

## Grapple plant (*Harpagophytum procumbens* (Burch.) DC. ex Meissn., Pedaliaceae) is a menacing new weed threat to Australia and the United States

Sandra G. (Sandy) Lloyd<sup>1,2</sup> and Roderick P. Randall<sup>1,2</sup>

<sup>1</sup>Department of Agriculture, Locked Bag 4, Bentley Delivery Centre, Western Australia 6983, Australia

<sup>2</sup>Cooperative Research Centre for Australian Weed Management

**Summary** *Harpagophytum procumbens* is heavily promoted by herbalists and alternative medical practitioners as an arthritis treatment. It has recently become available via mail order on the internet. Whatever its pharmaceutical properties, this plant has potential to establish and impact on native and introduced grazing animals in Australia and North America.

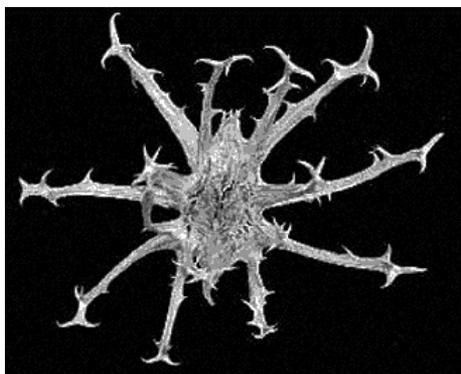
**Keywords** *Harpagophytum procumbens*, weed potential, CLIMATE, herbal use, harpagoside.

### INTRODUCTION

*Harpagophytum procumbens* (Burch.) DC. ex Meissn., Pedaliaceae, is commonly known by herbalists as devil's claw. However, the authors choose to use the alternative common name of grapple plant to distinguish it from three weedy species in the Pedaliaceae family, native to the Americas and naturalised in Australia, that are also known as devil's claw. These are small-fruit devil's claw (*Martynia annua* L.), purpleflower devil's claw (*Proboscidea louisianica* (Miller) Thell.) and yellowflower devil's claw (*Ibicella lutea* (Lindley) Esselt.). It is the weed potential of grapple plant outside its native range which is the focus of this paper.

### DISCUSSION

The threat from grapple plant relates to its fruit which is a large follicle, up to 10 cm across, covered with



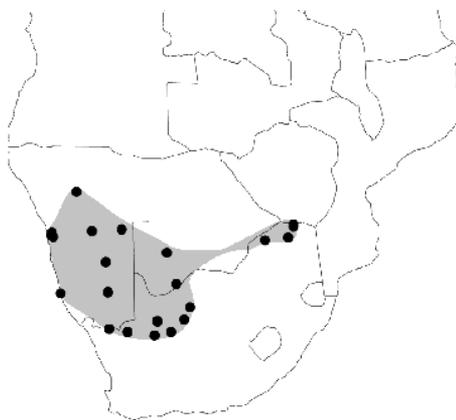
**Figure 1.** Fruit of grapple plant, *Harpagophytum procumbens* (Bergfeld *et al.* 2002).

stout three-pronged recurved hooks from which its preferred common name is derived (Figure 1). The fruits are adapted to attach to the feet of animals, so spreading the seeds as the animal moves around. In the course of this, however, the affected animal is likely to be crippled. In the event of a fruit becoming attached to the muzzle of an animal, severe ulceration or starvation can result (Wells *et al.* 1986).

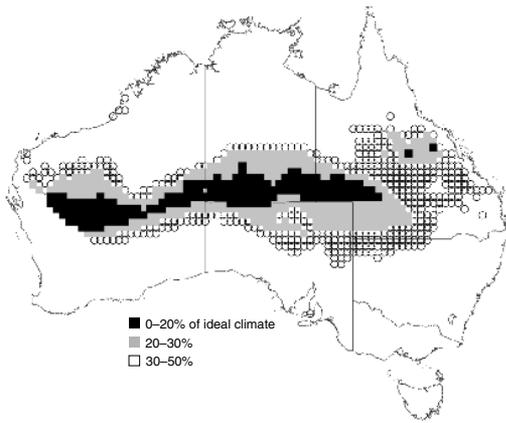
Extracts of the large root tubers of grapple plant contain harpagoside which is reputed by some to be effective in the treatment of arthritis and lower back pain, though others dispute this. Regardless of whether or not it is effective, there is a demand for herbal products made from this plant.

Grapple plant is native to South Africa, Botswana and Namibia (Figure 2). A CLIMATE analysis indicates grapple plant could thrive across large areas of central Australia (Figure 3) and south-eastern North America from southern California to southern Texas and into Mexico.

CLIMATE uses 16 climatic variables all derived from long term monthly temperature and rainfall data. The output parameters in the prediction map (Figure 3) equate to 0–20% variance from the ideal climate (black squares) to 30–50% variance from the ideal climate



**Figure 2.** Distribution of grapple plant in southern Africa (Anon. 2002).



**Figure 3.** Potential distribution of grapple plant in Australia based on a CLIMATE analysis.

(open circles). The black squares therefore represent those areas most at risk of grapple plant establishing and becoming problematic.

It would clearly be devastating to commercially valuable livestock should grapple plant become established in any of these regions. Australia's soft footed macropods would also be severely affected.

The authors were alerted to this problematic species when single grapple plant fruits were intercepted by Australian Quarantine and Inspection Service (AQIS) officers in two separate incidents at Perth International Airport, Western Australia. In both cases, the fruits had been brought in as novelty souvenirs.

There was concern that seeds could be available from mail order or internet suppliers, which have been documented as a source of many other weed species. Regular searches using Google™ revealed numerous webpages promoting products containing extracts of the plant and/or its abilities to treat arthritis and other conditions. An Australian Rural Industries Research and Development Corporation (RIRDC) report also promotes the cultivation of this plant (Michael 2000).

However, no internet sources of grapple plant seeds were identified until September 2001 when an Oregon based herb seed company was found to be advertising devil's claw (*H. procumbens*) seeds. In January 2002, a Petaluma (California) nursery specialising in cacti, euphorbias and other prickly plants was found advertising devil's claw (*H. procumbens*) plants on the internet.

The USDA and other appropriate authorities in the US were notified of these two suppliers but, at the time of writing, no action had been taken to stop sales. Apart from the two Perth airport interceptions, neither seeds nor plants have been documented in Australia. Grapple plant (listed as *H. procumbens*) is prohibited by the Australian Quarantine Inspection Service (AQIS); however, there remains the possibility that other travellers have brought fruits in undetected, or that seeds have (or will) enter Australia through the mail.

#### REFERENCES

- Anon. (2002). Avontuur Harpago. Distribution map of *Harpagophytum procumbens* in Namibia. Adapted from K. Nott (1986) and B. van Wyk *et al.* (1997). URL: [www.harpago.co.za/Project/part\\_2.htm](http://www.harpago.co.za/Project/part_2.htm)
- Bergfeld, A., Bergmann, R. and Sengbusch, P. (2002). Botany online: Fruits with highly specialized devices that serve their distribution (photo by A. Fock, 1985). URL: [www.biologie.uni-hamburg.de/b-online/e02/02f.htm](http://www.biologie.uni-hamburg.de/b-online/e02/02f.htm)
- Michael, D. (2000). New pharmaceutical, nutraceutical and industrial products – the potential for Australian agriculture. Report by Wondur Holdings for RIRDC. URL: <http://www.rirdc.gov.au/reports/Ras/00-173.pdf>
- Wells, M.J., Balsinhas, A.A., Joffe, H., Englebrecht, V.M., Harding, G. and Stirton, C.H. (1986). A catalogue of problem plants in southern Africa. *Memoirs of the Botanical Surveys of South Africa* No. 53. (Botanical Research Institute, Pretoria, South Africa).