

# Significance and Health Benefits of Conch Shell

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**Abstract**— Sound and music significantly influence the state of human mind and emotions. Listening to low volume melodious and harmonic music will aid to have a relaxed state of mind. Sound waves produced by conch shell enhance positive psychological vibrations and leads to state of improved focus and performance. It is believed that blowing of conch shell have huge beneficiary effect on health especially on heart and respiratory system. There are various studies which promote the use of conch shell as a therapy to relieve stress and anxiety. In this paper, sound emanating from conch shell is analyzed in both time and frequency domain. The increase in brain's activity due to the sound of conch shell is proved by recording brain wave data of test subject and processing it using MATLAB. The acquired EEG (Electroencephalogram) signal is filtered; its frequency spectrum and power spectral density is compared before and after hearing to sound from conch shell. Our goal is to prove the healing capability of sound from conch shell for people suffering from depression, anxiety, stress, hypertension, insomnia etc., as these cases have indeed increased a lot nowadays.

**Index Terms**—EEG, Brain waves, BIOPAC.

## I. INTRODUCTION

Conch shell have great importance in Hindu religion. It signifies Brilliance, luster, purity and auspicious beginning. It is hard and strong, made up of calcium and magnesium [1]. Conch shell or Shankh (in Sanskrit) is blown during auspicious beginning, festivals and in temples. It is believed that this helps in getting rid of negative energy and evil spirits [2]. Apart from these, various benefits of using conch shell like its positive vibes resulting in relaxed and receptive mind, healing effects motivated us to take this as a subject area of research.

Neuroscience says that there is strong bond between sound and emotional states of human brain. For example, slow and acoustic music has a soothing effect on human mind where as fast and loud music agitates the mind. Frequency of EEG signals changes to the frequency of the music or sound which has great impact on human brain. So, we venture to find the frequency and nature of the sound which provides the said soothing effect. The effect of this sound is comparable to the results of meditation.

Brain's response to the sound of the conch shell is studied by using EEG recordings. The EEG signals result from recording the electrical activity produced by firing of neurons in human brain. It is extracted from electrodes fitted along scalp of the subject and this is further processed. EEG is a linear combination of multiple sources of neural activity. EEG signals from the test subject was acquired using BIOPAC system which includes data acquisition hardware to record

and condition electrical signals. This electrical signal was further processed and analyzed using MATLAB. Before getting on to the procedure of data acquisition and analysis of acquired, brief literature review of brain wave sensing, signal processing, data acquisition and effect of sound on human brain is discussed as below.

Transforming sound files into discrete data using MATLAB as a tool for speech processing is explained in [3]. Design of Audio Signal Processor to process and analyze sound signals using FIR filters to get amplitude, time and frequency information is given in [4].

Sound therapy is popular and better preventive measure compared to traditional treatments and helps people in depression, suffering from sinus and help cancer patient recover from chemotherapy [5]. Lot of health related issues occur because of stress, anxiety and tension. Authors of [6] discuss about the effects of sound meditation. They highlight the usefulness of this type of sound meditation in reducing stress, anger and depression. A type of sound therapy known as Tomatis sound therapy method [7] reduce autistic symptoms in children and helps in improving communication and interaction. Brain waves sensed and extracted using MATLAB can be used to detect diseases. Different applications for simplifying everyday tasks can be done using meditation and concentration [8]. Study of EEG patterns, Alpha and Beta activity of subjects who have listened to Alpha music is detailed in [9]. Influence of Alpha music is to increase the level of Alpha wave and decrease Beta activity, thus reducing stress and increased relaxation. The study further signifies the advantage of music in relieving stress and how this can be used as a therapy to cure various illnesses. Effect of violin music on human brain was investigated in [10], where authors compare brain wave before, during, and after listening to violin music and concludes that both left and right brainwaves are balanced after listening to music. It also highlights the relationship between frequency of brain waves and power emitted by live music.

This paper is organized as follows. Section II highlights the various benefits of Conch shell. Section III details different types of brain waves. Section IV discusses about data acquisition and analysis using MATLAB. Finally conclusion and future scope is given in Section V.

## II. BENEFITS OF CONCH SHELL

Blowing Conch shell and listening to its sound and conch self itself has a lot of uses. Cosmic energy of the earth gets magnified on entering the conch shell. These vibrations radiate positive vibes and eradicate negative energy from

surroundings. The blowing of conch shell makes the atmosphere holy, pure and conducive for the spiritual growth of the individual. It also augments the positive psychological vibrations such as optimism, hope, determination, courage and willpower. These can also be felt by people listening to it.

The moment Shankh is blown our brain is emptied of all thoughts and one enters a state of Trans where he/she is more receptive [11]. Children suffering from stammering, pulmonary disorders, and asthma, cough, liver and spleen ailments can be cured by blowing conch shell [2]. Blowing the shankh regularly reduces blockages in heart and improves the respiratory system. Toughness of the conch make it a suitable material for helmets and body armor [12].

### III. BRAIN WAVES AND EEG

Millions of neurons produce a huge amount of electrical activity in the brain. This can be detected using electroencephalography (EEG), which measures electrical levels over areas of the scalp.

When the electrical activity of the brain is plotted using EEG, a wave pattern is obtained. The brain wave patterns are classified into five types: Gamma, Beta, Alpha, Theta and Delta [13].

#### A. Gamma waves

Gamma waves are important for cognitive functioning i.e., learning, memory, information processing and other high order processing tasks. Gamma wave is higher than usual for people in anxiety and stress. It is below nominal value for people with depression and learning disabilities. Good levels of gamma waves are observed during meditation. Frequency range of gamma wave is 40-100 Hz.

#### B. Beta waves

Beta waves help in completing conscious tasks like logical and critical thinking, problem solving, reading and writing. Right amount of beta waves allows one to focus and complete work based tasks. High levels of Beta lead to stress, anxiety and high arousal. When one is awake Beta waves are high frequency low amplitude waves. Beta wave level is small if a person is daydreaming or is in depression. Beta wave level can be increased by consuming coffee and energy drinks. Its frequency range is 12-40Hz.

#### C. Alpha waves

It has frequency range between Beta and Theta waves. These waves help to calm down and relax. If a person is stressed, alpha blocking may occur. Too much of alpha indicates daydreaming and inability to focus. If a person is in stress or anxiety, then alpha is too little. Optimal levels of alpha leads to relaxation and it is an ideal condition to perform more elaborate tasks, learn new information and analyze complex situations. Its frequency range is 8-12Hz.

The brain can effortlessly produce Alpha waves by hearing to soothing and rhythmic music. Listening to music with

binaural beat is the most effective way to reach state of deep relaxation within a short time. During meditation, electrical patterns in brain slow down and amplitude of brain waves stabilizes to Alpha frequency range.

#### D. Theta waves

Optimal levels of Theta wave indicate creativity, intuition and emotional connection. High levels of Theta wave can lead to hyperactivity and impulsivity. Low levels indicate, poor emotional awareness, stress and anxiety. Its frequency range is 4-8Hz.

## IV. RESULTS AND DISCUSSION

Firstly, sound waves from conch shell was extracted and its time-domain waveform plotted in MATLAB is as shown in Fig. 1 and its frequency domain representation after performing FFT is as shown in Fig. 2.

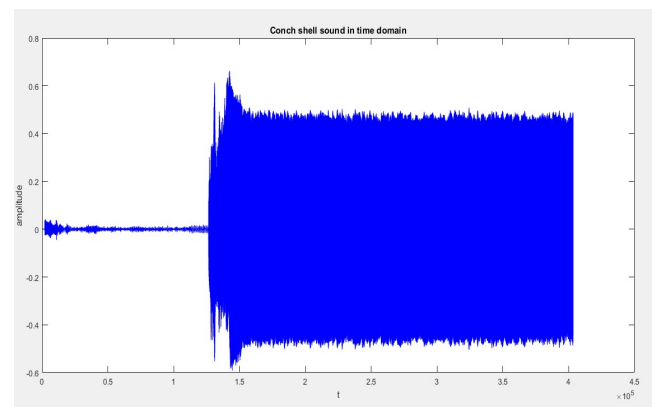


Fig. 1 Time domain plot of conch shell sound

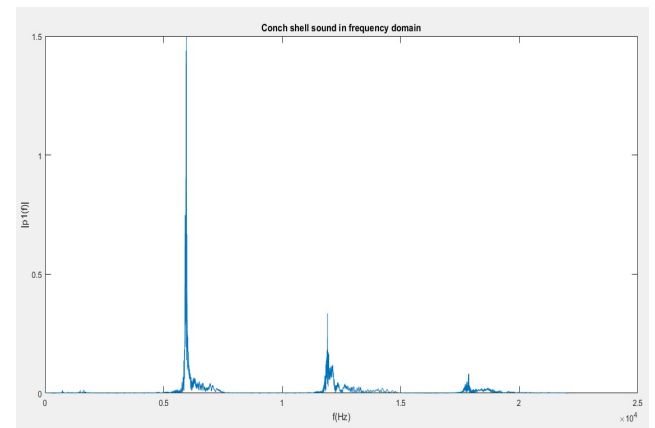


Fig. 2 Frequency domain plot of conch shell sound

Data acquisition of EEG signal from the test subject was recorded using BIOPAC system and data was exported to a spreadsheet. The values were then imported to MATLAB. Using these values, the EEG was plotted and also it was filtered to eliminate noise. Filtered EEG signal is as shown in Fig. 3.

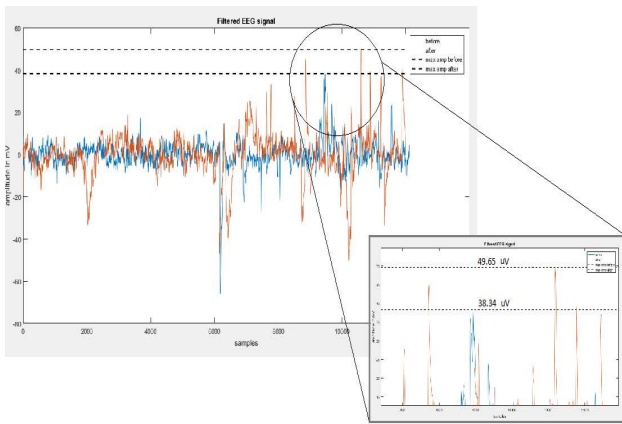


Fig. 3 Filtered EEG signal

In order to study Alpha and Beta waves, they were separately extracted and imported to MATLAB. Filtered Alpha and Beta waves is as shown in Fig. 4 and 5 respectively.

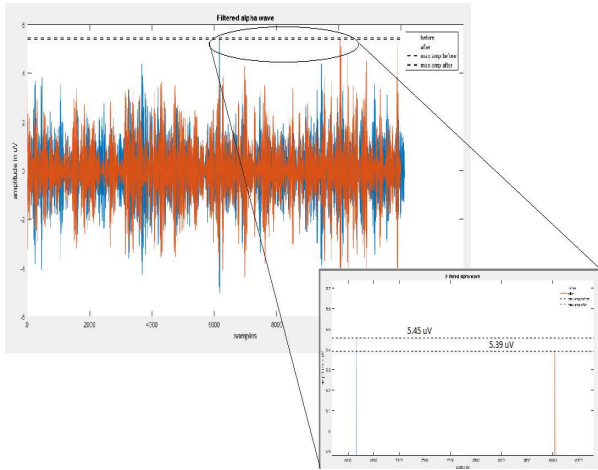


Fig. 4 Filtered Alpha wave

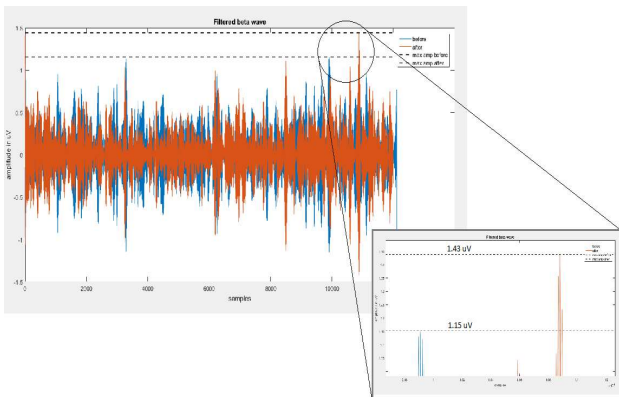


Fig. 5 Filtered Beta wave

The difference in mean value of Alpha wave is observed before and after listening to sound of conch shell. It can be seen that there is increase in the mean value of Alpha wave after listening to sound of Shankh, this is evident from Fig. 6.

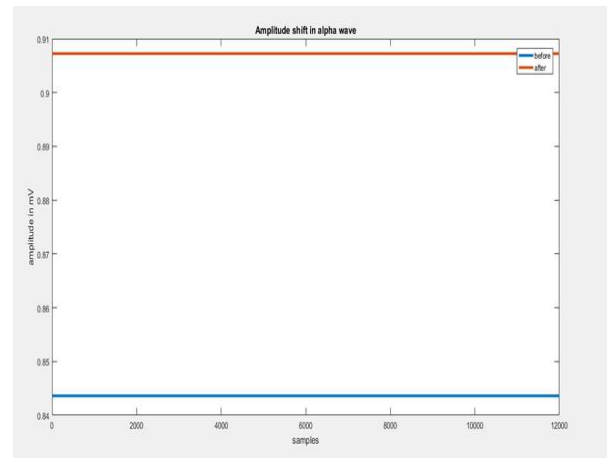


Fig. 6 Amplitude shift in Alpha wave

The amplitude shift of beta waves was also plotted and it was observed that there is a decrease in the mean amplitude of the beta waves. Drop in the amplitude is shown graphically in Fig. 7.

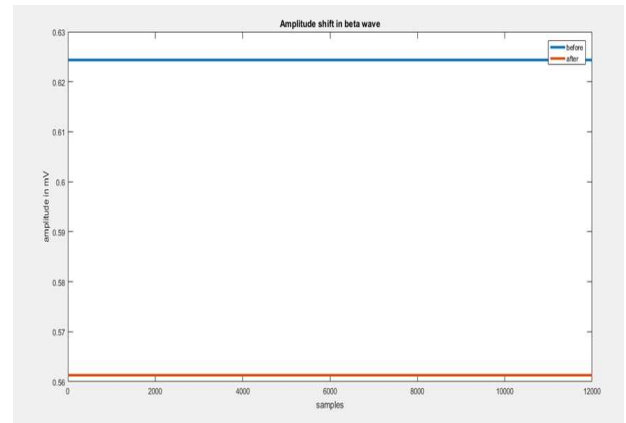


Fig. 7 Amplitude shift in Beta wave

Frequency spectrum waveform of EEG signal before and after listening to the sound is shown in Fig. 8 and 9 respectively.

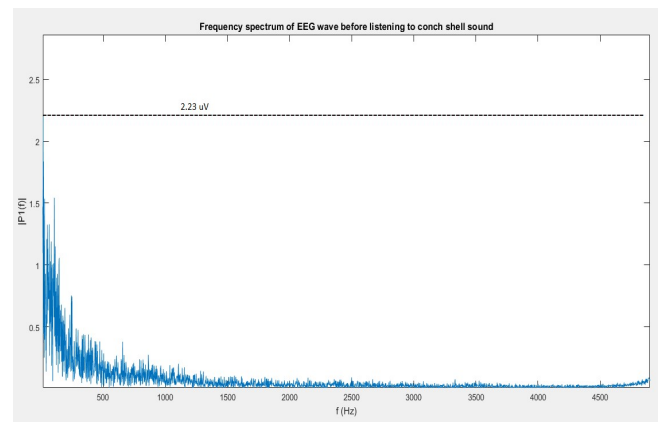


Fig. 8 Frequency spectrum of EEG signal before listening to conch shell sound

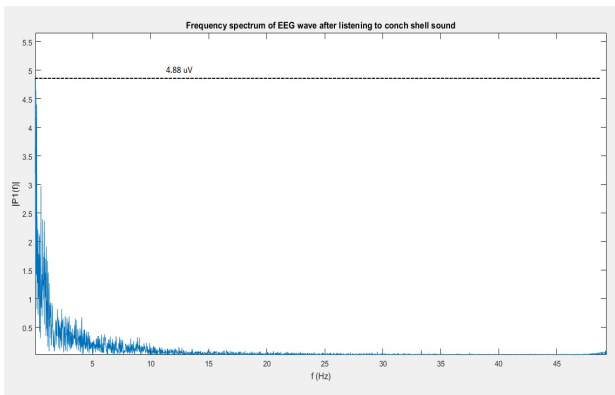


Fig. 9 Frequency spectrum of EEG signal after listening to conch shell sound

Power spectrum of the EEG signal before and after listening to the sound of conch shell is shown in Fig. 10.

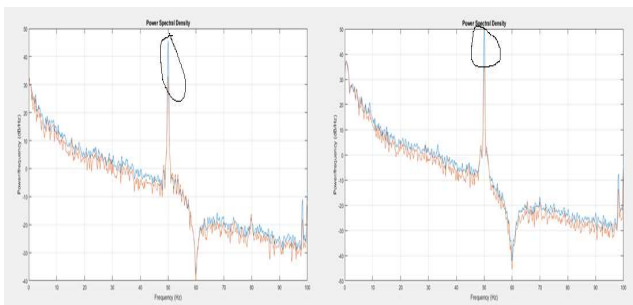


Fig. 10 Power spectral density of EEG signal (Left-Before, Right-After)

Similarly, frequency spectrum of Alpha wave was plotted before and after listening to conch shell. It can be seen from Fig. 11 that the alpha waves lie in the frequency region of 8-12 Hz and peak value of the alpha wave amplitude has increased from 0.237 $\mu$ V to 0.321 $\mu$ V after the exposure to the sound of the conch shell.

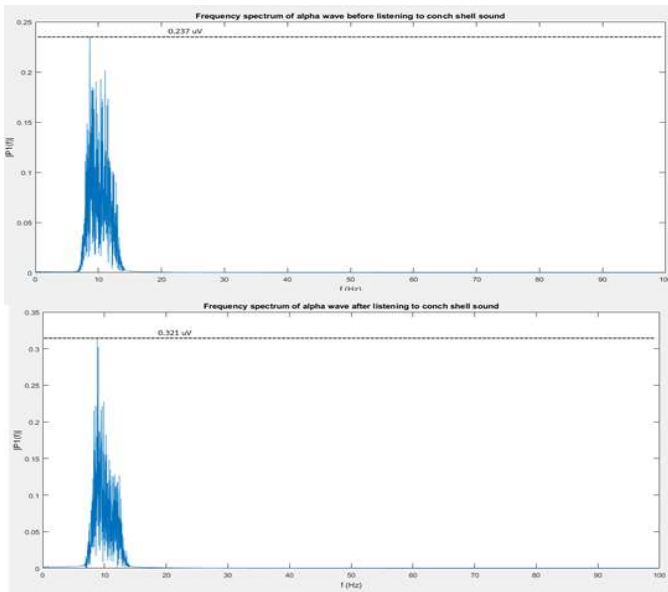


Fig. 11 Frequency spectrum of Alpha wave

Frequency spectrum of Beta wave was plotted before and after listening to conch shell. It can be seen from Fig. 12 that the beta waves lie in the frequency region of 12-30 Hz and peak value of the peak amplitudes have decreased after listening to the sound of the conch shell.

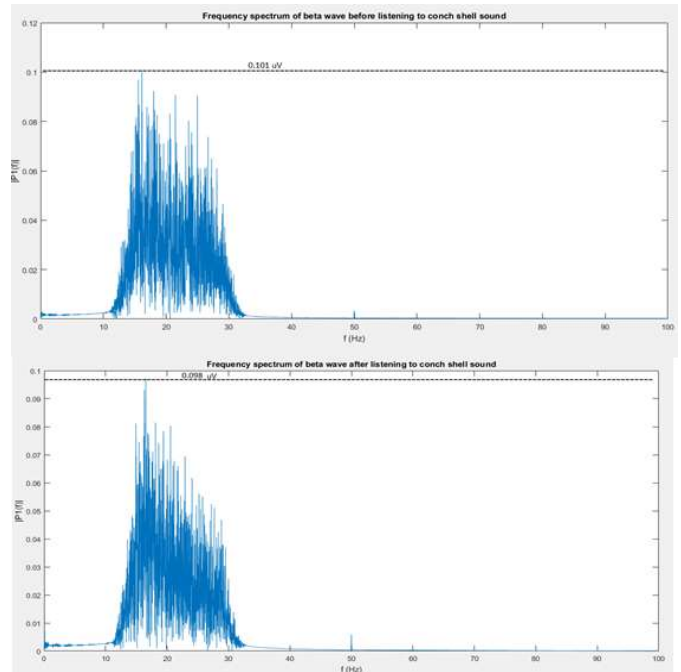


Fig. 11 Frequency spectrum of Beta wave

From all the graphs and obtained values it is evident that there is an increase in the alpha waves amplitude and decrease in the beta wave amplitude after listening to the sound of the conch shell. There is a noticeable effect of the conch shell sound on the human brain and that it influences positively to achieve a more focused state of mind. The increased Alpha activity observed after hearing to conch shell sound stimulus suggests relaxed state and reduced Beta activity indicates decrease in stress and anxiety.

#### V. CONCLUSION AND FUTURE SCOPE

In this paper, effect of conch shell sound on human brain in terms of changes in Alpha and Beta waves is studied. Certainly, it can be implied that a person hearing to the sound of Shankh gets into relaxed state. This promotes the use of conch shell for healing purposes. Focus can be changed to study of using sound for healing instead of pharmaceutical drugs for curing diseases. Other devices, instruments, or digitally produced sound waves with desired frequency band can be discovered and compared so that they can be effectively used as sound therapy for curing various diseases.

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