

1977). Interestingly in the same article he notes "Information from J. W. St Paul (a long time resident in the area) indicated that toii was more abundant on higher ground in the early 1900's (1910-14), being present in well lit openings in the tawa forest. Mr. St Paul remembered several large specimens, one in particular having multiple branching with several heads". It is likely that the occurrence of mountain cabbage tree in the Hunua Ranges is influenced largely by climate and the species may be a victim of the much touted global warming. Conversely there must certainly be a viable seed bank of *C. indivisa* lying just beneath the surface waiting on a germination trigger. Dakin also notes during his initial survey of the area "The condition of these plants is generally poor, they have been much browsed by goats...". In recent years the ARC has undertaken a major goat eradication programme throughout the Hunua Ranges that can only be beneficial to the emergence of young plants. Based on this information it would

be very surprising that this, the largest (and highest) area of continuous bush on the Auckland isthmus, is not home to still more examples of these magnificent plants. The most likely areas must be on the cooler, montane slopes west of Kohukohunui Trig in the Mangatawhiri Valley and south of the high point in the network of valleys feeding the Mangatangi Stream; areas that see little traffic due to the absence of tracks. It is also possible that there are still more toii plants hidden amongst the thick summit scrub that still supports other montane species such as mountain horopito (*Pseudowintera colorata*) and quintinia (*Quintinia serrata*).

Note: Other species of *Cordyline* in the surrounding area vary in abundance. *C. banksii* is very common especially on the Waharau side of Kohukohunui and seems to do well in the open. *C. australis* is less common than *C. banksii* and where it does occur is generally in more sheltered areas below ridgelines. *C. pumilio* also occurs very occasionally in the area.

References:

- Dakin, A. 1972: The distribution and condition of *Cordyline indivisa* on Point 21, Mt Kohukohunui, Hunua Ranges, *Auckland Botanical Society Newsletter* 29 (1): 1-3
Dakin, A. 1977: A further observation on *Cordyline indivisa* on Point 21, Mt Kohukohunui, Hunua Ranges, *Auckland Botanical Society Newsletter* 34 (2): 6-7
Greene, B. 2000: Mountain cabbage tree (*Cordyline indivisa*) in the Hunua Ranges, *Auckland Botanical Society Journal* 55 (1): 9



Sand tussock (*Austrostipa littoralis*) – an update on the Auckland Populations

Bec Stanley

In Auckland sand tussock was once widespread on both the mainland and also the Inner Gulf Islands. It has suffered a catastrophic decline in Auckland, and for the last 100 years, we have only known of populations on Great Barrier Island. The last known record for the Auckland mainland was in 1902, when Thomas collected sand tussock in 'damp sandy flats' at Te Henga, on the Waitakere Coast. Petrie may have found it after this time but his specimen from Waiuku has no exact date.

Two new sites of the sand tussock or hinerepe (*Austrostipa littoralis*) have been located in Auckland recently, one further population on Great Barrier, and one on the mainland at Pakiri Beach.

The Pakiri Beach population of c. 20 plants, many of which are seedlings, grow on the high rear dunes under pohutukawa and amongst *Calystegia soldanella* and *Spinifex sericeus*. The local landowners have fenced the dunes to protect them from erosion and stock damage, and intend to control the weeds; this will greatly enhance the chances for the plant to survive and prosper. Marram grass (*Ammophila arenaria*) is present on these dunes and has been observed at other sites as

a threat to sand tussock (Bergin 2000).

Further survey of Pakiri Beach could prove rewarding as only a small portion of the beach at the southern end was surveyed. In 1973 sand tussock was found at Ruakaka in Northland and this is the closest recorded population to Pakiri. It will be interesting to see if the sand tussock still grows there or indeed on any of the beaches south of Whangarei. There are more populations in Northland - at Te Paki and near Kaitaia (Karen Riddell pers. comm., 2001).

At Palmers Beach, on the eastern Great Barrier Coast, two new patches of sand tussock were located in October 2000. The sand dunes at Palmers Beach rise up to meet the fringe of pohutukawa forest at the base of the hills. The mobile fore-dunes support large populations of the native sand binders *Spinifex sericeus* and *Desmoschoenus spiralis*. The more stable rear dunes meet large pohutukawa under which the sand tussock grows. Small patches of both pampas and marram were recorded on Palmers Beach.

There are at least six major sandy beaches on Great Barrier's eastern coast, four of which (including

Palmers) are now known to support populations of sand tussock. 146 plants were counted at Palmers making this the largest population on Great Barrier; Kaitoke has 60 plants, Whangapoua 14 and Medlands 6 (Cameron 1999).

Observations of the habitat of this grass in Auckland support theories that this species prefers undisturbed sand dunes (Bergin 2000). Since stock and people have been excluded from the dunes at Pakiri seedlings have germinated around the two adult plants (*pers. obs.*). The stronghold in the

Conservancy remains Great Barrier, where populations are found on its remote, and consequently undisturbed, beaches. The high-level of modification by humans either directly, or indirectly by weed and pest invasion, probably explains its disappearance from the Auckland mainland. *Austrostipa littoralis* is classified as Declining (de Lange *et al.* 1999) reflecting the fact it is a plant of an ecosystem that continues to be threatened by our general regard for sand dunes as recreational areas.

References

- Bergin, D. 2000. Sand Tussock on Coastal Sand Dunes Guidelines for seed collection, propagation and establishment. *CDVN Technical Bulletin No. 3*. Forest Research Institute Ltd, Rotorua.
- Buchanan, J. 1875. On the Botany of Kawau Island: Physical Features and causes influencing distribution of Species. *Transactions and Proceedings of the New Zealand Institute* 9:503-527.
- Cameron, E. K. 1999. Botany of Whangapoua Wetlands and Dunes, Northeast Great Barrier Island. *Auckland Botanical Society Journal* 51(1): 56-67.
- Cheeseman, T. F. 1871. On the Botany of the Titirangi District of the Province of Auckland. *Transactions and Proceedings of the New Zealand Institute* 4:270-284.
- Cheeseman, T. F. 1874. Rangitoto. Unpublished notebook number 21.
- de Lange, P. J., Heenan, P. B., Given, D. R., Norton, D. A., Ogle, C. C., Johnson, P. N., Cameron, E. K. 1999. Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany*. 37: 603-628.
- Kirk, T. 1871. On the flora of the Isthmus of Auckland and the Takapuna District. *Transactions of the New Zealand Institute* 3: 148-161.
- Kirk, T. 1878. Notes on the Botany of Waiheke, Rangitoto and other Islands in the Hauraki Gulf. *Transactions and proceedings of the New Zealand Institute* 11:444-454.

Sand tussock Records for Auckland Conservancy

Auckland Mainland:

Auckland Isthmus and the North Shore. Kirk, T. 1871

Waitakere River Mouth, Te Henga. Thomas, A. P. 1902 (AKU 6867)

Waiuku. Petrie, D. n.d presumably early 1900's (AK 152717)

Titirangi District. Cheeseman, T. F. 1871

Pakiri Beach Stanley, R. J. 2001 (AK 252596).

Great Barrier Island:

Kaitoke. de Lange, P. J. 1995 (AK 228099)

Medlands. Stanley, R. J., Duggan, P. 1999 (AK 236522)

Palmers. Stanley, R. J. 2000 AK 251559

Whangapoua. Cameron, E. K. 1986 (AKU 19604),

1992 (AK 209409).

Inner Gulf Islands:

Kawau Island. Buchanan, J. 1875

Rangitoto Island. Cheeseman, 1874

Waiheke Island. Kirk, T. 1878

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The khat tree in Auckland

Mike Wilcox

I had a phone call in January from a friend in Epsom whose neighbour had a tree problem. The trouble was that Africans were regularly coming on to his place, often at night, and taking leaves off one of his ornamental trees. On visiting the tree, my initial suspicion was confirmed – the tree was a fine 8 m-tall specimen of khat (*Catha edulis*) (Fig. 1).

Khat ("cot"), also called kaht, chat, cafta, qat or Arabian tea, belongs to the family Celastraceae. It is an evergreen tree or shrub growing to 15 m tall, with weeping branches, and bronzy green foliage. The leaves are shiny, oval, opposite, 5-10 cm long, slightly toothed, and become tinted red in winter. The stem and bark is also reddish. The very small,

white flowers, are 5-merous, in 8 cm cymes borne from bases of the leaves. The fruit is a capsule, 8 mm long.

So much for what the tree looks like, but what were the African visitors after? Khat occurs at 1500-2000 m in mountains of eastern and southern Africa, and south Arabia, and also in Somalia (Krikorian 1973a, 1973b). It is also cultivated in these places, and in the Moslem countries of North Africa, where the leaves are used as a mild stimulant, both chewed fresh, or brewed like tea. The leaves and young shoots are widely used as a stimulant, and the leaves are used in the treatment of depression, fatigue, obesity and gastric ulcers. The khat