

Modular Representation of Thaala in Indian Classical System

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ABSTRACT

Thaala is a series of actions that recur at regular interval of time and used as a metrical unit in any music. These actions are called as thaala kriya or thaala execution. Thaala is executed by hand or using percussion instruments. Most of the Indian classical music is strictly bound to thaala. There are several books or literatures available on thaala, but in most of the literatures, some of the terms are not used consistently. Also there are several terms that are no longer needed in present day. For synthesizing the music using software, it is important to have common understanding with one terminology so that thaala can be modeled in the software. This paper tries to represent thaala with common and minimum terminology keeping the current requirements in mind. Paper does not attempt to give insight into ancient treaties on thaala.

Keywords:—Thaala (or taala or tala or thala), raaga, carnatic classical

I. INTRODUCTION

Thaala is very important part of any music. Thaala repeats itself in a specific pattern with specific speed. Thaala is indicated by a series of rhythmic beats using hand gestures or percussion instruments and this process is called as thaala reckoning or execution or kriya. One of such repeating pattern of thaala is called as an aavatha. Thaala may start just before the composition starts, at the start of composition or after composition starts. But once the thaala is started, it may continue until the end of the composition, without any break in between. If thaala goes out of sync with the music, the quality of the music will be lost. So it is very important to ensure that the thaala is repeating regularly with same speed. Technically speaking, thaala has a strong mathematical base.

There are several systems of thaala and this paper gives attention mainly to Sulaadi Saptha thaala and few types of chaapu thaala, even though other thaala systems may also be represented using this modern method of representation. Sulaadi saptha thaala and chaapu thaalas are very commonly used in carnatic classical. In Indian classical system, there are various terminologies used to represent the thaala. In some cases, these terms are interpreted differently. For example, there is no consistency in the usage of terms laya, tempo, gathi, kaala, kalai (or kalaa), nade, maathra, akshara etc. Some people relate some of these terms to reckoning of thaala and some people relate this to the arrangement of swaras within the thaala frame and some people refer this to both. Also some scholars consider subdivision of thaala beat itself as different thaala and they claim the presence of 175

thaalas in carnatic classical. Usage of English for representing Sanskrit words also could have created some confusion. For example, jaathi vs. jathi have different meaning in Sanskrit and can cause trouble especially to the learners. So the intention of this paper is to use the terms that are needed present day music and use them consistently.

II. BASICS OF THAALA

A. Parts of Thaala

There are four basic parts required to represent the thaala of carnatic classical and they are:

- Anudhrutha (one clap using palm)
- Finger Beat (tapping fingers)
- Visarjitha (waving or beating on reverse side of the palm)
- Viraama (silence or no beat)

Every thaala must be composed with these basic parts and each part is called as thaalaakshara. Some parts may not appear in a given thaala and some parts may appear more than once. Each instance of occurrence of a thaala part is separated by a fixed time interval. Total number of all such instances together in one thaala aavatha is called as “total thaalaakshara” or “thaalaakshara count”. The time between any two thaalaakshara (considering equal duration thaalaakshara) is known as “thaalaakshara kaala”. We could also say that thaalaakshara kaala is the amount of silence

between two thaalaakshara instances. Thaala repeats itself with same thaalaakshara kaala in cyclic pattern until it is stopped.

The speed with which thaala actions are performed is known as thaala laya of the music and it is measured in terms of number of Thaalaakshara Per Minute (TPM). Thaalaakshara kaala thus depends directly on the thaala laya in TPM of the thaala reckoning. We are not going to assign any names to thaala laya (such as Madhyama kaala, vilamba kaala etc which are in use today), instead we measure only with TPM.

$$\text{Thaalaakshara kaala in seconds} = 60/\text{TPM}.$$

Various thaala parts may be grouped to form an anga. So an anga is a group of equal sized thaalaakshara. User could define new anga as per his convenience. But there are three anga in use and they are Anudhrutha, Dhrutha and Laghu. Here the term anudhrutha can be used interchangeably for anga or for thaalaakshara since anudhrutha in both senses mean the same. Its absolute duration is one thaalaakshara kaala and can be represented by one hand clap.

The Combination of one anudhrutha followed by various finger beats is called as laghu. There are five types of laghu, depending on the number of finger beats used. They are thrishra laghu (one anudhrutha + two finger beats), chaturashra laghu (one anudhrutha + three finger beats), Khanda laghu (one anudhrutha + four finger beats), mishra laghu (one anudhrutha + six finger beats), and samkeerna laghu (one anudhrutha + eight finger beats). Combination of one anudhrutha and one visarjitha is called as Dhrutha and equals to two thaalaakshara count.

B. Types of Thaala

There are 7 major types of thaala under Sulaadi saptha thaala. These seven major thaala types are framed by combination of anudhrutha, laghu and dhrutha.

Seven thaalas are listed in TABLE I below along with their composition and symbol. Though laghu appear several times in few thaalas, same laghu type is used within a given thaala.

TABLE I. TYPES OF THAALA

Thaala type	Thaala Composition
Dhruva Thaala	Laghu + Dhrutha + Laghu + Laghu
Matya Thaala	Laghu + Dhrutha + Laghu

Roopaka Thaala	Dhrutha + Laghu
Jhampe Thaala	Laghu + Anudhrutha + Dhrutha
Tripura Thaala	Laghu + Dhrutha + Dhrutha
Atta Thaala	Laghu + Laghu + Dhrutha + Dhrutha
Eka Thaala	Laghu

C. Thaala sub types based on type of laghu

Under each type of Thaala, there are several sub types depending on the type of the laghu used. As indicated earlier, type of laghu remains same when there are multiple laghu in a thaala. For Ex: Thrishra laghu Dhruva Thaala will contain only thrishra laghu for all 3 occurrences of laghu. Finger counting starts with small finger and continues till thumb and again starts over to small finger in case of mishra and samkeerna laghu cases. Depending on these 5 types of laghu and 7 types of thaala, we have 35 thaalas under sulaadi saptha thaala.

Examples:

- Thrishra laghu Dhruva Thaala means dhruva thaala comprising of thrishra laghu.
- Chaturashra laghu dhruva thaala means dhruva thaala comprising of chaturashra laghu
- Khanda laghu roopaka thaala means roopaka thaala comprising of khanda laghu.

If type of laghu is not specified and only thaala name is specified, following default laghu types are assumed for various thaala:

- Dhruva Thaala - Chaturashra laghu Dhruva thaala
- Matya Thaala - Chaturashra laghu Matya thaala
- Roopaka Thaala - Chaturashra laghu Roopaka thaala
- Jhampe Thaala - Mishra laghu Jhampe thaala
- Tripura Thaala – Thrishra laghu Tripura
- Atta Thaala - Khanda laghu Atta thaala
- Eka Thaala - Chaturashra laghu Eka thaala

Note: Aadi Thaala is very widely used thaala and it could be considered as an alias name for chaturashra laghu Tripura thaala.

D. Modern Notation System

Several notation systems are used for representing the thaala. But in this paper, another simpler method is followed. In this method, laghu will be represented by the number of its laghu type. Anudhrutha is represented by 1, dhrutha by 2 and viraama is represented as 0. By looking at the representation, it is possible to calculate total thaalaakshara in a thaala. Example: Thrishra laghu Jhampe thaala is represented as 312 (thaalaakshara count = 3+1+2) samkeerna laghu Atta thaala as 9922 (thaalaakshara count = 9+9+2+2). Aadi thaala is represented as 422 (thaalaakshara count = 4+2+2). This also helps software to quickly decide the thaalaakshara count.

Table II illustrates the thaala with symbol and their laghu type with total thaalaakshara count.

TABLE II. THAALA SUB TYPES BASED ON LAGHU TYPE

Laghu Type → Thaala ↓	Thaalaakshara Count				
	Thris ha (3)	Chath urash ra (4)	Khanda (5)	Mishr a (7)	Samkeer na (9)
Dhruva	3233	4244	5255	7277	9299
Matya	323	424	525	727	929
Roopaka	23	24	25	27	29
Jhampe	312	412	512	712	912
Tripata	322	422	522	722	922
Atta	3322	4422	5522	7722	9922
Eka	3	4	5	7	9

The start of thaala is represented by two solid vertical lines “||”. Separation of each anga is represented by one vertical line “|”. Also the end of thaala aavartha is represented by two solid vertical lines.

E. Thaala nade or sub division of thaalaakshara

When the thaala laya is slow (low value of TPM), thaalaakshara kaala could be quite long. In such scenarios, there is a chance of going out of sync with thaala. To avoid this problem, each thaalaakshara can be further divided and represented by more than one beat per thaalaakshara so that the duration between beats is small. It is basically a modulation of thaalaakshara kaala we can say. So when the thaala laya is slow, each thaalaakshara could be further divided into equal duration inner parts called thaala nade. The duration of each inner part is called as thaala nade duration. In a given thaala with specific TPM, thaalaakshara

count per each thaala and hence the thaalaakshara kaala remains same, but thaala nade duration gets reduced as thaala nade counts are increased.

Abs duration of thaala nade = (60/TPM)/Thaala Nade count

In thaala kriya (execution), each thaalaakshara can be represented by reckoning one or more beats called as inner beats. Number of inner beats may be equal to thaala nade count itself or it may be different than nade count. These inner beats representing each thaalaakshara is called as nade beats. Table III shows few types of thaala nade and nade beats used to represent the nade. Nade beats usage is musician dependent and may vary from one musician to the other.

TABLE III. THAALA NADE AND NADE BEAT REPRESENTATION

Thaala nade name	Thaala nade count	Nade beat representation
Eka Nade	1	Represented by one nade beat per thaalaakshara. Unless and otherwise specified, Eka nade is the default nade. Example Composition: Vathapi Ganapathim Bhaje
Dvi nade	2	Represented by two nade beats per each thaalaakshara. Example Composition: Chakkani Raja Margamu
Thrishra nade	3	Usually represented by only two nade beats (Tha-Kita). First nade beat is of one nade duration and the second nade beat is of two nade duration.
Chathurashra nade	4	Represented by 2 nade beats per thaalaakshara.
Khanda nade	5	Usually represented by only two beats (Thaka-Thakita) per each thaalaakshara. First nade beat of is of two nade duration (thaka) the second nade beat is of three nade duration (tha ki ta). Some people also represent using three nade beats
Mishra nade	7	Usually represented by only

		three nade beats (Thakita-Thaka-Dhimi) per each thaalaakshara First nade beat of is of three nade duration (tha ki ta) the second nade beat is of two nade duration and the third nade beat is of two nade duration.
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F. Chaapu Thaala and other thaalas

Chaapu Thaala is a way of executing the thaala by anudhrutha alone. Chaapu thaalas are separately used and are not included in sulaadi saptha thaala, even though they can be represented using one of the 35 sulaadi saptha thaalas. The duration of each beat in chaapu thaala is not same. There are 5 types of chaapu thaalas. They are listed in table IV. The reckoning method may vary from musician to musician.

TABLE IV. THAALA NADE AND NADE BEAT REPRESENTATION

Name	Thaalaakshara count	Symbol
Thrishra Chaapu	3	110 (Anudhrutha+Anudhrutha+viraama)
Chathurashra Chaapu	4	1010 Or 1011
Khanda Chaapu	5	10100 or 10110
Mishra Chaapu	7	1001010
Samkeerna Chaapu	9	100011000

G. Relation between thaala and swara (note or syllable)

There must be a synchronization between thaala and musical composition. Once the thaala laya is decided, musician can present the music in such a way that number of swaras per thaalaakshara decides the apparent tempo or apparent speed of the overall composition. This is represented with a new term called swara laya. This swara laya of the composition is different from the thaala laya (measured using TPM). In most cases, thaalaakshara kaala is fixed once the composition is started. However by increasing or decreasing number of swara-s per thaalaakshara, it is possible to increase or decrease the apparent tempo of the music. Number of swaras per

thaalaakshara is called as swara nade. The time between two swaras is called as swaraakshara kaala. Increasing swara nade will increase the apparent speed of the music and hence decrease the absolute duration of the swara (swaraakshara kaala). We call this speed as apparent because the actual speed of the composition is decided based on TPM. By varying swara nade per thaalaakshara, speed of the music sounds different, but in reality it is not. Thaala laya will not vary with variation in swara nade. Here swaraakshara kaala is based on number of swaras per thaalaakshara kaala and not based on absolute duration of thaala nade. Because thaala nade is only conceptual and used for the convenience, thaala nade absolute duration is not used for any swaraakshara kaala calculations. Thaalaakshara is the only the reference duration used for deriving all other metrical units.

$$\text{Total number of swaras per thaalaakshara} = \text{swara nade}$$

$$\text{Absolute duration of swara} = \text{Swaraakshara kaala} = (60/\text{TPM})/\text{Swara Nade}$$

$$\text{Total number of swara per thaala aavartha} = \text{Thaalaakshara count} * \text{Swara Nade}$$

We will use another three terms while referring to compositions. These terms are used to indicate the relative swara nade of the composition with respect to the base speed. These terms are referred as base speed, half speed and double speed. Base speed swara nade is used as reference and this is derived from the composition itself. In most cases this base speed swara nade value is four (traditionally this used to be referred as chaturashra gathi). In case of half base speed, base speed swara nade count is halved and in double speed case, base speed swara nade count is doubled. When we say that we are rendering composition at different speeds, we usually refer to swara nade variation. Composition could start in base speed; go to half speed or double speed. Any other swara nade is also possible like swara nade of thrishra, khanda etc. (Comparing to the existing terminology, we could say that when music is rendered in thrishra nade, we arrange 3 swaras per thaalaakshara and in khanda nade 5 swaras per thaalaakshara is arranged). The figure 1 below shows the arrangement of swaras per thaalaakshara in base speed swara nade and half speed swara nade.

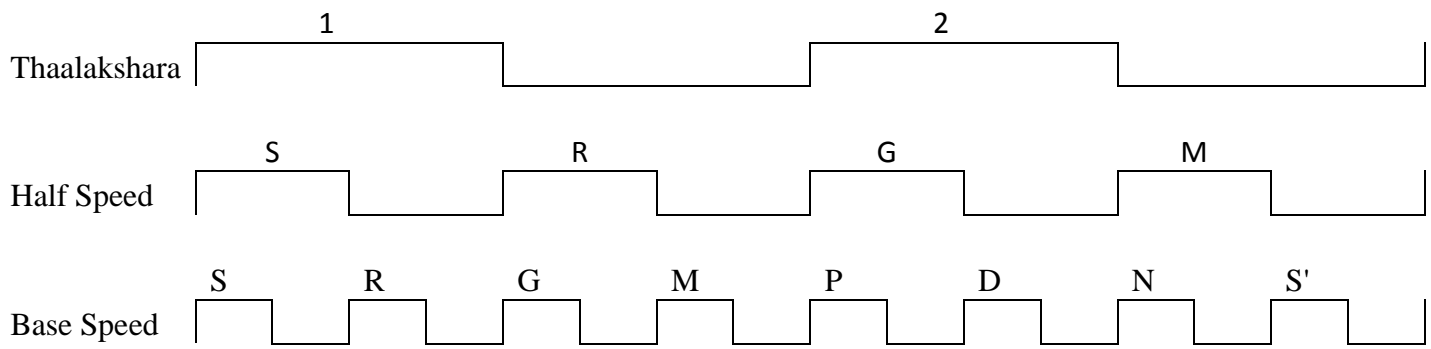


Figure 1 Swara arrangement per thaalaakshara

In Table V, swaras per thaalaakshara is shown considering few swara nade cases. This is only conceptual since Eke swara nade is seldom used. Chaturashra nade is commonly used. Table VI shows various swara nade names and number of swaras per thaalaakshara.

TABLE V. SWARA NADE REPRESENTATION

Thaalaakshara →	1	2	3	4	5	6	7	8																
Eke swara nade	S	R	G	M	P	D	N	S																
Dvi Swara nade	S	R	G	M	P	D	N	S	S	N	D	P	M	G	R	S								
Chathurashra Swara nade	S	R	G	M	P	D	N	S	S	R	G	M	P	D	N	S	S	N	D	P	M	G	R	S

Table VI shows various Swara nade and relation to thaalaakshara

TABLE VI. SWARA NADE REPRESENTATION

Swara Nade	Number of swara per thaalaakshara
Eka swara nade	1
Dvi swara nade	2
Thrishra swara nade	3
Chaturashra swara nade	4
Khanda swara nade	5
Mishra swara nade	7
Ashta swara nade	8
Samkeerna swara nade	9
Shodasha swara nade	16

Thaala and composition may not start together. If thaala and music starts together, it is called as Sama. If music starts first, it is called as 'Atheetha' and if thaala starts first

followed by the composition; it is called as 'Anaagatha'.

III. CONCLUSION

In this paper, we considered simplified representation of thaala and relation to swara arrangements. We got rid of certain terms such as nadai, gathi, kaala, laya etc and gave meaningful names such as swara nade, thaala nade etc. Though these new terms may confuse musicians who are well versed with current system, this may help to streamline the terminology and learners may find these usage simplified.

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