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66 part 1

Lectotypification of the species of *Pandanus* (Pandanaceae) from Madagascar described by U. Martelli and R.E.G. Pichi-Sermolli

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Lectotipificazione delle specie di Pandanus (Pandanaceae) del Madagascar descritte da U. Martelli e R.E.G. Pichi Sermolli — Fino ad ora il più importante contributo alla tassonomia della famiglia Pandanaceae per il Madagascar sono state le 38 specie descritte da U. Martelli e R.E.G. Pichi Sermolli nel 1951, pubblicate nelle *Mémoires de l'Institut scientifique de Madagascar*. Queste nuove specie furono basate su 83 raccolte fatte da H. Perrier de la Bâthie tra il 1898 e il 1928, molte delle quali hanno richiesto la tipificazione in accordo con l'ICBN. Abbiamo pertanto fatto uno studio completo di tutto il materiale disponibile nei due principali erbari di riferimento: l'Herbarium Centrale Italicum (FI) e l'erbario del Muséum d'Histoire Naturelle in Paris (P), anche a seguito di approfondite ricerche sul genere *Pandanus* svolte sia in campo che in laboratorio svolte da due degli autori (MWC & MOL). Vengono riportati commenti per ciascuna specie trattata in merito ai materiali esaminati e alle scelte nomenclaturali adottate.

Key words: lectotypification, Madagascar, *Martellidendron*, nomenclature, *Pandanaceae*, *Pandanus*.

In 1934, after the death of Ugolino Martelli, Prof. Henri Humbert from the *Muséum National d'Histoire Naturelle* in Paris asked Rodolfo E.G. Pichi-Sermolli to complete a manuscript on the dioecious genus *Pandanus* Parkinson (Pandanaceae) in Madagascar that Martelli had left unpublished. Seventeen years later, after

careful revision and with many additions to the manuscript, this important work containing the descriptions of 38 new species endemic to Madagascar was published in the *Mémoires de l'Institut scientifique de Madagascar* (Martelli & Pichi-Sermolli, 1951). The species were all based on the 83 collections of *Pandanus* made

by Henri Perrier de la Bâthie. Earlier, Martelli (1907, 1914) had published five new species from Madagascar based on the material collected by Mr. Rollot, an agricultural officer for the French colonial agricultural service based on the East Coast in Toamasina.

Perrier de la Bâthie made a total of more than 20,000 plant collections in Madagascar between 1898 and 1928 (Humbert, 1958). His collections are often accompanied by valuable annotations about the plant's habitat, biology and morphology based on his observations in the field, but often with highly generalised locality data and at best only the month of collection indicated. Perrier de la Bâthie renumbered many of his collections, giving series of consecutive numbers to groups of collections belonging to a single genus, such that adjacent numbers do not usually represent a chronological series of gatherings collected at a single or nearby localities.

Perrier de la Bâthie's *Pandanus* specimens were initially housed in the Muséum National d'Histoire Naturelle in Paris (P), but were sent on loan to the Herbarium Centrale Italicum in Florence (FI) for study by Martelli. Subsequently some of the specimens (mostly duplicates) were donated to Florence while the majority of the loaned specimens were returned to Paris. Martelli and Pichi-Sermolli did not designate individual parts of a specific gathering as the holotype for each of their new species in their publication or by annotations of the specimens themselves. As a result, most of the species described by Martelli and Pichi-Sermolli are based on two or more specimens, which are now housed in either (or both) of the two different institutions. In such cases, as well as those for which the original type material comprises a mixture of specimens collected (for example if a collection comprises both pistillate and staminate material), the species require lectotypification according to Art. 9.4 of the International Code of Botanical Nomenclature (ICBN) since they are based on syntypes. In the ICBN a syntype is defined as: «*any specimen cited in the protologue when there is no holotype, or any one of two or more specimens simultaneously designated as types*», as qualified by Art. 37.2: «*when the type is indicated by reference to a gathering that consists of more than one specimen, those specimens are syntypes*» (McNeill et al., 2006).

Interpretation of species of dioecious plants always presents a special challenge to taxonomists since material of a both pistillate and staminate individuals from a single population is not always available. In the genus

Pandanus this is further complicated by the fact that the stout stems, large leaves and enormous woody fruits of most species are not well represented by standard collecting techniques and as a result herbarium specimens are often fragmentary and incomplete and each specimen usually comprises a set of material including parts pressed and mounted, and syncarps and drupes conserved in spirit and in dry carpological collections.

Perrier de la Bâthie's practice of renumbering his collections sometimes poses problems for the correct typification of taxa based on his specimens. Among his *Pandanus* collections, several sets of specimens bearing a single number comprise separate staminate and pistillate specimens, and which, given that *Pandanus* species are all dioecious, must have originated from different individuals. While it is possible that a mixed set of specimens of this kind may represent a single gathering, for the purposes of lectotypification the staminate and pistillate material should not be regarded as part of a single specimen. Article 8.2 of the International Code of Botanical Nomenclature (ICBN) accepts that a type specimen may comprise multiple individuals (or parts of multiple individuals) preserved at a single institution, but it is explicit that these must be from a single gathering (McNeill et al., 2006). Furthermore Article 8.3 states that a specimen may be mounted as more than one preparation, as long as the parts are clearly labeled as being part of that same specimen and these constitute a single multipart specimen (McNeill et al., 2006). We interpret the multiple parts of Perrier de la Bâthie's *Pandanus* collections that are housed in either Paris or Florence herbaria to comprise multipart specimens of either staminate or pistillate gatherings and we have lectotypified accordingly in agreement with Article 8 of the ICBN.

During the past ten years numerous contributions have been published by MWC and MOL and other collaborators in the context of a global revision of the family Pandanaceae (Callmander, 2001; Callmander et al., 2003a, b, c, 2008, 2009, 2010; Callmander, Laivao, 2002, 2003a, b; Laivao et al., 2000, 2006 & 2007). This ongoing study includes taxonomic revisions of many sections of *Pandanus* and the transfer of six Malagasy species from *Pandanus* to the genus *Martellidendron*, three of which were originally described by Martelli & Pichi-Sermolli (1951), and the lectotypification of one of Martelli's species (Callmander et al., 2003). A thorough study of the material on which Martelli and Pichi-Sermolli's species are based was clearly necessary,

and this has now been completed by MWC and MOL (with the assistance of CN at FI, and PBP at P). In the present article we present the results of this work, discussing the nomenclature of the 38 species described by Martelli & Pichi-Sermolli (1951), and selecting lectotypes as needed. In our choices of lectotype we have been guided by the usual criteria and the recommendations in the ICBN, after completing a thorough examination of all Perrier de la Bâthie's *Pandanus* collections deposited in Florence (FI) and in Paris (P), and the few duplicates present in Antananarivo (TAN), Geneva (G), St. Louis (MO) and Washington (US). We have generally selected a suitable pistillate specimen rather than a staminate specimen as a lectotype when the choice existed, since characters of the former are generally better known and have proved more useful taxonomically. In fact, staminate specimens are not known for more than half of the species of *Pandanus* from Madagascar. In some cases we have designated a lectotype that comprises multiple fragments which have been mounted on separate sheets or stored in the carpological collection at a single institution but that are believed to comprise samples that represent a single gathering. This is permissible under the ICBN (Art. 8.3), and we believe it is desirable in the case of large plant species where material mounted on a single standard herbarium sheet is inadequate to represent its morphology. In the interests of clarity we have systematically noted known isoelectotypes (duplicates of the lectotype), and lectoparatypes (original syntype material other than the lectotype and its duplicates).

Collections cited were post-facto georeferenced as far as possible using the "Gazetteer to Malagasy Botanical Collecting Localities" (<http://www.mobot.org/MOBOT/Research/madagascar/gazetteer/>) and other sources, data which are surrounded by square brackets in the citation of collections examined. It is important to notice that the barcode numbers at P refer to individual specimen parts, while a single number is provided for all elements of a collection at FI, we therefore specify the number and the location (i.e. carpological collection = carpo.) for the collections held at FI.

Nomenclature

In this section we present nomenclatural details of the 38 taxa in alphabetical sequence, and designate lectotypes where necessary. The species not referred to the

genus *Martellidendron* are listed under their accepted names in this genus. Certain of the species are no longer accepted as distinct species, in which case comments on the currently accepted name are also provided.

1. *Martellidendron androcephalanthos* (Martelli) Callm. & Chassot, *Taxon* 52: 756. (2003).

= *Pandanus androcephalanthos* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 27, fig. 3 (1951). **Lectotype:** Madagascar. Prov. Antsiranana, Lokobe Reserve, Nosy Be, [13°40'S, 48°30'E], 10.1909, *Perrier de la Bâthie 10936* (P[P00141774]!), (staminate) (designated by Callmander *et al.*, 2003); **Isolectotype:** (FI[FI000955]!).

Pandanus androcephalanthos was based on two collections, *Perrier de la Bâthie 10936* and *10996*. These two specimens definitely do not belong to the same species and the former was selected as the lectotype by Callmander *et al.* (2003). The excluded syntype, *Perrier de la Bâthie 10996* is a specimen of *M. cruciatum* (Pic. Serm.) Callm. & Chassot (see Callmander, 2001: 367-368).

2. *Martellidendron cruciatum* (Pic. Serm.) Callm. & Chassot, *Taxon* 52: 756. (2003).

= *Pandanus cruciatus* Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, série B, 3: 33-34, fig. 1d-l (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, entre Andilamena et Mandritsara, près d'Ampataka, c. 900 m, s.d., *Perrier de la Bâthie 14979* (FI[FI000959: 1 sheet]!, FI[carpo.]!) **Isolectotypes:** (P[P00141776]!, P[P00568713: carpo.]!) (Fig. 3).

= *Pandanus hermaphroditus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 31-32, fig. 4a-d (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, forêt d'Analamazaotra, [18°57'20"S, 48°24'30"E], 800 m, s.d., *Perrier de la Bâthie 11010* (P[P00141782, P00141783, P00141784, P00141785, P00141786, P00141787]!). **Isolectotype:** (FI[FI001003: 2 sheets]!).

Pandanus cruciatus Pic. Serm. is based on a single leaf with separate drupes mounted on one sheet and a few drupes in the carpological collection at FI and at P. In our revision of *Pandanus* subgen. *Martellidendron* (Pic. Serm.) Callm. & Chassot (Callmander, 2001), which is now considered to be a separate genus (Callmander *et al.*, 2003), we did not fully resolve the nomenclature of *P. cruciatus* and its synonym *P. hermaphroditus*. The most complete material of *M. cruciatum* is held at FI with a sheet that comprises a complete leaf and a specimen packet with separate

drupes (some drupes are also present in the carpological collection), and this material is collectively selected as the lectotype.

Pandanus hermaphroditus is based on a single staminate collection: *Perrier de la Bâthie 11010*. Paris herbarium holds six sheets comprising leaves, bracts and spikes of the staminate inflorescence whereas only two sheets are present at FI (also comprising leaves, bracts and spikes). More representative material is present at P than at FI, so we designate the six individual parts at P collectively as the lectotype.

3. *Pandanus acanthostylus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 140-141, fig. 24a-d (1951). **Holotype: Madagascar. Prov. Fianarantsoa, bords de torrents du haut Matsiatra, Imody, 900 m, [21°01'S, 46°38'E], 5.1920, *Perrier de la Bâthie 13122* (FI[FI000957: 1 sheet]!).**

Pandanus acanthostylus Martelli is based on a single herbarium sheet at FI that is composed of a cluster of lateral leaves and a specimen packet with numerous drupes. There is no evidence that this is a mixed gathering, and no collection has been found elsewhere. The specimen is thus regarded as the holotype.

4. *Pandanus alpestris* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 144, fig. 25e-o (1951). **Holotype: Madagascar. Prov. Antsiranana, Mont Tsaratanana, [13°57'S, 48°51'E], 12.1912, *Perrier de la Bâthie 11898* (FI[FI000956: 1 sheet]!) (Fig. 1).**

Pandanus alpestris Martelli is based on a single herbarium sheet at FI comprising a single complete leaf and a specimen packet with numerous drupes. There is no evidence that this is a mixed gathering, and no collection has been found elsewhere. The specimen is thus regarded as the holotype.

5. *Pandanus ambongensis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 83, fig. 15, 16e-h (1951). **Lectotype designated here: Madagascar. Prov. Mahajanga, Firingalava (petit affluent de droite de l'Ikopa), Sitampika, entre Maevatanana et Andriba, 50-100 m, [16°56'S, 48°43'E], 9.1904, *Perrier de la Bâthie 729* (P[P00459604, P00459605, P00219136: excl. staminate material in the specimen packets for the 3 sheets]!; P[P00568770: carpo.]!). **Isolectotypes:** (FI[FI000954: 1 sheet: excl. st. sheet, carpo.]!). **Lectoparatypes:** (P[P00459604,**

P00459605, P00219136: specimen packets containing staminate material for the 3 sheets]!; P[P00459606, P00459607]!; FI[FI000954: st. sheet]!).

The type collection of *P. ambongensis*, *Perrier de la Bâthie 729*, is represented at P by five mounted sheets and two and a half mature syncarps and a separate peduncle in the carpological collection, and at FI by two mounted sheets (one pistillate and one staminate) and two mature syncarps in the carpological collection. The type material thus represents a mixture of at least two individuals, one pistillate and one staminate. Among this material, we select the pistillate sheets as the lectotype. Three sheets at P are a mix between pistillate and staminate material. We therefore exclude from the lectotype the staminate material present in specimen packets for these sheets (P00459604, P00459605, P00219136) from the lectotype. The material held at FI herbarium is rather poor with one sheet bearing a specimen packet with mature drupes and a picture of the habit of the plant and a sheet with leaves and fragments of a staminate inflorescence. It is important to note that two collections bear a type label at FI (*Perrier de la Bâthie 729 and 10931*). Nevertheless, *Perrier de la Bâthie 10931* is merely a paratype (Martelli & Pichi-Sermolli, 1951: 83). We selected the more complete pistillate material at P as the lectotype, it is mounted on three separate sheets with additional material present in the carpological collection.

6. *Pandanus analamazaotrensis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 116-117, fig. 19a-l (1951). **Lectotype designated here: Madagascar. Prov. Toamasina. Forêt d'Analamazaotra, 800 m, [18°56'S, 48°26'E], 12.1914, *Perrier de la Bâthie 4607* (P[P00459608, P00459610, P00459611, P00459612, P00459613, P00459614]!); **Isolectotypes:** (FI[FI000952: 1 sheet excl. the pistillate sheet, carpo. (test-tube)]!). **Lectoparatypes:** (P[P00568771, P00459609]!; FI[FI000952: pist. sheet]!) (Fig. 2).**

Material at P includes seven mounted sheets (six comprise a staminate inflorescence and bracts and one comprises young syncarps and bracts). *Perrier de la Bâthie 4607* is also represented in the carpological collection by a young infructescence and one mature syncarp. Material in FI is mounted on 2 sheets: one sheet includes part of a staminate inflorescence with bracts (with some stamens in a test-tube in the carpological collection), the other has two specimen pack-

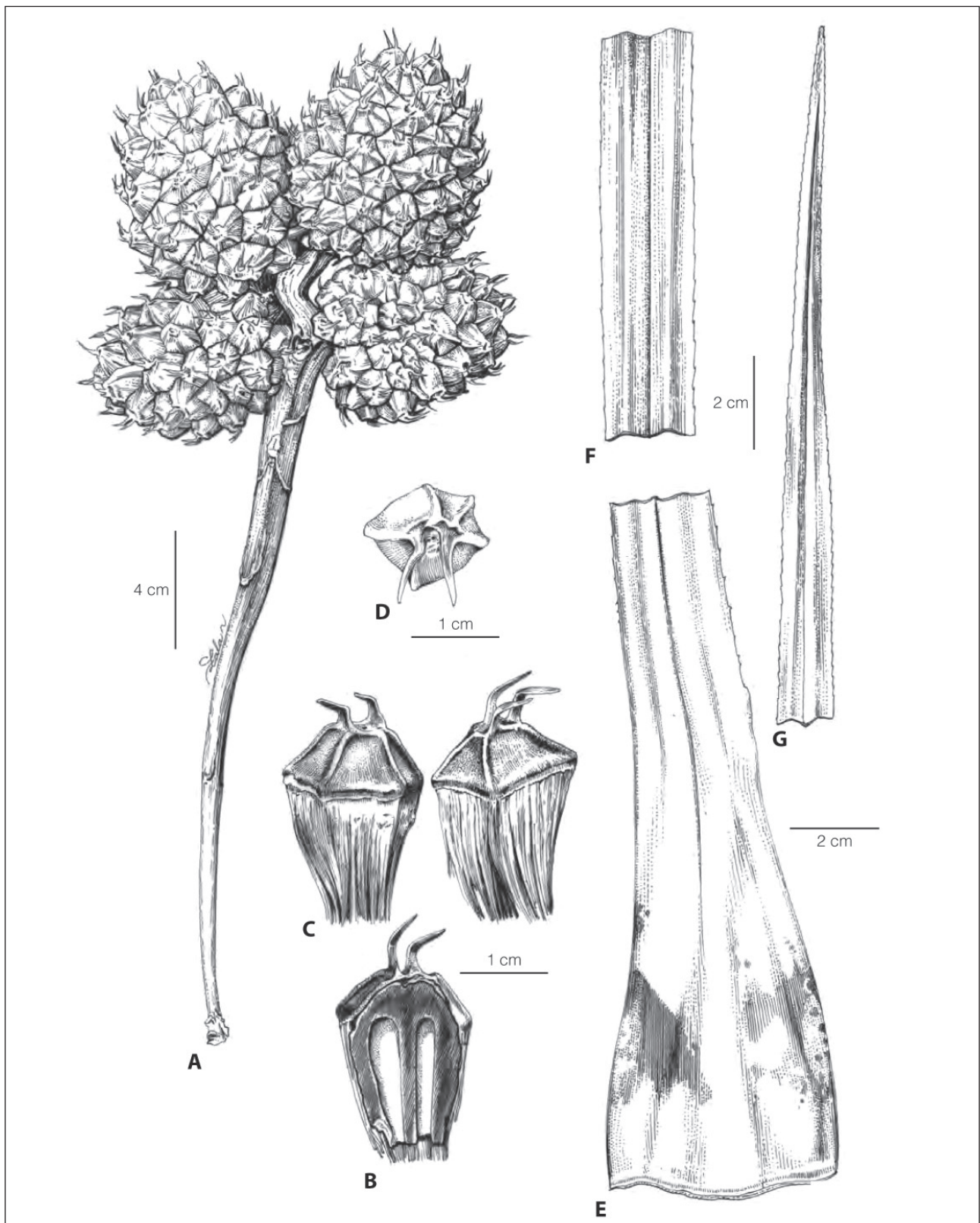


Fig. 1 – *Pandanus alpestris* Martelli - A. Polysyncarpic infructescence; B. Longitudinal section of a drupe; C. Lateral view of two drupes; D. Apical view of a drupe; E. Base of a leaf; F. Midsection a leaf. G. Apex of a leaf (A-D: *Rakotovoao & al.* 2425 (TAN); E-G: *Callmander et al.* 143 (TAN), drawings: R. L. Andriamiarisoa).

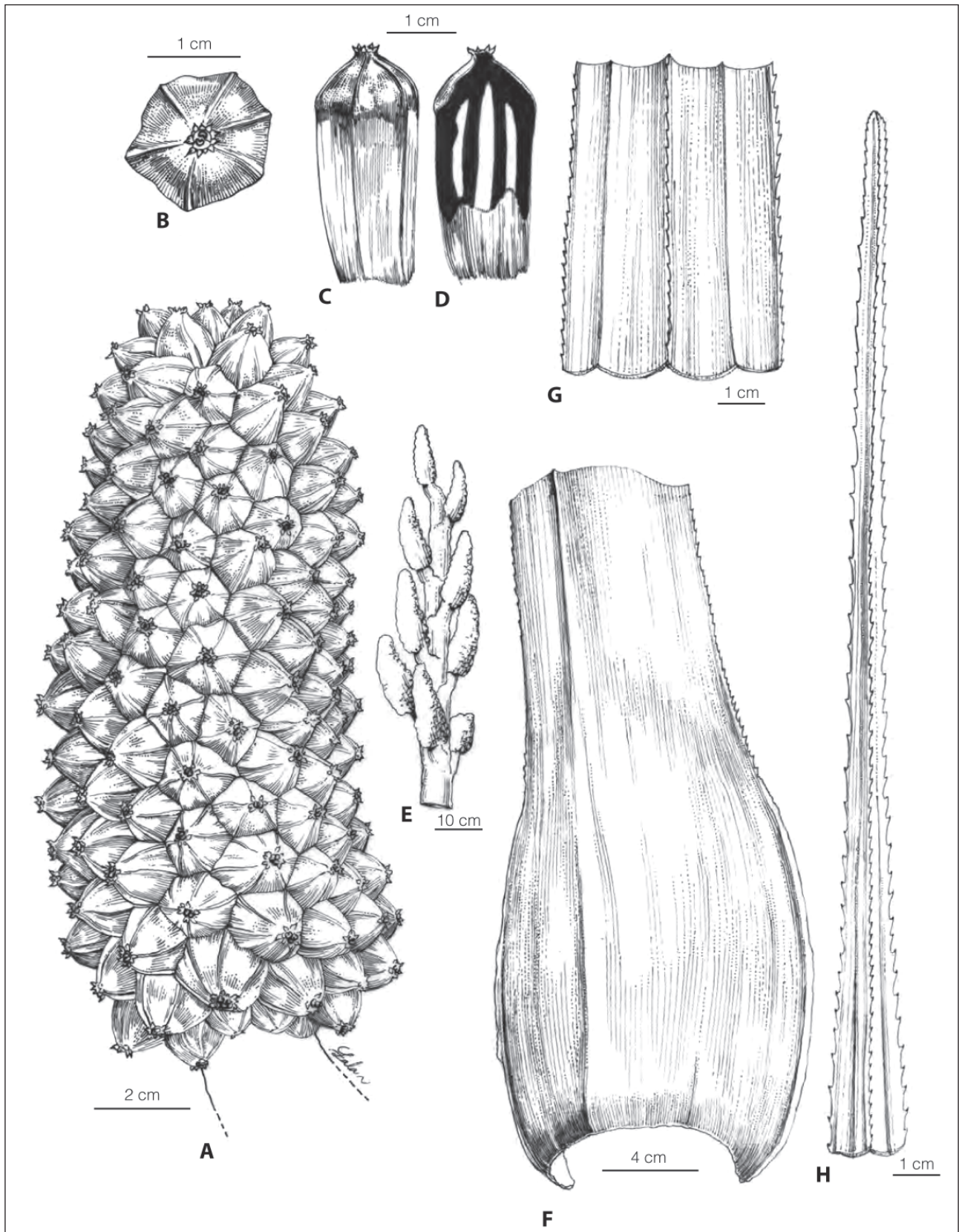


Fig. 2 – *Pandanus analamazaotrensis* Martelli - A. Details of a syncarp; B. Apical view of a drupe; C. Lateral view of a drupe; D. Longitudinal section of a drupe; E. General view of the plurisyncarpic infructescence; F. Base of a leaf; G. Midsection a leaf; H. Apex of a leaf. (Callmander *et al.* 66 (TAN, P), drawings: R. L. Andriamiarisoa).

ets containing fragments of young syncarps and mature drupes. A handwritten note from Pichi-Sermolli states that the mature drupes do not come from the syncarp with the original determination from Martelli. We select the staminate material as the lectotype because it is more complete than the pistillate material, and since the latter may represent a mixed gathering from different individuals. The more complete staminate material of *Perrier de la Bâthie* 4607 is present in the P herbarium with six herbarium sheets and is therefore designated here as lectotype.

7. *Pandanus bathiei* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 150, 152, fig. 28 (1951). **Lectotype**: Madagascar. Prov. Antsiranana, Tsaratanana, sylves à lichens, 2200 m, [13°57'S, 48°52'E], 5.1924, *Perrier de la Bâthie* 16225 (P[P00246909: carpo.]) (designated by Stone, 1970). **Isolectotype**: (FI[FI001077: 1 sheet!]).

Stone (1970) stated the «holotype» of *Pandanus bathiei* Martelli to be the specimen of *Perrier de la Bâthie* 16225 at P, but this was an error. Type material is also present at FI and, as with other cases discussed in the present article, there is no indication that Martelli or Pichi-Sermolli made a choice of one of these specimens to be the holotype. However, this error should be regarded as an involuntary act of lectotypification following ICBN Arts. 7.10, 7.11 & 9.8 which we correct here. The material at P is housed in the carpological collection and comprises a section of a branch with the terminal cluster of leaves with an infructescence consisting of one and half syncarps, and with separate drupes contained in a specimen packet, the specimens at FI consist of the same material mounted together. We agree with Stone that *P. bathiei* is a synonym of *P. sparganioides*.

8. *Pandanus bilamellatus* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 109, 110, fig. 18i-m (1951). **Lectotype designated here**: Madagascar. Prov. Fianarantsoa, bois humide et sablonneux dans le bassin de Faraony, forêt orientale, [21°47'S, 48°10'E], 10.1911, *Perrier de la Bâthie* 11909 (P[P00219010!]). **Isolectotype**: (FI[FI000970!]).

Pandanus bilamellatus is based on a single collection of pistillate material with specimens at FI and at P. The more complete material is in Paris and this is selected as the lectotype. The species is now includ-

ed within the concept of *Pandanus malgassicus* Pic. Serm. (Laivao et al., 2007).

9. *Pandanus comatus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3 (1): 129, fig. 22b, 24e-o (1951). **Lectotype designated here**: Madagascar. Prov. Toamasina, bords de lagune près de Vatomaniry, [19°20'S, 48°59'E], 9.1921, *Perrier de la Bâthie* 14110 (P[P00459619, P00459620, P00219133!]); **Isolectotypes**: (FI[FI000966: 3 sheets!]).

Pandanus comatus is based on *Perrier de la Bâthie* 14110 which comprises only pistillate material, the material at P is selected as the lectotype. It is mounted on three herbarium sheets and consists of a cluster of lateral leaves with a peduncle, two separate leaves and three specimen packets with mature drupes. Three sheets at FI comprise a cluster of lateral leaves with a peduncle, two separate leaves and an envelope with mature drupes.

10. *Pandanus cyaneoglaucescens* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 89, fig. 16i-n (1951). **Lectotype designated here**: Madagascar. Prov. Fianarantsoa, bords de torrents dans le Bassin de Mania, c. 1000 m, [20°23'S, 47°00'E], s.d., *Perrier de la Bâthie* 12406 (P[P00219132, P00246904!]). **Isolectotype**: (FI[FI000985: 1 sheet!]).

Pandanus cyaneoglaucescens is based on a single collection with specimens present at FI and at P. We lectotypify it on the material at P comprising a single sheet with leaves and a few mature drupes in a specimen packet and part of a mature syncarp with a peduncle in the carpological collection. The isolectotype at FI consists of a single sheet with a complete leaf and a specimen packet with a few mature drupes.

11. *Pandanus dauphinensis* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 38, fig. 5 (1951). **Lectotype designated here**: Madagascar. Prov. Toliara, bas Matitanana, dunes de la côte littorale de Fort-Dauphin, 10.1911, *Perrier de la Bâthie* 11888 (P[P00568769, P00568768: carpo.]). **Isolectotype**: (FI[FI000984, 1 sheet!]).

Pandanus dauphinensis is the type of *Pandanus* sect. *Dauphinenses* H. St. John which was revised by Callmander & Laivao (2002). In this revision, we wrongly stated the sheet at P to be the holotype. We correct this by lectotypifying the name here. The lectotype at P includes a sheet with part of a leaf in the

herbarium and the apical part of a peduncle and a mature syncarp in the carpological collection, while the isolectotype at FI consists of part of a leaf and separate drupes in a specimen packet.

12. *Pandanus diffusus* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 57-58, fig. 7a (1951). **Lectotype designated here:** Madagascar. Prov. Fianarantsoa. Rienana, bassin du Matitanana, 100 m, [22°26'S, 47°41'E], 01.10.1911, *Perrier de la Bâthie 11899* (P[P00459622, P00459623, P00459624, P00568766, P00568767]!, P00568712[carpo.]!). **Isolectotype:** (FI[FI000983: 1 sheet]!). **Lectoparatypes:** (P[P00459621]!, FI[FI000983: 1 sheet with pist. material]!).

Pandanus diffusus is based on an immature infructescence and a complete staminate inflorescence. The pistillate material at both FI and P is poor and not a suitable choice as lectotype, while the staminate material is considerably more complete. The five staminate sheets in P (incl. staminate inflorescence spikes, bracts and leaves and fragments of prop-roots in the carpo-collection) are designated here as lectotype whereas the single staminate sheet at FI is designated as isolectotype.

13. *Pandanus laxespicus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 126-127, fig. 20, 22a (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, Marais d'Analamazaotra, [800 m], [18°56'S, 48°26'E], s.d., *Perrier de la Bâthie 11885* (FI[FI000988: 1 sheet excl. st. sheet]!). **Isolectotypes:** (P[P00219160, P00219161]!). **Lectoparatypes:** (P[P00482871, P00482872, P00459630]!; FI[FI000988: 1 st. sheet and test-tube in carpo.]!).

Pandanus laxespicus is represented at P by five sheets: three with a staminate inflorescence and two with an immature infructescence. FI holds two sheets, one bearing a staminate inflorescence with leaves and the other a mature syncarp with leaves, as well as a test-tube in the carpological collection with a few staminate flowers that were used by Pichi-Sermolli for his description. The lectotype is designated on the only mature syncarp available which is deposited in the FI herbarium.

14. *Pandanus leptopodus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3 (1): 70, 72, fig. 10, 11a-e (1951). **Lectotype designated here:**

Madagascar. Prov. Toamasina, Forêt Analamazaotra, [18°57'20"S, 48°24'30"E], 800 m, 1.1912, *Perrier de la Bâthie 11910* (P[P00219149, P00568765: carpo.]!).

Isolectotype: (FI[FI000986, 1 sheet]!). **Lectoparatypes:** (FI[FI000987, 3 sheets]!; P[P00219151, P00219152]!).

Pandanus leptopodus Martelli (in Martelli & Pichi-Sermolli, 1951: 72) was based on two syntypes. One of these (*Perrier de la Bâthie 10927*) is a staminate collection with two sheets at both FI and P, whereas the other (*Perrier de la Bâthie 11910*) is pistillate including mature fruits and leaves, with a single sheet present at both FI and P. We therefore select the latter as the lectotype of this species. The material at P is more complete, comprising a mounted sheet with 2 complete leaves and a infructescence peduncle with bracts, as well as a cluster of leaves with 2 mature syncarps in the carpological collection and this material is therefore designated collectively as the lectotype.

15. *Pandanus longecuspis* Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 107-108, fig. 18e-h (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, environs d'Antalaha, [14°54'00"S, 50°16'30"E], 11.1912, *Perrier de la Bâthie 11904* (P[P00219026, P00219027]!). **Isolectotype:** (FI[FI001030, 1 sheet]!).

Pandanus longecuspis is part of *P.* sect. *Foulioya* Warb. revised by Laivao *et al.* (2007). In this revision, we omitted to formally lectotypify the species. The P material comprises two sheets bearing several leaves and two infructescences (one on each sheet), while there is only a single sheet with leaves and drupes in a specimen packet at FI. The material at P is therefore selected collectively as the lectotype.

16. *Pandanus longipes* H. Perrier ex Martelli, *Mémoire de l'Institut scientifique Madagascar*, sér. B, 3: 80, fig. 14b, 16a-d (1951). **Lectotype designated here:** Madagascar. Prov. Antsiranana. Bois secs, sud du Massif de Manongarivo, Nord de Maromandia, [14°10'S, 48°21'E], 1.11.1908, *Perrier de la Bâthie 10933* (FI[FI001031, excl. st. sheet]!). **Lectoparatypes:** (FI[FI001031: st. sheet]!; P[P00459633]!).

Perrier de la Bâthie 10933 is represented by staminate material at both P and FI, and by pistillate material only at FI. *Pandanus longipes* is here lectotypified on the FI sheet that includes leaves, a mature syncarp and a drawing of the habit of the plant (reproduced in Martelli & Pichi-Sermolli, 1951: 79, fig. 14b).

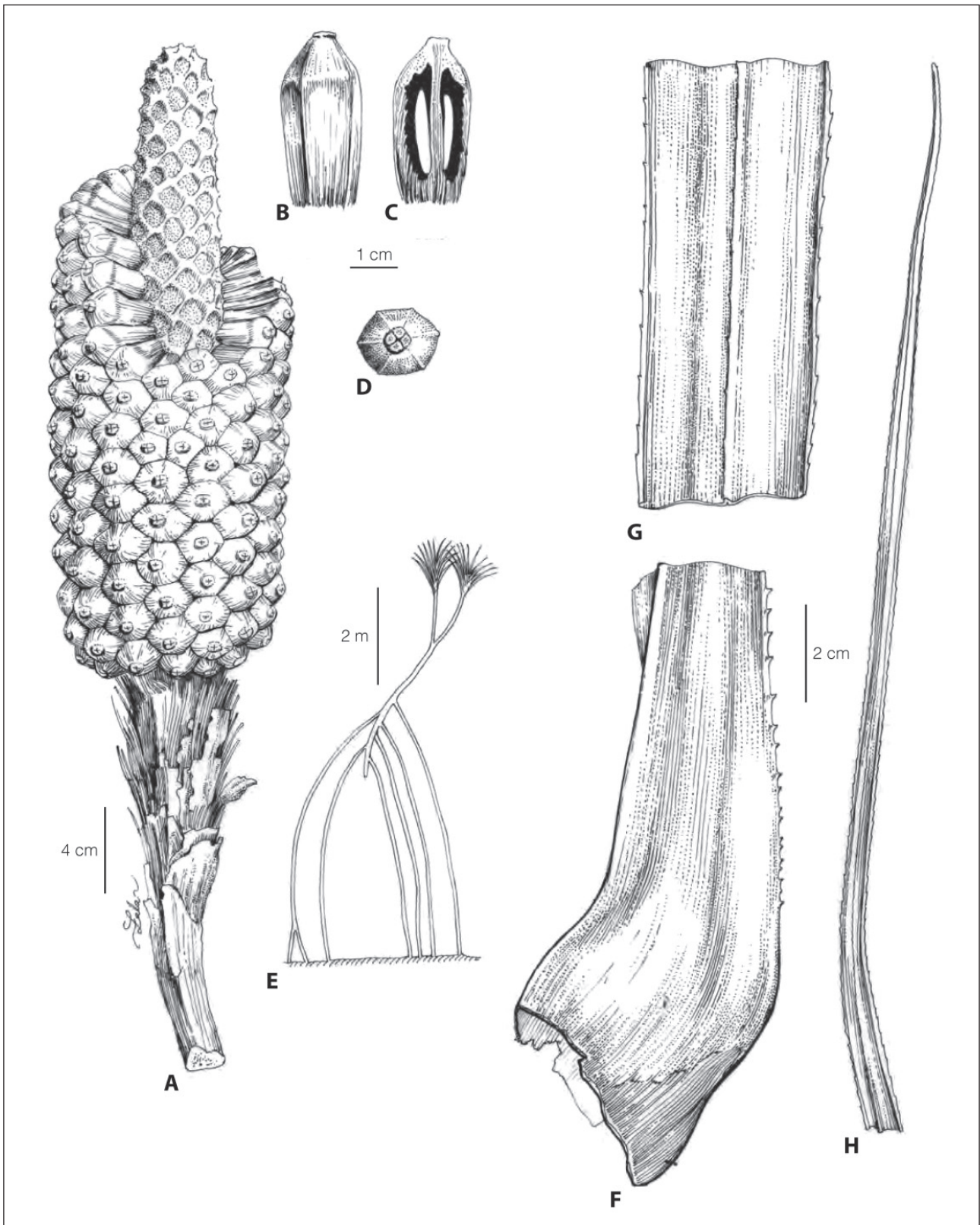


Fig. 3 – *Martellidendron cruciatum* (Pic. Serm.) Callm. & Chassot - A. General view of the syncarp. B. Lateral view of a drupe; C. Longitudinal section of a drupe; D. Apical view of a drupe; E. habit; F. Base of a leaf; G. Midsection of a leaf; H. Apex of a leaf (*Guillaumet 3851* (TAN), drawings: R. L. Andriamiarisoa).

17. *Pandanus longissimopedunculatus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 158, fig. 29 (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, forêt d'Analamazaotra, c. 800 m, [18°56'S, 48°26'E], s.d., *Perrier de la Bâthie 10027* (P[P00459634]!, P[P00246903: carpo.]!). **Isolectotype:** (FI[FI001034: carpo.]!).

The material at FI includes two sheets with drupes, a section of the middle of a leaf and a tip of leaf and leaves and a complete infructescence in the carpological collection. At P the material includes several mature drupes in a specimen packet in the herbarium and a complete leaf and infructescence in the carpological collection. Thus the latter is selected as the lectotype.

18. *Pandanus longistylus* Martelli & Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 145, fig. 25a-d (1951). **Lectotype designated here:** Madagascar. Prov. Fianarantsoa, Mt Vohidoza, bassin du Matitanana, S Vohipeno, 300 m, [23°20'S, 47°40'E], s. d., *Perrier de la Bâthie 11907* (P[P00219156, P00219157]!). **Isolectotype:** (FI[FI001029: 1 sheet]!).

Pandanus longistylus Martelli is lectotypified here on the material at P which comprises two sheets: one with several leaves and the other with leaves and a complete immature infructescence. The FI herbarium holds one sheet with fragment of an infructescence and the apical portion leaf.

19. *Pandanus maevaranensis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 91-92, fig. 17 (1951). **Lectotype designated here:** Madagascar. Prov. Mahajanga, bords de la Maevahinja, affluent de droite de la Maevarano, [14°34'00"S, 48°07'30"E], 11.1908, *Perrier de la Bâthie 11887* (P[P00568709]!). **Isolectotype:** (FI[FI001026]!) (Fig. 4).

The material available of the type collection, *Perrier de la Bâthie 11887*, is very poor. Only three drupes and a drawing are deposited at FI. At P only a fragment of a syncarp with no leaves attached has been found. We lectotypify *P. maevaranensis* of the herbarium sheet at P where the best material available is kept.

20. *Pandanus malgassicus* Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 103, fig. 18a-d (1951). **Lectotype designated here:**

Madagascar. Prov. Fianarantsoa, forêt littorale près de Vatmandry, [19°20'S, 48°59'E], 1.11.1921. *Perrier de la Bâthie 14095* (P[P00219002]!). **Isolectotype:** (FI[FI001035: 2 pist. sheets, excl. st. sheet]!). **Lectoparatypes:** (FI[FI001035: 1 st. sheet]!; P[P00219003]!).

Pandanus malgassicus is part of *P.* sect. *Foullioya* Warb. which was revised by Laivao *et al.* (2007). In that work, we omitted to formally lectotypify the species. At P *P. malgassicus* is represented by a single sheet with leaves and a mature infructescence with syncarps that is here selected as the lectotype.

21. *Pandanus mammillaris* Martelli & Pic. Serm., *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 47-48, fig. 6a-e (1951). **Lectotype designated here:** Madagascar. Prov. Antsiranana. Mt. Tsaratanana, c. 1200 m, [14°03'30"S, 48°47'00"E], 1.12.1922, *Perrier de la Bâthie 15234* (FI[FI001021: 1 sheet excl. the st. sheet, carpo.]!). **Isolectotype:** (P[P00219155: excl. st. bracts and specimen packet]!, P[P00568764: carpo.]!). **Lectoparatypes:** (FI[FI001021: st. sheet]!; P[P00219155, st. specimen packet and bracts]!).

Pandanus mammillaris is based on a single collection, *Perrier de la Bâthie 15234*, that comprises both staminate and pistillate material at both FI and P. The pistillate material deposited at FI is more complete, and is therefore selected as the lectotype. Staminate specimens included under *Perrier de la Bâthie 15234* are excluded and are regarded as lectoparatypes.

22. *Pandanus mangokensis* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 133-134, fig. 21g-m (1951). **Lectotype designated here:** Madagascar. Prov. Toliara. Bord de torrent, ouest de Midongy, bassin supérieur du Mangoky, 600 m, [21°37'S, 44°31'E], 2.1919, *Perrier de la Bâthie 12507* (P[P00219125: excl. sp. packet with st. material]!, P[P00459636, P00219126]!). **Isolectotype** (FI[FI001019: 2 sheets excl. st. material in a sp. packet]!). **Lectoparatypes:** (FI[FI001019: sp. packet]!; P P[P00219125: sp. packet]!).

The material of *P. mangokensis* at P comprises three sheets: one with large leaves from the apical crown, a second with a lateral cluster of leaves with a complete infructescence, and a third with a lateral cluster of leaves with a complete infructescence and 2 specimen packets with drupes and syncarps. Less material is present at FI with 2 sheets: one sheet with

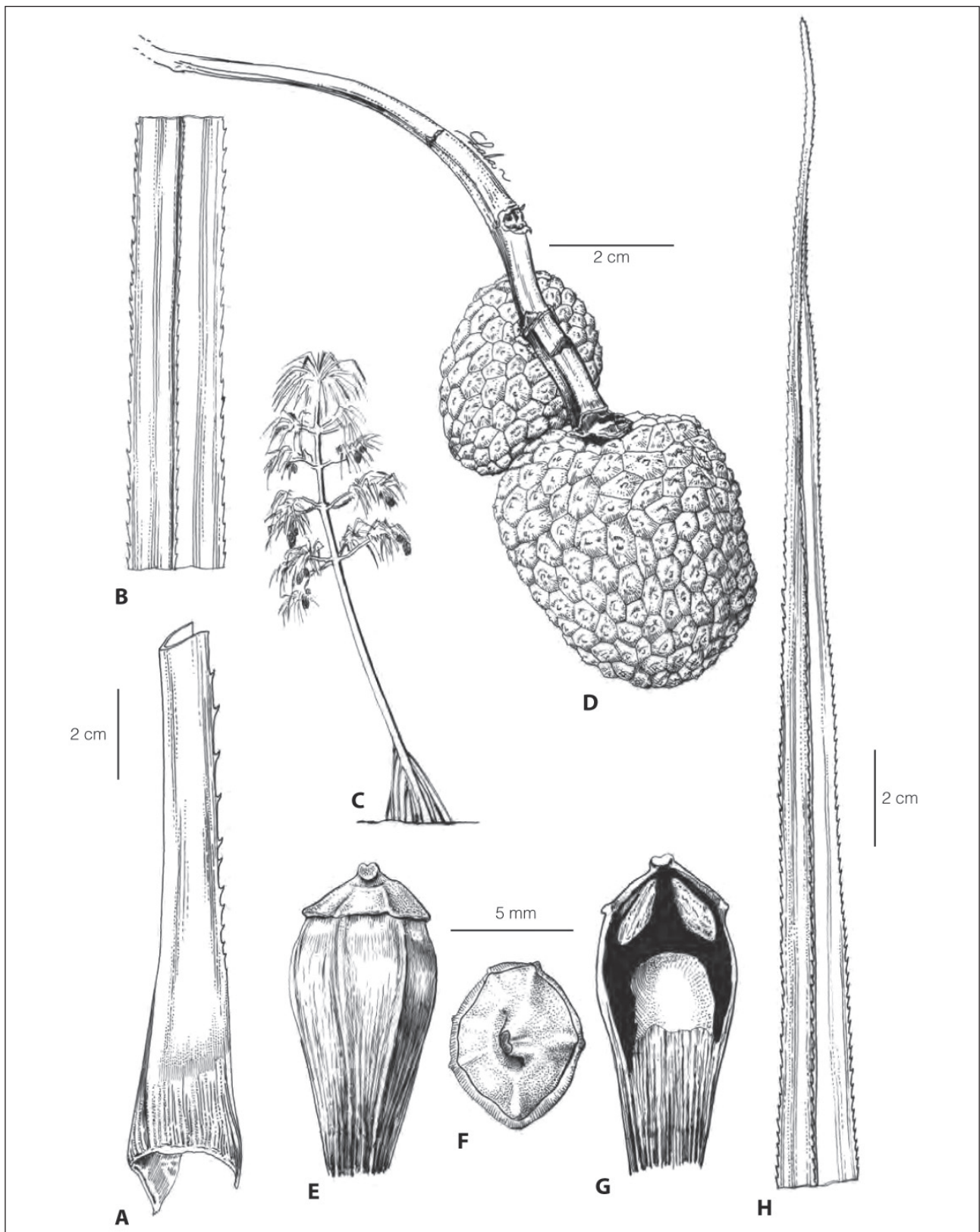


Fig. 4 – *Pandanus maevaranensis* Martelli - A. Base of a leaf; B. Midsection of a leaf; C. habit; D. General view of the infructescence. E. Lateral view of a drupe; F. Apical view of a drupe; G. Longitudinal section of a drupe; H. Apex of a leaf (*Callmander & Wohlhauser 280* (TAN, P), drawings: R. L. Andriamiarisoa).

several leaves, a complete infructescence and a specimen packet with staminate and pistillate material, and a second with a specimen packet with a fragment of a syncarp and drupes. We select the P material collectively as the lectotype.

23. *Pandanus namakiensis* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 148-149, fig. 26b-c, 27 (1951). **Lectotype designated here:** Madagascar. Prov. Mahajanga, Mt. Namakia, c. 800 m, [15°53'S, 46°48'E], 11.1922, *Perrier de la Bâthie 14838* (P[P00219123, P00219124, P00459641]!). **Isolectotype** (FI[FI001015: 2 pist. sheets excl. the st. sheet]!). **Lectoparatype** (FI[FI001015: 1 st. sheet, test-tube in the carpo.]!).

Pandanus namakiensis is represented at FI by three herbarium sheets (two pistillate and one staminate) and 1 test-tube with stamens. The material at P is more complete with three pistillate sheets each with a cluster of leaves surmounted by an infructescence (one very immature).

24. *Pandanus neoleptopodus* Pic. Serm., *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 78, fig. 11f-l, 14 a (1951). **Lectotype designated here:** Madagascar. Prov. Toamasina, Tampina, [18°31'S, 49°17'E], 11.1920, *Perrier de la Bâthie 13289* (P[P00459642, P00568710: carpo.]!). **Isolectotype** (FI[FI001014: 2 sheets]!).

Pandanus neoleptopodus is represented at FI by two sheets comprising complete leaves and two specimen packets with mature drupes. Similar material is present in the P herbarium but a mature infructescence and several leaves are also present in the carpological collection. Therefore, the material in P is more complete and selected collectively as the lectotype.

25. *Pandanus oligocarpus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 68-69, fig. 8f-g, 9 (1951). **Lectotype designated here:** Madagascar. Prov. Mahajanga, sable de l'Ankarafantsika (Boina), [16°12'S, 47°06'E], 12.1910, *Perrier de la Bâthie 11895* (P[P00199111, P00199112]!). **Isolectotypes** (FI[FI001010: 2 sheets]!). **Lectoparatypes** Madagascar. Prov. Mahajanga, plateau d'Antanimena (Boina), [16°18'S, 47°19'E], 6.1906, *Perrier de la Bâthie 10937* (FI[FI001011: 1 sheet]!; P[P00199113]!).

Pandanus oligocarpus is based on two syntype collections (*Perrier de la Bâthie 10937* and *11895*). The

collections of *Perrier de la Bâthie 10937* at both FI and P are sterile. *Perrier de la Bâthie 11895* comprises mature syncarps and complete leaves at both FI and P, more complete material is present at P (two sheets with two clump of leaves and a fragment of a mature infructescence), and this is therefore selected collectively as the lectotype.

26. *Pandanus perrieri* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 17-18, fig. 1 (1951). **Lectotype designated here:** Madagascar. Prov. Mahajanga, entre le Cap St. André et la Tsiribihina, Mt Ambohibengy, [16°48'13"S, 45°00'10"E], 11.1914, *Perrier de la Bâthie 13498* (P[P00246908: carpo.]!). **Isolectotype** (FI[FI001006]!).

Pandanus perrieri is known only from the very poor type material, consisting of a few fallen drupes (two at FI and three and a half at P) and no leaf or bract material, collected at a very remote and poorly-known site in western Madagascar. The only known specimens with similar drupes, and which may represent the same species, were discovered in the Daraina region by a team from the *Conservatoire et Jardin botaniques de la Ville de Genève* in 2003. However this region is far from the type locality and the substrate and habitat are rather different, so this material can only be referred provisionally to *P. perrieri*. A separate article will discuss this interesting discovery in greater detail. Until representative material from the type locality (or nearby) with identical drupes is found, and designated as an epitype, we select the more plentiful material at P as the lectotype.

27. *Pandanus petrosus* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 153-154 (1951). **Lectotype designated here:** Madagascar. Prov. Mahajanga, Makambana sur le cause d'Ankara, Boina, [17°10'S, 46°15'E], 6.1903, *Perrier de la Bâthie 1095* (FI[FI001053: pistillate material on 1 sheet]!). **Isolectotypes** (P[P00142017: sp. packet with drupes]!). **Lectoparatypes** (FI[FI001053: leaves on 2 sheets]!; P[P00142017: leaves, P00142018, P00142019]!).

Pandanus petrosus was originally described by Martelli on immature type material (Martelli & Pichi-Sermolli, 1951) comprising leaves and immature drupes, and an amended description of the same material with additional measurements and observations was provided by Huynh (2000). A careful study of

the specimens at FI and P has enabled us to conclude that Martelli's type material includes two different species. The leaves are sub-coriaceous, with veins visible on both sides and with a short flexible sheath (ca. 1.5 cm). They definitively belong to a species of either *P.* sect. *Souleyetia* (Gaudich.) Kurz or *P.* sect. *Mammillares* H. St. John. The drupes are rather spherical, ca. 2.5-3 cm diameter and possess spiniform stigmas, and they belong without any doubt to a species of *P.* sect. *Acanthostyla* Martelli. Leaves of this latter section are always coriaceous with veins barely visible on both sides and always with a long (at least 5-6 cm) and coriaceous sheath, quite different to those of *P.* sects. *Souleyetia* and *Mammillares*. While the leaf material cannot be identified definitely with any known species, we believe that the drupes probably belong to *P. namakiensis* Martelli. We therefore lectotypify *P. petrosus* on the drupes, and provisionally place this name in synonymy under the better known species *P. namakiensis* that was published simultaneously. It is interesting to note that Martelli stated (in Martelli & Pichi-Sermolli, 1951: 155) that the drupes were very different from an entire infructescence that was present in the material that he received with the same collection number, and he changed the designation of the infructescence to *Perrier de la Bâthie 1095bis* (instead of 1095). This syncarp is present in P and we believe that it belongs to *P. mammillaris*, a species known from the montane forests in Northern Madagascar that belongs to *P.* sect. *Mammillares*. It is possible that the leaf material included within Martelli's concept of *P. petrosus* is also material of this species and that it originated from the same gathering.

28. *Pandanus pseudobathiei* Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 137, fig. 23 (1951). **Lectotype designated here:** Madagascar. Prov. Antsiranana, Mt Tsaratanana, [13°57'S, 48°52'E], 10.1922, *Perrier de la Bâthie 15258 bis* (P[P00459646]!). **Isolectotype** (FI[FI003208: 1 sheet]!). **Paralectotype.** Madagascar. same locality and date, *Perrier de la Bâthie 15258* (FI[FI001048: 1 sheet]!).

This species was described by Pichi-Sermolli (in Martelli & Pichi-Sermolli, 1951) based on two syntypes (*Perrier de la Bâthie 15258* and *Perrier de la Bâthie 15258bis*). The latter is present at both FI and P whereas 15258 is only present at FI. *Perrier de la Bâthie 15258bis* is represented at P by a sheet includ-

ing a cluster of leaves surmounted by an immature infructescence, which we choose as the lectotype. At FI, this collection is represented by a specimen packet including a mature syncarp but no leaves.

29. *Pandanus pseudocollinus* Pic. Serm., *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 111, fig. 18n-r (1951). **Lectotype designated here:** Madagascar. Prov. Antsiranana, Bemarivo (N de Sambava), [14°11'S, 49°52'E], 500 m, 7.1912, *Perrier de la Bâthie 11891* (P[P00219015, P00219016]!). **Isolectotypes** (FI[FI001047]!, MO[MO-030212]!, TAN!).

The species belongs to *Pandanus* sect. *Foullioya* Warb. which was revised by Laivao et al. (2007). In this revision, we omitted to formally lectotypify the species. The specimen at P is more complete, comprising 2 sheets both with leaves and two infructescences (one mature and one immature) and we therefore choose this material collectively as the lectotype.

30. *Pandanus pulcher* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, sér. B, 3: 130, 132, fig. 21a-f, 22c (1951). **Lectotype designated here:** Madagascar. Prov. Majunga, tourbières de Sitampika (Ambongo), 80 km SW Maevatanana, 300 m, [16°05'S, 46°01'E], 1.11.1904, *Perrier de la Bâthie 1775* (P[P00219120, P00219121, P00219122, P00568708: excl. st. material]!). **Isolectotypes** (FI[FI001046: excl. the st. sheet]!). **Lectoparatypes** (FI[FI001046: st. sheet]!; P[P002219119, P00568708: st. sheet]!).

Pandanus pulcher was described on the basis of both staminate and pistillate plants under a single collection number (*Perrier de la Bâthie 1775*). At FI, the species is mounted on three herbarium sheets with some separate stamens in a test tube. The first comprises bracts, part of an apical cluster of leaves and lateral cluster, a staminate inflorescence and a specimen packet with drupes and the infructescence peduncle. The second comprises two specimen packets with drupes and the third bracts, leaves, a pistillate inflorescence and a specimen packet with drupes. At P, the collection is mounted on five sheets with a mixture of mature drupes, immature infructescences and leaves, two of the sheets also bear fragments of a staminate inflorescence with bracts. The most representative material is at P and we select the lectotype from this material with an exclusion of the staminate material.

31. *Pandanus punctulatus* Martelli, *Mémoires de l'Institut scientifique de Madagascar*, série B, 3 (1): 74-75, fig. 13a-c (1951). **Holotype:** Madagascar, Prov. Fianarantsoa, Bas Matitanana, sur basalte, 10.1911, *Perrier de la Bâthie 11903* (FI[FI001045: 2 sheets!]).

The type collection, *Perrier de la Bâthie 11903*, has been found to be represented only at FI. This single collection mounted on two sheets is therefore considered to be the holotype of *Pandanus punctulatus*. The material consists of a cluster of leaves and mature syncarps.

32. *Pandanus sambiranensis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 54-55, fig. 6f-i (1951). **Lectotype designated here:** Madagascar, Prov. Antsiranana, massif du Manongarivo, bords de Ramena et toute la région du Sambirano, 300-1000 m, [13°52'S, 48°51'E], 11.1909, *Perrier de la Bâthie 10934* (FI[FI001083: 1 sheet excl. st. material!]). **Isolectotype** (P[P00219106!]). **Lectoparatypes** (FI[FI001083: 1 st. sheet!]; P[P00219105!]).

Perrier de la Bâthie 10934 is consisting of four herbarium sheets. At FI *P. sambiranensis* is represented by a sheet of leaves with an immature syncarp and part of a mature one, and a second sheet with a specimen packet containing fragments of a staminate inflorescence. The pistillate material at P is less complete, comprising only a few mature drupes in a specimen packet, and staminate material. We therefore select the material at FI as lectotype.

33. *Pandanus saxatilis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 51-52, fig. 8a-b (1951). **Holotype:** Madagascar, Prov. Antsiranana, Ankaizina, près du massif Tsaratanana, 1500-1700 m, [14°15'S, 48°51'E], 9.1908, *Perrier de la Bâthie 11886* (P[P00568707: carpo.]).

The type collection of *Pandanus saxatilis*, *Perrier de la Bâthie 11886*, is represented in FI by a single sheet with only a few drupes in a specimen packet. A note on the sheet by Pichi-Sermolli states that the drupes in this specimen packet can only doubtfully be linked with *P. saxatilis* and that this species is typified by the sheet at P. The drupes are indeed too old to state with certainty that they belong to *P. saxatilis* and we believe that they can probably be identified as *P. sambiranensis*. The specimen at P is therefore regarded as the holotype. It is also rather poor, comprising only a syncarp and lacking leaves, but it can

be associated without difficulty with the much more complete material of the species now available.

34. *Pandanus stellatus* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 67, fig. 8c-e (1951). **Lectotype designated here:** Madagascar, Prov. Majunga, Besalampy, S du Cap St André, [16°44'30"S, 44°29'30"E], 9.1906, *Perrier de la Bâthie 10929* (P[P00246906!]). **Isolectotype** (FI[FI001072: 1 sheet!]).

The material available for *P. stellatus* is poor. At FI there is a single sheet with four leaves and one fallen drupe cut in half lengthwise. At P there is also a single sheet bearing four leaves and a fragment of a syncarp lacking some drupes but still showing its general aspect. We therefore choose the material deposited at P as the lectotype.

35. *Pandanus tsaratananensis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B: 81-82 (1951). **Lectotype designated here:** Madagascar, Prov. Antsiranana, env. du Mt Tsaratanana, 1500 m, [14°03'S, 48°50'E], 11.1912, *Perrier de la Bâthie 11893* (P[P00142022, P00142023!]) **Isolectotype** (FI[FI001066: 1 sheet excl. the sp. packet with st. material!]). **Lectoparatypes.** Madagascar, Prov. Antsiranana, env. du Mt Tsaratanana, 1200 m, [14°03'S, 48°50'E], 11.1912, *Perrier de la Bâthie 11892* (FI[FI001065!]; P[P00142025!]); env. du Mt Tsaratanana, 1500 m, [14°03'S, 48°50'E], 11.1912, *Perrier de la Bâthie 11893* (FI[FI001066: sp. packet with st. material!]; P[P00142024!]) (Fig. 5).

Pandanus tsaratananensis is based on two syntypes, both present at FI and P. One syntype, *Perrier de la Bâthie 11892* is staminate, while the other, *Perrier de la Bâthie 11893*, comprises an immature syncarp, leaves and staminate material at P, and a couple of immature drupes, leaves and a fragment of the staminate flower at FI. The more complete pistillate material of *Perrier de la Bâthie 11893* at P is thus selected as the lectotype, with isolectotype material at FI. *Perrier de la Bâthie 11892* and the staminate elements of *Perrier de la Bâthie 11893* at P and at FI are treated as lectoparatypes.

36. *Pandanus vandamii* Martelli & Pic. Serm., *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 41-42, figs 4e-i (1951). **Lectotype designated here:** Madagascar, Prov. Mahajanga, Sam-

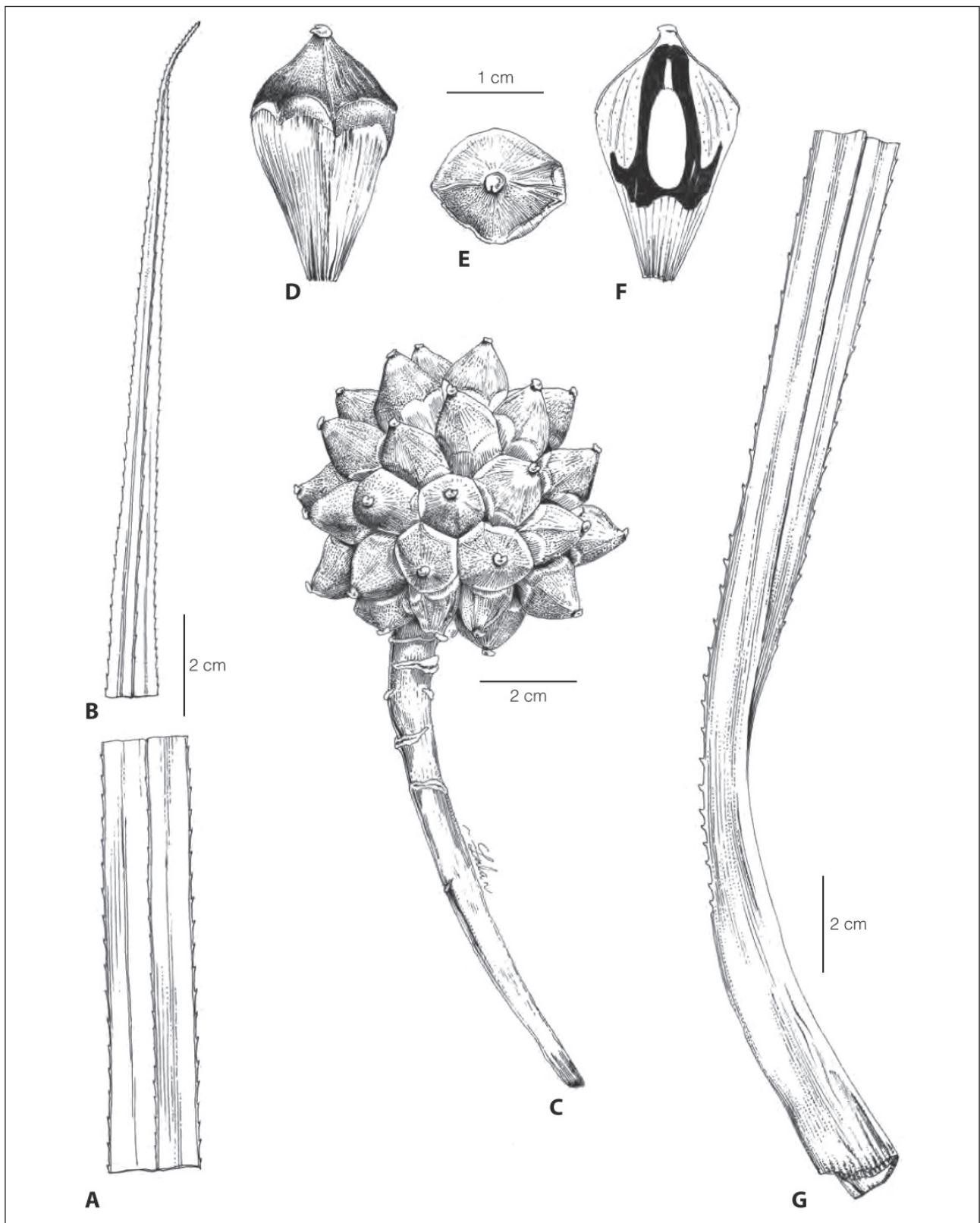


Fig. 5 – *Pandanus tsaratananensis* Martelli - A. Base of a leaf; B. Midsection of a leaf; C. Monosyncarpic infructescence; D. Lateral view of a drupe; E. Apical view of a drupe; F. Longitudinal section of a drupe; G. Apex of a leaf (*Callmander & al. 139* (TAN, P), drawings: R. L. Andriamiarisoa).

birano, bords de l'Andranomalaza, S du Massif de Manongarivo, [14°13'S, 48°06'E], 10.1908, *Perrier de la Bâthie 10939bis* (FI[carpo.]). **Isolectotype** (P[P00568706: carpo.]). **Lectoparatypes** *Perrier de la Bâthie 10935* (FI[FI001061: 2 sheets!]; P[P00459649, P00459650!]); *Perrier de la Bâthie 10939* (P[P00459651!]).

Pandanus vandamii is based on three collections (*Perrier de la Bâthie 10935*, *10939* and *10939bis*). *Perrier de la Bâthie 10935* is staminate while *10939* and *10939bis* are both pistillate. Only *Perrier de la Bâthie 10935* and *10939bis* are represented at both FI and P. The specimen of *Perrier de la Bâthie 10939bis* at FI is the most complete pistillate material (a mature syncarp and leaves) and is therefore the best choice as the lectotype. The isolectotype at P consists of drupes only.

37. *Pandanus variabilis* Martelli, *Mémoire de l'Institut scientifique de Madagascar*, sér. B, 3: 94 (1951). **Lectotype designated here: Madagascar. Prov. Toliara, aux bords de ruisseaux, gneiss aux environs de Beroroka, bassin du Mangoky, [21°50'S, 44°31'E], 8.1911, *Perrier de la Bâthie 11908A* (P[00219127!]). **Isolectotypes** (FI[FI001060!], K!, US[US00086641!], TAN!).**

Pichi-Sermolli divided *Perrier de la Bâthie 11908* into four parts, denoted by the letters *A* to *D* written on the specimen sheets. Only *11908A* (a fragmentary syncarp with peduncle and bract but with no leaf) mounted on a single sheet at FI and P was used as for the description of the species (Martelli & Pichi-Sermolli, 1951), material of this is present at FI and P, as well as in several other herbaria. Pichi-Sermolli left *11908B* (comprising a few separate drupes) and *11908C* (comprising a peduncle) undetermined, and he identified *11908D* (comprising a cluster of leaves with an immature infructescence) as *P. ambongensis*. The lectotypification is made on the material of *Per-*

rier de la Bâthie 11908A at P which is the most complete. Contrary to Pichi-Sermolli, we believe that all parts of the collection should be included in a more broadly circumscribed *Pandanus variabilis*, they show some variation in dimension of drupes and in the infructescences seem to bear a single or multiple syncarps on the same tree.

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REFERENCES

- CALLMANDER M.W., 2001 – *Pandanus subg. Martellidendron (Pandanaceae) part II: revision of sect. Martellidendron Pic. Serm. in Madagascar*. Bot. J. Linn. Soc. 137: 353-374.
- CALLMANDER M.W., WOHLHAUSER S. & LAIVAO M.O., 2001 – *Une nouvelle section du genre Pandanus (Pandanaceae) à Madagascar: Pandanus sect. Tridentistigma*. Adansonia 23(1): 49-57.

- CALLMANDER M.W. & LAIVAO M.O., 2002 – Révision de *Pandanus* sect. *Dauphinensia* H. St. John (Pandanaeae) à Madagascar. Bot. Helv. 112(1): 47-67.
- CALLMANDER M.W. & LAIVAO M.O., 2003a – New findings on *Pandanus* sect. *Imerinenses* and sect. *Rykiella* (Pandanaeae) from Madagascar. Adansonia 25: 53-63.
- CALLMANDER M.W. & LAIVAO M.O., 2003b – Biogeography and systematics of the Madagascan *Pandanus* (Pandanaeae) – In: GOODMAN S.M. & BENSTEAD J.P. (eds.), *The natural history of Madagascar*. The University of Chicago Press, Chicago: 460-467.
- CALLMANDER M.W., LAIVAO M.O. & WOHLHAUSER S., 2003a – Les *Pandanus* sect. *Acanthostyla* Martelli (Pandanaeae) d'altitude du Nord de Madagascar, avec description de deux nouvelles espèces. Candollea 58(1): 63-74.
- CALLMANDER M.W., WOHLHAUSER S. & GAUTIER L., 2003b – Notes biogéographiques sur les Pandanaeae des forêts humides du nord de Madagascar. Candollea 58(2): 351-367.
- CALLMANDER M.W., CHASSOT P., KÜPFER PH. & LOWRY II P.P., 2003c – Recognition of *Martellidendron*, a new genus of Pandanaeae, and its biogeographic implications. Taxon 52(4): 747-762.
- CALLMANDER M.W., BUERKI S. & WOHLHAUSER S., 2008 – A new threatened species of Pandanaeae from north-western Madagascar: *Pandanus sermolliana*. Novon 18(4): 421-424.
- CALLMANDER M.W., GAUTIER L. & TRIGUI S.M., 2009 – *Pandanus nusbaumeri* (Pandanaeae), a new species from northern Madagascar. Candollea 64(2): 213-218.
- CALLMANDER M.W., LAIVAO M.O. & RANDRIANAIVO R., 2010 – A new species of Pandanaeae from Northern Madagascar: *Pandanus ankaranensis*. Novon 20(3): 243-247.
- HUMBERT H., 1958 – Henri Perrier de la Bâthie (1873-1958). J. Agric. Trop. Bot. Appl. 5(12): 863-867.
- HUYNH K.-L., 2000 – The genus *Pandanus* (Pandanaeae) in Madagascar part 5. Bull. Neuch. Sci. Nat. 123: 27-35.
- LAIVAO M.O., CALLMANDER M.W. & BUERKI S., 2006 – Sur les *Pandanus* (Pandanaeae) à stigmates saillants de la Côte Est de Madagascar. Adansonia, sér. 3, 28(2): 267-285.
- LAIVAO M.O., CALLMANDER M.W. & BUERKI S., 2007 – Révision de *Pandanus* sect. *Foullioya* à Madagascar. Adansonia, sér. 3, 29(1): 39-57.
- MARTELLI U., 1907 – *Pandanus*, nuove specie Manipolo II. Webbia 2: 423-439.
- MARTELLI U. & PICHI-SERMOLLI R., 1951 – Les Pandanaeae récoltées par Pierre de la Bâthie à Madagascar. Mém. Inst. Sci. Madagascar, Sér. B, Biol. Vég. 3(1): 1-175.
- MCNEIL J., BARRIE F.R., BURDET H.M., DEMOULIN V., HAWKSWORTH D.L., MARHOLD K., NICOLSON D.H., PRADO J., SILVA P.C., SKOG J.E., WIERSEMA J.H. & TURLAND. J., 2006 – International Code of Botanical Nomenclature (Vienna Code). A.R.G. Gantner Verlag, Rugell, Liechtenstein [Regnum Vegetabile 146].
- STONE B.C., 1970 – New and critical species of *Pandanus* from Madagascar. Webbia 24: 579-618.

Summary: To date the most important contribution to the taxonomy of the family Pandanaeae in Madagascar has been the description of 38 species by U. Martelli and R.E.G. Pichi-Sermolli in 1951 in the *Mémoires de l'Institut scientifique de Madagascar*. These new species were all based on the 83 collections made by H. Perrier de la Bâthie between 1898 and 1928, most of which require lectotypification in accordance with the ICBN. We have made a complete study of all material available at the two most relevant herbaria: The Herbarium Centrale Italicum in Florence (FI) and at the Muséum d'Histoire Naturelle in Paris (P), following extensive field and laboratory studies of the genus *Pandanus* by two of us (MWC & MOL). Comments on the material seen and the reasons for the nomenclatural decisions are provided for each species.

