

The Other Polynesian Gourd¹

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ABSTRACT: A review of botanical specimens and ethnographic literature indicates that a small calabash used as a vessel for scented coconut oil in Polynesia before European contact belongs to *Benincasa hispida* (Thunb.) Cogn., the wax gourd, rather than to *Lagenaria siceraria* (Molina) Standl., the bottle gourd. Current literature does not mention any use of the edible wax gourd fruit as a calabash. It was also determined that there is no verifiable record of the bottle gourd having been present in western Polynesia before 1965, suggesting that the known occurrence of this species in eastern Polynesia before European contact may be attributed to dispersal from South America rather than from the west as is commonly believed.

A DICTIONARY definition of the term “gourd” includes “1. Any of several vines of the family Cucurbitaceae . . . bearing fruits with a hard rind. 2. The fruit of such a vine, as a calabash, often of irregular and unusual shape. 3. The dried and hollowed-out shell of one of these fruits, used as a drinking vessel or utensil” (Morris 1969). Another word often used synonymously is “calabash,” defined in part as “A utensil . . . made from the fruit of a calabash” (Morris 1969). In this paper, gourd is used to refer to vines that produce hard-shelled fruits, and calabash to containers or utensils made from the fruits of gourds. In Polynesia, gourd and calabash are both applied almost exclusively to the bottle gourd, *Lagenaria siceraria* (Molina) Standl., and the vessels made from its fruit. This is not unusual, because the most authoritative source on gourds, *The gourd book* (Heiser 1979), is largely devoted to this one species. The other well-known source of calabashes, the calabash tree (*Crescentia cujete* L.), is only a recently introduced novelty in Polynesia.

Until now, it was believed that only one gourd, *Lagenaria siceraria*, was present in ancient Polynesia; the variability of its fruit has been considered sufficient to account for the

wide variation in shapes and sizes of calabashes reported from the area. However, Parkinson (1973) recorded the existence of another gourd, called “*hooe-rorro*,” in Tahiti in 1769; he stated, “the fruit of this tree [*sic*] is about the size of a small orange, very hard, and quite round, serving them, instead of bottles, to put their monoe [scented coconut oil] or oil in.” He identified the plant as *Cucurbita pruriens* Parkinson. The existence of this distinct type of gourd was supported by Henry (1928), who, based upon her father’s notes on Tahiti from ca. 1825 to 1848, described a plant called *aroro* as “a small spherical gourd, the size of a medium-sized orange, and has been used by Tahitians exclusively as containers of coconut hair oil.”

The first Tahitian dictionary (Davies 1851) also supported this distinction: Davies noted *huaroro* as “a species of a small gourd, used for bottles to hold sweet scented oil.” In Andrews’ dictionary (1944), the name is spelled *hu’aroro* and the plant described only as a small gourd. Jaussen’s (1861) and Lemaître’s (1973) dictionaries note only *hue*, which is described as being a calabash or bottle. The correct Tahitian name for the plant is probably *hue’aroro*, apparently derived from the word for calabash (or vine), *hue*, and ‘*a roro*, possibly meaning “of the *roro*.” Although *roro* has no current recorded meaning in Tahitian, its Tongan and Samoan cognate *lolo* means coconut oil.

¹ Manuscript accepted 5 June 1989.

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Curcubita pruriens Parkinson is now recognized as a synonym of *Benincasa hispida* (Thunb.) Cogn. The name *Benincasa cerifera* Savi is another synonym for this cultivated vine, commonly called "wax gourd." Although the plant was collected in Tahiti during the Cook expeditions, Parkinson's description of the use of its fruit as a calabash was considered incorrect by later authorities. Merrill (1954), in discussing the botany of Cook's voyages, noted that "It is certain that what Parkinson saw in use as oil containers were actually small fruits of the common gourd, *Lagenaria siceraria*..." This determination, made by such a renowned botanist as Merrill, evoked no opposition; since Parkinson incorrectly identified the source of the calabash as a tree, it was not hard to conclude that Parkinson's identification of the plant as *B. hispida* (*C. pruriens*) was also incorrect.

Other authors have contributed information that has also clouded the issue. Nadeaud (1864) noted for the Cucurbitaceae in Tahiti, "On fait des ventouses avec les fruits du *Curcubita multiflora* (Forst.), *aroro*" (cupping glasses are made with the fruits of *Curcubita multiflora* [Forst.]). Petard (1986) also identified *aroro* as this species of *Cucurbita* and correctly recorded its use as a vessel for coconut oil. In a footnote, however, he equated *Cucurbita multiflora* with *Luffa cylindrica* (an aboriginally introduced or native species of loofa whose fibrous network was possibly used as a scouring sponge). *Luffa* is listed separately under a different Tahitian name in the entry above it. Petard made no mention in his text of *Benincasa* occurring in Tahiti, but included a photograph of Parkinson's drawing of the plant and listed the species under *mautini tinito* (Chinese pumpkin) in a table.

The identification of a calabash made from a fruit of the pumpkin and squash genus *Cucurbita* is not unique to Tahiti. Hillebrand (1888) noted *Cucurbita maxima* DuRoi as being the *ipu nui* of Hawai'i. This large variety of calabash, however, was correctly identified as *Lagenaria siceraria* by Eames and St. John (1943).

The use of the wax gourd fruit as a calabash has apparently never been recorded other than

by Parkinson. Purseglove (1968) noted that the fruits, described as nearly spherical to long-oblong and 20–35 cm by 15–20 cm in diameter, are boiled as a vegetable, and "cut into pieces and candied with sugar." He noted its origin in Java, but mentioned no use of the fruit as a calabash. Heiser (1979) noted that its oblong to globular fruits that reach lengths of 4 ft (1.2 m) may be eaten raw or cooked like a vegetable. Although he recounted how one he had kept for two years looked the same as the day he collected it and had lost little weight, Heiser did not associate this characteristic with any use as a calabash. I. M. Burkill (1935) noted the fruits being eaten by the Malays boiled or candied, but like the other authors said nothing about any use as a calabash. In a recent note by Walters and Decker-Walters (1989), there is also no mention of the use of the wax gourd fruit as a calabash.

In summary, although the wax gourd was known to be present in Tahiti at the time of the European discovery of the island, the notion that its fruit was used as a calabash was deemed incorrect. The *hue 'aroro* used as a vessel for the scented coconut oil (*monoe*) was thought to be a small-fruited *Lagenaria siceraria*. This was the state of the botanical knowledge in February 1987 as I was collecting plants and recording ethnobotanical information in Tonga. I was aware that *L. siceraria* had been reported from Tonga and elsewhere in western Polynesia, but that it is now rare or extinct. I had seen it only once before—in American Samoa in 1972 at the Agriculture Department farm at Taputimu (*Whistler 309*, in my personal collection). I was not aware of any other collections of it from western Polynesia and, like other scientists, assumed that it had quickly become rare after the advent of Europeans, who introduced the much more useful glass bottles.

During research in Vava'u, a Tongan man I was interviewing noted the presence in his village (Longomapu) of a vine (Figure 1, *left*) called *fangu* whose fruit (Figure 1, *middle*) is used as a vessel (Figure 1, *right*) for coconut oil. In the literature on Tonga, the name *fangu* was first noted by Rabone (1845), who defined it as "the calabash; the scented oil." The currently used Tongan dictionary of

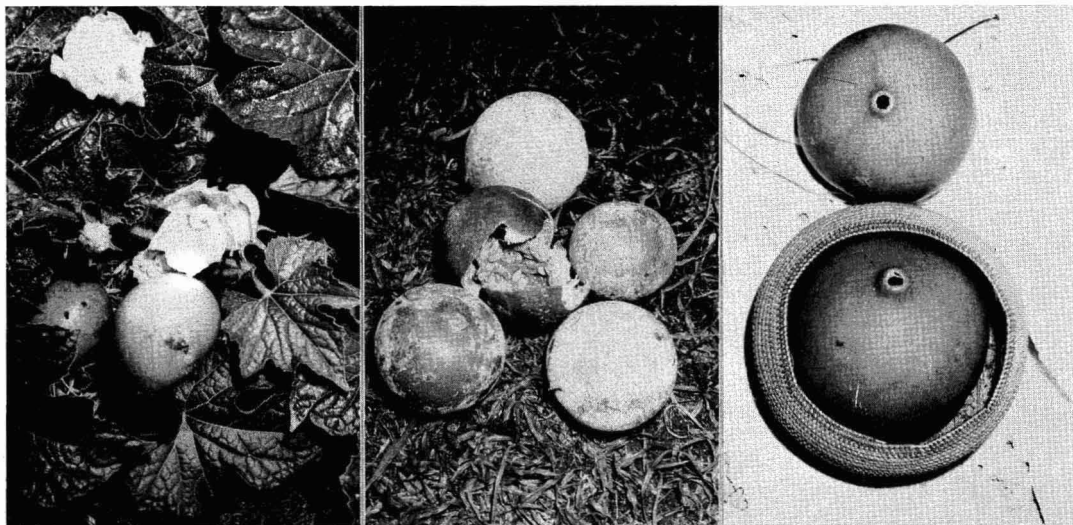


FIGURE 1. *Left*, *Benincasa hispida* in flower; *middle*, fruits of the Polynesian variety of wax gourd; *right*, calabashes from the fruits of the wax gourd, used as containers for scented coconut oil.

Churchward (1959) defines *fangu* as “calabash-shell used as a bottle (esp. for holding oil).” In an unpublished-manuscript in the Bernice P. Bishop Museum, Honolulu (n.d., but ca. 1930), W. C. McKern noted that “gourd bottles (*fangu*) are extremely rare now in Tonga, but apparently the gourds were rather small and round, and the bottles were chiefly used as scented coconut oil containers.” Pickering (1876) had noted the presence of *Lagenaria* in Tonga and described it as “a small-fruited variety cultivated, and the shell used for holding coconut oil.” I was elated at the prospect of finding the long-lost bottle gourd in Tonga.

But much to my surprise, the fruits brought to me were not of the bottle gourd, but of the wax gourd *Benincasa hispida*. I was already familiar with the latter because I had collected it in Western Samoa (*Whistler 184*, US) in 1972. At that time, however, I was not aware of, nor was I interested in, any ethnobotanical use for its peculiar fruits. In a subsequent ethnobotanical paper on Samoan plant names (1984), I recorded the name *fagu* (the Samoan spelling of *fangu*) as the bottle gourd based solely on information from previous authors.

In the literature, the name was first noted by Pratt (1862) as “1. A small species of gourd.

2. The fruit of the gourd used as an oil-bottle. 3. A bottle.” Powell (1868) had recorded the name on his list of Samoan plant names and noted that “the fruit is used by the natives as bottles for their scented oil.” However, he tentatively identified the plant as *Karivia samoensis* A. Gray (now called *Zehneria grayana* [Cogn.] Fosberg & Sacht), a species with a tiny fruit entirely unsuited as a calabash. Violette (1879) recorded *fagu* as a “Petite espèce de (138) gourde; son fruit sert de bouteille” (small species of gourd; its fruit serves as a bottle). Te Rangi Hiroa (1930) noted that “gourds called *fangu* were also used to contain oil. They were said to be small and their use as water vessels was denied.” The use of the word *fagu* to refer to a plant is now almost entirely forgotten, and in the current Samoan dictionary, Milner (1966) recorded simply “bottle” as its definition.

In the botanical literature, however, there is little mention of *Benincasa hispida* from either archipelago. I. M. Burkill (1901) noted its presence in Vava‘u based on a single collection, *Crosby 71* (BM) in ca. 1892, and its occurrence there was reiterated by Yuncker (1959) in a later flora of Tonga. In Samoa, it was first recorded by Rechinger (1915) based on his single collection from ‘Upolu,

Rechinger 134 (W), in 1905. There are only two other collections known from Samoa, *Powell 207* (K), without further locality, before 1875, and *Bristol 2413* (BISH), 'Upolu, in 1968. B. E. V. Parham (1972) noted the presence of *Benincasa*, which he called *melo*, but there is no indication that he was referring to the aboriginally introduced variety.

A search of pertinent literature from the rest of western Polynesia revealed that the vernacular name and the specific use of the plant were known from other islands. On 'Uvea (Wallis Island), Bataillon (1932) noted *fagu* as "(Fruit d'une Cucurbitacee), Petite gourde ou l'on met de l'huile" (fruit of a Cucurbitaceae, a small gourd where one puts oil). In the current 'Uvean dictionary, Rensch (1984) noted *fagu* as "gourde, cruche, fruit d'un Cucurbitacee" (gourd, container, fruit of a Cucurbitaceae). From the nearby island of Futuna, Rensch (1986) noted *fagu* as "Bouteille, gourd, cruche" (bottle, gourd, container). Apparently neither *Lagenaria* nor *Benincasa* has been collected from either of these islands. On Niue, McEwen (1970) defined *fangu* as "bottle." *Benincasa* has apparently never been recorded from Niue, and although *Lagenaria* was noted as occurring there by both Yuncker (1943) and Sykes (1970), neither botanist admitted to actually seeing the plant. In the dictionary of Tokelau (Anonymous 1986), *fagu* is defined as "bottle," but it is doubtful that any gourds were ever grown on those atolls.

A similar situation exists in Fiji. H. B. R. Parham (1943) recorded a gourd named *vago* (a Lau Islands' name that is a cognate of *fagu* of western Polynesia) and noted that "gourds from this plant were formerly extensively used as containers for coconut and other oil, in place of bottles before these were introduced." This she identified as *Lagenaria*. Seemann (1865-1873) recorded *vago* as *Lagenaria*; "In Viti it is extensively used for making bottles for holding oil and other fluids." In the current Fijian dictionary, Capell (1968) noted several names for gourds: (1) *vago*, described as "a plant, *Lagenaria vulgaris*"; (2) *dago*, a Tailevu name, described as "a kind of pumpkin, used as a bottle when

hollowed out"; (3) *daibe*, described as "a var. of gourd or calabash"; and (4) *didi*, described as "a variety of calabash, *Lagenaria vulgaris*, Cucurbitaceae."

In his flora of Fiji, Smith (1981) recorded the presence of both *Lagenaria* and *Benincasa*, the former on the basis of *Seemann 195* (incorrectly listed by Seemann as 495) from Tailevu, the latter from J. W. Parham (1972), who noted it (*Benincasa cerifera*, a synonym) as "Introduced and cultivated." However, upon further inspection, *Seemann 195*, which is in the collections of the Royal Botanical Garden, Kew, is actually *Benincasa hispida* (C. Jeffrey, pers. comm., 1988). Thus the only specimen of a gourd known from Fiji is *Benincasa*, not *Lagenaria*. However, on Rotuma, a Polynesian island that is politically a part of Fiji, *Benincasa* is an infrequent adventive species (*Whistler 6969*, in my personal collection) called *pirorogo*.

Apparently the aboriginal range of *Benincasa* extended eastward to the Marquesas, but less is known about the plant there. Brown (1935) listed two collections, *Brown 627* (BISH) from Nukuhiva in 1921 and *Mumford and Adamson 350* (BISH) from Hivaoa in 1929. Two additional specimens are known, *Brown 508* (BISH) from Nukuhiva in 1921, and *Decker 2672* (US) from Fatuhiva in 1974. Brown noted only that it was possibly of ancient introduction to the Marquesas, and that its native names are *hoe puo* on Nukuhiva, and *puoo* or probably *hoe puoo* on Hivaoa. In his dictionary, Dordillon (1904) used *hue puo'o* for colocynth (*Citrullus colocynthus*), a Mediterranean gourd not known from Polynesia, and possibly referring to *Benincasa* instead; *hue* is the word for gourd, and *puo'o* means dry. In his flora of French Polynesia, Drake de Castillo (1893) included *Benincasa* with a six-line description and noted three specimens, *Banks and Solander (s.n., in 1769)* and *Vesco (s.n., in 1847)* from Tahiti, and *Hombroon (s.n., in 1838)* from the Marquesas.

Benincasa hispida was also collected in the Cook Islands, but this is not recorded in the taxonomic literature. *Wilder 723* (BISH) collected on Rarotonga in 1929 belongs to this

species, but this specimen was misidentified on the sheet as *Luffa* sp. (Whistler 1990a) and was thus not included in Wilder's flora (1931). However, in his Rarotongan dictionary, Savage (1962) recorded a *ua roro* described as "a round calabash used by the ancient people as a water bottle." Based on its cognate from Tahiti, this is apparently *Benincasa*, but its use as a vessel for water rather than oil is puzzling.

The conclusions to be drawn from the above complicated discussion are the following: (1) *Benincasa hispida*, the wax gourd, was present in Polynesia before the advent of Europeans (1767); (2) the fruit of the wax gourd, at least the small round variety present in Polynesia, was used as a calabash for scented coconut oil in Tonga (where it is still occasionally used), Fiji, Samoa, 'Uvea, Futuna, Tahiti, and probably other islands and archipelagos as well; and (3) there is no record of the bottle gourd, *Lagenaria siceraria*, being present in Fiji or western Polynesia, except in recent times, and it was probably absent until recently introduced there as a novelty.

Two other remarks should be added concerning the oil bottles. Labillardière (1971), who visited Tonga in 1793, noted the presence of the oil containers (even depicting one in a drawing), but identified their source as the fruit of *Melodinus scandens* Forster (actually, *Melodinus vitiensis* Rolfe), a native liana of the family Apocynaceae. Although the fruit of this species is similar in size and shape to the fruit of *Benincasa*, such a use for it, or any use for it, is not found in the literature, and Labillardière is probably in error. In Fiji, H. B. R. Parham (1943) noted another Cucurbitaceae vine, *Luffa cylindrica* (L.) Roemer, that produced fruits used as oil vessels: "The gourd-like fruit were also used as containers for scented coconut-oil." This is extremely doubtful, however, because the shell of the *Luffa* fruit is very thin and fragile. It is not known on what basis Parham made this identification.

Because the Polynesian type of *Benincasa* seems to differ so much in fruit characteristics from what has been described for the rest of its range, a description is in order:

Herbaceous vine, prostrate or climbing over

low vegetation. Tendrils leaf-opposed, long, bifid. Stems, petioles, and leaves covered with stiff banded hairs mostly 1–4 mm long. Leaves alternate, simple, blade cordate 5- or more lobed, mostly 7–16 cm long and wide, tip acute, sinus broadly rounded, margins toothed, surfaces with banded hairs on veins and some between, interspersed with shorter, unbanded hairs, petiole 3–12 cm long. Glands at leaf base lacking, unlike in *Lagenaria*. Flowers solitary, axillary, yellow, on a peduncle 1–5 cm long (longer in Micronesia), plants monoecious. Calyx deeply divided into 5 reflexed sepals mostly 10–18 mm long. Corolla of 5 petals 3–5 cm long, pilose on the outside. Female flowers with a densely pilose, inferior ovary, stigmas 3, each bilobed, staminodes present. Male flowers with 3 stamens, ovary rudimentary. Fruit round to ovoid or obovoid, 5–12 cm in diameter, pubescent when immature, glabrous and covered with a white wax at maturity, pericarp ca. 1–1.5 mm thick, hard. Seeds many, 7–10 mm long, flattened teardrop-shaped, straw-colored.

The Polynesian *Benincasa* differs from the *Benincasa* description given by Purseglove (1968) principally in having much smaller fruits (5–12 versus 15–35 cm in longest diameter), smaller seeds (7–10 versus 10–15 mm), and a hard pericarp usable as a calabash. It seems distinct as a variety, and to distinguish it, the name *Benincasa hispida* var. *pruriens* (Parkinson) Whistler is hereby proposed, using Parkinson's basionym and the unnumbered specimen of Banks and Solander (K) collected in 1769 as the type. It is distributed from the Marquesas westward at least to Fiji; it may also extend further into Melanesia and Micronesia, but fruit specimens documenting its presence there were not seen.

The third conclusion listed above brings up an interesting point about the bottle gourd: how did it reach eastern Polynesia? Only two specimens of *Lagenaria* are known from western Polynesia and Fiji. One is from Tonga, *Soakai 894* (BM) collected in 1959 and the other is from Samoa (*Whistler 309* noted above). Thus, the only actual records of *Lagenaria* from the area date no further back

than perhaps 1959. Consequently, there is no evidence of a pre-European presence of the bottle gourd in western Polynesia or Fiji. Dodge (1943), in fact noted that in Samoa "gourds are almost never mentioned by writers and they are conspicuous by their absence in the legends."

However, *Lagenaria* is known with certainty to have been present in eastern Polynesia, including Hawai'i and New Zealand, before European contact. But by what route it arrived is the question. Because there is no evidence of its early presence in western Polynesia, other routes should be examined. Micronesia is an unlikely source since there is no evidence of any significant contact between that region and eastern Polynesia. Also, the bottle gourd is rarely found on atolls, the major type of island in Micronesia. The only other possible choice is South America. Such a plant introduction would not be unique, since the sweet potato was almost certainly introduced from South America to eastern Polynesia (Yen 1974). Also, it is likely that the coconut was aboriginally introduced from Polynesia to South America (Purseglove 1972), possibly on the same round trip.

The hypothesis of a South American introduction of the bottle gourd to Polynesia is supported by the presence of *Lagenaria* in South America long before eastern Polynesia was settled. Its presence there, and apparent absence from western Polynesia, suggest a dispersal not unlike that of the sweet potato, an intentional introduction by boat from South America. This must have occurred over a thousand years ago, since the bottle gourd apparently reached New Zealand early in those islands' Polynesian history. The minimal contact between eastern and western Polynesia, and the absence of colonization from east to west could easily account for its not being brought to western Polynesia until long after European contact.

If this introduction of the bottle gourd from South America to Polynesia actually occurred, it can be added to the sweet potato, and possibly *Solanum repandum* (Whistler 1990b), as plants introduced in a direction counter to the Polynesian migrations.

ACKNOWLEDGMENTS

I would like to thank the British Museum (Natural History) (BM), the Museum of Mankind (British Museum), the Herbarium of the Royal Botanic Gardens of Kew (K), the Pitt Rivers Museum (University of Oxford), the Smithsonian Institution Herbarium (US), and the Bernice P. Bishop Museum Herbarium (BISH) for the use of botanical specimens and/or the sharing of information.

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