

Why Swaras regarded as ‘Shudh’ (i.e. pure) by the Shastriya sangeet are at variance with Swaras regarded as ‘Suddha’ by the Carnatic traditions?

The term ‘Shudh Swaras’ mentioned in Shastriya Sangeet (or ‘Suddha Swaras’, as mentioned in Carnatic music traditions) refers to the seven ‘pure’ tonal positions, as derived directly from the Holy Sama Veda. These ‘Shudh’ swaras were grouped as the ‘Sadja-grama’ format, the oldest inheritance of the Indian Musicology.

Ancient Indian musicology calibrated the octave in terms of 22 equal divisions that were known as 22 ‘srutis’. Within this space, the srutis were bunched into bouquets of ‘2s’, ‘3s’ and ‘4s’: i.e. Sadja, Madhyam and Pancham – bouquets of 4 srutis each; Rishabh and Dhaivat – bouquets of 3 srutis each; Gandhar and Nishad – bouquets of 2 srutis each. It may, therefore, be inferred that the term ‘swara’ signified a sub-spectral ‘area’ or a ‘zone’ within the overall spectral space of the octave and not to a specific ‘point’ therein. Our ancient musicologists used another term known as ‘swara-sthaana’ to denote a specific ‘point’ within the octave that gave the identity for the Swara. Such a ‘Swara-sthaana’ occupied the extreme edges of the ‘zone of a swara’, (either the lower edge of the upper edge). There was no clarity as to which edge of the swara zone should be designated as the ‘swara-sthaana’; the ‘leading’ edge or the ‘trailing’ edge, as we ascend from the Tonic? Even during the days of Bharata and Dattila (i.e. as early as 200 B.C.E.), musicological schools held differences in view regarding the ‘sthaana’ occupied by a swara within a swara-zone!

Bharata accorded over-riding pre-eminence for the lower edge to characterize the ‘swara-sthaana’. He, therefore, contended that the swara-sthaana should get assigned first and the swara-zone should follow, as we ascend from the Tonic. As per Bharata’s doctrine, when the swara-sthaana for ‘Sadja’ (Tonic) is assigned at the reference position of 0.00 in the octave, the swara zone of Sadja commences from 0.00 and terminates at 4.00. The swara-sthaana for ‘Rishabh’ (i.e. the succeeding swara) is, then, assigned the position of 4.00 (i.e. at 218 cents or ‘4 srutis’ above the Tonic) within the octave. The swara zone of ‘Rishabh’ then commences from 4.00 and terminates just short of 7.00. The swara-sthaana for ‘Gandhar’ is then assigned the position of 7.00 (i.e. at 382 cents or ‘7 srutis’ above the Tonic) and its swara zone commences from 7.00 and terminates just short of 9.00. The swara-sthaana for ‘Madhyam’ is then assigned at 9.00 (i.e. at 491 cents or ‘9 srutis’ above the Tonic) and its swara zone commences from 9.00 and terminates just short of 13.00. The swara-sthaana for ‘Pancham’ is then assigned at 13.00 (i.e. at 709 cents or ‘13 srutis’ above the Tonic) and its swara zone commence from 13.00 and terminates at 17.00. The swara-sthaana for ‘Dhaivat’ is then assigned at 17.00 (i.e. at 927 cents or ‘17 srutis’ above the Tonic) and its swara zone commences from 17.00 and terminates just short of 20.00. The swara-sthaana for ‘Nishad’ is then assigned at 20.00 (i.e. 1090 cents or ‘20 srutis’ above the Tonic) and its swara zone commences from 20.00 and terminates just short of 22.00. Thus, the swara-sthaana for Sadja (Octave) gets assigned at 22.00. **Shastriya Sangeet seems to have adopted this interpretation of**

Bharata Muni. That's how their 'Shudh' Rishabh occupies a position that is '4' srutis above the Tonic Sadjā. Similarly, Shudh Gandhar is at a position '7' srutis above the Tonic; Similarly, Shudh Madhyam at '9'; Pancham at '13'; Shudh Dhaivat at '17' and Shudh Nishad at '20'.

However, the **Carnatic traditions seem to have adopted the Dattila's school. As per this School, the 'swara zone' is pre-eminent;** therefore, 'swara-sthaana' follows the 'swara zone'. In this system, 'Sadjā' (Tonic) is assigned at the reference swara-sthaana of '0' in the octave. The swara-zone of 'Rishabh' commence from '0' and terminates at '3.00' (i.e. at 164 cents or 3 srutis above the Tonic). Therefore, Rishabh is assigned the swara-sthaana of '3'. Then, the Gandhar swara-zone commences from position '3.00' and terminates at '5.00' (i.e. at 273 cents above the Tonic) which is the 'swara-sthaana' assigned for 'Gandhar'. Thereafter, the swara-zone of Madhyam commences from position '5.00' and terminates at '9.00' (i.e. at 491 cents above the Tonic) which is the 'swara-sthaana' for 'Madhyam'. The swara-zone of 'Pancham' commences from '9.00' and terminates at '13.00' (i.e. at 709 cents above the Tonic) which is the 'swara-sthaana' assigned for 'Pancham'. The swara-zone of 'Dhaivat' commences from '13.00' and terminates at '16.00' (i.e. at 872 cents above the Tonic) which is the 'swara-sthaana' for 'Dhaivat'. The swara-zone of 'Nishad' start from '16.00' and terminates at '18.00' (i.e. at 981 cents above the Tonic) which is the 'swara-sthaana' assigned for 'Nishad'. The swara-zone of Sadjā (octave) commences from '18.00' and terminates at '22.00'/'0.00' (i.e. at 1200 cents above the Tonic) which is the 'swara-sthaana' for 'Sadjā' (Octave). That's how when Shri. Venkatamakhin of the Carnatic traditions formulated the new Mela Karta scheme during the 17th century A.D., he assigned the positions: Sadjā- 0.00, Suddha Rishabha- 3.00 (164 cents), Suddha Gandhara- 5.00 (273 cents), Suddha Madhyama- 9.00 (491 cents), Panchama- 13.00 (709 cents), Suddha Dhaivata- 16.00 (872 cents), Suddha Nishada- 18.00 (981 cents) and back to Sadjā (Octave)- 22.00/0.00 (1200 cents).

However, it is noticed that contemporary Indian musicological traditions have modified their swara sthaanas in favour of the ancient Greek 'Pythagorean' system during the 20th century (*which is based on the Western concept of 'fractions'*), by discarding the age-old Indian concept of 'srutis'. (*There is no 'precedence' anywhere in the Indian musicological literature for the employment of 'fractions' in place of 'srutis' in this manner and therefore, this development had come, in fact, as a "change without Sanctions"!*).

Therefore, the viewers may observe that in the Carnatic traditions, sthaanas for the Suddha swaras are found modified as: Suddha Rishabha- $256/243$, i.e. an equivalent of 1.65 srutis (approx 90 cents), Suddha Gandhara- $9/8$, i.e. an equivalent of 3.74 srutis (approx 204 cents), Suddha Madhyama- $4/3$, i.e. an equivalent of 9.13 srutis (approx 498 cents), Panchama- $3/2$, i.e. an equivalent of 12.87 srutis (approx 702 cents), Suddha Dhaivata- $128/81$, i.e. an equivalent of 14.52 srutis (approx 792 cents) and Suddha Nishada- $27/16$, i.e. an equivalent of 16.61 srutis (approx 906 cents).

Similarly, the Shastriya Sangeet had modified their age-old sruti-sthaanas into swara-sthaanas based on 'Just Intonation' models. Their modified swaras are: Shudh

Rishabh- $9/8$, i.e. an equivalent of 3.74 srutis (approx 204 cents), Shudh Gandhar- $5/4$, i.e. an equivalent of 7.08 srutis (approx 386 cents), Shudh Madhyam- $4/3$, i.e. an equivalent of 9.13 srutis (approx 498 cents), Pancham- $3/2$, i.e. an equivalent of 12.87 srutis (approx 702 cents), Shudh Dhaivat- $27/16$, i.e. an equivalent of 16.61 srutis (approx 906 cents) and Shudh Nishad- $15/8$, i.e. an equivalent of 19.95 srutis (approx 1088 cents).

Swara-sthaanas other than those of the seven ‘Shudh srutis’ were described as ‘Vikrta’ swaras (i.e. *artificially synthesized by humans by ‘sharpening’/ ‘flattening’ the Shudh swara-sthaanas*). ‘Vikrta’ also means ‘deformed’.

The Carnatic tradition attempted to synthesize vikrta swaras by ‘sharpening’ the Suddha swara-sthaanas. For example, the Suddha Rishabha located ‘3’ srutis (approx 164 cents) above the Tonic was ‘sharpened’ by one sruti to obtain the ‘Chatur-Sruti Rishabha’ (i.e. at ‘4’ srutis or 218 cents) and ‘sharpened’ further by two srutis to obtain the ‘Shad-Sruti Rishabha’ (i.e. at ‘6’ srutis or 327 cents). Although, while doing so, the sharpened swara-sthaana of Rishabha intruded into the swara zone of Suddha Gandhara, such a process of evolving Vikrta swaras were accepted by the medieval Carnatic musicologists.

On the contrary, **Shastriya Sangeet traditions attempted to synthesize vikrta swaras by ‘flattening’ the Shudh swara-sthaanas.** For example, Shudh Rishabh located ‘4’ srutis (i.e. at 218 cents) above the Tonic was ‘flattened’ by one sruti to obtain the ‘Komal Rishabh’ (i.e. ‘3’ srutis / 164 cents). Such flattened Rishabh swara again intruded into the sruti zone assigned for Sadja; however, this process got the approval from their musicologists too!

In these processes, there were two major aberrations: firstly, the vikrta srutis intruded into the swara zones of other Shudh swaras; secondly, such inflexions (i.e. sharpening / flattening) were only ‘approximate’ because **no one knew the measure of one or two srutis in “quantified” terms.**

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