

1.0 Organism description

Scientific name

Kyllinga polyphylla Willd. ex Kunth., Cyperaceae.

Common names

Navua sedge (PIER).

Synonyms (PIER)

Kyllinga aromatica Ridley

Cyperus aromaticus (Ridl.) Mattf. & Kukenth

Cultivars, strains, or variants

Not assessed.

Previously recorded in New Zealand

No (Ministry of Agriculture and Forestry, Landcare Research).

2.0 Summary

- The identification of this plant was not confirmed at the time this assessment was prepared. Therefore it is a provisional assessment only. It relies on a limited number of sources and some sections are not fully assessed.
- *K. polyphylla* appears to be restricted to the humid and sub-humid tropics. In New Zealand, it is only likely to establish in the northern North Island. However, this is somewhat uncertain and vigilance would be prudent.
- It is a medium sized, clump-forming, rhizomatous, perennial sedge growing to 60cm tall. Propagation is by seed and the rhizomes. In favourable conditions, it is vigorous and aggressive, with high reproductive capacity and fast maturity. It grows in moist, disturbed places and is unpalatable to stock.
- *K. polyphylla* is a serious weed in pasture in parts of the Pacific, and has low to moderate impacts in crops in South East Asia. In Australia it is a noxious/controlled weed with impacts in both agricultural and natural systems.
- In New Zealand, *K. polyphylla* could be problematic in wet pasture and irrigated crops, and has potential to be an environmental weed in disturbed, moist or wet areas such as wetlands, marshes, or swampy forest clearings. However, climate is likely to reduce its growth and competitiveness, and if impacts occur they would probably be limited to warm areas north of Auckland.

3.0 Basic biology and ecology

3.1 Overseas distribution

- It appears to be restricted to the humid and sub-humid tropics including South East Asia, Africa, Mauritius, South America, Australia [north east Queensland, near Townsville] and a number of Pacific Islands (PIER, Parsons & Cuthbertson 1992).

3.2 Ecology/habitat (from Parsons & Cuthbertson 1992 unless otherwise stated).

- Medium sized, clump-forming, rhizomatous, perennial sedge growing to 60cm tall. Shallow but extensive fibrous root system with interconnected rhizomes or basal swellings. In favourable conditions, it is vigorous and aggressive, with high reproductive capacity and fast maturity.
- Grows in a range of soils generally in hot, wet, open sites. Often found in moist disturbed places, up to 700m elevation, in ditches, roadsides, lawns, pastures, crops, rice fields and occasionally in coconut and sugarcane plantations (Whistler 1995).
- It is most competitive in areas without a distinct dry season and where annual rainfall exceeds 2500mm. In regions with a dry season, and less rainfall, it is usually confined to wet, low-lying areas.
- The specimen grown in the glasshouse in New Zealand grew better, and set copious amounts of seed, compared to *K. nemoralis* (James pers. comm).
- Propagation is by seed and rhizomes. It can be a prolific seeder, although germination success varies. At least some light is obligatory for germination. Seeds can germinate at temperatures of 15° C in continuous light, but almost complete germination is obtained in alternating periods of light and dark and in fluctuating temperatures of 25/15° C.
- Unpalatable to stock with little feed value.

4.0 Likelihood of establishment and spread

4.1 Environmental tolerances overseas and comparison with New Zealand

4.1.1 Environmental tolerances overseas

- Appears to be restricted to the humid and sub-humid tropics (PIER, Parsons & Cuthbertson 1992).

4.1.2 Comparison with New Zealand

- The climate of northern New Zealand [Northland and Auckland] is closest to its overseas environments. However in New Zealand mean minimum temperatures are lower and frost days are more common.

4.2 History of spread in other countries

- Accidentally introduced to northern Queensland in the 1970's and since found in several parts of the Hambleton, Mulgrave and Babinda districts and at Kuranda in the far north of the state (Parsons & Cuthbertson 1992).
- First introduced to the Pacific Islands (Fiji) in c.1942, now occasional to locally abundant (Whistler 1995).
- Introduced and invasive in Fiji, New Caledonia, Western Samoa and Solomon Islands and Singapore (PIER).

4.3 Natural dispersal mechanisms and human assisted means of spread

4.3.1 Natural dispersal mechanisms

- Vegetative spread by extension of the rhizome system, and when viable rhizome fragments are transported. Seeds do not have specific adaptations for wind dispersal but are light enough to carry some distance in strong winds. Long distance spread is external/internal on birds and animals (Parsons & Cuthbertson 1992).

4.3.2 Human dispersal

- Human mediated dispersal is likely via transport of seeds or rhizome fragments in contaminated machinery, produce, soil, and stock feed.

4.4 Distribution of potential habitat in New Zealand

- Only likely to establish in the northern North Island, if at all.
- Habitats in New Zealand would probably be moist or wet, open sites in crops, gardens, lawns, pastures, and roadsides. It may also establish in marshes, ditches, and swampy forest clearings.

4.5 Constraints to spread and predicted rate of spread in New Zealand

4.5.1 Predicted rate of spread

- Moderate rate of spread by natural dispersal and unintentional human transport.

4.5.2 Constraints to spread

- Despite the seed germinating at relatively low temperatures, the climate in New Zealand is likely to be marginal for this species and is likely to limit its growth and competitiveness. However, this is somewhat uncertain and vigilance would be prudent.
- Other constraints not assessed.

5.0 Consequences

5.1 Overseas impacts

5.1.1 Economic impacts

- *K. polyphylla* has serious impacts in pasture in parts of the Pacific, and low to moderate impacts in crops in South East Asia.
- In South East Asia, the principal crops affected are rice, pineapples, watermelons and vegetables. Impacts are locally important in Malaysia and Singapore (Waterhouse 1993).
- In the Pacific, it is a serious weed of pasture and agricultural land. Very widespread and important in Fiji, where it is a noxious weed, and occurs in pastures, along roadsides, river banks, open swamps and rice fields (PIER, Waterhouse 1997).
- In Australia, it is a noxious/controlled weed in Queensland, with potential to spread in Northern Territory and Western Australia. It is a major problem in three locations in agricultural systems. It is noted to have the potential to be a greater problem than it currently is (Groves et al. 2003).

5.1.2 Environmental impacts

- Not fully assessed.
- May be a threat to native wetlands (PIER).

- In Queensland, it is a major problem in at least four locations in natural systems with potential to spread in Northern Territory and Western Australia (Groves et al. 2003).

5.1.3 Other impacts

- None known.

5.2 Potential impacts in New Zealand

5.2.1 Economic

- Potential economic impacts are likely to be low, but this will depend on where it establishes, and its growth rate and seeding habit.
- *K. polyphylla* could be problematic in wet pasture and irrigated crops. However, climate is likely to reduce its growth and competitiveness, and impacts would probably be limited to warm areas north of Auckland.

5.2.2 Environmental

- *K. polyphylla* is a potential environmental weed. It is invasive elsewhere, and can form dense infestations. However, it is likely to be near the limits of its environmental tolerance in New Zealand, and it is unlikely to invade undisturbed areas.
- Its impact is likely to be restricted to disturbed, moist or wet areas such as wetlands, marshes, or swampy forest clearings in the northern North Island. It may jeopardise the naturalness of these environments, displace native species, prevent regeneration, or threaten local populations of rare or endangered plants.

5.2.3 Other impacts

- May be problematic in nurseries and lawns.
- Establishment in lawns and turf could affect amenity values.

6.0 Control techniques

- An acceptable range of control techniques exist. However, it may be difficult to control as related species are known to have some resistance to herbicides. Herbicides known to be available in New Zealand are underlined.
- Small patches can be sprayed with glyphosate. MSMA can be applied on larger areas but repeat applications may be necessary and some pasture species may be damaged. Sedges are generally susceptible to 2,2-DPA (Parsons & Cuthbertson 1992).
- Hand weeding; however manual cultivation may spread the rhizomes and the rhizomes may be difficult to remove completely. Grazing and mowing do not control it but regular cutting prevents seeding.

7.0 Uncertainty summary

- This is a provisional assessment only. The plant identification was not confirmed at the time of writing and it relies on a limited number of sources. Some sections are not fully assessed.
- Potential New Zealand distribution is uncertain but it seems very likely to be limited by climate to the northern North Island [Northland and Auckland]. It may not establish in New Zealand at all.
- Economic and environmental impacts are uncertain. While *K. polyphylla* has moderate to serious impacts overseas, it is probably at the limits of its climatic tolerance in New Zealand. This is likely to moderate its potential economic and environmental impact.

8.0 References

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