

# Sadah: Aesthetical Quality of Talempong Sound– An Acoustical Study of Myth and Ontological Culture

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## Abstract

The goal of this research is to discover the effect of *sadah* (chalk) on the aesthetical quality of talempong sound (a bronze musical instrument). In order to preserve the aesthetical quality of talempong sound, talempong elders in Minangkabau use a solution of *sadah* (a type of chalk commonly used in betel chewing). The *sadah* solution is smeared onto the inside of the talempong – the resonating chamber –to achieve a particular standard of aesthetical quality. Here, aesthetical quality refers to the musical taste measured and owned by talempong elders; this includes talempong as a music system and talempong as a musical system – both of which begin with form and sound. Form and sound are an inseparable unit, and for this reason the physical quality – form – of the talempong is significant in obtaining a talempong sound with a particular aesthetical quality. The significance of aesthetical quality is determined by the sound colour (*rono*) and duration of the reverberation or sound resonating from the talempong when struck, which talempong elders call *dangiang*. The method used in this research combines qualitative principles with an experimental method. The experimental method is used to discover the sound quality of the talempong before and after it has been smeared with *sadah*.

**Keywords:** *sadah*, aesthetical quality, talempong sound, acoustic

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## 1. Introduction

*Sadah* is a type of chalk that is made from a shell and often referred to as ‘*sadah* for eating’ since it is used in betel chewing which in the past was a common practice among the women of Minangkabau. The chemical reaction produced by combining *sadah*, *gambir*, areca nut, and betel leaf gives a unique pleasurable sensation to the person chewing, as well as staining the lips and tongue red. A solution of dissolved *sadah* chalk is also used by talempong elders in Minangkabau to obtain a particular aesthetical quality in the sound colour (*rono*) of this bronze musical instrument. The type of *rono* considered good in talempong is one that is “round and short” and resonates well (is not *pakak*). According to Suka Harjana, “round and short” describes a dimension of sound and form that is influenced by its source (Hardjana, 1983: 52). *Pakak* is another dimension of sound that fails to produce a sound that matches the *rono* of the talempong.

It is important to preserve and maintain a good *rono* and character of talempong sound so that the duration of the reverberation or resonance (*sipongang*) is not too long. Talempong elders in Minangkabau have a special way of ensuring a good *rono* and *sipongang*. They use the concept of *manyadahi* (applying *sadah*), smearing a solution of dissolved chalk onto the inside of the talempong, in accordance with the sound condition of each instrument. The practice of “*manyadahi* talempong” is performed in a simple ritual with a number of special requirements. The requirements or concoction used include: (1) *limau/asamkapeh* or lime fruit; (2) *aiabatamu*, or water that is taken from two different springs which meet and become one at a particular place; (3) *aiamalampatang Kamih*; *malam Jumaik*, or water from a spring that is collected on a Thursday evening; and (4) *sadah*, a type of chalk made from snail shells which is usually known as “*sadah* for eating” because of its use in betel chewing.

The physical quality of the talempong is important with regard to its function both as a sound source and a resonating chamber. The sound source is the bossed knob (*momong* or *pencon*) on top of the talempong. A sound is produced when a special wooden mallet (*pangguguah*) strikes the *momong* with a particular force. When the *momong* produces a sound, the whole talempong vibrates. This vibration causes the air around the sound source to vibrate. The vibration in the air caused by the *momong* is influenced by the resonating chamber, or the physical shape of the cavity inside the talempong. The resonating chamber and physical quality have a relational connection in terms of their function to produce an aesthetical quality in the sound of a particular talempong or a set of talempong instruments. A set of talempong, usually known as *salabuhan*, consists of 6 talempong instruments with 6 different pitches, which make up a single music system. In this research, they are referred to as T1, T2, T3, T4, T5, and T6. The problem discussed in this research is related to the procedure and method for smearing the talempong with *sadah* (*manyadahi* talempong), and the effect of *sadah* on creating an aesthetical quality of talempong sound that is pleasing to the ear.

## 2. Literature Study

The various literature related to this research includes Suka Hardjana’s book *Estetika Musik* (1983). In principle,

this book discusses the understanding of aesthetics, the understanding of music, and the understanding of musical aesthetics, or music and beauty. In the section on music and beauty, Suka Hardjana discusses in detail various aspects of sound, including the anatomy of sound, tone, noise, and pitch. These four main topics cover: volume and intensity of sound, dynamics and vitality of sound, duration, range, sound quality, sound form, sound colour, and so on. In the discussion on sound form, he explains that a sound form that is short and round is a dimension of sound and form which is influenced by its source.

Andar Indra Sastra (2016), in his work *Estetika Talempong Renjeang*, discusses aesthetics in the performance of talempong *renjeang* in an attempt to reintroduce the potential of local culture through the concept of *batalun*. The concept of *batalun* as a phenomenon that provides an aesthetical flavour to the performance of talempong *renjeanganamsalabuhan* (a set of six instruments that are carried by hand) in Luhak Nan Tigo Minangkabau, is an endeavour to “revive the submerged stem” of the power of hegemony that changed the course of aesthetical flavour of talempong as a music system and talempong as a musical system – known locally as *mangkoanbunyi* (the system for tuning talempong).

In an article published in *Jurnal Humaniora*, Andar Indra Sastra (2017) explores the concept of talempong *renjeang* music which is made up of three pairs of talempong instruments: talempong *Jantan*, talempong *Paningkah*, and talempong *Pangawinan*. As the ‘leader’, the talempong *Jantan* maintains the consistency and integrity of the theme and *danyuik* (tempo) of the music, while the talempong *Paningkah* follows the path of the talempong *Jantan*, using different playing motifs, and the talempong *Pangawinan* has the role and authority for making the talempong tune (*guguah*) whole and forming the melody.

Sri Hastanto (2012), in his book entitled *Ngeng & Reng: Persandingan Sistem Pelarasan Gamelan Ageng Jawa Dan Gong Kebyar Bali Ngeng & Reng: Persandingan Sistem Pelarasan Gamelan Ageng Jawa Dan Gong Kebyar Bali*, includes a discussion on the science of acoustics. He writes that the distance between two pitches, known conventionally as an interval, is measured using a system of cents. This distance can be measured by means of a logarithmical calculation, with the aid of computer technology which uses the German software *Sengpielaudio*.

The Liang Gie (1983), in his book *Garis Estetik-Filsafat Keindahan*, discusses the phenomenon and aesthetical experience of an object that exudes aesthetical value. He explains that aesthetical value is the ability of an object to cause an aesthetical experience in the person observing or listening to the object. *Manyadahi* talempong is part of an aesthetical experience for ensuring that the sound produced is pleasing to the ear.

Deni Junaiedi (2018) writes about the definition of aesthetics, and the scope of his study includes the parameters of ‘attractiveness’ and ‘unattractiveness’ in the subject’s experience of an object and its aesthetical value. Martin Suryajaya (2015), in his book entitled *Sejarah Estetika: Era Klasik Sampai Kontemporer*, explains the term “aesthetic” in etymological terms. The noun form *aesthesis* refers to sensory perception which includes sight, sound, and also feeling.

Fatchur Rochman (1995), in his work *Kisah-Kisah Nyata dalam Al-Qur’an*, provides an important reference about the miracle or gift of the prophet David. It is wellknown that the prophet David had the gift of a voice that sounded sweet and pleasing to the ear of humans and spirits alike. This is the philosophical – mythological – basis for making this empirical knowledge a part of the process of *manyadahi* talempong. Heddi Shri Hamimsa-Putra (2001) in his work entitled *Strukturalisme Levi-Strauss, Mitos dan Karya Sastra*, includes a section on the topic of myth according to the view of Levi-Strauss.

The literature used as an academic reference in this research is studied as a reference for explaining the method and procedure for *manyadahi* talempong and the effect of *sadah* on creating an aesthetical quality of talempong sound that is pleasing to the ear. It should be emphasized that none of the literature used as a reference in this research was found to have the same focus on talempong as the material object, thus ensuring the originality of this research.

### 3. Research Method

The method used in this research is a combination of qualitative ideas and an experimental method. The qualitative method played an important role in the collection of data related to the ritual of *manyadahi* talempong, and the researcher acted as the research instrument. Data collection was carried out through interviews and audio, visual, and audio-visual recordings. An experimental method was used to find the different frequencies of talempong pitches and the duration of the talempong sound prior to and after applying the *sadah*. Subsequently, this method was assisted by other software such as *Cool Edit Pro* version 2.0, to obtain a concrete picture about the pitch levels – frequencies – of the talempong. Another measurement used was the cent, to measure differences in frequency between one talempong sound and another. Hastanto writes that in the science of acoustics, the distance or interval between two pitches is measured in cents (Hastanto, 2012: 20). This distance can be measured by means of a logarithmical calculation, with the aid of computer technology which uses the German-made software *Sengpielaudio* that can be operated on line. Other software used included

*Nuendo* 3, for measuring the duration of the sound waves.

## II. DISCUSSION

### 1. Procedure and Method of *Manyadahi* Talempong Between Myth and Ontological Culture

The need to implement the practice of *manyadahi* talempong may be due to a number of factors, which include the presence of: (1) *baduang*; (2) *danciang* or *dangiang*. First, *baduang* (or *pakak*) occurs when the talempong no longer produces a sound which is characteristic to that of a talempong when struck. Second, *danciang* or *dangiang* is the reverberation or additional sound that accompanies the main sound of a talempong when it is struck, and the talempong continues to sound for a long duration. The *manyadahi* talempong ritual takes place on a particular day and at a particular time, namely on a Thursday evening (*patang Kamih-malam Jumaik*). The local community believes that this is the time when God's grace descends from the sky.

The requirements or concoction used in *manyadahi* talempong include: (1) *limau/asamkapeh* or lime fruit; (2) *aiabatamu*, or water that is taken from two different springs which meet and become one at a particular place; (3) *aiamalampatang Kamih*, or water from a spring that is collected on a Thursday evening; and (4) *sadah*, a type of chalk made from snail shells, and usually known as "*sadah* for eating" because of its use in betel chewing. The procedure for *manyadahi* talempong involves the following methods: (1) performing ritual ablution; (2) reading a mantra; (3) combining the water (*aiabartamu* + *aiapatang Kamih*) with the lime (*limau/asamsaiktujuh* [seven cuts]); (4) combining the *sadah* with the water mixture (5) taking the talempong to be smeared with *sadah*; (6) checking the sound of the talempong; and (7) *malimaui* (applying the lime).

**First**, ritual ablution is performed to cleanse the body, because in essence, *manyadahi* talempong is considered to be a holy, sacred ritual in which a request is made to Almighty God that the talempong may produce a sound which fulfils a certain aesthetical quality. A sound with a good quality refers to the miracles of the prophets – in the case of the voice, to the prophet David. Fatchur Rochman writes that God awarded the prophet David with a gift or miracle of a sweet-sounding voice that was pleasing to the ears of humans, spirits, birds, mountains, wind, and leaves, all of which were delighted by the sound of the prophet David's voice. Every prophet had a particular miracle or gift (an extraordinary ability) which was a sign of their prophethood. In the case of Joseph, it was his face; in the case of Solomon, his kingship; and in the case of Muhammad, his light (Rochman, 1995: 219).

**Second**, a mantra is read for the prepared concoction, which begins with: (1) *istighfar*, recited 3 times – *astagfirullah 'al'azim*, asking God for forgiveness; (2) reciting the 2 parts to the creed of Islam 3 times – *asyhaduallillahailallahwaas'adhu'annamuhhammadarasulullah*; (3) reading surah Al-Fatihah; and (4) reciting *Alhamdulillahirabil'amin* with the following text.

*Bismillahirrahmanirrahim*  
*YaDautterlalulalai* (oh David, too remiss)  
*Tujuhlapihpatalolangik* (seven layers of heaven)  
*Tujuhlapihpatalobumi* (seven layers of earth)  
*Mangkotabuakmangkolanteh* (to penetrate then pass through)  
*Kanai bunyitalempongku* (find the sound of my talempong)  
*PakaipitnangNabiDaud* (use the mystical knowledge or suggestion [*pitunang*] of the prophet David)  
*Allahiwalssallam* (*Allahiwasallam*)  
*Buruangtabangtagun-tagun* (birds fly stunned)  
*Aia ilia tahanti-hanti* (water stops flowing downstream)  
*Mandangabunyitalempongku* (hearing the sound of my talempong)  
*PakaipitnangNabiDaud* (use the suggestion of the prophet David)  
*Allaihiwassallam* (*Allaihiwassallam*)  
*Tasengeangmaikdalamkubua* (smiling is the corpse in the grave)  
*Mandangatalempongku* (hearing my talempong)  
*Sadangkananakbidodaridalamsarugo* (while the cherubim in heaven)  
*Lagiterlatik, lagitertukik, lagiterlansik* (fascinated, swooping, amazed)  
*Mandangabunyitalempongku* (hearing the sound of my talempong)  
*Kununlahmantagisidanganakmanusia* (said to be the aura of all human children)  
*Ndakkarindumandangabunyitalempongku* (not longing to hear the sound of my talempong)  
*Pakaipitnang Nabi Daud* (use the suggestion of the prophet David)  
*Kabuabarakaik Laillahailallah* (fulfilled by *Laillahailallah*)

The above text of the mantra gives us an indication of the mystification in combining elements of culture and religion. This is clear in the narrative of the text composed in the form of a mantra, beginning with the word *bismillahirrahmanirrahim* (in the name of God, the most gracious and most merciful). It continues with the words of David, the seven layers of heaven and seven layers of earth, the sound of the talempong, the mystical knowledge [suggestion/*pitunang*] of the prophet David ... the smiling corpse in the grave, hearing the sound of

the talempong ... owing to *Laillahailallah*. The first word is *bismillah* and the final word is *lillahailallah*, which means this mantra is encased in a religious narration with cultural content.

**Third**, the water (*aiabatu* + *aiapatangKamih*) is combined with the lime (*limau/asam saiktujuh*) in a dish or other vessel. This mixture of water and acidic lime is used to dissolve the *sadah* and the talempong is wiped with lime after it has been smeared with *sadah*. In the description above of the first three steps, there is a clear indication of myth encased in religious knowledge. C.A. van Peursen, in his book *Strategi Kebudayaan* (1994), states that myths are stories which offer certain guidance or direction to a group of people – human behaviour. Through myths, people can participate in the course of their events (Peursen, 1994: 37). It is a fact that the role of talempong elders is important in their participation in the *manyadahi* talempong ritual as they endeavour to determine the aesthetical standard of talempong as a music system and a musical system.

It is important to realize that the understanding of myth in the structuralism of Levi-Strauss is not the same as the understanding of myth as is commonly used in the understanding of mythology. In accordance with the general view of anthropologists, Heddi Shri Hamimsa-Putra explains that the understanding of myth from the perspective of Levi-Strauss does not need to be contrasted with history or reality, because the difference in meaning between the two concepts seems increasingly difficult to defend in current times (Hamimsa-Putra, 2001: 77). What one group or community considers to be a historical account of events that really took place may be considered by another community as no more than a fairy tale or legend that cannot be accepted as truth; myth in the context of Levi-Strauss is none other than fairy tale or legend (Hamimsa-Putra, 2001: 77). A fairy tale is a story that was born from human imagination or fantasy, even though elements of this fantasy originate from events that really took place, such as in the *manyadahi* talempong ritual, which is connected to the power of suggestion of the prophet David. In such events, we find things that do not make sense or are not found in our day to day lives.

In myths we find interesting contradictions. There are numerous events in myths that we cannot and would not believe could really happen in daily life. Heddi Shri Hamimsa-Putra states that anything and everything may happen in a myth, ranging from something that makes sense to something that partially makes sense to something that makes no sense at all. Therefore, we often feel that there appears to be no logic at all in a myth (Hamimsa-Putra, 2001: 82). This is the case in the myth of the concept of suggestion (*pitunang*) in the *manyadahi* talempong ritual.

**Fourth**, the *sadah* is combined with the water that has already been mixed to a certain viscosity in a prepared dish or vessel. Next, one by one the talempong are smeared with the *sadah* solution on the inside surface. The talempong taken as a sample for this research consist of a set of six talempong, known as *anamsalabuhan* – referred to with the code T1, T2, T3, T4, T5, and T6. The talempong pitch order from T1, T2, T3, T4, T5, to T6 can be described as talempong as a music system. The pitch levels of each of the talempong – T1, T2, T3, T4, T5, and T6 – are determined based on the knowledge and musical experience of the talempong elders, a practice they call *mangkoanbunyi* (a system of tuning). Andar Indra Sastra writes that *mangkoanbunyi* is practiced based on the musical sensitivity of the talempong elders which is used as a reference. This standard reference is founded on their experience and musical knowledge about the difference in pitch levels in the talempong music system (Sastra, 2016: 17). The different pitch levels of the talempong are a guideline for identifying the talempong pairs, *talempong Jantan*; *talempong Paningkah*, and *talempong Pangawinan*. At this point we are talking about talempong as a musical system.

Talempong as a musical system consists of three pairs of talempong: 6 and 1 are known as talempong *Jantan*; 5 and 3 are called talempong *Paningkah*; and 4 and 2 are called talempong *Pangawinan*. In an article published in *Jurnal Humaniora*, Andar Indra Sastra (2017) writes that the talempong pair T6 and T1 always begins the work and acts as the leader in a performance. As the leader, the talempong pair T6 and T1 plays the opening melody and guides the imagination of the other players who play the talempong pairs T5 and T3 and T4 and T2 so that they are able to identify the type of melody (*guguah*) they are to play (Sastra, 2017: 62). As the leader, the musician who plays the talempong pair T6 and T1 not only has the role of determining the type of *guguah* to be played but is also responsible for controlling the tempo (*danyuik*) of the performance, although the dynamics, or *kareh-lunak*, are controlled by the talempong *Pangawinan* pair.

**Fifth**, the talempong are taken to be smeared with *sadah*. Before this is done, the talempong are first cleaned with water to get rid of the remains of any previous *sadah*, and then wiped dry with a cloth. After the talempong have been cleaned and dried, they are held in the hand (*direnjeang*) and struck one by one to hear the sound quality. Depending on the sound produced, it is decided which part of the talempong needs to be smeared with *sadah* and what pattern is used to *manyadahi* talempong.

**Sixth**, the sound is checked after all the talempong have been applied with *sadah*. Each talempong is held in the hand and struck in turn to listen to the individual sound. This is done to see whether the sound produced meets the desired aesthetical standard. If any of the talempong does not produce the quality of sound that is hoped for, it will usually be reapplied with *sadah* until the sound produced is good and meets the expectations of the person performing the *manyadahi* talempong. In other words, a cross-check is performed to obtain the desired sound

quality, according to the two indicators mentioned in the previous section. **Seventh**, the talempong are applied with lime, or rinsed, as a way of finishing the task, and they are then ready to be played.

Based on the analysis of *manyadahi* talempong, it can be concluded that the purpose of *manyadahi* talempong is to preserve the stability of the talempong sound in accordance with the desired aesthetical quality—according to a particular musical standard. Suka Harjana states that sound quality is usually concerned with how good-bad, beautiful-ugly a sound is when it reaches our ears (Harjana, 1983: 49). In addition, *manyadahi* talempong also includes an element of belief that this ritual will produce a talempong sound which captivates anyone who hears it – the local community call this *malakekan pitunang* (giving suggestion), or bestowing magical powers on the talempong. According to the informants and members of the local community interviewed, talempong that have been smeared with *sadah* and lime – or given suggestion (*pitunang*)– will remain in the hearts and memories of the people who hear it, even when the talempong is no longer being played (Dt. Sampono, interview, 29-10-2016). This phenomenon may be described as an aesthetical experience of an object which exudes aesthetical value. The Liang Gie describes aesthetical value as the ability of an object to cause an aesthetical experience in the person observing or listening to the object (Gie, 1983: 51).

If we look at the indication of myth – narration – that appears in the procedure and method for *manyadahi* talempong it is interesting to discuss this from the perspective of (rational-modern) ontological culture. Why so? Because there are a number of points which are of interest when studied from an ontological cultural perspective, such as: (1) *aiabatamu*, water taken from two different springs which meet and become one at a particular place; (2) *aiamalampatangkamih*, or water from a spring that is collected on a Thursday evening; (3) reading the mantra; and (4) applying the lime (*malimaui*).

**First**, *aiabatamu*, the water collected from two different springs which meet and become one at a particular place, is one of the requirements for *manyadahi* talempong. In terms of the function for beautifying the sound of the talempong, it cannot be explained from an ontological cultural perspective why the water needs to be collected from this specifically designated spot rather than another source. Here, *aiabatamu* is positioned as a myth that has become part of the *manyadahi* talempong ritual. **Second**, *aiamalampatangkamih* is one of the materials that must be present in the *manyadahi* talempong ritual. The first and second requirements are of equal status – both are water but have a different source, event, and meaning. The different event is that according to talempong elders, this water possesses supernatural powers and should therefore be used to dissolve the *sadah*. This *sadah* solution is used to improve the sound quality of the talempong.

Ontologically, the *sadah* solution that contains chemical properties can be used to improve the quality of the talempong sound. By experimenting, it was proven ontologically that by using such a solution of *sadah*, there was indeed a change in the quality of the talempong sound. See **Table 2** below for a summary of the duration of talempong sounds after the process of *mangkoanbunyi* and the application of *sadah*. **Third**, reading a mantra which uses the suggestion of the prophet David; it is believed that this narration provides suggestion or spiritual power for the talempong sound. **Fourth**, the application of lemon (*malimaui*) is the final part of the ritual procession, and includes wetting the talempong with a mixture of *aiabatamu* and *aiapatang Kamih*, along with various other ingredients. The **third** and **fourth** parts of the ritual contain mystical elements which combine elements of both culture and religion. Of course, it is difficult to prove in quantitative terms, from an ontological cultural perspective, the change in talempong sound, which produces a sense of pleasure – based on the laws of cause and effect, since the reality is in a noumenal domain. Meanwhile, on this level, it is important to remember that the **third** and **fourth** sections, knowledge and ontological culture – are connected through cause and effect.

## 2. Physical Quality: Talempong Sound and Aesthetical Quality

The physical quality of the talempong is important in its capacity as a sound source and also a resonating chamber. Aesthetically, the physical quality and *sadah* play an important role in improving the quality of the talempong sound. The goal of *manyadahi* talempong in the form of a simple ritual is to achieve an aesthetical sound quality that meets the musical standard of talempong elders in Minangkabau. Deni Junaedi defines aesthetics as “the study of a process that occurs between a subject, object, and the value contained in the object, including the experiences, properties, and parameters of attractiveness and unattractiveness” (Junaedi, 2018: 14). In the case of the *manyadahi* talempong ritual, we are studying the process that occurs between the subject and the object. The relationship between a subject and an object, according to Martin Suryajaya, includes seeing, hearing, and feeling (Suryajaya, 2015: 1); in this case, the *manyadahi* talempong ritual is the material object. In addition to discussing the relationship between the subject and the object, aesthetics, according to Martin Suryajaya, is not only concerned with value but also with aesthetical experience, the ontological status of a work of art, and the relationship between art and the community (Suryajaya, 2015: 3).

With regard to *manyadahi* talempong as a material object, in aesthetical terms the discussion is limited to the relationship between the subject and the object within the boundaries of procedure and method, as well as the physical quality: talempong sound and aesthetical quality. The reason for this limitation is not because the writer does not wish to discuss the broader topic of aesthetics, as explained by Deni Junaedi and Martin

Suryajaya, in its entirety, but rather due to the consideration of the limited space available for the publication of this article.

Aesthetically (in terms of beauty), the relationship between the subject and object places more emphasis on the construction of the ritual in connection with the *sadah* and the talempong – specifically the physical quality of the material object. The physical quality of the talempong and the *sadah* play an important role in altering the aesthetic quality of the talempong sound. The sound source of the talempong is the *momong*, or *pencon* (bossed knob) on top of the instrument. The talempong will produce a sound when the mallet (*pangguguah*) touches the *momong* with a particular force. When the *momong* produces a sound, the entire physical structure of the talempong also vibrates. This vibration causes the air around the sound source to vibrate. The vibration in the air caused by the *momong* is influenced by the resonating chamber, or the physical shape of the cavity inside the talempong. The resonating chamber and physical quality have a relational connection in terms of their function to produce a good sound on the talempong. For a clearer picture, see the illustration below.



**Picture 1.** Physical structure of the talempong, sound source, and resonating chamber  
(Photo: Documentation by A ndar, 2016)

Whether the sound of a talempong can be categorized as good or bad depends on the identification of three elements: *rono* (sound colour), *sipongang* (reverberation), and duration of the sound.

**a. Rono (colour)**

*Rono* in relation to sound is associated more with the auditory impression conveyed by the sound to the listener. The elements that distinguish one talempong sound from another are *rono* and the way the instrument is struck. A talempong sound with a good *rono* is one that produces a rounded sound with not too many sub-tones. Sub-tones are the additional sounds produced besides the main pitch. The cause of these sub-tones may be due to a crack on the talempong. A cracked instrument will produce multiple sub-tones or additional tones to the main pitch when the talempong is struck (*diguguah*). These multiple sounds may affect the quality of the *rono*. In other words, the *rono* of the talempong is determined by a number of factors, including material, shape, and the different ways of playing the sound source.

**b. Sipongang**

*Sipongang* (reverberation) is also sometimes known as *dangiang*, and refers to the quality of the talempong sound as it resonates or reverberates after it is struck. A talempong with a good quality sound can be identified by a *sipongang* sound that does not buzz, nor can it be described as *pakak* or *baduang*. *Pakak* does not mean there is no sound produced but rather is related to the auditory impression of a sound that no longer represents the *rono* of the talempong. Through the *sipongang* and *pakak* sound produced, talempong elders are able to identify talempong sounds with a good or bad quality of sound.

In order to obtain a good *sipongang* sound, the sound produced by a talempong needs to be muted in order to create a sound that meets the particular demands of musical taste. Talempong elders do this by smearing a solution of chalk (*manyadahi*) to the inside of the talempong, according to the level of damage or distortion in the talempong sound. The word *manyadahi* comes from the words *sadah*, with the additional prefix *ma* (denoting an active verb) and the suffix *i*, which indicates something is being done to the object, in this case the practice of ‘*manyadahi* talempong’. Dt. Sampono states that the use of *sadah* to mute the sound of the talempong is related to the belief – which contains a mystical element – that it enables the talempong to produce a sound which is pleasant to hear and captivates the listener (Dt. Sampono, interview, 06-06-2015). Whether or not a sound is considered pleasing to the ear can be identified by the presence of a *sipongang* sound that does not disturb the musical feel when the talempong instrument is played.

The part of the talempong that is applied with *sadah* is the inner surface. There are two forms of *manyadahi* talempong: (1) the inside of the *momong* is smeared with *sadah* and marked with a cross; (2) a cross is marked inside the instrument without applying *sadah* to the inside of the *momong*. In the first case, the inside of the *momong* is applied with *sadah* with the addition of a cross-shaped mark. This is done if the talempong sound produced by the *momong* is not good. The cross-shaped marking functions to preserve the stability of the sound and to dampen the duration of the *sipongang* so that it is not too long. Suka Harjana defines duration as the length of time a note continues to sound (Harjana, 1983: 48).

In the second case, only a cross-shaped mark is applied to the inside of the instrument, without applying *sadah* to the inside of the *momong*. This is an indication that the *momong* is still producing a good sound but its physical vibrations need to be muted, by applying a cross-shaped mark, to ensure a balanced sound and shorten the duration of the *sinpongang*. The process and pattern for *manyadahi* talempong can be seen in the picture below.



**Picture 2.** Process of *manyadahi* talempong  
(Photo: Documentation by Andar, 2015)



**Picture 3.** Pattern of *manyadahi* talempong  
(Photo: Documentation by Andar, 2015)

The purpose of using *sadah* to adjust the *sipongang* of the talempong is to improve its aesthetical quality in accordance with the wishes of the talempong elders. This not only involves a physical procedure but must also be accompanied by the non-physical element of the ritual, which talempong elders believe to be of great importance. Efforts to improve or maintain the *sipongang* sound of the talempong are required in order to preserve the aesthetical quality of the talempong sound.

### c. *Sound Duration*

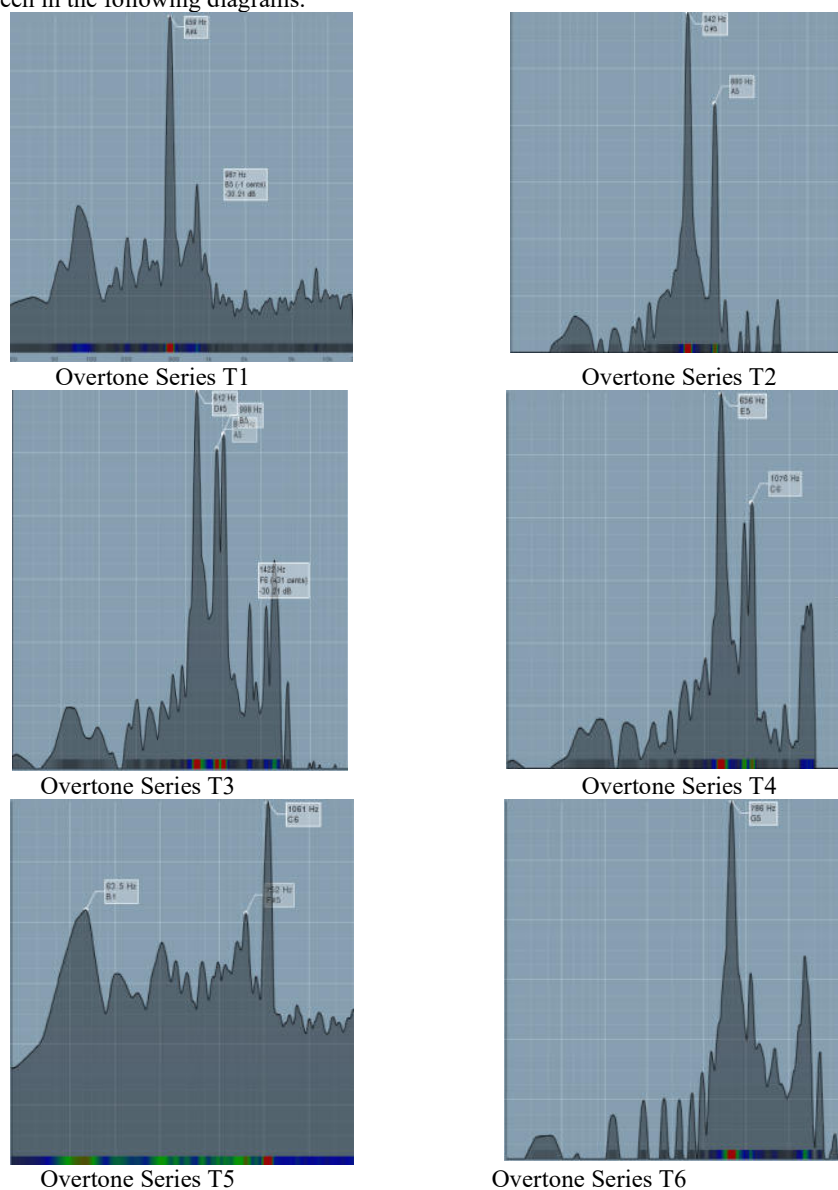
Sound duration refers to the time or length of time the sound continues to reverberate after the talempong instrument is struck. Through an experiment using a talempong that was considered to be of good quality, it was discovered the sound duration suitable for fulfilling the musical requirements of talempong elders. The experiment involved four stages of activities. First, a good quality talempong set was prepared by making a direct purchase from a talempong maker in Nagari Sungai Pua – Luhak Agam (see the illustration on the following page), and the talempong sounds were recorded using a digital voice recorder before the talempong elders tuned the instruments, a practice known as *mangkoanbunyi*. Second, the *mangkoanbunyi* talempong was performed based on the musical feel and musical standard of the talempong elders, and then the talempong sounds were recorded again. Third, the ritual of *manyadahi* talempong was performed, at which time the talempong elders “breathed spirit” – to use Hastanto’s term (Hastanto, 2012: 6) into the physical form of the talempong. Fourth, the sounds of the talempong were recorded again after the process of *manyadahi* was finished.

The results of the recordings of talempong sounds were processed using the digital software *Cool Edit Pro* version 2.0, and *Nuendo 3*. The software *Nuendo 3* used in this research helped to provide a concrete picture about the fundamental frequencies, sound duration, and overtone series, which were displayed on a diagram. Measurements of sound duration were taken before and after the *sadah* was applied, and the results can be seen in the table below.

| No | Position of Primary Pitch | Frequency (Hz) | Fundamental Frequency (Hz) | Sound Duration (Seconds) | Overtone series (Hertz) |
|----|---------------------------|----------------|----------------------------|--------------------------|-------------------------|
| 1  | 2                         | 3              | 4                          | 5                        | 6                       |
| T1 | A#4-31                    | 357.76         | A#4                        | 1.768                    | 459 Hz                  |
| T2 | C#5-47                    | 539.43         | C#5                        | 1.915                    | 542 Hz                  |
| T3 | D#5-28                    | 612.12         | D#5                        | 2.138                    | 612 Hz                  |
| T4 | E5-9                      | 655.63         | E5                         | 2.281                    | 656 Hz                  |
| T5 | C6+22                     | 1060.5         | C6                         | 1.486                    | 1061 Hz                 |
| T6 | G5+11                     | 789.01         | G5                         | 1.288                    | 786 Hz                  |

**Table 1.** Sound duration of talempong before the application of *sadah*

Table 1 above clearly shows that based on the fundamental frequency, the duration of the talempong sounds varies – see column 5. The sound waves produced by the basic frequency have a series of overtones. These overtones appear in multiple frequencies that continue until they are too high for the human ear to hear. Through an analysis of the audio system used in the *Nuendo 3* program, the overtone series of each talempong can be observed, as seen in the following diagrams.



**Picture 4.** Overtone series of six talempong pitches before the application of *sadah*

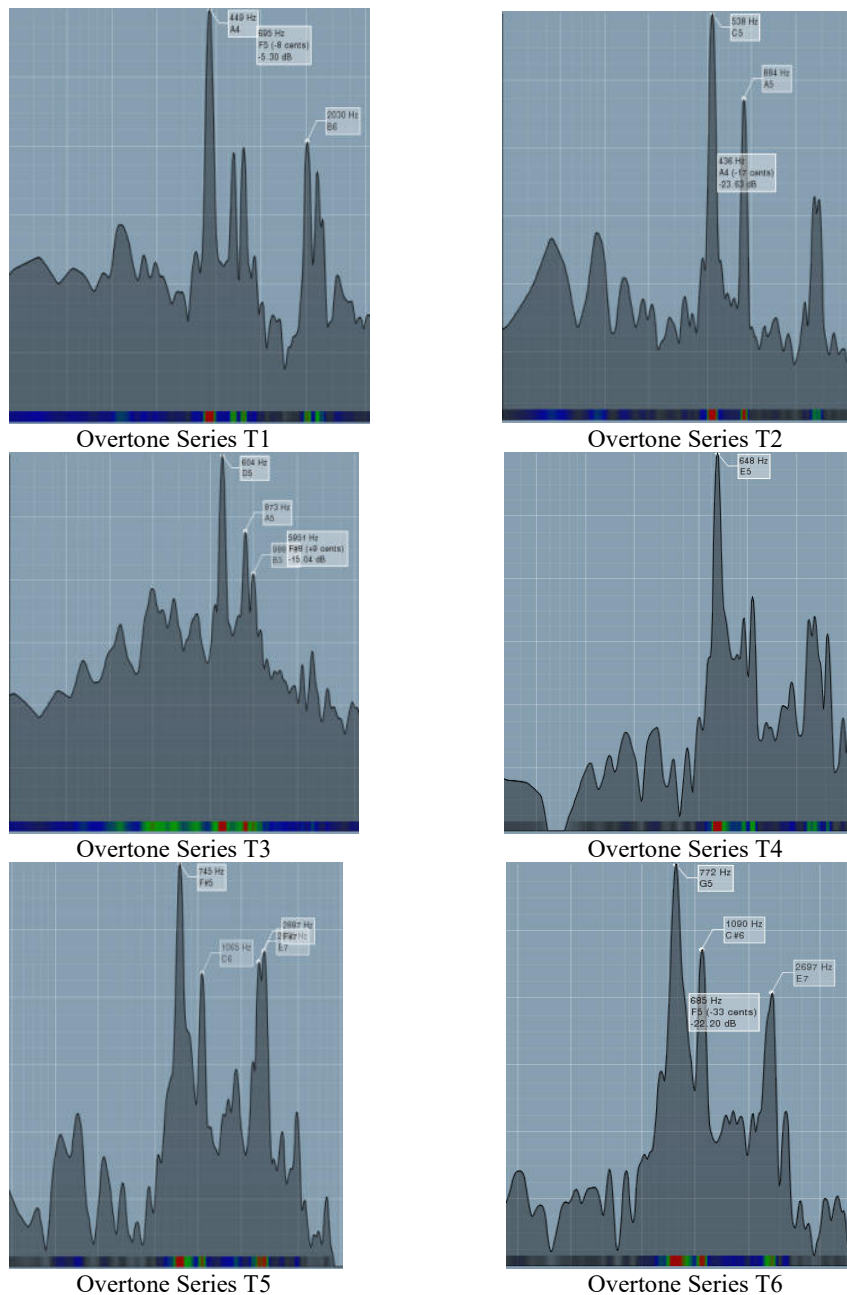


Picture 4 above shows that the overtone series is not a stable phenomenon, meaning that the multiple sounds produced above the fundamental frequency are not in multiples of the fundamental frequency as expected. For example, if the fundamental frequency is at the position A4 456 Hz, the overtone series should be at the position of 912 Hz or in multiples of the frequency 456 Hz. However, each of the six overtone series measured using *Nuendo 3* software displays different characteristics. After the process of *mangkoanbunyi* (tuning) and the *manyadahi* talempong ritual were finished, there was found to be a change in the musical structure and duration of the talempong sounds produced by the fundamental frequencies, as shown in the table below.

| No | Position of Primary Pitch | Frequency (Hz) | Fundamental Frequency (Hz) | Sound Duration (Seconds) | Overtone Series (Hertz) |
|----|---------------------------|----------------|----------------------------|--------------------------|-------------------------|
| 1  | 2                         | 3              | 4                          | 5                        | 6                       |
| T1 | A#4+46                    | 452.06         | A#4                        | 1.214                    | 449 Hz                  |
| T2 | C#5-48                    | 539.41         | C#5                        | 1.216                    | 538 Hz                  |
| T3 | D#5+28                    | 613.64         | D#5                        | 1.296                    | 604 Hz                  |
| T4 | E5-9                      | 656.63         | E5                         | 1.225                    | 648 Hz                  |
| T5 | F#5+20                    | 748.20         | C6                         | 1.112                    | 745 Hz                  |
| T6 | G5-11                     | 783.45         | G5                         | 1.040                    | 772 Hz                  |

**Table 2.**Duration of talempong sound after *mangkoanbunyi* and the application of *sadah*

Table 2 above shows the change in position of the primary pitches of T1 and T5, from T1 at the position A#4-31, and T5 at the position C6+22 (see table 1). After the process of *mangkoanbunyi* has been carried out by the talempong elders, T1 becomes A#4+46 and T5 becomes F#5+20 – see column 2 in table 2 above. Another important change occurs in the duration of the talempong sound before and after the application of *sadah*. After the *sadah* has been applied, the duration of the talempong sound becomes shorter – see column 5 in table 2 above. This means that the smaller the frequency of the vibration of the talempong sound, the longer the sound wave formed. In other words, the lower the talempong pitch, the longer the time required until the talempong sound is no longer audible to the human ear. On the contrary, the greater the frequency of the talempong sound, or the higher the pitch, the shorter the time duration – see columns 4, 5, and 6 on table 2 above. According to Jufri, the ideal sound duration on the talempong must match the reverberation of the pitch level of each instrument (Jufri, interview, 24 – 11- 2018). This means that the longer the reverberation of a talempong sound, the longer the time needed, and the shorter the reverberation of a talempong pitch, the shorter the duration needed. The sound waves that originate from the fundamental frequency have an overtone series and can produce multiple additional pitches. By analyzing the audio system through *Nuendo 3* software, the overtone series of talempong pitches can be observed in the following diagrams.



**Picture 5.** Overtone series of six talempong pitches after the application of *sadah*

The diagrams above show that the overtone series of the primary pitches do not display multiples of the fundamental frequency in the series of additional sounds produced when the talempong is struck. This is evident from the sound peaks that follow the primary pitches, which are different for each talempong. T1 has a fundamental frequency of 449 Hz in the tonal area A4, while the subsequent overtone series has a frequency of 695 Hz in the tonal area F5, and 2030 Hz in the tonal area B6. The primary pitch of T2 is recorded as 638 Hz in the tonal area C5, with the overtone series 884 Hz in the tonal area A♭, and 736 Hz in the tonal area A4. The primary pitch of T3 is recorded as 604 Hz in the tonal area D5, and the subsequent tones are recorded as 873 Hz in the tonal area A♭, and 5951 Hz in the tonal area F#8. The primary pitch of T4 is 648 Hz in the tonal area E5, and does not record any subsequent pitches. The primary pitch of T5 is 745 Hz in the tonal area F#5 and its subsequent pitches are recorded at the frequency of 1065 Hz in the tonal area C6, and 2897 Hz in the tonal area F#7. The primary pitch of T6 is recorded as 772 Hz in the tonal area G5, with the subsequent pitches 1090 Hz in the tonal area C#6, 685 Hz in the tonal area F5, and 2697 Hz in the tonal area E7. This kind of sound duration is an important component in the performance of talempong *renjeanganamsalabuhan* (set of talempong) for

achieving satisfaction and a high quality of performance.

### III. CONCLUSION

Traditionally, *sadah* is empirical knowledge that has been used by women in Minangkabau for many generations. This same knowledge has been inherited by talempong elders for a different purpose, namely to obtain an aesthetical quality in the sound of talempong. This empirical knowledge about the use of *sadah* is also complemented by mystification which is directed towards the voice of the prophet David. Through a qualitative and experimental method, it is found that acoustically, *sadah* has the ability to preserve the aesthetical quality of talempong sound in accordance with the musical standard of talempong elders in Minangkabau.

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