

Seed Identification of Noxious *Senecio* Species

Jennifer Neudorf, Angela Salzl and Ruoqing Wang*

Seed Science and Technology Section, Saskatoon Laboratory, Canadian Food Inspection Agency
301 - 421 Downey Road, Saskatoon, SK S7N 4L8, Canada *Email: ruoqing.wang@inspection.gc.ca

Noxious Species - *Senecio madagascariensis* Poir.

- Common names:** Madagascar ragwort, Séneçon de Madagascar, Fireweed
- Distribution:** Native to Africa, introduced to United States (Hawai'i), South America, Australia and elsewhere; absent in Canada^{1,3}
- Preferred Habitat:** Generally grows in disturbed habitats and pastures with fertile soil^{1,5}
- Crop contaminant:** May contaminate forage crops from infested pastures^{1,5}

References:
1. Centre for Agriculture and Bioscience International (CABI). 2023. Invasive Species Compendium, CAB International, Wallingford, UK.
2. Gardner, D.R., Thorne, M.S., Molyneux, R.J., Pfister, J.A., Seawright, A.A. 2006. Pyrrolizidine alkaloids in *Senecio madagascariensis* from Australia and Hawaii and assessment of possible livestock poisoning. *Biochemical Systematics and Ecology* 34: 736-744.
3. Global Biodiversity Information Facility (GBIF) Secretariat. 2023. <https://doi.org/10.15468/39omei> Accessed via <https://www.gbif.org/species/3109086>
4. López, M.G., Wulff, A.F., Poggio, L. and Xifreda, C.C. 2008. South African fireweed *Senecio madagascariensis* (Asteraceae) in Argentina: relevance of chromosome studies to its systematics. *Botanical Journal of the Linnean Society*, 158: 613-620.
5. Sindel, B. and Coleman, M. 2012. *Senecio madagascariensis*. A Best Practice Management Guide for Australian Landholders. Available online.

Regulations

- Prohibited Noxious, Class 1 in the *Canadian Weeds Seeds Order* (2016) under the *Seeds Act*
- List of Pests Regulated by Canada* under the *Plant Protection Act*
- Federal Noxious Weed List*, United States Department of Agriculture

Did you know?

- Debate exists whether *S. inaequidens* and *S. madagascariensis* comprise a single species complex rather than two separate species, a topic further complicated by hybridization between species⁴
- Toxic alkaloids, known as pyrrolizidine alkaloids (PAs), present in *S. inaequidens*, *S. madagascariensis*, and other *Senecio* species may cause irreversible liver damage especially when ingested by horses and cattle^{1,2}
- Pasture productivity declines when *S. madagascariensis* invades, as it outcompetes other desirable species for resources resulting in lowered biodiversity¹
- Control is expensive as illustrated by one Australian state's estimated annual herbicide expense of \$18 million for *S. madagascariensis* management⁵

Noxious Species - *Senecio inaequidens* DC.

- Common names:** South African ragwort, Séneçon du Cap
- Distribution:** Native to South Africa, introduced to Europe, Mexico, Colombia, Argentina and elsewhere; absent in Canada and the United States^{1,3}
- Preferred Habitat:** Disturbed, well-drained soils in open habitats¹
- Crop contaminant:** Seeds may be carried by vehicles and invade pastures¹



Achene surface



Style remnant and tissue



Achenes



Ring of tissue

Senecio madagascariensis

Identification Features

- Achene length: 1.7-2.1 mm; width: 0.4-0.5 mm
- Shiny reddish brown coloured, can also be brown or dark yellow
- Surface stippled, with several longitudinal ribs
- Sparse, short, worm-like hairs between the ribs
- Immature achenes have a long, white pappus

Identification Tips

- Generally shorter than *S. inaequidens*
- Both ends abruptly narrowed, *S. inaequidens* with only one end narrow
- Surface hairs sparse and shorter than *S. inaequidens*

Senecio inaequidens

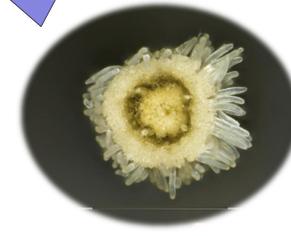
Identification Features

- Achene length: 2.7-3.1 mm; width: 0.3-0.5 mm
- Shiny brown or dark brown coloured
- Surface stippled, with several longitudinal ribs
- Dense, long hairs cover the surface
- Immature achenes have a long, white pappus and greenish colour

Identification Tips

- Generally longer than *S. madagascariensis*
- One narrowed end, or both wide, *S. madagascariensis* with both ends narrow
- Surface hairs longer and more dense than *S. madagascariensis*

Similar Species



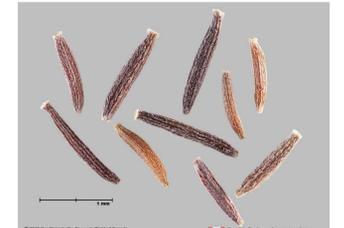
Style remnant and tissue



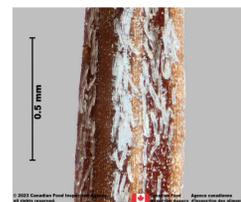
Achene surface



Ring of tissue



Achenes



Achene surface



Style remnant and tissue



Achenes



Ring of tissue

Senecio vulgaris L. (common groundsel)

- Achene length: 1.9 – 2.7 mm; width 0.4 – 0.6 mm
- Achenes are generally longer than *S. madagascariensis* with long and dense surface hairs
- Achenes are generally smaller than *S. inaequidens* with shorter surface hairs and both ends are abruptly narrowed
- Only style remnant end with an obvious ring of white tissue



Style remnant and tissue



Achenes

Crepis capillaris (L.) Wallr. (smooth hawk's-beard)

- Achene length: 1.7 – 2.7 mm; width: 0.4 – 0.7 mm
- Achenes are generally smaller than *S. inaequidens*
- Achenes do not have surface hairs and are yellow or brown coloured
- Only style remnant end with a ring of white tissue



Achene with pappus



Ring of tissue

Pentanema britannicum (L.) D. Gut. Larr. et al. (British yellowhead)

- Achene length: 1.0 – 1.5 mm; width: 0.2 – 0.5 mm
- Achenes are generally smaller than the noxious *Senecio* species with surface hairs more sparse than *S. inaequidens* and longer than *S. madagascariensis*
- Grooves are deeper between the ribs compared to the noxious *Senecio* species
- The long, white pappus persistent in mature achenes



Side view of the rim



Achenes

Jacobaea vulgaris Gaertn. (tansy ragwort)

- Achene length: 1.2 – 2.0 mm; width: 0.4 – 0.7 mm
- Achenes are generally smaller and wider than *S. madagascariensis* and *S. inaequidens* with or without surface hairs (dimorphic), wider ribs and are yellow or yellowish brown coloured
- J. vulgaris* achenes generally have a pronounced rim around the style remnant end