

**Taxon:** *Odontonema callistachyum* (Schltdl. & Cham.) Kuntze

**Family:** Acanthaceae

**Common Name(s):** firespike  
purple firespike

**Synonym(s):** *Justicia callistachya* Schltdl. & Cham.

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 22 Jun 2022

**WRA Score:** 8.0

**Designation:** H(HPWRA)

**Rating:** High Risk

**Keywords:** Perennial Herb/Shrub, Naturalized, Ornamental, Shade Tolerant, Explosive Dispersal

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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)	High
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	y
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)	n
304	Environmental weed		
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		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
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		
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		
604	Self-compatible or apomictic		
605	Requires specialist pollinators		
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal		
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m <sup>2</sup> )		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

**Supporting Data:**

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"Widespread and common in mostly moist forests of southern Mexico southward into Belize and Guatemala." [No evidence of domestication in genus]

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"Widespread and common in mostly moist forests of southern Mexico southward into Belize and Guatemala"

202	Quality of climate match data	High
	Source(s)	Notes
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"Widespread and common in mostly moist forests of southern Mexico southward into Belize and Guatemala"

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	The National Gardening Association. (2022). Purple Firespike ( <i>Thyrsacanthus callistachyus</i> ). <a href="https://garden.org/plants/view/117762/Purple-Firespike-Thyrsacanthus-callistachyus/">https://garden.org/plants/view/117762/Purple-Firespike-Thyrsacanthus-callistachyus/</a> . [Accessed 20 Jun 2022]	"Minimum cold hardiness: Zone 8a -12.2 °C (10 °F) to -9.4 °C (15 °F) Maximum recommended zone: Zone 11"
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. Contributions From the University of Michigan Herbarium, 20, 147-171	[Broad elevation range in tropical latitudes] "in lowland rain forests, montane rain forests, tropical deciduous forests, tropical subdeciduous forests, evergreen seasonal forests, mesophytic montane forests, mixed oak woodlands, and pine-oak forests; 40-2000 m"

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. Contributions From the University of Michigan Herbarium, 20, 147-171	"Distribution. Mexico (Chiapas, Guerrero, Hidalgo, Jalisco, Michoacan, Oaxaca, Puebla, Queretaro, San Luis Potosi, Tabasco, Veracruz; Fig. 6), Belize, and Guatemala; in lowland rain forests, montane rain forests, tropical deciduous forests, tropical subdeciduous forests, evergreen seasonal forests, mesophytic montane forests, mixed oak woodlands, and pine-oak forests; 40-2000 m"
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 20 Jun 2022]	"Native Northern America NORTHERN MEXICO: Mexico [San Luis Potosí] SOUTHERN MEXICO: Mexico [Chiapas, Guerrero, Hidalgo, Jalisco, Michoacán de Ocampo, Oaxaca, Puebla, Querétaro, Tabasco, Veracruz de Ignacio de la Llave] Southern America CENTRAL AMERICA: Belize, Guatemala, Honduras, Panama, El Salvador Cultivated (also cult.) Naturalized Southern America CARIBBEAN: Cuba, Dominican Republic"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Fosberg, F.R., Sachet, M.-H. & Oliver, R.L. (1993). Flora of Micronesia, 5: Bignoniaceae-Rubiaceae. Smithsonian Contributions to Botany 81: 1-135	"A variable species, native from Mexico to Panama and widely cultivated, usually under the name <i>Odontonema strictum</i> . The two seem almost indistinguishable, but <i>Justicia stricta</i> was described as having acute corolla lobes. The genus needs revision. Known in Micronesia only from Guam."
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>O. callistachyum</i> is native to Mexico and Central America and is now naturalized in Cuba and the Dominican Republic. In Florida it occurs only in cultivation (USDA-ARS, 2014)."

Qsn #	Question	Answer
301	<b>Naturalized beyond native range</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 20 Jun 2022]	"Naturalized Southern America CARIBBEAN: Cuba, Dominican Republic"
	Port St. Lucie Botanical Gardens. (2022). Firespike Pink or Lavender. <a href="https://www.pslbg.org/purple-firespike.html">https://www.pslbg.org/purple-firespike.html</a> . [Accessed 21 Jun 2022]	"Origin: South America (but has naturalized to Florida)."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence

302	<b>Garden/amenity/disturbance weed</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	[No evidence to date] "Within and outside its native distribution range, <i>O. callistachyum</i> is a shrub commonly planted as an ornamental for its attractive pinkish purple tubular flowers (USDA-ARS, 2014). Because the two closely related species <i>O. cuspidatum</i> and <i>O. tubaeforme</i> have both escaped from cultivation and become invasive on many islands in the Caribbean and the Pacific Ocean, <i>O. callistachyum</i> is listed as "potentially invasive" for Cuba and the Dominican Republic. Where invasive, <i>Odontonema</i> species are a serious problem to the conservation of native vegetation due to their ability to invade the understorey of native forests (Meyer and Lavergne, 2004; PIER, 2014)."

303	<b>Agricultural/forestry/horticultural weed</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	[No evidence] " <i>O. callistachyum</i> is listed as "potentially invasive" and consequently there is still no information available about ecological or economic impacts. However, the two closely related species <i>O. cuspidatum</i> and <i>O. tubaeforme</i> are highly invasive and aggressive species that can grow forming dense thickets in the understorey of secondary and relatively unaltered forests (Meyer and Lavergne 2004; PIER, 2014)."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[No evidence] "References: Pacific-W-3, El Salvador-N-1849, Global--1324."

304	<b>Environmental weed</b>	
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	[No evidence to date, but potential suspected based on impacts of congeners] "O. callistachyum is listed as "potentially invasive" and consequently there is still no information available about ecological or economic impacts. However, the two closely related species O. cuspidatum and O. tubaeforme are highly invasive and aggressive species that can grow forming dense thickets in the understorey of secondary and relatively unaltered forests (Meyer and Lavergne 2004; PIER, 2014). "

305	Congeneric weed	y
	Source(s)	Notes
	Space, J.C. & Flynn, T. (2002). Report to the Government of the Cook Islands on invasive plant species of environmental concern. USDA Forest Service, Honolulu, HI	" <i>Odontonema tubaeforme</i> (fire spike, cardinal flower) was seen to a limited extent in the wild on Rarotonga and Mangaia. This species is invasive at a number of locations in moist forests in Samoa. Although it primarily spreads by vegetative means, it is a problem species due to its ability to invade the understory. "
	Space, J.C. & Flynn, T. (2002). Report to the Government of Samoa on invasive plant species of environmental concern. USDA Forest Service, Honolulu, HI	" <i>Odontonema tubaeforme</i> (totoe, fire spike, cardinal flower) is invasive at a number of locations on both Upolu and Savai'i. It is a serious problem due to its ability to invade the understory. While it is present on a number of Pacific islands, the infestations seen in Samoa are the worst seen to date...invasive in a number of locations; control in sensitive and natural areas such as Vailima Reserve."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	O. cuspidatum, O. strictum, and O. callistachyum listed as naturalized or weeds, but taxonomic confusion makes differentiation of impacts between putative species difficult.

Qsn #	Question	Answer
401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Durkee, L. H. (1978). Flora of Panama. Part IX. Family 177. Acanthaceae. Annals of the Missouri Botanical Garden, 65(1), 155–283	[No evidence] "Suffrutescent herb to 2 m tall; stems subquadrangular, glabrous to puberulous. Leaves elliptic to elliptic ovate, 15-30 cm long and 4-12 cm wide, apically acuminate with the tip often curved to one side, basally attenuate, glabrous above, puberulous beneath along the midrib and the major costa, the cystoliths visible on both surfaces, more so above, the margins entire to crenulate; petioles wanting or to 1 cm long. Inflorescences in terminal thyrses to 30 cm long, the lateral peduncles to ca. 5 mm long, the flowers in fascicles, each fascicle subtended by a subulate, keeled, puberulous bract 2-3 mm long, the flowers mostly borne in dichasial cymes, each subtended by a similar, though slightly smaller, more triangular bract; rachises subtomentose to tomentose; pedicels 3-6 mm long, puberulous to tomentose. Flowers with the calyx 5-merous, the segments equal, subulate, keeled, puberulous, 2-3 mm long; corolla red, bilabiate, funnelform, often curved to one side, to 3.0 cm long, 5 mm wide at the throat and 2 mm wide at the base, the tube puberulous on both surfaces, the upper lip 6-7 mm long, 4.5 mm wide at the base, 2-lobed, the lobes ovate, 4.5 mm long, 2.5 mm wide, apically obtuse, the lower lip of 3 lobes, each 7-8 mm long, 2 mm wide, apically obtuse; stamens extending to or just beyond the notch of the upper lip, the filaments villous, the staminodes to 3.5 mm long, the apex slightly enlarged, curved and apiculate, the sterile anthers puberulous, the filaments glabrous. Capsule not observed."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Durkee, L. H. (1978). Flora of Panama. Part IX. Family 177. Acanthaceae. Annals of the Missouri Botanical Garden, 65(1), 155–283	"Suffrutescent herb to 2 m tall; stems subquadrangular, glabrous to puberulous." [Acanthaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Floridata, (2022). #214 <i>Odontonema strictum</i> . <a href="https://floridata.com/plant/214">https://floridata.com/plant/214</a> . [Accessed 22 Jun 2022]	[Possibly no. Related species, <i>Odontonema strictum</i> , browsed by deer] "Unfortunately, white-tailed deer love firespike too, and will eat the leaves. Defoliated plants will grow new leaves, but if the deer persist, the plant eventually will be killed."

405	Toxic to animals	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence in genus
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence in genus

406	Host for recognized pests and pathogens	n
	<b>Source(s)</b>	<b>Notes</b>
	Plant Lust. (2022). <i>Odontonema callistachyum</i> . <a href="https://plantlust.com/plants/35987/odontonema-callistachyum/">https://plantlust.com/plants/35987/odontonema-callistachyum/</a> . [Accessed 21 Jun 2022]	"Firespike is a shade tolerant species bothered by few pests or diseases and is quite adaptable to soil types but prefers regular moisture and average fertility."
	Port St. Lucie Botanical Gardens. (2022). Firespike Pink or Lavender. <a href="https://www.pslbg.org/purple-firespike.html">https://www.pslbg.org/purple-firespike.html</a> . [Accessed 21 Jun 2022]	"Pests/Diseases: No pests or diseases of major concern. Occasional mealy bug infestations."

407	Causes allergies or is otherwise toxic to humans	n
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence in genus
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence in genus

408	Creates a fire hazard in natural ecosystems	
	<b>Source(s)</b>	<b>Notes</b>
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. Contributions From the University of Michigan Herbarium, 20, 147-171	[Unknown, but probably not. No indication that this plant occurs in fire prone habitats or increases fire risk] "in lowland rain forests, montane rain forests, tropical deciduous forests, tropical subdeciduous forests, evergreen seasonal forests, mesophytic montane forests, mixed oak woodlands, and pine-oak forests; 40-2000 m"

409	Is a shade tolerant plant at some stage of its life cycle	y
	<b>Source(s)</b>	<b>Notes</b>
	Plant Lust. (2022). <i>Odontonema callistachyum</i> . <a href="https://plantlust.com/plants/35987/odontonema-callistachyum/">https://plantlust.com/plants/35987/odontonema-callistachyum/</a> . [Accessed 21 Jun 2022]	"Firespike is a shade tolerant species bothered by few pests or diseases and is quite adaptable to soil types but prefers regular moisture and average fertility."
	AgriLife Extension. (2011). Creating the Tropical Look: Low-care tropicals for the Upper Gulf Coast of Texas. AgriLife Extension Texas A&M System Galveston County Office, Dickinson, Texas	"Firespike is one of the best blooming plants for shady areas."



Qsn #	Question	Answer
	Dave's Garden. (2022). Thysacanthus Species, Firespike, Purple Firespike, Purple Flame - Thysacanthus callistachyus. <a href="https://davesgarden.com/guides/pf/go/62195/">https://davesgarden.com/guides/pf/go/62195/</a> . [Accessed 21 Jun 2022]	"Sun Exposure: Sun to Partial Shade Light Shade Partial to Full Shade"
	The National Gardening Association. (2022). Purple Firespike (Thysacanthus callistachyus). <a href="https://garden.org/plants/view/117762/Purple-Firespike-Thysacanthus-callistachyus/">https://garden.org/plants/view/117762/Purple-Firespike-Thysacanthus-callistachyus/</a> . [Accessed 21 Jun 2022]	"Sun Requirements: Full Sun to Partial Shade Partial or Dappled Shade"
	Andrle, R. F. (1964). A biogeographical investigation of the Sierra de Tuxtla in Veracruz, Mexico. PhD Dissertation. Louisiana State University, Baton Rouge, LA	[An understory plant, suggesting shade tolerance] "A common understory plant at the summit of Cerro Tuxtla was the red-flowered <i>Odontonema can i stachyum</i> S.&C. Kuntze, which averaged about two meters in height; I did not observe it so numerous elsewhere."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Plant Lust. (2022). <i>Odontonema callistachyum</i> . <a href="https://plantlust.com/plants/35987/odontonema-callistachyum/">https://plantlust.com/plants/35987/odontonema-callistachyum/</a> . [Accessed 22 Jun 2022]	"Firespike is a shade tolerant species bothered by few pests or diseases and is quite adaptable to soil types but prefers regular moisture and average fertility."
	AgriLife Extension. (2011). Creating the Tropical Look: Low-care tropicals for the Upper Gulf Coast of Texas. AgriLife Extension Texas A&M System Galveston County Office, Dickinson, Texas	"It can be grown in heavy clay soils and wet conditions."
	Gardening Chores. (2022). 25 Shade-Loving Perennial Flowers That Grow In Full Or Partial Shade. <a href="https://www.gardeningchores.com/perennials-for-shade/">https://www.gardeningchores.com/perennials-for-shade/</a> . [Accessed 22 Jun 2022]	[ <i>Odontonema callistachyum</i> ] "Soil: it will grow well in most types of soil, especially if fertile with a pH from acidic to neutral, as long as always moist and well drained."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Durkee, L. H. (1978). Flora of Panama. Part IX. Family 177. Acanthaceae. <i>Annals of the Missouri Botanical Garden</i> , 65(1), 155–283	"Suffrutescent herb to 2 m tall; stems subquadrangular, glabrous to puberulous."

412	Forms dense thickets	
	Source(s)	Notes
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. <i>Contributions From the University of Michigan Herbarium</i> , 20, 147-171	"in lowland rain forests, montane rain forests, tropical deciduous forests, tropical subdeciduous forests, evergreen seasonal forests, mesophytic montane forests, mixed oak woodlands, and pine-oak forests; 40-2000 m" [Not reported from native range]
	Woodson, R. E., Schery, R. W., & Durkee, L. H. (1978). Flora of Panama. Part IX. Family 177. Acanthaceae. <i>Annals of the Missouri Botanical Garden</i> , 65(1), 155–283	"This species is found in rain forests at lower elevations of Mexico and Central America." [Densities not reported]

Qsn #	Question	Answer
	Munn-Estrada, D. X. (2017). Contribution to the Floristic Knowledge of the Sierra Mazateca of Oaxaca, Mexico. <i>Lundellia</i> , 20(1), 25-59	[No evidence. <i>Odontonema callistachyum</i> reported in the region, but the only dense stands reported in this publication are stands of oak trees] "An interesting and quite particular aspect of the areas near the community of San Pedro de los Encinos is the presence of dense stands of oaks—5–7 m tall—with very narrow trunks."
	CABI. (2022). <i>Invasive Species Compendium</i> . Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	No evidence

501	Aquatic	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Durkee, L. H. (1978). Flora of Panama. Part IX. Family 177. Acanthaceae. <i>Annals of the Missouri Botanical Garden</i> , 65(1), 155–283	[Terrestrial] "This species is found in rain forests at lower elevations of Mexico and Central America."

502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). <i>Germplasm Resources Information Network (GRIN-Taxonomy)</i> . National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 20 Jun 2022]	"Family: Acanthaceae Subfamily: Acanthoideae Tribe: Justicieae"

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2022). <i>Germplasm Resources Information Network (GRIN-Taxonomy)</i> . National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 20 Jun 2022]	"Family: Acanthaceae Subfamily: Acanthoideae Tribe: Justicieae"

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"Plants suffruticose to fruticose, 1--4.5 m tall; stems subquadrangular, mostly glabrous in older portions, puberulent on the younger portions; leaves narrowly to broadly elliptic, the blade 10--35.5 cm long, 4--12 cm wide,"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"Widespread and common in mostly moist forests of southern Mexico southward into Belize and Guatemala."

Qsn #	Question	Answer
602	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Baum, V. M. (1982). A revision of the genus <i>Odontonema</i> (Acanthaceae). Master of Science Thesis. University of Maryland, College Park, MD	"capsules clavate, 2--2.5 cm long, 2--3 mm broad, 4 mm thick, glabrous, 4-seeded."
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>O. callistachyum</i> spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010). "
	Dave's Garden. (2022). <i>Thyrsacanthus</i> Species, Firespike, Purple Firespike, Purple Flame - <i>Thyrsacanthus callistachyus</i> . <a href="https://davesgarden.com/guides/pf/go/62195/">https://davesgarden.com/guides/pf/go/62195/</a> . [Accessed 21 Jun 2022]	"Propagation Methods: From softwood cuttings From seed; direct sow after last frost"
	Port St. Lucie Botanical Gardens. (2022). Firespike Pink or Lavender. <a href="https://www.pslbg.org/purple-firespike.html">https://www.pslbg.org/purple-firespike.html</a> . [Accessed 21 Jun 2022]	"Propagation: Easy to propagate from softwood stem cuttings or by seed."

603	Hybridizes naturally	
	Source(s)	Notes
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. <i>Contributions From the University of Michigan Herbarium</i> , 20, 147-171	[Possibly Yes] "Species sometimes occur in close proximity to one another, and the possibility of hybridization exists. The ranges of several species in the <i>O. callistachyum</i> complex (including <i>O. callistachyum</i> , <i>O. cuspidatum</i> , and <i>O. tubaeforme</i> ) overlap in southern Mexico and northern Central America. Some of the rare and unusual forms noted above of otherwise consistent species may represent hybrids."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Kress, W. J., & Beach, J. H. (1994). Flowering plant reproductive systems. Pp. 161-170 in McDade, L.A. et al. (eds.). <i>La Selva: Ecology and Natural History of a Neotropical Rain Forest</i> . The University of Chicago Press, Chicago	"Appendix 12.1 Checklist of the reproductive biology of the flowering plants of La Seva" [Unknown. <i>Odontonema callistachyum</i> listed as having a hermaphroditic sexual system, but does not specify type of Breeding System, or Self-Compatibility]

Qsn #	Question	Answer
605	<b>Requires specialist pollinators</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. Contributions From the University of Michigan Herbarium, 20, 147-171	"Flowers of Mexican species in the <i>O. callistachyum</i> complex all appear to be adapted for pollination by hummingbirds. Corollas are brightly colored, have a well-developed tube with an open throat, lack nectar guides and detectable fragrances, and possess ample quantities of nectar." [Although adapted for hummingbirds, it is also reported to attract bees and butterflies. The efficacy of these insects as pollinators is unknown]
	AgriLife Extension. (2011). Creating the Tropical Look: Low-care tropicals for the Upper Gulf Coast of Texas. AgriLife Extension Texas A&M System Galveston County Office, Dickinson, Texas	"Its brilliant spikes of deep red, fuchsia violet and purple are cherished by hummingbirds, bees and butterflies."
606	<b>Reproduction by vegetative fragmentation</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>O. callistachyum</i> spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)."
607	<b>Minimum generative time (years)</b>	<b>2</b>
	<b>Source(s)</b>	<b>Notes</b>
	Dave's Garden. (2022). <i>Thyrsacanthus</i> Species, Firespike, Purple Firespike, Purple Flame - <i>Thyrsacanthus callistachyus</i> . <a href="https://davesgarden.com/guides/pf/go/62195/">https://davesgarden.com/guides/pf/go/62195/</a> . [Accessed 21 Jun 2022]	"On Dec 8, 2013, vossner from East Texas, United States (Zone 8a) wrote: P)planted [sic] in bright shade in my garden. After 2 years, it has yet to bloom."
701	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>O. callistachyum</i> spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)." [Possibly as dumped garden waste, or in seeds attached to footwear, vehicle or equipment in soil, but direct evidence is lacking]
702	<b>Propagules dispersed intentionally by people</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	"Because <i>O. callistachyum</i> is still commercialized as an ornamental, the risk of introduction into new habitats is moderate to high."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Ornamental Dispersed by: Humans"
703	<b>Propagules likely to disperse as a produce contaminant</b>	<b>n</b>

Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"O. callistachyum spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)." [No evidence of produce contamination]

704	Propagules adapted to wind dispersal	
	<b>Source(s)</b>	<b>Notes</b>
	Hernández-Dávila, O., Laborde, J., Sosa, V. J., Gallardo-Hernández, C., & Díaz-Castelazo, C. (2020). Forested riparian belts as reservoirs of plant species in fragmented landscapes of tropical mountain cloud forest. <i>Botanical Sciences</i> , 98(2), 288-304	[Not specifically adapted for wind dispersal, but wind may facilitate movement of explosively dehisced seeds] "Table S2 Taxonomy of species plants recorded in 14 forested riparian belts sampled in central Veracruz State, Mexico. Life form (h= herb, Fe = Fern, P = Palm, Sr = Shrub, E = Epiphyte, T = Tree). Dispersal mode (W = Wind, A = Animal, Gr = Gravity, Ex = Explosion, U = Unknown)." [Odontonema callistachyum (Schltdl. & Cham.) Kuntze - Dispersal mode = Ex = Explosion]

705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"O. callistachyum spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)." [Pathway Vectors include Water moving Seeds and stem fragments]
	Hernández-Dávila, O., Laborde, J., Sosa, V. J., Gallardo-Hernández, C., & Díaz-Castelazo, C. (2020). Forested riparian belts as reservoirs of plant species in fragmented landscapes of tropical mountain cloud forest. <i>Botanical Sciences</i> , 98(2), 288-304	"Table 1 Abundance, basal area (m2) and frequency (n = 84 transects) for all species sampled in 14 segments of forested riparian belts, showing their respective Importance Value Index (I.V.I)." [Odontonema callistachyum occurs in riparian belts. Its seeds, which are explosively dispersed, may be secondarily moved by water in riparian habitats]

706	Propagules bird dispersed	n
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"O. callistachyum spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)."
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. <i>Contributions From the University of Michigan Herbarium</i> , 20, 147-171	[Not fleshy-fruited] "Capsule (10.5-) 15-23 mm long, glabrous, stipe (4-) 6-11 mm long, head (6.5-) 8.5-13 mm long. Seeds subcordate in outline, 3-5 mm long, 2.6-3.3 mm wide, surface rugose (not tuberculate)."

707	Propagules dispersed by other animals (externally)	n
	<b>Source(s)</b>	<b>Notes</b>
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc	"O. callistachyum spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)."

Qsn #	Question	Answer
708	Propagules survive passage through the gut	n
	Source(s)	Notes
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	" <i>O. callistachyum</i> spreads by seeds and vegetatively by stem segments or root-suckers. Seeds are produced in capsules that fall off before drying, liberating the seeds (Daniel, 1995; 2010)." [No evidence of ingestion]

801	Prolific seed production (>1000/m <sup>2</sup> )	
	Source(s)	Notes
	Daniel, T. F. (1995). Revision of <i>Odontonema</i> (Acanthaceae) in Mexico. Contributions From the University of Michigan Herbarium, 20, 147-171	[Numbers unknown. Possibly no, if pollinator limited] "Capsule (10.5 -) 15-23 mm long, glabrous, stipe (4-) 6-11 mm long, head (6.5-) 8.5-13 mm long. Seeds subcordate in outline, 3-5 mm long, 2.6-3.3 mm wide, surface rugose (not tuberculate)."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown, although seeds may be rarely produced in Hawaiian Islands or other island ecosystems lacking appropriate pollinators

803	Well controlled by herbicides	
	Source(s)	Notes
	CABI. (2022). Invasive Species Compendium. Wallingford, UK: CAB International. <a href="http://www.cabi.org/isc">www.cabi.org/isc</a>	"There is no information available about prevention or control strategies for this species."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	AgriLife Extension. (2011). Creating the Tropical Look: Low-care tropicals for the Upper Gulf Coast of Texas. AgriLife Extension Texas A&M System Galveston County Office, Dickinson, Texas	"If it freezes, it will re-sprout in the spring."
	Grower Jim. (2013). Friday, February 8. <i>Odontonema callistachyum</i> (purple firespike). <a href="https://growerjim.blogspot.com/2013/02/odontonema-callistachyum-purple.html">https://growerjim.blogspot.com/2013/02/odontonema-callistachyum-purple.html</a> . [Accessed 22 Jun 2022]	[Possibly. Tolerates regular pruning] "The plant grows up to 8 feet tall and wide but can be kept pruned to about half that size. The growth habit is somewhat sprawling, so a little trimming back is usually required anyway. Pruning also forces additional branching and therefore more flowers. I usually do a final pruning in late summer so that new growth has a chance to mature before the initiation of flower spikes."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Broad elevation range in tropical climates
- Thrives and can spread in regions with tropical climates
- Reported to be naturalized in Cuba, Dominican Republic, and Florida, but no evidence in the Hawaiian Islands to date
- Other biologically and ecologically similar *Odontonema* species are invasive weeds
- Shade tolerant
- Tolerates many soil types
- Reproduces by seeds and vegetatively by stem segments or root-suckers
- Seeds dispersed explosively from dehiscent pods, possibly through water and aided by wind, and through intentional cultivation
- Vegetative fragments may also be spread in dumped garden waste, or water
- May be able to resprout after cutting or damage

Low Risk Traits

- No negative impacts documented for this species to date
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Adapted for hummingbird pollination. Other pollinators may be less effective, resulting in reduced seed set in areas lacking hummingbirds
- Reduced seed set in cultivation may reduce risk of escape or accidental dispersal