



## DAVID FAIRCHILD'S PLANT HUNTING EXPEDITION IN THE LESSER ANTILLES: YEAR 1932

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### ABSTRACT

“The USDA 1931–1932 Allison V. Armour Expedition to the West Indies”, led by Dr. David Fairchild, was a germplasm collecting exercise that took place in the Caribbean Islands, Guyana, and Suriname over the course of five months. The largest portion of the trip targeted the Lesser Antilles (January 22–February 10, 1932; and March 7–17, 1932). Seventeen islands were visited and a total of 358 germplasm collections were made, 242 of cultivated species, 82 of native taxa, 34 of Caribbean Island endemics and 10 of Lesser Antillean endemics. Some collections (113) included herbarium vouchers, and two of these accessions are currently cultivated in Fairchild Tropical Botanic Garden. The travelogue of this trip was written by expedition member Palemon H. Dorsett with details regarding botanic gardens and botanists of the region. It also included accounts of ethnobotanical/horticultural practices, main crops, interesting plants encountered, landscapes, historical events, and the botany of the Lesser Antilles. Botanical nomenclature used has been totally updated and herbarium specimens collected in the Lesser Antilles were located and examined on-line. A total of 495 photos were also found; many were taken by Fairchild (203) and Dorsett (280). A further 12 photos were taken by expedition members Leonard R. Toy or Harold F. Loomis. A motion picture movie comprising four reels was also shot; however, this film has not been located yet. Research was conducted in the US National Herbarium at the Smithsonian Institution, the Archive and Library of Fairchild Tropical Botanic Garden, and the US National Archives at College Park, MD. Copies of photos and documents found during the study are posted in [archive.org](http://archive.org).

**Key words:** Botanical History, Ex situ Plant Conservation, Plant Genetic Resources, *Utowana*, West Indies

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## INTRODUCTION

Between December 1931 and April 1932, Dr. David Fairchild (1869–1954; FIGURE 1) led an extensive plant exploration expedition that targeted the Caribbean Islands, Guyana, and Suriname. This was one of his last plant hunting expeditions, prior to his retirement from the USDA in 1935 (Harris 2015: 247). This endeavor resulted in many collections of germplasm and/or herbarium specimens and yielded an extensive record of photographs and documents. A recently discovered two-volume, 902-page travelogue and expedition report that was written by USDA plant explorer Palemon H. Dorsett (1862–1943, FIGURE 2) was one such finding (Francisco-Ortega et al. 2019). In addition, Fairchild (1934) wrote a popular article on this USDA expedition that had details regarding the flora, history, and ethnobotany of the visited regions. Previous historical research pertinent to this major plant hunting enterprise was performed by Francisco-Ortega et al. (2018b) and Chavarria et al. (2020) focusing on Haiti and The Bahamas, respectively. The portion of the trip that targeted the Lesser Antilles was the most extensive one, a 31 day survey of 17 islands of this archipelago during the outbound and return trips between Miami and Suriname (FIGURE 3).

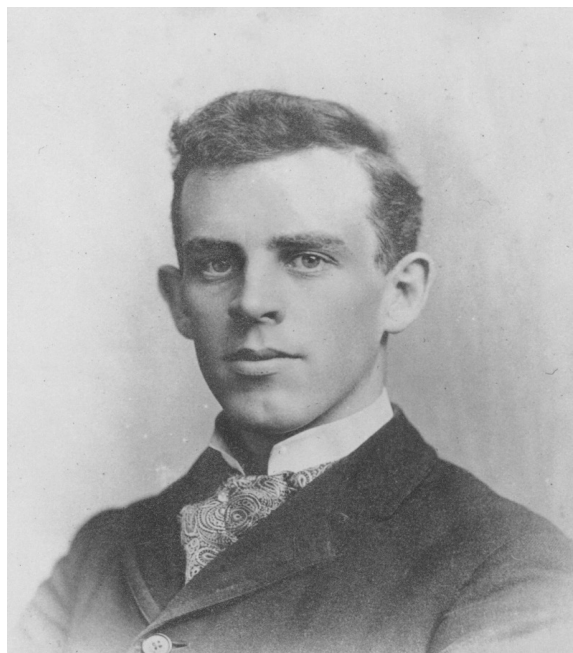


FIGURE 1. David Fairchild, year 1893. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden (photo #188).



FIGURE 2. Palemon H. Dorsett with camera, near yellow-flowered *Crotalaria maypurensis*; Fairchild 2642. Davis Estate Belmont, St. Kitts; 24 January 1932. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #6903 and Scrap Books 19 (38A) and 20 (48 middle right)]. Photo credit: David Fairchild.

## Expedition Members

The expedition was sponsored by Allison V. Armour (1863–1941), a wealthy businessman who supported several of Fairchild's several plant explorations for the USDA. These voyages were undertaken on board the research yacht *Utowana* (FIGURE 4) between 1925 and 1933 (Fairchild 1930; Henderson & Powell 2004). This particular expedition is referred in the USDA records as the "1931–1932 Allison V. Armour Expedition to the West Indies." Armour himself joined this party; other expedition members included Leonard R. Toy (1900–1973; FIGURE 5) from the University of Florida State Experimental Station at Homestead, Miami-Dade County; Harold F. Loomis (1896–1976; FIGURE 6), from the Miami USDA Research Station at Chapman Field; and the aforementioned P. H. Dorsett. There are biographical accounts for these expedition members, except for Leonard R. Toy.

David Fairchild is regarded as one of the most important plant explorers of the United States. Under his leadership many crops were introduced into this country and he is one of the most important figures in the development of economic botany as a discipline in the Americas (Epstein & Epstein 1961; Jauly 2007; Lee 2013; Harris 2015; Stone 2018). He had a solid friendship with Allison Armour, and this is evidenced by Fairchild's (not dated-a) own words: "[...] I find

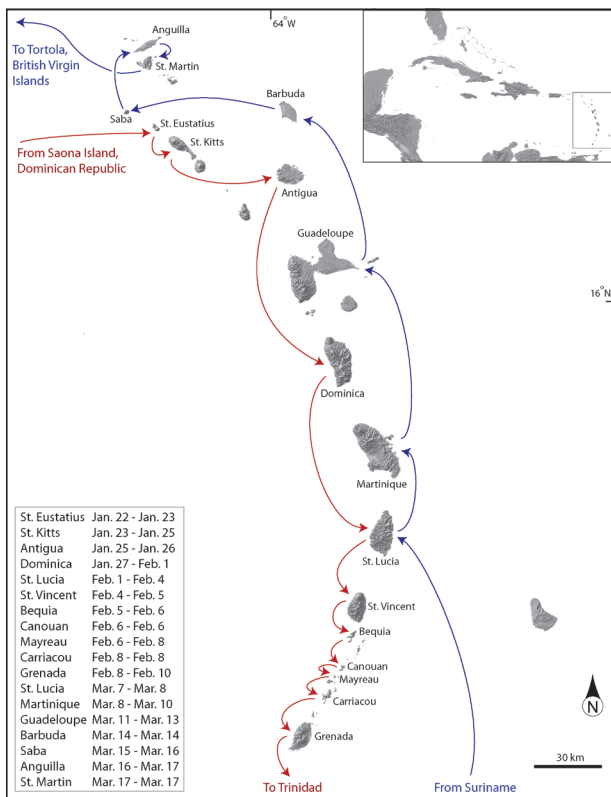


FIGURE 3. Itinerary followed in the Lesser Antilles by expedition members on board *Utowana*. Outward (in red) and return (in blue) trips are indicated.



FIGURE 4. The research yacht *Utowana*, Puerto Colón, Panama, 19 January 1928. Courtesy of the Special Collections, USDA National Agricultural Library (Creech Files, National Arboretum, Box 31J). Photograph was taken during the “Allison Armour 1928 Expedition” to the Caribbean Islands, Central America, and Mexico. Photo credit: Palemon H. Dorsett.

it very difficult to give any picture of one who was so close a friend for so many years.” This statement is found in what believe was part of an unpublished obituary to celebrate the life and achievements of Armour. They exchanged over 60 letters; this correspondence and that obituary are housed in the Archive and Library of Fairchild Tropical Botanic Library. David Fairchild was instrumental in Armour being awarded the prestigious “Frank N. Meyer Medal” of the American Genetic Association in 1931, in recognition for his plant exploration initiatives (Anonymous 1931, 1942: 24). Armour and Fairchild travelled together in *Utowana* expeditions that targeted the Old World between 1925 and 1927; and the Caribbean in 1931–1932 and 1933 (Fairchild 1930, 1932–1942; 1934; Henderson & Powell 2004). Armour sponsored a total of eight Caribbean expeditions on board this research vessel between 1928 and 1934; they focused on botany, agriculture, zoology, and archeology with researchers from USDA, University of Florida, Harvard University, and Yale University (Barbour 1928, 1945; Armour 1931; Barbour 1932; Fairchild 1934; Dorsett 1936; Rainey, 1941, 1992: 34–38, Henderson & Powell 2004; Poe 2014). Armour was a Yale graduate (Anonymous 1942), and his involvement in these expeditions went beyond providing financial support as he also wrote at least one report on the achieved results (Armour 1931).

Palemon Dorsett was also one of the most important plant explorers of USDA, and he received the “Frank N. Meyer Medal” in 1936 (Fairchild 1936). He retired in 1932 (Anonymous 1932); therefore, this expedition was the last one he made for this federal agency. Indeed, Dorsett’s (1936) travelogue and official report was finished and submitted to the USDA long after his retirement. Prior to his voyage to the Lesser Antilles, Dorsett collected in Brazil, China, Cuba, Denmark, Indonesia, Japan, Korea, Malesia, Mexico, Norway, Panama, Sri Lanka, Sweden, and the Caribbean between 1914 and 1932 (Fairchild 1934; Hodge & Todd 2009; Todd 2009). In 1928 he was already travelling for the first time on board *Utowana* mostly to distribute germplasm from the USDA to the Botanic Garden of La Soledad, Cuba (currently *Jardín Botánico de Cienfuegos*) and the Summit Garden in Panama (Dorsett 1927; Grey 1928; Anonymous 1929).

Harold F. Loomis was an entomologist and an important figure in the horticulture history of South Florida. Like Dorsett he had ample field experience and prior to this expedition he explored Central America, China, and Mexico. He served as director

of the USDA agriculture research station of Chapman Field, Miami between 1945 and 1958. Loomis was also actively involved with Fairchild Tropical Garden serving as board member (Weems 1977).

### Surveyed Area and Expedition Objectives

Within the Lesser Antilles, the team surveyed a broad geographical area that included islands that at this time were overseas territories of France, Great Britain, or the Netherlands. Therefore, the records of this expedition provide a unique perspective regarding the horticulture and floristic status of this insular region during the first third of the 20<sup>th</sup> century, just a few years before the Second World War. This plant exploration initiative was part of the extensive program for plant genetic resources established by the Section of Foreign Seed and Plant Introduction of the USDA. This USDA unit was created in 1897, and it had Fairchild as its leader and organizer (Jauly 2007: 127; Harris 2015: 44–46; Shurtleff & Aoyagi 2017: 3226). This federal office has had different official names since its establishment [reviewed by Hyland (1977)], and is currently known as the National Germplasm Resources Laboratory.

Regarding the specific goals of this major plant exploration expedition, it aimed “to search for the wild relatives of cultivated cotton, also varieties of palms native to the regions visited, as well as new, rare and valuable plants deemed worthy of introduction and trial in the United States, and its possessions” (Dorsett 1936: 1). Sea-island cotton was one of the main priorities of the trip (Fairchild 1934; Dorsett 1936: 2). This crop was important in Southeastern USA because of its long silky fibers (Stephens, 1976; Porcher & Fick, 2005) and it was believed that the Caribbean Islands were its center of origin (Moore 1934; Dorsett 1936: 2). As far as we are aware this was the first extensive USDA germplasm expedition that targeted the Lesser Antilles. However, previously, in January 1899 Fairchild and his benefactor Barbour Lathrop visited the islands of Barbados, Grenada, Jamaica, and Trinidad where they also collected plant material for the USDA (Fairchild not dated-b). In this contribution we present and discuss the plant collection, photographic and document records generated by the visit that the “1931–1932 Allison V. Armour Expedition to the West Indies” made to the Lesser Antilles.

## METHODOLOGY

### Herbarium and Archival Research

The core of Fairchild’s herbarium collections is housed in the U.S. National Herbarium, Smithsonian Institution (herbarium code US). Using the online resources of this institution, searches were made for his Lesser Antillean collections and high resolution images of specimens were



FIGURE 5. Leonard R. Toy holding two specimens of *Cajanus cajan* (L.) Millsp. (Fabaceae; Fairchild 2742, Fairchild 2743), Bequia, 5 February 1932 (Dorsett 1936: 352). Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photo in scrapbook 17 (75B)]. Photo credit: Palemon H. Dorsett (negative #57979).



FIGURE 6. Harold F. Loomis holding a branch of *Strophanthus gratus*; Botanic Garden of St. Vincent; undated. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #6837 and Scrap Books 17 (68A) and 20 (70 bottom right)]. Photo credit: David Fairchild.

subsequently examined. The complete Caribbean Island herbarium collections have been databased as part of the Flora of the West Indies Project led by Dr. P. Acevedo-Rodríguez. Arrangements were made to make personal visits to US but they had to be canceled because of the COVID-19 pandemic. Therefore, specimens for six species (*Crotalaria maypurensis* from St. Kitts, *Fairchild* 2642; *Hymenaea courbaril* from St. Lucia, *Fairchild* 2731; Orchidaceae sp. from Saba, *Fairchild* 3792; Orchidaceae sp. from Saba, *Fairchild* 3867; *Passiflora maliformis* from Guadeloupe, *Fairchild* 3769; and *Pennisetum setosum* from St. Kitts) were not examined (SUPPLEMENTARY TABLE 1). Taxonomic experts, as listed in the Acknowledgments section of this paper, were consulted to identify the herbarium material that was retrieved for this study. As a working taxonomy we followed Acevedo-Rodríguez and Strong (2012) or identifications provided by the experts.

Dorsett's (1936) travelogue is housed at the US National Archives at College Park, Maryland. As a public record document, the two volumes of this journal were scanned, and they are available in two webpages of archive.org (see details in Literature Cited). Pages of Dorsett's journal devoted to the Lesser Antilles were examined; an annotated facsimile of this part of the travelogue was produced and posted online as a supplementary document [APPENDIX 1 (<https://archive.org/details/fairchild-in-lesser-antilles-travelogue>)]. Pages 212–381 of volume 1 and 563–629 of volume 2 narrate the Lesser Antillean expeditions. Pages 1–3 from volume 1 and 714–840, 851–861, 864–902 from volume 2 are also available in this online supplementary document as they have expedition introductory statements, the list of collected germplasm, information of a movie that was shot during the trip, the list of relevant people who were met, and the index.

Further research was undertaken in the Archive and Library of Fairchild Tropical Botanic Garden, as this site has the core of David Fairchild's documents and photos. His photos and collection books from the Lesser Antilles were catalogued, studied, and posted online also as supplementary documents. Collection books (APPENDIX 2) are available at <https://archive.org/details/david-fairchild-in-lesser-antilles-collection-books/page/2668/mode/2up>. Copies of single photoprints and negatives (APPENDIX 3) can be retrieved at <https://archive.org/details/david-fairchild-in-lesser-antilles-photos/page/n1/mode/2up>. Finally, copies of scrapbook pages (APPENDIX 4) that have mounted photos can be

downloaded at: <https://archive.org/details/david-fairchild-in-lesser-antilles-scrapbook-photos/page/15/mode/2up>.

## RESULTS AND DISCUSSION

### The Lesser Antillean Itinerary

The Lesser Antillean leg of the expedition had two different portions. The first one took place between St. Eustatius and Grenada during the voyage to the Guianas. The second portion was between St. Lucia and St. Martin and took place during the return trip from Suriname to Miami (FIGURE 3).

After finishing a survey of the island of Saona (Dominican Republic), *Utowana* arrived at the Dutch island of St. Eustatius on January 22. Ten additional islands were visited during the outward trip towards the Guianas. From Grenada, the party left for Trinidad on February 10. Regarding the return trip, from Suriname the USDA team reached St. Lucia on March 7. From this British island, the yacht cruised towards the north stopping at six additional islands. St. Martin, an island that is a shared possession of France and the Netherlands, was the last Lesser Antillean stop. From St. Martin the expedition left for Tortola (British Virgin Islands) on March 17. All of the visited islands, except St. Lucia, were explored only once. Dominica was the island where the team spent the longest time (six days). The small island of Carriacou in the Grenadines was visited only for one day. Therefore, all of the major islands of the Lesser Antilles were surveyed, except Barbados, Marie-Galante, Montserrat, and Nevis (FIGURE 3).

Plant exploration in the Lesser Antillean expeditions was arduous and intense, and this is clearly stated by Dorsett (1936: 357, 358) when he described the visit to Mayreau, where the party had a short layover:

“This matter of making an island a day and some times two in one day is not what it is cracked up to be, especially when one takes into account the handling of the collections, making pictures and writing up field notes. [...] Remaining at anchor also gave us a longer time in which to get our work in shape because we will not be on rolling sea.”

During their itinerary, Fairchild (1934) and Dorsett (1936) not only documented the main botanical and horticultural highlights of these islands. Their records also mentioned the catastrophic volcanic activity of Martinique's Mount Pelée and St. Vincent's La

Soufrière that brought massive destruction to these islands in 1902 (Dorsett 1936: 309, 311–315, 330, 581). Furthermore, they provided highlights on historical aspects of the Lesser Antilles, such as the “discovery” by Christopher Columbus of St. Kitts (which he named St. Christopher, a name no longer used) during his second voyage to the Americas in 1493. France and England waged war in this region for some two hundred years because of the strategic situation of the Lesser Antilles, and this was also discussed by Fairchild (1934: 711). Within this colonial history framework the intense naval battles that occurred near the islet of Diamond Rock off Martinique between 1804 and 1805 (Rowbotham 1956) were also mentioned (Fairchild 1934: 734; Dorsett 1936: 310). Finally, reference to the rebellion of slaves under the leadership of Julien Fédon that took place in Grenada between 1795 and 1796 (Cox 1982) was also included in Dorsett’s (1936) travelogue.

### The Plant Collection Record and Botanical Accounts

Details on the material collected for the USDA germplasm repositories are found in David Fairchild’s collection books and in the official USDA plant introduction journal (FIGURES 7A–B). The small pocketbooks of David Fairchild also have scattered information on the plants that were recorded (FIGURE 7C) as well as details of the photos that were taken, people who were met, business cards, relevant addresses, and notes with short descriptions of the visited sites. Fairchild reported the germplasm collections of this expedition in 15 numbered collections books; nine of them (numbers 2–6, 11–4) were devoted to the Lesser Antilles. Among the six pocketbooks that account for the whole expedition, four of them have notes for the Lesser Antilles.

A total of 358 germplasm collections were made and both living material and seeds were obtained (FIGURE 8). Dominica (69) and St. Lucia (50) were the islands that yielded the highest number of accessions, whereas Mayreau (5) and Anguilla (7) were the islands with the fewest collections (FIGURE 9, TABLE 1). We found that 27 of the collections listed in David Fairchild’s collection books were not subsequently registered in the USDA inventories. Likewise, six of the samples recorded in these inventories are not found in the collection books. Herbarium vouchers were collected for 113 of the germplasm samples (FIGURE 10). Only six of the herbarium collections did not have matching germplasm accessions. Dominica was also the island with the highest

number of herbarium collections and no vouchers were collected in St. Martin.

Among the plant families the most relevant ones were legumes (90 accessions in 67 species), palms (35 accessions in 29 species), Malvaceae (12 accessions in 67 species), orchids (12 accessions in 12 species), and Moraceae (11 accessions in five species). *Mangifera indica* (mango) was the species most widely collected (18 samples representing 14 cultivars from six islands) followed by *Colocasia esculenta* (taro, six cultivar samples from two islands) and *Crotalaria retusa* (rattleweed, six unnamed

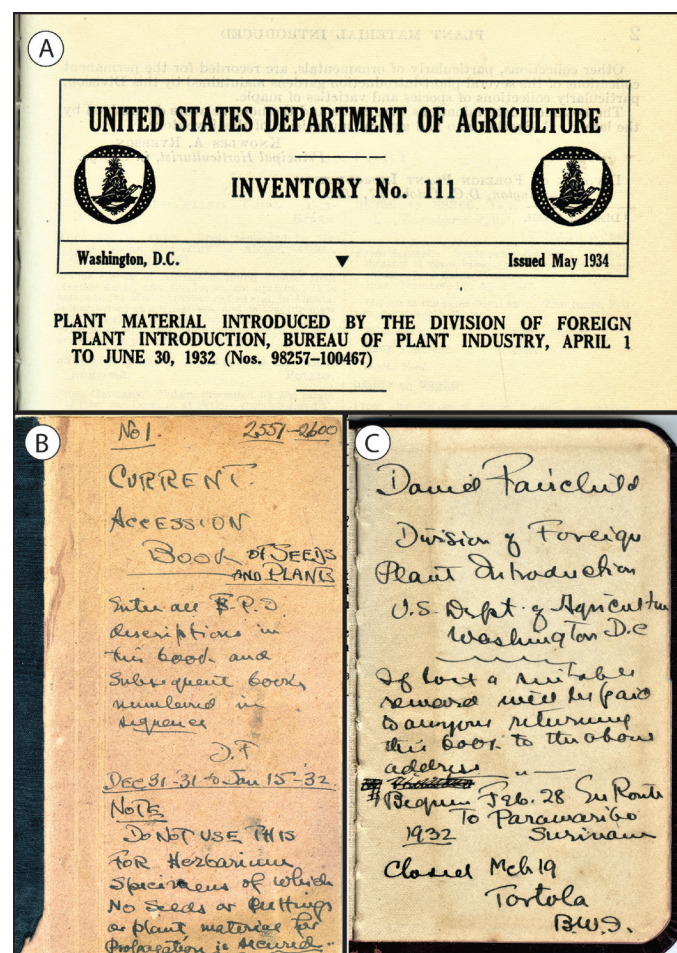


FIGURE 7. Documents containing germplasm records for the 1931–1932 Allison V. Armour Expedition to the West Indies. A. Front page of one of the official USDA germplasm inventory journals (Ryerson 1934), this particular issue of the journal included material collected during the expedition. B. Cover of the first of the 15 collection books that David Fairchild used during the expedition. C. Cover the fourth pocketbook that David Fairchild used during the expedition. This pocketbook accounts for the return trip between Suriname and St. Martin. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden.



FIGURE 8. Superintendent of Dominica Botanic Garden Frederick G. Harcourt (right) and two assistants posing with a Wardian case to be transported in *Utowana* that has living plants collected during the expedition, 30 January 1932. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #8530 and Scrap Book 19 (68D)]. Photo credit: David Fairchild.

cultivar samples from six islands that may have been introduced as ornamentals; Dorsett 1936: 225, 236). Nine cultivars were collected for *Xanthosoma* (tannia, three species from two islands). For pigeon pea (*Cajanus cajan*) eight cultivars were collected/reported in Bequia (Dorsett 1936: 349, 352; FIGURE 5). Five additional cultivars of yam (*Dioscorea* sp.) were collected/reported for Martinique and St. Kitts (Dorsett 1936: 234, 586, 593). Furthermore, seven collections were sampled within each of the following genera: *Citrus* (three hybrid cultivars from Dominica), *Coccoloba* (five species from three islands), and *Ficus* (four species from four islands).

Although cotton was a major focus of the expedition, only seven accessions of *Gossypium* from six different islands were obtained. Dorsett's travelogue had few references regarding the presence of this crop in the Lesser Antilles. They only concerned Anguilla, Barbuda, Canouan, Martinique (wild plants), and St. Vincent (Dorsett 1936: 337, 348, 353, 581, 603, 622). Dorsett's (1936: 603) records for Barbuda were the only ones for sea-island cotton but no collection of this crop was made on this island.

We are uncertain on the impact that these collections had in subsequent plant breeding programs and the horticulture trade. In a study conducted by Knight and Schnell (1992), pertinent to the developing of mango as a Florida crop, there is no mention of collections made by USDA botanists in the Caribbean Islands.

Among the collected cultivars only "Amelie" and "Julie" are listed as significant within the wide list of mango morphs. The "Amelie" cultivar has a West African origin, whereas "Julie" was developed in the West Indies (Knight et al. 2009). We have not found any additional reference for the cultivation of the reported cultivars of pigeon peas, tannia, and taro. Interestingly, it is likely that the cultivars of yam collected in Martinique are still used in the region as indicated by Degras et al. (1976).

We are certain that material collected during "The USDA 1931–1932 Allison V. Armour Expedition to the West Indies" yielded subsequent results at least from The Bahamas. A collection of *Coccothrinax* from Great Inagua was studied by Fairchild Tropical Botanic Garden plant taxonomist Robert W. Read (1931–2003) and resulted in the description of the only palm species endemic to this archipelago (Read 1966), *C. inaguensis* Read.



FIGURE 9. Germplasm collections made in the Lesser Antilles. Numbers in parentheses are first, collections recorded both in David Fairchild's collection books and in USDA germplasm entry record books, then collections recorded only in USDA germplasm entry record books and finally collections recorded only in David Fairchild's collection books. USDA Germplasm entry book records are available from Ryerson (1933, 1934). David Fairchild's collection books records are available in APPENDIX 2.

Previous historical research shows that Fairchild often collected in botanic gardens, research stations, and markets (Rose et al. 2017; Chavarria et al. 2020). This collection strategy was also followed in the Lesser Antilles as useful and ornamental plants were also a major focus of the expedition. Eighty-three germplasm samples came from six of these gardens [Dominica (47 samples), Grenada (20 samples, FIGURE 11), St. Lucia (four samples), Antigua (six samples), St. Vincent (two samples), Carriacou (two samples), and Guadeloupe (two samples)]. Agricultural/plant research stations were also surveyed in Martinique (21 samples), St. Lucia (seven samples), Guadeloupe (four samples), and St. Kitts (three samples). Regarding material from markets, there were accessions from Dominica (four samples), Guadeloupe (four samples), St. Kitts (two samples, FIGURE 12), and St. Lucia (three samples).

The botanic gardens of the Lesser Antilles played an important role in the history of germplasm exploration and introduction in the Americas (Plucknett et al. 1987: 50–51). For instance, the Botanic Garden of St. Vincent was established in 1766; it is the



FIGURE 11. Scene of the Botanic Garden of Grenada, 9 February 1932. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #6855 and Scrap Books 17 (86C)]. Photo credit: David Fairchild.



FIGURE 10. Herbarium collections made in the Lesser Antilles. Numbers in parentheses are firstly total number of collections then number of collections for which germplasm was not collected.

second oldest tropical botanic garden in the world (Plucknett et al. 1987: 46; Howard 1997–1998) and it was involved in the direct introductions of tropical crops such as breadfruit from the Pacific into the West Indies (DeLoughrey 2007). Fairchild (1934: 712, 719, 721, 722) and Dorsett (1936: 261–262, 331, 337, 341, 351) acknowledged the historical importance and relevance of these gardens; therefore, it is not surprising as they were targeted during the expedition. Interestingly, during the visit to the Dominica Botanic Garden, it was found that two accessions of “*Pairtesis* sp.” (it is likely referring to *Parathesis*, Primulaceae) and *Plinia cauliflora* were derived from germplasm that was provided by the USDA prior to this visit (Dorsett 1936: 270, 274).

Although not the major thrust, native and endemic species were also collected. Thirty-four of the accessions belonged to species restricted to the Caribbean Islands, ten of which are Lesser Antillean endemics (FIGURE 13). Accessions were also made of 82 non-endemic, native taxa during the expedition. The remaining 242 collections were for cultivated species, including those grown in botanic gardens



FIGURE 12. Market scene in St. Kitts, undated. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #6900 and Scrap Books 19 (40D); 20 (48 bottom right)]. Photo credit: David Fairchild.

and agricultural stations.

Despite the limited time spent in each of the islands, expedition members explore areas that were distant to the anchoring place of *Utowana*. For instance collections were made in the rain forests of the volcanoes of Mt Misery, St. Kitts (Fairchild 1934: 707, 711; Dorsett 1936: 244–246; FIGURE 14) and The Quill, St. Eustatius (Fairchild 1934: 707; Dorsett 1936: 217–221); montane and arid regions of St. Lucia (Dorsett 1936: 317, 322) and Grenada (Dorsett 1936: 368–369, 373, 375–376); and in dry areas located in St. Vincent (Dorsett 1936: 337, 344–345, 346), the western side of Canouan (Dorsett 1936: 353), and the base of the Mt. Pelée volcano in Martinique (Dorsett 1936: 581).

During the expedition plant material was sent by air-express to the USDA office in Washington, D.C. Three different consignments of the Lesser Antillean collections were shipped from Antigua and St. Lucia (Fairchild 1934: 712; Dorsett 1936: 259, 319, 571). Upon his return to the United States, Fairchild kept track of the location and conditions of the collected samples in USDA germplasm repositories. He used the original pages of his collection books to make notes regarding the post-expedition status of these accessions. These notes have details pertinent to

the sites where these samples were propagated and he tracked the survival of these plants at different dates. Only two places [Washington DC (“USDA Det. House”) and Miami (USDA Chapman Field station)] were indicated as final destinations for the collected material. These collection books have notes for the whereabouts of 181 accessions. Concerning the present status of this material, it appears that none of these samples are currently part of the germplasm stocks of the USDA.

Records of the Horticulture Department of Fairchild Tropical Botanic Garden show that several species collected by Fairchild worldwide were utilized to establish the early plantings of this garden in 1938 (Francisco-Ortega et al. 2018a). Francisco-Ortega et al. (2019) found that two of the palm species that Dr. Fairchild collected in the Lesser Antilles during this expedition are currently growing in this botanic garden (the Australian-New Guinea endemic *Ptychosperma macarthurii*, USDA 97288, Fairchild 2678; and the Caribbean Island endemic *Sabal causiarum*, USDA 97289, Fairchild 2671; FIGURE 15).

None of the ethnobotanical observations concerned the native flora of the islands; however, details of the traditional use of arrowroot [*Maranta arundinacea*;



FIGURE 13. Individuals of the Caribbean Island endemic Turk's cap cactus (*Melocactus intortus*) growing in Anguilla, 16 March 1932. Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden (photo #12719). Photo credit: Harold F. Loomis.

Dorsett (1936: 337, 344–346] in St. Vincent and of nutmeg and mace in Grenada [*Myristica fragrans*; Dorsett (1936: 362, 369, 375–376); Fairchild (1934: 722–723)] were documented. Grenada today is still one of the main producers of nutmeg and mace worldwide (Thomas-Francois and Francois 2014). It has been indicated that this spice crop was introduced in this island by Frank Gurney at Belvidere Estate (parish of St. John's) from the island Banda, Indonesia in 1843 (Fairchild 1934: 722–723; Groome 1970). Fairchild's (1934: 722–723) accounts provided details on nut production, quality, and marketing of nutmegs. Arrowroot is still an important source of starch in St. Vincent (Asha et al. 2015). Dorsett's (1936: 344–345) travelogue included three photos showing traditional processes to extract starch from its roots in a mill located near the valley of Mesopotamia, in the southern section of the island (Dorsett (1936: 337).

Most of the collections (see above), photographs, and records concerned cultivated plants; however, Dorsett's (1936) travelogue and Fairchild's (1934) popular article have accounts or photos for eleven of the Caribbean Island endemics. Photos recently taken for a selection of these species, are shown in FIGURE 16. Specific references were made to these endemics: *Begonia obliqua* in Dominica (Dorsett 1936: 305), *Clusia plukenetii* in St. Lucia (Dorsett 1936: 323, as *C. rosea*), *Coccoloba pubescens* in Antigua and St. Lucia (Dorsett 1936: 257–258, 267, 317–318, 322, 324–325), *Melocactus intortus* in Anguilla, Antigua, Barbuda, St. Kitts (Dorsett 1936: 242, 255, 608, 622), *Pitcairnia angustifolia* in Dominica Botanic Garden (Dorsett 1936: 280 as *P. coccinea*), *P. bifrons* (Dorsett 1936: 347 as *P. bracteata*), *Plumeria alba*



FIGURE 14. Collecting in the rain forest of Mt. Misery (now Mt. Liamuiga), St. Kitts. In the front, processing specimens (left to right: Palemon H. Dorsett, Leonard R. Toy, Harold F. Loomis); in the back, standing (left to right: Harold E. Box from Commonwealth Institute of Entomology, Lieutenant Commander Brooks from *H.M.S. Norfolk*; and G.B. Gregory of unknown affiliation), undated Courtesy of the Archive and Library of Fairchild Tropical Botanic Garden [photos #6889 and Scrap Book 19(40C)]. Photo credit: David Fairchild.

in Mayreau, St. Kitts, and St. Lucia (Fairchild 1934: 721; Dorsett 1936: 226, 328), *Poitea carinalis* in Dominica Botanic Garden (Dorsett 1936: 272), *Stigmaphyllon emarginatum* in Anguilla (Dorsett 1936: 622, 625, 626 as *S. lingulatum*), and *Tabebuia heterophylla* in Grenada (Dorsett 1936: 373 as *T. leucoxylla*).

During his expeditions Fairchild usually met local botanists and horticulturists who assisted him with logistics and information applicable to collections sites and economic botany practices (Francisco-Ortega et al. 2012; Korber et al. 2016). Dorsett's travelogue provides details of several colleagues who the party met during the Lesser Antillean trip (FIGURES



FIGURE 15. Individuals of the Caribbean Island endemic palm *Sabal causerianum* growing in Fairchild Tropical Botanic Garden (accession X.1-487, plot 106). This accession came from germplasm that was originally collected in the Dominica Botanic Garden (January 28, 1932) by David Fairchild (USDA 97289, Fairchild 2671). Photo credit: Yisu Santamaria.

8, 14). Among them there were R.E. Kelsick, director of the Experimental Station of Basseterre at St. Kitts (Dorsett 1936: 225, 238); Harold E. Box from the Commonwealth Institute of Entomology (Dorsett 1936: 226, 247); Joseph Jones, retired curator of the Dominica Botanic Garden (Dorsett 1936: 268–270, 272–273, 276); Frederick George Harcourt, superintendent of the Dominica Botanic Garden (Dorsett 1936: 268–270, 272–273, 296; FIGURE 8); Mr. and Mrs. Waters from the Botanic Garden of St. Lucia; T.P. Jackson, curator of the Botanic Garden of St. Vincent; and K.T. Rae of the Botanic Garden of Grenada. The strong relationships between Fairchild Tropical Botanic Garden and gardens throughout the Caribbean today probably had a foundation in these contacts that Fairchild made during the expedition.

### The Photographic and Cinematographic Record

A total of 495 photos taken by Dorsett, Fairchild, Loomis, or Toy documented the expedition (SUPPLEMENTARY TABLE 2, FIGURE 17). We have

located only eleven photos made by Loomis; six of them were published by Fairchild (1934: 708, 711, 721, 732, 734, 737), the remaining are housed in the Archive and Library of Fairchild Tropical Botanic Garden (photos 8540, 8555, 8564, 8583, 12719; TABLE 2). The core of Dorsett's photos (280) were published in his travelogue, except one of them (photo 12714) that was only found in the Archive and Library of Fairchild Tropical Botanic Garden. This library also has 175 duplicates of the photos that were included in this travelogue. All of the photos taken by Fairchild (203 pictures), except two that were published by Fairchild (1934: 719, 735), are housed in this library. Four of the 203 Fairchild's photos housed in the Archive and Library of Fairchild Tropical Botanic Garden (photos 6851, 6852, 6899, and 8530) were also published by Fairchild (1934: 716) and Tiernan (2019: 53, 57; 2020: 76). Regarding

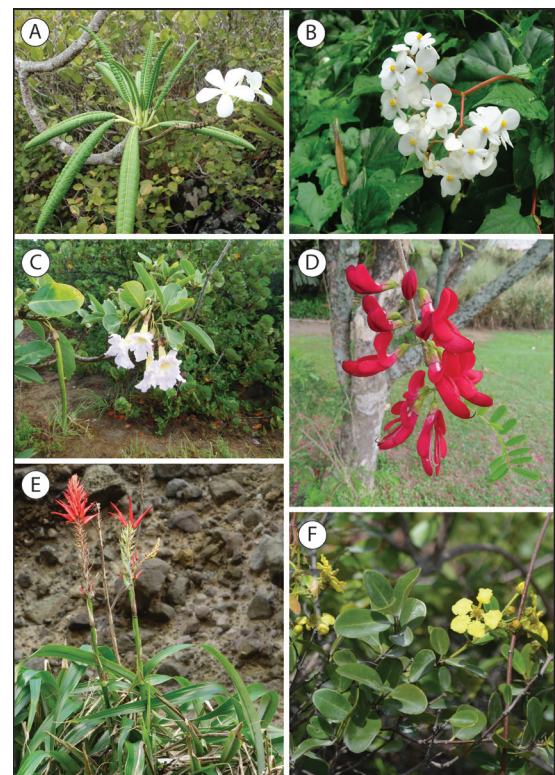


FIGURE 16. Photos of endemic species reported or collected in the Lesser Antilles during the USDA 1931–1932 Allison V. Armour Expedition to the Caribbean on board *Utowana*. A. *Plumeria alba*, in habitat in Martinique. B. *Begonia obliqua*, in habitat in Martinique. C. *Tabebuia heterophylla*, in habitat in Barbados. D. *Poitea carinalis* in Dominica Botanic Garden. E. *Pitcairnia angustifolia*, in habitat in Martinique. F. *Stigmaphyllon emarginatum*, in habitat in Anguilla. Photo credits: A: Benjamin Ferley; B, E: Guillaume Viscardi; C, F: Sean Carrington; D: Arlington James.



FIGURE 17. Photographs made in the Lesser Antilles. Total number of photos that were taken are indicated in parentheses.

Toy's photographs only one of them was found (photo 12720) and is located in the Archive and Library of Fairchild Tropical Botanic Garden.

This extensive photographic record concerned specific plants, landscapes, crops, ethnobotanical practices, life on *Uto*wana, people met during the expedition, and scenes of towns, farms, and markets (see above). They provided a unique window to life in the Lesser Antilles during this period.

The expedition activities were also filmed in a movie. According to Dorsett (1936: 851-857), a total of 12 motion-picture reels were shot during the journey. Four motion-picture reels focused on the Lesser Antilles. Recent archival research has found that documentary movies were also produced during at least three of the expeditions that Fairchild and/or Dorsett undertook in Indonesia, Sri Lanka, and China in the years 1924-1926 and 1939-1940 (Francisco Ortega et al. 2020). Unfortunately, during our archival research we could not locate the motion-pictures that were made during the USDA 1931-1932 Allison V. Armour Expedition to the West Indies. Searches were made not only in the National Archives but in the Special Collections of the USDA

National Agricultural Library, all without success. Clearly this is a historical research line that needs to be explored in the future.

### CONCLUDING REMARKS

The three initial objectives of this expedition [i.e., collecting (1) sea-island cotton cultivars or relatives, (2) palms, and (3) new species with potential horticulture value] were only partially achieved. There were many collections of palms and also of species belonging to other groups such as fruit trees, tuber/root crops, legumes, orchids, and bromeliads. The collected material had a wide scope and included endemics, natives and importantly accessions from remote regions of the Old World. Many of these collections came from botanic gardens and agriculture research stations; therefore, they already had horticultural use. However, there were very few collections of sea-island cotton. Stephens (1976) indicated that this crop was the result of hybridization events between *Gossypium barbadense* L. and *G. hirsutum* L. In the 1930s it was suggested that this type of cotton came from stocks introduced in the southeastern United States from Anguilla (Moore 1934: 260 [reference also found in Fairchild 1934: 705]), The Bahamas, or Barbados (Dorsett 1936: 2). The team explored Anguilla; however, no samples of *Gossypium* were collected in this island. It is difficult to understand why Barbados was not visited as Dorsett's (1936: 2) clearly indicated that this was an island where sea-island cotton was cultivated. Likewise, it is not clear why samples of this crop were not collected in Barbuda since Dorsett's (1936: 603) stated: "The staple commercial crop of the island just now is reported to be Sea Island Cotton, which is ginned in a local ginnyery." During the first third of the 19<sup>th</sup> century cotton plantations were well established in the Lesser Antilles; however, it appears that during the 1931-1935 period there were yield declines (Abbott 1964: Table 9). This could explain why the expedition accounts have few collections and reports for this crop in the Lesser Antilles.

We are aware that through our research we were not able to determine the extent to which the collected samples made an impact in horticulture research programs of America. The relevance of David Fairchild's contribution in the history of economic botany worldwide has been already highlighted elsewhere, as under his leadership many crops became part of Western cultures (Stone 2018). It seems that these Lesser Antillean collections did not reach the relevance of other economically important plants introduced by him and his team members;

however, the broad scope of the activities developed during this Caribbean expedition cannot be diminished.

We found remarkable the efficiency of *Utowna* biologists in collecting plant material and recording their observations. Their activities were meticulously supported by many documented photographs, herbarium and germplasm collections; an extensive travelogue; an expedition report; and a motion picture film. These items provided an unusual plant exploration account that went beyond a botanical survey of the Lesser Antilles in the 1930s, and also provide an insight into the state of horticulture at that time across the English, French and Dutch Caribbean. Because many islands were visited in a short period of time the team could not really deeply explore their territories. Despite these limitations there was no other previous, wide-ranging Lesser Antillean plant exploration expedition that in such a short period of time yielded so many results. Dorsett's (1936) travelogue has a unique perspective to these islands that are valuable not only to botanists but to historians, anthropologists, and geographers. It is unfortunate that the movie filmed during this endeavor still remains missing as this was the earliest cinematography documentary made on plant exploration in the Caribbean Islands.

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