

**Family:** *Crassulaceae*

**Taxon:** *Crassula multicava*

**Synonym:** *C. quadrifida* Bak.

**Common Name:** Cape Province pygmyweed  
Fairy crassula

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	WRA Score	12
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)		Intermediate
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)		Low
203	Broad climate suitability (environmental versatility)		y=1, n=0		n
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)		
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)		n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)		y
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		n
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		y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		y=1, n=0		
411	Climbing or smothering growth habit		y=1, n=0		n

412	Forms dense thickets	y=1, n=0	y
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	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
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	
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	n
704	Propagules adapted to wind dispersal	y=1, n=-1	
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	
801	Prolific seed production (>1000/m <sup>2</sup> )	y=1, n=-1	
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	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 12

**Supporting Data:**

101	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Is the species highly domesticated? No. No evidence] "C. multicava is a moderate to fast growing, mat-forming, evergreen groundcover up to ± 300 mm, that produces an outstanding uniform effect when planted in masses. As with all members of the genus, the glossy, oval to round leaves are formed in opposite pairs. They are light to dark green depending on the position in the garden, darker in the shade and paler in semi-shade to sunny places. The flowers are petite, charming little stars hence the common name fairy crassula, and appear in masses above the attractive leaves. The leaves contain hydathodes (water secreting pores), which serve for rapid absorption of water from the leaf surface."
102	2011. WRA Specialist. Personal Communication.	NA
103	2011. WRA Specialist. Personal Communication.	NA
201	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	[Species suited to tropical or subtropical climate(s) 1-intermediate] "Native to the Cape of Good Hope...Coming as it does from a temperate climate, C. multicava does best in Hawaii at higher, cooler elevations, such as Kokee on Kauai and around Volcano and Waimea on the Big Island."
202	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	[Quality of climate match data? 0-low] "Native to the Cape of Good Hope...Coming as it does from a temperate climate, C. multicava does best in Hawaii at higher, cooler elevations, such as Kokee on Kauai and around Volcano and Waimea on the Big Island."
203	2011. Dave's Gardern. PlantFiles: PlantFiles: Fairy Crassula - Crassula multicava. <a href="http://davesgarden.com/guides/pf/go/58166/">http://davesgarden.com/guides/pf/go/58166/</a>	[Broad climate suitability (environmental versatility)? No] "Hardiness: USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
204	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] "C. multicava occurs on forest margins, river and stream banks, and in coastal and subtropical thickets from Mpumulanga, Natal to the Eastern and southern Cape."
204	2005. Wagner, W.L./Herbst, D.R./Lorence, D.H.. Flora of the Hawaiian Islands website. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm">http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Crassula multicava Harv. Status: Naturalized Distribution: K (Waimea Canyon) [Kauai, Hawaiian Island]"
205	2011. Dave's Gardern. PlantFiles: PlantFiles: Fairy Crassula - Crassula multicava. <a href="http://davesgarden.com/guides/pf/go/58166/">http://davesgarden.com/guides/pf/go/58166/</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] Widely cultivated ornamental
301	1995. Lorence, D.H./Flynn, T.W./Wagner, W.L.. Contributions to the flora of Hawai'i. III. New additions, range extensions, and rediscoveries of flowering plants. Bishop Museum Occasional Papers. 41: 19-58.	[Naturalized beyond native range? Yes] "Crassula multicava is native to the Cape Province of South Africa. This is a new naturalized record of this species in the Hawaiian Islands. On Kauai it has spread from cultivated plants and has become naturalized locally in the Kokee region along a road through eucalyptus plantings in mesic forest where it is spreading vegetatively via plantlets produced by the fruiting inflorescences and possibly also by seed."
301	1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia	[Naturalized beyond native range? Yes] "A succulent plant native to South Africa (Swarbrick and Skarratt 1994) which has naturalised in Victoria. The numerous small populations threaten dry sclerophyll forest and woodlands, dry coastal vegetation and rock outcrop vegetation (Carr et al. 1992)."
301	2002. Wotherspoon, S.H./Wotherspoon, J.A.. The evolution & execution of a plan for invasive weed eradication & control, Rangitoto Island, Hauraki Gulf, New Zealand. Pp. 381-288 in Turning the tide: the eradication of invasive species. IUCN, Gland	[Naturalized beyond native range? Yes] "Approximately 60% of the plant species we now consider invasive on Rangitoto were probably introduced to the island as garden plants. The garden plants that have naturalised are typically succulent (e.g. Crassula, Sedum, Aloe, Bryophyllum spp.)..."
301	2006. Domingues de Almeida, J./Freitas, H.. Exotic naturalized flora of continental Portugal – A reassessment. Botanica Complutensis. 30: 117-130.	[Naturalized beyond native range? Yes] "Six years after our last study on the exotic naturalized flora of continental Portugal, we present a reassessment. In 1999, we have considered the existence of 500 exotic species of vascular plants (invasive or more or less naturalized). From 1999 until now 64 new plant species records were added (12.8 % more), attaining now a total number of 564 taxa (including, as in precedent works, species, subspecies and some hybrids), belonging to 113 families." [Table 2. Crassula multicava naturalized in 1999]

301	2006. Howell, C.J./Sawyer, J.W.D.. New Zealand naturalised vascular plant checklist. New Zealand Plant Conservation Network, Wellington, NZ <a href="http://www.nzpcn.org.nz">www.nzpcn.org.nz</a>	[Naturalized beyond native range? Yes] "Crassula multicava = Fully naturalised" [New Zealand]
301	2010. Sanchez Gullon, E.. Flora alóctona ornamental naturalizada en la provincia de Huelva (Andalucía Occidental, España) I.. <i>Bouteloua</i> . 7: 21-28.	[Naturalized beyond native range? Yes] "One presents a study centred on ornamental naturalized or adventitious flora on the province of Huelva (Western Andalusia, Spain) .... No está recogido como especie invasora en Andalucía" [Translation from Spanish:: "It is collected as an invasive species Andalusia"]
302	2010. Zimer, E.. The adventive Crassulaceae of Rangitoto Island, Hauraki Gulf, New Zealand. International Crassulaceae Network, <a href="http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en">http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en</a>	[Garden/amenity/disturbance weed? A garden weed with negative environmental impacts. See 3.04] "it grows everywhere, even in debris of dead vegetation, and forms well sized populations especially nearby abandoned gardens."
303	2007. Randall, R.P.. Global Compendium of Weeds - <i>Crassula multicava</i> [Online Database]. <a href="http://www.hear.org/gcw/species/crassula_multicava/">http://www.hear.org/gcw/species/crassula_multicava/</a>	[Agricultural/forestry/horticultural weed? No] No evidence
304	2002. Wotherspoon, S.H./Wotherspoon, J.A.. The evolution & execution of a plan for invasive weed eradication & control, Rangitoto Island, Hauraki Gulf, New Zealand. Pp. 381-288 in <i>Turning the tide: the eradication of invasive species</i> . IUCN, Gland	[Environmental weed? Yes] "The degree to which an invasive species impacts on native vegetation processes was accorded the most influence in setting priorities for control. We considered invasive species to have a high impact on native vegetation processes if they were: ... able to form a dense ground cover that prevents the regeneration of native species, such as <i>Crassula multicava</i> (Crassulaceae)."
304	2010. Zimer, E.. The adventive Crassulaceae of Rangitoto Island, Hauraki Gulf, New Zealand. International Crassulaceae Network, <a href="http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en">http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en</a>	[Environmental weed? Yes] " <i>Crassula multicava</i> ssp. <i>Multicava</i> Lemaire 1862 is probably the worst succulent pest occurring in New Zealand. It was mentioned in botanical literature for the first time in 1959, but there is a strong belief that it has been naturalized much earlier in several parts of the country, probably even in the very early 20th century. Although seed hasn't been observed in New Zealand plants, possibly due to clonal propagation in the early years of cultivation, <i>Crassula multicava</i> retains its high invasive potential because of the tiny plantlets formed in the axils of the inflorescence peduncles which can easily become airborne. In Rangitoto it is by far the most spread succulent adventive plant, being present in large numbers especially from Gardiners Gap down to Islington Bay and further south to Yankee Wharf on the eastern coast of the island and pretty much everywhere around Rangitoto wharf and the neighbouring beaches in the south. Plants in their many thousands are scattered in the affected areas, from very small plants just becoming established (most of them) to large mounds up to 100 cm wide. "
305	2009. Hussner, A.. Growth and photosynthesis of four invasive aquatic plant species in Europe. <i>Weed Research</i> . 49: 506–515.	[Congeneric weed? Yes] " <i>Crassula helmsii</i> , <i>Hydrocotyle ranunculoides</i> , <i>Ludwigia grandiflora</i> and <i>Myriophyllum aquaticum</i> are four well known invasive aquatic plants in European waters."
401	1938. McVeigh, I.. Regeneration in <i>Crassula multicava</i> . <i>American Journal of Botany</i> . 25(1): 7-11.	[Produces spines, thorns or burrs? No] " <i>Crassula multicava</i> is a low herb with more or less decumbent base. The stems are succulent and bear opposite, decussate leaves (fig. 1). The petioles are short, sometimes so short that the leaves appear almost sessile, and petioles of a pair are joined. The fleshy, glabrous leaves are obovate with very obtuse tips and a tapering base. Numerous hydathodes give the leaves a more or less spotted appearance."
402	2011. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2005. Staples, G.W./Herbst, D.R.. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Parasitic? No] "Perennial herb to 1' tall; stems erect or base sprawling." [Not parasitic; Crassulaceae]
404	2008. Blanch, E.. Husbandry Guidelines for Hog deer ( <i>Axis porcinus</i> ). Western Sydney Institute of TAFE, Richmond, Australia <a href="http://nswfmpa.org/Husbandry%20Manuals/Published%20Manuals/Mammalia/Hog%20Deer.pdf">http://nswfmpa.org/Husbandry%20Manuals/Published%20Manuals/Mammalia/Hog%20Deer.pdf</a>	[Unpalatable to grazing animals? No] "Table 5. Plant species used by Hog deer ( <i>Axis porcinus</i> ) in Australia" [Includes <i>Crassula multicava</i> ]
405	2005. Staples, G.W./Herbst, D.R.. <i>A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places</i> . Bishop Museum Press, Honolulu, HI	[Toxic to animals? No] No evidence

405	2008. Blanch, E.. Husbandry Guidelines for Hog deer ( <i>Axis porcinus</i> ). Western Sydney Institute of TAFE, Richmond, Australia <a href="http://hswfmpa.org/Husbandry%20Manuals/Publicated%20Manuals/Mammalia/Hog%20Deer.pdf">http://hswfmpa.org/Husbandry%20Manuals/Publicated%20Manuals/Mammalia/Hog%20Deer.pdf</a>	[Toxic to animals? No] No evidence
406	2002. MacKenzie, D.S.. Perennial ground covers. Timber Press, Portland, OR	[Host for recognized pests and pathogens? Possibly] "Diseases such as anthracnose, leaf spot and root rot are occasionally encountered. Mealybugs and cyclamen mite are its primary pests."
407	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	[Causes allergies or is otherwise toxic to humans? No] No evidence
407	2011. WRA Specialist. Personal Communication.	[Causes allergies or is otherwise toxic to humans? No] Popular ornamental with no mention of toxicity or allergenic properties
408	2005. South African National Biodiversity Institute. PlantzAfrica.com - <i>Crassula multicava</i> Lem.. <a href="http://www.plantzafrica.com/plantcd/crassmulticav.htm">http://www.plantzafrica.com/plantcd/crassmulticav.htm</a>	[Creates a fire hazard in natural ecosystems? No] "There are not many shade-loving succulents that create as beautiful a display as <i>C. multicava</i> ." [Succulents not likely to increase fire hazards]
408	2009. Kubiak, P.J.. Fire responses of bushland plants after the January 1994 wildfires in northern Sydney. <i>Cunninghamia</i> . 11(1): 131-165.	[Creates a fire hazard in natural ecosystems? No] No evidence
409	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	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Given full sun or light shade, it forms an attractive ground cover that blooms during the short days of fall and winter."
409	2010. Baldwin, D.L.. Succulent Container Gardens: Design Eye-Catching Displays with 350 Easy-Care Plants. Timber Press, Portland, OR	[Is a shade tolerant plant at some stage of its life cycle? Yes] "Vining crassulas include <i>Crassula multicava</i> , which is long and lanky but thrives where most other succulents will not, in full shade."
409	2010. Zimer, E.. The adventive Crassulaceae of Rangitoto Island, Hauraki Gulf, New Zealand. International Crassulaceae Network, <a href="http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en">http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] "It grows in full sun, it grows in shade, on bare lava blocks or hidden between higher plants where accumulations of organic soil have started to form..."
410	2002. MacKenzie, D.S.. Perennial ground covers. Timber Press, Portland, OR	[Tolerates a wide range of soil conditions? Yes] "This species grows well in full sun to light shade, in about any well-drained soil."
410	2005. South African National Biodiversity Institute. PlantzAfrica.com - <i>Crassula multicava</i> Lem.. <a href="http://www.plantzafrica.com/plantcd/crassmulticav.htm">http://www.plantzafrica.com/plantcd/crassmulticav.htm</a>	[Tolerates a wide range of soil conditions? Yes] "Plants show a preference for well-composted, deep soils as well as clay soils and occur in partial shade."
411	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	[Climbing or smothering growth habit? No] "Perennial herb to 1' tall; stems erect or base sprawling."
412	2002. Wotherspoon, S.H./Wotherspoon, J.A.. The evolution & execution of a plan for invasive weed eradication & control, Rangitoto Island, Hauraki Gulf, New Zealand. Pp. 381-288 in <i>Turning the tide: the eradication of invasive species</i> . IUCN, Gland	[Forms dense thickets? Yes] "The degree to which an invasive species impacts on native vegetation processes was accorded the most influence in setting priorities for control. We considered invasive species to have a high impact on native vegetation processes if they were: ... able to form a dense ground cover that prevents the regeneration of native species, such as <i>Crassula multicava</i> (Crassulaceae)."
412	2010. Zimer, E.. The adventive Crassulaceae of Rangitoto Island, Hauraki Gulf, New Zealand. International Crassulaceae Network, <a href="http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en">http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en</a>	[Forms dense thickets? Yes] "The biggest problem with this plant is that if unchecked it can form dense mats of impenetrable vegetation preventing the natural regeneration of native ground covers. No wonder that the ultimate goal set for this plant is Eradication."
501	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	[Aquatic? No] "Perennial herb to 1' tall; stems erect or base sprawling." [Terrestrial]

502	2005. Wagner, W.L./Herbst, D.R./Lorence, D.H.. Flora of the Hawaiian Islands website. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm">http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm</a>	[Grass? No] Crassulaceae
503	2005. Wagner, W.L./Herbst, D.R./Lorence, D.H.. Flora of the Hawaiian Islands website. Smithsonian Institution, Washington, D.C. <a href="http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm">http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/index.htm</a>	[Nitrogen fixing woody plant? No] Crassulaceae
504	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	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Not a true geophyte
601	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Evidence of substantial reproductive failure in native habitat? No] "Crassula multicava is not endangered and due to its free-seeding, easy rooting and perennial nature, they generally occur in abundance in their natural habitat. "
602	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Produces viable seed? Yes] "The seeds are very fine and germinate quickly in damp shady areas often on rocks covered with thin layers of soil...It is easy to grow plants vegetatively as well as sexually. For quick results, leaf or stem cuttings can be made from mature plants. Cuttings can be made throughout the year and root readily in a well-drained medium. Many rooted plants will form from the mother plant in the garden. It may therefore be easier to transplant young plants as they root from leaves that have fallen off in the garden. The seeds are very fine and must be harvested as soon as the inflorescence turns brown as the fruit ripens. Seeds should be sown on a damp, sandy medium and be kept shaded and moist while cuttings are inserted into coarse river sand and later transplanted into ordinary garden soil."
602	2011. Dave's Gardern. PlantFiles: PlantFiles: Fairy Crassula - Crassula multicava. <a href="http://davesgarden.com/guides/pf/go/58166/">http://davesgarden.com/guides/pf/go/58166/</a>	[Produces viable seed? Yes] "This plant is now everywhere in my garden where there is shade, obviously spreading from seeds. What does not make it into the pest category that is it slow growing and very easy to remove given that it seems to have very shallow roots. " [Comment from a gardener from San Diego, CA]
603	2011. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2007. Kubitzki, K./Bayer, C./ Stevens, P.F.. The families and genera of vascular plants: Volume IX. Flowering Plants. Eudicots. Springer-Verlag, Berlin, Heidelberg, New York	[Self-compatible or apomictic? Unknown, but probably no] "Crassulaceae appear to be usually self-incompatible..."
605	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Requires specialist pollinators? No] "In spring bees that are the primary pollinators visit the masses of flowers."
606	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Reproduction by vegetative fragmentation? Yes] "C. multicava is designed for rapid colonization where they occur in the wild. Apart from seed dispersal, they easily root and spread from leaves that fall or break off from the mother plant. They also propagate themselves by producing plantlets on the flowerhead that drop off and develop into independent plants."
607	2005. South African National Biodiversity Institute. PlantzAfrica.com - Crassula multicava Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Minimum generative time (years)? Unknown. But ability to spread vegetatively will allow for rapid reproduction] "C. multicava is designed for rapid colonization where they occur in the wild. Apart from seed dispersal, they easily root and spread from leaves that fall or break off from the mother plant. They also propagate themselves by producing plantlets on the flowerhead that drop off and develop into independent plants."
701	2011. Eurobodalla Shire Council. South Coast Weeds: Species Profile - Succulents. <a href="http://www.esc.nsw.gov.au/weeds/Sheets/herbs/H%20Succulents.htm">http://www.esc.nsw.gov.au/weeds/Sheets/herbs/H%20Succulents.htm</a>	[Propagules likely to be dispersed unintentionally? Yes] "Mostly spread vegetatively by dumping of garden waste...Do not dump succulents, or grow them in gardens adjacent to native vegetation."
701	2011. Rangitoto Island Beach Community Association. Rangitoto Weedbusters. <a href="http://www.ribca.org.nz/weedBusters.html">http://www.ribca.org.nz/weedBusters.html</a>	[Propagules likely to be dispersed unintentionally? Yes] "Spreads locally by plantlets on flowerheads dropping off and rooting, and elsewhere by carelessly discarded stem fragments."

702	2005. South African National Biodiversity Institute. PlantzAfrica.com - <i>Crassula multicava</i> Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Propagules dispersed intentionally by people? Yes] "Horticulturally the plants are very popular in rock gardens, on rocky embankments, hanging baskets, and as perennial container plants. They make beautiful displays when planted en masse in shade or semi-shade."
703	2011. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence, although ability to spread by way of vegetative fragments could enable plants to contaminate other ornamentals when grown together in horticultural settings
704	2010. Zimer, E.. The adventive Crassulaceae of Rangitoto Island, Hauraki Gulf, New Zealand. International Crassulaceae Network, <a href="http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en">http://crassulaceae.net/voyages/62-habitat/1016-the-adventive-crassulaceae-of-rangitoto-island-hauraki-gulf-new-zealand-en</a>	[Propagules adapted to wind dispersal? Probably gravity dispersed] "Although seed hasn't been observed in New Zealand plants, possibly due to clonal propagation in the early years of cultivation, <i>Crassula multicava</i> retains its high invasive potential because of the tiny plantlets formed in the axils of the inflorescence peduncles which can easily become airborne."
705	2005. South African National Biodiversity Institute. PlantzAfrica.com - <i>Crassula multicava</i> Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Propagules water dispersed? Probably yes] " <i>C. multicava</i> occurs on forest margins, river and stream banks, and in coastal and subtropical thickets from Mpumulanga, Natal to the Eastern and southern Cape."
706	1995. Lorence, D.H./Flynn, T.W./Wagner, W.L.. Contributions to the flora of Hawai'i. III. New additions, range extensions, and rediscoveries of flowering plants. Bishop Museum Occasional Papers. 41: 19-58.	[Propagules bird dispersed? No] "...seeds brown, ellipsoid, 0.3–0.4 mm long; fruiting inflorescences proliferous, producing plantlets in axils of bracteoles."
707	1995. Lorence, D.H./Flynn, T.W./Wagner, W.L.. Contributions to the flora of Hawai'i. III. New additions, range extensions, and rediscoveries of flowering plants. Bishop Museum Occasional Papers. 41: 19-58.	[Propagules dispersed by other animals (externally)? No] "...seeds brown, ellipsoid, 0.3–0.4 mm long; fruiting inflorescences proliferous, producing plantlets in axils of bracteoles." [No means of external attachment]
708	2011. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] Unlikely to be consumed
801	2005. South African National Biodiversity Institute. PlantzAfrica.com - <i>Crassula multicava</i> Lem.. <a href="http://www.plantzafrika.com/plantcd/crassmulticav.htm">http://www.plantzafrika.com/plantcd/crassmulticav.htm</a>	[Prolific seed production (>1000/m <sup>2</sup> )? Unknown] "The seeds are very fine and germinate quickly in damp shady areas often on rocks covered with thin layers of soil...It is easy to grow plants vegetatively as well as sexually. For quick results, leaf or stem cuttings can be made from mature plants. Cuttings can be made throughout the year and root readily in a well-drained medium. Many rooted plants will form from the mother plant in the garden. It may therefore be easier to transplant young plants as they root from leaves that have fallen off in the garden. The seeds are very fine and must be harvested as soon as the inflorescence turns brown as the fruit ripens. Seeds should be sown on a damp, sandy medium and be kept shaded and moist while cuttings are inserted into coarse river sand and later transplanted into ordinary garden soil." [Information from introduced range indicates that plants may only spread vegetatively, and do not produce seeds, as is apparently the case in New Zealand]
802	2011. WRA Specialist. Personal Communication.	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]
803	2009. Happy, S.. Forest and Bird North Shore Branch Restoration Plan for Tuff Crater and Heath Reserve. Te Ngahere, Auckland, NZ	[Well controlled by herbicides? Presumably yes] "Appendix D: Weed Species Specific Control Methodology" [ <i>Crassula multicava</i> = Triclopyr; Manual = grub out; Efficacy unknown]
803	2010. Auckland Council. Biosecurity - Pest Plant - pitted crassula - <i>Crassula multicava</i> . <a href="http://www.arc.govt.nz/albany/index.cfm?63E0F20E-14C2-3D2D-B905-50098EBBE4B9&amp;plantcode=Cramul">http://www.arc.govt.nz/albany/index.cfm?63E0F20E-14C2-3D2D-B905-50098EBBE4B9&amp;plantcode=Cramul</a>	[Well controlled by herbicides? Presumably yes] "Recommended approaches: Spray (200ml glyphosate + 20ml penetrant/10L)."
804	2009. Kubiak, P.J.. Fire responses of bushland plants after the January 1994 wildfires in northern Sydney. <i>Cunninghamia</i> . 11(1): 131-165.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Appendix 1. Observations on fire responses (after 100% leaf scorch) of vascular plants in the Lane Cove River (LCR) (observations mainly Jan 1994 – Oct 1999) and Narrabeen Lagoon (NL) (Mar – Oct 1994) catchments, following the fires of January 1994." [ <i>Crassula multicava</i> = pR; pR = probably resprouted after the fires]
805	2011. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]