

## ANCIENT WEIGHT MEASURES AS MENTIONED IN THE TAMIL EPIGRAPHS

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### Abstract

The main objective of the paper is to bring to light the ancient weight measures that are being inscribed in the Tamil inscription. A special interest is given on the names of the weighing stones that are mentioned. Necessary conversion is done for easy understanding and to compare with the other known weight measurements.

**Keywords:** Kuṅṛimaṇi, Gadayāna, Kaḷañju, Mañjāḍi, Varāhan, Kōvai, Māru, Kal, Āḍavallān, Viḍelviḍugu, etc.,

### Introduction

The metals such as gold, silver etc., which are used for making ornaments and utensils, are weighted using the balance. These measurements of gold were small like Kuṅṛimaṇi, is the seed of a plant. The fineness of these metals and the composition of them with copper and other metals has a significant role in those days. The commodities like sugar, salt and turmeric are sometimes measured by

weighing them using the weighing balances. The inscriptions give us only very little information regarding the weight measure and their relationships with other measures.

Two weight systems are traceable from the ancient coins of the South. 'The gold gadyana coin of the Deccan averages 58, grains, the heaviest reaching 60.1 grains', this was the standard unit called gadayāna or kaḷañju in the Tamil country. If the weight of the lost gold coin of Uttama Chōla figured by Elliot is correctly recorded as 50 to 60 grains, this coin must have followed the old gadyāna standard and must have remained in circulation late in the tenth century. The survival to late times of a small cess called Kumarakaccanam may be accepted as confirmation of the same fact. But in the Chola period the more usual standard was the kaḷañju of twenty mañjāḍi equal in theory to 72 grains, but sometimes going up to 80. In the earlier days kaḷañju and mañjāḍi were the standard measurements for weighing the gold.

In a record of Pallava king Nriupatuṅgavarmaṅ dated in his 24th regnal year (8th century), there is a reference to the use of kaḷaṅju and maṅjāḍi as weight measures for gold. The above inscription from Tirumukkūdal from Chinglepuṭ district states that the assembly had agreed to maintain a perpetual lamp in the temple of Viṣṇu Bhaṭṭar out of the interest of 30 kaḷaṅju of gold received from a donor. The interest for 30 kaḷaṅju of gold comes to  $4\frac{1}{2}$  kaḷaṅju. For the  $4\frac{1}{2}$  kaḷaṅju the assembly agreed to supply oil at the rate 40 nāḷi per kaḷaṅju for maintaining the lamp. The calculation is as follows.

For 30 kaḷaṅju, interest accrued =  $4\frac{1}{2}$  kaḷaṅju  
Therefore, Interest for 1 kaḷaṅju = 3 maṅjāḍi  
interest for 30 kaḷaṅju =  $30 \times 3$  maṅjāḍi  
= 90 maṅjāḍi

1 kaḷaṅju = 20 maṅjāḍi (as per Tamil literature)

Therefore,

$$\begin{aligned} 90 \text{ maṅjāḍi} &= 90 / 20 \\ &= 4\frac{1}{2} \text{ kaḷaṅju} \end{aligned}$$

### Types of Weight measure

Gold is differently called by several terms like varāhan, kōvai, kaḷaṅju, maṅjāḍi etc.. From the inscriptions we come to know that kaḷaṅju and kōvai has been recognized as standard gold. In the medieval period revenue was collected in terms of standard gold called

kōvai. This is referred to in a record of Sakā 1328 (1406 A.D). The quality of gold is also judged by the finess of the gold. This is referred to by the term māri. In one of the records of Parantaka Chōla I from Tirupārkaḍal 50 kaḷaṅju of gold was endowed carrying  $9\frac{1}{2}$  māru in finess. As we know that kaḷaṅju and maṅjāḍi are referred to as gold weight right from the Pallava period. Besides these 2 weights, the fraction of gold weight is referred to by the term piḷavu. In a record of Rājarājā I from Kālahasti dated in his 24th regnal year (1009 A.D.), for a gift of  $14\frac{3}{4}$  kaḷaṅju and one Kuṅṛi of gold. The annual interest accrues comes to 2 kaḷaṅju, 4 maṅjāḍi and 1 piḷavu at the rate of 1 piḷavu, 1 kaḷaṅju for one month.

### Kuṅṛi

A record of Māraṅjaḍaiyaṅ or Pāṅḍiyādhipati Varaguṅa dated in his 4th regnal year (8th century) from the upper rockcut cave at Trichy at Tiruchy district, states a gift of 537 kaḷaṅju of gold out of which 4 gold Paṭṭams and a gold flower were made for decorating the god. Here Kuṅṛi is a fraction of gold weight.

Like the other measures the weight measures are also named by different ways.

## Dharmakaṭṭalai kal

An inscription from Tirunāgēśvaram dated 1042 A.D. refers to weights of several items as weighted by weighing stones called Dharmakaṭṭalai kal and kuḍigai kal. The variation between the two weights ranges from 4.75 % to 19.75 %. This difference is due to the wear and tear caused to the stone and on account of its being put to use for long time.

There seems to be a standard measure for weighing gold. 46 kaḷañju of gold is weighed by this measure for a diadem which is mentioned in an inscription of Rājendra Chōla I dated in his 24th regnal year (1009 A.D.) from Kālahastiśvara temple in Chittoor district. Two other inscriptions mention this. One at Jalanāthēśvarā temple at Takkōlam near Arakōnam in North Ārcot district records an investment of 80 kaḷañju of gold weighed by Dharmakaṭṭalai kal. The second is mentioned in an inscription from Varāha Perumāḷ temple at Tiruvidandai in Chingleput district. It may be assumed that Dharmakaṭṭalai kal is a measure that is maintained in the court.

## Nīrai kal

The gold piece seems to have been weighed by the standard weight of stone of the local areas where they were used in the course of the transaction. The standard stone is known as nīrai kal and they are sometimes

known by names like Āḍavallāṅ, Viḍelviḍugu, etc., . The kaṭṭalaikal is used to indicate the weighing stone.

## Parakēsari kal

A record from Gōshthīśvara temple at Pērūr in Coimbatore mentions that the gold was weighed by Parakēsari kal. This seems to have been named after the Chōla king's title.

## Āḍavallāṅ and Tulākkōl

An inscription from Rājarājēśvara temple at Tañjāvūr records the gift by the priest Sadāśiva Paṇḍita, of 8 gilt copper pots during the 2nd year of king Rājendra Chōla's reign period. It is worthy to note that some of the copper pots were weighed with the scale tulākkōl called Āḍavallāṅ and the rest with the stone used in the city bearing the same name. Here the Āḍavallāṅ is made equivalent to tulākkōl and also with Kuḍigai kal. Text of the inscription reads as follows

**kuḍam onru Āḍavallāṅ ennum tulākkōlāl Nīrai**

**kuḍam onru Āḍavallāṅ ennum kuḍigai kallāl**

## Nagarakal

The record at Vaṭamulēśvara temple from Kīlappaḷuvūr in Trichy district mentions Nagarakal for weighing 193 kaḷañjarai of silver. This kal might have been used only in the nagara that is the city/town.

## Kuḍigai kal

Mention may be made of the Kuḍigai kal for weighing 6 kaḷañju of gold in Pañchanadiśvara temple at Kīlappaḷuvūr in Trichy district. It is mentioned as equivalent to māḍai figūring in another inscription at Satyavāchakēśvara temple at Tiruvārūr in Tañjāvūr district belonging to the reign period of Kulōttuṅga Chōla I dated 1096-97 A.D. It records the gift of gold weighed by Kuḍigaikal which is equivalent to a māḍai. The text reads as:

குடி கை கல்லால் மாடை யொடொடுக்கும்  
nghண்

## Kuḍigaikallāl māḍaiodukkum poṇ

It means that the weight of Kuḍigai kal is 1 māḍai. Prior to Kulōttuṅga, in a record of Rājarājā I (988 A.D.) dated in his 4th year, there is a reference to chemmai kuḍigaikallāl by which 497 kaḷañju of gold was weighed. This shows that the weighing measure was pure and perfect. In the same record mention may be made of the use of weighing measure called kuḍigaikallāl by which 2 kaḷañju and 7 mañjāḍi and 1 Kuṇṇi was weighed and offered Lord Mahādēva.

## Pachchirkal

A record from Kuranganātha temple at Śrīnivāsanallūr in Trichy district registers a sale of land made tax free in lieu of the gold received for 233 kaḷañju and 5 ½ mā weighted using Pacchir kal, during the 20th regnal year of the king Parāntaka I dated 926-27 A.D. The significance of this term is not clear.

**Nāvalūr kōl:** It is interesting to note from a record dated in the 21st regnal year of king Rājarājā I (1006 A.D.), kōl which is a term used to denote the measuring rod is used as weight measure in the inscription at Bhakthajanēśvara temple at Tirunāmanallūr in South Ārcot district. It states that

## நாவலூர் கோலால் நிறை 1150 பலம்

“---- Navalūr kōlāl niṟai 1150 palam”

The term niṟai means weight.

## Āyiravan tilak kōl and kāśu kal

Earlier commodities like turmeric were weighed using āyiravan tilakkōl. It is found mentioned in an inscription from Viraṭānēśvara temple at Kīlūr near Tirukoyilūr in South Ārcot district. During the reign period of Rājēndra I dated 1021 A.D., 1 palam of turmeric was weighed using this kal and another gift made by some Vēṅgaḍavaṇ consist of a thūlai niṟai poṇ using kāśu kal which is of about 5 kaḷañju.



## Kāṣeṭṭāṅgal

This kal is mentioned in many inscriptions. One such measure is found in the inscription from Ardhanariśvara temple at Tiruchchencode in Namakkal district. It records an endowment of 20 kaḷaṅju of gold weighed by the Kāṣeṭṭāṅgal and left incharge of the assembly. Another inscription from Varadarājaperumāḷ temple at Nērūr in Karūr Taulk of Trichy district, records the gift of 3 ½ kaḷaṅju of gold by standard weight Kāṣeṭṭāṅgal. It also reveals the fact a kaḷaṅju of gold was equivalent to 8 kāṣu in weight during the period of Kulōttuṅga I

**That is, 1 kaḷaṅju = 8 kāṣu in weight**

**Kāṣu kal:** A record of Śrīvallabha dēva dated in his 17th regnal year from Tiruttakīśvara temple, Tirupattūr taluk, Rāmanāthapuram district, registers a gift of 11 kaḷaṅju 6 maṅḷāḍi of sempon gold to be measured by the weighing stone named Kāṣukal, by a merchant to the temple

**Sokkachchīyaṅ kal:** An inscription records the royal gift of gold ornaments weighing in all 25 kaḷaṅju of gold by the standard weight measure called Sokkachchīyan kal to the god Subrahmanya Piḷḷaiyār set up in the temple. It is a record from Abhirāmēśvara temple at Tiruvāmattūr in South Ārcot district dated in the reign of Kāḍava chief Kopperuṅḷiṅga. The

same kal is mentioned in another inscription from Sōmēśvaram Uḍaiyār temple at Sōmūr in Trichy district.

**Guruvarāyaṅ poṅ:** 15 Guruvarāyaṅ poṅ was donated to god by Adiyappa Gounder and Mallai Gounder on Makara saṅkrānti day for offerings to the god in the year 1527 A.D. falling in the reign period of Krishṇadēvarāyā.

**Paṅḍārakal:** A gift of silver lamp and gold, towards the maintenance for burning Bhīmasēnai camphor is recorded in an inscription from Raṅganātha svāmi temple at Śrīraṅgam during the reign period of Parāntaka I dated in his 17th regnal year (923-24A.D). The gold here was weighed by using Paṅḍārakal. It is probably the weighing stone that is being maintained in the temple granary. Another inscription from Śivayōganātha temple at Tiruvisalūr states that a gift of a silver pot weighing 294 kaḷaṅju was weighed using Paṅḍārakal dated in 1015-16 A.D. It is a record dated the 3rd regnal year of the king Rājēndra Chōla I.

**Malaikal:** An inscription from Aṛappaḷisvara temple at Valapūrṇadu in Nāmakkal district belonging to Uttama Chōla and dated in his 14th regnal year records the gift of 2 kaḷaṅju of gold left incharge of the Nāṭṭār of Koḷḷimalai for burning a lamp. The gold was weighed by using malaikal. This weighing stone is being named after the place.

## Kal yeḍai

The term kal yeḍai is mentioned as a measure in an inscription belonging to the 35th regnal year of king Kulōttuṅga Chōla III from Vyāghrapādēśvara temple at Siddhalingamaḍam, in South Ārcot district.

## Ūr kal

An inscription from Viḷināthaśvāmi temple at Tiruvīlimilalai in Tañjāvūr district states that 120  $\frac{1}{4}$  kaḷañju of gold was endowed to the temple and the gold was weighed by using ūr-kal. The same ūrkal is mentioned in an inscription from Chandramaulīśvara temple at Brahmaḍēśam in North Ārcot district dated in the 4th regnal year of Parakēsarivarman. Silver was also weighed using ūrkal is found mentioned in the Mānavalēśvara temple at Tiruviḷakkāḍu in Tañjāvūr district.

It may be suggested that maintaining these weighing stones in the temple might be for standardization and also for accuracy. An inscription from Nāganāthaśvāmi temple at Tirunāgēśvaram refer to 3 types of kal for weighing the gold viz., Dharmakaṭṭalāi kal, Kuḍigai kal and kaṭṭalāi kal. Dharmakaṭṭalāi kal used gives the weight “Muk kaḷañjē Iranḍu Mañjāḍi yum”. Three types of weighing stones have been used in the same place in order to avoid queue while many people come for the payment of the tax. It may also be that

the measures used by the successive kings are present in the temple.

Kaḷañju, māḍai and Kuṅṛi seems to be the descending order of weights of gold units. Palam is also a weighting measure used to weigh sugar, turmeric etc. The term tuḷai nīrai poṇ is found in many inscriptions. One of the records is at Varāhaperumāl temple, Tiruviḍandai in Chinglepuṭ district, dated in the 4th regnal year of a Chōla king. The term tuḷai nīrai poṇ means gold is being punctured at the centre. Tuḷai means ‘a hole’. Tuḷai nīrai kāśu kallāl was used for weighing 15 kaḷañju. This is mentioned in a record in the Viraṭṭānēśvara shrine Kīlūr, near Tirukoyilūr in South Ārcot district and dated in the 9th regnal year (1021 A.D.) of king Rājēndra Chōla I.

The art of making ornaments of gold and precious stones must have reached an advanced stage in the Chōla country by about the beginning of the 11th century A.D. A large number of the ornaments which are mentioned in the Tañjāvūr inscriptions either go by other names at present or have no representatives in modern South- Indian jewelry shops. Nine gems are mentioned in one of the inscriptions (Inscription No. 93). Their names are diamond (vairam), sapphire (nīlam), pearl (muttu), topaz (pushyarāgā), cinnamon-stone (komēdagam), coral (pavaram), emerald

(pachchai/ maragatam), lapislazuli (vaiḍūrya), and ruby (māṇikkam).

The chief image of the Tañjāvūr temple was called Āḍavallāṇ. Āḍavallāṇ was also the name of a weight measure, while Dakṣiṇamēru-Viḍaṅgaṇ was the standard measure used for weighing precious stones.

In the same temple another inscription mentions that the copper images which had been set up in the temple, after it had been measured by the cubit measure preserved in the temple of the lord, after the jewels given to it had been weighed without the threads and copper nails by the stone Dakṣiṇamēru-Viḍaṅgaṇ, and after the gold had been weighed by the stone called Āḍavallāṇ. This inscription also mentions the measurements of the idols.

## Māḍai

The term māḍai refers to the gold coins that were used for payments. Nilakanta sastri in his work entitled The Cholas says "By the side of several inscriptions which seem to employ the kaḷaṅju, in recording payments by weights, there are some which mention the poṅ and equate it to the kaḷaṅju, implying thereby that the poṅ was coined for the gold of the full weight of kaḷaṅju. This coin was also called Madhurāntakaṅ māḍai, served as the standard of fineness for testing gold." Hence we find that the term māḍai refers to the gold

coin of weight of 1 kaḷaṅju. This conclusion is drawn from the inscriptions of Rājarāja I. But this seems to have changed over years during the period of Rājendra II. A record from Naṭanapadēśvara temple at Tirukānthēsvaram in South Ārcot district registers the gift of 18 kaḷaṅju of gold, stated to be equivalent to madhūrāntakaṅ māḍai for burning a perpetual lamp to god.

Thus one Madhurāntakaṅ māḍai is equivalent to 18 kaḷaṅju. This is mentioned in a record of Rājendrā II dated in his 9th regnal year dated 1060-61 A.D.

## 1 māḍai = 18 kaḷaṅju

From the reign period of Kulottuṅga I several other types of māḍais make their appearance in the inscriptions and these were issued by the local rulers who were feudatories of the empire. One such example is Gaṇḍagōpālaṅ māḍai, Jayamāḍa, Chāmara māḍā, Paḷam pulli māḍai, Bhujabālan māḍai etc.,

## Conclusion

From the inscriptions we come to know that kaḷaṅju has been recognized as standard gold measure. As we know that kaḷaṅju and mañjāḍi are referred to as gold weight right from the Pallava period. Inscriptions also reveal the fact that a kaḷaṅju of gold was

equivalent to 8 kāṣu in weight during the period of Kulōttuṅga I. Besides these 2 weights, the fraction of gold weight is referred to by the term pilavu. Kuṅṛi is also a fraction of gold weight. In the medieval period revenue was collected in terms of standard gold called kōvai.

The quality of gold is also judged by the purity of the gold. This is referred to by the term māri or māṛru. This varies from 9 māṛru to 10.5 māṛru.

Like the other measures the weight measures are also named by different ways. It may be assumed that Dharmakaṭṭalai kal is a measure that is maintained in the court. Nagara kal might have been used only in the nagara that is the city. It is named after the place. Paṇḍarakal is probably the weighing stone that is being maintained in the temple granary.

The standard stone is known as niṛai kal and they are sometimes known by names like Āḍavallāṅ, Viḍelviḍugu, etc., The term tuḷai niṛai pon is found in many inscriptions. The term tuḷai niṛai pon means gold is being punctured at the centre. Tuḷai means a hole.

The other metals like copper, silver are also weighed for making pots and other utensils. We can find many instances from the inscriptions. It is worthy to note that some of the copper pots were weighed using tulākkōl called Āḍavallāṅ. Here the Āḍavallāṅ is made

equivalent to tulākkōl and also with Kuḍigai kal. Here kōl means weighing balance. Earlier commodities like turmeric, sugar were weighed using āyaravantilakkōl. Palam is also a weight measure used to weigh sugar, turmeric etc.,

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