

# Beccari's "Grande Nouveauté": the Discovery, Taxonomic History and Typification of *Pelagodoxa henryana*

JOHN LESLIE DOWE  
*Australian Centre for  
Tropical Freshwater Research  
James Cook University  
Townsville  
Qld 4811 Australia*

AND

MELANY H. CHAPIN  
*Bernice P. Bishop Museum  
Research Associate  
Hawaii, USA*

*Pelagodoxa henryana*, one of the palm family's most distinctive and highly threatened species, was first collected from the Marquesas in 1916 by Charles Henry. The following year, Odoardo Beccari established the genus and named the type species after the collector. The relationship of *Pelagodoxa* to other palms has puzzled botanists, but by applying advanced research techniques along with precise morphological examination, a clearer understanding of its position within the family has been made possible. A search of relevant herbaria indicated that the materials on which *P. henryana* was described were not extant, and therefore *P. henryana* is lectotypified here with illustrations that accompanied the protologue.

*Pelagodoxa* and its type species *P. henryana* were established and described by Beccari (Bois 1917), based on a collection made by Charles Henry in 1916 from Nuku Hiva, Marquesas Islands in the Pacific Ocean. Specimens of fruits and a set of photographs were originally

sent by Henry to the horticultural botanist Désiré Bois then editor-in-chief of *Revue Horticole*, at the Muséum d'histoire naturelle in Paris. Bois passed them on to Beccari, described as "*le savant palmographe de Florence*." Beccari's new genus and species were included as a

footnote in Bois' (1917) paper '*Palm nouveau des Iles Marquises*' in *Revue Horticole*. Beccari included with his protologue two illustrations of fruit, one by an unknown artist (Fig. 1) and the other by his own distinctive hand (Fig. 2). In an accompanying letter sent with the protologue and quoted by Bois, Beccari noted a similarity with *Teysmannia altifrons* [= *Johannesteijsmannia altifrons*] and *Manicaria saccifera*, but he could not ascertain the systematic position of this "*grande nouveauté*."

Subsequently, Henry (1918) made a brief reference to *P. henryana* in a paper about the flora of the Marquesas, describing "*une autre sorte de Palmier, peut-être inconnue, a feuilles entières et argentées du plus bel aspect*" [another kind of palm tree, perhaps unknown, with entire leaves and with a silver coloration giving it a beautiful appearance] and including a footnote, apparently included by the editor, about its recent formal description. The following year Bois (1919) provided a summary and partial quote of Beccari's protologue of *P. henryana* and emphasized the uniqueness of the species.

Although Beccari did not specifically explain his choice of name for the new genus, derivation of the generic name comes from the Greek *pelagos*, meaning the sea or flowing water, and *doxa*, meaning praise or glory, and can be construed as 'glory of the oceans.' According to Bois (1917), Henry described the habitat as being at low altitude, in very shady places near pools on slopes under a canopy of *Hibiscus tiliaceus* L. Henry was active in plant collecting in the Marquesas from 1916 to 1922 and was the author of at least two papers on the flora of the archipelago (Henry 1918, 1920). Biographical information on Henry has been elusive. He was the Director of the French Society of the Marquesas around this time, and his few collections, mainly deposited in Paris Herbarium, are mostly cultivated species that occurred in gardens or in agriculturally disturbed sites. This suggests that Henry may have been involved with, or had an interest in agriculture or crop plants.

In 1920 and 1921, Charles Henry sent seeds from the Marquesas to the horticulture department of the Muséum d'histoire Naturelle in Paris. Unfortunately these either arrived in a desiccated condition or perished soon after germination (Bois 1924). The young seedlings had what was identified as a fungal problem, which was called "*Penicillium incarnatum*." This may have been *Gliocladium vermoeseni*

(Biourge) Thom, a pathogen that afflicts many palms today. It caused the young seedlings of *Pelagodoxa* to damp off and perish. The difficulty of growing *P. henryana* in a cool climate was soon recognized, and cultivation was recommended in either heated greenhouses or in gardens within tropical locations.

A second species of *Pelagodoxa*, *P. mesocarpa* Burret, was described by Burret (1928), based on a collection made by the botanist Hugh Cuming, labeled as collected in New Caledonia. However, Cuming never visited New Caledonia, so the origin of the type material of that taxon remains in doubt. The Cuming specimen is extant in Berlin Herbarium (B) (J. Dransfield pers. comm.). Burret described *P. mesocarpa* with somewhat smaller fruits than *P. henryana*, but this was the only character used to distinguish the two species (Fig. 3).

Beccari (in Boise 1917) was unable to provide a complete description of *P. henryana* in the

1. Part of the lectotype of *Pelagodoxa henryana*, in D. Bois, *Revue Horticole* 15: 302, fig. 76 (1917).

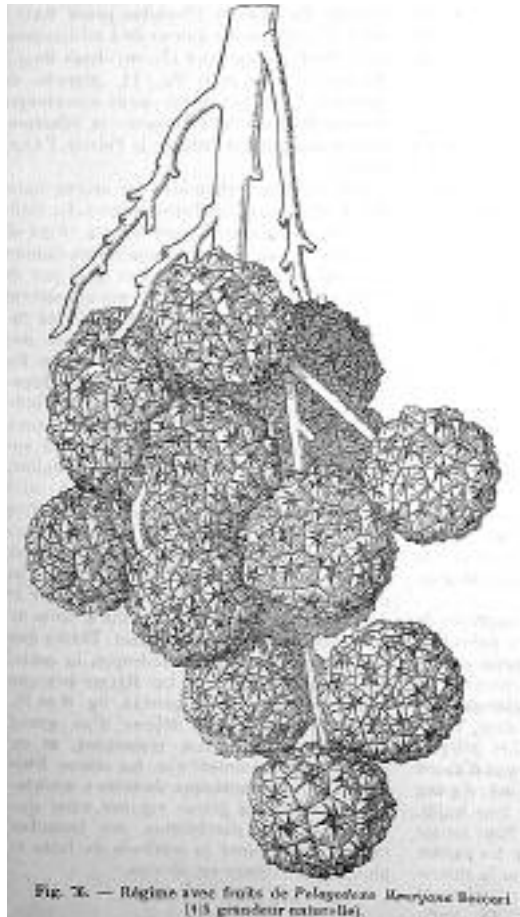
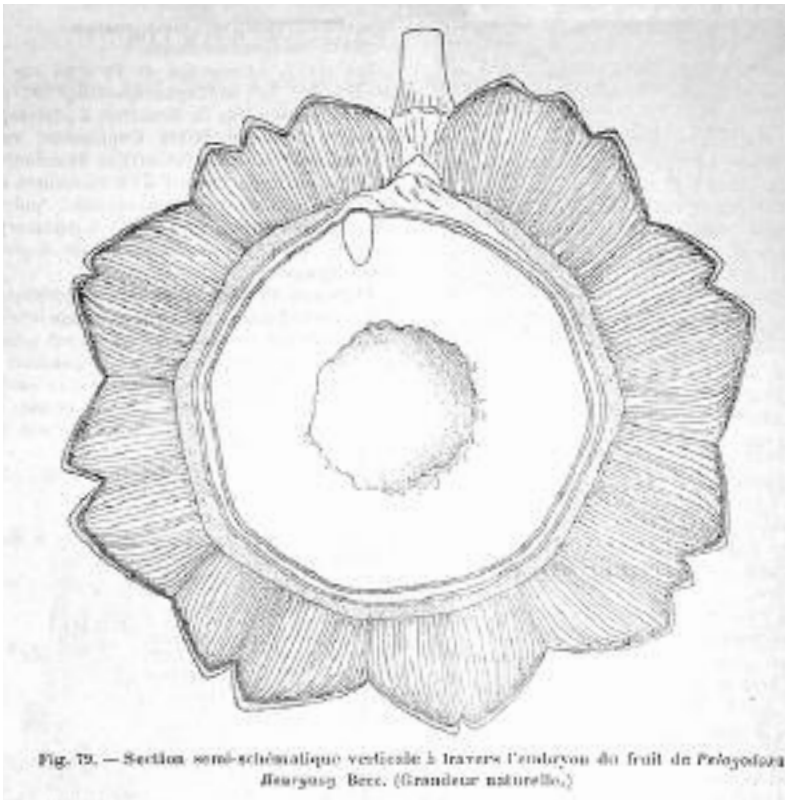


Fig. 76. — Régime avec fruits de *Pelagodoxa henryana* Beccari (1/3 grandeur naturelle).



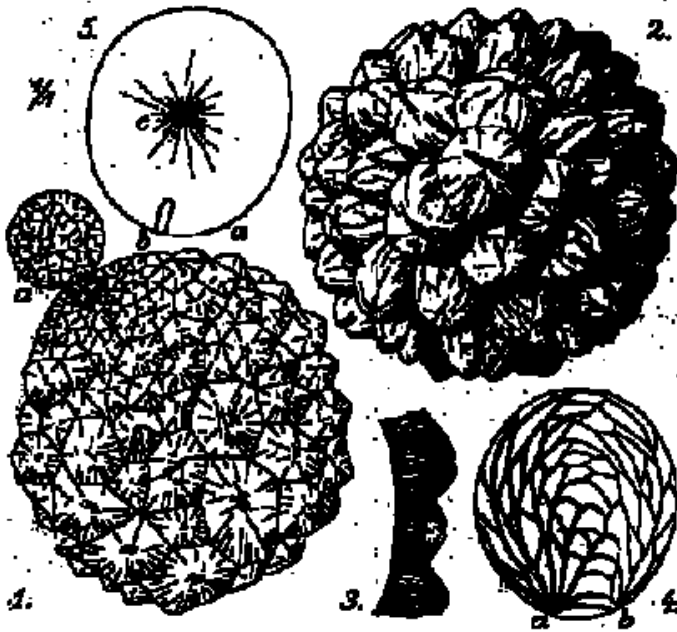
2. Part of the lectotype of *Pelagodoxa henryana*, in D. Bois, *Revue Horticole* 15: 304, fig. 79 (1917).

protologue because of lack of material. It was Martelli (1932) who presented the first thorough description. Martelli had additional collections at his disposal and had also corresponded directly with the collector, Charles Henry, who was by then residing in Paris, as well as Father Simeone Delmas, a missionary who had spent 40 years in the Marquesas. The description did not include female flowers, but otherwise Martelli suggested that there was a close relationship between *Pelagodoxa* and *Orania*. Martelli (1935), while confirming the identity and status of the genus and *P. henryana* in his work on the synonymy of palm genera in the tribe Areceae, appears to have overlooked Burret's *P. mesocarpa*.

In a posthumous treatment of the Arecoideae based on Beccari's unpublished notes, *Pelagodoxa* was placed as a "*Genus incertae sedis*" [unable to be placed genus] (Beccari & Pichi-Sermolli 1955). In that work, the close relationship of *Pelagodoxa* to *Sommieria* was clearly outlined, and the placement of the genus in the Iguanurinae was proposed. The second species, *P. mesocarpa*, was maintained, although no comments as to its validity as a distinct species were provided.

The inclusion of *P. mesocarpa* as a second species was accepted by Moore (1957), but it was subsequently placed in synonymy under *P. henryana* in Moore's treatment of Fiji palms (Moore 1979). Current accounts consider *Pelagodoxa* to be a monotypic genus (Uhl & Dransfield 1987, Govaerts & Dransfield 2005).

*Pelagodoxa* has always been of considerable interest and perplexity to palm botanists because of its unusual set of characters, its undetermined relationship to other genera, and its difficulty in systematic placement. Beccari, when establishing the genus, suggested there were gross similarities to *Johannesteijsmannia* and *Manicaria*, based on leaf size and form, and the appearance of the large fruit (Bois 1917). He otherwise could not ascertain with any confidence the systematic position of the genus without examining the "intimate structures" of the flowers and fruit. Burret (1928) recognized a relationship with *Sommieria*, among other genera. Martelli (1932) placed it in his '*Orania* group,' then later in the tribe Areceae (Martelli 1935), and Beccari and Pichi-Sermolli (1955) tentatively placed it within the Iguanurinae. Tomlinson (1961) found leaf morphology very distinct, in that *P. henryana* had a unique arrangement of cells around the stomata, but otherwise could not



3. Illustration of *Pelagodoxa mesocarpa* in M. Burret, Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem 10: 287, fig. 3 (1928).

relate it to other genera. In a novel arrangement of the palm family, Satake (1962) placed *Pelagodoxa* in the Phytelphantoideae along with *Phytelphas*, *Sommieria* and *Manicaria*.

Moore (1973) organized the Arecaceae according to the evolution of palms as it was understood at that time. Of the 27 genera that Moore included in his 'Clinostigma alliance,' he placed *Pelagodoxa* closest to *Neoveitchia*, *Sommieria* and *Iguanura*. Subsequently, Dransfield and Uhl (1986) included it formally within the Iguanurinae and later suggested a possible relationship to *Heterospatha* but otherwise noted "it does remain very isolated" (Uhl & Dransfield 1987, p. 420).

Essig et al. (1999), in a histological study of fruits in the Iguanurinae, concluded that there was nothing in the pericarp structure of *Pelagodoxa* that could be used to infer generic relationships. However, the lack of an operculum in *Pelagodoxa* [the presence of an operculum is a defining character of genera in the Iguanurinae] indicated that the genus was misplaced in the Iguanurinae (Chapin et al. 2001), and that its systematic position should be reconsidered. Chapin and Dowe (2005) concluded that three distinct fruit size cohorts exist in the known population of *P. henryana*, and that selection and distribution by humans has played some part in that situation. However, variation in fruit size *per se* should not necessarily indicate that the taxonomy of

the species should be reconsidered, as fruit size variation is apparent in many palm species.

Once molecular work began refining the phylogenetic placement of Arecaceae, it became apparent that some genera in the tribe Arecaceae were indeed "misplaced." When samples included members of the Iguanurinae, they indicated this subtribe to be paraphyletic. As more molecular studies were conducted they too began to suggest the paraphyly of the Iguanurinae (Hahn 2002a, 2002b, Lewis & Doyle 2002). DNA sequence data consistently placed *Pelagodoxa* and *Sommieria* in a strongly supported sister relationship isolated from other genera (Lewis & Doyle 2002). Additional molecular work using low-copy nuclear DNA and mapping of morphological data of the Indo-Pacific Arecoid palm genera also supported *Pelagodoxa* and *Sommieria* as immediate relatives, thus concurring with Lewis and Doyle's placement (Norup et al. 2006). Floral studies further supported a close relationship of these two genera and reinforced the isolation of them from other palms (Stauffer et al. 2004). In consideration of their uniqueness and isolation, *Pelagodoxa* and *Sommieria* have recently been placed in their own tribe, the Pelagodoxeae (Dransfield et al. 2005).

#### Typification

Beccari's protologue of *P. henryana* (Bois 1917) was based on a collection of fruits and a photograph of a plant in habitat, all of which

4. Undated specimen of *Pelagodoxa henryana* in Florence Herbarium (FI) of fruits/seeds suspected to be failed germinants sent by Bois to Beccari after 1917.



were provided by Charles Henry from a collection he made in the Marquesas in 1916. To determine whether or not any of the original plant material was extant, we attempted to locate the collections made by Henry in both the Florence (FI) and Paris (P) herbaria. The search at Florence was based on the historical precedent that Beccari very often placed material there of species that he described. Sometimes he kept only a fragment of a collection if it was to be returned to another herbarium. After Bois received the original materials of 1916 from Henry, they were then sent to Beccari from Paris. It likely follows that once Beccari had finished with the materials they were returned to Bois, except for possible fragments that Beccari retained. The focus of the search of Paris was based on the fact that that was where the Henry materials were dispatched from, and would likely have been returned to. Secondly, Moore (1979) in his treatment of *P. henryana*, noted that a specimen that he reservedly proposed as the type, was extant in Paris.

The collection managers, other staff at FI and P, and colleague Dr. Fred Stauffer were contacted with the request to locate any material that may be relevant to the typification of *P. henryana*, as well as any other associated specimens collected and deposited in those herbaria. Images of all materials of *P. henryana* were examined by the authors. The search of Florence resulted in the location of a number of specimens, none of which could be considered as type material. The earliest collection located in FI was dated 1916, and

this was of a portion of inflorescence and flowers only, and not relevant to the protologue. Another collection, dated October 1919 was similarly of a portion of inflorescence and flowers. The only fruit specimens located had had their epicarps removed and consisted of partially decayed seeds and remnant mesocarp. These specimens were undated and accompanied by a note stating that they had been sent by Bois. Bois (1924) discussed the germination attempts of *P. henryana*, and that certain batches of fruit, sent from the Marquesas on separate occasions, had either arrived in a desiccated condition in Paris, or otherwise failed to germinate. It is suspected that all the fruit specimens in Florence are failed germinants sent by Bois to Beccari, after 1917 (Fig. 4).

The search of Paris revealed a group of four sheets consisting of leaves or portions of leaves, annotated as being collected by Henry in August 1920. There were also two apparently separate collections of fruit in the carpological collection; one fruit collection was in a box with two labels, one label stated that it was a collection by Henry in 1917, and the other label lacked a reference to a collector or date. The second collection, in a plastic bag, was designated as collected by Henry but undated. The specimen cited by Moore in 1979 was amongst the group of leaf specimens, and annotated by him as a questionable "isotype?" during a visit to Paris in 1977 (Fig. 5). Neither this specimen, nor any of the others in Paris, can be accepted as a type of *P. henryana*, as the collection date of these specimens postdates

publication of the name and lacks the material upon which Beccari based his protologue or are otherwise undated. From our herbarium searches, we concluded that Henry's original 1916 collection of fruits was not extant, or if indeed was extant and was one of the undated collections in the carpological section, was otherwise unable to be positively identified. Therefore, in the absence of specimens unequivocally related to the protologue, choosing a new type specimen for the species was required.

The procedure for assigning a new type for a name for which the holotype material has been lost or destroyed is outlined in Articles 9.2, 9.9, 9.10 and 9.11 in the *International Code of Botanical Nomenclature* (Greuter et al. 2000). A new type can be chosen either from materials that were inextricably associated with the protologue, in the absence of an isotype, syntype or paratype, and would be a lectotype, or other materials that may or may not be directly related to the protologue, and would

be designated as a neotype. In the case of *P. henryana*, the only materials used by Beccari in the protologue were an infructescence, fruit, and a photo of the species in habitat. The illustrations of fruit published along with the protologue were more than likely drawn from the Henry specimens, and as the illustrations are materials associated with the protologue, they can therefore be chosen as the lectotype of *P. henryana*. The use of illustrations as types has many examples in palm taxonomy. The updated taxonomy and typification of *P. henryana* is as follows:

*Pelagodoxa henryana* Becc. in Bois, Rev. Hort. n.s. 15: 302. 1917. Type: Lectotype (here designated). Illustrations in D. Bois, Rev. Hort. n.s. 15: 302–304, figs. 76 & 79 1917 (herein reproduced in Figs. 1 & 2).

*Pelagodoxa mesocarpa* Burret, Notizblat. Bot. Gart. Berlin-Dahlem 10: 288. 1928. Type: New Caledonia, *H. Cuming s.n.* (holotype: B).



5. Specimen of *Pelagodoxa henryana* collected by Charles Henry and dated 21 August 1920 in Paris Herbarium (P) labelled as 'isotype?' by H.E. Moore Jr. This specimen cannot be the type of *P. henryana* as the collection date postdates publication date of the protologue (1917).

Specimens located in Florence and Paris: "Enui," Marquises, 17 July 1916, *C. Henry s.n.* (FI); Iles Marquises, Nuku Hiva, October 1919, *C. Henry s.n.* (FI); Is Marquesas [from Bois], undated, *anon.* (FI, carpological collection); Is Marquesas, undated, *Delmas s.n.* (FI, carpological collection); Iles Marquises, 21 August 1920, *C. Henry s.n.* (P); Iles Marquises, 1917, *Henry s.n.* (P, carpological collection in a box); Iles Marquises, undated, *Henry s.n.* (P, carpological collection in a plastic bag).

### Conclusion

The circuitous route of discovery and documentation of *Pelagodoxa* and the meandering process of investigating its phylogenetic position are as unique as its morphology and anatomy suggests. Beccari's assessment of *Pelagodoxa* being a '*grande nouveauté*' is still valid, as it remains one of the greatest novelties in the palm family, both morphologically and historically.

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## TROPICAL PLANT & SEED LOCATORS

**Adenium obesum** - Desert Rose

**Bismarckia nobilis** - Bismarck Palm

**Chambeyronia macrocarpa**  
Red Feather Palm

**Hyophorbe lagenicaulis** - Bottle Palm

**Ravenea rivularis** - Majesty Palm

**Wodyetia bifurcata** - Foxtail Palm

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