BIODIVERSITAS
Volume 24, Number 1, January 2023
Pages: 609-616

ISSN: 1412-033X
E-ISSN: 2085-4722
DOI: 10.13057/biodiv/d240169

Ethnobotanical identification of mango (*Mangifera indica* L.) and other fruit trees mentioned in Old Javanese Ramayana (10th century Java, Indonesia)

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Manuscript received: 22 November 2022. Revision accepted: 26 January 2023.

Abstract. *Mulyanto D, Supangkat B, Nurseto HE, Iskandar J. 2023. Ethnobotanical identification of mango (*Mangifera indica *L.) and other fruit trees mentioned in Old Javanese Ramayana (10th century Java, Indonesia). Biodiversitas 24: 609-616.* Among the 2778 stanzas in Old Javanese Ramayana (OJR), only 46 (1.6%) mentioned fruit trees. There are 63 Old Javanese phytonyms for fruit or fruit tree and only 12 (19%) of them are Sanskrit in origin. Fifty-six species from 44 genera and 26 families are identified, higher than the number of fruit trees carved in reliefs of Borobudur Temple. Of the 56 species, 13 are exotic, specifically from the Indian subcontinent. One of the exotic trees from India that has been naturalized in Java for centuries is *Mangifera indica*, which is the most often mentioned in the text. Meanwhile, 39 of them are expressly described as fruits that can be consumed raw as food/dessert. It was also found that there are four landscapes, namely hermitage, countryside, forest, and royal garden, which depict the presence of fruit trees. The forest is the landscape with the most mentioned fruit trees in its description. Furthermore, the fruit tree present in the depiction of all landscapes is *Mangifera indica*. The prevalence of mango trees in these landscapes is probably related to the mango fruit's edibility as well as its symbolic and religious significance. Other fruit trees, such as *Aegle marmelos*, *Garcinia xanthochymus*, *Phyllanthus emblica*, and *Tamarindus indica* also have religious significance in Hinduism.

Keywords: Ancient Java, fruit, historical ethnobotany, kakavin, phytonym

INTRODUCTION

The potential use of historical texts for ethnobotanical studies has generated renewed interest in the relationship between human and plants (Fatur 2019; Coimbra and Welch 2020; Petran et al. 2020; Liu et al. 2021). These texts are not only considered important as sources for obtaining information highlighting the relationship between the people of a particular area and their botanic environment in the past, but also demonstrate the continuity and change of traditional knowledge about plants (Pardo-de-Santayana et al. 2007; Kalle and Soukand 2012; Castro et al. 2013; Silva et al. 2014; Herrero and Cardano 2015; Rahman et al. 2019; Petran et al. 2020; Ford 2020; Dafni et al. 2021; Saraci and Damo 2021).

Discovering information in manuscripts, books, or other historical sources promotes a chronological view of evolving plant uses (Silva et al. 2014), and the chronological analysis of food concepts throughout history, for example, can help to clarify current conceptions (Jákl 2015a; Hoogervorst and Jákl 2020). Plants often keep their names and essential purposes over millennia and across continents. On the other side, people have always done their best to take their most important plants with them when they move from their homelands (Hoogervorst 2013).

Past ethnobotanical knowledge is often hidden in literary works (Pardo-de-Santayana et al. 2006; Ryan 2018; 2020), including folksongs (Cardano and Herrero 2014; Herrero and Cardano 2015; Fernandez-Llamazares and Lepofsky 2019; Ivanova et al. 2021; Fiser 2022). These literary texts can be treated as documents about folk traditions, although not necessarily reliable as historical document (Sorokin 2019). The texts frequently reflect customs and capture the thoughts, beliefs, or traditions of the culture and the time they were written in ways that are not always intentional but indirect and sometimes distorted. Therefore, literary texts can be seen as a source of ethnobotanical studies (Pardo-de-Santayana et al. 2006).

Along with vegetables and cereal products, fruits have been consumed in ancient Java since the earliest times (Hoogervorst and Jákl 2020). Many fruits were known to ancient Javanese and proof of their cultivation date back to the ninth century (Metusala et al. 2020). The reliefs of the Buddhist monument Borobudur and Mendut, constructed and reconstructed in the ninth century, show different kinds of fruits and fruit trees. The same holds true for the reliefs of the Hindu counterpart, the complex of Prambanan (Steinmann 1934).

Old Javanese Ramayana (OJR) is regarded as a rich source of a cultural history of premodern Java (Acri 2010; Worsley 2012; Jákl 2016a; Robson 2018; Bronner and Creese 2019) and has been used as a source to study its historical milieu (Acri 2010; 2011; 2014; Saraswati 2013). Furthermore, some studies have also listed the occurrence

of several fruit trees in this text and remarked on the actual presence or use of such plants in ancient Java (Jákl 2015; 2015a; 2016; 2017; Hoogervorst and Jákl 2020). These studies also inform us how important the fruit was not only in Javanese plant symbolism but also in the premodern economy of Java. For example, the coconut palm is represented in kakavins as a plant element typical of the coastal and lowland environment and of secluded, often small, upland villages in the outback. This image indicates that this plant may have been an essential, if not predominantly, element of outback inland settlement reliant on the palm economy rather than on wet rice cultivation (Jákl 2016).

Zoetmulder (1974) addressed a long section of the literary representations of plants and trees, covering notes on fruits cited in OJR when the author portrayed countryside and forest landscapes. It was assumed that these fruits were Javanese rather than Indian. However, all the Javanese phytonym for these fruits mentioned in this kakavin are left unchecked without any botanical reference and were not analyzed from an ethnobotanical viewpoint. This paper explores and finds botanical reference to Old Javanese phytonyms mentioned in OJR and then review the uses of fruits or fruit trees as reflected in the text.

MATERIALS AND METHODS

Source

The data used in this study were obtained from the OJR, a kakavin or courtly poem modeled on traditional Sanskrit meters (*kāvya*). It is believed to have been written in Central Java (Indonesia) in approximately the late ninth or early tenth century during the era of the Medang Kingdom. This oldest and lengthiest kakavin ever written has always been deemed the pinnacle or artistic expression. A large number of conserved manuscripts is proof of its popularity and adaptation (Acri 2016).

Old Javanese scholars agree that the textual source of the OJR might have been the Sanskrit poem Rāvanavadha, better known as Bhatti-kāvya, written between the sixth and seventh century AD. Moreover, the first half of the OJR is an exact rendering of this poem (Medhacitto 2018). This study utilized the standard three-volume edition of 'Ramayana Kakawin' which was romanized and translated into English by Santoso (1980). OJR consists of 26 chapters (sargas), each composed of stanzas. Each of these stanzas consists of four lines, having the same number of syllables and constructed on the same metric pattern, except for some stanzas in chapters 25 and 26.

Procedures

All chapters, stanzas, and lines in OJR were reviewed successively, and the fragment of the poem where the fruit or fruit tree appears with their context was recorded. With this information, a database arranged in the following fields was created: the Javanese phytonym of the fruit or fruit tree mentioned, the number of times it is cited, the symbolic value attributed to the plant and other data, such as the ecosystem.

Data analysis, especially related to the identification of Old Javanese phytonyms

Some ancient phytonyms correspond to botanical taxa in the modern scientific sense. However, when working with Old Javanese phytonym, the absence of any unified system of plant names in the era of kakavin texts creation should be considered. Therefore, one of the most crucial methods for disclosing the meaning of ancient phytonyms is the analysis of context of the quotations where the phytonym occurs. The more often a certain phytonym is come across and the more diverse the contexts are, the more information about the plants meant by ancient authors can be obtained. This is why identifying phytonyms that occur only once in the corpus is exacting (Sorokin 2019).

Numerous Austronesian languages spoken by native Indonesians are the most important information source for reconstructing the meaning of Old Javanese botanical vocabulary. The presence of Old Javanese phytonym parallels in other Austronesian language groups, specifically those with strong linguistic and historical relationships, allowed this study to put forward several of very convincing hypotheses regarding the OJR plants. The sources of this information, such as de Clercq (1909), Heyne (1922-1927), and Osche and Bakhuizen-van-den-Brink (1931), are specifically relevant in the case of the botanical name, where the initial meaning was not preserved in modern Javanese language.

To confirm the existence of fruit trees mentioned in OJR and their botanical references, the previous list was compared with the list of fruit trees carved in reliefs of the Borobudur Temple built in the eight to ninth century AD. In addition, their scientific names were identified by archaeologists (cf. Steinman 1934; Metusala et al. 2020).

Finally, to determine the origin of a species and the phytogeographic zones used to determine a species is native or exotic to Java, authors consulted Plants of the World Online (https://powo.science.kew.org/).

RESULTS AND DISCUSSION

Diversity of fruit trees

Among the 2778 stanzas in OJR text, only 45 stanzas (1,6%) mention fruit or fruit tree. At least 63 Old Javanese phytonyms refer to 58 different botanical species (see Table 1.). Of these 63 names, 34 (54,8%) are mentioned in only two stanzas, namely 16.44 and 16.45. Some species are referred to by two different phytonyms. For example, bael (*Aegle marmelos*) is named *maja* (Javanese) and *wila* (a metathesis from Sanskrit 'vilva'); jackfruit (*Artocarpus heterophyllus*) as *naṅka* (Javanese) and *panasa* (Sanskrit); and Spanish cherry (*Mimusops elengi*) as *tanjuṅ* (Javanese) and *bakula* (Sanskrit). Of the 63 phytonyms, only 12 (19%) are Sanskrit's in origin. This study could not identify the botanical references to two Old Javanese phytonyms, namely *luṅga and sūkara*. There was no clue regarding the first, and for the second, the tracking led to *sahakāra*, an Indo-Aryan gloss with reference to varieties of fragrant mangoes (Dhammika 2015).

Table 1. List of species, family, Old Javanese phytonym, English common name, biogeographical status, number of citation

Scientific name, family	Old Javanese name	Common English name	Status	No. of mention
Aegle marmelos (L.) Corrêa, Rutaceae	*maja, wila	bael	exotic	3
Aleurites moluccanus (L.) Willd., Euphorbiaceae	kañiri	candlenut	native	1
Antidesma bunius (L.) Spreng., Phyllanthaceae	*wuni	bignay	native	1
Artocarpus elasticus Reinw. ex Blume, Moraceae	*kukap	terap	native	3
Artocarpus heterophyllus Lam., Moraceae	*naṅka, panasa	jackfruit	native	5
Artocarpus integer (Thunb.) Merr., Moraceae	*barkakan	chempedak	native	1
Baccaurea racemosa Müll.Arg., Phyllanthaceae	*kapuṇḍuṅ	kapundung	native	3
Barringtonia acutangula (L.) Gaertn., Lecythidaceae	putat	mango-pine	native	1
Borassus flabellifer L., Arecaceae	tal	palmyra-palm	native	7
Calophyllum inophyllum L., Calophyllaceae	punnāga	penaga	native	1
Calophyllum dasypodium Miq., Calophyllaceae	surabhi	mastwood	native	5
Caryota mitis Lour., Arecaceae	haṇḍuru	fishtail palm	native	1
Castanopsis argentea (Blume) A.DC., Fagaceae	*wara-waraṅan	berangan	native	1
Citrus L., Rutaceae	*limo, jruk	citrus	native	3
Cocos nucifera L., Arecaceae	nyū	coconut	native	5
Dialium indum L., Fabaceae	kurañji	velvet tamarind	native	1
Diospyros ebenum J.Koenig ex Retz., Ebenaceae	harĕṅ	ebony	exotic	1
Diospyros malabarica (Desr.) Kostel., Ebenaceae	culik	Malabar ebony	native	1
Donella lanceolata (Blume) Aubrév., Sapotaceae	*calakĕt	star-apple	native	1
Dracontomelon dao (Blanco) Merr. & Rolfe., Anacardiaceae	*rahu	Argus pheasant	native	1
Durio zibethinus L., Malvacee	*duryan	durian	native	3
Elaeocarpus floribundus Blume, Elaeocarpaceae	*kaměsa	Indian olive	native	1
Ficus racemosa L., Moraceae	*lwa	cluster fig	native	2
Flacourtia rukam Zoll. & Moritzi, Salicaceae	*rukĕm	Indian prune	native	2
Garcinia mangostana L., Clusiaceae	*maṅgis, maṅgusta	mangosteen	exotic	2
Garcinia xanthochymus Hook.f. ex T.Anderson, Clusiaceae	tamāla	sour mangosteen	exotic	1
Garuga floribunda Decne., Burseraceae	*wyu	garuga	native	1
Lansium domesticum Corrêa, Meliaceae	*laṅsĕb	langsat	native	2
Lepisanthes rubiginosa (Roxb.) Leenh., Sapindaceae	*kalayu	mertajam	native	1
Limonia acidissima L., Rutaceae	*kawista	wood apple	exotic	1
Madhuca longifolia (J.Konig) J.F.Macbr., Sapotaceae	madhuka	butter-fruit	exotic	1
***Mangifera indica* L., Anacardiaceae**	***poh**	**mango**	**exotic**	9
Mangifera foetida Lour., Anacardiaceae	*limus	horse mango	exotic	2
Mangifera odorata Griff., Anacardiaceae	*ambawaṅ	Saipan mango	exotic	3
Mimusops elengi L., Sapotaceae	*bakula, tanjuṅ	Spanish cherry	native	6
Momordica cochinchinensis (Lour.) Spreng., Cucurbitaceae	karkolakā	gac	native	1
Musa acuminata Colla, Musaceae	*pisaṅ waraṅan	banana	native	1
Musa x paradisiaca L., Musaceae	*pisaṅ	banana	native	1
Nephelium lappaceum L., Sapindaceae	*wulwan	rambutan	native	3
Pavetta sylvatica Blume, Rubiaceae	puryan	bride's bush	native	1
Phyllanthus emblica L., Phyllanthaceae	*kamalaka	gooseberry	native	1
Pometia pinnata J.R.Forst. & G.Forst., Sapindaceae	*sĕntul	island lychee	native	1
Protium javanicum Burm., Burseraceae	*taṅgulun	tenggulun	native	1
Punica granatum L., Punicaceae	dālima	pomegranate	exotic	6
Salacca zalacca (Gaertn.) Voss., Arecaceae	*salak	snake-fruit	native	3
Sandoricum koetjape (Burm.f.) Merr., Meliaceae	*kacapi	santol	native	2
Schleichera oleosa (Lour.) Oken., Sapindaceae	*gintuṅan	oil-nut	native	3
Sterculia foetida L., Malvaceae	kĕpuh	Indian almond	native	3
Syzygium aqueum (Burm.f.) Alston, Myrtaceae	*jambu	water-apple	native	4
Syzygium cumini (L.) Skeels, Myrtaceae	*duhĕt	Java plum	native	5
Syzygium malaccense (L.) Merr., Myrtaceae	sudarśana	pomerac	exotic	1
Syzygium polycephalum (Miq.) Merr. & Perry, Myrtaceae	*kalihasĕm	Java bay-leaf	native	1
Syzygium pycnanthum Merr. & L.M.Perry, Myrtaceae	kulampwak	rose-apple	native	1
Tamarindus indica L., Fabaceae	*kamalagi	tamarind	exotic	1
Terminalia catappa L., Combretaceae	katapaṅ	sea almond	native	1
Ziziphus mauritiana Lam., Rhamnaceae	*wadarā	Indian jujube	exotic	2
Unidentified	*luṅga	?	?	1
Unidentified	*sūkara	?	?	1

Note: *clearly mentioned in the text as edible/sweet fruit which is its fruits are eaten raw; the underlined phytonyms are Sanskrit's or metathesized from it.

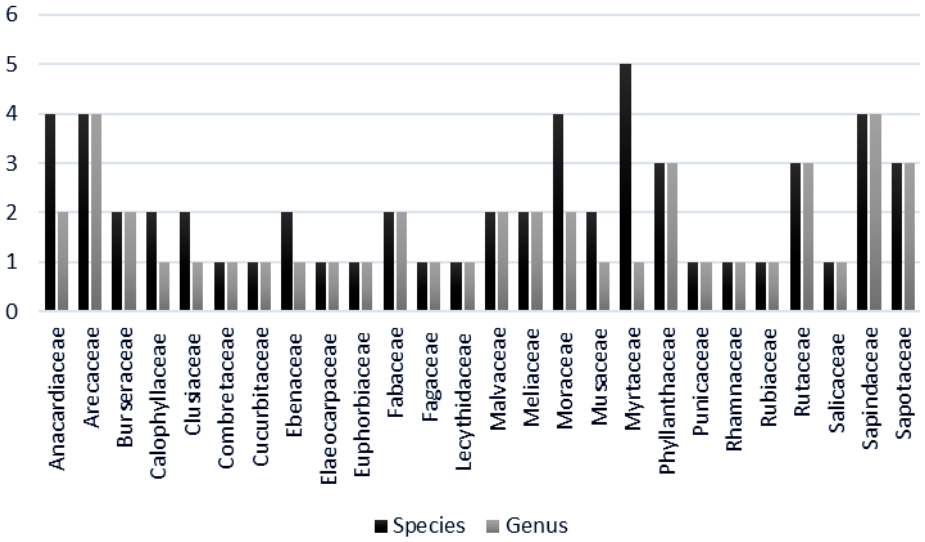

Figure 1. Distribution of number of species and genera in families of plant

A total of 56 species from 44 genera and 26 families have been identified (Figure 1). Of the 56 species, 13 species are exotic, mostly from Indian subcontinent, including bael (*Aegle marmelos*), stone apple (*Limonia acidissima*), and common mango (*Mangifera indica*), as well as fruit from a more distant region, such as pomegranate (*Punica granatum*).

Based on the number of species mentioned in the text, several dominant plant families are Myrtaceae with 5 species, Anarcadiaceae, Arecaceae, Moraceae, Sapindaceae with 4 species each, and Phyllanthaceae, Rutaceae, Sapotaceae with 3 species each (Figure 1).

The most mentioned fruit tree in the text is common mango, stated nine times. Other members of the genus *Mangifera* mentioned in OJR are *M. foetida* (*limus*) and *M. odorata* (*ambawaṅ*), referred to two and three times, respectively. These trees are also carved in the Borobudur temple (Table 3). Other fruit trees mentioned more than four times are *Borassus flabellifer*, *Mimusops elengi*, *Punica granatum*, *Artocarpus heterophyllus*, *Calophyllum dasypodium*, *Cocos nucifera*, and *Syzygium cumini*.

Fruits as food/dessert

A relatively complete list of fruits, which were also explicitly stated to be sweet (*mamanis*), can be found in two successive stanzas, namely 16.44 and 16.45. There are 34 types of fruits in these stanzas (see note of Table 1). In total, there are 39 species which are explicitly mentioned as 'fruit' (*wwah-wwahan*) in its colloquial meaning, namely the fruit of a plant that can be eaten raw (Table 1).

Some fruit trees are described to be planted around the hermitage and it is implicitly mentioned that their fruits are consumed by hermits. For example, stanza 2.28 states that all the herbs the great sage planted were no longer ruined and successfully bore excellent crops. Meanwhile, common mango, binjai, and all kinds of mangoes bore a lot of low, laden with fruit as though they were presented to the people. It is mentioned in stanza 25.9 that there is plenty of sugarcane and banana plants around the hermitage because both are the staple-food of the great ascetics. Furthermore, in stanzas 24.98 and 25.14 on hermitage fruits, it is stated that the durian smells good, and by chance, they are tasteful as sweetmeat-cookies and Indian jujube fruit keeps falling on the roof of the building. In stanza 26.25 which describes the festive atmosphere in the royal palace, several fruits, i.e. *Citrus* sp., *Artocarpus heterophyllus*, *Musa* sp., and *Salacca zalacca* are mentioned as dessert.

Fruit trees and description of landscapes

OJR provides lively descriptions of several landscapes having fruit trees, which would have been familiar to the author and audiences of these poems, namely hermitage, countryside, forest, and royal garden. One of the elements in the depiction is the presence of fruit trees. Furthermore, 11 fruit tree species were depicted in the hermitage, 5 in the countryside, 42 in the forest, and 12 in the royal garden (Table 2). On a river bank in the countryside, for example, it is stated that "there grow cluster-fig and dwarf pandanus, with their bloom resembling the form of a pike" (Stanza 25.83).

The common mango tree (*M. indica*), is the only fruit tree mentioned in the depiction of all four landscapes. For example, on the mountain slope depicted in stanza 15.68, "**the mango**, laurel, and banyan trees on the slopes moved in the wind as though they were the undone hairknot of the Sikarini". Also, in stanza 8.10, Mount Menaka warmly greeted Hanuman when carrying out a spy duty by calling out: "O' Son of Bayu, drop down here for a while and rest. Take your time! I have something to offer you, such as water-apple, durian, **mango**, mangosteen, lolly-fruit, citrus, horse-mango, kapundung, langsat, and Java plum, all sweet and nice. Eat to your heart's content".

Table 2. List of plant species mentioned in landscape depictions

Landscape	Species mentioned	No. of stanzas
Hermitage	*Artocarpus heterophyllus* *Durio zibethinus* *Flaucortia rukam* ***Mangifera indica*** *Mangifera odorata* *Musa x paradisiaca* *Oroxylum indicum* *Punica granatum* *Syzygium aqueum* *Syzygium cumini* *Ziziphus mauritiana*	2.28, 24.98, 24.105, 24.108, 25.9, 25.14, 25.42, 25.43, 25.49
Countryside	*Artocarpus elasticus* *Caryota mitis* *Cocos nucifera* ***Mangifera indica*** *Sterculia foetida*	19.104, 22.51, 25.74
Forest	*Aegle marmelos* *Antidesma bunius* *Artocarpus heterophyllus* *Artocarpus integer* *Baccaurea racemosa* *Borassus flabellifer* *Barringtonia acutangula* *Calophyllum dasypodium* *Castanopsis argentea* *Citrus sp.* *Diospyros malabarica* *Donella lanceolata* *Dracontomelon dao* *Durio zibethinus* *Elaeocarpus floribundus* *Ficus racemosa* *Flacourtia rukam* *Garcinia mangostana* *Garcinia xanthochymus* *Lansium domesticum* *Lepisanthes rubiginosa* *Limonia acidissima* *Madhuca longifolia* *Mangifera foetida* ***Mangifera indica*** *Mimusops elengi* *Momordica cochinchinensis* *Nephelium lappaceum* *Phyllanthus emblica* *Pometia pinnata* *Protium javanicum* *Punica granatum* *Salacca zalacca* *Sandoricum koetjape* *Schleichera oleosa* *Syzygium aqueum* *Syzygium cumini* *Syzygium polycephalum* *Syzygium pycnanthum* *Tamarindus indica* *Terminalia catappa* *Ziziphus mauritiana*	6.157, 8.10, 15.68, 16.18, 16.21, 16.24, 16-29, 16.32, 16.44, 16.45, 25.68, 25.69, 25.70, 25.75, 25.77, 25.83, 25.89, 25.100, 25.105.
Royal garden	*Artocarpus heterophyllus* *Baccaurea racemosa* *Cocos nucifera* *Durio zibethinus* *Garcinia mangostana* ***Mangifera indica*** *Mangifera odorata* *Mimusops elengi* *Nephelium lappaceum* *Punica granatum* *Schleichera oleosa* *Syzygium aqueum*	9.44, 9.53, 9.54, 9.56, 11.3, 17.118,

Symbolic and religious aspects of some fruit trees

The presence of certain fruit trees in the story is not only related to bringing to life the depiction of various landscapes, and some species are also used as a parable. For example, in stanza 8.76, the hand of a giant with twenty hands "were like kapok tree heaped together with Java-olive and **mango** tree", and in stanza 9.39 a giant brahmin "was as tall as a palmyra-palm tree". Furthermore, as an allusion to certain teaching, stanza 25.105 stated "but the branches of a wild rose-apple tree are broken because they did not go along with the stream of the flood but stood firm. Therefore, it is wrong to oppose more powerful forces. You can see the result, the trunk of the tree is collapsed and uprooted".

Some fruit trees are planted in the hermitage because they are considered to have certain meaning or symbolize something that can serve as a reminder to the ascetics of their purpose in being there. For example, stanza 25.43 mentions that the trumpet-flower trees are symbols of repaying the good deed of others. It is also said that the young leaves of the Java plum tree keep away badness, the sprout of the prune tree destroys the impurities caused by passion. Furthermore, stanza 25.49 states that the jackfruit symbolizes everything that can give good return to mankind and this is the characteristic of a perfectly successful priest.

That mango is the most mentioned fruit tree and present in the depictions of the four landscapes, may have something to do with its importance in poetry influenced by Sanskrit literature. For example, in stanza 9.53 of OJR, the presence of mango trees in the royal garden is depicted together with various species of flowering plants, i.e. ashoka (*Saraca asoca*), flame-of-the-forest (*Butea frondosa*), ironwood (*Mesua ferrea*), and Java olive (*Sterculia foetida*). Another example can be found in stanza 9.44, when the beauty of the royal garden is described and mango is mentioned with other flowering plants:

> "The flowers [in the garden] are of all kinds, smelling fragrant everywhere. Lotus [*Nymphaea* sp.], Spanish cherry, champak, mastwood, pandanus, tiger's claw [*Erythrina variegata*], jasmine, penaga (*Calophyllum inophyllum*), laurel [*Terminalia tomentosa*], pomegranate, coral jasmine [*Nyctanthes arbor-tristis*], and **mango**".

Also, in stanza 25.77, the beauty of the flowering season is described in which the mango blossom form part of the picture along with the flowers of other fruit trees:

> "the gold-colored karnikar flower [*Pterospermum acerifolium*] are numerous and are picked up by the youths. The half-ripe pomegranate fruits are in clusters and padanten flowers are growing well. The pollen of the flowers of the **mango** and water-apple trees fall down softly and the hearts of those people passing through are enchanted by them"

Discussion

Compared to the number of fruit trees carved in Lalitavistara reliefs of Borobudur Temple, the diversity of fruits mentioned in the OJR is higher. In total, only 31 (55,3%) of 56 species mentioned in the text were identified as carved in the reliefs (Table 3). It is remarkable that although hardly any fruit is mentioned in the inscriptions, several different fruits and their consumption are stated in the reliefs and the OJR indicating that fruit was regarded as a common foodstuff.

Metusala et al. (2020) commented on the presence of mango trees in reliefs of Borobudur Temple as follows: "the plant appears very often in the Lalitavistara reliefs to complete various elements in the scenery, from royal garden, village settlement, to the wild forest". A similar impression was also found in the OJR text. In line with this study, Zoetmulder's (1974) conjectured that the fruits mentioned in kakavins are Javan's or at least well known in the region for a long time. In terms of phytonyms, more than 80% of fruit names mentioned in OJR are Javan's; likewise their biogeographical status.

In reference to stanza 25.46 of OJR and stanza 10.21 of Arjunawijaya kakavin, Jákl (2015a) emphasized that together with tubers and vegetables, wild fruits are associated with hermits and some religious groups, such as Saiva ascetics, and with their specific dietary codes. However, from the description above, it is clear that some species of fruit trees and varieties of mangoes were deliberately planted around the hermitage as a food source. According to Christie (2004), the forest-edge mixed garden with bamboos, fruit trees, and shade-tolerant perennials as well as annuals (*talun*), was mentioned in ninth century Old Javanese literatures as a type of productive land. Soil fertility and water availability are also two main criteria for selecting of a temple site in Indian manuals which states that the only suited for a temple is a site where all sorts of cultivated seeds can grow and bear fruits (Degroot 2009).

The celebration of spring is a major theme in Sanskrit poetry (Sarma 2003). Spring is the season when Kama—the God of Love—stirs up the passions of the young. Kama carries a bow made of sugarcane or flowers and the lovely flowers that bloom in spring are used as arrows to target the youth. Mango blossom is one of the various of vernal flowers. The frequent mention of the mango tree and its presence in all landscapes, probably relates not only to its importance as a source of fruit but also to its symbolic significance influenced by the tradition of Sanskrit poetry.

The common mango, *Mangifera indica*, probably originates in India-Burma regions but probably spread to Southeast Asia during the last two millennia (Blench 2008). However, other study suggest that mango has a more complex history of domestication (Warschefsky and Wettberg 2019). One of the modern Javanese names for this species, *pelem*, is from Malay *mempelam* which is, in turn, from Sanskrit through Tamil and etymologizes as *mahaphalam*, 'the great fruit' (Blench 2008a). This is not a name, but an epithet. Meanwhile, the only term used to mention mango in OJR is *poh*, which is probably a metathesis of an Austronesian gloss. This term is still used in modern Balinese with reference to two species, namely *M. indica* dan *M. altissima*; while in modern Javanese, the binomial *pelem poh* specifically refers to *M. altissima* (Clercq 1909).

Table 3. List of fruit species mentioned in OJR and also carved in Lalitavistara reliefs of Borobudur temple

Scientific name	Steinman (1934)	Metusala et al. (2020)
Aegle marmelos (L.) Corrêa	√	√
Aleurites moluccanus (L.) Willd.	-	√
Antidesma bunius (L.) Spreng	√	√
Artocarpus elasticus Reinw. ex Blume	-	-
Artocarpus heterophyllus Lam.	√	√
Artocarpus integer (Thunb.) Merr.	√	-
Barringtonia acutangula (L.) Gaertn.	-	√
Borassus flabellifer L.	√	√
Calophyllum inophyllum L.	√	√
Citrus L.	√	-
Cocos nucifera L.	√	√
Diospyros malabarica (Desr.) Kostel.	√	-
Durio zibethinus L.	√	-
Ficus recemosa L.	√	-
Flacourtia rukam Zoll. & Moritzi	-	√
Garcinia mangostana L.	√	-
Lansium domesticum Corrêa	√	-
Limonia acidissima L.	√	-
Madhuca longifolia (J.Konig) J.F.Macbr.	√	-
***Mangifera indica* L.**	√	√
Mangifera foetida Lour.	√	√
Mangifera odorata Griff.	-	√
Mimusops elengi L.	-	√
Musa x paradisiaca L.	√	√
Oroxylum indicum (L.) Benth. ex Kurz.	√	-
Sandoricum koetjape (Burm.f.) Merr.	-	√
Syzygium aqueum (Burm.f.) Alston	√	√
Syzygium cumini (L.) Skeels	√	√
Syzygium malaccense (L.) Merr.	-	√
Tamarindus indica L.	-	√
Terminalia catappa L.	-	√
Total number	21	20

The reconstruction **pahu*(*q*) in Proto-Malayo-Polynesian, cognate with **pau*(*q*) in Proto-Oceanic language, for *Mangifera* sp., probably also applies to the pahutan (*M. altissima*) (Blench 2008a). Unlike common mango, pahutan is a native plant in Malesian regions and Java. From this information, it can be said that the Javanese, such as other Malayo-Polynesian language-speaking societies, previously used the name *poh* with reference to pahutan. Moreover, the name was also attached to *M. indica* during Indian colonization, when the tree became more popular and important. At the time OJR was written, it appeared that the term *poh* applies to both species (and probably also to other members of the genus *Mangifera*, as basal mononomial to form binomial) with *M. indica* as the designated focal species.

The epithet given to the mango fruit, namely the great fruit, may also be related to the fact that its tree has religious significances in Indian religion. In Hinduism, this tree is regarded as an impersonation of Prajapati God, the lord of all creatures, and the leaves are used to decorate the rooms for wedding ceremonies, while its wood is used during funerals (Rana et al. 2016). A pot with water, mango leaves and coconut symbolizes of Goddess Lakshmi (Chauhan and Chauhan 2019).

Besides mango, some fruit trees also have religious significance and perhaps their mention in OJR is related to this. For example, bael is considered the residence of Goddess Lakhsmi, the deity of wealth and prosperity, and it is also said that Lord Shiva is pleased when the leaves of bael tree are brought. The baby Krishna is believed to be compared to the unfolded leaf of sour mangosteen and Lord Caitanya meditated under this sacred tree. Indian gooseberry is worshiped in India and is considered sacred because it is believed to be an impersonation of Lord Vishnu. In Hindu legend, it is believed that this tree was acquired from drops of nectar, accidentally spilled on the ground in the battle between gods and demons after the ocean churning. Also, in Valmiki's Ramayana, tamarind personifies the god of rain (Chauhan and Chauhan 2019).

ACKNOWLEDGEMENTS

The research undelying this paper was funded through RDPD (*Riset Data Pustaka dan Daring*, Library and Online Data Research) Grant from Padjadjaran University on behalf of Budiawati Supangkat for 2022 fiscal year. The authors are grateful to the Rector of Padjadjaran University for the support provided.

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