

## CONTRIBUTIONS TO THE VASCULAR FLORA OF PUERTO RICO

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### ABSTRACT

We report several contributions to the vascular flora of Puerto Rico, based on botanical collections from 2021–2023 that resulted from an interagency effort (Ecological Site Descriptions — ESDs), comprising previously unreported species, naturalizations, and new distributions. Notes including known islandwide distributions are provided for applicable cases.

Records of previously unreported species, naturalizations, and new distributions were produced through floristic surveys conducted in Puerto Rico during 2021–2023, as part of a collaborative project between the USDA Natural Resources Conservation Service (NRCS) and the USDA Forest Service-International Institute of Tropical Forestry (FS-IITF) — Ecological Site Descriptions (ESDs). These contributions were generally determined using a combination of Axelrod (2011), Acevedo-Rodríguez and Strong (2012), Gann et al. (2015–2023), and USDA-NRCS (2023). However, some particular cases required the use of other references and are cited accordingly within each respective taxon. Previously known distributions in Puerto Rico are included for applicable cases in accordance with Axelrod (2011) unless stated otherwise.

Specimens from Puerto Rico herbaria (MAPR, SJ, UPR, and UPRRP) were physically examined, as well as imaged specimens from several digital herbarium collections, in order to confirm or disregard dubious records and/or distributions. The following virtual herbaria from North America were consulted for such purposes: MO (<https://www.tropicos.org/home>), NY (<https://sweetgum.nybg.org/science/vh/>), and US (<https://collections.nmnh.si.edu/search/botany/>). Examined specimens are cited in select cases and include collection locality and year. Personal observations and/or personal communications are also included within some taxa. Previously unreported species are accompanied with photographs of *in situ* specimens and herbarium vouchers. All record vouchers are deposited at the University of Puerto Rico - Río Piedras Herbarium (UPRRP).

## NEW SPECIES RECORDS

### *Acmella radicans* (Jacq.) R.K. Jansen (Asteraceae)

Record voucher: Caguas, Bo. Río Turabo, elev 94 m, 2 Mar 2023. *Maldonado Silvestrini 1349* with *J.D. Crespo* (UPRRP) (Figure 1). Notes: Collected along a dirt road in a disturbed secondary forest near urban development. Its known native distribution comprises Hispaniola, Guadeloupe, Martinique, Trinidad, and South America (Acevedo-Rodríguez & Strong 2012). Also collected in the municipality of Patillas (*Maldonado Silvestrini 824* [UPRRP]) and observed in the municipality Yabucoa (SMS pers. obs.). This taxon has also been referred to as *Acmella radicans* (Jacq.) R.K. Jansen var. *debilis* (Kunth) R.K. Jansen.



Figure 1. *Acmella radicans*, Caguas, Puerto Rico, 2 March 2023 (left). *Maldonado Silvestrini 1349* (UPRRP) (right). Photos by Steve Maldonado-Silvestrini.

### *Bambusa chungii* McClure (Poaceae)

Record voucher: Río Grande, Bo. Palmer, Cruce PR-191 con PR-955, elev 11 m, 24 Feb 2023, *Maldonado Silvestrini 1347* with *J.D. Crespo* (UPRRP) (Figure 2). Notes: Collected in an urban area at the foothills of El Yunque National Forest, from a cultivated individual for ornamental purposes. This species has been planted and persists in several environments and elevations on the island. It has also been observed cultivated in the municipality of Patillas and the metropolitan area of San Juan, as well as Pico del Este and other areas within El Yunque National Forest where it persists (SMS pers. obs.).



Figure 2. *Bambusa chungii*, Río Grande, Puerto Rico, 27 June 2023 (left). *Maldonado Silvestrini 1347* (UPRRP) (right). Photos by Steve Maldonado-Silvestrini.



Figure 3. *Vitex trifolia*, Canóvanas, Puerto Rico, 12 August 2022 (left). *Maldonado Silvestrini 1237* (UPRRP) (right). Photos by Steve Maldonado-Silvestrini.

***Vitex trifolia* L. (Lamiaceae)**

Record voucher: Canóvanas, Bo. San Isidro: Finca Los Llanos-Pinto, elev 3 m, 12 Ago 2022, *Maldonado Silvestrini 1237 with J.D. Crespo* (UPRRP) (Figure 3). Notes: Collected in a rural farm, near the San Isidro lagoon east to PR-188; naturalized in grasslands and herbaceous wetlands. Previously recorded from the municipality of Canóvanas, as per examined specimen. Examined specimens: *Woodbury 003189* (UPR) from unknown locality in 1978; *Sustache 2269* (SJ) from Canóvanas in 2021. This species is occasionally planted for ornamental purposes in Puerto Rico.

**NEW NATURALIZATION RECORDS*****Alpinia purpurata* (Vieill.) K. Schum. (Zingiberaceae)**

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1336 with J.D. Crespo* (UPRRP). Notes: First naturalization record of a planted and persistent species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Previously recorded from Puerto Rico's Central Cordillera and Sierra de Luquillo, only under cultivation or persisting.

***Caryota mitis* Lour. (Arecaceae)**

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1341 with J.D. Crespo* (UPRRP). Notes: First naturalization record of a species cultivated for ornamental purposes in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Also naturalized in wetland areas in the Tropical Forest at Palmas del Mar Conservation Easement, municipality of Humacao (SMS pers. obs.).

***Dypsis lutescens* (H. Wendl.) Beentje & Dransf. (Arecaceae)**

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1340 with J.D. Crespo* (UPRRP). Notes: First naturalization record of a species cultivated for ornamental purposes in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Also naturalized along other riparian areas such as Quebrada Los Cedros in the municipality of Isabela, Río Demajagua in the municipality of Fajardo, and around Baños de Coamo (SMS pers. obs.). This species was initially noted as naturalized in Liogier and Martorell (1982) and in Francis and Liogier (1991), but no herbarium specimens are referable to support such statements. Subsequently, it was included as only under cultivation in Axelrod (2011) and as exotic in Acevedo-Rodríguez and Strong (2012). We confirm its naturalized status on the island with a record voucher. This taxon has also been referred to as *Chrysalidocarpus lutescens* H. Wendl.

***Tabebuia rosea* (Bertol.) Bertero ex A. DC. (Bignoniaceae)**

Record voucher: Aguadilla, Bo. Aguadilla Pueblo: Parque Colón, elev 10 m, 15 Ago 2022, *Maldonado Silvestrini 1239 with J.D. Crespo* (UPRRP). Notes: First naturalization record of a species cultivated for ornamental purposes in Puerto Rico. Collected in an urban area near the coast, adjacent to the Río Culebrinas; naturalized in mangrove forest, planted individuals in the vicinity.

## NEW DISTRIBUTION RECORDS

### *Amblovenatum opulentum* (Kaulf.) J.P. Roux (Thelypteridaceae)

Record voucher: Canóvanas, Bo. San Isidro: Finca Los Llanos-Pinto, elev 8 m, 12 Ago 2022, *Maldonado Silvestrini 1235 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a rural farm, near the San Isidro lagoon east to PR-188, at the footslope of a limestone hill. Previously recorded from Puerto Rico's Sierra de Luquillo, and has also been observed along Quebrada Los Cedros in the municipalities of Aguadilla and Isabela (SMS pers. obs.). This taxon has been previously referred to as *Thelypteris opulenta* (Kaulf.) Fosberg.

### *Cedrela odorata* L. (Meliaceae)

Record voucher: Loíza, Bo. Canóvanas: Ex-Vaquería Hacienda Grande, elev 1 m, 10 Ago 2022, *Maldonado Silvestrini 1228 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a plantain farm; growing on the edge of the Caño Palúdica stream. Previously recorded from Puerto Rico's Northern Limestone Hills, Las Tetras de Cayey, Eastern Cordillera, and Central Cordillera, as well as Rio Abajo and Maricao Forest Reserves.

### *Crotalaria spectabilis* Roth. (Fabaceae)

Record voucher: Jayuya, Bo. Collores: Hacienda Santa Rosa, elev 676 m, 25 Ago 2021, *Maldonado Silvestrini 933 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a rural farm, near Cerro Punta, on a dirt road bordered by grasses. Previously recorded from the municipalities of Mayagüez and Luquillo, as per examined specimens. Examined specimens: *McClelland s.n.* (NY) from Mayagüez Experiment Station in 1925; *McClelland s.n.* (NY) from Mayagüez Experiment Station in 1931; *Burch 6608* (NY) from Luquillo in 1973; *Liogier 30534* (NY) from Mayagüez in 1980. This species was regarded as a misidentification of *Crotalaria retusa* L. in Axelrod (2011), but examined specimens were confirmed as *C. spectabilis*.

### *Cyclosorus interruptus* (Willd.) H. Itô (Thelypteridaceae)

Record voucher: Canóvanas, Bo. San Isidro: Finca Los Llanos-Pinto, elev 1 m, 25 May 2022, *Maldonado Silvestrini 1178 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a rural farm, near the San Isidro lagoon east to PR-188; growing abundantly among *Annona glabra* L.. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Toa Baja to Laguna Tortuguero), Northern Limestone Hills (Florida), Rio Abajo Forest Reserve, Eastern Coast (Humacao), and Western Coast (Añasco). This taxon has been previously referred to as *Thelypteris interrupta* (Willd.) K. Iwats.

### *Cyperus blepharoleptos* Steud. (Cyperaceae)

Record vouchers (2): 1) Loíza, Bo. Torrecilla Alta: Finca Virginia, elev -2 m, 20 Apr 2022, *Maldonado Silvestrini 1113* (UPRRP). 2) Manatí, Bo. Tierras Nuevas Poniente: Reserva Natural Hacienda La Esperanza, elev 0 m, 22 Jul 2022. *Maldonado Silvestrini 1211 with J.D. Crespo* (UPRRP). Notes: New locality records of a naturalized species in Puerto Rico. 1) Collected in a herbaceous wetland area mostly dominated by cattails, sedges and grasses, near mangrove and *Pterocarpus officinalis* Jacq. tree mitigations. 2) Collected on the grounds of a nature reserve, adjacent to the Río Grande de Manatí; growing on a stream near a secondary forest. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Toa Baja, Dorado). Also reported from Lago Las Curias in the metropolitan area of San Juan (Wahl et

al. 2020) and observed at a rural farm in the municipality of Canóvanas (SMS & JDCZ pers. obs.). This taxon has been previously referred to as *Oxycaryum cubense* (Poepp. & Kunth) Lye.

***Digitaria eriantha*** Steud. (Poaceae)

Record voucher: Lajas, Bo. Sabana Yeguas: Estación Experimental Agrícola de Lajas, elev 37 m, 10 Sep 2021, *Maldonado Silvestrini 938 with J.D. Crespo* (UPRRP). Notes: New locality record of a cultivated and naturalized species in Puerto Rico. Collected in a rural farm, in an abandoned grassland area occasionally managed for cow fodder. Cultivated and naturalized. Previously recorded from Puerto Rico's Northern Coastal Lowlands and Eastern Cordillera. Also recorded from the municipalities of Corozal, Adjuntas, and Gurabo, as per examined specimens. Examined specimens: *Del Llano s.n.* (NY) from Corozal Experiment Station in 1979; *Del Llano s.n.* (NY) from Adjuntas Experiment Station in 1979; *Proctor 42924* (US) from Gurabo in 1987. This taxon has been previously referred to as *Digitaria decumbens* Stent.

***Eragrostis hypnoides*** (Lam.) Britton, Sterns & Poggenb. (Poaceae)

Record voucher: Canóvanas, Bo. San Isidro: Finca Los Llanos-Pinto, elev 1 m, 18 May 2022, *Maldonado Silvestrini 1158 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a rural farm, near the San Isidro lagoon east to PR-188; growing abundantly in humid places. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Laguna Tortuguero), Northern Limestone Hills (San Sebastián), and Southwestern Coastal Lowlands (Lajas). Also recorded from the municipalities of Río Grande, Cabo Rojo, Bayamón, San Juan, and Fajardo, as per examined specimens. Examined specimens: *Eggers 1207* (US) from Río Grande in 1883; *Sintenis 674* (NY) from Cabo Rojo in 1885; *Sintenis 1225* (NY) from Bayamón in 1885; *Heller 649* (NY) from San Juan in 1889; *Britton 1665* (US) from Fajardo in 1913.

***Eucharis amazonica*** Linden ex Planch. (Amaryllidaceae)

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023. *Maldonado Silvestrini 1335 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Previously recorded from Puerto Rico's Northern Limestone Hills and Central Cordillera, as well as Rio Abajo and Maricao Forest Reserves.

***Heliotropium lamarckii*** Feuillet. (Heliotropiaceae)

Record voucher: Cabo Rojo, Bo. Boquerón. elev 24 m, 26 Jul 2021, *Maldonado Silvestrini 921 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a coastal area, in the shaded understory of a dry semi-deciduous forest near mangroves, salt flats and dry scrub hills. Previously recorded from Puerto Rico's Northern Limestone Hills and Southern Coastal Limestone. This taxon has been previously referred to as *Tournefortia scabra* Lam.

***Hygrophila costata*** Nees (Acanthaceae)

Record voucher: Aguadilla, Bo. Aguadilla Pueblo: Urbanización Victoria. elev 5 m, 15 Ago 2022, *Maldonado Silvestrini 1241 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in an urban area near the coast, adjacent to the Río Culebrinas. Previously recorded from Puerto Rico's Northern Coastal Lowlands, Eastern Coast, Caguas Valley, and Sierra de Cayey.

***Pachystachys spicata*** (Ruiz & Pav.) Wassh. (Acanthaceae)

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1338 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Previously recorded from the municipality of San Juan, as per examined specimen. Examined specimen: *Areces 966* (UPRRP) from San Juan in 2014. This species has been incorrectly identified as *Pachystachys coccinea* (Aubl.) Nees., and the taxon has also been previously referred to as *Justicia spicata* Ruiz & Pav.

***Phyllanthus debilis*** J.G. Klein ex Willd. (Phyllanthaceae)

Record voucher: Loíza, Bo. Canóvanas: Ex-Vaquería Hacienda Grande. elev 1 m, 10 Ago 2022, *Maldonado Silvestrini 1225 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a plantain farm; growing among the crops. Previously recorded from Puerto Rico's Northern Coastal Lowlands (San Juan). Also naturalized in the municipality of Vega Alta (SMS pers. obs.). Likely more widespread in Puerto Rico than current herbarium collections indicate and also easily misidentified as other herbaceous *Phyllanthus* spp.

***Ptychosperma macarthurii*** (H. Wendl. ex Veitch) H. Wendl. ex Hook. f. (Arecaceae)

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1344 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Also naturalized in wetland areas within the municipalities of Dorado and Loíza, riparian areas around Baños de Coamo, as well as limestone hills in Toa Alta (SMS pers. obs.), Camuy, Aguadilla (A. Morales-Pérez pers. comm. to SMS), and Hatillo (O. Monsegur-Rivera pers. comm. to SMS). Previously recorded from the municipality of Guaynabo, as per examined specimen. Examined specimen: *Monsegur 814* (MAPR) from Guaynabo in 2006.

***Schoenoplectus tabernaemontani*** (C.C. Gmel.) Palla (Cyperaceae)

Record voucher: Loíza, Bo. Torrecilla Alta: Finca Virginia, elev 1 m, 28 Jun 2022, *Maldonado Silvestrini 1188 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a herbaceous wetland area mostly dominated by cattails, sedges and grasses, near mangrove and *Pterocarpus officinalis* Jacq. tree mitigations. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Toa Baja, Vega Alta), Río Abajo Forest Reserve, Southern Coastal Lowlands (Salinas), and Southwestern Coastal Lowlands (Guánica, San Germán). Also reported from the Piñones State Forest (Del Llano et al. 1980) and observed in a herbaceous wetland at the municipality of Carolina (SMS and JDCZ pers. obs.). This taxon has been previously referred to as *Schoenoplectus validus* (Vahl) Á. Löve & D. Löve, as well as *Scirpus validus* Vahl.

***Stigmaphyllon puberum*** (Rich.) A. Juss. (Malpighiaceae)

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco, elev 15 m, 24 Feb 2023, *Maldonado Silvestrini 1345 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Fajardo).

***Strobilanthes reptans*** (G. Forst.) Moylan ex Deng & Wood. (Acanthaceae)

Record voucher: Río Grande, Bo. Mameyes II: PR-191, KM 1.6 & Quebrada Tabonuco. elev 15 m, 24 Feb 2023. *Maldonado Silvestrini 1342 with J.D. Crespo* (UPRRP). Notes: New locality record of a naturalized species in Puerto Rico. Collected in a riparian forest at the foothills of El Yunque National Forest. Previously recorded from Puerto Rico's Northern Coastal Lowlands (San Juan). Also naturalized in the municipality of Patillas (SMS pers. obs.). This taxon has been previously referred to as *Hemigraphis reptans* (G. Forst.) T. Anderson ex Hemsl.

***Urochloa arrecta*** (Hack.) Morrone & Zuloaga (Poaceae)

Record vouchers (2): 1) Loíza, Bo. Torrecilla Alta: Finca Virginia. elev 1 m, 28 Jun 2022, *Maldonado Silvestrini 1190 with J.D. Crespo* UPRRP). 2) Manatí, Bo. Tierras Nuevas Poniente: Reserva Natural Hacienda La Esperanza, elev 2 m, 11 Jul 2022, *Maldonado Silvestrini 1204 with J.D. Crespo* (UPRRP). Notes: New locality records of a naturalized species in Puerto Rico. 1) Collected in a herbaceous wetland area mostly dominated by cattails, sedges and grasses, near mangrove and *Pterocarpus officinalis* Jacq. tree mitigations; growing abundantly in herbaceous wetland adjacent to the San Fermin Solar Farm. 2) Collected on the grounds of a nature reserve, adjacent to the Río Grande de Manatí; growing occasionally in managed pasture along Cll La Esperanza. Previously recorded from Puerto Rico's Northern Coastal Lowlands (Toa Baja), Sierra de Cayey, and Central Cordillera. Also reported from the municipality of Dorado (Más 1994) and the Punta Guaniquilla Nature Reserve in Cabo Rojo (Vázquez and Kolterman 1998). Likely more widespread in Puerto Rico than current herbarium collections indicate. This taxon has been previously referred to as *Brachiaria arrecta* (Dur. & Schinz.) Stent.

***Urochloa dictyoneura*** (Fig. & De Not.) Veldkamp (Poaceae)

Record voucher: Lajas, Bo. Palmarejo: Subestación Experimental Agrícola, Vaquería de Lajas - UPRM, elev 20 m, 8 Jul 2021, *Maldonado Silvestrini 913 with J.D. Crespo* (UPRRP). Notes: New locality record of an introduced and cultivated species in Puerto Rico. Collected in a rural farm, in a fenced-in area for cow fodder. Presumably only under cultivation. Previously recorded from the municipalities of San Juan and Corozal, as per examined specimens. Examined specimens: *Woodbury s.n.* (UPR) from Río Piedras Agronomic Station in 1962; *Liogier 31760* (NY), *32578* (UPR) from Corozal Experiment Station in 1981. This taxon has been previously referred to as *Brachiaria dictyoneura* (Fig. & De Not.) Stapf, as well as *Urochloa humidicola* (Rendle) Morrone & Zuloaga.

***Zephyranthes puertoricensis*** Traub (Amaryllidaceae)

Record voucher: Manatí, Bo. La Luisa: PR-616, elev 44 m, 11 Jul 2022, *Maldonado Silvestrini 1205 with J.D. Crespo* (UPRRP). Notes: New locality record of a native species in Puerto Rico. Collected in a suburban area between limestone hills. Previously recorded from Puerto Rico's Northern Coastal Lowlands (San Juan) and has also been observed in the municipality of Vega Baja (SMS pers. obs.). Likely undercollected due to going unnoticed until flowering and requiring a very specific set of conditions to do so.

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