**Acknowledgments and Author Contributions**

We thank Asia Jones, Evan Jordan, and especially Christopher Jason for assistance with rearing monarchs used in this study. Hillary Streit assisted with generating chemical data for monarchs from Guam, and Ivan Munkres assisted with generating all other chemical data. Myron Zalucki provided Australian monarchs used in greenhouse rearing, and Louie Yang and Will Haines assisted with monarch collection from Hawaii. MGF, RLV, SYS, and SRR conceived of the study. MGF and SC performed caterpillar rearing. MGF, MDH, and RLV generated chromatograms used for chemical analysis. MGF performed all data analysis and wrote the first draft. Seeds for all milkweed plants grown during this experiment were collected and imported under USDA permit number P37-15-00580. Monarchs collected in the United States and U.S. territories were imported under USDA permit P526P-18-02061, and monarchs collected in Australia were imported under USDA permit P526P-17-02696. Funding to MGF was provided through the NSF Graduate Research Fellowship, National Geographic Society, and the Center for Population Biology. MDH was supported by NSF grant DEB-1256115. RLV was supported by USDA Multistate Award NE1501.