Types of Musical Instruments Depicted in the Stone Carvings of the Gadaladeniya Temple in Sri Lanka

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Abstract: *The Gadaladeniya Temple was built with the contribution of local and Indian craftsmen under the supervision of Sthapathi Ganapathi Ganeshwarachari, who was a leading craftsman in India between the Gampola era of 1341 to 1415 CE. Various types of musical instruments and performance styles were represented on the stone carvings of the building. The present research was done with the objective of identifying the types of musical instruments depicted in the stone carvings of the Temple. The study had been undertaken by way of field research and gathering of information through secondary sources (books and journal) under the qualitative research methodology. The methodology of musical iconography including the Hornbostel and Sachs (H&C) musical instrument classification system and Jaap Kunst's forms of drums were used for data analysis. All depicted musical instruments in the temple could mainly be categorized under four main groups of the H&C classification. The temple under survey had more than eleven drum variants, approximating six groups under the H&C classified categories; namely Tubular drum, Double-conical drum, cylindrical drum, Single-skin cylindrical drum, Frame drums, Hourglass-shaped drum. Further, more than six variants of wind instruments in approximately six H&C classified categories such as Oboe with conical bore, End-blown straight trumpets, Side-blown flutes, Conch, and Side-blown horns could also be seen. The depictions of Idiophone could be seen having more than three variants of two H&C classified categories such as shaken idiophones or rattles and gong. Only one string instrument could be seen among the Gadaladeniya Carvings as stick zithers with one resonator gourd.*

Keywords: Gadaladeniya Temple, Musical Iconography, Musical Instruments, Classification, Sri Lanka, Archaeomusicology, Stone Carvings

Introduction

During the years 1341-1415 CE, the Gadaladeniya temple (Figure 1) was constructed in the Gampola era. The Temple was built with the advice given by the Ven. Dharmakeerthi, a philosopher and monk along with the contribution of local and Indian craftsmen under the supervision of Sthapathi Ganapathi Ganeshwarachari, a leading craftsman from India (Atabage, 1997, p. 15). This temple is a beautiful representation of Sri Lankan and Indian artistic collaborations. The image house of the temple (*pilimiageya*) was constructed in the *Gedige* artistic style, completed only using stone as building material. The structure also represents a religious collaboration as noticed by the

presence of a womb for both Lord Buddha and Vishnu in the image house. According to archaeologists and historians in Sri Lanka, the Gampola period was the first time that Hindu and Buddhist wombs were built in a single building, but this statement still proves to be controversial today. Many researchers have concluded that the building construction and formation of the Gadaladeniya temple was influenced by the South Indian *Vijayanagara* Hindu temple architectural pattern. The temple itself is replete with stone carvings around the base (*Padama*) of the outer stage (*Pitatha Mandapaya*), in the steps, pillars, and on the roof of the structure. These stone carvings include figures with various types of musical instruments, in playful and dancing postures, and with fashionable costumes. Furthermore, the same figures depicted here can be seen carved in stone from other temples of the Gampola era such as in the *Niyamgampaya, Alawathura,* and *Horana* temples etc. (Atabage, 1997, p. 50). The present research concentrates on investigating the musical instruments depicted in the Gadaladeniya temple stone carvings. The research objective considered here is regarding the proper classification and identification of the types of musical instruments themselves. Many carvings have faded in the present day and the presence of fungus on some of the carvings, were the main issues encountered in the identification of the instruments. These issues have occurred due to weather and unwanted human activities in the area. Thus, the results presented here were based on recognizable stone carvings alone.



Figure 1: The Gadaladeniya temple

Literature Review

A Musical Iconographic perspective is a novel method and discipline in the Sri Lankan research context. Early Sri Lankan researchers did not have any interest in the interpretation and description of musical features in the depictions of murals, sculptures, carvings, etc. The literature review conducted for this study revealed that in the past, Sri Lankan researchers had simply named the musical instruments on these stone carvings by a social idiom without any further analysis (e.g., this is a vina, this is a drum, etc.). But in many other countries, researchers have analysed the musical iconography related to stone carvings, and have properly categorized them., They have also tried to construct the history of music in an area scientifically with the help of archaeological data. This fact should be considered as an important point for Sri Lanka. There is significant historical literature about musical information in the country, but there is no way to conclude their accuracy. Because of that problem, Sri Lanka has an undetermined music history in comparison to other countries. This realisation emerges from the review of the historical research on music based on Sri Lankan literature. That issue can now be solved by using research perspectives other than available historical literature, for example, researchers can use a variety of disciplines such as palaeography, epigraphy, ethnography, linguistics, archaeology, iconology, iconography, anthropology, etc. in their study of music history in Sri Lanka.

The discipline of iconography is a useful perspective among researchers, and Musical Iconography and Iconology can be used for 'Archaeomusicological' researches. Around the World, historical carvings, sculptures, and murals represent many varieties of musical data; these representations depict important iconographic and iconological information about the origin and evolution of music. Researcher Zdravko Blažeković has pointed out that musical iconography provides clues about the morphology of musical instruments and their dissemination; performance practice and instrumental playing techniques; contexts of performances, including performance space, audience, and reception; the combination of performing forces in particular repertoires or social functions; biographical information of musicians and their likenesses; social, commercial, and intellectual history of music; and the role of music in associated performing arts such as dance and musical theatre (Blažeković, 2019).

According to the Oxford Bibliography, 'iconography' is concerned with *identification* and 'iconology' is concerned with *interpretation*. Scholars have used three separate investigation levels under those two disciplines. In recent decades, however, these boundaries have become blurred, and iconography has typically embraced all three levels of investigation (Barbara, 2014). The present research is conducted in a basic investigative level, with a formal study of the elements of the depictions and object interpretations, related to the musical instruments of Gadaladeniya temple. As the study should be conducted in an acceptable method, the research orientation and discussions have been built on the *Hornbostel* and *Curt Sachs (H&C)* classification. Curt Sachs and Hornbostel submitted their Musical Instruments classification system in 1914 based on Mahillon's scheme (Lee, 2019, pp. 2-4).

The authors of Hornbostel-Sachs had clear ideas about the users and purposes of their scheme. Hornbostel and Sachs were designing their scheme for musicologists, ethnologists, and curators of ethnological collections and cultural history. So, the Hornbostel-Sachs classification was designed to be a scheme for theoretical and for practical purposes (Lee, 2019, p. 3).

This classification system was also used in Jaap Kunt's basic forms of two-head drums (Figure 2). These basic forms had been published in Jaap Kunt's book of *Hindu Javanese Musical Instruments* (Kunst, 2013, Fig. 121).

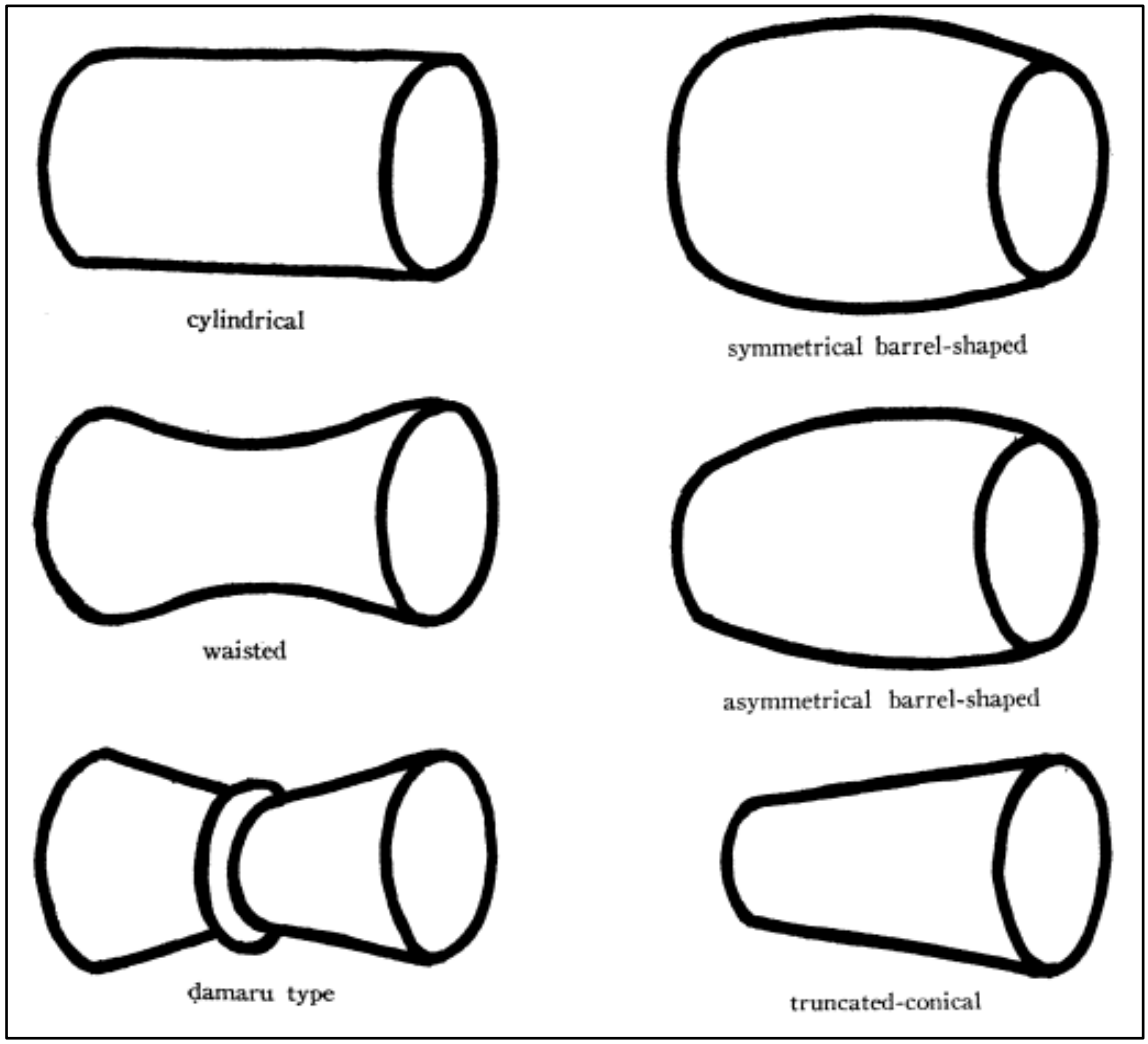


Figure 2: Basic Forms of Two-Headed Drums (BFTHD)

Olsen's valuable description i.e., Organology, the classification of musical instruments, is one of the most frequently used sciences in 'archaeomusicology', because musical instruments comprise the largest primary source for the study of ancient musical cultures. It is vital that archaeomusicologists, like any music scholars, use musical instrument classification terms and concepts correctly and with consistency (Olsen, 2007, p. 12).

Methodology

The study has been conducted through field research and through information gathering using secondary sources (books and journals) under the qualitative research methodology. The body of the article has two stages; the first one is to identify iconographical variations in the forms that are depicted in the carvings, under the methodology of musical iconography and to identify the variants according to the inside and outside edge lines of the musical instruments. The second stage is to classify the identified variants according to Sachs and Hornbostel's musical instrument classification system (Hornbostel. E, Sachs. C, 1961) and through Jaap Kunst's typology of drums.

Results and Discussion

The Hornbostel-Sachs system divides the musical instruments into four categories viz. Membranophones, Aerophones, Idiophones and Chordophones (Hornbostel. E, Sachs. C, 1961). All these categories of musical instruments are depicted in the stone carvings of the Gadaladeniya temple.


Figure 3


Figure 4


Figure 5


Figure 6


Figure 7


Figure 8


Figure 9


Figure 10


Figure 11


Figure 12


Figure 13


Figure 14

Membranophone

First Drum Variant: The middle part of the upper edge is linear, both sides are slightly convex and, the line in the bottom is exactly convex (Location- Outer stage, base, Left side) (Figures 3 and 4).

Second Drum Variant: This depiction has a stick in the palm of the drummer's left hand. Further, investigation in the drum's body shows that the middle part has a curved shaped object maybe, a blanket on it. But some sort of doubts can also be cast in all the above iconographical details as a result from the fading of minute details in the carving and conclusion cannot be settled to. However, two ropes are also seen hanging on each side of the drum (Location- Outer stage, base, Left side) (Figure 5).

Third Drum Variant: The third drum variant (Figure 6) has a curved upper line and convex bottom line, and a blanket on the top of the drum body (Location- Outer stage, base, Left side).

Fourth Drum Variant: Both lines are exactly curved (Location- Outer stage, base, In front) (Figure 7).

Fifth Drum Variant: Both lines are curved (Figure 8), but the bottom line is curved more than the upper line. Many stripes can also be seen on the drum body representing the lace of the drumheads. A blanket is on the top of the drum body and the drummer strikes the right side of the drum with both hands (Location- Outer stage, base, In front).

Sixth Drum Variant: The bottom line of this carving has a concave shape (Location- Outer stage, Roof, Right side) (Figure 9).

Seventh Drum Variant: The upper and bottom edge lines have similar iconography. These depictions represent the left hand raised and right hand raised drum players, because the figures are depicted on either side of the steps of the building structure (Location- Outer stage, Steps, In front) (Figures 10 and 11).

Eighth Drum Variant: The two carvings of this variant have similar iconography. At plain sight, these carvings represent the same drum variant, but the first carving has a blanket on the top of the drum body. Sometimes left-handed and right-handed drum players have been represented in these carvings. (Location- Outer stage, base, In Front, and Location- Outer stage, base, Right side) (Figures 12-13).

Ninth Drum Variant: The two drums have different diameters, but the hands technique of the drummer is the same. The first drummer (Figure 14) holds his drum on his left knee and the second drummer (Figure 15) holds his drum on the right knee. We can see only one side of the drum being struck by both hands (Location- Outer stage, Base, In Front, and Location- Outer stage, base, Right side).

Tenth Drum Variant: Except for one drummer (Figure 20), all the other drummers are playing the instrument in variations of seated postures. Figure 20 is in a standing posture

and his drum is smaller than other the drums in this variant. All the Seated players' have both their hands on the drumhead. The seated drummers can further be divided into left-hand drummers (Figure 17) (Location- Outer stage, Roof, In Front), (Figure 18) (Location- Outer stage, Base, Steps), and right-hand drummers (Figure 16) (Location- Outer stage, Base, Left side), (Figure 18), (Figure 19) (Location- Outer stage, Base, Right side). All the seated drummers have one hand on the top and another hand on the middle of the drum. The seated players also have their drums held in associated with their laps, knees, and thighs. The standing drummer (Figure 20) (Location- Outer stage, Base, left side), has a different playing technique which is very different from the other drummers and, is doubtful whether he is holding a drum at all.


Figure 15


Figure 16


Figure 17


Figure 18


Figure 19


Figure 20


Figure 21


Figure 22


Figure 23


Figure 24


Figure 25


Figure 26

Eleventh Drum Variant: These carvings are represented with hourglass shaped drum and are played using the left hand (Figure 21) (Location- Outer stage, Roof, In Front) (Figure 22) (Location- Outer stage, Roof, In Front).

Aerophone

First Variant: This variant's special characteristic is that the oboe's body is systematically conical. If you investigate very closely, you can observe the instrument body between the starting point and the endpoint gradually conforms to the conical shape. The first musical instrument held by Figure 23 (Location- Outer stage, Roof, In Front) is smaller than the musical instrument held by Figure 24 (Location- Outer stage, Roof, In Front).


Figure 27


Figure 28


Figure 29


Figure 30


Figure 31


Figure 32


Figure 33


Figure 34


Figure 35


Figure 36


Figure 37


Figure 38


Figure 39


Figure 40


Figure 41

Second Variant: The instrument in this variant has the combined shape of a cylinder and a funnel. The wind blowing point and the middle part of the instrument are cylindrical, but the bell is funnel-shaped (Figure 25) (Location- Outer stage, Roof, Left side).

Third Variant: This carving is faded, but we can identify the sketch of musical instrument and its parts. Probably, the body of this instrument is a combination of three parts i.e., the conical wind blowing point, the cylindrical middle part, and the shot glass shape bell. The cylindrical wind blowing point is smaller than the cylindrical middle part in this instrument (Figure 26) (Location- Outer stage, Pillar, Left side).

Fourth Variant: These carvings represent horizontal flutes. The first (Figure 27) and the third flutists (Figure 29) play in the left-hand posture and the second flutist (Figure 28) in the right-hand posture. All of these flutes have an air-blowing point in the middle and side of the flute body, and one cannot justify the instrument as a side-blown or middle-blown flute.

The first (Figure 27) (Location- Outer stage, Pillar, Left side) and second (Figure 28) (Location- Outer stage, Pillar, Left side) flute bodies has a straight shape, but the third flute body (Figure 29) (Location- Outer stage, Pillar, Right side) has a bend in between the middle and right-side of the instrument.

Fifth Variant: Obviously, this is a conch (Figure 30), held in a vertical posture and is played by blowing the end (Location- Outer stage, Roof, In-front).

Sixth Variant: These instruments (Figures 31 and 32) (Location- Outer stage, Roof, Right side and Location- Outer stage, Pillar, Right side) generally begin with a narrow shape and gradually conform to being wide-shaped and bent shaped. The blowing point of the musical instrument can be identified in the side of the body.

Idiophone

First Variant: Location- Outer stage, Base, Left side (Figure 33) and (Figure 34) (Atabage, 1997, Fig. 46/8).

Second Variant: Location- Outer stage, Base, Right side (Figure 35) and (Figure 36) (Atabage, 1997, Fig. 46/9), (Figure 38) (Location- Outer stage, Base, Right side) (Atabage, 1997, Fig. 46/11), (Figure 39) (Location- Outer stage, Pillar, Right side).

Third Variant: Location- Outer stage, Base, In-front (Figure 40).

All these musical instruments (Figure 33, Figure 35, Figure 37, and Figure 39) have a narrow middle part and is wide in two sides; the player holds the narrow middle part, and both his hands are carved in a pattern of motion.

An important point is that the second variant is smaller than the first one. The left hand has a circular-shaped plate (Figure 40); the right hand has a stick striking the plate. In addition, the circular-shaped plates have been tied on some of the players' hips (Figure 20, Figure 33, Figure 35, and Figure 37).

Table 1: Classifying the identified variants according to the Sachs and Hornbostel's musical instrument classification system and Jaap Kunst's typology of drums

Membranophones		
Variants	**H and S Classification**	**Jaap Kunst's BFTHD**
First	211.23 Double-conical drum	Symmetrical barrel-shaped
Second (?)	211.21 Cylindrical drum	Symmetrical barrel-shaped / Asymmetrical barrel-shaped
Third	211.23 Double-conical drum	Symmetrical barrel-shaped
Fourth	211.23 Double-conical drum	Symmetrical barrel-shaped
Fifth	211.23 Double-conical drum	Symmetrical barrel-shaped
Sixth	211.23 Double-conical drum	Symmetrical barrel-shaped
Seventh	211.23 Double-conical drum	Symmetrical barrel-shaped
Eighth (?)	211.2 Tubular drum / 211.23 Double-conical drum	Cylindrical / Symmetrical barrel-shaped
Ninth	211.21 Single-skin cylindrical drum	_
Tenth	211.31 Frame drums (without handle)	_
Eleventh	211.24 Hourglass-shaped drum	Waisted / Damaru type
Aerophones		
Variants	**H and S Classification**	
First	422.122 Oboe with conical bore	
Second (|)	423.121.1 End-blown straight trumpets	
Third (?)	423.121.1 End-blown straight trumpets	
Fourth (|)	421.12 Side-blown flutes	
Fifth	423.1 Natural trumpets, 423.11 Conch	
Sixth	423.122.2 Side-blown horns	
Idiophones		
Variants	**H and S Classification**	
First	112.2 Shaken idiophones or rattles, 112.13 Vessel rattles	
Second	112.2 Shaken idiophones or rattles, 112.13 Vessel rattles	
Third	111.241 Gongs, 111.241.1 (Individual) gongs	
Chordophones		
Variants	**H and S Classification**	
First	311.2 Stick zithers, 311.221 With one resonator gourd	

Chordophone

First Variant: This instrument (Figure 41) (Location- Outer stage, Pillar, left side) has been characterized as a straight stick with a barbed end and a funnel shaped resonator on the top has a peg. The player is seen holding the instrument with his left hand. The "(?)"and "(|)" marked musical instrument variants could be properly classified among the categories because of two reasons: the first one is that the iconographical shapes of

"(?)" marked variants are distorted today due to fading, and the second is that the "(|)" marked variants do not have an exactly relevant category under the classification systems, and only an approximate category placement has been mentioned. However, all musical instrument variants are included in table 1.

Now, we can suggest the special points in regard to the musical instruments represented. The base (*Padama*) of the Gadaladeniya temple was carved only with Membranophone and Idiophone musical instruments by craftsmen, and the figures holding these instruments are carved with dance postures and rhythmic movements. An interesting question arises as to why only the figures using drums are seen in the base of the building. The drum rhythm is basic in all forms of music and is especially used for time counting in musical performances; it is, therefore, reasonable to accept that a musical composition is based on the rhythm of the drum. The craftsmen may have used this reasoning to carve drums as the only musical instruments on the base of the Gadaladeniya temple.

Conclusion

The Gadaladeniya temple has more than eleven drum variants and approximately six classified categories (H and C) i.e., Tubular drum, Double-conical drum, Cylindrical drum, Single-skin cylindrical drum, Frame drums (without handle), Hourglass-shaped drum. Further, more than six variants of wind instruments in approximately six classified categories (H and C) such as Oboe with conical bore, End-blown straight trumpets, Side-blown flutes, Conch, and Side-blown horns are noticed. The Idiophone has more than three variants of two classified categories (H and S) such as the shaken idiophones or rattles and (Individual) gong. Only one string instrument has been carved in the Gadaladeniya carvings, as stick zithers with one resonator gourd.

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