



United States  
Department of  
Agriculture



Forest Service

Southern Forest  
Experiment Station

# ResearchNote

so-374  
September 1993

## Seeds of Puerto Rican Trees and Shrubs: Second Installment

John K. Francis and Alberto Rodriguez

### SUMMARY

Seed weights and germination information were obtained for 119 native Puerto Rican and naturalized exotic trees and shrubs. Fruit was collected from 34 of these species, and the weights were recorded. The data are presented in tables that list the species alphabetically by scientific names.

### INTRODUCTION

During the 1940's, scientists at the Tropical Forestry Experiment Station (now the International Institute of Tropical Forestry) carried on an active program of forest tree seed research. Their effort resulted in a published summary of the data gathered (Marrero 1949). Seed weights and/or germination data were recorded for 128 species, the majority of which were exotics imported for adaptability tests in Puerto Rico. Although the work represents only a small portion of the more than 850 native and naturalized tree species in Puerto Rico, it remains a valuable reference.

In the course of collecting seeds for international exchange, and as necessary data for silvical descriptions, additional data on the seeds of native Puerto Rican trees and shrubs and naturalized exotics have been obtained. Air-dried seed weights, germination periods (time from sowing to first germination), and germination percentages have been obtained for 119 species in addition to the fruit weights for 34 of the species. Weights and germination percentages for a few of these species were also reported by Marrero (1949). The weights reported by Marrero agree fairly well with the weights obtained for this report.

### METHODS

The fruits and seeds were collected by a variety of methods. Many were gathered from the ground under seed-bearing trees or clipped from fruit-laden branches with pruning poles. For some species, a number of parent trees and sites are represented; however, a small number of trees on a single site were the source for most species. Replication was generally not possible due to the limited time available for collections and because a number of species are rare and seldom seen bearing seeds. When fruits were collected, they were weighed immediately or kept refrigerated until weighing could be done. The seeds were separated from the fruits by hand or by screening for the small quantities needed for research and exchange programs. Many tropical plant species have recalcitrant seeds (those that cannot withstand drying); therefore, each species was evaluated as to how much air-drying its seeds could tolerate. Seeds of most of the species collected were dried in front of an air conditioner for a few hours to 2 or 3 days. Hard-seeded legumes and species with similar seeds were dried in a solar drier.

In most cases, the seeds were weighed individually on an analytical balance. However, very small seeds were generally weighed in groups of 100; all weights are given as number of seeds per kilogram. Some of the hard-coated seeds were scarified by nicking the seed-coat with a knife blade or a file. Germination was done at ambient temperature (24 to 30 °C) in one of three substrates: potting mix in trays, sand in trays, or moistened filter paper in petri dishes (blotter method). Time lapse from sowing until the first germination occurred (germination period) and the percentage of seeds finally germinating were noted.

Southern Forest Experiment Station/T-10210 U.S. Postal Services Bldg., 701 Loyola Avenue, New Orleans, La. 70113  
Forest Service, U.S. Department of Agriculture

Serving Alabama, Arkansas, Louisiana, Mississippi, E. Oklahoma, Tennessee, E. Texas, Puerto Rico, U.S. Virgin Islands

## RESULTS AND DISCUSSION

Seed weight, germination period, and total germination percentage for each species are given in table 1. Fruit weights for some of the species listed in table 1 are given in table 2.

The germination period indicates the time it will take seeds to begin germinating. The method of germination has some influence on this period. In the blotter method, germination was recorded when the radicle emerged from the seed. In the soil (potting mix) and sand tray methods, germination was recorded when the cotyledons became visible. For most species, these last two methods took an additional day. In a few species, such as *Mammea americana* L., a few days to several weeks are required for germination because a root system must develop before the green shoot will emerge.

The seeds of most legume species germinated rapidly and in high percentages. Legumes with hard seedcoats responded very well to mechanical scarification. Generally, recalcitrant seeds of species, such as *Andira inermis* (W. Wright) H.B.K., *Clusia rosea* Jacq., *Cupania americana* L., *Dacryodes excelsa* Vahl, *Inga fagifolia* (L.) Willd., *I. quaternata* Poepp. & Endl., *M. americana*, and *Pithecellobium arboreum* (L.) Urban, germinate well if the moisture content is kept high and the seeds are sown soon after collection. The seeds of

*Acrocomia media* O.F. Cook (a thick-shelled palm) took 565 days to germinate; attempts with scarification failed. The seeds of *Bourreria succulenta* Jacq. var. *succulenta*, *B. virgata* (Sw.) G. Don, *Trema micrantha* (L.) Blume, *Cecropia peltata* L., *Guapira fragrans* (Dum.-Cours.) Little, *Miconia racemosa* (Aubl.) DC., and *Piper aduncum* L., which normally pass through a bird's gut during dispersal, may need some sort of pretreatment before they will germinate successfully.

## CONCLUSION

The limitations of this data are recognized. Because of environmental and genotypical differences, seed weights sometimes vary twofold from one collection to another. Replication across the range of each species (something this exploratory study could not provide) is recommended for an accurate picture of seed variability. However, this study does provide limited data for a large number of species until detailed studies can be made. Germination varies, depending on seed quality, treatment after collection, and a host of genetically programmed inhibitors and triggers. Some species are consistent germinators; others are highly inconsistent. The data provided in this paper give an indication of the speed and success of germination that can be expected from these species.

Table 1. -Seeds per kilogram, method of germination, time lapse to first germination, and percentage of germination for 119 Puerto Rican trees and shrubs

| Species  | Sample size        | Seeds/kg | Germination |         |         |
|--|--------------------|----------|-------------|---------|---------|
|  |                    |          | Method*     | Period* | Percent |
|  | ----- Number ----- |          |             | Days    |         |
| <i>Acacia farnesiana</i> (L.) Willd.                     | 100                | 7,560    | B/Sc        | 6       | 56      |
| <i>Acrocomia media</i> O.F. Cook                         | 100                | 11s      | S           | 565     | 23      |
| <i>Adenanthera pavonina</i> L.                           | 100                | 3,550    | B/Sc        | 6       | 66      |
| <i>Albizia procera</i> (Roxb.) Benth.                    | 100                | 25,300   | B/Sc        | 2       | 99      |
| <i>Alchornea latifolia</i> Sw.                           | 100                | 23,600   | M           | 31      | 62      |
| <i>Andira inermis</i> (W. Wright) H.B.K.                 | 100                | 66       | M           | 7       | 30      |
| <i>Bauhinia monandra</i> Kurz                            | 100                | 5,660    | B           | 4       | 100     |
| <i>B. multinervis</i> (Kunth) BC.                        | 100                | 4,240    | B           | 6       | 90      |
| <i>B. purpurea</i> L.                                    | 100                | 4,670    | B           | 4       | 99      |
| <i>B. variegata</i> L.                                   | 100                | 4,950    | B           | 4       | 77      |
| <i>Bourreria succulenta</i> Jacq. var. <i>succulenta</i> | 99                 | 50,000   | B           | ....    | 0       |
| <i>B. virgata</i> (Sw.) G. Don                           | 100                | 43,500   | B           |         | 0       |
| <i>Buchenavia capitata</i> (Vahl) Eichl.                 | 100                | 761      | M           | . 35'   | 67      |
| <i>Bucida buceras</i> L.                                 | 10,000             | 64,700   | S           | 17      | 16      |
| <i>Byrsonima spicata</i> (Cav.) H.B.K.                   | 100                | 3,120    | M           | 33      | 35      |
| <i>Calophyllum brasiliense</i> Jacq.                     | 100                | 299      | M           | 29      | 94      |
| <i>Cassia emarginata</i> L.                              | 100                | 41,700   | B/Sc        | 3       | 96      |
| <i>C. grandis</i> L.f.                                   | 100                | 1,940    | M/Sc        | 7       | 19      |
| <i>C. polyphylla</i> Jacq.                               | 100                | 20,400   | B           | 2       | 59      |
| <i>C. siamea</i> Lam.                                    | 100                | 40,200   | B           | 4       | 92      |
| <i>C. spectabilis</i> DC.                                | 100                | 45,500   | B/Sc        | 3       | 95      |

John K. Francis is a research forester and Alberto Rodriguez is a biological science technician at the International Institute of Tropical Forestry, U.S. Department of Agriculture, Forest Service, Río Piedras, PR 00926-2500, in cooperation with the University of Puerto Rico, Río Piedras, PR 00928-4984.

Table 1. -Seeds per kilogram, method of germination, time lapse to first germination, and percentage of germination for 119 Puerto Rican trees and shrubs-Continued

| Species  | Sample size | Seeds/kg   | Germination |         |         |
|--|-------------|------------|-------------|---------|---------|
|  |             |            | Method*     | Period† | Percent |
|  | Number      |            |             | Days    |         |
| <i>Cassine xylocarpa</i> Vent.   | 100         | 592        | M           |         | 0       |
| <i>Catalpa longissima</i> (Jacq.) Dum.-Cours.  | 500         | 802,000    | M           | 8       | 40      |
| <i>Cecropia peltata</i> L.   | 100         | 1,390,000  | B           |         | 0       |
| <i>Ceiba pentandra</i> (L.) Gaertn.  | 100         | 22,100     | B           | 3       | 4       |
| <i>Chrysobalanus icaco</i> L. var. <i>icaco</i>  | 45          | 1,790      | M           | 34      | 89      |
| <i>Citharexylum fruticosum</i> L.  | 100         | 20,700     | M           | 13      | 80      |
| <i>Clusia rosea</i> Jacq.  | 100         | 84,000     | M           | 4       | 85      |
| <i>Coccoloba diversifolia</i> Jacq.  | 100         | 3,880      | M           | 15      | 82      |
| <i>C. microstachya</i> Willd.  | 100         | 70,400     | B           | 18      | 98      |
| <i>Colubrina elliptica</i> (Sw.) Briz. & Stern   | 100         | 70,400     | B           | 11      | 1       |
| <i>Conocarpus erectus</i> L.   | 100         | 250,000    | B           | 9       | 12      |
| <i>Cordia alliodora</i> (R. & f?) Oken   | 100         | 88,200     | B           | 8       | 25      |
| <i>C. laevigata</i> Lam.   | 100         | 2,980      | M           | 19      | 91      |
| <i>C. obliqua</i> Willd.   | 100         | 850        | M           | 18      | 44      |
| <i>C. sebestena</i> L.   | 100         | 3,790      | M           | 45      | 52      |
| <i>C. sulcata</i> DC.  | 100         | 10,200     | M           | 13      | 21      |
| <i>Crescentia cujete</i> L.  | 100         | 20,800     | B           | 9       | 78      |
| <i>Cupania americana</i> L.  | 100         | 2,750      | M           | 20      | 53      |
| <i>Dacryodes excelsa</i> Vahl  | 100         | 503        | M           | 15      | 73      |
| <i>Daphnopsis americana</i> (Mill.) J.R. Johnst.<br>ssp. <i>caribaea</i> (Griseb.) Nevl. | 93          | 40,000     | B           | 7       | 2       |
| <i>Drypetes lateriflora</i> (Sw.) Krug & Urban   | 100         | 2,920      | M           | 55      | 54      |
| <i>Duranta repens</i> L.   | 100         | 1,940      | B           | 128     | 29      |
| <i>Enterolobium cyclocarpum</i> (Jacq.) Griseb.  | 100         | 1,050      | B/Sc        | 3       | 79      |
| <i>Erythrina fusca</i> Lour.   | 100         | 1,720      | M           | 22      | 88      |
| <i>Erythroxylum aerolatum</i> L.   | 100         | 20,300     | B           | 12      | 35      |
| <i>E. rotundifolium</i> Lunan  | 100         | 21,700     | B           | 8       | 72      |
| <i>Eugenia biflora</i> (L.) DC.  | 100         | 9,090      | M           | 38      | 4       |
| <i>E. maleolens</i> Pers.  | 89          | 14,900     | M           | 89      | 51      |
| <i>E. stahlii</i> (Kiaersk.) Krug & Urban  | 100         | 215        | M           | 50      | 73      |
| <i>Faramaea occidentalis</i> (L.) A. Rich.   | 100         | 3,980      | B           | 57      | 98      |
| <i>Ficus citrifolia</i> P. Miller  | 100         | 4,590,000  | B           | 10      | 38      |
| <i>F. sintenisii</i> Warb.   | 100         | 2,840,000  | B           | 9       | 77      |
| <i>Genipa americana</i> L.   | 100         | 19,900     | M           | 25      | 80      |
| <i>Goetzea elegans</i> Wydler  | 37          | 18,800     | M           | 27      | 78      |
| <i>Gonzalagunia spicata</i> (Lam.) Gomez Maza  | 100         | 182,000    | B           |         | 0       |
| <i>Guaiacum officinale</i> L.  | 100         | 3,550      | M           | 17      | 48      |
| <i>Guapira fragrans</i> (Dum.-Cours.) Little   | 100         | 45,700     | M           | 18      | 1       |
| <i>Guarea guidonia</i> (L.) Sleumer  | 50          | 2,090      | M           | 28      | 10      |
| <i>Guazuma ulmifolia</i> Lam.  | 1,000       | 239,000    | B           | 2       | 48      |
| <i>Helicteres jamaicensis</i> Jacq.  | 100         | 333,000    | B           | 8       | 58      |
| <i>Hernandia sonora</i> L.   | 100         | 358        | M           | 35      | 58      |
| <i>Hibiscus tiliaceus</i> L.   | 100         | 41,000     | M           | 31      | 53      |
| <i>Hura crepitans</i> L.   | 38          | 740        | M           | 8       | 95      |
| <i>Hyeronima clusioides</i> (Tul.) Muell.-Arg.   | 100         | 204,000    | B           | 20      | 53      |
| <i>Hymenaea courbaril</i> , L.   | 50          | 253        | M/Sc        | 14      | 88      |
| <i>Inga fagifolia</i> (L.) Willd.  | 100         | 1,120      | M           | 5       | 88      |
| <i>I. quaternata</i> Poepp. & Endl.  | 100         | 420        | M           | 8       | 75      |
| <i>Jacquinia arborea</i> Vahl  | 100         | 51,300     | B           | 8       | 100     |
| <i>Juglans jamaicensis</i> C. DC.  | 25          | 115        | S           | 41      | 40      |
| <i>Lantana exarata</i> Urban & Ekman   | 500         | 2,400,000  | B           | 14      | 19      |
| <i>Lepianthes peltatum</i> (L.) Rafinesque   | 481         | 8,930,000  | B           |         | 0       |
| <i>Magnolia portoricensis</i> Bello  | 100         | 7,410      | M           | 44      | 84      |
| <i>Mammea americana</i> L.   | 31          | 14         | M           | 31      | 97      |
| <i>Mastichodendron foetidissimum</i> (Jacq.)<br>H.J. Lam.                                | 32          | 2,580      | M           |         | 0       |
| <i>Melicoccus bijugatus</i> Jacq.  | 80          | 379        | M           | 27      | 83      |
| <i>Miconia racemosa</i> (Aubl.) DC.  | 478         | 62,500,000 | B           |         | 0       |
| <i>Morinda citrifolia</i> L.   | 100         | 38,800     | B           | 70      | 24      |
| <i>Moringa oleifera</i> Lam.   | 200         | 3,140      | M           | 7       | 85      |
| <i>Myrsine coriacea</i> (Sw.) R. Br.   | 100         | 75,200     | B           | 59      | 18      |

Table 1. -Seeds per kilogram, method of germination, time lapse to first germination, and percentage of germination for 119 Puerto Rican trees and shrubs-continued

| Species  | Sample size        | Seeds/kg  | Germination |         |         |
|--|--------------------|-----------|-------------|---------|---------|
|  |                    |           | Method*     | Period+ | Percent |
|  | ----- Number ----- |           |             | Days    |         |
| <i>Ocotea coriacea</i> (Sw.) Britton                                 | 100                | 1,950     | M           | 24      | 87      |
| <i>O. floribunda</i> (Sw.) Mez                                       | 100                | 1,570     | M           | 115     | 73      |
| <i>O. moschata</i> (Meissn.) Mez                                     | 100                | 148       | M           | 28      | 49      |
| <i>Ormosia krugii</i> Urban  | 89                 | 1,390     | M           | 22      | 51      |
| <b><i>Palicourea crocea</i> var. <i>riparia</i> (Benth.) Griseb.</b> | 100                | 57,100    | B           | 21      | 58      |
| <b><i>Parkinsonia aculeata</i> L.</b>                                | 100                | 13,300    | B/Sc        | 2       | 59      |
| <i>Petitia domingensis</i> Jacq.                                     | 100                | 80,200    | M           | 23      | 42      |
| <i>Picramnia pentandra</i> Sw.                                       | 100                | 11,900    | B           | 14      | 100     |
| <i>Pimenta racemosa</i> (Miller) J.W. Moore var. <i>racemosa</i>     | 100                | 35,700    | B           | 21      | 25      |
| <i>Piper aduncum</i> L.  | 500                | 7,750,000 | B           | . . . . | 0       |
| <i>Piptadenia peregrina</i> (L.) Benth.                              | 100                | 13,300    | B           | 3       | 98      |
| <i>Piscidia carthagenensis</i> Jacq.                                 | 100                | 20,800    | M           | 8       | 88      |
| <i>Pisonia albida</i> (Heimerl) Britton ex Standl.                   | 100                | 98,000    | B           | 5       | 70      |
| <b><i>Pithecellobium arboreum</i> (L.) Urban</b>                     | 110                | 1,400     | M           | 5       | 90      |
| <b><i>P. dulce</i> (Roxb.) Benth.</b>                                | 100                | 6,060     | M/Sc        | 2       | 50      |
| <b><i>P. unguis-cati</i> (L.) Mart.</b>                              | 50                 | 14,300    | B           | 3       | 31      |
| <i>Podocarpus coriaceus</i> L.C. Rich.                               | 100                | 7,190     | M           | 25      | 14      |
| <i>Poeppigia procera</i> Presl.                                      | 100                | 31,400    | B           | 4       | 98      |
| <i>Pouteria hotteana</i> (Urban & Ekman) Baehni                      | 84                 | 128       | M           | 17      | 88      |
| <b><i>P. multiflora</i> (A. DC.) Eyma</b>                            | 89                 | 43        | M           | 22      | 99      |
| <i>Prosopis pallida</i> (H. & B. ex Willd.) H.B.K.                   | 100                | 37,000    | B           | 4       | 48      |
| <i>Pterocarpus macrocarpus</i> Kurz                                  | 100                | 11,500    | M           | 5       | 87      |
| <i>Rheedia portoricensis</i> Urban                                   | 12                 | 101       | M           | 30      | 100     |
| <i>Roystonea borinquena</i> O.F. Cook                                | 100                | 2,980     | S           | 14      | 80      |
| <b><i>Sabal causiarum</i> (O.F. Cook) Becc.</b>                      | 100                | 2,920     | S           | 21      | 93      |
| <i>Spathodea campanulata</i> Beauv.                                  | 1,000              | 290,000   | M           | 8       | 38      |
| <i>Spondias mombin</i> L.  | 50                 | 1,180     | M           | 12      | 22      |
| <b><i>Sterculia apetala</i> (Jacq.) Karst.</b>                       | 100                | 870       | M           | 10      | 53      |
| <i>Swietenia macrophylla</i> X <i>mahagoni</i>                       | 100                | 2,580     | M           | 17      | 83      |
| <b><i>Tabebuia donnell-smithii</i> Rose</b>                          | 500                | 172,000   | M           | 7       | 97      |
| <i>T. haemantha</i> (Bert.) DC.                                      | 100                | 67,100    | B           | 8       | 98      |
| <b><i>Tecoma stans</i> (L.) H.B.K.</b>                               | 100                | 208,000   | B           | 3       | 97      |
| <i>Thespesia grandiflora</i> DC.                                     | 20                 | 2,550     | M           | 8       | 80      |
| <i>T. populnea</i> (L.) Soland. ex Correa                            | 100                | 8,410     | M           | 9       | 79      |
| <b><i>Trema micranthum</i> (L.) Blume</b>                            | 100                | 4,220     | B           | . . . . | 0       |
| <b><i>Trichilia hirta</i> L.</b>                                     | 100                | 9,520     | M           | 18      | 85      |
| <b><i>Urera baccifera</i> (L.) Gaud.</b>                             | 100                | 500,000   | B           | 28      | 49      |
| <b><i>Zanthoxylum martinicense</i> (Lam.) DC.</b>                    | 100                | 75,200    | M           | 40      | 5       |
| <i>Ziziphus mauritiana</i> Lam.                                      | 100                | 1,800     | M           | 48      | 7       |

\*S = germinated in sand, M = germinated in potting mix, B = germinated on fitter paper (blotter paper method), Sc = seed scarified by mechanical means.

\*When no germination occurred, germination period is shown as dot leaders.

Table 2. —**Fresh** fruit type and weight for some of the species listed in table 1

| species  | Number<br>in sample | Fruit<br>type | Weight<br>per fruit* |
|--|---------------------|---------------|----------------------|
|  |                     |               | Grams                |
| <i>Acrocomia media</i> O.F. Cook                                 | 83                  | Drupe         | 24.3 ± 0.251         |
| <i>Afchornea latifolia</i> Sw.                                   | 100                 | Capsule       | 0.541 ± 0.116        |
| <b><i>Bourreria succulenta</i> Jacq.</b>                         | 100                 | Drupe         | 0.619 ± 0.126        |
| <i>B. virgata</i> (Sw.) G. Don                                   | 100                 | Drupe         | 0.453 ± 0.093        |
| <i>Buchenavia capitata</i> (Vahl) Eichl.                         | 55                  | Drupe         | 5.46 ± 1.14          |
| <i>Cassine xylocarpa</i> Vent.                                   | 100                 | Drupe         | 5.59 ± 1.10          |
| <b><i>Chrysobalanus icaco</i> L. var. <i>icaco</i></b>           | 45                  | Drupe         | 4.36 ± 1.17          |
| <i>Coccoloba microstachya</i> Willd.                             | 100                 | Hypanthium    | 0.0517 ± 0.0075      |
| <b><i>Conocarpus erectus</i> L.</b>                              | 50                  | Drupe         | 0.155 ± 0.045        |
| <b><i>Cordia laevigata</i> Lam.</b>                              | 37                  | Drupe         | 1.52 ± 0.507         |
| <i>C. oblique</i> Willd.   | 100                 | Drupe         | 1.88 ± 0.432         |
| <b><i>C. sebestena</i> L.</b>                                    | 100                 | Drupe         | 6.22 ± 1.676         |
| <b><i>Dacryodes excelsa</i> Vahl</b>                             | 100                 | Drupe         | 3.47 ± 0.66          |
| <i>Duranta repens</i> L.   | 100                 | Drupe         | 0.516 ± 0.009        |
| <b><i>Erythroxylum areolatum</i> L.</b>                          | 100                 | Drupe         | 0.119 ± 0.013        |
| <i>E. rotundifolium</i> Lunan                                    | 100                 | Drupe         | 0.046 ± 0.008        |
| <i>Eugenia maleolens</i> Pers.                                   | 99                  | Berry         | 0.181 ± 0.032        |
| <b><i>Faramea occidentalis</i> (L.) A. Rich.</b>                 | 100                 | Drupe         | 0.825 ± 0.123        |
| <b><i>Ficus sintenisii</i> Warb.</b>                             | 100                 | Syconia       | 0.0483 ± 0.0081      |
| <b><i>Goetzea elegans</i> Wydler</b>                             | 27                  | Drupe         | 3.01 ± 1.39          |
| <b><i>Gonzalagunia spicata</i> (Lam.) Gomex Maza</b>             | 100                 | Drupe         | 0.0885 ± 0.0419      |
| <i>Guaiacum officinale</i> L.                                    | 100                 | Capsule       | 0.394 ± 0.111        |
| <b><i>Guazuma ulmifolia</i> Lam.</b>                             | 100                 | Capsule       | 2.79 ± 0.69          |
| <b><i>Hyeronima cfusioides</i> (Tul.) Muell.-Arg.</b>            | 100                 | Berry         | 0.0176 ± 0.0045      |
| <i>Jacquinia arborea</i> Vahl                                    | 100                 | Berry         | 0.315 ± 0.055        |
| <i>Mastichodencron foetidissimum</i> (Jacq.) H.J. Lam.           | 36                  | Drupe         | 2.94 ± 0.42          |
| <b><i>Ocotea cofiacea</i> (Sw.) Britton</b>                      | 91                  | Berry         | 0.927 ± 0.253        |
| <b><i>Petitia domingensis</i> Jacq.</b>                          | 100                 | Drupe         | 0.122 ± 0.068        |
| <i>Picramnia pentandra</i> Sw.                                   | 100                 | Berry         | 0.231 ± 0.043        |
| <i>Pimenta racemosa</i> (Miller) J.W. Moore var. <i>racemosa</i> | 100                 | Berry         | 1.01 ± 0.33          |
| <b><i>Prosopis pallida</i> (H. &amp; B. ex Willd.) H.B.K.</b>    | 100                 | Legume        | 2.56 ± 0.68          |
| <b><i>Pterocarpus macrocarpus</i> Kurz</b>                       | 100                 | Legume        | 0.882                |
| <b><i>Urera baccifera</i> (L.) Gaud.</b>                         | 100                 | Drupe         | 0.213 ± 0.076        |
| <b><i>Ziziphus mauritiana</i> Lam.</b>                           | 67                  | Drupe         | 6.52 ± 1.48          |

\*Mean and standard deviation.

## LITERATURE CITED

- Liogier, Henri Alain; Martorell, Luis F. 1982. Flora of Puerto Rico and adjacent islands: a systematic synopsis. Rio Piedras, PR: Editorial de la Universidad de Puerto Rico. 342 p.
- Marrero, José. 1949. Tree seed data from Puerto Rico. Caribbean Forester. 10(1): 1138.