



The *Ukāy*, *Salvadora persica* (Salvadoraceae): Historical and literary evidence from stone inscriptions, copper plates, and literature

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Abstract

Salvadora persica occurs widely in the dry and semi-arid regions of the Indian subcontinent, the Middle East, and parts of Africa, where it is commonly used as a ‘toothbrush’. The present paper attempts to chronicle the history of *S. persica* in present-day Tamil Nadu. Sangam literature (300 BCE–300 CE) in Tamil is widely acknowledged for identifying floral and faunal elements of parts of Southern India, particularly modern Tamil Nadu and Kerala. The description of floral elements in Sangam literature, when definitively linked to the present-day scientifically determined plant identities, enables us to estimate and evaluate their present distribution. In addition, this paper collates the references to the plant *ukāy* from both Sangam and the later-period Tamil literature and traces the history and use of this plant in the Tamil region.

Keywords *Salvadora persica* · Salinity · Toothbrush tree · Peelu · *Ukāy* · Tamil

1 Introduction

Salvadora persica, the toothbrush tree (Farang et al., 2021; Sher et al., 2010), belongs to the Salvadoraceae plant family. It is a large, extensively branching evergreen shrub or small tree with soft, whitish-yellow bark and drooping branches (Khatak et al., 2010), widely distributed in North Africa and Asia from the Middle East to India and Sri Lanka. *S. persica* is *peelu* in Urdu (Platts, 1884), *miswak*, *meswak* in Arabic (Halawany, 2012; Hattab, 1997), and known by various other names elsewhere (Aumeeruddy et al., 2018). Textual sources in Tamil¹ identify *S. persica* as *ukā*, *ukāy*, *kaḷar-ukāy*, *kaḷarvā* (Krishnamoorthy, 2011; Sreedharan, 2017; University of Madras, 1982) as do oral sources in different parts of Tamil Nadu.² The names given to *S. persica* in other Dravidian languages are: in Malayalam, *uvā*, *ukāy* or *ukā-maram*; in Kannada, *goni*; in Telugu, *gunnangi* and Tulu, *kirgonji* (Aumeeruddy et al., 2018). Though no other Dravidian names could be traced in the literature or current usage, Mukhopadhyay (2021) proposes, from a linguistic perspective, that the Dravidian root for tooth—*pal*—could

be the root for the words that denote elephant and also *S. persica* in the Indus Valley Civilization (IVC). This linguistic perspective is seen in the historical and cultural context of the current distribution of *S. persica* in the Indian subcontinent and the names by which different people know it.

2 Sangam literature and epigraphy sources

The Sangam literature (300 BCE–300 CE) and inscriptions between 300 BCE and 600 CE are important sources that help reconstruct various facets of Tamil history (Srinivasan, 2016). The available Sangam period poetry includes 2381 poems of varying lengths (some of 4 lines, such as poems of *Kuṟuntokai*, to the longest with 782 lines, *Matu-*rai Kāñci**) written by 473 poets during varied periods from the third century BCE to the third century CE (Mahadevan, 2003). These poems have been anthologized and grouped into the Eight Anthologies (*Eṭṭuttokai*) and the Ten Songs

¹ *Ukāy* seems to be recorded in some research papers as either *kalawa* or *kakkol* (Gautam, 2013, p. 309; Khatak et al., 2010, p. 209) probably because *kaḷar-ukāy* or *kaḷarvā* in spoken language could have been heard and recorded as *kalawa* (dropping ‘r’) given the diglossia in Tamil that can lead to non-native speakers recording what they hear as it is.

² The local people in Ramanathapuram, Panrutti, Pudukkottai, Thiruchy areas call *S. persica* as *ukāy* even today.

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(*Pattuppāṭṭu*). Based on their contents, these anthologies are further distinguished into *akam* (interior) and *puram* (exterior). The *akam* poetry deals with love and love-related human emotions, whereas the *puram* deals with the glory of princes, warriors, wars, the aftermath of wars, society, and morality. In the *akam* segment, landscape elements are glorified, linking nature and human emotions (Takahashi, 1991; Thaninayagam, 1966). For example, a widely known poem of *Kuruntokai* uses the rainwater flowing on red soil changing to red as a metaphor for the union of the lovers' minds. In addition to natural elements, such as flora, fauna, seasons, and rain, society's material culture, such as handcrafts, vehicles, and other human products, is also linked to human emotions in *akam* poems.

The inscriptions record different kings and other patrons and their contributions to social causes, such as building shelters, beds, temples, and water storage in various locations. The inscriptions on hero stones document the cause of the heroic death of a warrior or an animal protecting a village. The names of places mentioned in the inscriptions can often be correlated with names in Sangam literature. For example, *Pūlāṅkuricci* (10.2748 N; 78.5068 E) inscriptions, dated to around the fifth century CE (Subbarayalu & Varier, 1991), mention administrative divisions such as *Mīlalai* and *Muttūru* which correspond to the place names mentioned in one of the Sangam anthologies (*Puranānūru*, 18, 24). Similarly, epigraphists and historians show that the Chera kings mentioned in the Sangam anthology *Patirruppattu* with the *Pukaḷūr* (11.0769 N; 77.9974 E) inscriptions. Historians generally use this method to correspond Sangam era place names and genealogies with those in later inscriptions to locate them in present-day maps and/or geography. The present paper attempts to understand the environmental and cultural history of *S. persica* through such literary and epigraphic sources.

3 *Salvadora persica*

Salvadora persica is a slow-growing tree capable of adapting to soil conditions that range from excessively dry to highly saline. It can grow as either a large shrub or a small tree, up to 12 m high and 4.7 m girth. The main trunk is mostly erect but occasionally could be trailing. When trailing, it branches profusely, with a sprawling crown consisting of crooked, straggling and/or drooping branches. The bark of this tree is rough, greyish brown on the main trunk, and pale elsewhere. The fruit is yellow and ripens in May–June. Mature fruits are smooth, fleshy, globose, pink-scarlet drupes up to 10 mm in diameter, with persistent calyx and single-seeded. Seeds turn pink to purple-red and are partly transparent when ripe (Kumar et al., 2012). The fruit pulp is pungent and mildly hot-spicy, as in *Brassica juncea*

(Brassicaceae) or *Piper nigrum* (Piperaceae) (Kumari et al., 2017). This fruit is used in cooking for its peppery taste in the Middle-Eastern countries (Royle, 1846). This tree and seed are indicated in the Bible (New Testament) as the 'mustard of the scripture' (Royle, 1846) and the toothbrush tree of Prophet Muhammad (Aumeeruddy et al., 2018).

Salvadora persica is drought tolerant, which has enabled its expansive distribution in the arid parts of Africa, the Middle East, the Arabian Peninsula, and parts of the Indian subcontinent.³ The IUCN Red List of Threatened Species in 2018 is listed as a species of 'least concern'.⁴ In India it is distributed widely in the dry and semi-arid regions of Gujarat, Rajasthan; to some extent in the semi-arid segments of Uttar Pradesh, Punjab, and Delhi; and to a lesser extent in Maharashtra, Andhra Pradesh, Karnataka, Kerala and Tamil Nadu (Gunasekaran & Paramasivam, 2012; Sreedharan, 2017; Tripathi, 2016).

4 Distribution of *S. persica* in Tamil Nadu

Salvadora persica is not widely distributed in Tamil Nadu. Although, it is found in Ramanathapuram (9.36 N, 78.84 E) and most coastal districts of Tamil Nadu, its distribution here is not as large scale as in the Arabian Peninsula, parts of Africa, and the Middle East (Sher et al., 2010). The tree occurs sporadically, along the Eastern coastal stretch of Tamil Nadu, especially in the sacred groves recorded in the districts of Pudukkottai, Perambalur, Trichy, Villupuram, Cuddalore, Chengalpattu, Kanchipuram, Nagapattinam, Thanjavur, Thiruvarur, Mayiladuthurai, Thoothukudi, Ramanathapuram and Thiruvallur and in the bioregion of Puducherry (Gunasekaran & Paramasivam, 2012; Gamble, 1935; Gill et al., 1998; Sreedharan, 2017) (Fig. 1). The soils are primarily coastal alluvium and coastal black soil (Britto, 2019). Flora volumes of southern India (e.g., Gamble, 1935; Udayakumar & Parthasarathy, 2010) list this taxon and ascribe diverse habitats to it: from coastal to tropical dry evergreen forests (TDEF) to slightly elevated landscapes (plateaus of Pudukkottai (c. 100 m amsl), Dharmapuri (c. 500 m amsl)).

We, the authors of this article, found four trees in an urban forest patch protected by the Forests and Wildlife Department of the Government of Puducherry. The Tamil Nadu Forest Department report *Heritage trees of Tamil Nadu* (2017) indicates that in the Thiruchirapalli district, 215 trees are protected by Annai-Kamatchi Amman temple authority

³ <http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:779348-1>, accessed on October 23, 2021.

⁴ <https://www.iucnredlist.org/species/138472280/146211537>, accessed on September 24, 2023.





Fig. 1 *Ukāy* tree, Marakkanam (salt pan in the background)

within the temple complex (10.77 N; 78.69 E). According to the report, the age of *S. persica* is estimated to be more than 200 years, but many trees of this species live even longer. For example, the *ukāy* tree seen in Apparsamy madam (a monastery) in Thiruvamur (11.77 N; 79.48 E) near Panrutti (Fig. 3) is considered by local people to be at least 200 years older. The term *kaḷar-ukāy*, hanging on the signboard, perfectly matches its saline and dry habitat. The prefix *kaḷar*, according to the University of Madras (1982, p. 812), means either a saline landscape or an alkaline landscape, which indicates the habitat of this tree. An analysis of ethnomedicinal uses of temple trees (Gunasekaran & Paramasivam, 2012) also listed *S. persica* as *kaḷar-ukāy*; however, it does not locate the temple where this tree grows.

5 *Salvadora persica* in Sangam literature

In the Sangam literature corpus, as mentioned earlier, landscape elements are glorified, linking nature and human emotions. Some poems in *Narṛiṇai* and *Kuṛuntokai* use the tree *ukāy* and its features in this way. Further, Panchavarnam (2020), in *Caṅka-ilakkiya*

tāvaran̄kaḷ (Plants cited in the Sangam literature), records this tree from various literary sources beginning from the Sangam period to Bhakti period (700 CE–900 CE). The name itself is still in Tamil and is validated by botanical works, too (Krishnamoorthy, 2011; Sreedharan, 2017).

The external morphological characteristics of the tree, such as its bark, berries, parched trunk, and distribution in drylands and wastelands, leads us to conclude that *ukāy* referred to in Sangam literature is *S. persica*. The lovers' suffering because of their separation is compared with a dry land flora in the following verses (the occurrences pertinent to *S. persica* in the poems are underlined):

Miḷaku peytaṇaiya cuvaiya puṇkāy
Ularutalai ukāyca citarcitart tuṇṭa
Pulampukoḷ neṭuñciṇai yēriṇi naintutaṇ
Porikiḷar eruttam veripaṭa maṛukip
Puṇpurā uyavum ventuka ḷiyavu
 (Narṛiṇai 66 (Iyer, 1956))

My lovely daughter left to be with her lover,
 on a hot, dusty path, where a pigeon chases
 away bees and eats small, ukāy berries that
 taste like pepper, feels confused and afraid,
 sits on a tall tree branch and shakes its bright,
 spotted neck in pain, regretting what it did.

(Trans. by Vaidehi Herbert (2012))

Puṛavup puṛattanna puṇkā lukāy
Kāciṇai yaṇṇa naḷikaṇi
 (Kuṛuntokai 274)

Here, the trunk of the ukāy tree is soft,
 as the back of a dove, and its beads of fruit.

(Trans. by A.K. Ramanujan, 2014)

Pullarai ukāy variniḷal vatiyum
Iṇṇā aruñcuram
 (Kuṛuntokai 363)

go into the painful, harsh wasteland
 where a noble, fine wild *marai* stag
 with a flower strand on his horns,
 takes shelter in the dappled shade
 of an ukāy tree with parched trunk

(Trans. by Vaidehi Herbert, 2012)

Kuyiṛkaṇ ṇaṇṇa kuṛūukkāy murri
Maṇikkā caṇṇa māṇiṇa iruṅkaṇi
Ukāy meṇciṇai utirvaṇa kaḷiyum
Vēṇil veñcuram
 (Akanāṇūru 293)



In the summer season, the unripe fruits of the ukāy tree,
looking like a kuyil's eyes, have matured and the large
 ripe fruits,
 with their lovely ruby-like colours

(Trans. by George Hart, 2015)

The *Akanānūru* (Nattar et al., 1944) mentioned above, describes *ukāy* as having coral-like berries which are similar to the eyes of a cuckoo and mature into dark-colored fruits that look like coins (Fig. 1). The fruits of *Cordia obliqua* (Boraginaceae) and *Murraya koenigii* (Rutaceae), often compared to cuckoo's eyes, are relatively bigger than *S. persica*. The first of these, commonly known in Tamil as *nariviḷi*, eyes of the Jackal (Krishnamoorthy, 2011) is known to thrive only in freshwater and non-saline soils, whereas *M. koenigii* survives in fertile and saline soil, unlike *S. persica*, which requires salinity (Britto, 2019). *M. koenigii* is also referred in Sangam literature as *kañ-cakam* (Raghavaiyengar, 308). The characterizations of *ukāy* described in Sangam literature cited above and their distribution in semi-arid land fit with the present-day botanical descriptions of *S. persica*.

The semi-arid regions, including dry, barren, and degraded lands, are called *pālai* in Sangam literature. *Pālai* is a region that flourished once, but later, due to the absence of rain and other natural events, may turn dry and become *pālai*. Salinity-affected regions are also considered as *pālai* (Srinivasan, 2016). In Sangam literature *ukāy* is a tree of *pālai* region. Hence *ukāy*, based on literary evidence, can survive in adverse edaphic and other environmental conditions.

The Sangam poets use the characteristics of the dry *pālai* landscape to portray the depth of the separated lovers' grief. The female persona is the most affected and anguished; the poets use similes of *pālai* flora and fauna to depict this anguish.

In his edition of *Kuruntokai*, Saminathaiyar (1937, p. 35) describes the characteristics of *ukāy*:

Ukāy. An arid zone tree is usually denoted with 'y' at the end when spelt with Roman letters of the alphabets and, sometimes, without it—*ukā*. The stem of this tree is ash coloured, and hence compared with pigeon's back. It is evident through the occurrences *punḱāl-ukāy*, *pullarai-ukāy* that this tree is dull coloured. Since the fruits are spherical and yellow⁵ they are usually compared to gold coins. The leaves are less dense hence the shade they provide is scattered.



Fig. 2 Fruits of *Ukāy* tree at Marakkanam, a high-saline coastal region (Rani & Kalaiselvam, 2018)

After the literary evidence from Sangam literature,⁶ *Perunkatai*, an extensive text (a *kāppiyam*, epic) written by a Jain (seventh century CE), mentions *ukāy* in *pālai* region (Saminathaiyar, 1935). The Jain Muni Neminatar's grammatical treatise *Nēminātam* (twelfth century CE) supplies *ukāy* as an example of the complexity of 'y' ending words with its compound form '*ukāy-p-pazham*' (1945, p. 26)—the fruit of *ukāy*.

Apart from the available literary evidence, inscriptional records enable us to locate the occurrences of this tree in historical contexts. A Tiruvālaṅkāṭu copper plate (attributed to Rajendra Chola I, eleventh century C.E.) mentions *ukāy* nine times as a boundary in a bequeathed donation (Sastri, 1987, no. 205). *Tiruvālaṅkāṭu* (13.1311 N, 79.7759 E), on the Chennai–Arakkonam road, is a semi-arid township, and

⁶ One unidentified poet of the Sangam period uses the epithet *ukāy-k-kuṭi-k-kiḷār* (*Kuruntokai* 63), which includes *ukāy* (*S. persica*) as a prefix. *Ukāy-k-kuṭi* (*kuṭi* means a settlement or a small village in *Sangam*) should have been named after this tree, although presently we are unable to locate this village. *Kiḷār* in classical Tamil refer to a person who belongs to a particular region.

⁵ Fruits are not yellow but brownish red (Fig. 2).





Fig. 3 *Ukāy* labeled as *kaḷarukāy* in the Apparsamy temple, Panruti

the citation here is consistent with the current distribution of *S. persica* in Tamil Nadu.⁷

A widely known Tamil adage for healthy teeth is *ālum vēlum pallukku uruti* (young stems of *Ficus benghalensis* and *Acacia nilotica* are healthy for the teeth). *Ukāy* has been used to brush teeth in northern India and the Middle East. But the Tamil adage does not include *ukāy*.⁸ What is the likely reason for excluding *S. persica* from normal use in Tamil Nadu? The occurrence of *S. persica* is restricted to coastal regions, in contrast to the widespread presence of *Ficus benghalensis* (Moraceae) and *Acacia nilotica* in Tamil Nadu, which could be one reason for the popularity of these two trees. Interestingly, a list of chewing sticks in a recently published paper on *Salvadora* includes *A. indica* stems and *S. persica* as a widely used material in the Indian subcontinent (Wu et al., 2001, p. 280).

The Tamil Siddha medical tradition acknowledges using *ukāy* in treating various illnesses. Five head words for *ukāy* are found in the Siddha dictionary: *ukā*, *ukā-p-paṭṭai*, *ukāya-vāikai*, *ukāy*, *uvāy-p-paṭṭai* (Anandan, 2008, p. 157). According to Anandan (2008), the tree bark is used as a balm for pain relief and inflammation and as a general wound healer (ibid. p. 157, 223). Interestingly, no Siddha medical treatments have identified *S. persica* for tooth-related issues.

⁷ Anantanarayanan Raman, has shared (*pers comm.*) his experience of seeing flourishing trees of *S. persica* on the Ennore shore, Thiruvallur district more than 50 years ago. This gives a record of *S. persica*'s distribution in Tamil Nadu.

⁸ It does not include neem (*Azadirachta indica*) (*vēmpu*) either, which is, however, used by and known to the people in many parts of Tamil Nadu.

6 Indus Valley Civilization (IVC): *Pīlu* tree

The language spoken by the people of the Indus Valley (2500 BCE to 1700 BCE) is the subject of an unresolved debate. Using linguistic and DNA analyses has made this issue more popular in recent years, especially because of the availability of sophisticated computational tools and libraries (Mohan, 2021; Mukhopadhyay, 2021). Mukhopadhyay (2021), in particular, traces the language spoken by the people of the Indus Valley through linguistic analysis, especially by selecting the names commonly used to refer to the floral and faunal elements, arguing that the Dravidian root for tooth—*pal*—could be the root for the words that denote elephant and also *S. persica*. The names of *S. persica* (*ukāy* or *kaḷar-ukāy*) in Tamil do not relate to tooth-related roots. However, Mukhopadhyay surmises that *pīlu*—which denotes *S. persica* in IVC—could be a proto-Dravidian root. She concludes that the Indus people might have spoken a proto-Dravidian language based on her analysis, linking a proto-Dravidian root to the Indus floral and faunal elements. However, the names used continuously in Tamil Nadu for *S. persica* from historical times are *ukāy*⁹ and *kaḷar-ukāy* (Fig. 3).¹⁰ In other Dravidian languages, as mentioned earlier, the names do not relate to *pīlu*, *pal*, or any tooth-related name.

7 Conclusion

Although linguistics is a powerful tool for understanding the origins of words, literature, history, and culture are essential for understanding how people use words in speaking and writing (Guy, 1990). In the case of *S. persica*, though a proto-Dravidian origin of its name (*pīlu*) is proposed, this name or its variant is not found in current popular usage or in ancient or modern Tamil literature, where this tree is known as *ukāy*. The name *pīlu*, though, has been transmitted in Sanskrit and Arabic (Meulenbeld, 2008; Mukhopadhyay, 2021), and the plant itself continues to be valued in tooth care in those regions, unlike in Tamil Nadu, where it is recognized in ancient Siddha medicine for other medicinal uses unrelated to tooth care. Thus, though qualitative and indirect, literature and historical markers like inscriptions can be a powerful complement to linguistics; other fields, such as paleo-ecology, could also help in better understanding of questions such as how long the history of *S. persica* goes back in peninsular India.

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⁹ K.V. Krishnamoorthy in *Tamiḷarum tāvaramum* refers to this plant as *ukāy* in Tamil.

¹⁰ In Trichy and Panruti temples this tree has been mentioned as *kaḷar-ukāy* in a signage.



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