Taxon: Lobelia xalapensis Kunth

Family: Campanulaceae

Common Name(s): barba de guajolote
hierba loca
pizigual

Synonym(s): Dortmannia xalapensis (Kunth) Kuntze
Lobelia monticola Kunth
Lobelia palmaris Willd. ex Schult.
Rapuntium affine C. Presl

Assessor: Chuck Chimera **Status:** Approved **End Date:** 1 Mar 2024

WRA Score: 11.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Annual Herb, Naturalized (Oahu), Weedy, Self-Compatible, Nursery Contaminant

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	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n = question 205	y
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	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		
406	Host for recognized pests and pathogens	y = 1, n = 0	y
407	Causes allergies or is otherwise toxic to humans		
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	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
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		
604	Self-compatible or apomictic	y = 1, n = -1	y
605	Requires specialist pollinators	y = -1, n = 0	n
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	y
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	y
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
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)		
708	Propagules survive passage through the gut	y = 1, n = -1	n
801	Prolific seed production (>1000/m2)		
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
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[A wild plant with no evidence of domestication] "In forests, along streams and trails, and rarely in open areas, central Mexico to Peru and Argentina."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2024). 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
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	"In forests, along streams and trails, and rarely in open areas, central Mexico to Peru and Argentina."
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."

202	Quality of climate match data	High
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Tropicos.org. (2024). Tropicos v3.4.2. Missouri Botanical Garden. http://www.tropicos.org/. [Accessed 28 Feb 2024]	Collected over an elevation range of 5 - 20 m to 3035 m elevation, and over a broad latitudinal range (06°52'S - 21°05'S and 00°53'N - 20°26'N) demonstrating environmental versatility

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes

Qsn #	Question	Answer
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	"Landscaping, where it was common growing in both pots and from the ground in the nursery. It was identified as Lobelia xalapensis by Tina Ayers (ASC). This species is native to Central and South America and is the first time it has been reported outside of its native range. Given that it was found in a nursery, it is almost certain this species was introduced as a contaminant in soil of nursery stock. In its native range, L. xalapensis has also been described as weedy (Senterre & Castillo-Campos 2008) or a weed in agriculture (De Egea et al. 2016), and inhabits riverbanks, forest edges, rocky slopes, and open moist places (Daly et al. 2006)." ... "Material examined. KAUA'I: Kauai Nursery & Landscaping off of Kaumuali'i Hwy just W of Puhi, weed around garden center area, seen growing in both pots of plants for sale as well as from the ground, common, hundreds of plants seen, small annual, 101 m, 21.962828, -159.405831, 08 Jul 2022, K. Faccenda & S. Vanapruks 2517."
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	**Notes**
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[No evidence] "A strange, annual, weedy Lobelia was found growing as a weed at Kauai Nursery & Landscaping, where it was common growing in both pots and from the ground in the nursery. It was identified as Lobelia xalapensis by Tina Ayers (ASC). This species is native to Central and South America and is the first time it has been reported outside of its native range. Given that it was found in a nursery, it is almost certain this species was introduced as a contaminant in soil of nursery stock."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Kauai] "Lobelia xalapensis Kunth New state record A strange, annual, weedy Lobelia was found growing as a weed at Kauai Nursery & Landscaping, where it was common growing in both pots and from the ground in the nursery. It was identified as Lobelia xalapensis by Tina Ayers (ASC). This species is native to Central and South America and is the first time it has been reported outside of its native range. Given that it was found in a nursery, it is almost certain this species was introduced as a contaminant in soil of nursery stock. In its native range, L. xalapensis has also been described as weedy (Senterre & Castillo-Campos 2008) or a weed in agriculture (De Egea et al. 2016), and inhabits riverbanks, forest edges, rocky slopes, and open moist places (Daly et al. 2006)."

302	Garden/amenity/disturbance weed	
	Source(s)	**Notes**
	Senterre, B. & Castillo-Campos, G. (2009). Campanulaceae. Flora de Veracruz. Fascículo 149. Instituto de Ecología A. C. Xalapa, Veracruz, México	[Common on roadsides and in the gardens] "Tipos de vegetación. Bosque de pino; bosque de pino-encino; bosque mesófilo de montaña; selva alta perennifolia; selva mediana subcaducifolia; pastizal; cultivos; común en los bordes de carretera y en los jardines."

Qsn #	Question	Answer
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	[Described as a weedy species of unspecified impacts] "Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Nursery weed] "weed around garden center area, seen growing in both pots of plants for sale as well as from the ground, common, hundreds of plants seen"

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Could potentially affect nursery production or incur control costs] "A strange, annual, weedy Lobelia was found growing as a weed at Kauai Nursery & Landscaping, where it was common growing in both pots and from the ground in the nursery."
	De Egea, J., Mereles, F., del Carmen Pena-Chocarro, M., & Céspedes, G. (2016). Checklist for the crop weeds of Paraguay. PhytoKeys, 73: 13-92	[Possibly. Includes Lobelia xalapensis, but no impacts to crop yield or production are described] "Paraguay, a country whose economy is based mainly on agriculture and livestock for export, has experienced a major expansion in mechanized crops during the last few decades. Despite being heavily dependent on agriculture, Paraguay has very limited research on crop weeds, in spite of these having a high economic impact on production. Th is work aims to update and enhance the knowledgebase on the most common weeds aff ecting productive fi elds throughout the diff erent ecoregions of Paraguay. We present here the fi rst checklist of crop weeds for the country, which includes a total of 256 taxa (189 species, 10 subspecies, 54 varieties and 3 forms), with the most species-rich families being Poaceae and Asteraceae followed by Malvaceae, Amaranthaceae, Fabaceae and Solanaceae. Th e list includes three new records for the country. Synonyms, distribution details within Paraguay, habit and a voucher specimen are provided for each taxon."

304	Environmental weed	
	Source(s)	**Notes**
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	"This species is native to Central and South America and is the first time it has been reported outside of its native range."

Qsn #	Question	Answer
305	Congeneric weed	y
	Source(s)	**Notes**
	Baskin, J. M., & Baskin, C. C. (1992). Role of temperature and light in the germination ecology of buried seeds of weedy species of disturbed forests. I. Lobelia inflata. Canadian Journal of Botany, 70(3), 589-592	"Lobelia inflata L. is a weedy species that may be abundant in disturbed forest sites."
	Stepp, J. R. (2004). The role of weeds as sources of pharmaceuticals. Journal of Ethnopharmacology, 92(2-3), 163-166	"Lobelia inflata L. is a weedy species that may be abundant in disturbed forest sites."
	Webster, T. M., Cardina, J., & White, A. D. (2003). Weed seed rain, soil seedbanks, and seedling recruitment in no-tillage crop rotations. Weed Science, 51(4), 569-575	"Table 1. Weed species occurrence in fall seed rain, spring soil seedbanks, and seedling recruitment in each site-year." [Includes Indiantobacco - Lobelia inflata]
	Gargiullo, M.B. (2007). A Guide to Native Plants of the New York City Region. New York City Department of Parks and Recreation, New York, NY	[Lobelia inflata regarded as a weed] "Open woodlands, edges, sometimes a garden weed."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Numerous Lobelia species listed as naturalized and/or weeds

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Erect annual herbs (5-) 1040(-60) cm tall; stems usually sparsely chaff-ypubescent below; roots fibrous. Principal leaves with blades usually slightly longer than broad, ovate, marginally sinuate as well as coarsely toothed, mostly 1-3(-5.5) cm long, 0.5-2(4.5) cm wide, apically acute, basally rounded to cordate; petioles 0.5-3 cm long, chaffy-pubescent. Inflorescences not secund, often coiymbose when young, few- to 40-flowered, pedunculate; pedicels slender, mostly 10-15 mm long at maturity, minutely but densely prickly puberulent, basally bibracteolate with knoblike bracteoles 0.1-0.2 mm long; bracts usually linear to filiform, 2-12 mm long. Flowers 4-6(-7) min long; hypanthium pricklypubelulent but becoming glabrate especially in fruit, shallowly cupuliform in anthesis, 0.8-1.2 mm high; calyx lobes linear-subulate, entire, 2 4 mm long, glabrous or marginally ciliate; corolla pale blue to violet varying to white or even purplish, the tube externally glabrous, internally sparingly pubescent, ca. 2.5 mm long, dorsally slit to approximately 1mm from the base but not fenestrate, the 2 upper lobes erect, ca. 1.5 mm long, the 3 lower lobes rounded and coalesced into a lip 1.5-2 mm long; filament tube 2-2.5 mm long, glabrate, connate for about the upper third, the anther tube 0.5-1 mm long, gray, the 3 longer anthers either glabrous or bristly short-pubescent near the apex, the 2 shorter anthers with a thin fringe of apical bristles ca. 0.1 mm long, otherwise either glabrous or sparingly to moderately short-pubescent. Capsules % inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 min long."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown. No evidence found

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Erect annual herbs (5-) 10-40(-60) cm tall" [No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown. Another species, Lobelia inflata, is reported to have acrid foliage that is highly toxic and avoided by mammalian herbivores, including White Tailed Deer.

405	Toxic to animals	
	Source(s)	Notes
	Nelson, L., Shih, R.D. & Balick, M.J. (2007). Handbook of Poisonous and Injurious Plants, The New York Botanical Garden. Springer, New York, NY	[Unknown for Lobelia xalapensis. Members of the genus are reported to be toxic] "The lobelias are annual weeds in most of the United States, and some (e.g., Lobelia cardinalis) are widely cultivated. Lobelia inflata is cultivated as a pharmaceutical plant. Lobelia cardinalis grows in damp areas (shores, meadows, and swamps) in Minnesota east to Michigan, north to Ontario, east to New Brunswick, south to eastern Texas, and east to Florida. Lobelia inflata grows by roadsides and in open woods in New Brunswick and Nova Scotia, west to Ontario, and south to Kansas, Arkansas, and Georgia. Lobelia siphilitica occurs in rich moist woods and swamps in southwest Manitoba, east of Ontario, south to Texas and Louisiana, and from Maine south to North Carolina. Toxic Part: The whole plant is poisonous. Toxin: Lobeline and related nicotine-like alkaloids."

406	Host for recognized pests and pathogens	y
	Source(s)	Notes
	Romo, J. P., Osorio, J. G. M., & Yepes, M. S. (2012). Identification of new hosts for Ralstonia solanacearum (Smith) race 2 from Colombia. Revista de Protección Vegetal 27(3): 151-161	[Identified as a host of the plant pathogenic bacterium Ralstonia solanacearum] "Ralstonia solanacearum Smith induces the Moko disease on banana, plantain and heliconia flowers. The objectives of this work were: I) to identify R. solanacearum hosts in weeds or cultivated hosts and II) to determine its pathogenicity on the susceptible host plantain cv. Dominico-Hartón. A survey in search of natural hosts of R. solanacearum race 2 was performed in selected Colombian regions. Sixty bacterial colonies showing R. solanacearum characteristics in a semi-selective medium were used in further pathogenicity tests in the susceptible plantain plants. Twenty six isolates induced Moko disease symptoms in plantain during the 60 days of evaluation. Twelve new hosts were found for R. solanacearum at the worldwide level: nine of them were weeds (Euphorbia graminea Jacq., Blechum piramidatum Lam., Oxalis latifolia Kunth, Cuphea micrantha Kunth, Eleusine indica L., Gliricidia sepium Kunth ex Steud., Lobelalia xalapensis Kunth, Stachys lamioides Benth., Salvia aff. lasiocephala Hook. & Arn.) and three cultivated crops (Colocasia esculenta L., Cucurbita maxima Duchesne and Psidium guajava L.). The presence of R. solanacearum race 2 in weeds and cultivated crops should be managed as an important component of an integrated Moko disease control program."

407	Causes allergies or is otherwise toxic to humans	

Qsn #	Question	Answer
	Source(s)	Notes
	Nelson, L., Shih, R.D. & Balick, M.J. (2007). Handbook of Poisonous and Injurious Plants, The New York Botanical Garden. Springer, New York, NY	[Unknown for Lobelia xalapensis. Members of the genus are reported to be toxic] "The lobelias are annual weeds in most of the United States, and some (e.g., Lobelia cardinalis) are widely cultivated. Lobelia inflata is cultivated as a pharmaceutical plant. Lobelia cardinalis grows in damp areas (shores, meadows, and swamps) in Minnesota east to Michigan, north to Ontario, east to New Brunswick, south to eastern Texas, and east to Florida. Lobelia inflata grows by roadsides and in open woods in New Brunswick and Nova Scotia, west to Ontario, and south to Kansas, Arkansas, and Georgia. Lobelia siphilitica occurs in rich moist woods and swamps in southwest Manitoba, east of Ontario, south to Texas and Louisiana, and from Maine south to North Carolina. Toxic Part: The whole plant is poisonous. Toxin: Lobeline and related nicotine-like alkaloids."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[No evidence, and unlikely given habit, and habitat] "Erect, moderately to profusely branched annual herb 1-5 dm tall" ... "In forests, along streams and trails, and rarely in open areas"

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Daly, D. C., Costa, D. P., & Melo, A. W. F. (2006). The salao vegetation of Southwestern Amazonia. Biodiversity and Conservation, 15(9), 2905-2923	"Lobelia xalapensis H.B.K. - Mexico S to Paraguay (but apparently patchily distributed in N South America); usually shaded on river beaches, in forest edges in sandy soils, forests on rocky slopes, moist open places."
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[Forest habitat, and rare occurrence in open areas suggests plant is shade tolerant] "In forests, along streams and trails, and rarely in open areas"
	Smithsonian Institution. (2024). Lobelia xalapensis Kunth [digitized herbarium specimen]. https://collections.si.edu/search/detail/edanmdm:nmnhbotany_13828546. [Accessed 1 Mar 2024]	[Specimen details from Costa Rica] "Shaded bank, Camino de Hatillo, near San José, San José, Costa Rica, Central America - Neotropics"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Selina Wamucii. (2024). Lobelia xalapensis - Uses, Benefits & Care. https://www.selinawamucii.com/plants/campanulaceae/lobelia-xalapensis/. [Accessed 1 Mar 2024]	"It grows in moist, sandy soils in open woods, meadows, and roadsides."
	Daly, D. C., Costa, D. P., & Melo, A. W. F. (2006). The salao vegetation of Southwestern Amazonia. Biodiversity and Conservation, 15(9), 2905-2923	"Lobelia xalapensis H.B.K. - Mexico S to Paraguay (but apparently patchily distributed in N South America); usually shaded on river beaches, in forest edges in sandy soils, forests on rocky slopes, moist open places."
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	[Unknown. Probably not substrate limited] "Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."

411	Climbing or smothering growth habit	n

Qsn #	Question	Answer
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Erect annual herbs (5-) 10-40(-60) cm tall"

412	Forms dense thickets	n
	Source(s)	Notes
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	"In forests, along streams and trails, and rarely in open areas" [No evidence]
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Grows in large numbers, but an annual not documented to form dense stands] "weed around garden center area, seen growing in both pots of plants for sale as well as from the ground, common, hundreds of plants seen, small annual"
	Rojas Chavarría, K., & Ramírez Muñoz, F. (2013). Plantas arvenses asociadas al cultivo de aguacate de altura en la Zona de Los Santos. Universidad Nacional, Heredia, Costa Rica	No evidence

501	Aquatic	n
	Source(s)	Notes
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[Terrestrial, but occurs in proximity to riparian areas] "In forests, along streams and trails, and rarely in open areas"

502	Grass	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	Campanulaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	Campanulaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Erect annual herbs (5-) 10-40(-60) cm tall; stems usually sparsely chaffy-pubescent below; roots fibrous."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes

Qsn #	Question	Answer
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Lobelia xalapensis is a widespread weedy species ranging from Vera Cruz to Oaxaca and thence throughout Central and South America into northern Argentina; it is also known from the Lesser Antilles and the Galapagos Islands."

602	Produces viable seed	y
	Source(s)	**Notes**
	Selina Wamucii. (2024). Lobelia xalapensis - Uses, Benefits & Care. https://www.selinawamucii.com/plants/campanulaceae/lobelia-xalapensis/. [Accessed 1 Mar 2024]	"Propagation is by seed or cuttings."
	Rojas Chavarría, K., & Ramírez Muñoz, F. (2013). Plantas arvenses asociadas al cultivo de aguacate de altura en la Zona de Los Santos. Universidad Nacional, Heredia, Costa Rica	"Se reproduce por semilla." [It reproduces by seed.]
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Presumed seed contaminant in nursery materials] "weed around garden center area, seen growing in both pots of plants for sale as well as from the ground, common, hundreds of plants seen, small annual,"
	McMullen, C. K. (1987). Breeding systems of selected Galapagos Islands angiosperms. American Journal of Botany, 74(11): 1694-1705	[Produces seeds through selfing] "TABLE I. Bagging experiment results. Plant data include resident status, vegetation zone where tests were performed, and test dates. Fr = fruit, Fl = flower, SC = self compatible, I = inconclusive, D = dioecious" [Lobelia xalapensis - Breeding Strategy = SC = self compatible]

603	Hybridizes naturally	
	Source(s)	**Notes**
	WRA Specialist. (2024). Personal Communication	Unknown. Hybridization documented in genus

604	Self-compatible or apomictic	y
	Source(s)	**Notes**
	Chamorro, S., Heleno, R., Olesen, J. M., McMullen, C. K., & Traveset, A. (2012). Pollination patterns and plant breeding systems in the Galápagos: a review. Annals of Botany, 110: 1489-1501	"TABLE 1. Compilation of known information regarding the breeding systems of the Galapagos vascular flora" [Lobelia xalapensis - Autonomously self-pollinates = Yes; Self-compatible = Yes]
	McMullen, C. K. (1987). Breeding systems of selected Galapagos Islands angiosperms. American Journal of Botany, 74(11): 1694-1705	"TABLE I. Bagging experiment results. Plant data include resident status, vegetation zone where tests were performed, and test dates. Fr = fruit, Fl = flower, SC = self compatible, I = inconclusive, D = dioecious" [Lobelia xalapensis - Breeding Strategy = SC = self compatible]

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Chamorro, S., Heleno, R., Olesen, J. M., McMullen, C. K., & Traveset, A. (2012). Pollination patterns and plant breeding systems in the Galápagos: a review. Annals of Botany, 110: 1489-1501	"TABLE 1. Compilation of known information regarding the breeding systems of the Galapagos vascular flora" [Lobelia xalapensis - Autonomously self-pollinates = Yes; Self-compatible = Yes]

606	Reproduction by vegetative fragmentation	n

Qsn #	Question	Answer
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	[Annual. No evidence of vegetative reproduction] "Erect annual herbs (5-) 10-40(-60) cm tall; stems usually sparsely chaffy-pubescent below; roots fibrous."

607	Minimum generative time (years)	1
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Erect annual herbs (5-) 10-40(-60) cm tall"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	[A weedy, small-seeded species with the potential to thrive on roadsides, trails or other disturbed habitats, and with small seeds that could adhere to vehicles, footwear or tools in soil] "Capsules % inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 min long. Lobelia xalapensis is a widespread weedy species ..."
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[Occurs along trails, suggesting adaptation to disturbance and/or transport by people or animals utilizing trails] "In forests, along streams and trails, and rarely in open areas, central Mexico to Peru and Argentina."
	Ziffer Berger, J. (2008). Vascular Flora of the Babitonga Bay Region (Santa Catarina, Brazil): Diversity and Origins. PhD. Dissertation, University of Erlangen - Nürnberg, Erlangen, Germany	[Roadsides] "Lobelia xalapensis Kunth: herb; near pavements roadsides"

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Selina Wamucii. (2024). Lobelia xalapensis - Uses, Benefits & Care. https://www.selinawamucii.com/plants/campanulaceae/lobelia-xalapensis/. [Accessed 1 Mar 2024]	"Lobelia xalapensis is often used as an ornamental plant in gardens and as a ground cover. It can also be used to attract hummingbirds and butterflies to the garden."
	Rojas Chavarría, K., & Ramírez Muñoz, F. (2013). Plantas arvenses asociadas al cultivo de aguacate de altura en la Zona de Los Santos. Universidad Nacional, Heredia, Costa Rica	[Cultivated as an ornmental elsewhere] "Importancia: ornamental; muy utilizada por sus propiedades medicinales, como expectorante, sedante, antiespasmodico, discretamente laxante y diuretica." [Importance: ornamental; widely used for its properties medicinal, such as expectorant, sedative, antispasmodic, discreetly laxative and diuretic.]
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[No evidence] "A strange, annual, weedy Lobelia was found growing as a weed at Kauai Nursery & Landscaping, where it was common growing in both pots and from the ground in the nursery. It was identified as Lobelia xalapensis by Tina Ayers (ASC). This species is native to Central and South America and is the first time it has been reported outside of its native range. Given that it was found in a nursery, it is almost certain this species was introduced as a contaminant in soil of nursery stock."

703	Propagules likely to disperse as a produce contaminant	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Faccenda, K. (2024). Report of 24 new naturalized weeds across the islands of Hawai'i. Bishop Museum Occasional Papers 156: 71-110	[Presumably Yes] "A strange, annual, weedy Lobelia was found growing as a weed at Kauai Nursery & Landscaping, where it was common growing in both pots and from the ground in the nursery. It was identified as Lobelia xalapensis by Tina Ayers (ASC). This species is native to Central and South America and is the first time it has been reported outside of its native range. Given that it was found in a nursery, it is almost certain this species was introduced as a contaminant in soil of nursery stock."

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Capsules ¼ inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 mm long." [WInd may facilitate some movement of seeds, but no obvious morphological adaptations for wind dispersal]

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Foster, R. B., Arce, J. B., & Wachter, T. S. (1986). Dispersal and the sequential plant communities in Amazonian Peru floodplain. In Frugivores and Seed Dispersal (pp. 357-370). Springer, Dordrecht	"Appendix 1. Beach Transect: species in each dispersal category" [Lobelia xalapensis listed among the WATER DISPERSAL? category]
	Wiggins, I.L., Porter, D.M., & Anderson, E.F. (1971). Flora of the Galápagos Islands. Stanford University Press, Stanford, CA	[Along streams, suggesting movement by water] "In forests, along streams and trails, and rarely in open areas, central Mexico to Peru and Argentina."
	Juárez, F. C. (2022). Lobeliaceae R. Br. Aportes Botánicos de Salta, Vol. 6	[Distribution includes river beds, suggesting seeds are moved by water] "Se extiende desde México hasta Bolivia, Paraguay y norte de Argentina, también en Corrientes y Misiones. Frecuente en la provincia de Salta, en pastizales serranos, quebradas de bosques húmedos, y lechos de ríos." [Translation: It extends from Mexico to Bolivia, Paraguay and northern Argentina, also in Corrientes and Misiones. Common in the province of Salta, in grasslands mountain ranges, humid forest ravines, and river beds.]

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Capsules ¼ inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 mm long." [Not fleshy-fruited. Reported to be dispersed by water]

707	Propagules dispersed by other animals (externally)	
	Source(s)	**Notes**
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Capsules ¼ inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 mm long." [Possibly. Small seed size may facilitate external dispersal in soil attached to animals]

708	Propagules survive passage through the gut	n

Qsn #	Question	Answer
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Capsules ¼ inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 mm long." [Not fleshy-fruited and presumably not adapted for internal dispersal]

801	Prolific seed production (>1000/m2)	
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	[Seeds small, but densities unknown] "Capsules ¼ inferior or less, 4-5.5 mm long, 2-3 mm in diameter; seeds ellipsoid, brown, smooth, highly polished, ca. 0.5 mm long."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown. Long-lived seed banks reported for other members of the large genus.

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown. Other weedy Lobelia species may be successfully controlled using herbicides.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Woodson, R. E., Schery, R. W., & Wilbur, R. L. (1976). Flora of Panama. Part IX. Family 183. Campanulaceae. Annals of the Missouri Botanical Garden, 63(3), 593-655	"Lobelia xalapensis is a widespread weedy species" [Unknown, but as a weedy species, it may be able to tolerate some mechanical damage or disturbance]

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2024). Personal Communication	Unknown

Summary of Risk Traits:

Lobelia xalapensis is an erect, annual herb native from Mexico to Central and South America, as well as the Lesser Antilles and the Galapagos Islands. Although not widely cultivated, it was recently found growing in both pots and from the ground in a Kauai nursery and was likely introduced as a contaminant of soil in nursery stock. Described as weedy within its native range, and reported to be a weed of agricultural settings, this self-seeding annual possesses traits that would likely facilitate its spread in similar disturbed or cultivated habitats in the Hawaiian Islands and elsewhere.

High Risk / Undesirable Traits
• Broad elevational and latitudinal range
• Thrives and spreads in regions with tropical climates
• Naturalized on Kauai (Hawaiian Islands). First record of naturalization outside its native range.
• Described as weedy, or a weed of agriculture, within its native range (negative impacts have not been described)
• Other Lobelia species are invasive weeds
• A host of the plant pathogenic bacterium Ralstonia solanacearum
• Shade tolerant (may be able to invade shade, native forest understory)
• Reproduces by seeds.
• Self-compatible (able to produce seeds by self-fertilization)
• Annual (reaches maturity in one growing season)
• Tiny seeds likely dispersed by water and as a contaminant in soil of nursery stock, and possibly in mud attached to vehicles, equipment, footwear and animals.
• May also be intentionally cultivated

Low Risk Traits
• Unarmed (no spines, thorns, or burrs)