

**Appreciating Carnatic Music**  
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**Lecture - 06**  
**Lecture title: Musical Material: A hard Look II**

Now, I told you that we should take a hard look at the musical material - the seven swaras or the twelve swara sthanas. Now let us get to a more fundamental question: Why do we say or how is it that we can say that there are only seven notes or seven plus five swara sthanas? Now look at the keyboard, for instance: (Video Starts: 00:47) (Video Ends: 00:49) How many frets are there? surely more than twelve.

Look at the veena: (Video Starts: 00:50) (Video Ends: 01:00)

The veena's fret board has, a standard veena has 24 frets and surely you and I can hear many more pitches than just twelve. Then how is it that we are able to account for all the musical material with just this, seven plus five swara sthanas?

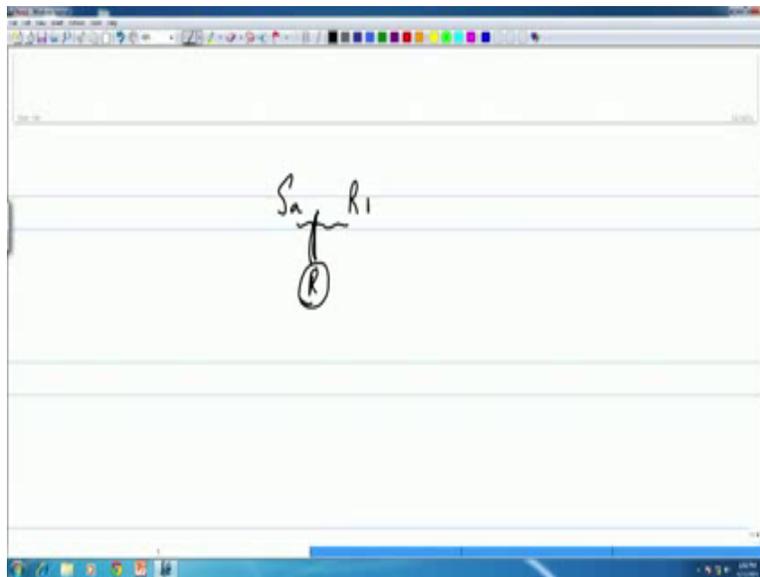
Now we say sa re ga ma pa dha ni (Singing Starts: 01:22) (Singing Ends: 01:26) and like anybody would know, the next swara is again sa (Singing Starts: 01:30) (Singing Ends: 01:38). That is again sa but it is a different pitch it is not this as here: (Singing Starts: 01:42) (Singing Ends: 01:44)

This is a different pitch, then how is it that they are giving the same name? And, in fact, it goes on ad infinitum (Singing Starts: 01:53) (Singing Ends: 02:00) and so on and on this side also (Singing Starts: 02:02) (Singing Ends: 02:07) now how is it that they are giving the same name to different pitches.

Now this is possible because of a unique and very fascinating property of sound perception-how humans perceive sound. Now for a moment, if we compare the phenomenon of sound with the phenomenon of light. The one thing that is common to both is that, they are both a continuum. Now, between one colour shade and another there is a continuum. Theoretically there are infinite shades. But the human eye is able to, discern the differences between some, at certain points were able to discern the colour differences. And we give it names; we give them names like red, orange, blue, violet, indigo and so on.

So also in sound: theoretically, between any two pitches there are infinite pitches; theoretically. And even in practice. Now I say this is: sa (Singing Starts: 03:25) (Singing Ends: 03:27) and the next pitch on the keyboard is ri (Singing Starts: 03:30) (Singing Ends: 03:32). But let me try to produce a pitch between these two (Singing Starts: 03:37) (Singing Ends: 03:42). This is the pitch here (Singing Starts: 03:45) (Singing Ends: 03:54). Now this is neither there nor here; it is in between, but it is just a little raised, but we do not give it, the status of the swara; we do not give any position on the keyboard; we do not use it to make music; what is happening is this,

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We have Sa and we have Ri, which is the next position in the twelve swara sthAnas schemas. So: (Singing Starts: 04:24) (Singing Ends: 04:29). Now theoretically, there are infinite pitches possible between these two and in actual practice also, a couple of pitches at least are discernible between these two, which is what I tried to demonstrate. So, let us say that there is this, the other pitch here which is almost Ri, we can - this is certainly a pitch that we can hear (Singing Starts: 04:56) (Singing Ends: 04:59) this is Ri, (Singing Starts: 05:01) (Singing Ends: 05:04) this is almost Ri1.

Now this position and this pitch, will not be given the status of a swara sthAna or a swara in the context in which Sa, this Sa and this Ri1 are swaras; as such this is a pitch, this is a musical pitch

and surely, will be a swara; but only, it will be a swara in any, in another context, not in the context in which this and this are swaras.

Given that, this is the Sa (Singing Starts: 05:44) (Singing Ends: 05:46) and this is the Ri (Singing Starts: 05:47) (Singing Ends: 05:48), if this is Sa, that is Ri. Now this position which is almost Ri is not accorded the status of a swara; it could, of course, be a swara, only, not in this context because music is made by combining swara-s and this pitch cannot be viably combined with this Sa or this Ri. Music is essentially involves, combining swaras relating them and these relations and how these relations sound, that is what has determined, what pitches have been picked out, as musical notes. It really has got to do with the harmonics of notes, which is a physical phenomenon.

Now the human ear and brain perceive sound in ratios. The relationship between one pitch and another is perceived in terms of their ratio. Now when I say (Singing Starts: 07:01) (Singing Ends: 07:09). Now let me play these two notes together, this Sa and this higher Sa and you can see that they are merging: (Singing Starts: 07:14) I am actually playing two pitches, you can hear two pitches. Like you can, if I play this. You can hear two pitches here. there is a mergence and that is why this is also called sa. (Singing Ends: 07:43)

This as I said again is possible. This is say  $x$  hertz frequency. (Singing Starts: 07:48) (Singing Ends: 07:52). This is  $2x$  hertz and we perceive it as a ratio. The ratio is perceived and we hear a mergence of the two swaras, which is why we can call this swara also, this pitch is also Sa (Singing Starts: 08:08) (Singing Ends: 08:12). This is also Ri (Singing Starts: 08:13) (Singing Ends: 08:15). If we compare, this with perception of color, we don't see a similar phenomenon, as the wave length increases, the colors keep moving away from each other. There is no mergence, at least as far as the human range goes.

Now this space between this (Singing Starts: 08:40) Sa and this Sa, where this note merges with next note-that space is called the Sthayi ,

(Singing Ends: 08:58)

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the sthayi or a sthAna in Carnatic music which corresponds to the Octave in Western classical music and Saptak in Hindustani music. So, this position between the two Sa-s is called one octave or is called a sthayi or a sthAna in Carnatic music. Now we can say with a little more clarity that, within one sthAyI or within one sthAna or within one saptak there are seven notes and five variants.

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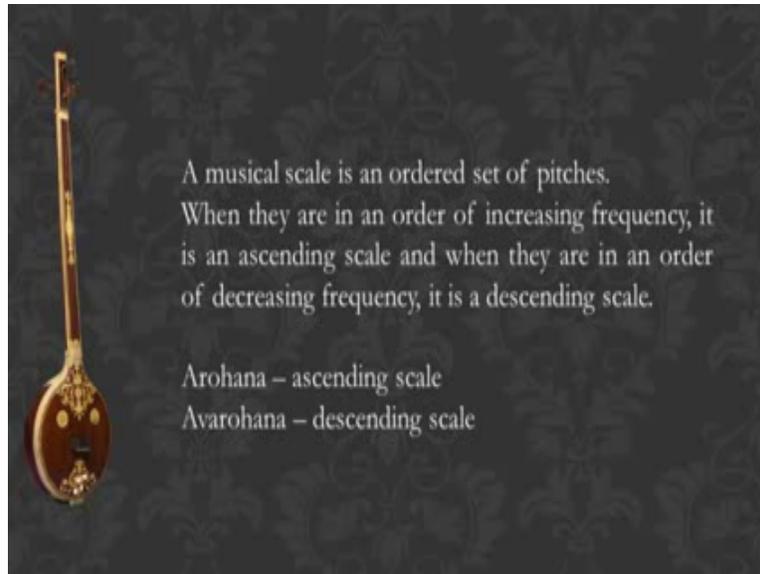


Although there are many more pitches within this sthAna. But the musically relevant ones are, at least at the superficial level – in the case of Carnatic music we will see later on, that even the

other pitches, not named in these twelve swara sthAnas - even many other pitches come into play.

Now let me also talk about the notion of scale here. Now, scale is also another very widely used word and most of us would have heard of the expression musical scale.

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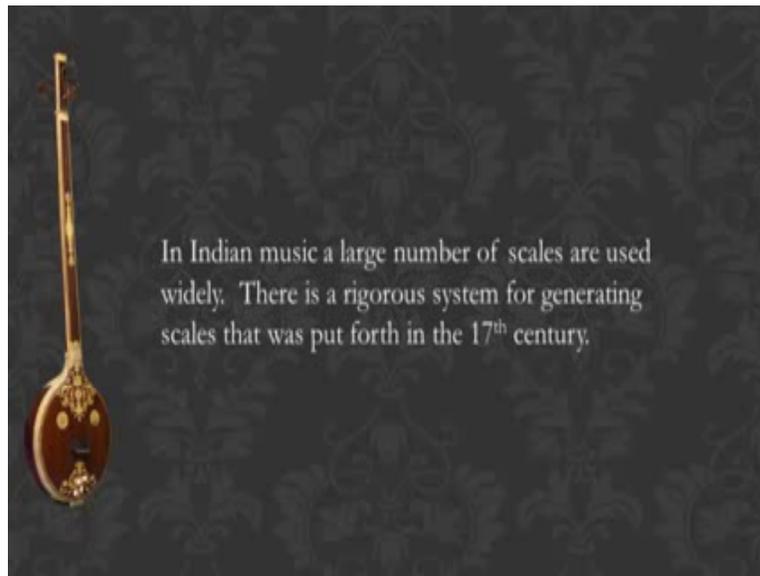


Now, what is a scale? A scale is an ordered set of pitches. If the pitches are in increasing frequency or ordered in increasing frequency, then it is called an ascending scale. And if the frequencies are in descending order, it is called a descending scale. And the corresponding terms for it in Indian music are ArohaNa and avarohaNa.

Let us look at some of the scales, that are used in other kinds of music. I have a small demonstration here by Vibha. This is the major scale, C major scale: (Video Starts: 11:14) (Video Ends: 11:29). The other scale that is widely used in Western classical music is minor scale. The minor scale (Video Starts: 11:36) (Video Ends: 11:49). The Chinese scale is a pentatonic - or it uses five notes (Video Starts: 11:58) (Video Ends: 12:10). This scale is also widely used in Indian classical music, which is Mohanam in Carnatic music and Bhoop in North Indian music.

Now we just saw that in Western classical music, predominantly two scales are used. And in Chinese music a pentatonic or a scale that has five pitches - that is predominantly used.

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In Indian music, Indian classical music we have a very large number of scales that are used widely and there is also a rigorous system of generating scales that was put forth around the seventeenth century. And we will see more about this later on in the course.

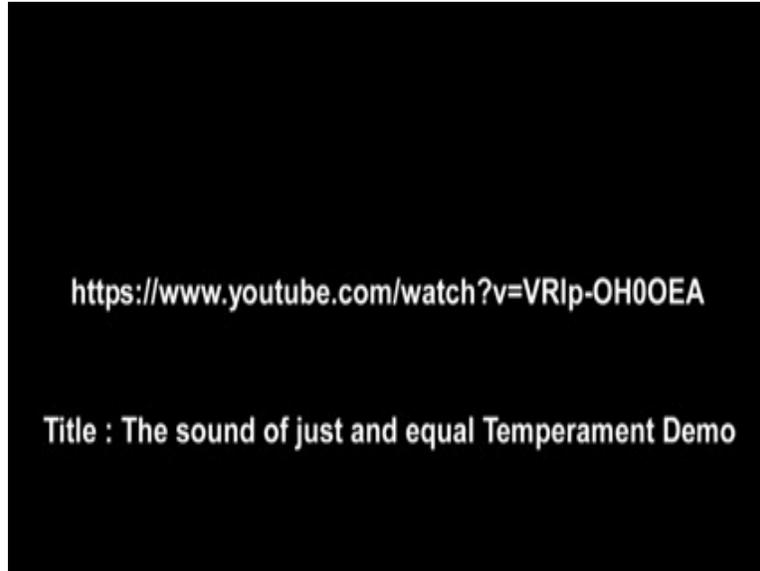
Now, we move on to a related and perhaps slightly technical issue of the tuning of the scale. Now, we have two ways of tuning this scale; the even tempered tuning or the just tempered or natural scale. And this also revolves around ratios and intervals.

Now when we say that there are twelve note positions or swara sthAnas in a sthAyi, in an octave, it is only natural to assume that, these twelve notes are spaced at regular intervals. That is, they are the steps are equal or the difference between any two consecutive notes is the same. But actually it is not so. The way music has naturally evolved or what may be called the natural scale - the natural scale that the human ear, naturally picks out, is based on ratios. And this happens, because of the physics of sound, of harmonics, and how we perceive sound; though the steps in the natural scale are actually uneven.

So, the difference between sa and the first re and the difference between this and this: (Video starts: 14:41) (Video Ends: 14:46) this and this are not equal; they are not spaced evenly. And it is not glaringly different. But it is enough to make a significant difference to the music making.

This is a fascinating topic, and it can get pretty technical, for those who are interested there is an interesting video at this YouTube link. You may visit it.

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For the purposes of this course, what it is necessary and sufficient to know that, the steps between the note positions in the natural scale are uneven; but the keyboard or the piano. A keyboard like this, is tuned such that the steps are regular and this is in response to the needs of Western orchestral music. And in fact the difference between any two notes, note positions will be in the order of the twelfth root of two. So each step is of that order. All tones are separated by equal intervals.

Now Indian music, all Indian music being essentially melodic, there is no room for the equal tempered or the even-tempered scale. We only use the natural scale. And this is also one of the reasons that a keyboard or a harmonium is inadequate, even undesirable in Carnatic or even Hindustani music for that matter. There are other compelling reasons too but this is one of the reasons.

The next concept...what I am doing in these sessions is just covering some basic concepts, so that we can enter into the realm of Carnatic music, equipped with an understanding of these concepts.

So, another important concept is that of the “AdhAra shadja”. “AdhAra” means that which bears; it is fundamental; it is the base and “shadja” is of course the name for the first note sung. So

AdhAra shadja is simply the tonic or the fundamental. Now tonic is important in other musical forms too, even Western classical music. All melody, has to have a strong sense of the tonic; must return to the tonic; if it doesn't you have the sense of the melody hanging in the air; not quite returning home. But in the context of Indian music, Indian classical music specifically, AdhAra shadja has a much more significant role.

The Sa is, what determines the rest of the scale. And this Sa can be any pitch at all. Now I can use this as my Sa (Singing Starts: 18:31) (Singing Ends: 18:35). Once I have fixed this, the rest of my scale is determined. Now I could use this as my Sa (Singing Starts: 18:43) (Singing Ends: 18:46) and with reference to this, rest of the scale is determined. Or I could use a pitch between these two.

The Sa is fixed according the performer's convenience. In contrast with this, if we say, what is "A" for instance, in Western classical music, it is a specific frequency - four hundred and forty hertz. If we say "C" that also is a particular frequency; but if we say Ga or Sa or Pa you cannot, just say that it is this frequency or that. You determine the Sa, once the Sa is determined, you have your other swaras.

Now this has an important implication that a composition in Carnatic music or Hindustani music is not tied to any particular pitch as a fundamental; as its fundamental. The same composition can be performed with any pitch as its tonic. I may sing a composition using this as my tonic (Singing Starts: 20:02) (Singing Ends: 20:03). Someone else may sing using (Singing Starts: 20:06) (Singing Ends: 20:07) this as a tonic and it is a same composition.

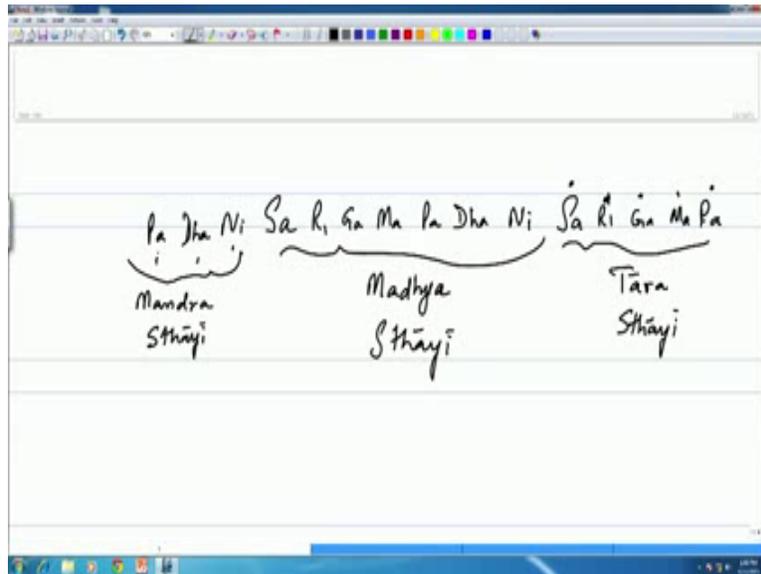
There is a no problem at all here. What matters; however, is that once the particular pitch is chosen as a tonic that has to be maintained; it cannot be changed. A tonic cannot be changed again. Something could happen in the context of Western piece of music, the tonic does change, sometimes in what is called modulation.

Now another implication for this is that since a composition may be rendered by adopting any pitch at all as the fundamental, or the tonic, the performer is expected to sing or perform or play the instrument with the tonic of her convenience, this also implies that there is no division of voices into types. In western music we have the voices divided into types: Soprano, Tenor, Baritone and so on.

There is no, its simply irrelevant in the context of Carnatic or Hindustani music, because these voice types are based on the absolute range of the voice. So, Soprano is the voice that has a range from two sixty-one to eight hundred and eighty hertz; but this is simply irrelevant. The composition, any composition can be sung with any pitch at all as its tonic. And therefore the need for providing voices into types simply does not arise in the context of Indian music.

Now once this, the Sa is fixed, we have also fixed the sthAyi or the registers. We have three registers that we speak of: three sthAnas. Now this is the Sa (Singing Starts: 22:19) (Singing Ends: 22:23), anything below this (Singing Starts: 22:24) (Singing Ends: 22:27) is called the mandra sthAyI, (Singing Starts: 22:28) (Singing Ends: 22:33) that is the mandra sthAyI and (Singing Starts: 22:38) (Singing Ends: 22:40) this is the madhya saptak or madhya sthAyI and from Sa onwards (Singing Starts: 22:47) (Singing Ends: 22:53) and from here onwards and upwards it is called the tara sthAyI, tAra sthAna.

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And this is the AdhAra shadja and this is the madhya sthAyi, sa re ga ma pa dha ni. This is the Madhya sthAyI. From here, the higher Sa onwards, this is the tAra sthAyI and lower; (Singing Starts: 24:03) (Singing Ends: 24:06) and so on. These notes indicate, these dots indicate that it is the lower register. This is the mandra sthAyI. And it is expected that a Carnatic vocalist, should have a range from this to this; given the AdhAra shadja, half an octave below and one and a half above.

Many Carnatic musicians do have a range beyond this but as far as Carnatic compositions go , this two octave range is quite adequate.

I will now sign off with this rendition of a great composition by Thyagaraja. It is in the rAga Kedaragowla, in Adi tAlam. The composition demands this range - Mandra pancham to Tara pancham. That is the range of two octaves, not all compositions demand this range and very few demand a range beyond this.

Listen to this and write to us, what you think of this composition, of this music.

And having covered some of these fundamental concepts, in these last two sessions. We are now ready to enter the portal of Carnatic music proper and we will take up a topic of rAga in our next.

(Music Starts: 26:08) (Music Ends: 35:50)