



Perennial herb up to 1,5-3 m, rhizomatous, with yellow fragrant flowers and arranged in upright inflorescences.

**Scientific name:** *Hedychium gardnerianum* Sheppard ex Ker Gawl.

**Common names:** kahili ginger, kahila garland-lily, wild ginger

**Family:** Zingiberaceae

**Status in Portugal:** invasive species (listed in the Plano regional de erradicação e controlo de espécies de flora invasora em áreas sensíveis)

**Risk Assessment score:** (in development)

**Synonymy:** *Gamochilus speciosus* T. Lestib., *Hedychium pallidum* Regel, *Hedychium gardnerianum* var. *pallidum* Regel

**Last update:** 11/07/2014

### How to recognise it

Perennial herb up to 1,5-3 m, with rhizomes of large dimensions, with leafy stems and aromatic flowers arranged in large erect inflorescences.

**Leaves:** alternate, oblong to lanceolate, sessile, acuminate, entire, with 20-60 x 5-12,5 cm, dark green and glabrous on the upper surface and sparsely pubescent and whitish on the lower surface.

**Flowers:** yellow with only one red stamen, tubular, disposed in erect inflorescences (spikes), ovoid, with 15-20 x 8 cm.

**Fruits:** capsules up to 1,5 cm long, orange-red within,



Close-up of stamens (Photo: Direção Regional dos Recursos Florestais)

## *Hedychium gardnerianum* (kahili ginger)

containing numerous small seeds (5-6 mm), reddish and wrapped by an aril.

**Flowering:** July to October.

### Similar species

There are other species of *Hedychium* with which *Hedychium gardnerianum* may be mistaken with. Meanwhile, the colour of the flowers is a distinctive characteristic. In the Azores archipelago *Hedychium coronarium* J. Koenig is also invasive and is distinguished from *Hedychium gardnerianum* because it has white flowers.

### Characteristics that aid invasion

It propagates by seed, producing a high number of seeds (each spike has, in mean, between 300 to 500 seeds) that are easily dispersed by wind, water and birds.

It also propagates vegetatively, by rhizomes.

### ORIGIN AND DISTRIBUTION

#### Native distribution area

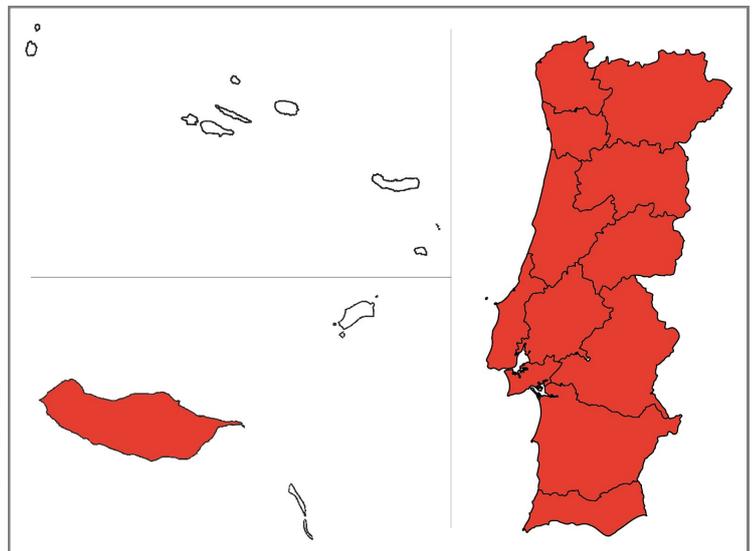
Asia (India, east from the Himalayas and Nepal).

#### Distribution in Portugal

Azores archipelago (all islands), Madeira archipelago (Madeira island).

#### Other places where the species is invasive

Europe (Spain, France), Pacific island (Micronesia, Cook, French Polynesia), North America (USA - Hawaii), Australia, New Zealand, South America (Caribbean), South Africa.



### Introduction reasons

Ornamental reasons.

### Ambientes preferenciais de invasão

Along watercourses, roadsides, disturbed areas, forests and crop areas.

It also invades natural and semi-natural areas.

### IMPACTS

#### Impacts on ecossistemas

The rapid growth leads to the formation of dense and impenetrable areas that inhibit the development of native vegetation.

#### Economic impacts

High costs in the application of control methodologies.

## *Hedychium gardnerianum* (kahili ginger)

On the banks of streams, when in large amounts, it may obstruct the drainage channels, consequently enhancing flood risk.

### Other impacts

Very aromatic plant, being able to cause allergic reactions.

### CONTROL

Controlling an invasive species demands a well-planned management, which includes the determination of the invaded area, identifying the causes of invasion, assessing the impacts, defining the intervention priorities, selecting the adequate control methodologies and their application. Afterwards it is fundamental to monitor the efficiency of the methodologies and recuperation of the intervened area as to perform, whenever necessary, the follow-up control.

The control methodologies used for *Hedychium gardnerianum* include:

#### Physical control

**Hand pulling:** preferential methodology for small invaded areas. In more compacted substrates, hand pulling must be made during the rainy as to facilitate the removal of the root system. As much as possible, it should be guaranteed that there are no rhizomes and/or large rhizome fragments left in the ground because they regenerate very vigorously, diminishing the efficacy of this methodology.

#### Physical + chemical control

**Cut stump method:** methodology applicable to large invaded areas. The stems should be cut as close to the ground as possible and applied herbicide (active substance: glyphosate, metsulfuron-methyl) to the cut surface. Some authors refer that the sprouts are more sensitive to herbicide so, alternatively, the application of herbicide may be done when the sprouts achieve 50 to 60 cm high.

#### Chemical control

**Foliar application of herbicide:** methodology applicable to seedlings and young plants, up to 50 cm high. Spray with herbicide (active principle: metsulfuron-methyl) limiting the exposure to the target species. It should be made on the time of the plants' greater growth.

#### Biological control

The bacteria *Ralstonia solanacearum* (E. F. Smith) was tested in Hawaii, as a biological control agent of *Hedychium gardnerianum* but, its use is not yet authorized.

This agent has not yet been tested in Portugal as to verify its safety relatively to native species, so its use has not yet constituted an alternative in our country.

For additional information, visit the webpage [www.invasoras.pt](http://www.invasoras.pt) and/or contact us at [invader@uc.pt](mailto:invader@uc.pt).

### REFERENCES

Anderson RC, Gardner DE (1999) An evaluation of the wilt-causing bacterium *Ralstonia solanacearum* as a potential biological control agent for the alien kahili ginger (*Hedychium gardnerianum*) in Hawaiian forests. *Biological Control* 15(2): 89-96.

CABI (2013) *Hedychium gardnerianum*. In: *Invasive Species Compendium*. CAB International, Wallingford, UK. Available: [www.cabi.org/isc](http://www.cabi.org/isc) [Retrieved 06/01/2013].

## *Hedychium gardnerianum* (kahili ginger)

Cordeiro N, L Silva (2003) Seed Production and vegetative growth of *Hedychium gardnerianum* Ker-Gawler (Zingiberaceae) in São Miguel Island (Azores). *Arquipélago, Life and Marine Sciences* 20A: 31-36.

Csurhes S, Hannan-Jones M (2008) Pest plant risk assessment: Kahili ginger (*Hedychium gardnerianum*), White ginger (*Hedychium coronarium*), Yellow ginger (*Hedychium flavescens*). Biosecurity Queensland, Department of Primary Industries and Fisheries, Brisbane, 22pp.

DAISIE European Invasive Alien Species Gateway (2013) *Hedychium gardnerianum*. Available: <http://www.europe-aliens.org/speciesFactsheet.do?speciesId=5464#> [Retrieved 06/01/2013].

Global Invasive Species Database (2005) *Hedychium gardnerianum*. Disponível: <http://www.issg.org/database/species/ecology.asp?si=57&fr=1&sts=sss&lang=EN> [Retrieved 06/01/2013].

Govaerts R (2014) *Hedychium gardnerianum* Sheppard ex Ker Gawl. Facilitated by the Royal Botanic Gardens, Kew. Available: [http://apps.kew.org/wcsp/prepareChecklist.do?checklist=selected\\_families%40%40062030320142357447](http://apps.kew.org/wcsp/prepareChecklist.do?checklist=selected_families%40%40062030320142357447) [Retrieved 03/03/2014].

Penacho ML, Amaral RS, Malveiro A, Machado CAS, Aranha JTM (2009) Controlo de invasoras *Hedychium gardnerianum* e *Gunnera tinctoria* em áreas florestais na ilha de S. Miguel - Açores. In: SPCF (ed) 6º Congresso Florestal Nacional: A floresta num mundo globalizado, Ponta Delgada, Açores, pp. 802-806.

PIER (Pacific Island Ecosystems at Risk) (2003) *Hedychium gardnerianum*. Available: [http://www.hear.org/pier/species/hedychium\\_gardnerianum.htm](http://www.hear.org/pier/species/hedychium_gardnerianum.htm) [Retrieved 06/01/2013].

Silva L, Corvelo R, Moura M, Fernandes FM (2008) *Hedychium gardnerianum* Sheppard ex Ker Gawl. In: Silva L, Land EO, Luengo JLR (eds) Flora e fauna terrestre invasora na Macaronésia. Top 100 nos Açores, Madeira e Canárias. Arena, Ponta Delgada, pp. 217-220.