

# The Identity of *Clinostigma onchorhynchum*<sup>1</sup>

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*Clinostigma* belongs to subtribe Iguanurinae of tribe Areceae in the arecoid subfamily of palms (Dransfield and Uhl 1986). It includes 13 species which occur in islands of the South Pacific. Six species have been described from Samoa: *C. samoense* H. A. Wendl., *C. onchorhynchum* Becc. (this species was originally named as "*C. onchorhyncha*," but since the name "*Clinostigma*" is neuter rather than feminine, the specific epithet should be "*onchorhynchum*"), *C. savaiiense* Chris., *C. powellianum* Becc., *C. vaupeii* Burret, and *C. warburgii* Becc.

The type species, *Clinostigma samoense* was described by H. A. Wendl. (1862) from a specimen collected by Pickering of the U. S. Exploring Expedition on Upolu Island in Samoa. Wendl. described the specimen as consisting of parts of a leaf, and a piece of an inflorescence with no staminate flowers, but with immature fruit. He describes the fruit as being egg-shaped, almost spherical, with the stigmatic scar not occurring at the apex of the fruit, but on the ventral side between the base and apex. Subsequently Reinecke referred a specimen he collected in Upolu (Fig. 2e) to *Cyphokentia samoensis* indicating probable synonymy with *Clinostigma samoense* (Reinecke 1898). This practice of placing specimens

in *Cyphokentia samoensis* and indicating probable synonymy with *Clinostigma samoense* was followed by Karl Rechinger (1910) who noted that a photograph of this species appeared in Schimper (1903 fig. 151).

Later Beccari (1914) described a second species of *Clinostigma* from Upolu based on a collection made by the Rev. S. J. Whitmee from Lake Lanatoo in August 1875. Beccari incorrectly reported the locality as "Lake Lamitoo," but examination of Whitmee's label on the specimen makes it clear that Beccari misread Whitmee's handwritten locality of "Lake Lanatoo." Beccari described the mature fruit as being obovoid to oblong and reflexed with a very eccentric apex. The foliar characteristics described for both species are nearly identical. In an earlier publication, Beccari stated that he had not seen the Pickering material (Beccari 1913) and hence probably described *C. onchorhynchum* without seeing the type of *Clinostigma samoense*.

Subsequent to Beccari's description, few specimens of *Clinostigma* collected from Upolu have been referred to as *Clinostigma samoense*; most have been referred to *C. onchorhynchum*. Burret (1928) placed in *C. onchorhynchum* several specimens which Rechinger (1910) had previously referred to *Cyphokentia samoensis* Warburg. Christophersen (1935) examined all of the *Clinostigma* specimens present in the Bishop Museum and found none to be conspecific with *Clinostigma samoense*. Subsequently Langlois (1976) reported finding and pho-

<sup>1</sup> This paper includes field work performed by both authors and reflects the general conclusions of the late Professor Moore; his tragic death occurred before this work had reached manuscript stage, however, and thus the responsibility for any errors is borne solely by Cox.

tographing (figs. 49, 50) both *C. onchorhynchum* and *C. samoense* on Upolu island at Afiamalu and Mofa (sic) Pass respectively, although collections were not cited. Voucher specimens collected by Cox (1980) near Afiamalu on Upolu in support of a study of crown relationships were also referred to *C. onchorhynchum*. I am aware of no collectors who have referred specimens to *C. samoense* since Beccari's (1914) description of *C. onchorhynchum*.

Concerned that *C. onchorhynchum* and *C. samoense* might indeed be the same species, we conducted a survey of *Clinostigma* populations in Upolu, Western Samoa. We also searched the island of Tutuila, American Samoa, for *Clinostigma* populations; Cox had previously seen a palm referable to *Clinostigma* in the mountainous interior of the island while Moore had heard reports of *Clinostigma* species in cultivation in Iliili village. These studies were a continuation of previous field work on *Clinostigma* in Samoa begun by Moore in 1971.

We found two localities of *Clinostigma samoense* in Tutuila Island, American Samoa (an anecdotal account of this discovery is found in Cox 1982). The first consisted of several trees (*Moore and Cox 10538*) in cultivation in the garden of Atualevao Maiu'u in Iliili village. Atualevao, age 75, told us that in about 1905 her father brought seeds of *C. samoense* from Lalomanu village in Upolu, Western Samoa and planted them in Iliili, American Samoa. He anticipated using the "niu vao" (*Clinostigma*) stems to use for substructure of huts and the leaves as thatching. Some *Clinostigma* palms were also said to have occurred in the lowland forest near Iliili (from introduced trees?) but none was seen subsequent to the clearing of the forest. The second locality on the island consisted of a single individual (*Moore and Cox 10539*) found about 3 km west of Aloau village at an altitude of about 760 m in primary forest. We therefore believe that *C. samoense* is an intro-

duced rather than an indigenous palm on Tutuila island; this view is in accordance with the floristic studies of Setchell, who did not report the palm from the island (Setchell 1924).

In Upolu we studied a variety of *Clinostigma* populations including those at Afiamalu, Lake Lanoataata, Tiavi Pass, Siumu Road, Le Pupue National Park, and Mafa Pass. We found a complete intergradation of *C. samoense* fruits and *C. onchorhynchum* fruits among the individuals of each population. For example, two palms, *Moore and Cox 10541* and *Moore and Cox 1054*, were found 50 m apart at the Le Mafa Pass population at an altitude of 360 m. *Moore and Cox 10541* (Fig. 1) had a gray, lichenous trunk about 6 m tall. Three inflorescences, one in a staminate flower, one in young fruit, and an intermediate were present. The staminate flowers were cream-colored, scented of violets, with pale filaments, yellowish anthers, and a pale pistillode. The fruits were red-brown, beaked, with liquid endosperm (Fig. 2c). Although the fruit characteristics match the description of *C. onchorhynchum*, we believe this to represent a late maturation stage of *C. samoense* since the neighboring tree (*Moore and Cox 1054*) was nearly identical in all respects, except that it had green, rounded fruits (Fig. 2d) ascribable to *C. samoense*.

Our conclusion that *C. onchorhynchum* is merely a later developmental stage of *C. samoense* is further confirmed by careful examination of the relevant types and other specimens. The type of *C. samoense*, collected by the U.S. Exploring expedition (GH), consists of part of a leaf, part of an inflorescence, and several fruits in various stages of early maturation (Fig. 2a). The immaturity of these fruits was recognized by Wendland (1862) in his type description. They are small, ovoid to slightly obovoid with an eccentric stigma, and only slightly beaked (Fig. 2a). Our collection of greenish, immature fruit as

cited above (*Moore and Cox 10542*, Fig. 2c) corresponds in all respects with the type of *C. samoense*. The fruits of the Whitmee collection used by Beccari as the type of *Clinostigma onchorhynchum* are obovoid to oblong, somewhat curved, with an eccentric stigma and a distinct beak (Fig. 2b). This type corresponds closely with our collection (*Moore and Cox 10541*, Fig. 2d) of mature fruits as cited above. We therefore propose that *Clinostigma onchorhynchum* be reduced to synonymy with *Clinostigma samoense*.

*Clinostigma samoense* H. A. Wendland, Bonplandia 10: 196. 1862. Type: Samoa, U.S. Exploring Expedition 1838-1840, s.n. (Holotype GH, isotype BH 380860 (fragments)).

*Clinostigma onchorhynchum* Beccari, Webbia 4: 284, 1914. Type: Samoa, J. Whitmee s.n. in August 1875. (Holotype FI; isotype BH (fragments), US).

**Synon. nov.**

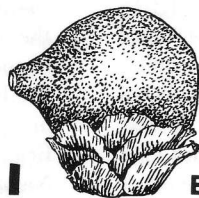
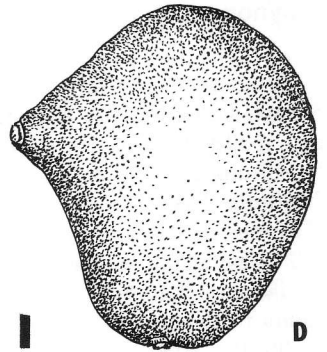
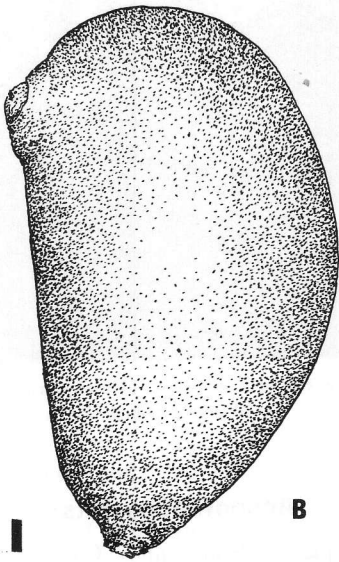
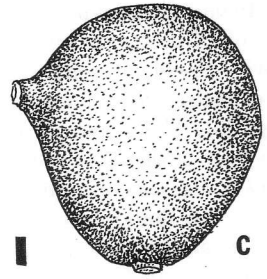
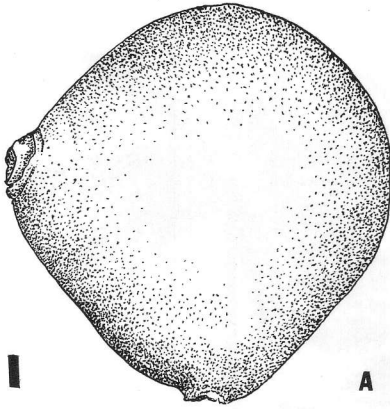
**SPECIMENS EXAMINED.** WESTERN SAMOA, UPOLU: U.S. Exploring Expedition, 1838-1840 (GH). (fragments from type fruits are also found in BH as BH 380860); Lake Lanotoo, 2,100 ft. alt., Whitmee (US); Lake Lanotoo, Reinecke 322 (US); hilltop on edge of fernland east of Tiavea, Whistler 4196 (US); Apia-Siumu road, south side of ridge, elevation 1,500 ft., Bristol 2179 (US); Mt. Fia Moe, Cox 153 (GH); Sauniatu inland from Salafuata, Moore and Fasavalu 9983 (BH); ridge above Tiavi at highest point on road from Apia to Siumu, 740 m alt., Moore, Fasavalu, and Haskell 9978 (BH); Le Mafa Pass, 360 m alt., Moore and Cox 10541 (BH); Le Mafa Pass, 360 m alt., Moore and Cox 10541 (BH); Le Mafa Pass, 360 m alt., Moore and Cox 10542 (BH). AMERICAN SAMOA, TUTUILA: Ilili, in garden of Atualevao Maiu'u, Moore and Cox 10538 (BH); west of Aloau village on ridge, Moore and Cox 10539 (BH).



1. *Clinostigma samoense* at Le Mafa Pass, Upolu, Western Samoa

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2. a. Fruit from type of *Clinostigma samoense* Wendland. In this and all other drawings, the bar is equivalent to a length of 1 mm. b. Fruit from type of *Clinostigma onchorhynchum* Beccari. c. Fruit from *Moore and Cox 10542*. d. Fruit from *Moore and Cox 10541*. e. Fruit from *Reinecke 322*