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Pigafetta

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Large, highly distinctive and easily recognized palms often repay careful reassessment. It is all too easy dismissively to identify a palm such as *Pigafetta filaris* and not look more closely. *Pigafetta filaris*, after all, is unlike any other tree palm in the Far East and is instantly recognizable. With a plethora of other palms in the region requiring taxonomic disentanglement, why bother to waste any more time on a species as distinctive and apparently as well known as *Pigafetta*?

I have certainly been guilty of not taking the trouble to look more closely, until 1988 when I was confronted in Queensland in a private collection by two growers and their two palms. The palms were both obviously pigafettas, and yet significantly different from each other in size, rate of growth, and coloration. This was the first inkling I had that there might be two quite different taxa in the genus *Pigafetta*, and it was at this point that my wife, Soejatmi, said "I told you so, but you wouldn't listen." She had seen *Pigafetta* growing in Sulawesi and the Moluccas in the mid-1970s and had told me that the Moluccan palm appeared to be different from the Sulawesi palm.

At this point we need to mention that most of the very few herbarium specimens of *Pigafetta* look the same. They are usually so poorly collected and with such scanty notes that if you followed current dictum that there is only one species of *Pigafetta* you would not look twice. Such large palms tend to defeat the herbarium method that underpins classification; plants that are manifestly distinct when growing can look identical when reduced to scraps stuck to a herbarium sheet, a point I made in my paper on *Caryota* (Dransfield 1974).

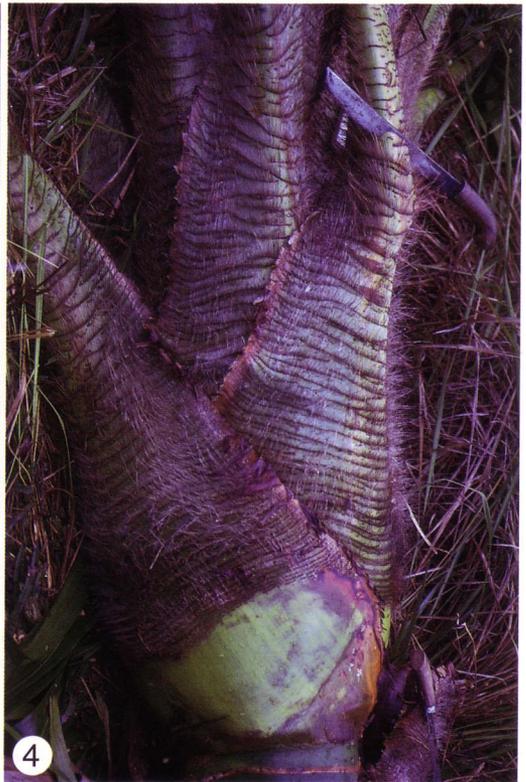
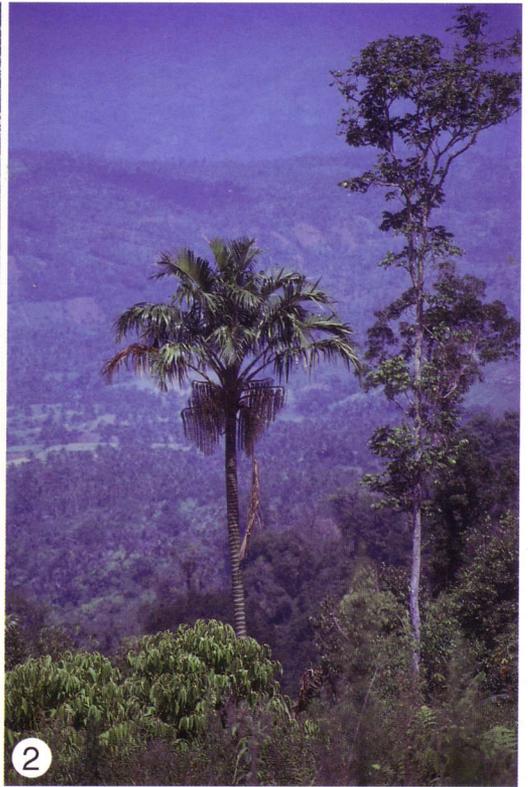
I first saw *Pigafetta* in 1971 in Sibolangit Botanic Garden in North Sumatra (Dransfield 1973). At the time the genus had been almost lost from general cultivation. As David Fairchild's favorite palm, there was a great deal of interest among growers to obtain more information about the palm and to reintroduce it into cultivation. I

introduced the first batch of seeds and seedlings from Sibolangit to Bogor where the palm had once grown but had then been lost. No one knows the origin of the Sibolangit *Pigafetta*; the Sibolangit Garden had long since stopped functioning as a botanical garden, and as far as I know there are no records of the introductions to the Garden, although there is a strong possibility that the seed came to Sibolangit from Bogor. Seedlings from this first reintroduction I made were planted out in the Kebun Raya, Bogor in 1974 (Fig. 1), some to form an avenue. Since then the trees have reached maturity and beyond, and several have been felled and replaced with more seedlings of the same type of *Pigafetta*.

In 1973 I saw *Pigafetta* for myself in the wild for the first time in North Sulawesi (Fig. 2)—a most impressive palm (Dransfield 1976). I made full, detailed herbarium collections of the palm and was also able to make a large collection of ripe seed (Fig. 3); it was from this collection that the IPS Seed Bank distributed seed around the world. Many of the now large individuals in collections originate from this 1973 introduction. During my stay in Indonesia I did not have the opportunity to travel farther east than North Sulawesi so was unable to see *Pigafetta* in the field in the Moluccas and New Guinea.

In 1993 we were once more in Queensland and saw the same cultivated specimens of *Pigafetta*, now considerably larger, and I began to be convinced that *Pigafetta* required a careful reassessment. The most striking difference between the two forms is in the petioles and rachises. In the Sulawesi *Pigafetta* the petioles and rachises of the mature exposed leaf present a rather forbidding dark color, densely covered with dark spines (Fig. 4), while in the other palm, said to be from New Guinea, the petioles and rachis are pale, covered in white powder, and with sparser spines (Fig. 5).

In 1995 I finally saw the eastern *Pigafetta* in the field (see Back Cover and Fig. 6). Together with Soejatmi, Scott Zona from Fairchild Tropical



Garden, Rudi Maturbongs from Manokwari, and Ary Prihardhyanto Kiem from Bogor, we visited forest in the north-east Kepala Burung area of Irian Jaya. *Pigafetta* is abundant here, growing at elevations from sea level up to about 300 m (incidentally, this is the type locality of Beccari's *Pigafetta papuana*). What instantly differentiates it from the Sulawesi taxon is the color of the petioles and rachises, as described above.

At last convinced that there might be two species of *Pigafetta* I set out to determine how they actually differ from each other in detail and what they should be called. Underlying the whole story is the recurring theme of the frequent inadequacy of herbarium specimens to record manifest differences between palms. I have to state immediately that, although we have a few vegetative differences between the two taxa, the full differences have yet to be properly studied. However, it is clear that there is a rising awareness that there are two different pigafettas for which we need scientific names. The following imperfect account does at least provide names for the two palms.

History of the Genus

It is not at all surprising that *Pigafetta* was well known to early Dutch naturalists working in the Netherlands East Indies; so abundant is the palm in Sulawesi and the Moluccas and so much used by local people that an enquiring naturalist could not fail to become aware of it. The first published account of the palm is that of the great Dutch naturalist Rumpf (Rumphius). In the first volume of his monumental *Herbarium Amboinense* (1741) the palm is referred to as *Sagus Filaris*; published before the time of Linnaeus this name has no nomenclatural priority. Nevertheless the account does have some nomenclatural significance as I shall show below. Rumphius provided in Latin and Dutch a good description of the palm, its uses, and its geographical distribution. He also provided an illustration of a leaf, leaflet, and infructescence and a fruit. Although the illustration is rather

crude, it is nevertheless clearly a *Pigafetta*. The palm that Rumphius described grew in Ceram, Buru, and neighbouring islands (but not Ambon), and was well known to local people, as it was used for the production of fiber for cloth weaving. After discussing the form of the palm, its distribution, names and uses, Rumphius added a note about the tree called Wanga that grows on the east coast of Celebes (Sulawesi) in the region of Tambocco; Wanga is taller and thicker than the Calappa (coconut) and is very much like *Sagus Filaris* but is not used for clothing by local people, except as fiber for sewing, and is also used as a source of spongy material for the occlusions of blow-pipe darts. The palm called Wanga at the present day in North Sulawesi is indeed a *Pigafetta*, so I have no doubt that Rumphius was referring to this same Sulawesi *Pigafetta*.

What is most important is that Rumphius clearly stated that the palm he named *Sagus Filaris* is the one that grows in Ceram and Buru. Although not saying how the Sulawesi palm is distinguished from the Moluccan, he clearly gave it a separate entry.

The first post-1753 reference I have found to the palm we now call *Pigafetta* is that of Houttuyn (1774), where the author provided a description of the Draad or Gaaren-Boom of Ceram, giving an abbreviated transcription of Rumphius' account and directly referring to *Sagus Filaris* of Rumphius. Whether this can be interpreted as effective publication is debatable. At any rate, Giseke (1792) explicitly published a binomial, *Sagus filaris* Giseke. Understanding of the palm and its structure had then to wait until the time of Martius and Blume.

In the first edition of part 7 of the third volume of *Historia Naturalis Palmarum* (1838), Martius (p. 216) provided brief diagnoses of *Metroxylon filare* and *M. (?) elatum* but confused their ranges. The former was described as occurring in Ceram, Xulla, and Buru and also in Celebes. He refers to Rumphius' account of *Sagus Filaris*. The only

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1-4. *Pigafetta elata*. 1. Cultivated individual in Kebun Raya, Bogor. 2. *Pigafetta elata* growing in Minahassa, North Sulawesi. 3. Mature fruits. 4. Close-up of crown, showing dense, dark spines and thin indumentum. All photos J. Dransfield.

→ (p. 38)

5-8. *Pigafetta filaris*. 5. Close-up of leaf sheath, showing dense white indumentum and pale spines. 6. View of the crown of *Pigafetta filaris* near Nuni, Manokwari, Irian Jaya. 7. The two auricles at the distal end of the petiole. 8. Immature fruits. All photos J. Dransfield.

Table 1. Differences between *Sagus filaris* and *S. elata* recorded by Blume.

<i>filaris</i>	fruit scales in 13-15 orthostichies	fruit ellipsoid	seed angular or foveolate	sheath spines distant
<i>elata</i>	fruit scales in 11-12 orthostichies	fruit globose	seed depressed- globose	sheath spines very dense

character clearly differentiating it from the next species is the shape of the fruit, which was described as oval. *M. elatum* was described as having a globose fruit and was said also to occur in Celebes. Martius referred to *Sagus elata*, a name suggested by Reinwardt in a letter; he also went on to say that the palm is very frequent in Ceram. By the time Martius published the second edition of this part (see Dransfield and Moore 1982), Blume had already provided a much more complete description and had used the epithet *Pigafetta* as a sectional name under *Metroxylon*.

Blume (1843) in Rumphia, Volume 2, provided a full description of *Sagus (Pigafetta) filaris*, illustrating his description with a fine plate of part of an infructescence. In a much shorter passage he named and described *Sagus (Pigafetta) elata*, saying that it differs from the former by having globose rather than ovoid fruit. The former was described as originating in Ceram and other islands of the Moluccas while the latter was described as originating in Celebes, thus effectively correcting the confusion in geographical distribution published by Martius. The differences between the two species mentioned by Blume are shown in Table 1.

In the Second (replacement) Edition of part 7 of Volume 3 of *Historia Naturalis Palmarum*, Martius (1845) was able to correct mistakes in the first edition and added information on the number of vertical rows of scales on the fruit: 13-15 in *M. filare*, 11-12 in *M. elatum*. Miquel (1855) repeated much of what Martius and Blume had said before, recognizing two species (*M. filare* and *M. elatum*). Fruit of *M. elatum* was described as "drupae globulo sclopeti minores, globosae"—that is, fruit globose, the size of a musket ball.

Beccari was the first botanist post Rumphius actually to have had field experience of *Pigafetta*, having seen and collected the palm at Andai in the Manokwari area of what is now Irian Jaya, New Guinea. This was the basis of his name, *Pigafetta papuana*, published in Malesia, Volume 1, in 1877. In this article he also transferred *Metroxylon filare* to *Pigafetta* but not *M. elatum* (this was

transferred by Wendland in Kerchove's *Les Palmiers* in 1878). In his commentary to the description of *P. papuana*, he stated that because his material was incomplete he could not be certain that it was distinct. He believed it could be distinguished from *P. filaris* by the absence of ramenta on the undersurface of the leaflets and the calyx being entire or more rarely minutely three-lobed rather than being trifid or three-toothed. Eventually Beccari wrote in his last account of *Pigafetta*, published in the *Annals of the Royal Botanic Garden Calcutta* in 1918:

I think there is only one species of Pigafetta, as the specific differences between Metroxylon filare and M. elatum indicated by Blume, Martius and Miquel seem to me to be very obscure, and I have not noticed any diagnostic character among the numerous specimens of Pigafetta examined by me.

Thus, by 1918 the three species of *Pigafetta* recognized by Beccari and previous authors had been subsumed into one, a situation not contradicted by the herbarium specimens and followed by most authors ever since. Although the three names have been used from time to time, their use has not been accompanied by any real understanding of differences between taxa.

Just before Beccari's account was published, Merrill published his interpretation of Rumphius' Herbarium Amboinense (Merrill 1917). Under *Pigafettia* (sic), he referred to two names, *P. filifera* (Giseke) Merrill and *P. elata* (Reinw.) H. Wendl., based on Rumphius *Sagus Filaris* and *Wanga*, respectively.

Records for *Pigafetta filaris* for Indochina are based on loose fruits, collected by Otto Kuntze, and said to be from Indochina. First described as *Calamus kunzeanus* Becc., Beccari later decided that the fruits were those of *Pigafetta*. The material is so meagre that we can scarcely be certain of their identity.

Two other names have been associated with *Pigafetta*—*Metroxylon microcarpum* and *M. microspermum*. Both names were published by



Table 2. Apparent differences between the two species of *Pigafetta*.

Characteristic	<i>Pigafetta filaris</i>	<i>Pigafetta elata</i>
Locality	Maluku, New Guinea	Sulawesi
Indumentum	dense chalky white indumentum abundant on leaf sheath and rachis	indumentum sparse, dull, not chalky white
Spines	sparse, usually golden	dense, golden in juveniles, dark brown in the leaves of mature individuals
Auricles	Two very conspicuous auricles present at the tip of the apparent petiole, usually projecting beyond the base of the lowermost leaflets (Fig. 7)	Auricles low, rounded, not projecting beyond the base of the lowermost leaflets
Posture of leaves in juveniles	Tending to be held more or less erect	Tending to be held more horizontally
Fruit	Ovoid (Fig. 8)	Globose to ovoid
Scales	13–15 vertical rows	11–12 vertical rows
Seed	Somewhat angled-foveolate	More or less smooth
Habitat	Common in lowlands from sea level up to about 300 m	Usually restricted to areas above 500 m above sea level to about 1000 m.

Martius (1838) based on two names published by Zippelius in Macklot (1830), *Sagus microcarpa* and *S. microsperma*. These four names, published without description, are *nomina nuda* and without botanical standing. Beccari (1877) assumed they both referred to *Pigafetta filaris* and so they are sometimes cited in synonymy.

How Many Species?

In fact, the evidence available to me now suggests that there are two species, one in Sulawesi and the other in Maluku (Moluccas) and the western part of New Guinea. The correct name for the former is *Pigafetta elata*, while the correct name for the latter is *Pigafetta filaris*. As most material in cultivation apparently originates from Sulawesi, and is referred to as *Pigafetta filaris*, there will thus need to be a change in the name on these palms to *P. elata*, a situation I regret. Nevertheless, I am sure all who grow *Pigafetta* will be excited by the thought that there are clearly two species with apparently slight ecological differences that may extend the range of climates in which the genus is grown.

Precise differences between the two species have yet to be described in full—herbarium material is limited and, as far as I know, although several collectors and gardens have both species, nowhere have both species growing together reached flowering, thereby allowing a direct comparison.

Synonymy may be cited thus:

PIGAFETTA (Blume) Beccari, Malesia 1: 89 (1877).

Sagus section *Pigafetta* Blume, Rumphia 2: 154 (1843).

Metroxylon section *Pigafetta* (Blume) Martius, Historia Naturalis Palmarum 3 (ed. 2): 213 (1845).

“*Pigafettia*”

1. *Pigafetta filaris* (Giseke) Becc., Malesia 1: 90 (1877).

Sagus filaris Giseke, Prael. Ord. Nat. Pl. 94 (1792); Blume, Rumphia 2: 154 (1843). Lectotype: Tab. 19, Herb. Ambon. Vol. 1.

Metroxylon filare (Giseke) Martius, Hist Nat Palm. 3 (ed.1): 216 (1838); (ed. 2.): 215 (1845); Miquel, Fl. Ind. Bat. 3: 149 (1855). Type: as above.

Pigafettia filifera (Giseke) Merrill, Interpr. Rumph. Herb. Amboinense 114 (1917). Type: as above.

Pigafetta papuana Beccari, Malesia 1: 89 (1877). Type: Irian Jaya, Andai, Beccari s.n. (FI).

?*Calamus kunzeanus* Beccari, Ann. Roy Bot. Gard. Calcutta 11: 490 (1908). Type: Kuntze s.n. (FI).

Sagus Filaris Rumphius, Herb. Amb. 1: 84, t.19 (1741).

2. **Pigafetta elata** (Martius) H. Wendl., in Kerchove, *Les Palmiers* 253 (1878).

Metroxylon elatum Reinw. ex Martius, *Hist. Nat. Palm* 3(ed.1): 216 (1838), (ed.2): 216 (1845). Miquel, *Fl. Ind. Bat* 3: 150 (1855). Type: **Wanga** Rumphius, *Herb. Amb.* 1: 85 (1741).

Sagus elata Reinw. ex Blume, *Rumphia* 2: 156 (1843). Type: **Wanga** Rumphius, *Herb. Amb.* 1: 85 (1741).

Wanga Rumphius, *Herb. Amb.* 1: 85 (1741).

Acknowledgments

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(Continued from p. 56)

cited as "holotype" and "lectotype" for *Oenocarpus tarambapo*). And the printer, apparently not used to taxonomic texts, has been sloppy with such details as italicizing and indenting correctly the synonymy blocks (e.g., *Mauritiella armata*). The illustrations in the book are disappointing. The line drawings only give a very general idea of what the plant looks like. Taxonomic details on which the separation of the species depend are hardly illustrated. Four color plates with 16 photographs are beautiful and highly illustrative, but their number is far from adequate to make up for the lack in quality of the line drawings. The distribution maps are clear and give excellent impressions of overall distribution and collection density, but it would be easier to use them if the name of the taxon in question had been written directly on the map and not only in the figure legend. For a pricey book from

a prestigious publisher one expects more careful editing and handling of illustrations.

Regardless of these points of critique, the book stands as a milestone in the study of Amazonian palms. It will be the reference that everyone who studies the palms of the region, taxonomists, ecologists, and ethnobotanists alike, will consult and will learn a great deal from. For the taxonomists the book will be a solid point of departure for further studies of the variation and distribution of Amazonian palms. Many taxonomic problems remain unresolved, but the book provides a solid framework. Many taxonomic problems will be much easier to define and circumscribe than they were before. That may be this book's greatest contribution and service to botanists who study the flora of the Amazon basin.

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