

SUCCULENT PLANTS ON RANGITOTO ISLAND

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INTRODUCTION

The flora of Rangitoto has long been of interest because of the uniqueness of the habitat and presumably also closeness of Auckland and ease of access. Studies have concentrated upon the floristics and ecology of the indigenous plants; Lancaster (1929) estimated that there were about 80 species of indigenous vascular plants and Cranwell (1981) over 200. Cranwell (loc. cit) also stated that "at least 250 exotic species" were wild or had been cultivated. *Metrosideros excelsa*, pohutukawa, and its hybrid with *M. robusta* dominates most vegetation types and forms an open and rather low forest. This community even extends to the two areas of settlement where the succulents often grow within their light shade. These ± succulent herbs and small shrubs are a conspicuous feature in these areas and are immediately evident to visitors to Rangitoto.

Rangitoto Island is a young (recently extinct) volcano. The surface mainly consists of raw basaltic and extremely rough and fissured black lava with a scoriaceous crater cone. The roughly circular island of c. 2800 hectares rises to a small central crater whose rim rises to 260 metres altitude. Thus there is little or no soil and large areas are sparsely vegetated, with the remainder mainly supporting an open and rather low forest.

Rangitoto's lava surface drains very rapidly and there is extreme drying out of the surface accentuated by heating up of the black rock. Rainfall is moderate and hours of sunshine are quite high, whilst the maritime position means that frosts are almost or entirely absent. Therefore, it is not surprising that drought-resistant plants dominate the old house sites and their vicinity.

The two main settlements were more or less evacuated some years ago as a result of the creation of the Rangitoto Island reserve. Islington is at the eastern end of the island near the causeway to adjoining Motutapu Island and Rangitoto Wharf is about halfway along the southern side. Many of the old houses have been destroyed in line with Department of Conservation policy to remove the buildings when their leases expire. The remainder serve either as weekend baches or are derelict. Rangitoto's proximity to Auckland City across the Waitemata Harbour means that there has always been frequent communication and many thousands of people visit the island sanctuary annually. In the past, the island's inhabitants introduced many ornamental plants to the small gardens they created, nearly all originally from beyond New Zealand.

Many of the species which have persisted as relics of cultivation or which have become adventive are succulent or semi-succulent. Most are still confined to the vicinity of the two settlements and many only reproduce vegetatively. Thus, as pointed out in Woolnough (1984, 67) predictions that these succulents would spread all over Rangitoto were unduly pessimistic and this has not happened. However, in and around these settlements the resulting community is especially rich in Crassulaceae and, although most of them also occur elsewhere in New Zealand, the combination of species and the frequency of some of them is unique to Rangitoto. This uniqueness is a reflection of the combination of climate and the unusual geological structure of the island. Little attention has been paid to them botanically however, although many records are scattered through the pages of Webb, Sykes & Garnock-Jones (1988). The aim of this account is to remedy this defect. One of the few references is the brief mention of a "bright red Sedum" greeting the visitor on arrival (Cranwell loc. cit. p.58). This may refer to *Sedum album* but is more likely to mean the much more conspicuous *Crassula multicava* or the striking but much rarer *C. coccinea*.

The regions of origin of these succulent plants parallels and emphasises the situation occurring in some other parts of New Zealand where succulent adventive plants are prominent; Whakatane, Napier, Wellington Harbour, Banks Peninsula (including the Port Hills) and the Otago Peninsula. Species from southern Africa and Macaronesia (Canary Islands, Madeira and the Azores) predominate with a lesser number from Mexico. On Rangitoto, adventive succulent plants do not seem to be threatening the indigenous flora

except possibly *Crassula multicava*, whereas a few shrubs, notably *Rhamnus alaternus*, evergreen buckthorn, and *Buddleia davidii*, buddleia, are causing alarm. Although beyond the scope of this account it is interesting to note that many other species from southern Africa and Macaronesia thrive on Rangitoto, e.g. South African Iridaceae and Macaronesian *Argyranthemum*.

The following checklist of 36 species (17 belonging to the Crassulaceae) includes persistent relics of cultivation, as well as those species which are adventive. This is because; 1) the distinction is not always easy to make, and 2) it is unreasonable to include minute inconspicuous species such as *Crassula decumbens* and exclude conspicuous relics of cultivation such as the large clumps of *Aloe arborescens*. Most of the succulents on Rangitoto only spread vegetatively, a single clone often representing the species. Six indigenous succulents are included, these being mostly inconspicuous on Rangitoto. They are denoted by a † before the name. The adventives have an asterisk and the relics of cultivation an □.

Crassulaceae is the predominant family and is treated first. The rest of the dicotyledons follow and then the monocotyledons. Within each family and genus the order is alphabetical. The word succulent has been interpreted fairly loosely and includes a few plants which could be best described as semi-succulent, but excluded are indigenous shrubs and trees with somewhat fleshy leaves like *Avicennia marina* var. *resinifera*, *Myoporum laetum* and *Brachyglottis kirkii*. My studies on Rangitoto have extended at infrequent intervals over 20 years and the many resulting voucher specimens are in the Herbarium of the Botany Institute of DSIR (CHR). In addition, substantial collections of Rangitoto succulents are held at Auckland University (AKU) and at the Auckland Institute and Museum (AK). All specimens cited are from Rangitoto and where available the locality on the island is given.

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CHECKLIST OF SUCCULENT PLANTS FROM RANGITOTO ISLAND

Crassulaceae

The abundance of plants in this family around Islington and Rangitoto Wharf give these areas a unique character. Most species on the island are adventive and in places several have become abundant. The few which have not become adventive there are amongst the most tropical in origin.

From the list it is obvious that most adventive Crassulaceae of the northern half of the North Island are represented on Rangitoto, several being known in the wild state from there only. There are three taxa recorded in the Auckland region which are not on Rangitoto but the only surprising absence is *Cotyledon orbiculata*, pig's ears, since it is popular in cultivation from North Auckland southwards and is often adventive.

Aeonium Webb et Berth.

With one exception the species of this genus are endemic to Macaronesia, the islands of which are also of volcanic origin, with some being recently active. The Rangitoto record of *A. arborescens* (L.) Webb et Berth. in Webb et al. (1988) is erroneous, being based on a specimen of *A. undulatum* (Gardner 5249, Islington, 18 Jul. 1987, AK).

****Aeonium xfloribundum* A. Berger**
(*A. caespitosum* x *A. spathulatum*)

Islington. A few plants only and these originated from a cultivation relic nearby. The only other adventive records of it in New Zealand are from Whakatane and Canterbury's Banks Peninsula, although it is commonly cultivated as a pot or rock wall plant. Garden origin.

Gardner 5253, Islington, 18 Jul. 1987, AK; *Sykes 582/89*, Islington, 6 Dec. 1989, CHR; *Cameron 6387*, Islington, 10 Feb. 1991, AKU.

****Aeonium haworthii* (Salm-Dyck) Webb et Berth.** pinwheel aeonium

Islington and Rangitoto Wharf. A few small plants only. This contrasts with the size and abundance of this species in areas like the seaward slopes of the Port Hills in Canterbury. *A. haworthii* is also adventive in Whakatane and Wellington. Indigenous to the Canary Islands.

Sykes 427/86, Rangitoto Wharf, 5 Dec. 1986, CHR; *Sykes 581/89*, Islington, 6 Dec. 1989, CHR; *Sykes 474/91*, Rangitoto Wharf, 30 Nov. 1991, CHR.

****Aeonium undulatum* Webb et Berth.** giant aeonium

Islington and Rangitoto Wharf. Regenerating prolifically in large numbers on and around old house sites in a number of places. The plants are usually much smaller, although otherwise similar, to wild and cultivated plants further south, presumably because of the substrate. The species is cultivated in various places in New Zealand but is otherwise only known wild from Banks Peninsula, Canterbury. Indigenous to the Canary Islands.

Sykes 240/82, Islington, 10 Sep. 1982, CHR; *Sykes 428/86*, Islington, 5 Dec. 1986, CHR; *Sykes 423/86*, Rangitoto Wharf, 5 Dec. 1986, CHR; *Gardner 5249*, Islington, 18 Jul. 1987, AK.

One plant from Rangitoto, part of which was grown to flowering at Auckland University, has whitish or cream flowers instead of the usual golden ones of this species; *Sykes 499A/87*, Islington, 13 Dec. 1987, CHR; *Cameron 4707*, cultivated at Auckland University (ex Rangitoto), 16 Dec. 1987, AKU.

***Bryophyllum* Salisb.**

A tropical and subtropical genus which is only adventive to a very minor extent.

□*Bryophyllum aliciae* (Hamet) Berger.

Islington. On an old house site where it persists as a relic of cultivation. Not known to be adventive in New Zealand. Indigenous to Madagascar.

Sykes 424/86, Islington, 5 Dec. 1986, CHR; *Sykes 268/87*, cultivated in Christchurch (ex Islington), 8 Nov. 1987, CHR.

****Bryophyllum delagoense* (Ecklon et C. Zeyher) Schinz** lizard plant

Islington. By old house site in lava wall crevice. Only a few plants present. In Flora of New Zealand, IV (Webb et al. 1988), I stated that there were two sites on Rangitoto but the voucher specimen for one of them has been redetermined as *B. 'Houghtonii'*. Although well-known in cultivation, lizard plant is not known to be wild elsewhere in New Zealand. Indigenous to S.E. Africa.

Sykes 238/85, Islington, 21 Nov. 1985, CHR; *Gardner 5221*, Islington, 18 Jul. 1987, AK.

***Bryophyllum 'Houghtonii'**

coconut plant

(*B. daigremontianum* Raym. - Hamet et Perrier $\times$ *B. delagoense*).

Islington. By track near shore and on old dwelling site. Locally abundant in open areas at Yankee Wharf. Seen in about three places. Not recorded as adventive in Webb et al. (1988) because it was previously misidentified as *B. delagoense*. It is now known wild from Coromandel Peninsula and Burgess Id., Mokohinau Is, as well as on Rangitoto. The plants are uniform, indicating that this hybrid spreads vegetatively. Coconut plant was recorded as *Kalanchoe daigremontiana* $\times$ *K. tubiflora* from Burgess Island, Mokohinau Islands, by Cameron (*Tane* 32: 124, 1990). Garden origin.

Esler 3475, locality unstated, 12 Sep. 1971, CHR; *Gardner* 5225, Islington, 21 Jun. 1987, AK; *Julian*, Islington (Yankee Wharf), 21 Dec. 1987, AKU 21072 & AKU 21073; *Sykes* 585/89, Islington, 6 Dec. 1989, CHR.

Crassula L.

The most conspicuously naturalised genus of succulents on Rangitoto. All species there, apart from the indigenous *C. sieberiana*, originate from South Africa.

***Crassula coccinea L.**

rochea

Islington, Rangitoto Wharf and Wilson's Park (base of crater cone). Abundant around old house sites in several areas, as well as on adjacent open lava beds. This is easily the most spectacular species of the genus on Rangitoto when its crimson flowers appear in summer. Elsewhere in New Zealand only a few plants are known to be adventive. They are on Banks Peninsula and there is a recent record of a few from Mikotahi, Sugarloaf Islands, near New Plymouth, *Taylor*, 22 Jan. 1989, AKU 22627, are known to be adventive. Indigenous to South-western Cape Province, South Africa.

Sykes 237/82, Islington, 10 Sep. 1982, CHR; *Sykes* 1/86, cultivated in Christchurch (ex Islington 1982), CHR; *Cameron* 4115, Rangitoto Wharf, 17 Aug. 1986, AKU; *Sykes* 429/86, Rangitoto Wharf, 5 Dec. 1986, CHR; *Gardner* 5226, Islington, 21 Jun. 1987, AK; *Julian*, Islington, 21 Dec. 1987, AKU 21053; *Sykes* 473/91, Wilson's Park, 30 Nov. 1991 CHR.

***Crassula decumbens Thunb.**

Cape crassula

Rangitoto Wharf. Only observed in and west of this settlement where it grows on open lava fields near coastal tracks. It may have escaped notice elsewhere because of its small size and rather ephemeral habit. *C. decumbens* in section Glomeratae has been sometimes erroneously considered as an indigenous species, such as the similar *C. sieberiana*. *C. decumbens* mainly grows in coastal areas of the North Island, especially in dry open places, and also near Westport, Hokitika and Kaikoura. Indigenous to southern Africa and temperate Australia.

Miller, Rangitoto Wharf, 20 Aug. 1977, AKU 8048; *Julian*, southern side, 26 Sep. 1987, AKU 20621; *Julian*, western side, 25 Oct. 1987, AKU 20436; *Sykes* 131/90, Rangitoto Wharf, 19 Aug. 1990, CHR.

***Crassula multicava Lemaire**

fairy crassula, pitted crassula

Islington and Rangitoto Wharf, Steve Monument area and the crater cone area, including Wilson's Park. The most abundantly naturalised succulent plant on Rangitoto. It often carpets the lava surface around old houses and extends a little way into the surrounding scrub and along the tracks. Thus it grows in the open as well as in partial shade, unlike most succulents on Rangitoto. *C. multicava* probably mostly spreads by means of the small plantlets produced on the inflorescence branches in the warmer months. Coastal areas from Whangaroa Harbour

(North Auckland) southwards to Wellington. Also coastal areas of Nelson, Marlborough and, less frequently, Canterbury. Indigenous to South Africa.

Mason 7120, crater rim, 29 Aug. 1959, CHR; *Sykes*, Islington, 22 Jan. 1972, CHR 231743; *Orchard 4997*, near lighthouse, 7 Dec. 1977, AK; *Sykes 250/82*, Islington, 10 Sep. 1982, CHR; *Julian*, Islington, 3 Nov. 1986, AKU 20597; *Sykes 584/89*, Islington, 6 Dec. 1989, CHR; *Sykes 426/91*, Wilson's Park, 30 Nov. 1991, CHR.

†*Crassula sieberiana* (Schultes et Schultes f.) Druce

Rangitoto Wharf and on nearby coast, especially to the west, as well as the crater cone area. This very small indigenous plant is apparently a rather short-lived annual on Rangitoto and may well have been overlooked at other localities on the island. It grows on open lava and is sometimes present with *C. decumbens*, another member of section *Glomeratae*. Indigenous to New Zealand from North Auckland, southwards to Wellington and in the South Island southwards to C. Otago and Westland. Also indigenous to temperate Australia.

Cranwell, no locality or date, AK 69136; *Esler and Astridge 3215*, no locality, 11 Jan 1971, CHR; *Julian*, south side, 15 Oct. 1987, AKU 20420; *Sykes 132/90*, Rangitoto Wharf, 19 Aug. 1990, CHR; *Sykes 462/91*, crater cone area, 30 Nov. 1991, CHR.

**Crassula tetragona* subsp. *robusta* (Toelken) Toelken

Islington and Rangitoto Wharf. A few small patches around house sites on open lava rubble, each containing a number of plants. Also adventive in Whakatane, Nelson and Banks Peninsula. Indigenous to South Africa.

Sykes, Rangitoto Wharf, 22 Jan. 1972, CHR 231742; *Sykes 430/86*, Islington, 5 Dec. 1986, CHR; *Julian*, Islington, 21 Dec. 1987, AKU 21088.

Echeveria DC.

On Rangitoto this genus is only adventive to a very minor extent and there are never more than a few plants present. This is also the situation elsewhere in New Zealand and is perhaps a reflection of the more or less tropical origin of most of the species. The genus is very common in cultivation, especially in warm coastal places.

**Echeveria multicaulis* Rose

copper roses

Islington. A few plants only by an old house site which were apparently wild. Not known to be adventive elsewhere in New Zealand although it is cultivated at least as far south as Dunedin. Indigenous to Mexico.

Esler, Islington, 12 Sep. 1971, AK 200014; *Sykes 589/89*, Islington, 6 Dec. 1989, CHR.

**Echeveria secunda* W.B. Booth

hen and chickens echeveria

Islington. A few, small, non-flowering plants only, growing around an old house site. Also adventive at Glen Eden (Auckland) and Birdlings Flat (Canterbury). Indigenous to Mexico.

Sykes, Islington, 22 Jan. 1972, CHR 231744; *Sykes 607/89*, Islington, 6 Dec. 1989, CHR.

**Echeveria setosa* Rose et J. Purpus.

firecracker plant

Rangitoto Wharf. Two young plants seen around an old house on lava rubble seemed to be spontaneous. Not reported as adventive elsewhere in New Zealand. Indigenous to Mexico.

Sykes 124/90, Rangitoto Wharf, 19 Aug. 1990, CHR.

Sedum L.

stonecrops

Species from both America and Europe are adventive on Rangitoto.

***Sedum album L.**

white stonecrop

Islington and Rangitoto Wharf. Near houses and beside the tracks near the settlements, sometimes forming large mats several metres across. Also adventive from Taipa in North Auckland, Kaiaua in Thames district, and from there southwards to Dunedin but is commoner in the South Island. Indigenous to Europe, N. Africa, W. Asia.

Sykes 425/86, Islington, 5 Dec. 1986, CHR; *Gardner 5227*, Rangitoto Wharf, 21 Jun. 1987, AK; *Sykes 608/89*, Islington, 6 Dec. 1989, CHR; *Cameron 6388*, Islington, 10 Feb. 1991, AKU.

***Sedum mexicanum Britton**

Rangitoto Wharf. A few patches, in shady sites besides old houses. The plants seem to flower sparingly on Rangitoto but have flowered freely when taken to Christchurch.

This is the plant recorded from Rangitoto and some other places in the region as *Sedum forsterianum* Smith (Webb et al. 1988), but the latter species apparently is not wild in New Zealand. *S. mexicanum* is also wild in Auckland City; it has grown for many years near the landing site on Little Barrier Island, and there is a single collection from Christchurch. Indigenous to Mexico.

Cheeseman, no locality or date, AK 69104; *Cranwell 43*, no locality or date, AK; *Sykes 431/86*, Rangitoto Wharf; 5 Dec. 1986, CHR; *Sykes 127/90*, Rangitoto Wharf, 19 Aug. 1990, CHR; *Sykes 319/90* cultivated at Lincoln (ex Rangitoto Wharf), 20 Dec. 1990, CHR; *Sykes 445/91*, near Rangitoto Wharf, 30 Nov. 1991, CHR; Anon (no details), CHR 3391.

***Sedum praealtum A. DC.**

shrubby stonecrop

Islington and Rangitoto Wharf. Present in a number of places near old houses, often on lava banks and walls. The large conspicuous freely flowering plants contrast with the other two stonecrops on Rangitoto. Also occasionally adventive elsewhere in the Auckland area but otherwise only recorded wild from Wellington and the South Island. Indigenous to Mexico.

Sykes 426/86, Rangitoto Wharf, 5 Dec. 1986, CHR; *Julian*, Islington (Yankee Wharf track), 23 Sep. 1987, AK 21090; *Julian*, Islington (Yankee Wharf), 21 Dec. 1987, AKU 21089; *Sykes 583/89*, Islington, 6 Dec. 1989, CHR.

Aizoaceae

***Carpobrotus edulis (L.) L. Bolus**

ice plant

Islington and Rangitoto Wharf. Two small patches seen, one near the causeway to Motutapu near Islington where it is apparently adventive, and the other below the Information Centre by the jetty at Rangitoto Wharf where it was planted recently. Adventive from North Auckland to Southland down the east side of both islands but apparently lacking in Poverty Bay and Hawkes Bay. Also in the Chatham Islands and Stewart Island. Indigenous to South Africa.

Sykes 144/90, Rangitoto Wharf, 19 Aug. 1990, CHR.

†Disphyma australe (W.T. Aiton) N.E. Br. subsp. australe

New Zealand ice plant

Represented by a single specimen from Rangitoto. Although collected many years ago, it probably still occurs there. It is a very common coastal plant throughout the area and is

present on nearly all islands in the region. Endemic to the New Zealand Botanical Region.

Petrie A. & D., no locality stated, Jan. 1920, CHR 295516.

□*Lampranthus* sp.

A single unnamed specimen represents *Lampranthus* on Rangitoto. The genus is commonly cultivated elsewhere in many parts of New Zealand, particularly coastal areas. The Rangitoto plant was most probably a relic of cultivation. *Lampranthus* is indigenous to southern Africa.

Cranwell 41, no locality or date stated, CHR.

†*Tetragonia tetragonioides* (Pallas) Kuntze

New Zealand spinach

Only known with certainty on Rangitoto from T.F. Cheeseman's specimen cited below. The species was recorded from there by Thomas Kirk (1889, as *T. expansa* Murray). New Zealand spinach occurs around the shores of New Zealand from the Kermadecs to Stewart Island. Beyond this country it is widely cultivated as a pot herb (mainly from New Zealand forms), but is indigenous to many parts of Australia, Japan, Taiwan, southern Tonga, and Chile (including Easter and Juan Fernandez Islands). Cheeseman, no locality or date stated, AK 3991 (2 sheets).

A sterile specimen from Rangitoto, Mackie, no locality stated, 1 Nov. 1932, AK 100188, is labelled *Tetragonia trigyna* Hook.f. but its specific identity is uncertain. Both species of *Tetragonia* occur in the Hauraki Gulf area.

Asteraceae

**Senecio angulatus* L.f.

Cape ivy

Islington. A few small patches on or around old house sites where it is spreading vegetatively and obviously adventive. It may not form viable seed as no seedlings or young plants were seen. It is well naturalised in many coastal North Island and northern South Island areas. The leaves are semi-succulent. Indigenous to South Africa.

Sykes 602/89, Islington, 6 Dec. 1989, CHR.

Balsaminaceae

**Impatiens sodenii* Engl.

shrubby balsam

Islington and Rangitoto Wharf. In a few places around or near old house sites, one prominent instance being a small quarry where there were many plants. The species regenerates freely from seed on Rangitoto. Also adventive in a few other places north of the Volcanic Plateau from Kerikeri to Opotiki and on Great Barrier Island. An eastern African species.

Sykes 245/82, Islington, 5 Sep. 1982, CHR.

Chenopodiaceae

†*Sarcocornia quinqueflora* (Ung.-Sternb.) A.J. Scott

saltwort

This species is often abundant on coastal lava platforms, depressions and bays where some silt has accumulated. Widespread on New Zealand coasts, including the Chatham Islands. Also indigenous to Australia.

Carse 65H/2, rocky beach, Jan. 1898, CHR; Mackie, no locality given, 1 Nov. 1931, AK

10063; *Allan*, no locality given, 13 Apr. 1939, CHR 17711; *Sykes 449/91*, Rangitoto Wharf, 30 Nov. 1991, CHR

†*Suaeda novae-zelandiae* Allan

sea blite

Rangitoto Wharf. Scattered plants grow in the saltwort community in the bay near the landing jetty. It probably grows in similar habitats elsewhere on Rangitoto. Widespread around New Zealand coasts but much commoner in the south.

Mackie, no locality stated, 18 Jun. 1932, AK 100619; *Molesworth*, no locality stated, 1938?, AK 44735; *Powell*, no locality stated, 2 Jan. 1948, AK 44735; *Sykes 436/91*, Rangitoto Wharf, 30 Nov. 1991, CHR.

Geraniaceae

Pelargonium (L.) L'Hér.

People in all coastal areas of New Zealand cultivate species and hybrids of these popular garden plants, including the so-called "gardener's geraniums" and some of the "scented geraniums". The first two taxa listed for Rangitoto have more or less succulent stems but the leaves are not succulent, whereas the third species is truly a succulent. Surprisingly, the zonal pelargonium, *P. × hortorum* L. Bailey, so abundant in cultivation elsewhere, was not seen on Rangitoto.

**Pelargonium* × *asperum* Willd.

(*P. graveolens* Aiton × *P. radens* H. Moore)

Islington and Rangitoto Wharf. Around a number of old house sites where it regenerates in the vicinity of the original plants. The plants on Rangitoto and elsewhere in New Zealand are uniform and apparently mostly spreads by vegetative means. It is the commonest of the scented-leaved geraniums and is wild around the North Island coast and on some offshore islands. The New Zealand plants resemble the second parent much more than the first one. Arose in South Africa.

Cranwell 3, no locality or date, AK; *Sykes*, Islington, 22 Jan. 1972, CHR 231726; *Sykes 247/82*, Islington, 10 Sep. 1982, CHR; *Sykes 221/85*, Islington, 21 Nov. 1985, CHR; *Julian*, Rangitoto Wharf, 7 Nov. 1986, AKU 20602; *Sykes 415/86*, Islington, 5 Dec. 1986, CHR; *Cameron 6386*, Islington, 10 Feb. 1991, AKU.

**Pelargonium* × *domesticum* L. Bailey

regal pelargonium

Islington and Rangitoto Wharf. Old house surrounds on lava banks and lava walls, and occasionally in nearby scrub. Present in several places and is sometimes adventive to a minor extent. At least one of the small populations had single rosy purple flowers with a dark purple blotch. Such flowers characterise the usual cultivar which is adventive and often cultivated in coastal northern North island places. This hybrid group is of garden origin and at least three species are involved. Of these three, Rangitoto plants have more characters of *P. cucullatum* (L.) Aiton.

Cranwell 13 & 18, no locality or date stated, AK; *Sykes 236/82*, Islington, 10 Sep. 1982, CHR; *Sykes 248/82*, Rangitoto Wharf, 10 Sep. 1982, CHR; *Sykes 233/85*, Islington, 21 Nov. 1985, CHR.

**Pelargonium peltatum* (L.) L'Hér.

ivy-leaved geranium

Islington. Very few plants in scrub near an old house site. The cultivar represented had double pinkish-mauve flowers and is also adventive elsewhere in New Zealand. Although very common in cultivation, ivy-leaved geranium has only been recorded as adventive at a

few places in New Zealand; Paekakariki, near Kekerengu (north of Kaikoura) and the Banks Peninsula area. Indigenous to South Africa.

Sykes 591/89, Islington, 6 Dec. 1989, CHR.

Piperaceae

†*Peperomia urvilleana* A. Rich.

Rangitoto Wharf area. Although not collected elsewhere it almost certainly grows in other parts of Rangitoto. It usually grows amongst moss in rock crevices and recesses, sometimes in more open sites, and is occasionally epiphytic on the mossy bases of trees. Indigenous to the New Zealand Botanical Region from the Kermadec Islands (Raoul Id) southwards to Nelson and Buller as far as Punakaiki. Also in Norfolk Island, Western Samoa and Fiji.

The Fijian plants are usually treated as var. *fijiana* Yuncker. The type of *P. urvilleana* is from New Zealand but my examination of many specimens from the New Zealand Botanical Region, Fiji and Norfolk shows that the characters supposedly separating var. *fijiana* do not hold, for its supposed diagnostic characters are found in some New Zealand specimens from the Auckland area and beyond.

Sykes 443/91 & 444/91, Rangitoto Wharf, 30 Nov. 1991, CHR.

Monocotyledons

Agavaceae

**Agave americana* L.

century plant

Islington and Rangitoto Wharf. A small group of plants just outside one of the old gardens and thus apparently adventive. Although not seen in flower, the old dead inflorescences were 4-5 metres high. The plants had uniformly green leaves but occasionally there are large clumps growing as relics of cultivation which represent the white-edged leaf cv. 'Variegata'. Also adventive else in the Auckland area, on islands in or near the Hauraki Gulf, Bay of Plenty, Wellington, Kaikoura.

Gardner 5228, south-east side, 21 Jun. 1987, AK; Julian, south-east side, 17 Dec. 1987, AKU, 21003; Sykes 590/89, Islington, 6 Dec. 1989, CHR; Sykes 128/90, Rangitoto Wharf, 19 Aug. 1990, CHR; Sykes 475/91, Rangitoto Wharf, 30 Nov. 1991, CHR.

□ *Aloe arborescens* Miller

Islington, Rangitoto Wharf and Wilson's Park at base of crater cone. A few clumps, mainly around the houses. The plants are thriving and flowering freely but cannot be considered adventive because they have not reproduced themselves. Fairly commonly cultivated in warm coastal areas of New Zealand southwards to Banks Peninsula at least. Indigenous to South Africa.

Gardner 5245, Islington, 18 Jul. 1987, AK; Sykes 588/89, Islington, 6 Dec. 1989, CHR; Sykes 129/90, Rangitoto Wharf, 19 Aug. 1990, CHR; Sykes 472/91, Wilson's Park, 30 Nov. 1991, CHR.

□ *Aloe ciliaris* Haw.

climbing aloe

Islington. One straggling plant on an old garden site. Like the above species *A. ciliaris* is only a relic of cultivation. Sometimes cultivated in warmer parts of the country. Indigenous to South Africa.

Sykes 587/89, Islington, 6 Dec. 1989, CHR.

****Aloe saponaria* (Aiton) Haw.**

soap aloe

Islington, Rangitoto Wharf and Wilson's Park at base of crater cone. Grows in a number of places and regenerates freely with many young plants of varying sizes in the vicinity of old houses or house sites. Also adventive in several places in North Auckland and around Auckland City, as well as the Port Hills (Canterbury). Indigenous to South Africa. Sometimes confused with *Aloe vera* (L.) Burm. in New Zealand, but that well-known medicinal plant has much narrower leaves which are not conspicuously white-blotched.

Sykes, Rangitoto Wharf, 22 Jan. 1972, CHR 231749; Gardner 5247, Islington, 18 Jul. 1987, AK; Julian, Rangitoto Wharf, 17 Dec. 1987, AKU 21034; Sykes 586/89, Islington, 6 Dec. 1989, CHR; Sykes 424, Wilson's Park, 30 Nov. 1991, CHR; Sykes 450/91, Rangitoto Wharf, 30 Nov. 1991, CHR.

□ *Yucca recurvifolia* Salisb.

Islington and Rangitoto Wharf. Occasional plants growing as relics of cultivation on old garden sites. *Y. recurvifolia* is known in New Zealand as a cultivated plant only. It is related to the much more commonly cultivated *Y. gloriosa* L. but that has much more rigid leaves which are not recurved as in *Y. recurvifolia*. Both species are from coastal areas of the south-eastern United States.

Gardner 5252, Islington, 18 Jul. 1987, AK; Sykes 604/89, Islington, 6 Dec. 1989, CHR.

Araceae

****Alocasia brisbanensis* (Bailey) Domin**

elephant's ear

Wilson's Park at base of crater cone. A few plants only. Elephant's ear is common in cultivation around Auckland and beyond. It is also scattered in the wild from North Auckland to the Bay of Plenty, as well as in Nelson (Healy and Edgar 1977). However, on Raoul Island in the Kermadecs it dominates the vegetation in both open and forested places throughout and has had a greater effect on the indigenous plants than any other adventive (Sykes 1977). *A. brisbanensis* is indigenous to Queensland.

This plant has been known up to now as *A. macrorrhizos* in the New Zealand Botanical Region; the true *A. macrorrhizos* (L.) G. Don occurs in tropical Polynesia where it is a subsidiary crop often grown as famine food, being known by such names as kape or ape. It is only naturalised sparingly there. This species and *A. brisbanensis* are best distinguished by the extent of the sterile band of tissue separating the male and female flowers, the shape of the synandria (stamen groups) and, probably of less importance, the colour of the terminal sterile appendage of the spadix. The Pacific, New Guinea and Australian species of *Alocasia* have been recently revised (Hay & Wise 1991).

Julian, Wilson's Park, 24 Jan. 1988, AKU 21079; Sykes 421/91, Wilson's Park, 30 Nov. 1991, CHR.

****Colocasia esculenta* (L.) Schott**

taro

Wilson's Park at base of crater cone. A few patches only. This famous tropical Pacific root crop, has peltate ± glaucous leaves and pinkish petioles. Taro apparently has the same distribution as an adventive in New Zealand as the previous species (Healy and Edgar loc. cit.). Indigenous to the Indo-Malaysian region, and taken by Pacific peoples to places as far apart as Hawaii and New Zealand. However it is unlikely that the Rangitoto plants represent a pre-European introduction.

Gardner 5468, Wilson's Park, 27 Jan. 1988, AK; Sykes 422/91, Wilson's Park, 30 Nov. 1991, CHR.

**Zantedeschia aethiopica* (L.) Sprengel

arum lily

Western end and in Wilson's Park at base of crater conc. A large stand densely covering many square metres of the rough lava surface beneath pohutukawa hybrids. The plants flower freely but it is not known if viable seed is produced.

Julian, near Steve Memorial, McKenzie's Bay, 7 Nov. 1987, AKU 20599; *Sykes 140/90*, near Steve Memorial, McKenzie's Bay, 19 Aug. 1990 CHR; *Sykes 423/91*, Wilson's Park, 30 Nov. 1991, CHR.

Commelinaceae

**Tradescantia cerinthoides* Kunth

flowering inch plant

Islington. One small patch in a lava crevice on the margin of scrub near an old house site. The semi-succulent plants exhibited limited rooting from the lower parts of the stems as do many other species in this family.

Tradescantia cerinthoides has usually been treated as *T. blossfeldiana* Mildbr. in New Zealand and elsewhere. This is apparently the first report of it being adventive here. Probably indigenous to northern Argentina.

Sykes 223/85, Islington, 21 Nov. 1985, CHR.

Orchidaceae

□*Epidendrum cinnabarinum* Lindl.

Islington. A single, large, tangled mat on a lava pinnacle around an old house site, but apparently was no more than a relic of cultivation although showing a tendency to layer. This species and its hybrids form one of the commonest groups of epiphytic orchids in cultivation in New Zealand. The Rangitoto plant seems to belong to the species itself because its flowers resemble those on early paintings of *E. cinnabarinum*. Indigenous to northern S. America.

Sykes 599/89, Islington, 6 Dec. 1989, CHR.

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