

*Salsola tragus* [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Caryophyllales	Chenopodiaceae

**Common name** Russian tumbleweed (English), Russian-thistle (English), Russian-cactus (English), soude roulante (French), spineless saltwort (English), ci sha peng (Chinese), tumbleweed (English), hari-hijikii (Japanese), Ukraine Salzkraut (German), soude épineuse (French)

**Synonym** *Salsola australis* , R. Br.  
*Salsola iberica* , auct.  
*Salsola kali* , auct. w. N. Amer.  
*Salsola kali* , subsp. *iberica* (Sennen & Pau) Rilke  
*Salsola kali* , var. *tenuifolia* Tausch  
*Salsola kali* , subsp. *tragus* (L.) Nyman  
*Salsola pestifer* , A. Nelson  
*Salsola ruthenica* , Iljin  
*Salsola tragus* , subsp. *iberica* Sennen & Pau  
*Salsola kali* , subsp. *ruthenica* (Iljin) Soó

**Similar species**

**Summary** *Salsola tragus* is an annual weed that begins life as a typical multiple branched bush but then takes on a spherical form. Once the spherical form is achieved the plant breaks at the soil line and becomes a tumbleweed which is blown by the wind, spreading thousands of seeds. It is abundant in semi-desert regions and is a typical plant of salty soils, where rainfall is not abundant. It infests range and semi-arid pasture lands as well as cropland, railroad, and highway rights of way, as well as vacant agricultural, residential and industrial areas. *Salsola tragus* is a road hazard, as tumbling plants can surprise drivers and cause traffic accidents. It is also responsible for allergic sensitisation in Europe and North America. It should be noted that nitrates and soluble oxalates accumulate in the plants photosynthetic parts at levels poisonous to sheep.



[view this species on IUCN Red List](#)

## Species Description

The Ontario Ministry of Agriculture and Food (2003) state that, "*S. tragus* is an annual, reproducing only by seed. A very bushy, much-branched, spiny plant 5-120cm high, its diameter often exceeds its height. Stems are green, and usually striped with red lines, and rough with short, firm hair. Cotyledons are very narrow and grass-like, gradually lengthening and reaching 3-5cm long. The first true leaves are opposite (2 per node) and as long as or longer than the cotyledons which are needle-like, round, or slightly flattened in cross-section. Older leaves gradually become shorter and are mostly alternate (1 per node). Young plants are often crowded with erect leaves and resemble a grass. Older plants have firm, short, bract-like leaves, usually only 6mm long, with a broad base tapering to a slender point and ending in a hard, sharp spine. Flowers are small, and lacking petals but with 5 pinkish to greenish-white, membranous-winged sepals. *S. tragus* is stalkless in the axil of each cluster of 3 spine-tipped bract-like leaves. At maturity, the brittle stem breaks at the top of the root and the whole plant is rolled and tumbled by the wind, dropping seeds with each bounce and turn. Seeds cone- or top-shaped, the broader end flattened or hollowed and with a small point in the center, about 2mm across and the same long; the coiled embryo being visible through the nearly transparent seed coat."

## Notes

Ryan and Ayres (2000) state that, "*S. tragus* spread rapidly throughout the western United States owing to plant dispersion by wind perhaps aided by railroad shipment of cattle."

## Lifecycle Stages

Carnes *et al.* (2003) state that once the spherical form of the bushes starts aging, "the plant breaks at the soil line and becomes a tumbleweed. In this shape, the plant is blown by the wind, spreading between 20 000 and 50 000 seeds."

## Uses

Duke (1983) states that, "Young plants serve as useful fodder, as long as they are not too high in nitrites or oxalic acids. As a low-water-use plant, germinating quickly on minimally disturbed soils, and relatively free of diseases and parasites, this has been suggested as a fuel source for arid lands (Foster *et al.*, 1980). This is one of several plants burned to make soap, even in Biblical times, at least so we read in WSSA. Soap made in this fashion is still traded at Joppa and other Mediterranean ports [WSSA Newsletter 9(4): 12. 1981]. On account of its high alkali content, the plant has also been used in making glass (Watt and Breyer-Brandwijk, 1962). Salsolin has been used to regulate the blood pressure, said to resemble papaverine in its effect on vasoconstriction, hydrastine in its effect on the smooth muscles of the uterus (List and Horhammer, 1969-1979)." Williams (undated) states that, "A severe drought in the 1930's in Canada led farmers to use young *S. tragus* as hay and silage for livestock."

## Habitat Description

Carnes *et al.* (2003) state that, "*S. tragus* is abundant in several semi-desertic regions of the United States and central Australia. *S. tragus* is a typical plant of salty soils, where rainfall is not abundant." They also state that, "In the USA, *S. tragus* are found along the coast from the northeast to the west. In Europe, it is also very common in coastal areas from the Baltic Sea to the Mediterranean coast. In Spain, *S. tragus* is very common in Aragón, Andalucía, Murcia and Levante." This species can also be found on range and semi-arid pasture as well as crop-land, railroad, and highway rights of way, and vacant agricultural, residential, and industrial areas (Hasan *et al.*, 2001). Williams (undated) states that, "*S. tragus* thrives in salty and alkaline soils but will generally be out competed by natives in undisturbed habitats."

## Reproduction

The Ontario Ministry of Agriculture and Food (2003) state that, "At maturity, the brittle stem of *S. tragus* breaks at the top of the root and the whole plant is rolled and tumbled by the wind, dropping seeds with each bounce and turn. Seeds are cone or top-shaped, and the broader end is flattened or hollowed and with a small point in the center, and about 2mm across and the same long. The coiled embryo is visible through the nearly transparent seed coat."

## General Impacts

Sobhian *et al.* (2003) states that, "S. tragus was introduced in the USA in the late 1800s and since then has become one of the most troublesome weeds in the drier regions of western North America (Whitson, 1992). It infests range and semi-arid pasture lands as well as cropland, railroad, and highway rights of way, and vacant agricultural, residential and industrial areas. Moreover, the plant is a primary summer host of the beet leafhopper, *Circulifer tenellus* (Baker) (Cicadellidae), which is a vector of curly top virus to several important crops including sugar beets, tomatoes, beans, melons, and cucurbits (Goeden, 1968; Bennett, 1971). *S. tragus* is a road hazard as tumbling plants surprise drivers and cause traffic accidents. Windblown plants fill irrigation canals and catchments, pile against fences and dwellings and accumulate other windblown debris (Goeden and Pemberton, 1995). It is a weed of wheat in the northwestern United States, where infestations have caused yield losses of greater than 50% in spring wheat (Pan *et al.*, 2001)."

Carnes *et al.* (2003) state that, "The family Chaenopodiaceae contains several genera, such as *Chenopodium* and *Salsola*, which are responsible for allergic sensitization in Europe and North America. In Spain, *S. tragus* pollen load may represent up to 5% of the total pollen, being responsible for many allergic sensitizations. In 1933, Lamson *et al.* described the first cases of sensitization to this pollen in Arizona. In 1978, Powell *et al.* described two cases of contact dermatitis after exposure to tumbleweed. Shafiee *et al.* described nine Iranian patients with hypersensitivity to pollen of *Salsola spp.*, who showed positive skin-prick tests to *S. tragus* and detectable levels of specific IgE. In some regions of Spain, with a high concentration of *S. tragus* pollen, more than 30% of the allergic patients who inhabit these areas are allergic to this pollen and exhibit a positive skin-prick tests and symptoms upon exposure."

The Manitoba Department of Weeds, Insects, and Disease (2001) states that, "Nitrates and soluble oxalates accumulate in the plants photosynthetic parts at levels poisonous to sheep." *S. tragus* also acts to increase the amount of available phosphorous in the soil (Cannon *et al.*, 1995).

## Management Info

For details on bio-control of this species please see [biological control](#)

**Principal source:** Sobhian *et al.* 2003. Observations on the host specificity and biology of *Lixus salsolae* (Col., Curculionidae), a potential biological control agent of Russian thistle, *Salsola tragus* (Chenopodiaceae) in North America.

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Expert review underway

**Publication date:** 2005-10-17

## ALIEN RANGE

[1] AUSTRALIA  
[48] UNITED STATES

[1] CANADA

## BIBLIOGRAPHY

16 references found for *Salsola tragus*

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## Management information

Bruckart, W., Cavin, C., Vajna, L., Schwarczinger, I., and Ryan, F.J., 2004. Differential susceptibility of Russian thistle accessions to *Colletotrichum gloeosporioides*. *Biological Control*. 30 (2): 306-311.

**Summary:** Information on the biological control of Russian thistle using the fungal pathogen *Colletotrichum gloeosporioides*.

Carnes, J., E. Fernandez-Caldas, A. Marina, C. Alonso, C. Lahoz, C. Colas, and A. Lezaun. 2003. *Immunochemical characterization of Russian thistle (Salsola kali) pollen extracts. Purification of the allergen Salk 1*. *Allergy* 58: 1152-1156.

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

[Duke, J. A. 1983. \*Salsola kali\* L.. Handbook of Energy Crops, Purdue University Center for New Crops and Plants Products.](#)

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Available from: [http://www.hort.purdue.edu/newcrop/duke\\_energy/Salsola\\_kali.html](http://www.hort.purdue.edu/newcrop/duke_energy/Salsola_kali.html) [Accessed 17 August 2004]

Hasan, S., Sobhian, R., and F. Herard. 2001. *Biology, Impact and Preliminary Host-specificity Testing of the Rust Fungus, Uromyces salsolae, a Potential Biological Control Agent for Salsola kali in the USA*. *Biocontrol Science and Technology* 11: 677-689.

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

[Manitoba Department of Weeds, Insects, and Disease. 2001. \*Russian Thistle\*. Manitoba Agriculture, Food and Rural Initiatives.](#)

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Available from: <http://www.gov.mb.ca/agriculture/crops/weeds/fab45s00.html> [Accessed 17 August 2004]

[Ontario Ministry of Agriculture and Food. 2003. \*Ontario Weeds: Russian thistle\*. Ontario Weeds Gallery](#)

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Available from: [http://www.gov.on.ca/OMAF/english/crops/facts/ontweeds/russian\\_thistle.htm](http://www.gov.on.ca/OMAF/english/crops/facts/ontweeds/russian_thistle.htm) [Accessed 17 August 2004]

Ryan, F. J., and D. R. Ayres. 2000. *Molecular markers indicate two cryptic, genetically divergent populations of Russian thistle (Salsola tragus) in California*. *Canadian Journal of Botany* 78: 59-67.

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Sobhian, R., Fumanal, B., and Pitcairn, M. 2003. *Observations on the host specificity and biology of Lixus salsolae (Col., Curculionidae), a potential biological control agent of Russian thistle, Salsola tragus (Chenopodiaceae) in North America*. *Journal of Applied Entomology* 127: 322-324.

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Sobhian, R., Ryan, F.J., Khamraev, A., Pitcairn, M.J., and Bell, D.E. 2003. DNA phenotyping to find a natural enemy in Uzbekistan for California biotypes of *Salsola tragus* L. *Biological Control*. 28 (2): 222-228.

**Summary:** Information on the biological control of Russian thistle using the gall midge *Desertovellum stackelbergi*.

[Williams, D. B. Undated. \*Tumbleweed\*. DesertUSA.com and Digital West Media Inc.](#)

**Summary:** This page contains information on common names, description, habitat, propagation, native range, impacts, and control measures.

Available from: <http://www.desertusa.com/mag01/may/paprtweed.html> [Accessed 17 August 2004]

## General information

Barrows, C.W. 1997. Habitat relationships of the Coachella Valley fringe-toed lizard (*Uma inornata*) *Southwestern Naturalist*. 42(2). 1997. 218-223.

**Summary:** Information on the habitat preferences of the fringe-toed lizard in south-eastern Arizona.

Cannon, J.P., Allen, E.B., Allen, M.F., Dudley, L.M., and Jurinak, J.J. 1995. The effects of oxalates produced by *Salsola tragus* on the phosphorus nutrition of *Stipa pulchra*. *Oecologia*. 102 (3): 265-272.

**Summary:** Information on the effects of oxalates produced by Russian thistle on available soil phosphorus levels.

[CONABIO. 2008. Sistema de información sobre especies invasoras en México. Especies invasoras - Plantas. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad. Fecha de acceso.](#)

**Summary:** English:

The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), under the section Novedades for information on updates.

Invasive species - Plants is available from: [http://www.conabio.gob.mx/invasoras/index.php/Especies\\_invasoras\\_-\\_Plantas](http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas) [Accessed 30 July 2008]

**Spanish:**

La lista de especies del Sistema de información sobre especies invasoras de México cuenta actualmente con información acerca de nombre científico, familia, grupo y nombre común, así como hábitat, estado de la invasión en México, rutas de introducción y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la página de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualización, por favor consulte la portada (<http://www.conabio.gob.mx/invasoras/index.php/Portada>), en la sección novedades, para conocer los cambios.

Especies invasoras - Plantas is available from: [http://www.conabio.gob.mx/invasoras/index.php/Especies\\_invasoras\\_-\\_Plantas](http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas) [Accessed 30 July 2008]

Richter, B.S., Tiller, R.L., and Stutz, J.C. 2002. Assessment of arbuscular mycorrhizal fungal propagules and colonization from abandoned agricultural fields and semi-arid grasslands in riparian floodplains. *Applied Soil Ecology*. 20 (3): 227-238.

**Summary:** Information on the plant communities of Arizona, including details of Russian thistle.

[USDA-GRIN \(Germplasm Resources Information Network\). 2004. \*Salsola tragus\*. National Genetic Resources Program \[Online Database\] National Germplasm Resources Laboratory, Beltsville, Maryland.](#)

**Summary:** Information on common names, synonyms, and the distributional range of species.

Available from: [http://www.ars-grin.gov/cgi-bin/npgs/html/tax\\_search.pl?Salsola+tragus](http://www.ars-grin.gov/cgi-bin/npgs/html/tax_search.pl?Salsola+tragus) [Accessed 17 August 2004]

[USDA-NRCS \(Natural Resource Conservation Service\). 2004. \*Salsola tragus\*. The PLANTS Database Version 3.5 \[Online Database\] National Plant Data Center, Baton Rouge, LA.](#)

**Summary:** Available from:

<http://plants.usda.gov/java/nameSearch?mode=Scientific+Name&keywordquery=Salsola+tragus&go.x=14&go.y=10> [Accessed 17 August 2005]