

Major Jenkins' Fan Palm in Thailand

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1. Habit of *Livistona
jenkinsiana*. Phu Soi Dao.
(Photo: Katja Anker)

Major Jenkins' Fan Palm, *Livistona jenkinsiana*, is currently under threat in northern Thailand from habitat destruction caused by unsustainable agricultural practices. Based on recent field work and other research, we discuss the historical background and the taxonomic delimitation of the species.

Livistona jenkinsiana Griff. (Figs. 1 & 2) was first described by William Griffith (1845), based on his field observations and a collection made in 1842 from Assam by Major Francis Jenkins, and named in his honor (Box 1). The type specimen, conserved in the herbarium of the National Botanic Garden of Belgium, consists of an inflorescence and remnants of flowers and a few fruits (Fig. 3). The protologue clearly described the fruit and seed as: "Drupe reniform, round, slightly attenuate at the base, the size of a musket ball, of a leaden blue colour, marked on one side with a depressed white line. Seed erect, presenting on the side corresponding with the above line on the fruit a broad raphe-like line. Albumen horny, opposite the centre of the above line deeply excavated; cavity as usual filled with a spongy substance. Embryo opposite the excavation or in the centre of the dorsal face." Griffith (1850) subsequently provided two illustrations to accompany his account of *L. jenkinsiana* in his *Palms of British East India*. One plate included a full leaf, whilst the second plate included an inflorescence, and flower and fruit dissections (Fig. 4). Some descriptive elaboration of the fruit was provided by Blatter (1926), who noted the dimensions as "3/4-1 inch in diameter" but otherwise quoted verbatim the description in the protologue. More thoroughly, Beccari (1931) described the fruit from "very good specimens" collected from Naga Hills by Gustav Mann as: "globular, 22-28 mm in diam. often slightly broader than high and somewhat asymmetrical," as well as providing a diagnostic illustration of fruit "from Assam," but still without significant variation from the protologue. More recently, Rao and Joseph (1962) provided a diagnostic illustration of the fruit, which conformed to the previous descriptions for the species. In summary, the fruit of *L. jenkinsiana* is rather similar in all the

descriptions noted above, and does not display any significant variation across its natural distribution.

Taxonomic status relative to *Livistona speciosa*

Twenty-nine years after Major Jenkins' Fan Palm was described from Assam, another species of fan palm was published by the German botanist Wilhelm Sulpiz Kurz, who at the time was curator of the herbarium in Calcutta. The new species was named *Livistona speciosa*, which means the showy or splendid one. Kurz (1874) described the new species based on a collection he had made in the mountains of Pegu Yoma of central Burma (Kurz 3330/3331). That collection, conserved in the Natural History Museum London and Kew Herbarium, has been accepted as the type specimen (Dowe 2009). Kurz noted in the protologue of *L. speciosa* the similarity of *L. speciosa* and *L. jenkinsiana*, and he distinguished the species as "differing chiefly by the smooth (not scurvy) spathes and in shape of fruits." He furthermore described the fruits of *L. speciosa* as: "Drupes elliptically obovoid, to nearly an inch long, dark blue, smooth, 1-seeded, seated on the short thick indurated perianth jointed with the nipple- or disk-shaped very short peduncle." The illustration accompanying Kurz's protologue conformed to his description. Beccari and Hooker (1894) provided a brief and similar description, whilst Beccari (1931) provided a very detailed description based on the type and other Kurz specimens, as: "Fruit obovate obpyriform, exactly rounded above, distinctly narrowed to a rather acute base, 2.5 cm long, 18 mm through, carried by a pedicel 4-5 mm long and 2.5 mm thick, formed by the hardened and somewhat thickened perianth and by the also somewhat increased flower bearing tubercle..... Seed oblong-elliptical,

Livistona jenkinsiana was named for Major Francis Jenkins (b. St Clement, Cornwall, U.K., 4 Aug., 1793; d. Guwahati, Assam, 28 Aug., 1866), collector of the type specimen in 1842 at Nowgong, Assam. He was Captain in the Mercantile Marine when given the task of assessing the resources of Assam (Bhuyan 2006). In the company of Indian Army Officers Lieutenant R.B. Pemberton and Captain G.T. Gordon he explored a route for communication between Assam and Manipur in January 1832, thus initiating the annexation of Assam and placing it under British colonial jurisdiction (Kanungo 2006). Subsequently, Jenkins was appointed as the British Commissioner of Assam and Agent to the Governor-General for the Northeastern Frontier of India, serving in that role from 1834 to 1861 (Bhuyan 2006). The development and establishment of the tea industry in Assam, and the formation of the Assam Tea Company in 1839, was facilitated by Jenkins (Royle 1840; Sharma 2006). Apart from being a capable and diplomatic administrator (Zou 2005), Jenkins had interests in natural history and botany (Griffith 1847), and Assamese history, culture and art (Robinson 1841), upon which he wrote a number of published articles (Bhuyan 2006).



2. *Livistona jenkinsiana*. A. Habit. B. Leaf petiole and blade. C. Detail of petiole. D. Infructescence. E. Fruit, longitudinal section. F. Fruit, lateral view. Scale bars A = 1 m; B = 10 cm; C = 1 cm; D = 10 cm; E = 1 cm; F = 1 cm. All from Barfod et al. 714. Drawn by Katja Anker.

rounded at both ends, 17 mm long, 12 mm through." Beccari's accompanying diagnostic illustration conformed precisely to his description. Furthermore, Beccari (1931) noted that "*L. speciosa* is related to *L. jenkinsiana* and

as to the leaves and the spinescence of the petioles it is hardly distinguishable from it: it is however, recognizable by its smaller flowers, but especially by the quite different form of the fruit and the thickness of its pericarp."



3 (above). Type specimen of *Livistona jenkinsiana*, collected by Major Francis Jenkins, in 1842 from Nowgong, Assam, and conserved in the Herbarium, National Botanic Garden of Belgium (BR) (reproduced with permission). 4 (below). Illustration of *Livistona jenkinsiana*, from Griffith, W., Palms of British East India, plate 226B (1850).



Although both *L. jenkinsiana* and *L. speciosa* can be readily distinguished in literature descriptions by fruit characteristics, it is the variability of *L. speciosa* as met with in the field that has caused botanists to query the taxonomic status of the two species. Dowe (2001, 2003) concluded that the two taxa were indistinguishable and represented variation within a single species, and placed *L. speciosa* as a synonym of *L. jenkinsiana*, as the latter had nomenclatural priority in such an action. This assessment was followed by Dransfield et al. (2004) and Govaerts and Dransfield (2005). Although the fruit of *L. speciosa* was unambiguously described by Kurz and subsequent botanists, it has been found to be variable in both size and color across its distributional range. It must be noted that fruit shape and size are generally conservative for *Livistona* species, i.e., fruit characters and dimensions usually fall within a narrow range for a particular species, and that the broad range, particularly in dimensions, for *L. speciosa* is unusual for the genus.

Field work to investigate *Livistona* in Thailand

In 2006, a joint team of Danish and Thai researchers visited the Phu Soi Dao National Park in connection with the Flora of Thailand project. The Park, which extends across Pittsanulok and Uttaradit provinces in northern Thailand, was established to conserve forest ecosystems that are in danger of being converted into agricultural land. The landscape within the national park is mountainous with altitudinal range of 500–2000 m.

Outside Phu Soi Dao National Park, solitary trees of *L. speciosa* are found scattered throughout the landscape. While we were preparing specimens of that species for pressing, a local farmer told us about another fan palm of a similar stature but with larger, blue fruits that ripened earlier than *L. speciosa* and was in season at that time. Arriving at our final destination, the Rom Klao Botanical Garden, we learned that the head of the Garden, Mr. Danai Sabbhasri, wrote his Master's thesis on this very palm with special emphasis on its uses. Locally it is called *Kho*, and the mesocarp is considered a delicacy. The palm was reported to grow in populations some hours away near the border with the Lao People's Democratic Republic (Laos).

On the morning of March 4th, a group consisting of A.S. Barfod, P. Suksathan, D. Sabbhasri, illustrator Katja Anker from the



5. Young fruits of *Livistona speciosa*. The fruits grow in size but retain their overall shape and green metallic luster until maturity. Phu Soi Dao. (Photo: Anders S. Barfod)

Botanical Museum in Copenhagen and assistants from the Phu Soi Dao Botanical Garden set out to hunt for the mysterious blue-fruited fan palm. At mid-day, after an arduous journey consisting of various types of tractor transport and eventual hiking, we arrived at undisturbed forest with several rattan species in the understorey, and the mysterious fan palm in all its beauty and splendor at the peak of fruiting (Figs. 1, 6 & 7). An appropriate individual for sampling was identified, and the tree climber carefully climbed the tree to cut down material for pressing – carefully, because the petioles were heavily armed. The tree was about 9 m tall and relatively easy to climb because the stem was stepped by old leaf bases. The crown was composed of 35–40 leaves with a “skirt” of 10–15 old, dead leaves. The leaf bases were 50–60 cm long, split to the base, eventually breaking up in brown fibrous mesh. The petioles were 240–260 cm long, with up to 2 cm long, basally swollen, slightly recurved, green to blackish spines, which decreased in size towards the blade. The blades were circular in outline and 280 cm across. The tree sampled carried five infructescences, which were branched to the third order. The peduncles were about 25 cm long and the rachis about 1 m long with 5–6 first order branches. The fruits were about 3 cm wide and

2.6 cm long and matched Griffith's 164 year old description almost exactly: “*Drupe reniform, round, slightly attenuate at the base, the size of a musket ball, of a leaden blue color, marked on one side with a depressed white line*” (Griffith 1845). After having carefully noted down the key measurements and thoroughly photographed all the different parts of the palm we managed to prepare a beautiful collection in four duplicates, which are stored in herbaria in Thailand, the UK and Denmark. While we were sweating away making the collections, Katja Anker managed to produce a number of sketches. It is these sketches upon which the line drawing shown in Fig. 6 is based. The drawing will eventually appear in the palm treatment for Flora of Thailand.

Our conclusion

Based on the original descriptions by Griffith and Kurz, the observations in the field described above and further research by Dowe (2009), the authors had somewhat independently arrived at the conclusion that *Livistona jenkinsiana* and *L. speciosa* should be considered as taxonomically distinct entities, with *L. jenkinsiana* readily distinguished by fruit that is globose to reniform, 19–28 mm long, 20–30 mm wide, leaden blue to dark bluish-purple and with subapical stigmatic

remains, whilst the fruit of *L. speciosa* is much more variable, obovoid, obpyriform, to ovoid, rounded apically, narrowed basally, 25–35 mm long, 18–25 mm wide, greenish-blue to light-blue at maturity; and with apical stigmatic remains (Fig. 5). Perhaps the simplest way to distinguish the fruit is that in *L. jenkinsiana* it is wider than long, whereas in *L. speciosa* it is longer than wide. Characters used to recognize *L. jenkinsiana* and *L. speciosa* in the field are presented in Table 1.

Distribution and conservation status of *Livistona jenkinsiana*

The range of *Livistona jenkinsiana* is from northern India, through Sikkim, Bangladesh, Myanmar, southern China to Thailand (Fig. 8). Because of the lack of precise distribution data and with no documentation of population numbers, the conservation status of *L. jenkinsiana* cannot presently be determined with acceptable precision, but there is reason to suspect that it is regionally threatened, if not endangered. A rare and/or endangered status has been applied to the population in India (Basu 1991, Behera et al. 2002, Aumeeruddy-Thomas & Pei 2003). Dowe (2009) applied the IUCN- World Conservation

Union rating as “near threatened,” based on the known distribution data. The definition of “near threatened” is:

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future (IUCN 2007).

In Thailand, *L. jenkinsiana*, unlike the more gregarious *L. speciosa*, is locally rare, and therefore threatened by unmanaged fire, forest clearing, agriculture and urban development. The populations in Phu Soi Dao are under immediate pressure from expanding agriculture associated with ginger cultivation (Fig. 9). The unsustainable agricultural practice most often used in connection with this type of semi-subsistence agriculture is a contentious issue, which is closely linked to the on-going debate on ethnicity and opium eradication programs.

Uses of *Livistona jenkinsiana* in Thailand

As is often the case with palms, *Livistona jenkinsiana* is used for multiple purposes based on its structural and nutritional properties.

Table 1. Diagnostic differences between *Livistona jenkinsiana* and *L. speciosa* in Phu Soi Dao National Park.

	<i>L. jenkinsiana</i>	<i>L. speciosa</i>
LEAVES		
Blade size across (cm)	270–290	200–210
Petiole length (cm)	240–260	190–200
INFRACTESCENCE		
peduncle length (cm)	50	25
branching	to the 3 rd order	to the 4 th order
FRUIT		
shape	wider than long, kidney-shaped	longer than wide, obovoid
color	leaden blue	turquoise, iridescent
position	solitary	solitary or in pairs
PHENOLOGY		
flowering season	December–January	February–March
Fruiting season	25–26 months after	November–January*

*Since the fruits are not consumed, our informants were not aware whether it takes one or two years for them to mature.



6. *Livistona jenkinsiana*, leaf. Phu Soi Dao National Park, Thailand. (Photo: Katja Anker)

The leaves are used for thatching houses in the Phu Soi Dao area. After harvest 5 or 6 leaves in the center of the crown are left on the palm to prevent it from dying. The palm heart is edible. The fleshy mesocarps of the boiled fruits are considered a delicacy. It takes almost two years for the fruits to reach maturity. Seeds

from the boiled fruits do not only survive the heat treatment but allegedly germinate faster. The fruits are also boiled to extract oil used for skin moisturizers. In India, Aumeeruddy-Thomas and Pei (2003) recorded that the leaves are used for thatching and hat-making and that the mesocarp is edible.



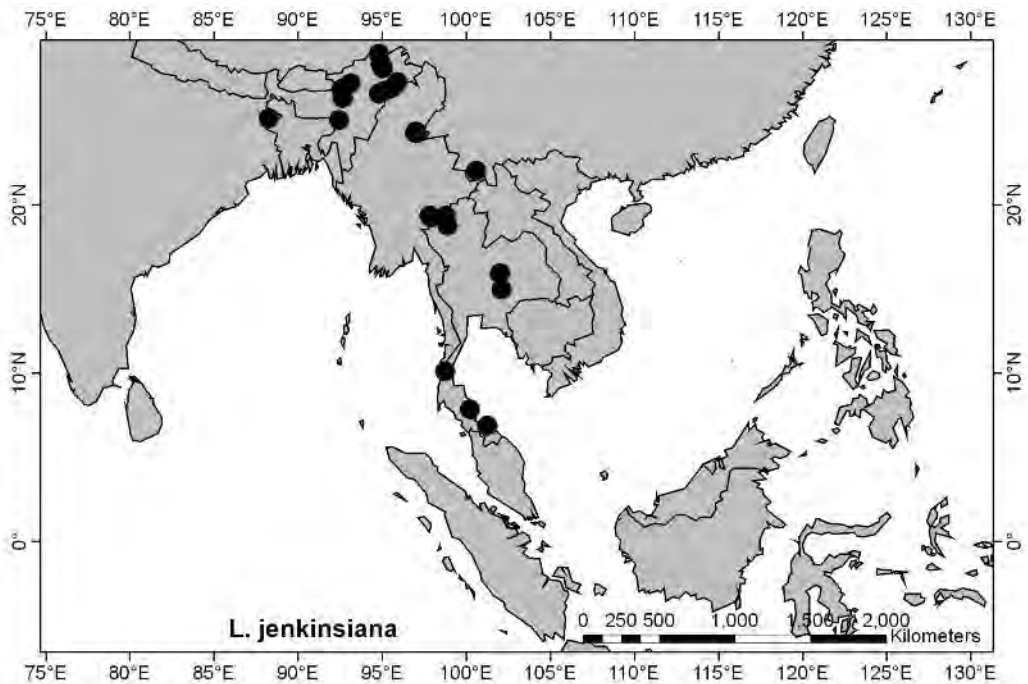
7. *Livistona jenkinsiana*, infructescence. Phu Soi Dao National Park, Thailand. (Photo: Piyakaset Suksathan)

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