

# NOBANIS – Invasive Alien Species Fact Sheet

## *Lysichiton americanus*

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### Species description

**Scientific names:** *Lysichiton americanus* Hultén and St. John 1931 (Araceae)

**Synonyms:** *Lysichitum americanum*, *Lysichiton americanum* (for nomenclature see Alberternst and Nawrath 2002: 94).

**Common names:** American Skunk-cabbage (GB), Western Skunk-cabbage (US), Amerikanischer Stinktierkohl (DE), Amerikanische Scheinkalla (DE), Amerikanischer Riesenaronstab (DE), gul kæmpekalla (DK), ameerika kevadvõhk (EE), keltamajavankaali (FI; kelta = yellow, *Lysichiton* = majavankaali), Moeraslantaarn (NL), skunk-kala (NO), Tulejnik amerykański (PL), amerikansk skunkkalla (SE), gul skunkkalla (SE).



**Fig. 1 and 2.** *Lysichiton americanus* inflorescences and spadix, photo by Beate Alberternst.



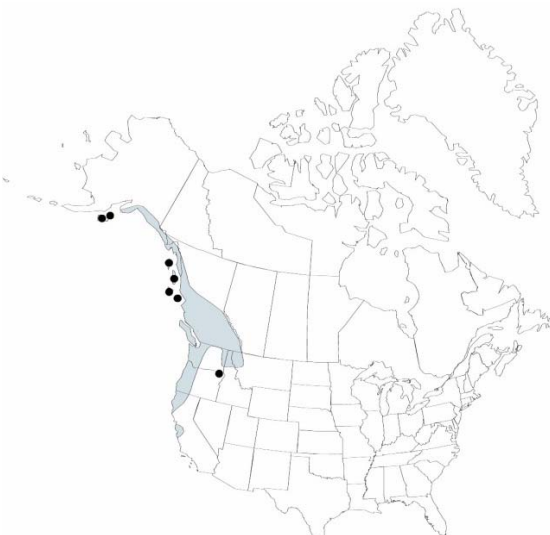
**Fig. 3.** *Lysichiton americanus* population, photo by Beate Alberternst. You may see more photos of the species on the [virtual flora](#) of Sweden.

### Species identification

*Lysichiton americanus* is a tall herb (up to 1.5 m high, covering approximately 1 m<sup>2</sup> ground) with large (40-70 cm up to 1.5 m) tobacco-like, stemmed leathery leaves with a light sheen and stems as thick fleshy rhizomes (up to 30 cm long and 2.5-5 cm diameter) under the ground. The 1 to 2 (sometimes up to 4) inflorescences are coated by a showy bright yellow spathe up to 45 cm high, enclosing one fleshy, up to 25 cm big spadix carrying many flowers at the bottom. Flowers are small yellowish green, often monoecious with female flowers below and male above (with generally 4, sometimes 6 stamens); also bisexual flowers are found. Flowers consist of generally 4, sometimes 6 free or fused tepals. They usually flower between March and May (June) (in Germany and in Finland in May) before leaves appear. The fruits are green berries at the end of the spadix, mature in its natural range from June to July, in Germany in July or early August.

### Native range

*L. americanus* originates from the Pacific part of North America from Alaska to California (Western Canada, US-Federal States Alaska, Washington, Oregon, California, Montana, Idaho; Flora of North America Editorial Committee 1993)



**Fig 4.** Distribution of *Lysichiton americanus* in North America, Source: [Flora of North America](#)

## Alien distribution

### History of introduction and geographical spread

*Lysichiton americanus* has first been introduced in Europe for cultivation in Great Britain in 1901. The first records from the wild come from Surrey, GB in 1947 (Clement and Foster 1994), recorded four times before 1970, 11 times until 1986 and 159 times until 1999 (Preston *et al.* 2002). In Ireland 24 sites are recorded (Preston *et al.* 2002, Doyle and Duckett 1985, O'Malley 1996). It was first mentioned in the 1980 edition of *Flora Europaea* (Tutin *et al.* 1980) for the British Isles incl. Ireland.

The species was introduced to Sweden around 1975 as an ornamental plant (Melanie Josefsson, Swedish Environmental Protection Agency, pers. comm. 2004). Today, 29 sites are recorded (map of Larson 2003), in south and central Sweden. Examples are the rivulets Vinån and Fylleån in the province of Halland, Tveta in the province of Södermanland (Lenfors and Nilsson 1987) and in the province of Östergötland (Lind 1988) in bogs and moist forests, where it propagates well and seems well established (Arne Anderberg, Naturhistoriska Riksmuseet Stockholm, pers. comm.).

Three sites in south Norway are reported (gardens escapes observed in 2001 near Arendal), where it probably was introduced in 1934 and > 200 plants since 2001 in a swamp on the island Tromøy near Arendal, where two plants have been planted around 1960 ([link to Norwegian description](#), Per Arvid Åsen pers. comm.). It has also been reported as escaped from a garden in Bergen at the West coast of Norway (Lid and Lid 1994).

One site is known in Finland since May 2005 in a Natura 2000 area close to a brook quite far from human settlements in the Pohja commune (between Karis and Salo, southern Finland) (Harry Helmisaari, pers. comm. 2005).

In Denmark *L. americanus* was first observed in the wild in the 1950s. From this original site (Vestbirk in Jutland) the species has apparently dispersed via the waterways 20 km downstream. The dispersal has not been documented and it is not known whether seeds or rhizomes were the means of dispersal (Jan Kjærsgaard, pers. comm. 2010). Besides this there is a larger population along Gudenåen by Langå in a swampy forest (at least 100 flowering plants in 2009 ([www.fugleognatur.dk](http://www.fugleognatur.dk)) and it is found scattered in gardens all over the country (Kjærsgaard, J, 2009).

Six sites are known from Germany ([Distribution map for Germany](#)). The Taunus population near Frankfurt derives from plants released from a gardener in the 1980s which increased meanwhile to some thousand huge (>80 cm) and with many thousand small plants (Korneck and Krause 1990, König and Nawrath 1992, Alberternst and Nawrath 2002), before control measures started in 2004 (still ongoing but most of the plants have been removed; Alberternst *et al.* 2008). The other five populations are smaller: at about 20 plants in swamp forests near Mülheim/Ruhr since 2002 (Fuchs *et al.* 2003, [electronic version](#)), 20 plants at two locations in the Harz near Elendstal (Herdam 1994a; 1994b; in 2005 controlled successfully; Schönborn 2006), 10 plants in Pillebachtal in Düsseldorf since 2004 (Dr. Michael Luwe, Kempen, pers. comm.), an unknown number of plants in Brexbachtal near Koblenz since the beginning of the 1990s (Fischer and Schausten 1994), and three tall (>80 cm) plants and approximately 150 small plants in the Eifel (Rhineland) near Rom.

In the Netherlands, there are two reports of small populations in wetland woods (van Valkenburg, pers. Comm. 2009). The first population discovered in 2005, comprised some 50 mature plants and dozens of seedlings. This population is at present under eradication (Peters-van der Meijden and Rotteveel 2006). The second smaller smaller population was only reported in 2008.

In Switzerland one site with 100 plants is known since May 2003 in the protected area of Meienmoos near Burgdorf in the canton of Berne (controlled in 2003 and 2004) ([description](#)). Judging from this alien range, the native range, the site conditions, the biology and observations from cultivation *e.g.* in botanic gardens it is most probable that the species will spread slowly but continuously from garden populations in Northern and Central Europe. In France, the first and only record is from the Massif Central (Delaigue 2001).

Since 2006, a few plants have been recorded in 3 sites in the Meuse and Ardenne regions in Belgium, where it was most probably planted. A large population of *L. americanus* and its hybrid with *L. camtschatcensis* has been observed along a small water course near an arboretum (see picture and distribution map at <http://ias.biodiversity.be/ias/species/show/13>). The two other populations are only made of a few individuals near a pond, and another in a forest, but it is not known whether the hybrid or the species are present there. No further spread has been observed, and the species is not considered a priority for action (E. Branquart, pers. comm., 2009).

### **Pathways of introduction**

The plant is grown in many botanical gardens (for Germany see [link](#)) and is getting more and more favoured among gardeners as a plant for ponds and other wet places, because it is nice looking and robust. In 1993 *Lysichiton americanus* got an “Award of Garden Merit” from the Royal Horticultural Society Floral Committee (GB): “Over the years the plants have seeded themselves freely and now make a fantastic display covering the full length of the stream and beyond.” ([link to text](#)). It is no mass selling ornamental, but easily available from garden catalogues and internet shops for garden lovers and specialists (*e.g.* available in 46 nurseries in Great Britain according to RHS 2004). The intended plantation in the Taunus (Germany) shows that it sometimes will be planted directly into nature to “enhance native flora”, but most populations probably descend from unintended actions like clearing of garbage in forest etc.

### **Alien status in region**

Within the Nordic and Baltic countries it is established in Norway, Sweden, Denmark, Germany and probably in Finland (see table 1). Moreover, since it is not a common garden plant but often found in Botanic Gardens and sometimes in parks, it is cultivated. Within Europe the most and longest established populations are found in Great Britain and Ireland.

Country	Not found	Not established	Rare	local	Common	Very common	Not known
Austria	X						
Belgium			X				
Denmark			X				
Estonia	X						
European part of Russia							
Finland			X				
Faroe Islands	X						
Germany			X				
Greenland	X						
Iceland	X						
Ireland			X				
Latvia	X						
Lithuania	X						
Netherlands			X				
Norway			X				
Poland	X						
Sweden				X			

**Table 1.** The frequency and establishment of *Lysichiton americanus*, please refer also to the information provided for this species at [www.nobanis.org/search.asp](http://www.nobanis.org/search.asp). Legend for this table: **Not found** –The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available.

## Ecology

### Habitat description

In its natural and introduced range *Lysichiton americanus* grows in the transition zone of terrestrial, semi-aquatic and aquatic habitats like swamps, wet woods and shrubs, along streams and riverbanks, lakesides, ponds, in boggy and other wet areas. As long as the site is wet, it has no specific soil requirements (from light sand soils to heavy clay soils of acid, neutral or basic reaction) and can grow in shade or full light. It is hardy to at least -15°C and grows from 0-1400 m altitude. In contrast to most other alien plant species it is restricted to these more or less natural habitats which in Central Europe are rare and often highly endangered or protected.

### Reproduction and life cycle

The plant species is perennial and grows at a slow rate but can get very old (> 80 years). It can build dense populations. In nature it usually reproduces sexually. Since the plant is very regenerative by water or animals torn of and dispersed rhizomes are able to rebuild a new plant. Flowers have an unpleasant aroma like a combination of skunk (name!), carrion and garlic that attracts flies, midges and beetles as pollinators. Each flower develops to a berry with generally two seeds of 5-11 mm. Each spadix has between 100 and 650 berries (Alberternst & Nawrath 2002).

## **Dispersal and spread**

When mature most seeds fall to the ground with the withered spadix so that most seeds germinate directly next to the mother plant. When growing in running waters, berries can also be transported downstream. In its native range long distance dispersal is ensured by birds and other animals (small rodents like squirrels, birds, but also bears) eating the berries or collecting them for winter stock. In its European range it is not known if the species is distributed by transportation of berries/seeds by birds, although close relatives of the propagating birds of North America also occur (tits, crow-like birds). Since artificial propagation for gardening is mainly done by dividing the rhizome, fragmentation of rhizomes may also be a vector for distribution (*e.g.* with machines and vehicles used for silviculture).

## **Impact**

### **Affected habitats and indigenous organisms**

Since the species is able to build dense stands, smaller plants growing in wetlands are out-competed by shadowing. Vegetation studies in the Taunus area of Germany clearly showed that mosses (*e.g.* *Sphagnum* species), *Viola palustris*, orchid species and other plants are displaced within some years (Alberternst, in prep.). Since the invaded habitats are rare and endangered in Germany, *Lysichiton americanus* especially threatens some endangered or rare plant species in Germany. It can be expected that the displacing effects also appear in other countries where the impact may be judged differently due to the higher frequency of the habitats and species affected.

With the change of the light conditions and the plant community structure, effects on the fauna, especially insects, and the food web are most probable. Effects on abiotic parameters (*e.g.* soils, hydrology) are not probable.

### **Genetic effects**

Hybridisation with the closely related alien species *Lysichiton camtschatcensis* occur (*e.g.* Stace 1997)

### **Human health effects**

*Lysichiton americanus* has no effects on human health.

### **Economic and societal effects (positive/negative)**

Positive economic and social effects of the plant are reported from its native range where it has been used as food (in famine times), medicine (for burns and injuries) and waxed paper of Native Americans. In Europe it is used as an ornamental. Data about its market value is not available, but since it is no common garden plant, it may not be significant.

Eradication measures are known for the Taunus and the Harz populations in Germany and the population from Switzerland. The costs of these measures are not known but they differ significantly between Switzerland (only some hundred plants which were dug out in the first and controlled in the second season) and Taunus (several thousand plants in many localities which were dug out by volunteers and forest workers). In the Netherlands, plants were dug out by volunteers and consecutive monitoring was done by the Plant Protection Service (Peters-van der Meijden and Rotteveel 2006).

## Management approaches

### Prevention methods

The most extended prevention method would be to stop trading the species, although control *e.g.* of the internet market would be difficult. Preventing plantations in the wild and preventing disposal of garden litter into nature should be regarded as a minimum requirement even though litter dumping is forbidden in Denmark, Germany and other countries.

The species is also listed on the action list of the European and Mediterranean Plant Protection Organization (EPPO) to draw the attention of member countries to *Lysichiton americanus* and to achieve early warning (see [quarantine action](#) list). The species is also regarded as a weed by the Global Compendium of Weeds ([Link to \*Lysichiton americanus\* in compendium](#)).

### Eradication, control and monitoring efforts

Since the plant develops slowly monitoring seems to be appropriate as a basis for early detection. When recognized, rapid measures should take place consisting of the mechanical removal of the plant (pesticides are not appropriate in wetlands). Therefore, the plant, *i.e.* its rhizomes, has to be dug out and removed from the site. It is not necessary to remove the smaller, vertical growing contractile roots if they stay in the dark. In case these roots receive light, they are capable to regenerate a new plant. Measures can take place during the whole growing season, but the best time is in early summer because this weakens the remaining rhizomes. The first control and a potential second treatment can take place in the same year (late summer/autumn). Controlled areas have to be monitored the following years to repeat the treatment for plants that have survived or have been overlooked or new offspring. Seeds are viable for at least nine years after removal of the fruits. Control measures should take place two times a year in the first four vegetation periods and at least one time (May to July) per year in the following two or more years depending on the occurrences in the previous year.

In Denmark they are dug up with a spade every spring, This will eradicate the population eventually if done thoroughly – by now after 4 years there are no more flowering plants, but it must be followed up every year for a couple of more years since small plants is still found.

### Information and awareness

Management efforts should be connected with information to local inhabitants to ensure acceptance of the measures and to prevent new plantations or escapes. A broad awareness raising campaign on the species may be counterproductive since it may increase the interest in the species as a garden plant.

### Knowledge and research

Knowledge about the biology of the species and its management is quite good and ensures a basis for effective management measures. Nevertheless, further research/observation on how long the seeds stay viable and whether the berries are transported by birds to assess the risk of spread and establishment is needed.

### Recommendations or comments from experts and local communities

When taking measures against established populations it should be taken into account that the conservation value of habitats and species affected by *Lysichiton americanus* differs. In Central Europe wetlands are nowadays generally rare and some of them, like swamps, are extremely endangered and often protected by law. This differs from other biogeographical regions, especially in Northern Europe.

## References and other resources

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### Links

Fact sheet of the [EPPO Alert list](#)

[Fact sheet](#) (in German)

Den [virtuella floran Sweden](#)

[Artsdatabase of Norway](#)

[Flora of North America](#)

[US-Flora](#)

[Flora of Northern Ireland](#)

[Population](#) in Switzerland

Description of [population near Mülheim](#) (Germany)

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