Conclusion

During my research I found out following things:

1. In Indian Classical Music no standardization of notes has been done yet as done in western country, as I mentioned earlier.

   With the advancement of Science the western scholars gave importance to Frequency of notes and its Interval on the basis of Physics and Mathematics consequently Indian scholars also gave place of above matter in their books on Classical Music. *(Sangit Shashtra Tatha Raga Mala by Pandit Bhola Dutt Joshi)*

   We tune our instruments purely by perception and the tuning is within the limit of judgment of the player of the instrument. In many orchestras there is some dissonance because of the perceptional differences of individual players. Also, the same raga (say Mohana/Bhoop) is played differently by Hindustani and Karnatak musicians. Dissonance in orchestral/jagalbandi music may be avoided by carefully tuning our instruments to a reference frequency standard. This implies that we understand the 22 srutis correctly so that we can create a frequency standard of our own.

   During my analysis of 12 notes and analysis of different ragas of different artiste I found that there must be one standard Reference note with a particular frequency so that all other instruments can be tuned uniformly anywhere at anytime. By viewing different singing range of different artists I suggest the frequency of reference not C(Sa) should be between 130-133Hz.

   C=130-133Hz

   With the help of this reference frequency, I also found out frequencies of 12 notes of Indian classical music.

2. Using computer software mentioned earlier, I analyzed ragas of Indian classical music sung/played by eminent artistes

   I did four different type of analysis.

   1. One Raga – Different Artist
   2. Different Raga - Different Artist
   3. One Raga – Sung by one artist at different time.
   4. Different raga – One Artiste.

   I found from the analysis that all Indian notes, except sa can move a microtone depending on the ragas. The same note of raga differs from artiste to artiste and also for the same artiste time to time. We already know this fact but findings of this research gives scientific proof of this fact, which I have analyzed through computer software and

also derived some mathematical calculations and methods to prove my work. Harmonium is not a suitable instrument for accompaniment of Indian classical music the reason is Haromonium is tuned on the basis of equal tempered scale where whatever the key, the frequencies always match, producing harmony in a polyphonic situation. However, because of this equal temperament the individual notes lost their melody to a noticeable extent. The interval between adjacent srutis in our scale of 12 notes is not constant. It is precisely this difference that gives rise to the additional srutis in our musical scale, totalling 22 srutis. In the equi-tempered scale the difference between adjacent notes is constant, and hence there is absolutely no scope for additional frequencies or srutis to be generated.

Whenever we visit any institution we find that reference note (Sa) is different (High or low).Even students can not perform well because they have to compromise with their natural scale as all the time they get different reference note from 'swarpeti'. Electronic sruti box which is tuned on the basis of standard scale is not available every time and it is also not accompanying instrument as Harmonium. Harmonium is accepted everywhere in Air and Classical Music concerts. As I mentioned above every time the artiste has to compromise with the note during their performance so there is a need of some standard to tune the Harmonium to overcome the problem.

Findings of this research may not change the nature of any raga, but may make it easier for teacher to teach the subtleties in ragas.

I am sure the subject will be of immense value to many in the field of Music educators, learners, performers, and beginners to enhance their knowledge. Indirectly it will propagate to preserve our rich heritage of Music

A clear understanding of the 22 srutis will enable us to sing and play the ragas better and with greater feeling. It will also help immensely in teaching our music to students. For example, we can tell the student that the so-called komal gandhar of raga DARBARI is actually lower and he should use the next lower variety of gandhar (in the scale of 22 srutis), and so on.

We need not have to reconsider any srutis that we have been singing. On the other hand, this tells us what sruti we are using and we become more aware.

There are different opinions about distance between srutis while some scholar believes as equal and some as having unequal distance. We sing swars and not srutis. Sangit Martand Pt.Omkarnathji also mentions about this differences of swars in his book 'Pranav Bharati', I have made attempt to highlight this differences by scientific analysis of the cassettes of some of the artistes.

Music and grammer (Kavya) are correlated to each other. As I quoted earlier, Bharatmuni also accepted this in context of Veena and Maharishi Patanjali in context with Voice. Scholars have also given due importance during discussion on Music.

In this regard statement by learned Dr.Premlata Sharma is authentic which says "field of 'gita' and 'kavya' overlap". The following part of a well-known shloka refers to this.

'Sahitya math sangitam Saraswati Kuchadwyam' (Sangitraj by Maharana kumbha, P.78).

This may also one of the reasons of 'swarbhed' in different ragas. Their must be some other reason also like rendition of the raga along with the grammer of music depends on the mental state and the energy at that particular moment.

One gets an opportunity to listen to the same raga rendered by an expert vocalist or instrumentalist at different time. The rendering can offer the listeners different types of pleasure thus the presentation of music is largely associated with the artist's emotion and feelings. A maestro through his creative approach can make a unique presentation confining him to the grammer of music.

I would like to clear a common misconception that is associated with the relative frequency ratios of our srutis. It is very difficult to play or sing a complex ratio such as 729/512. This is actually a misconception, which is removed once you see it as a number and not a fraction. In fact, we cannot produce exactly even the simple ratio of 9/8. The point is, while we sing or play we go by perception and not by these numbers. It is however important that we stay near these ideal values. The human voice can really make extremely melodious music because it can hold on to these notes within the accuracy range of the ear.

I shall feel fruition if this research on subject thesis in the field of North Indian Classical Music finds usefulness not only to musicians and artistes but also to persons interested in carrying out research on the concept of Science behind Music.

I have tried to be precise in presenting my thesis but still however if there is an typographical error it is regretted.