How Many Species of *Salsola* tumbleweeds (Russian Thistle) Occur in the Western USA?

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Abstract

Russian thistle or common tumbleweed, *Salsola tragus* L. (sensu lato), is an alien weedy annual plant that infests over 41 million hectares in the western United States. The taxonomy of this plant has had a long confusing history, with frequent misapplication of the species names kali and australis. Recent studies based on morphology, allozymes and molecular genetics indicate that "Russian thistle" comprises seven distinct species in North America. *Salsola tragus* is probably the most widespread species. *Salsola collina* Pall. occurs primarily east of the Rocky Mountains, *S. paulsenii* Litv. primarily in deserts, and *S. kali* is restricted to ocean shores and is not a rangeland weed. *Salsola australis* R., sometimes reported as "type B", occurs primarily in California, South Africa and Australia, but has never been documented to occur in Eurasia. Almost all uses of this name before 2008 are probably misapplications. Polyploid hybrids include *S.* x *gobicola* (includes *S. tragus* and *S. paulsenii* ancestry), which is known from western USA and central Asia, and *S.* x *ryanii* (includes *S. tragus* and *S. australis* ancestry), which is known only from California. A gall forming midge, *Desertovelum stackelbergi* Mamaev, from Uzbekistan (Sobhian *et al*. 2003. Biol. Control 28: 222-228) and a fungal pathogen, *Colletotrichum gloeosporoides* (Penz), from Hungary (Bruckart *et al*. 2004. Biol. Control 30: 306-311) had much higher rates of attack and damage to *S. tragus* than *S. australis*. Although it was previously believed that all species in the kali section of *Salsola* originated in Eurasia, the presence of 4 indigenous species in Australia suggests a separate clade (Borger *et al*. 2008. Aust. J. Bot. 56: 600–608). It is likely that *S. australis* is native to Australia.