# Ancient Indian Polyrhythms:
## The Structure of the Mārgatālas Containing an Explanation of their Prominent Status in the History of Indian Rhythm

THOMAS KINTAERT

### INTRODUCTION

This article focuses on a feature of the innate structure of the *mārgatālas* which caught my attention while beginning research for my M.A. thesis, a German translation and study of the section on *tāla* of the *Dattilam*[1]. Since this thesis is still in its early stages, the elaboration offered in this article is limited, but the subject is of sufficient interest to persuade me to publish my findings somewhat prematurely.

*Contents*: Part A gives a short description of the modern tāla system of north Indian classical music, while part B goes to the roots of the same and other rhythm systems of the Indian subcontinent, i.e., to the mārgatālas. The following part, C, constitutes the main part of this study, detailing the polyrhythmic structures of the mārgatālas and the answers these structures provide. Part D comes up with some additional thoughts, while in part E we again travel through time to point out some polyrhythmic remnants of those ancient tālas in modern practice. Some final remarks then conclude this article.

Before proceeding to these points, I would like to describe the concept of tāla in a few words. Tāla is, and was during its more than two-thousand-year-old history[2], one of the two main components of Indian classical music, namely the rhythmical, measuring one, the other, the measured part, being *svara*[3]. This tāla system, in all the multitude of forms which it has adopted till the present day, doesn't seem to be paralleled for its complexity, ingenuity and tradition in theoretical treatises. The fact that such unique rhythmical systems are still very much alive today makes the search for the origins of tāla in the distant past a most fascinating undertaking.

### A. THE TĀLA SYSTEM OF NORTH INDIAN CLASSICAL MUSIC

As one example of contemporary tāla practice, I would like to give a brief introduction to the tāla system of North Indian (i.e., Hindustānī) classical music by expounding a few of its major characteristics—*āvarta*, *saṃ*, *prastāra* and *tihāī*.

#### a. *Āvarta*

The rhythm of modern Hindustānī music (as also of most other Indian systems)

is basically of a cyclic nature, one cycle being called an āvarta. A certain tāla is identified *with*, and can be recognised *by*, a specific pattern of drumstrokes-cum-syllables, the so-called *ṭhekā* of a tāla. This ṭhekā is repeated cyclically again and again[4] by the drum-player while supporting the vocalist or instrumentalist who 'performs' the rāga in order to give structure to a musical recital. As the art of drumming reached a very high degree of sophistication, there came into being a tradition of percussion solo performances where a multitude of compositions together with improvised parts came to be played. (This tradition continues to flourish today.) In order to help the listener keep track of the chosen tāla, its cycle is kept by a musical instrument (nowadays mostly the Sārangī or harmonium), which during the entire performance keeps on repeating a melody of the length of one āvarta.

b. *Saṃ*

The first beat of a tāla cycle (āvarta), and therefore also the meeting point between all the subsequent cycles, is called the saṃ. It is the single most important beat, the point on which compositions as well as whole performances usually finish, and in classical recitals (including drum-solos), rhythmical figures played by the drummer and/or by the vocalist-instrumentalist often create a tension which gets dissolved on reaching this beat[5].

c. *Prastāra*

The principle of prastāra, i.e., permutation in its broadest sense, is a concept which pervades all the Indian arts and especially music, where it is a major composing and improvising aid in both rāga and tāla. In the latter it is one of the *daśaprāṇas*[6] and as such constitutes a framework in which not only all existing, but even all theoretically possible tālas have their place[7]. Moreover, even within an individual tāla, prastāra is used, consciously or otherwise, to compose or to improvise on compositions.

The value of prastāra shouldn't be underestimated. Its use in so many fields clearly reveals a longing of the Indian mind for holism, by exhausting all possible combinations of a given set of elements[8].

d. *Tihāī*

A tihāī is a phrase played by the drummer and/or vocalist-instrumentalist ending with an accentuated beat, which, at the end of a phrase, composition, and most strikingly at the end of a performance, is played three times in order to end on the saṃ of the tāla. Each of these repetitions is placed shifted *on* the underlying (or *under* the superimposed) cyclic tāla-pattern, by which means a tension is

created which gets resolved when the two different cycles[9] finally meet on the saṃ[10].

## B. THE MĀRGATĀLAS AND THE GĪTAKAS

### 1. *Literary Sources*

The main sources for our knowledge of the mārgatālas are basically limited to three Sanskrit works from the first millenium A.D.: the *Nāṭyaśāstra*[11](NS), its commentary the *Abhinavabhāratī*[12] (AB), and the *Dattilam* (D). In the *Nāṭyaśāstra* the verses about the mārgatālas and the gītakas, which are the vocal compositions in which the mārgatālas occur, are limited to chapter 31 and parts of chapters 5, 29, and 32. The remaining 32 chapters, apart from treating of *gāndharva*[13], are dedicated to the exposition of subjects as diversified as dance, poetry, grammar, architecture, etc.

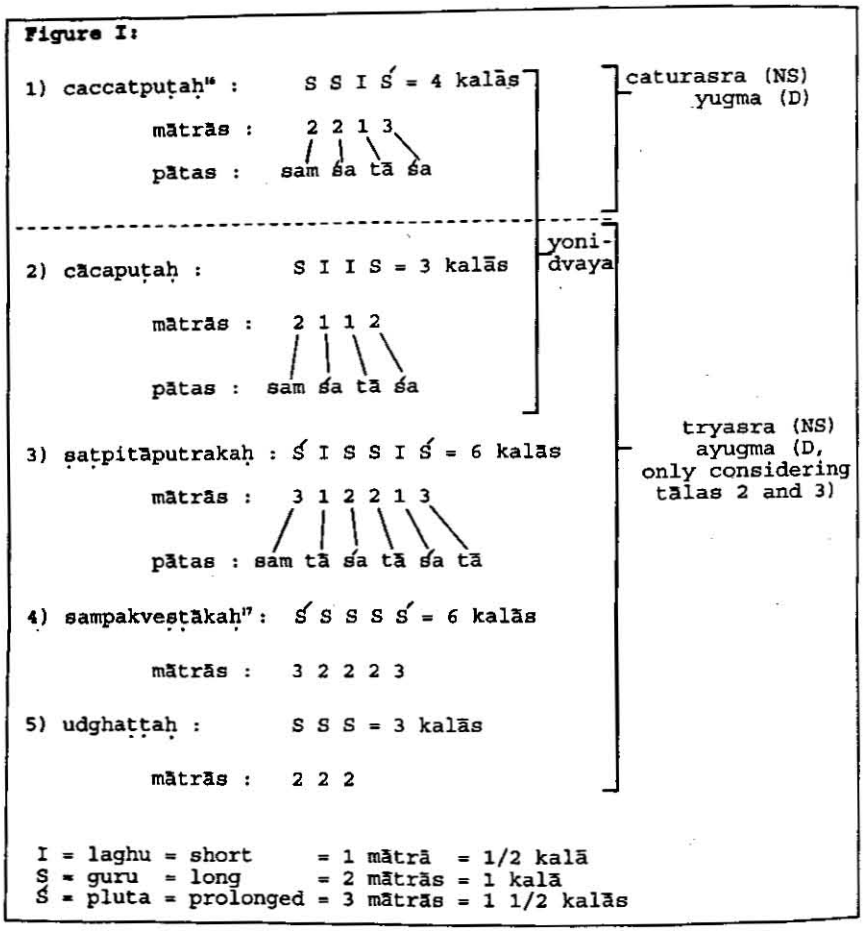
The *Dattilam*, attributed to the sage Dattila, is on the contrary solely devoted to gāndharva. Its first section deals with the melodic components of this music (viz. the *jātis*, etc.), while its second, i.e., last part, occupying a little more than half of the work, treats of the mārgatālas and gītakas. This part later attained an authoritative status in the field of ancient rhythm, which the numerous citations of its verses in subsequent music treatises clearly show[14].

### 2. *The Structure of the Mārgatālas*

In the *Nāṭyaśāstra* and most later texts which considered this treatise as authoritative, the mārgatālas number five, whereas only the first three of this list are described in the *Dattilam*. In the following pages, we will also confine ourselves to these first three tālas[15].

Figure I (p. 18) lists the mārgatālas in their traditional order, and may serve as a reference for the following, more detailed, explanations.

To begin with, the mārgatālas are divided into two categories: the first, solely represented by the Caccatpuṭaḥ tāla, is termed "square" (*caturasra*) or "even-numbered" (*yugma*), while the second category, which includes the remaining four tālas, is considered "triangular" or "odd-numbered". The reason behind this differentiation lies in the lengths of the five tālas. The first mārgatāla consists of a sequence of four beats of different lengths, namely *guru-guru-laghu-pluta* (i.e., 2-2-1-3), written with the metrical symbols S-S-I-Ś. As can be seen after studying Figure I, this tāla is made up of a total of 8 *mātrās* or 4 *kalās*, thus explaining the terms caturasra and yugma. The other tālas can also be analysed in the same way. The tālas 3 and 4, although consisting of 6 kalās each (i.e., of an even or yugma number of kalās), have been regarded as forms derived from the three-kalā tāla Cācaputaḥ, and have thus been included in the *ayugma* group.




This brings us to the next point. The first two mārgatālas, Caccatputaḥ and Cācaputaḥ, are called the "*yonidvaya*", that is, the "two original" or "prototypal" tālas, as the former is considered to be the origin of all yugma tālas, and the latter the origin of the ayugma tālas. Dattila, quoting a now nonextant text attributed to Kohala, shows how the Ṣaṭpitāputrakaḥ can be obtained by doubling the Cācaputaḥ[18], which seems to point to the high status of the latter tāla.

We now come to a point of major importance for us. The mārgatālas were performed with specific hand-beats or *pātas*: a beat with the right hand called *śamyā* (sometimes abreviated as *śa*)[19], a beat with the left hand called *tāla*[20] (or *tā*), and finally a beat of both hands called *sannipāta* (or saṃ). The modern practice of marking the saṃ of a tāla by clapping the hands together[21] seems to

indicate that the ancient sannipāta was clapped in an identical way. Still, I don't want to reject the idea that maybe the prefix 'sam' emphasized more the temporal than the spacial 'togetherness', i.e., the clapping *at the same time* of both hands, probably on the respective leg.

Equipped with this information and with the help of Figure I, one should now be able to clap the mārgatālas[22]. Yet it seems that these mārgatālas were not executed alone but were integrated in the gītakas, which were rigidly fixed vocal compositions, considered sacred, of which mainly the rhythmical structure has been preserved [23]. In part D we'll come across these gītakas again.

3. *Questions*

Regarding the mārgatālas now, some major questions remain. As becomes clear when for example considering Dattilam 110a[24] and 222[25], the mārgatālas, and with them the gītakas, were considered sacred (as was, in fact, gāndharva as a whole[26]), and could therefore not be altered[27]. The obvious question now is: Why were those and only those tālas considered sacred? Is there any logic which justifies or explains their choice as the only tālas whose performance in the ritual theatre was considered to produce transcendental merit? If, as was assumed, they really were the origin for other (non-mārga) tālas[28], isn't it strange then to find rhythms as complex as the Ṣaṭpitāputrakaḥ (Ś-I-S-S-I-Ś) amongst those basic, prototypal tālas? Another unclear point, which was already debated during the first millenium A.D., was the controversy about whether certain tālas have to begin with the sannipāta or not[29]. And finally: What is the reason behind the seeming absence of cyclic rhythm in the gītakas, in contrast to the later cyclic *deśītālas* from which the modern tālas developed?

To these and other remaining questions, I'll try to give some answers in the following pages.

## C. THE POLYRHYTHMIC STRUCTURE OF THE MAIN MĀRGATĀLAS

One of the primary constituent elements of rhythm is ratio[30]. Pulsation of some kind is of course just as fundamental to it, but when it comes to more complex and creative rhythmic performances, then the ratio of time-units, beats, phrases, etc., is in fact what rhythm consists of. In many of the percussive traditions of the world, the beating of simple numerical ratios[31] is common both as exercise as well as part of actual performance. The reason behind this widespread use of these ratios seems to lie in their basic nature, i.e., structure, whose psycho-physiological effect can be experienced by anyone who executes one of these polyrhythms (particularly 2:3 and 3:4) by means of beating or in any other way. They are moreover of such a fundamental nature that people have been able to

discover them independently in different parts of the world and at different times. This considered, it is astonishing to find that the polyrhythmic structures of the three main mārgatālas seem to have been overlooked, even though they have been put down by the ancient authors as accurately as possible. Figure II (p. 21) shows the polyrhythmic structures, expressing simple numerical ratios, of mārgatālas 2 and 3, i.e., Cācaputaḥ and Ṣaṭpitāputrakaḥ.

As will be clear now, in the Cācaputaḥ tāla the right hand beats every second mātrā, while the left hand beats every third. Thus, within the same time span one hand beats three times and the other two times[32]. Similarly, in the Saṭpitāputrakaḥ the right hand beats every fourth and the left hand in the same period every third mātrā[33]: so those two tālas are clearly polyrhythms!

Having identified the 2 to 3 (2:3) and 4 to 3 (4:3) relationships in tālas 2 and 3 respectively, we shall now see what possible answers they can provide to the questions raised earlier.

• As two of the three main tālas, and perhaps even all three as we shall see in part E, express ratios of small whole numbers, they clearly stand out against other, non-mārga, tālas. It is therefore not surprising to see them classified together in a distinct group. As to their sacredness, it seems probable that their polyrhythmic structure, when executed correctly and attentively[34], was thought to increase the transcendental merit of the performer. One interpretation could be that the two revolving cycles of a polyrhythm were seen as representing the differentiation of our empirical world, while their meeting, i.e., uniting, on the sannipāta stood for the dissolution of these opposites in the undifferentiated unity. Whatever the reason for the high status of these tālas, it is quite obvious that their polyrhythmic structure had something to do with it.

• The Ṣaṭpitāputrakaḥ, first considered to be an unusually complex tāla considering its status as a basic mārgatāla, suddenly appears to be the simplest possible expression of the 3 to 4 ratio[35]!

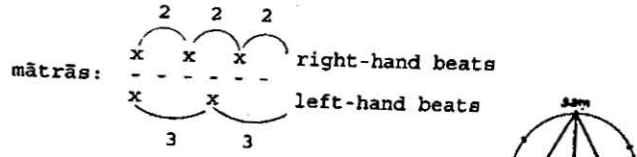
• The controversy about whether the main mārgatālas necessarily must or mustn't start with the sannipāta loses its basis in view of the above facts, as in a polyrhythm the saṃ can't be added at will, but simply happens when and where the two cycles meet!

Although there were different views, the ancient authorities seemed to share pretty much the same opinion that the tāla version which starts with a sannipāta was stronger and purer and therefore more sacred, probably because of which only that version, i.e., the polyrhythmic one, appeared in the *saptarūpa*[36].

• As the saṃ of polyrhythmic structures automatically occurs as an effect of their cyclicity, one may be amazed to find that this cyclicity seems to be absent in the gītakas. Yet this is only a first impression. When looking, for example, at

**Figure II:**

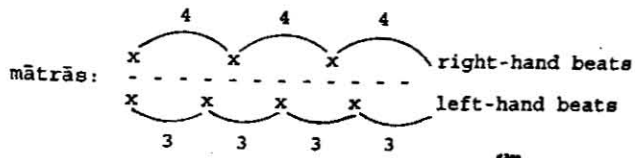
a) cācaputaḥ: S I I S = 6 mātrās
saṃ śa tā śa




or, expressed in a cycle:

=> 2 : 3

b) ṣaṭpitāputrakaḥ: Ś I S S I Ś = 12 mātrās
saṃ tā śa tā śa tā




or, expressed in a cycle:

=> 4 : 3 or 3 : 4

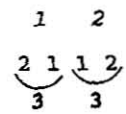
*Dattilam* 138 (*parivarta*) and at the common repetitions of the Ṣaṭpitāputrakaḥ (in the guise of *Śīrṣakas*, etc.) in the gītakas, it becomes clear that the idea of cyclic rhythm wasn't completely absent in them[37].

The polyrhythmic structure of mārgatālas 2 and 3 can probably provide more explanations, but as those are of a more speculative nature, they will be mentioned under a separate heading.

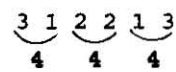
## D. SOME ADDITIONAL THOUGHTS

a. As prastāra has so much importance in Indian rhythm, it may be interesting to note that this concept of permutation is evident in the above-mentioned mārgatālas, or even constitutes them as a result of the numerical ratios they

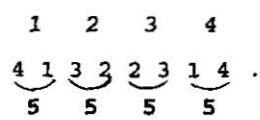
express. Cācaputaḥ (2:3) thus automatically reveals the two permutations of $3^{38}$, i.e.:



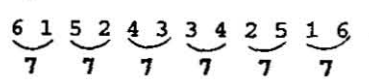

while the Ṣaṭpitāputrakaḥ expresses the three permutations of 4, i.e.:



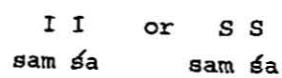

That this is not merely due to coincidence will become clear when identifying similar permutations in other polyrhythmic structures. The 4 to 5 ratio, for example, produces a structure with the 4 possible permutations of 5:



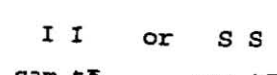

Similarly, 6:7 would be expressed as:




b. The previous point may help to clear up another matter. As already two of the three tālas mentioned in the *Dattilam* are polyrhythms, one could expect the first one, i.e., Caccatputaḥ, to have a similar nature. Yet, when beating the 2213-structure[39], the left hand beats 4-4, whereas the right hand beats 2-3-3, obviously not a pattern made up of equidistantly distributed beats. Keeping the remaining two tālas in mind, it would seem somehow logical to find a 1 to 2 relation in the first one, so as to get the series 1:2, 2:3, and 3:4 (or 4:3). Now the simplest way to express this 1 to 2 ratio would be:




or alternatively:




A possible explanation for this differing Caccatputaḥ could be that, those structures being *too* simple, a more complex form was chosen in which the 1 was expressed by the sannipāta (the first beat of the right hand) and the 2 by the left-

hand beats. An indication in favour of this theory, that the Caccatputaḥ is just a rather complex 1:2 polyrhythm, is found when one looks at the above-mentioned polyrhythm-prastāra connection. The 2213-structure then clearly expresses a 2 to 4 ratio, i.e., 2 permutations of 4:

$$\underset{\underset{4}{\frown}}{2\ 2}\ \underset{\underset{4}{\frown}}{1\ 3} \quad \Rightarrow \quad 2 : 4\ ,$$

which brings us back to the 1 to 2 relation, as 2:4 = 1:2[40]!

c. If the above assumption proves to be true, then another idea may be put forward, admittedly still in the field of speculation. This concerns the *dhruva*[41] 'beat', a snapping of the fingers, mentioned in the *Nāṭyaśāstra* as the fourth audible beat (pāta), but not present in the *Dattilam*, maybe because there it was taken for granted[42]. This finger-snapping mainly occurred in the beginning of most gītakas, in the so-called *upohana* section[43], where it was performed at equidistant intervals of one mātrā each, till the structured part of the composition, on the rhythmical level indicated by the other three audible beats and the four silent hand gestures, started[44]. Not only was any kind of tāla structure absent in the upohana (apart from the dhruva pulsation), but the notes were sung with meaningless syllables. The unfolding of the musical and philosophical idea as the gītaka moved on to its structured part is indicated in Figure III.

The performance of the gītakas was perhaps viewed as an imitation of creation, from the unmanifest to the manifest, not unlike modern performances of Indian classical music, which ideally start with an *ālāpa* where no tāla is used and which, when sung, sometimes consists of meaningless syllables[45].

**Figure III:**

| | | |
|---|---|---|
| dhruva | = 1 | = the firm, motionless[46], changeless, undivided, unmanifested[47], omnipresent, symbol for the ultimate and highest reality, i.e. brahman[48] |
| caccatputaḥ | = 1 : 2 | ratio, polarity, manifestation, unfoldment of the creation, the empirical[49] world |
| cācaputaḥ | = 2 : 3 | |
| ṣaṭpitāputrakaḥ | = 3 : 4 | |

d. Another thought, which might be very controversial, relates to the identity between polyrhythms and musical harmonies. As known since the times of Pythagoras, the octave expresses the 1 to 2 ratio (1:2), the fifth the 2 to 3 ratio

(2:3), and the fourth the 3 to 4 ratio (3:4). It is generally assumed that the numerical proportions of these intervals were unknown in India[50], but the following points could perhaps question this assumption:

- The octave, fifth and fourth have always been strong intervals in Indian music.
- Furthermore, in some gītakas the ending sannipāta[51] of a Caccatputaḥ or Ṣaṭpitāputrakaḥ had to coincide with a prescribed *nyāsa* or final note, which always constituted a 'strong' interval with the *aṃśa,* i.e., the tonic or predominant note of a *jāti*[52]! Thus, at the point where tāla and svara merged, both created a feeling of resolved tension, the tāla by reaching the saṃ of the polyrhythm, and the melody by reaching the fundamental or some other important note. This was intensified when at the same point the meaning of the sung sentence finally got conveyed[53].
- As we have already seen, two, and maybe even all three, main mārgatālas are polyrhythms. This becomes clear when analysing their structure, but is, as far as we know, not written down explicitly in any extant text, probably because sacred also implied secret. As such secrecy is not at all uncommon in the tradition of Indian arts, it doesn't seem improbable that the relation between musical harmonies and simple numerical ratios was known in ancient times, but couldn't be put down in the music treatises because of the sacred context[54].

Perhaps further study will throw some light on this issue.

## E. POLYRHYTHMIC REMNANTS IN MODERN HINDUSTĀNĪ MUSIC

The mārgatālas and with them the gītakas were considered sacred, and even when they weren't performed any more, they were handed down in the appropriate treatises. It is therefore not surprising to find some remnants of the ancient polyrhythms in modern Hindustānī music, a few examples of which now follow:

- The concept of prastāra which, as we have seen, is inherent in the mārgatālas, forms a substantial and obvious part of modern tāla practice. This observation, of course, is not intended to prove that the use of prastāra originated in the mārgatālas, but merely shows a continuous use of this concept in the field of rhythm. Whether its occurrence in the mārgatālas has ever been specially noticed is of course another matter.
- A somewhat clearer polyrhythmic remnant can be identified in the contemporary tihāī structure. Both here and in the polyrhythms of the gītakas we

have two differently revolving rhythmical cycles which meet at the point called saṃ(nipāta), *on* and *by* which the created tension is resolved, often coinciding with an important note of the musical scale[55].

• Further examples are the chironomic movements[56] which are used nowadays to mark the divisions of a tāla. The beat which starts every āvarta and connects it with the next is the saṃ, which is, as we have already noted before, most certainly identical with the sannipāta of gāndharva. Another chironomic characteristic may finally be noted, namely the fact that, at least in some schools of Tablā and Pakhāvaj solo drumming (the so-called *gharānās*), it is still the practice when clapping tālas in slower speeds, after the first beat of a *vibhāga* or section of the tāla, to count the remaining beats starting with the *small finger*. In gāndharva, indications are given concerning separate finger movements which, in some situations, had to be performed together with the already mentioned beats[57], and although they seem to have been of a different nature than the modern ones, they also had to start with the *small finger*[58].

I am aware that the thoughts in parts D and E are of a speculative nature. Nevertheless, I hope that a few of these ideas might contribute in some measure to the study of ancient Indian rhythm.

## F. FINAL REMARKS

While citing examples of modern tāla practice, I have chosen the Hindustānī music system simply because I am more familiar with that system than with others. The Carnatic tāla system, for its part, is said to have preserved a great deal of ancient rhythm. It would therefore be very interesting to study that and other systems, such as the Maṇipurī and Oḍissi tāla systems, while investigating polyrhythms in Indian music.

Other areas of study which might yield valuable information are the rhythms used in the temple ceremonies of the Indian subcontinent, as well as the rhythms of the sacred and/or classical music of regions which, in the past, were influenced by the culture of India.

Interdisciplinary studies might also prove to be very enlightening, as different Indian classical arts, having sprung from a similar cultural background, also seem to have been structured by similar principles. It is desirable that further research is carried out to make the philosophical impulses behind the choice of those principles used in the various performing and visual arts intelligible.

Above all, no effort should be spared to keep these beautiful arts, which at the core have survived for so many centuries, alive. □

## NOTES AND REFERENCES

1. A work on *gāndharva* music, usually dated at the beginning of the Christian era. For editions, together with English translations and studies of this text, see: E. Wiersma-te Nijenhuis, *Dattilam: A Compendium of Ancient Indian Music* (Leiden: E.J. Brill, 1970); Mukund Lath, *A Study of Dattilam: A Treatise on the Sacred Music of Ancient India* (New Delhi: Impex India, 1978); Mukund Lath (ed.), *Dattilam* (Delhi: IGNCA and MLBD, 1988).

2. Cf. Lewis Rowell, 'Tāla', in *Concepts of Space and Time*, ed. Bettina Bäumer, Vol. 2 *of Kalātattvakośa: A Lexicon of Fundamental Concepts of the Indian Arts*, gen. ed. Kapila Vatsyayan (Delhi: IGNCA and MLBD, 1992), pp. 333, 337, 342.

3. That is, the melodic component of music. Svara, actually meaning a musical note, is here taken to mean the melodic whole.

4. Although with variations and rhythmical interludes.

5. Often coinciding with the *ṣaḍja* (*sa*) or some other important note of the rāga.

6. A classification of the ten main tāla topics, in use since medieval texts on music.

7. For clear descriptions of prastāra in the field of tāla, see: R. Sathyanarayana, *Nartananirṇaya of Paṇḍarīka Viṭṭhala,* Vol. 1 (Delhi: IGNCA and MLBD, 1994), pp. 150–151, 238–244; and Subhadra Chaudhary, *Time Measure and Compositional Types in Indian Music* (Delhi: Aditya Prakashan, 1997), pp. 82–84.

8. For some examples from different fields, cf. the *trikagaṇas* of Indian metrics, the description of the three primary colours and their derivatives (i.e., combinations) in the chapter on *āhārya* of the *Nāṭyaśāstra* (ch. XXI, 78b–86a of the Parimal Sanskrit Series edition; see footnote 11), the chapter on the manufacturing of perfumes in the *Bṛhatsaṃhitā* of Varāhamihira [M. Ramakrishna Bhat, *Varāhamihira's Bṛhatsaṃhitā,* Vol. 2 (Delhi: MLBD, 1993), chapter 77, pp. 705–718], etc.

9. Or, better, the strong beats of those cycles.

10. An example may help to clarify this:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tīntāla- | **sam** | | | | | | | | | | | | | | |
| ṭhekā: | **dhā** | dhin | dhin | dhā | dhā | dhin | dhin | dhā | dhā | tin | tin | tā | tā | dhin | dhin | dhā |
| tihāī: | **ti** | ra | ki | ṭa | dhā | - | ti | ra | ki | ṭa | dhā | - | ti | ra | ki | ṭa |
| | **dhā** | | | | | | | | | | | | | | |

The vertical lines in the above example divide the āvarta of *tīntāla* into its four *vibhāgas* or sections.

11. The famous work on the theatrical arts, attributed to the sage Bharata and usually dated between the 2nd century B.C. and the 4th century A.D. Edited together with the *Abhinavabhāratī* by R.S. Nagar in 4 volumes: *Nāṭyaśāstra of Bharatamuni with the Commentary Abhinavabhāratī by Abhinavaguptācārya* (Delhi: Parimal Publications, Parimal Sanskrit Series No. 4, 1989).

12. Written by the famous Kashmir Śaiva philosopher of the 10th–11th century, Abhinavagupta.

13. The ritual sacred music employed in the ancient Indian theatre, especially during its ritualistic preliminaries (the so called *pūrvaraṅga*), considered to produce "unseen" merit (*adṛṣṭa*), and of which the mārgatālas, incorporated in the gītakas, formed an important part. Lath's *A Study of Dattilam* deals with all aspects of gāndharva in detail.

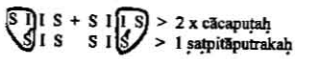
14. See Lath, *Dattilam*, pp. 202–208.

15. It is for this reason that the specific hand beats for tālas 4 and 5 have been omitted in Figure I.

16. The names of the mārgatālas, seemingly of a nonsensical nature, have a more profound meaning, as the metrical length of their syllables (short or long) express the different beats (*laghu* or *guru*) of the tāla they denote, the *pluta* beats of tālas 1, 3 and 4 being separately indicated in the texts. Unlike the other Sanskrit

words in this article, I have kept the names of the mārgatālas in the nominative case so as to highlight this relation between the syllables and the respective tāla.

17. This tāla was considered to be derived from the Ṣaṭpitāputrakaḥ, while the Udghaṭṭaḥ was said to have originated from the Cācaputaḥ (see : Subhadra Chaudhary, *Time Measure and Compositional Types in Indian Music*, pp. 42–43, 46–47; Lath, *A Study of Dattilam*, p. 335). Maybe this, together with the fact that only the first three tālas were used prominently in the seven main *gītakas* (the so-called *saptarūpa*), is the reason why those tālas are the only ones described by Dattila.

18. 


19. The interpretation of this beat as the right hand slapping the left hand (and the reverse situation for the left-hand beat) seems to me rather far-fetched, especially regarding the nature of the mārgatālas, as we will see in part C. It seems to be more likely that śa and tā denoted beats of the right and left hand on the right and left leg respectively, or on any other surface.

20. Not to be confused with the more general meaning of the word tāla.

21. For example when reciting compositions, without actually performing them on drums.

22. I am aware of simplifying things. This study for example doesn't consider the inaudible hand movements which were used in expanded versions of the mārgatālas and gītakas, as they aren't of immediate interest for us here and their exposition would have made this article too long.

23. The texts of the gītakas were invocations to Śiva, while the melody was structured by the jātis of gāndharva. It should be noted that the rhythmical structures of the gītakas were perhaps a frame on which the drums played their own rhythms. See Lewis Rowell, *Music and Musical Thought in Early India* (Chicago and London: The University of Chicago Press, 1992), p. 116–117. This could have been the case when gāndharva accompanied dances as, in other instances, drums seem to have been hardly used in gāndharva (see Lath : *A Study of Dattilam*, pp. 451–452).

24. *tālāt sāmyaṃ bhavet sāmyādiha siddhiḥ paratra ca* : Tāla leads to *sāmya* and *sāmya* to *siddhi*, (both) here and hereafter (Lath, *Dattilam*, p. 25). The word sāmya has been rendered as "equipoise" in Lath, *A Study of Dattilam*, p. 313.

25. *ityevam ṛṣibhirgītam sāmavedasamudbhavam. saptarūpamato jātaṃ gītajātaṃ purākila*: Thus did the *ṛṣis* in ancient times sing the *saptarūpa*, which was born of the Sāmaveda. The entire gamut of *gītas* has arisen from it (Lath, *Dattilam*, p. 43).

26. Cf. Lath, *A Study of Dattilam*, pp. 81–86, 91, 97–106, 119–122, 128–129, etc.

27. This explains why the structure of those ancient tālas could be transmitted unaltered up to the present, even during times in which they probably weren't actually used anymore.

28. Lath, *A Study of Dattilam*, p. 167, footnote 4.

29. The views held on this point by Bharata and Dattila are schematized below:

| | Bharata(NS) | Dattila(D) |
|---|---|---|
| Caccatputaḥ: | saṃ(śuddha)/ no saṃ | saṃ/ no saṃ |
| Cācaputaḥ: | saṃ (balavat)/ no saṃ | saṃ |
| Ṣaṭpitāputrakaḥ: | saṃ | saṃ |

(Lath : *A Study of Dattilam*, pp. 324–329)

30. In this article the word ratio has only been used denoting a fixed numerical relation.

31. Mainly the polyrhythms expressing the 1 to 2, 2 to 3, and 3 to 4 ratios, i.e., 1:2 (beat-offbeat), 2:3, and 3:4.

32. Or to put it in another way: one hand divides the time-span in 3, while the other hand divides it in 2 equal parts.

33. Cf. *Dattilam* 133b–134a.

34. *avadhānena* (*Dattilam* 3b). This concentration (*avadhāna*) was an indispensable element of gāndharva. See also Lath, *Dattilam*, pp. 66–67.

35. Just as the Cācaputaḥ is the simplest possible expression of the 2 to 3 ratio.

36. Cf. Lath, *A Study of Dattilam*, pp. 325–326; Chaudhary, *Time Measure and Compositional Types in Indian Music*, p. 44.

37. A difference between the gītakas and modern tālas of course can't be denied, although it is perhaps not so much the gītakas but the mārgatalas themselves which should be taken for comparison.

38. That is, only using whole numbers, and only two of them for each permutation.

39. 


40. If the Caccatputaḥ was really meant to express the ratio of 1 to 2, then it can be observed that in each of the polyrhythmic mārgatālas, the left hand beats the even-numbered cycle and the right hand the odd-numbered one.

41. Firm, unchangeable, constant.

42. See Lath, *A Study of Dattilam*, pp. 23, 25–26.

43. As well as in the *pratyupohana* sections, which had a similar function as the upohana, but were shorter and occurred in the beginning of subsections of the gītakas.

44. It seems that the dhruva beat was also inherent in this tāla-structured part (which fact would attain a special significance in view of Figure III) preceding the audible hand movements (see: Lath, *A Study of Dattilam*, p. 25; and Subhadra Chaudhary, *Time Measure and Compositional Types in Hindustani Music*, p. 17). On p. 210, however, Chaudhary states that, in the gītakas, the dhruvapāta was confined to the upohana.

45. As the first part of a modern ālāpa is often devoid of any pulsation (which only appears in the following *joḍ* and *jhālā* sections), it doesn't seem improbable that a similar section also preceded the upohana, but, due to its lack of structure, wasn't written down and/or was simply taken for granted.

46. It is fascinating to observe that the firm Pole Star, another meaning of the word dhruva, gave birth in India to a concept in the visual arts which is perhaps similar to the concept of dhruva in gāndharva music, the time dimension being exchanged for the space dimension. Also here, in the form of the *brahmasūtra*, the vertical middle line of sacred sculptures and paintings (nowadays mainly Tibetan thangka paintings), it symbolizes the motionless, changeless and sacred, by reference to which the sculpture or painting is to be seen, and in this way exerts its psychological effect on the viewer. For more information on this topic, the reader may be referred to the works of Alice Boner.

47. Realized with meaningless syllables, in contrast to the meaning-bearing words of the 'manifested' tāla-structured part.

48. The identification of the unchanging brahman with the Pole Star already occurs in the *Hiraṇyakeśi Gṛhya*

*Sūtra:* see Joel P. Brereton, 'Cosmographic Images in the Bṛhadāraṇyaka Upaniṣad', *Indo-Iranian Journal*, 34 (1991), p. 5.

49. That the first three mārgatālas form an interdependent series gets substantiated by a verse from the Kāvyamālā edition of the *Nāṭya Śāstra* (NS 31, 11), which says that the Cācaputaḥ is based on the Caccatputaḥ, which is here called Cañcūputaḥ (Cañcūputāśraya; see Wiersma-te Nijenhuis, *Dattilam, A Compendium of Ancient Indian Music*, p. 338). The Cācaputaḥ, as the origin of all ayugma tālas, is, for its part, again the base of the Ṣaṭpitāputrakaḥ.

50. Alain Daniélou seems to have been aware of the identity between musical intervals and rhythms, but didn't mention the polyrhythmic structure of the mārgatālas. See Alain Daniélou, *Einführung in die indische Musik. Aus dem Franzosischen von Wilfried Sczepan* (Wilhelmshaven: Florian Noetzel Verlag, 3. ed. 1991), pp. 67, 170–171.

51. In the expanded versions of the mārgatālas the sannipāta is shifted to the back of the tāla while the other beats appear in their usual order. This again hints at the cyclicity of those tālas, the sannipāta not only occuring at the beginning but also at the end of a cycle.

52. To put it in other words: if for example the Ṣaṭpitāputrakaḥ is performed with the prescribed hand-beats, and one accelerates these beats artificially up to a sufficient speed, the sound of the left-hand beats would be the fourth of the sound of the right-hand beats. Thus, if for example the last saṃ of this tāla coincided with a fourth, then there would be two 'simultaneous' expressions of the 3 to 4 ratio!

53. *arthasamāpti*; *Dattilam* 177, describing a section of the gītaka *aparāntaka*.

54. Another explanation could be that the merging of a sannipāta with a nyāsa was considered necessary on purely psychological grounds, i.e., a nyāsa sounded pleasant and therefore had to coincide with the equally pleasant tension-resolving sannipāta.

55. In the case of the tihāī and similar structures, only one of the cycles is expressed acoustically, while the other is the inaudibly (but clearly felt) continuing cyclic pattern, i.e., the *ṭhekā* of the tāla.

56. Specific hand movements.

57. *Dattilam* 135–137.

58. Abhinavagupta attached to this injunction a ritual meaning (AB on NS 31, 40–50): see Lath, *A Study of Dattilam*, pp. 341–342.