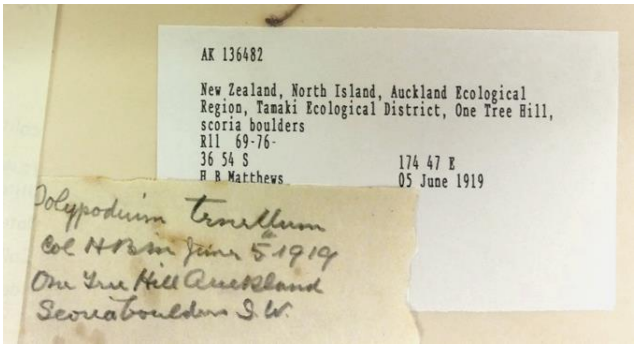

Fig. 2. H.B. Matthews' original hand-written label on AK 136482.

exacerbated has seen their replacement by sheep. There is little doubt that the *Arthropteris* itself is grazed during drier times when there is less pasture growth. The fact that only new, light green fronds grew exposed, and that older, dark green fronds only occurred in crevices out of grazers' reach supports this.

Consider this a trailer for the full fern flora of Maungakiekie, coming to a Journal near you soon.

Fig. 3. *Arthropteris tenella* collection site in basalt boulder field. Photo: A.E. Wright, 2 April 2016.

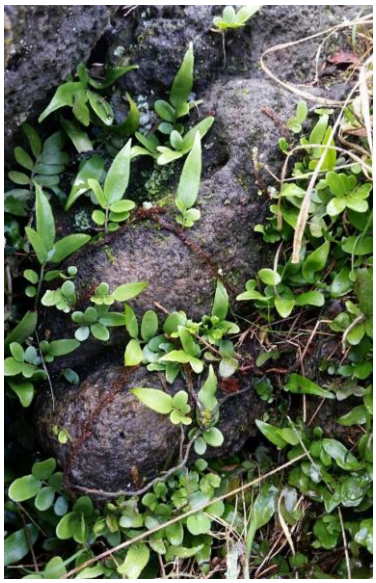

Fig. 4. Largest area of *A. tenella* on basalt boulder face. Photo: A.E. Wright, 2 April 2016.

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Oleander (*Nerium oleander*, Apocynaceae) seeding down

Rhys Gardner

Introduction

The oleander, an ornamental shrub so commonly cultivated in warmer parts of the world, is believed to have a very wide native range too, from Portugal and North Africa east to southern China. Its natural habitat, though, seems to be more restricted: the plant is often described as growing in seasonally dry, rocky river-beds, that is, as a rheophyte. It is said to be "not at all particular about soil, tolerating poor drainage or ... high salt content" (Brenzel 1995). It grows so well in New Zealand that one might suppose that it could naturalise along our rivers too. The *Flora of New Zealand* account (Webb et al. 1988: 141) is rather vague on the oleander's biology here, saying just that the plant is "an occasional escape from cultivation in the vicinity of

gardens in the warmest parts of NZ". It describes the fruit, but not the seed, and claims that "seed is only formed when 2 or more cvs are grown together".

Observations

Among the large trees and shrubs in the north-east corner of Auckland's Gribblehirst Park there is a pair of oleander bushes. I do not know which of the many cultivars they might represent (any labels have long gone) but they seem to me to be "the same", in particular, their flowers are pink and single rather than double. This August, both had made a few fruits on the higher, exposed parts of their canopies. Some of these long-cylindrical "follicles" had split open to reveal a filling of brownish plumed (wind-dispersed) seeds (Figs. 1, 2). Examination of a few showed them to be "good", that is, they were full of tissue (mainly embryo). Seeds sown shallowly into a pot of damp peaty sand and kept in a warm place (outdoors, mid-August) began germinating within three weeks.

So I suspect that different cultivars might not be needed to make fertile seed. (Of course it could be that pollen had been brought to those plants from anywhere around, perhaps by monarch butterflies or bees).

The question of whether the plant naturalises here, or simply persists after being planted, is more definitely resolved, from the evidence of the four specimens in AK (Auckland War Memorial Museum herbarium) cited below. As our climate warms, such records are likely to become more frequent, though at first they will perhaps be mainly from street gutters, culvert aprons, and similar places in the urban landscape.

Specimens

AK 276456, *Cameron* 4364 & *Braggins*, 8 April 1987, Symonds St /Alten Road, several seedlings between footpath and concrete edging.

AK 198282-83, *Gardner* 5724, 1 August 1989, 74 Sarsfield, St Herne Bay, [fruiting specimen].

Fig. 1. *Nerium oleander*, dehisced, pendent fruit-pod, with seeds. ROG 11254, coll. Gribblehirst Park. Scale bar 1 cm. Photo: ROG, 31 Aug 2016.

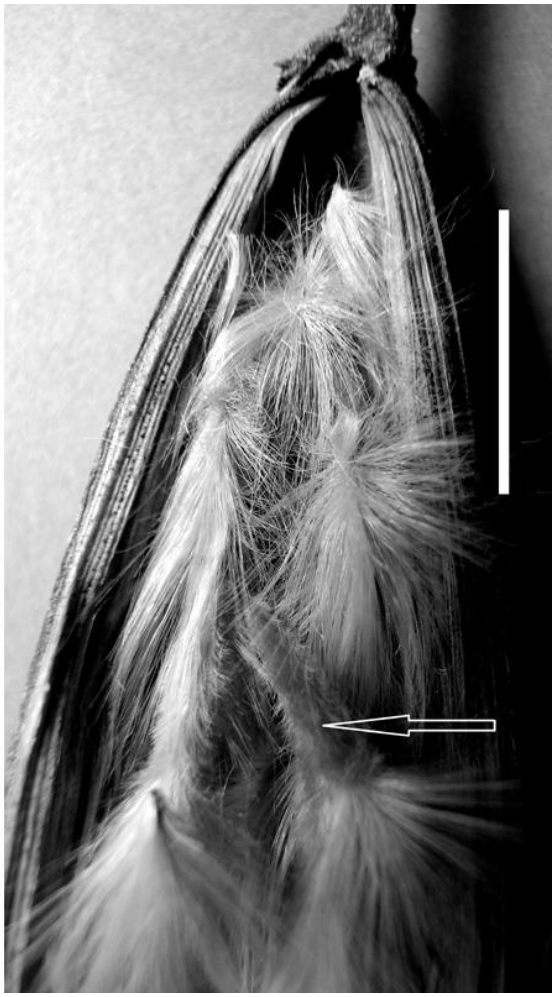

Fig. 2 *N. oleander*. Proximal end of dehiscent fruit-pod, with seeds. Arrow indicates the finely hairy (light brown in life) seed-body. Scale bar 1 cm. (Other details as in Fig. 1)

AK 281842, *Waller*, 28 June 2001, Te Uenga crossroads near Russell, Northland, in water-table (drain) where litter and soil collects, plant well-rooted, 50 cm tall.

AK 282850, *Forester* & *Cashmore*, 4 September 2002, Whale Island, Bay of Plenty, one seedling established on stable sand at back of beach.

References
Brenzel, K. N. (ed.) 1995: *Sunset Western Garden Book*. Sunset Publishing, Menlo.
Webb, C. R.; Sykes, W. R.; Garnock-Jones, P. J. 1988: *Flora of New Zealand*. Vol. IV. Botany Division DSIR, Christchurch.

Some tall weedy willowherbs (*Epilobium* spp., Onagraceae)

Rhys Gardner

Introduction

We probably all know that New Zealand has numerous native species of willowherb (*Epilobium*) and just a handful of introduced, weedy ones. The natives are mainly lower-stature plants of swamps, stream edges and mountain habitats, and are of rather local occurrence around Auckland now. The introduced species, though, are less fussy, requiring only a site that is unshaded and neither too dry nor too wet.

The *Flora of New Zealand* account of *Epilobium* (Webb et al. 1988) was based on a well-regarded monograph of the genus in Australasia (Raven & Raven 1976). There are places in these works, however, that are less than clear, and over the years misidentified specimens have built up in AK (Auckland Museum herbarium), particularly of the introduced species, which resemble one another closely in their tall habit and in the general aspect of their foliage and flowers.

So I want to try to improve the situation, at least for the Auckland region, with an account of five taxa. Three are introduced species (*E. ciliatum* from North America; *E. obscurum* and *E. tetragonum* from Eurasia); two are natives (*E. pallidiflorum*, a wetland plant, and *E. hirtigerum*, an uncommon coloniser of damp ground). It seems likely that all these plants are, generally, self-pollinating, but there appear to be few barriers to crossing between the species (achieved by insect pollination), even between native and introduced species. It may be easier to name a specimen then if this possibility is assessed during the collection process rather than in the herbarium.

The characters

The observations below come from the above-cited works, my own examination of AK material, and the account of the genus in the second edition of Stace's invaluable British Flora (1997). The five species are annuals or short-lived perennials, and in their first season of spring growth develop a single erect main stem, slightly woody at the base and sometimes 50 cm, or more, tall.

Hairs The predominant type of hair is a slender unicellular one, rather short and curved over to make a sub-appressed indument; these hairs give the stems and inflorescence their usual greyish colour. Two other types are more diagnostic. The first is also unicellular and slender but much longer and relatively straight. It is found, in the species here, only in *E. hirtigerum*, and gives a "hirsute" (irregularly shaggy) appearance to that plant. The second is the stalked glandular hair, the spherical gland at its apex standing just above the rest of the indument and visible even in dried material as a minute glistening ball. The presence or absence of gland-hairs on the lower part of the calyx ("hypanthium" of some books), on the fruit-capsule, and on the stem, may be of critical significance.

Leaves In all five species the leaves are oppositely arranged below, then alternately as the inflorescence is approached. They are rather similar in their ovate to lanceolate shape, distant toothing, thin texture, and near-absence of a petiole.

Flowers Among the five species only *E. pallidiflorum* stands out as different: its flowers are relatively large, and, as the name suggests, are almost always white to cream-coloured (rarely, pink). The small flowers of the other species are mainly pink to magenta-coloured, though *E. hirtigerum*, at least in the Auckland region, has (always ?) white flowers.

Fruit-capsule The greyish slender willowherb capsule, its four valves recurving to expose lines of small plumed seeds stacked one above the other, will be familiar to most. As far as I can tell the only useful distinction here seems to be one of size: the capsule of *E. tetragonum* is a relatively stout one,