Fire risk report for *Flacourtia indica*

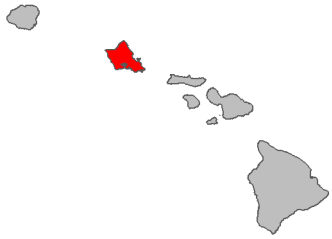
Full Species Name
Flacourtia indica (N.L.Burm.) Merr.

Family: Salicaceae

Common names:
governor's plum
ramontchi

Synonyms:

Known occurrences (as of 2020)



Year first documented as naturalized in Hawai'i: 2009

This species has been ranked by the Hawai'i Weed Risk Assessment program as High Risk with a score of 12.

View photos on Starr Environmental

View on Wikipedia

View occurrences on iNaturalist

View at Plants of Hawaii

View photos on Flickr

0 | .5 1

Lowest risk ⇔ Highest risk

This species is likely a **low** fire risk in Hawai'i with a fire risk score of **0.16**.

This species was ranked by our machine learning algorithm using the data presented on the next page. A predicted score of > .34 suggests the plant is a high fire risk.

Summary of Fire ecology	
Native habitat fire proneness	Fire-prone
Fire promoting plant in its native range	No
Fire promoting plant in its introduced range*	No
Regenerates after fire	Yes
Promoted by fire	Yes
Reported flammable*	No Data
Relative is flammable*	No

*These values were used by the model to predict fire risk

Detailed summary of Fire Ecology

Native habitat fire proneness (In any part of the plant's native range is its habitat described as fire prone due to natural or human caused fires?)	Fire-prone	"This deforestation and degradation are the results of a combination of factors including expanding cultivation, commercial logging, overgrazing, rapid population growth, and frequent fires (Chenje and Johnson 1994) [F. indica perviously listed as occurring in this habitat]." https://www.fs.fed.us/rm/pubs_journals/2015/rmrs_2015_hollingsworth_l001.pdf Hollingsworth, L. T., Johnson, D., Sikaundi, G., & Siame, S. (2015). Fire management assessment of Eastern Province, Zambia. Washington, DC: USDA Forest Service, International Programs. 88 p. --- "the mean fire-return interval is 6 years, in the tropical dry thorn forest mean fire-return interval is 10 years, and in the tropical moist deciduous forest mean fire return interval is 20 years [F. indica listed as occuring in the dry deciduous and dry thorn forest. appendix 1]" Kodandapani, N., Cochrane, M. A., & Sukumar, R. (2008). A comparative analysis of spatial, temporal, and ecological characteristics of forest fires in seasonally dry tropical ecosystems in the Western Ghats, India. Forest Ecology and Management, 256(4), 607-617.
Fire promoting plant in its native range (Does the species act as a major fuel source, increase fire severity, frequency, or modify fuel bed characteristics within its native range?)	No	"[occurs in infrequenly burned, rarely burned, and unburned plots, does not occur frequently burned plots. table 6]" https://www.researchgate.net/profile/Kobsak_Wanthongchai/publication/275653404_Effects_of_Past_Burning_Frequency_on_Woody_Plant_Structure_and_Composition_in_Dry_Dipterocarp_Forest/links/554323b90cf24107d3948f2c.pdf Wanthongchai, K., Bauhus, J., & Goldammer, J. G. (2014). Effects of past burning frequency on woody plant structure and composition in dry dipterocarp forest. Thai J. For, 33(3), 109-130.
Fire promoting plant in its introduced range (Same as Fire Promoting Native but within the species introduced range)	No	

Regenerates after fire (Does the plant regrow after fire by any means? This includes resprouters, reseeders, and recruiters which dispersed into the area within approximately one year post fire)	Yes	"The tree can be coppiced and grown as a hedge." ... "It does not tolerate fire and should be protected." 2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK --- "TABLE 2. The Brachystegia-Julbernardia woodland group; these species do not grow under chipya conditions, but require some form of protection from fire for them to pass through the sapling stage and form a woodland [F. indica listed as part of association]" Lawton, R. M. (1978). A study of the dynamic ecology of Zambian vegetation. The Journal of Ecology, 175-198. --- "[average of 5 resprouts per plant after fire. fig 1]" Nefabas, L. L., & Gambiza, J. (2007). Fire-tolerance mechanisms of common woody plant species in a semiarid savanna in south-western Zimbabwe. African journal of Ecology, 45(4), 550-556. --- "[lists respout score as 2.8/3, table 3]" Joseph, G. S., Seymour, C. L., Cumming, G. S., Mahlangu, Z., & Cumming, D. H. (2013). Escaping the flames: large termitaria as refugia from fire in miombo woodland. Landscape Ecology, 28(8), 1505-1516.
Promoted by fire (Does the plant increase in abundance after a fire?)	Yes	" In contrast to the dominants, there are quite a number of other species, particularly in the lower-layer categories, which showed greater numbers of small regeneration in the early-burnt plot than in the protected plot, and even a very few which showed equal or greater numbers under late burning. The following fall under the first head as having most small growth (1P1 to 4 6 m) in the early-burnt plot: [lists F. indica as part of this group]" Trapnell, C. G. (1959). Ecological results of woodland and burning experiments in Northern Rhodisia. The Journal of Ecology, 129-168.
Reported flammable (Is the species described as being flammable, being a major wildfire fuel, or high fire risk?)	No Data	
Relative is flammable (Does a plant in the same genus meet the	No	

Reported Flammable criteria?)		

Text in quotes are direct quotes from the source
Text in square brackets was added by the assessor to clarify something or to summarize from a figure.
Text preceded by a "#" is comment from the assessor

The data presented were assembled from literature and database searches for each species using as much data as could be collected regarding the plant's fire ecology under natural conditions. Searches aimed to be exhaustive and consist of as much data as could be located in 2020. Our machine learning algorithm was trained on 49 species of plants which had their fire risk ranked by 49 managers in Hawai'i in November 2020. The model used a conditional random forest regression algorithm to predict scores for each species using the manager score as the response variable and the fire ecology traits of each plant as the predictor variables to generate a fire risk score. This trained model was then used to predict the fire risk for all species which were not ranked by managers. The model was calibrated such that it is 90% accurate at predicting high fire risk plants and 79% accurate at predicting low fire risk plants. This research and the resulting fire risk model has been published in the journal Biological Invasions by Kevin Faccenda and Curt Daehler (both at the University of Hawai'i at Mānoa).

Note that the analysis doesn't account for a plant species' spatial distribution, population density, or distinct climate and ecosystem conditions (which can also influence fire risk). The fire risk of these species are mostly under "worst case" environmental conditions where the climate is dry enough to maintain fire, but wet enough to allow for plant growth and fuel accumulation. The fire risk ranking should not be taken as a stand-alone risk metric in prioritizing weed control efforts. Rather, this information may also be useful for determining if a newly discovered species poses a potential fire threat in wildland areas.

More general information on the weed risks and ecology of non-native plants in Hawai'i is available from the Hawai'i Invasive Species Committee's Weed Risk Assessment database.

View more fact sheets at https://www.pacificfireexchange.org/weed-fire-risk-assessments

---

Fact sheet prepared by Kevin Faccenda (faccenda@hawaii.edu) in November 2021. Data were prepared by Kevin Faccenda in 2020.

This research was funded by the Department of the Interior Pacific Islands Climate Adaptation Science Center. The project described in this publication was supported by Grant or Cooperative Agreement No.G20AC00073 to Curt Daehler from the United States Geological Survey. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Geological Survey. Mention of trade names or commercial products does not constitute their endorsement by the Pacific Islands Climate Adaptation Science Center or the National Climate Adaptation Science Center or the US Geological Survey.