

**Family:** *Plantaginaceae*

**Taxon:** *Antirrhinum majus*

**Synonym:** *Antirrhinum cirrhigerum*  
*Antirrhinum latifolium* var. *cirrhigerum*  
*Antirrhinum linkianum*  
*Antirrhinum litigiosum*  
*Antirrhinum tortuosum*

**Common Name:** snapdragon  
 grand muflier  
 gueule de lion

<b>Questionnaire :</b>	current 20090513	<b>Assessor:</b>	Assessor	<b>Designation:</b> EVALUATE
<b>Status:</b>	Assessor Approved	<b>Data Entry Person:</b>	Assessor	<b>WRA Score</b> 3
101	Is the species highly domesticated?		y=-3, n=0	n
102	Has the species become naturalized where grown?		y=1, n=-1	
103	Does the species have weedy races?		y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)	Low
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)		y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0	n
205	Does the species have a history of repeated introductions outside its natural range?		y=-2, ?=-1, n=0	y
301	Naturalized beyond native range		y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)	
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs		y=1, n=0	n
402	Allelopathic		y=1, n=0	
403	Parasitic		y=1, n=0	n
404	Unpalatable to grazing animals		y=1, n=-1	
405	Toxic to animals		y=1, n=0	n
406	Host for recognized pests and pathogens		y=1, n=0	
407	Causes allergies or is otherwise toxic to humans		y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		y=1, n=0	

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
604	Self-compatible or apomictic	y=1, n=-1	n
605	Requires specialist pollinators	y=-1, n=0	y
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: EVALUATE

WRA Score 3

## Supporting Data:

101	2010. Hudson, A./Critchley, J./Erasmus, Y.. The Genus <i>Antirrhinum</i> (Snapdragon) A Flowering Plant Model for Evolution and Development. Pp 105-118 in Emerging Model Organisms: A Laboratory Manual, Volume 1. CSH Laboratory Press, Cold Spring Harbor, NY	[Is the species highly domesticated? Assessment of wild type. Cultivars may be highly domesticated] "The garden snapdragon <i>A. majus</i> has several centuries' history of cultivation as a flowering ornamental. It emerged as a model organism during early studies of inheritance and mutation (e.g., Darwin 1868) because of its diploid inheritance, ease of cultivation, and variation in morphology and flower color. Laboratory lines of <i>A. majus</i> were produced from cultivars, and a substantial collection of mutants had amassed during the course of the 20th century. This collection included lines with unstable mutations in pigment genes, which produced variegated flowers"
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	1988. Thompson, D.M.. Systematics of <i>Antirrhinum</i> (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Species suited to tropical or subtropical climate(s) 0-Low] "The original native distribution of <i>A. majus</i> , the common garden snap dragon, is difficult to ascertain; it has apparently been cultivated since Roman times, escaping and persisting throughout the Mediterranean region (Rothmaler 1956)."
202	1988. Thompson, D.M.. Systematics of <i>Antirrhinum</i> (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Quality of climate match data 0-Low]
203	2007. Gilman, E.F.. <i>Antirrhinum majus</i> Snapdragon. FPS-44. University of Florida IFAS Extension, Gainesville, FL <a href="http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf">http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf</a>	[Broad climate suitability (environmental versatility)? Yes] "USDA hardiness zones: all zones"
203	2013. Floridata. <i>Antirrhinum majus</i> . <a href="http://www.floridata.com/ref/a/anti_maj.cfm">http://www.floridata.com/ref/a/anti_maj.cfm</a> [Accessed 12 Dec 2013]	[Broad climate suitability (environmental versatility)? Yes] "Hardiness: USDA Zones 4 - 11. Snapdragons perform best in cool weather, and most cultivars can tolerate frost and an occasional light freeze. They don't do well in summer heat, and in zones 9-11, snapdragons are grown in the winter."
204	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Native or naturalized in regions with tropical or subtropical climates? No] "widely naturalized in temperate regions "
205	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] "widely cultivated in temperate regions"
301	1981. Sykes, W.R.. Checklist of dicotyledons naturalised in New Zealand 7. Scrophulariales. New Zealand Journal of Botany. 19(1): 53-57.	[Naturalized beyond native range? Yes] "A sporadic escape from cultivation in various parts of New Zealand."
301	1988. Hickey, M./King, C.. 100 Families of Flowering Plants. Cambridge University Press, Cambridge, UK	[Naturalized beyond native range? Yes] "...often grown in gardens from which it sometimes escapes and becomes naturalised, mainly on old walls."
301	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Naturalized beyond native range? Yes] "N.; S.: widely scattered, casual cultivation escape."
302	1978. McCready, G.A./Cooperrider, T.S.. The Scrophulariaceae Subfamily Scrophularioideae of Ohio. <i>Castanea</i> . 43(2): 76-86.	[Garden/amenity/disturbance weed? No] "Of southwestern European origin, widely planted in flower gardens in Ohio. Occasionally an adventive escape, not persisting long out of cultivation."
302	2007. Gilman, E.F.. <i>Antirrhinum majus</i> Snapdragon. FPS-44. University of Florida IFAS Extension, Gainesville, FL <a href="http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf">http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf</a>	[Garden/amenity/disturbance weed? No evidence] "Invasive potential: not known to be invasive"
302	2012. Nursery and Garden Industry Australia. Grow Me Instead - A Guide for Gardeners in Queensland Darling Downs. <a href="http://www.growmeinstead.com.au/public/GMI-brochure-Qld-Darling-Downs.pdf">http://www.growmeinstead.com.au/public/GMI-brochure-Qld-Darling-Downs.pdf</a> .	[Garden/amenity/disturbance weed? Recommended as a non-invasive alternative to <i>Cosmos bipinnatus</i> ]
303	2011. Invasive Plant Council of British Columbia. Grow Me Instead - Beautiful Non-Invasive Plants for your Garden. <a href="http://www.bcinvasiveplants.com">www.bcinvasiveplants.com</a>	[Agricultural/forestry/horticultural weed? Listed as a non-invasive alternative to weedy plants]

303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? Listed as an agricultural weed, but no evidence of negative impacts have been found]
304	2009. Donaldson, S./Miller, A.. Invasive Weeds of the Lake Tahoe Basin. University of Nevada Cooperative Extension, Reno	[Environmental weed? Not in Lake Tahoe. Listed as a Non-native look alike to the noxious weed <i>Linaria vulgaris</i> ]
304	2010. Moravcova, L./Pyšek, P./Jarošík, V./Havlíčková, V./Zákravský, P.. Reproductive characteristics of neophytes in the Czech Republic: traits of invasive and non-invasive species. <i>Preslia</i> . 82(4): 365-390.	[Environmental weed? Not in the Czech Republic] "Table 2. – Seed production and dispersal traits of alien neophytes in the Czech flora. Whether a species was considered invasive or not was taken from Pyšek et al. (2002) with modifications reported in Kubešová et al. (2010)" [Antirrhinum majus - Invasive = no]
304	2013. Kelly, J./O'Flynn, C./Maguire, C.. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service.	[Environmental weed? Not in Ireland] "APPENDIX 1: ... All species listed here were assessed as having a low risk to conservation goals during the first risk assessment process and were not reassessed during the current process."
305	2003. Starr, F./Starr, K./Loope, L.L.. Antirrhinum orontium - Lesser snapdragon - Scrophulariaceae. <a href="http://www.starrenvironmental.com/publications/species_reports/pdf/antirrhinum_orontium.pdf">http://www.starrenvironmental.com/publications/species_reports/pdf/antirrhinum_orontium.pdf</a>	[Congeneric weed? Yes] "Antirrhinum orontium is naturalized in Hawai'i on the islands of O'ahu, Maui, and Kaho'olawe (Wagner et al. 1999, Staples et al. 2002, Starr et al. 2002). On Maui, A. orontium is locally common in dry sites where it forms dense patches on lava and cinder substrates. It is spreading on the south slope of Haleakala, at Lualailua Hills and Kahikinui. It is also established in Pukalani, Makawao, and Pu'u o Kali." ... "Chemical control: Apparently, in the Pacific Northwest, A. orontium is increasingly becoming a roadside weed due to its tolerance for many herbicides (Markham 1995). Trials would be needed in Hawai'i to find the best methodology for effective control."
401	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Produces spines, thorns or burrs? No] "Short-lived perennial; stems to c. 60 cm tall, becoming woody at base, simple or branched. Lvs shortly petiolate. Lamina 20-50 × 3-15 mm, usually linear to lanceolate, occasionally broader, glabrous; base narrowly cuneate."
402	2013. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	1988. Thompson, D.M.. Systematics of Antirrhinum (Scrophulariaceae) in the New World. <i>Systematic Botany Monographs</i> . 22: 1-142.	[Parasitic? No] "Nonparasitic annuals or herbaceous perennials with fibrous roots." [Genus description]
404	2010. Masters, R./Mitchell, P./Dobbs, S.. Ornamental and garden plants: controlling deer damage F-6427. Oklahoma State University Cooperative Extension Unit, <a href="http://www.icwdm.org/publications/pdf/deer/osudeerdamage.pdf">http://www.icwdm.org/publications/pdf/deer/osudeerdamage.pdf</a>	[Unpalatable to grazing animals? Possibly Yes] "Herbaceous Plants—Annual Flowers Rarely Damaged" [Includes Antirrhinum majus]
404	2013. Missouri Botanical Gardens. Antirrhinum majus. <a href="http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561">http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561</a> [Accessed 12 Dec 2013]	[Unpalatable to grazing animals?] "Tolerate: Deer"
405	2001. Knight, A.P./Walter, R.G.. A guide to plant poisoning of animals in North America. Teton NewMedia, Jackson, WY	[Toxic to animals? No evidence]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No evidence]
405	2013. ASPCA. Garden Snapdragon. <a href="http://www.aspc.org/pet-care/animal-poison-control/toxic-and-non-toxic-plants/garden-snapdragon">http://www.aspc.org/pet-care/animal-poison-control/toxic-and-non-toxic-plants/garden-snapdragon</a> [Accessed 13 Dec 2013]	[Toxic to animals? No evidence] "Toxicity: Non-Toxic to Dogs, Non-Toxic to Cats"
406	2011. The Royal Horticultural Society. Antirrhinum majus Sonnet Series. <a href="http://apps.rhs.org.uk/plantselector/plant?plantid=4991">http://apps.rhs.org.uk/plantselector/plant?plantid=4991</a> [Accessed 13 Dec 2013]	[Host for recognized pests and pathogens? Common plant pests] "Pests - May be attacked by aphids" ... "Diseases - Prone to antirrhinum rust and powdery mildew"

406	2013. Missouri Botanical Gardens. <i>Antirrhinum majus</i> . <a href="http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561">http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561</a> [Accessed 12 Dec 2013]	[Host for recognized pests and pathogens?] "Rust can be a significant problem. If rust does appear in a planting, it is best to grow snapdragons in another part of the garden the following year. Also susceptible to mold, fungal leaf spots, downy mildew, wilt and root rots. Watch for aphids."
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No evidence]
407	2013. Pollen Library. Garden Snapdragon ( <i>Antirrhinum majus</i> ). IMS Health Inc., <a href="http://www.pollenlibrary.com/Specie/Antirrhinum+majus/">http://www.pollenlibrary.com/Specie/Antirrhinum+majus/</a> [Accessed 13 Dec 2013]	[Causes allergies or is otherwise toxic to humans? No evidence] "Allergenicity: No allergy has been reported for Garden Snapdragon ( <i>Antirrhinum majus</i> ) species"
408	2007. Skelly, J./Smith, E.. Choosing the Right Plants for Northern Nevada's High Fire Hazard Areas. University of Nevada Cooperative Extension, Reno, NV	[Creates a fire hazard in natural ecosystems? No] "Based on these characteristics, homeowners living in high fire hazard areas should select the following types of plants for use within 30 feet or more of the house" [ <i>A. majus</i> recommended as a low risk plant]
409	2007. Gilman, E.F.. <i>Antirrhinum majus</i> Snapdragon. FPS-44. University of Florida IFAS Extension, Gainesville, FL <a href="http://edis.ifas.ufl.edu/pdffiles/FP/FP04400.pdf">http://edis.ifas.ufl.edu/pdffiles/FP/FP04400.pdf</a>	[Is a shade tolerant plant at some stage of its life cycle?] "The plants require full sun and moist soil."
409	2013. FloridaData. <i>Antirrhinum majus</i> . <a href="http://www.floridata.com/ref/a/anti_maj.cfm">http://www.floridata.com/ref/a/anti_maj.cfm</a> [Accessed 12 Dec 2013]	[Is a shade tolerant plant at some stage of its life cycle? Possibly] "Light: Snapdragons do best in full sun, but can tolerate partial shade."
409	2013. Missouri Botanical Gardens. <i>Antirrhinum majus</i> . <a href="http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561">http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a561</a> [Accessed 12 Dec 2013]	[Is a shade tolerant plant at some stage of its life cycle?] "Sun: Full sun"
410	2007. Gilman, E.F.. <i>Antirrhinum majus</i> Snapdragon. FPS-44. University of Florida IFAS Extension, Gainesville, FL <a href="http://edis.ifas.ufl.edu/pdffiles/FP/FP04400.pdf">http://edis.ifas.ufl.edu/pdffiles/FP/FP04400.pdf</a>	[Tolerates a wide range of soil conditions? Yes] "Soil tolerances: acidic; slightly alkaline; clay; sand; loam"
411	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Climbing or smothering growth habit? No] "Short-lived perennial; stems to c. 60 cm tall, becoming woody at base, simple or branched. Lvs shortly petiolate."
412	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Forms dense thickets? No evidence] "Gutters, gravel paths and similar well-drained sites, especially in waste places near buildings, sometimes less modified sites such as coastal sand dunes, river banks and cliff faces." [Typical distribution of <i>A. majus</i> throughout introduced range]
501	2013. WRA Specialist. Personal Communication.	[Aquatic? No] Terrestrial
502	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Grass? No] "Family: Plantaginaceae tribe: Antirrhineae. Also placed in: Scrophulariaceae Veronicaceae "
503	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Nitrogen fixing woody plant? No] "Family: Plantaginaceae tribe: Antirrhineae. Also placed in: Scrophulariaceae Veronicaceae "
504	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Short-lived perennial; stems to c. 60 cm tall, becoming woody at base, simple or branched. Lvs shortly petiolate."
601	1988. Thompson, D.M.. Systematics of <i>Antirrhinum</i> (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Evidence of substantial reproductive failure in native habitat? No] "The original native distribution of <i>A. majus</i> , the common garden snap dragon, is difficult to ascertain; it has apparently been cultivated since Roman times, escaping and persisting throughout the Mediterranean region (Rothmaler 1956)."

602	1988. Thompson, D.M.. Systematics of Antirrhinum (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Produces viable seed? Yes] "Snapdragon or garden antirrhinum is very commonly cultivated throughout N.Z. and the sp. seeds prolifically here."
602	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Produces viable seed? Yes] "Young plants are usually purchased in flats from nurseries, although seeds are readily available through garden shops or by mail."
603	2010. Hudson, A./Critchley, J./Erasmus, Y.. The Genus Antirrhinum (Snapdragon) A Flowering Plant Model for Evolution and Development. Pp 105-118 in Emerging Model Organisms: A Laboratory Manual, Volume 1. CSH Laboratory Press, Cold Spring Harbor, NY	[Hybridizes naturally? Yes] "The Antirrhinum species group also has a history of use in studies of natural variation. The close relatives of <i>A. majus</i> form a monophyletic group of about 20 species native to the Mediterranean region, particularly southwestern Europe and northern Africa. The species vary widely in morphology and ecology and are adapted to different—often extreme—habitats. However, all are able to form fertile hybrids with one another and with <i>A. majus</i> , allowing the identification of genes that underlie their differences (see, e.g., Langlade et al. 2005)."
604	2006. Mateu-Andrés, I./De Paco, L.. Genetic diversity and the reproductive system in related species of Antirrhinum. Annals of botany. 98(5): 1053-1060.	[Self-compatible or apomictic? No] "wild populations of <i>A. majus</i> are self-incompatible"
605	1988. Hickey, M./King, C.. 100 Families of Flowering Plants. Cambridge University Press, Cambridge, UK	[Requires specialist pollinators? Yes] "...in Antirrhinum and certain related genera the corolla is so designed that only long-tongued bees can penetrate the flower."
606	2007. Gilman, E.F.. Antirrhinum majus Snapdragon. FPS-44. University of Florida IFAS Extension, Gainesville, FL <a href="http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf">http://edis.ifas.ufl.edu/pdf/FP/FP04400.pdf</a>	[Reproduction by vegetative fragmentation? No] "Snapdragons may be propagated by seeds, or by cuttings which root readily."
607	2010. Hudson, A./Critchley, J./Erasmus, Y.. The Genus Antirrhinum (Snapdragon) A Flowering Plant Model for Evolution and Development. Pp 105-118 in Emerging Model Organisms: A Laboratory Manual, Volume 1. CSH Laboratory Press, Cold Spring Harbor, NY	[Minimum generative time (years)? <1] " <i>A. majus</i> is amenable to classical genetics. It has a relatively short generation time of about 4 months, is diploid (2n = 16), and is easily self- and cross-pollinated"
701	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Possibly Yes] "Gutters, gravel paths and similar well-drained sites, especially in waste places near buildings" [Although lacking means of external attachment, small seed size could aid in dispersal through adherence to mud stuck on vehicles, footwear etc.]
701	2010. Bennallick, I.J.. Plant records for Cornwall up to September 2009. Botanical Cornwall. 14: 43-92.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Possibly Yes] "Casual, roadside" [Although lacking means of external attachment, small seed size could aid in dispersal through adherence to mud stuck on vehicles, footwear etc.]
702	1988. Thompson, D.M.. Systematics of Antirrhinum (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Propagules dispersed intentionally by people? Yes] "The Old World <i>A. majus</i> Linnaeus is the familiar garden snapdragon and a major cutflower crop."
702	2005. Staples, G.W./Herbst, D.R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Propagules dispersed intentionally by people? Yes] "In Hawaii, snapdragons are grown as winter annuals that thrive best where temperatures are cooler (i.e., at higher elevations on Maui and the Big Island.)"
703	2013. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? Unknown] Small seed size and prolific seed production could result in contamination of other potted plants
704	1988. Thompson, D.M.. Systematics of Antirrhinum (Scrophulariaceae) in the New World. Systematic Botany Monographs. 22: 1-142.	[Propagules adapted to wind dispersal? Yes] "The small seeds of Antirrhinum (0.6-1.3 mm long) and the poricidal fruits of most species of this genus obviously aid in their dispersal by wind." [Morphology of <i>A. majus</i> is similar]
705	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules water dispersed? Probably yes] "Seeds c. 1 mm long, oblong, dark, strongly rugose with irregular ridges." ... "Gutters, gravel paths and similar well-drained sites, especially in waste places near buildings, sometimes less modified sites such as coastal sand dunes, river banks and cliff faces." [Small seed size and distribution along river banks would aid in movement by water]

706	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules bird dispersed? No] "Capsule (8)-12-15 mm long, ovoid or ovoid-oblong, densely glandular-hairy. Seeds c. 1 mm long, oblong, dark, strongly rugose with irregular ridges."
707	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules dispersed by other animals (externally)? Possibly] "Capsule (8)-12-15 mm long, ovoid or ovoid-oblong, densely glandular-hairy. Seeds c. 1 mm long, oblong, dark, strongly rugose with irregular ridges." [Small seed size may aid in adherence to animal fur or mud on feet]
708	1988. Webb, C. J./Sykes, W.R./Garnock-Jones, P.J.. Flora of New Zealand, Volume IV: Naturalised pteridophytes, gymnosperms, dicotyledons. Botany Division, DSIR, Christchurch, New Zealand <a href="http://FloraSeries.LandcareResearch.co.nz">http://FloraSeries.LandcareResearch.co.nz</a>	[Propagules survive passage through the gut? Unlikely to be internally dispersed] "Capsule (8)-12-15 mm long, ovoid or ovoid-oblong, densely glandular-hairy. Seeds c. 1 mm long, oblong, dark, strongly rugose with irregular ridges."
801	2010. Moravcova, L./Pyšek, P./Jarošík, V./Havlíčková, V./Zákavský, P.. Reproductive characteristics of neophytes in the Czech Republic: traits of invasive and non-invasive species. <i>Preslia</i> . 82(4): 365-390.	[Prolific seed production (>1000/m2)? Yes] "Table 2. – Seed production and dispersal traits of alien neophytes in the Czech flora." ... "Antirrhinum majus - Population propagule number (per m2)"
802	1988. Thompson, D.M.. Systematics of Antirrhinum (Scrophulariaceae) in the New World. <i>Systematic Botany Monographs</i> . 22: 1-142.	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly Yes. Other species have long-lived seeds] "Seed longevity. The tendency of several of the New World species of Antirrhinum to appear suddenly in large numbers following chaparral fires in areas where they are otherwise rare or absent suggests that the seeds of these species are very long-lived. The successful germination of <i>A. ovatum</i> seeds purportedly over 35 years old from soil collected in its native habitat is remarkable, given the small size of the seeds and the severe summer heat and drought prevailing in its native range."
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly Yes. Orthodox seeds] "Storage Behaviour: Orthodox Storage Conditions: No loss in viability following 14 years storage at 40% r.h. and 4°C (Bass, 1980); seeds not damaged from exposure to liquid nitrogen (Stanwood & Bass, 1981); viability is halved after >6 years open storage (Priestley, 1986)"
803	1985. U.S. Department of the Interior Bureau of Land Management. Northwest Area Noxious Weed Control Program Environmental Impact Statement. Oregon State Office Bureau of Land Management, Portland, Oregon	[Well controlled by herbicides? Yes] "Appendix E Susceptibility of Common Weeds to Control by 2,4-D, Dicamba, Picloram, and Glyphosate Herbicides" [Snapdragon ( <i>Antirrhinum majus</i> ) - Glyphosate = Excellent (E)] Over 95 percent of the weed population is killed by a single treatment. Plant is highly susceptible to the chemical.]
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

## **Summary of Risk Traits**

### **High Risk / Undesirable Traits**

- Widely naturalized
- An agricultural weed
- Related Papaver species have become invasive
- Unpalatable
- Toxic to cattle and other animals if consumed in large quantities
- Potentially toxic to people
- Tolerates many soil types
- Can form dense monocultures
- Annual plant that reaches maturity in 1 growing season
- Prolific seeder
- Seeds dispersed by animals, people, as a contaminant
- Produces a persistent seed bank

### **Low Risk Traits**

- Grows in temperate climates
- Requires full sun
- Ornamental and culinary uses
- Self-incompatible
- Does not spread vegetatively
- Certain herbicides may provide effective control