

REPORT ON INVESTIGATION OF WILD MANGO TREES
IN PENINSULAR MALAYSIA, SABAH AND SARAWAK

by

Dr A H G H Kostermans

WWF PROJECT NO. MAL 75/85 (~~PART ONLY~~)

World Wildlife Fund Malaysia
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Malaysia

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Prepared by
Dr A H G H Kostermans
for
World Wildlife Fund-Malaysia
November 1986

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DURATION

Itinerary

- 19.08.1986 Flight from Jakarta to Kuala Lumpur
- 20.08.1986 Kuala Lumpur (Office of WWF Malaysia and Forest
to Research Institute Malaysia, Kepong)
- 21.08.1986
- 22.08.1986 Flight to Kota Kinabalu
- 23.08.1986 At Kota Kinabalu
- 24.08.1986 By car to Tenom (south-west of Sabah) via Crocker
Range to the Agriculture Station in Tenom with Mr A
Lamb.
- 25.08.1986
to Tenom and vicinity, hunting for mangoes
- 26.08.1986
- 27.08.1986 Return to Kota Kinabalu by car via Crocker Range,
hunting for mangoes in the Bundu Tuan valley
- 28.08.1986 Flight to Sandakan and by car to the Sepilok Forest
Research Centre
- 29.08.1986 Hunting for mangoes in the south-west and south-
to central parts of Sabah
- 14.09.1986
- 15.09.1986 Return flight to Kota Kinabalu; delivering a speech
for the Society of Sabah Agriculturists and the
Sabah Society
- 16.09.1986 Flight to Kuching
- 17.09.1986 Hunting for mangoes in the Kuching area, trip to
to Lundu, north-west of Kuching
- 24.09.1986
- 25.09.1986 Flight to Singapore. Complete identifying the
herbarium specimens study (started last year)
- 28.09.1986 Flight to Kuala Lumpur
- 29.09.1986 Stationed at the Forest Research Institute Malaysia,
to Kepong studying the herbarium mango collections
- 03.10.1986
- 04.10.1986 Return flight to Jakarta.

RESULTS

Results were far above expectations, thanks to the cooperation of several people and the excellent pre-arrangements made by Mr Ken Scriven.

The first two days in the Forest Research Institute Malaysia, Kepong Herbarium enabled me to correct many wrong identifications.

In Tenom (25th - 27th August), a giant (45 m tall) undescribed mango tree was discovered by Mr Tony Lamb. For MR\$50, two Dayaks made a ladder and climbed the tree to get the flowers (two days work). I have provisionally named the species Mangifera lambii Kosterm., species nova. After a long search, a second specimen of this species was found. Mr Lamb would ensure that fruits would be collected for propagation in an arboretum and in a forest patch. Photographs of the key identification parts would be taken.

The most common mango species planted here for hundreds of years but is also found in the wild is the manga aer (aer = water), of which the tasty fruit appear regularly in markets. The fruit is still greenish when ripe, turns yellow at full maturity, is rather fibrous, has a good taste and is juicy. It resembles a large but less compressed common mango. After 2 weeks I came to the conclusion that it represented an (scientifically) undescribed species (which I have called Mangifera aquaea Kosterm., species nova).

Other common mangoes are listed below:-

- 1) the beluno (Mangifera caesia), a commercial sweet, juicy, large, white-fleshed mango (at market price MR\$1.50 - MR\$2.00). (I know now, that the rare and elusive binglu, of which a few trees still exist in West Java, represents this species and that it is the same as the well known wani from the island of Bali).
- 2) the bambangan (Mangifera pajang Kosterm.) is less common and fetches MR\$2.00 a piece. We know now that it has become extinct in the wild.
- 3) The most common mango, after manga aer is Mangifera foetida, the bachang, embacang or here called pau, of which many varieties exists (I have seen a tree of 90 cm diameter). It is both wild and cultivated and is common in markets. The red flowers are very conspicuous, but it is not as completely covered with flowers as manga aer.

The exploration of the Bundu Tuan valley (the name is wrongly spelt Bundu Tuhan; bundu = beluno = Mangifera caesia; tuan or twan = fallen), yielded, apart from a flowering Durio

kinabaluensis Kosterm. (with enormous bunches of large, pink flowers, literally dripping with nectar) the first live tree of the wahab (perhaps, Mangifera beccarii); several varieties of Mangifera foetida, one with highly coloured (yellow and red) young fruit which is very unusual and also a magnificent youngish tree of Mangifera rufocostata Kosterm., species nova, of a meter in diameter and a very dense, enormous blackish green crown (this tree can grow up to 50 m height).

In the Arboretum of the Agriculture Station at Tenom, several trees could be named. In the neighbourhood of Sepilok in East Sabah, Mr Patrick Andau brought me to a 60 m high tree of Mangifera rufocostata (doompiring) in a ladang; we hope that this tree will provide seeds for replanting in the adjacent Sepilok Forest Reserve. The Reserve itself, which has been very thoroughly explored has one tree of Mangifera decandra and one of M. rufocostata, a proof of how rare these trees are. On the Labuk Road to Ulu Dusun, there were formerly - after logging - many giant mango trees left. They have been cut recently when the land was cleared for cocoa plantation.

The quest was now to find more wahab trees and the elusive rancha-rancha. We succeeded in finding both on a trip in the vicinities of Ranau and Keningau. Several planted trees of the wahab (the word means swallowing as a whole; the fruit is a few cm long, black outside, orange, juicy, sweet inside and can be swallowed with the stone) were found on a hill. The tree is perhaps extinct in the wild. A sweet fruited rancha-rancha tree (which proved to be Mangifera quadrifida) was found in a remote Dayak settlement. So this problem was solved too.

The season for Mangifera odorata started (it is generally called kweenee or kuweni, but in Sabah it is called wani, a name causing confusion with the wani of Bali and the wanyi of Kalimantan, both Mangifera caesia). It is picked rather green but is already ripe. If fully ripe it turns pale yellow but gives off an offensive penetrating smell. A variety (hybrid?) was found in the Ulu Dusun Agriculture Station.

Altogether 25 different mango species were located in Sabah, ten more than so far known. Of one, we could not get material: it grows near the Ulu Dusun Agriculture Station in temporarily inundated land. Two trees, both dead, were found (the forest was heavily destroyed). There were, however, many seedlings. Mr William Wong of the Ulu Dusun Agriculture Station promised to get flowering and fruiting material of it.

The station has a good collection of mangoes, mostly manga aer and kweenee (kuwini = wani) but also the most popular cultivar of Mangifera indica (the manga manila, a smallish thin skinned flattish delicious variety from the Philippines). Many other cultivars from Java have also been introduced recently (aru manis, simanalagi, indramaju, golek). In a forest, we found a large specimen of M. decandra, the unknown one is mentioned above.

No trace was found of the delicious, promising **manga kasturi** of Central south Kalimantan, of which I have brought several live seedlings to the Tenom Agriculture Station.

The best cultivar is without doubt, however, the **manga apple**, which looks exactly like an apple, is thin skinned, has very juicy sweet pale flesh, no fibres and an extremely small stone.

Both Mr William Wong and Mr A Lamb will collect wild mango seeds and re-introduce them in forest patches and in Arboreta, to prevent extinction.

A talk, presented in Kota Kinabalu on the last night, before leaving for Kuching, was so animated that the Director of Agriculture of Sabah suggested the creation of a Division of wild fruit trees, economically, a sound plan as several wild mangoes will find ready markets in Kuala Lumpur, Singapore, Hong Kong and elsewhere. Australia will also be interested.

Apart from studying mangoes in the Sandakan herbarium (headed by Mr Lee Ying Fah), I have also identified hundreds of other herbarium specimens of numerous families. Moreover, I could help the botanist (female) of the Danum Valley project in identifying her enormous ecological collections. We hope, that she will become a cooperator in the wild fruit trees project as she will be stationed for an indefinite period in the Danum Valley.

The older staff members of the Sandakan herbarium are still very interested in new collections and know much more of plants than the younger and often titled colleagues. Mr Patrick Andau had collected a seed of Mangifera whitmorei (only known from the Malay Peninsula) from Telupit and planted in his own private garden, a gesture of a good conservationist.

The Sarawak trip was originally mainly aimed at working through the herbarium collections of the Forestry Department and for me to solve the puzzle of Mangifera griffithii and M. havilandii. The experienced Dr Paul Chai has been transferred to the Ministry of Environment and Tourism and his successor, Mr Abang Kassim has the difficult task coping without guidance, next to his voluminous administrative work, to get acquainted with plants. Luckily an old hand: Haji Osman, was still active and he arranged for my hunting trips along the Kuching River and to Lundu and elsewhere.

The most startling discovery was a dried specimen, collected in the Hose Mountains of a 30 m high mango tree with fruit (mature, black, sweet of only 1 - 1.5 cm length. It represents either an undescribed species or a small leaved variety of Mangifera blommesteinii).

Haji Osman brought me to a kampong where I saw a live Mangifera sclerophylla, growing half in water, also **manga aer** and **asam kumbang**, which proved to be the **rancha-rancha** of Sabah (Mangifera

quadrifida). There were quaint varieties of Mangifera foetida, the embachang, one pale yellow outside, a new puzzle.

The trip to Lundu brought surprising results. There is a road from Lundu to the seacoast and part of the road is flanked by old manga gardens of Dayaks. These gardens look like primary forest, the trees are an average of 30 to 45 m tall, with enormous clear holes.

Here I saw a good specimen of my Mangifera torquenda Kosterm., the puteran (so called because it is eaten by making a cross cut and twisting the two parts), a tree of 40 m with a special name, it is undoubtedly a "good" species and not even related to Mangifera similis of Sumatra, in which it was placed recently. There were special gardens full of the rawa, Mangifera griffithii of which the leaves of seedlings and saplings are quite different from those of the mature trees.

We found also an unknown species, called asam lepih (lepee) a giant tree, said to have small, tasty fruits.

I was lucky to make the acquaintance with Mrs Robert Lian Labang-Pearce, an English botany lecturer at Universiti Pertanian, Kuching who for years has been interested in fruit trees and who, I hope, will become a welcomed member of the wild fruit group. I could show her the different mangoes in the herbarium collections and gave her a list of the species of which additional flowering and fruiting material and photographs are wanted. She moreover will plant seeds of wild fruit trees in the new campus ground of the college.

In this way there are now four stations: Tenom, Sandakan, Ulu Dusun and Kuching for establishing collections and returning them to the protected forest areas.

In the Singapore Herbarium, the status of Mangifera subsessilifolia Kosterm., species nova could be established. It occurs even on Bukit Timah, but only as seedlings and has been confused by botanists with a Semecarpus species. Ding Hou, the author of the latest, rather poor revision of the mangoes in "The Flora Malesiana" mixed it even with Mangifera macrocarpa. The seedlings of the latter are exactly like the leaves of Semecarpus lineatus Kosterm., species nova and are even difficult to distinguish from the seedlings of a Ganua species of the Sapotaceae family.

Conclusions: Many problems in the taxonomy of the mango species could be solved with field work. The propagation of wild mangoes is now in proper hands. Areas are available to raise seeds and areas are found where they can be re-introduced into the forest for future conservation. But dedicated people are still a must for this work; it is surprising how little interest is shown by local people, which had their education at colleges and universities. The cause is possibly that the teachers of this young generation of scientists do not know the plants.

We hope that a forthcoming book with many figures and plates will help to overcome this, at least partly.

Acknowledgements

In the text we have already expressed our gratitude to Mr Ken Scriven for the excellent way in which he has prepared our trip.

In a broader scope we have to thank especially Dr Williams, Head of IBPGR Roma, who has always shown his great interest in conserving the germplasm of wild fruit trees and substantiated this by extending generous grants for printing the coloured photographs of the mangoes and another grant for Mr J M Bompard (University of Montpellier) who is at this moment continuing his collecting, photographing, etc. of mangoes and other fruit trees in East Kalimantan.

Mr Bompard will be the future link between North Borneo and Indonesian Borneo and in this moment we are already trying to establish one or more centres for conservation of fruit trees in Kalimantan.

We have to thank further WWF International, Gland for financial and other help, mainly via Mr Ole Hamann and the endeavours of IUCN to collaborate.

The blanks in our knowledge are still there, surprisingly. The Moluccas, where Rumphius in 1741 described several wild species, up to this day unknown to science; the second is Sumatra (we hope that Mr Bompard will be given the opportunity to continue his work there); and the Malay Peninsula, where a number of species is still only known from one collection, made half a century ago and where the status of some described species is uncertain. There is a species in the Cameron Highlands, near the Boh Estate, of which, tens of years ago, a single fruit was collected. It is easily accessible and the local sakai people have even a name for it and collect the fruit, which is unidentifiable, because we need the flowers (I called it provisionally Mangifera orephila Kosterm., species nova).

Submitted by:

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