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Visharad Pratham Theory

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Theory: Written Exam Paper # 2: Chapter 1:

Mathematical construction of seventy two Mel (Thaat) by Vyankatmakhi

Pandit Vyankatmakhi's research work gave a well a defined structure to South Indian Classical music. He was also known with two other names: Vyankataadhvaree and Vyankateshvar Deekshit. His father's name was Govind Deekshit and mother's name was Naagamaambaa. His older brother was Naaraayan Deekshit. His whole family was ascetic and followed religious traditions.

Vyankatmakhi wrote a treatise called 'Chaturdandiprakaashikaa' around year 1620. King of Tanjaavar, King Achyut Vijayraaghav Naayak (Ruled 1614 – 1672) inspired him to write. Vyankatmakhi was an expert scientist and specialized in scholarly investigations. He published many scholarly documents including 'analysis of Kumaaril Bhatt commentary', 'RaagLakshan' and 'RaagLakshan Geet'.

1. Vyankatmakhi systematically and mathematically calculated how many raag can be created with existing swar. Along with seven notes in a Saptak, he added a Shadja in taar saptak, which has frequency twice that of Madhya saptak Shadja at bottom. This makes the total notes to be eight.
2. Out of all shuddha and vikrut swar, Vyankatmakhi proposed three types of notes for (Re ,Ga ,Dha,Ni).

Vyankatmakhi assumed following swar in a saptak:

	South Indian Swar	Vyankatmakhi's swar	North Indian Swar	Swarlipi
1	Shadja	Shadja	Shadja	Sa
2	Shuddha Rishabh	Shuddha Rishabh	Komal Rishabh	Re
3	Shuddha Gaandhaar	Chatuhshruti Rishabh	Shuddha Rishabh	Re
4	Saadhaaran Gandhaar	Shatshruti Rishabh	Komal Gandhaar	Ga
5	Antar Gandhaar	Antar Gandhaar	Shuddha Gandhaar	Ga
6	Shuddha Madhyam	Shuddha Madhyam	Shuddha Madhyam	Ma
7	Prati Madhyam	Prati Madhyam	Teevra Madhyam	Ma⁄
8	Pancham	Pancham	Pancham	Pa
9	Shuddha Dhaivat	Shuddha Dhaivat	Komal Dhaivat	Dha
10	Shuddha Nishaad	Chatuhshruti Dhaivat	Shuddha Dhaivat	Dha
11	Kaishik Nishaad	Shatshruti Dhaivat	Komal Nishaad	Ni
12	Kaakali Nishaad	Kaakali Nishaad	Shuddha Nishaad	Ni

From these swar, remove teevra madhyam (Ma) and add Shadja from taar saptak ($\dot{Sa}$). This makes total number of swar to be 12. Divide these into two parts.

1. From bottom shadja to madhyam. This half will have six swar ($Sa\ R\underset{\smile}{e}\ Re\ G\underset{\smile}{a}\ Ga\ Ma$)
2. From pancham to taar shadja. This half will have six swar ($Pa\ Dh\underset{\smile}{a}Dha\ N\underset{\smile}{i}\ Ni\ \dot{Sa}$)

(Sa ,Pa) are Achal or immovable and do not become vikrut (komal or teevra). According to rules of Thaat, Thaat has swar in straight successive order and thaat always has seven swar. Keeping these rules in mind, from parts 1 and 2 above, first and second half of thaat is obtained respectively.

	Poorva Mellardha (First half of thaat or mel)		Uttar Mellardha (Second half of thaat or mel)
1	Sa R̥e Re Ma	1	Pa Dh̥aDha S̊a
2	Sa R̥e Ga Ma	2	Pa Dh̥a N̥i S̊a
3	Sa R̥e Ga Ma	3	Pa Dh̥aNi S̊a
4	Sa Re Ga Ma	4	Pa Dha N̥i S̊a
5	Sa Re Ga Ma	5	Pa DhaNi S̊a
6	Sa G̥a Ga Ma	6	Pa N̥iNi S̊a

Each first half will be connected to each second half to make one full thaat. Hence mathematically, 6 X 6 = **36 thaat will be created**. Each of these thaat has a shuddha madhyam. When you replace this shuddha madhyam in each thaat with a teevra madhyam, 36 more unique thaat will be created. Hence Vyankatmakhi calculated 36+36 = 72 thaat.

Each one of these 72 thaat is unique. These are called 'Melkarta'. It can be proven that any raag will definitely originate from one of these thaat. Raag is a child (janya) and thaat is a parent (janak).

Even so, these thaat are created using mathematics. The raag that originate from these thaat have their own rules, such as, raag has to be entertaining. Hence, all that are not used in practice. Pandit Vyankatmakhi himself only accepted only nineteen thaat (example: Seenharav). These nineteen thaat are still in use in south India.

North Indian Thaat Paddhati (Thaat method)

Vyankatmakhi's thaat or mel paddhati cannot be used as it is in North Indian classical music. Pandit Bhatkhande ji was very impressed with Pandit Vyankatmakhi's mel paddhati and he thought about it through many angles to use it in North Indian classical music. In the above 72 thaat, there are many thaat that have two forms of same swar in a row (komal and shuddha), which is not permitted in a raag in North Indian classical music (Exceptions: raag Lalit, Jog, Malhar etc.). With this rule, each part will have only four swar clusters in each half thaat above. Hence total number of thaat available will be 4 X 4 = 16 with shuddha Madhyam + 16 more with teevra madhyam = 32 thaat. Hence Pandit Bhatkhande ji concluded that total 32 thaat will be available for North Indian classical music. From thses 32 thaat, more cuts were imposed and total 10 thaat remained, which are still in use world over.

	Thaat	Number of vikrut swar	Swar
			Pandit Bhatkhande Thaat Paddhati
1	Bilaaval	None	All swar shuddha
2	Kalyaan	One	Madhyam teevra
3	Khamaaj	one	Two Nishaad (Komal and shuddha)
4	Kaafee	Two	Gandhaar and Nishaad komal
5	Bhairav	Two	Rishabh and Dhaivat komal
6	Maarvaa	Two	Rishabh komal, Madhyam teevra
7	Aasaavaree	Three	Gandhaar, Dhaivat and Nishaad komal
8	Poorvee	Three	Rishabh, Dhaivat komal, Madhyam teevra
9	Todi	Four	Rishabh, Gandhar, Dhaivat komal, Madhyam teevra
10	Bhairavee	Four	Rishabh, Gandhar, Dhaivat, Nishaad komal

Pandit Bhatkhande ji explained thaat/raag classification in one of his compsotions. The lyrics describe raag characteristics this way:

1. Yaman, Bilaaval and Khamaaj have (Re Ga Dha) shuddha.
2. Bhairav, Poorvee, Maarvaa are 'Sandhiprakaash (twilight)' raag. Twilight is when day turns into night and also when night turns into day.
3. Kaafee, Aasaavaree and Bhairavee have (Ga Ni) komal.
4. Todi thaat has mixed character.

Based on these 10 thaat, other raag are born. Hence these raag are called 'Aashray' or shelter raag of the thaat that has the same name.