsequent investigation by Ewen Cameron resulted in the discovery of a herbarium specimen from this site, lodged by Alan Esler in 1985 (AK 170932). It has also been recorded in the past in a number of scenic reserves in the district - Ed).