



# Graha bhedom

**Graha Bhedom** in Carnatic music is the process (or result of the process) of shifting the Tonic note (*śruti*) to another note in the rāgam and arriving at a different rāgam. Its equivalent in Hindustani classical music is called a *murchhana*. Expressed in Western music theory terms, this is the process of arriving at a different scale by shifting to another mode in the key, i.e, modulation.

*Graha* literally means *position* and *Bhedam* means *change*. Since the position of the *śruti* is changed (pitch of the base note or drone), it is also sometimes called **Swara Bhedom** or **Śruti Bhedom** though *Śruti Bhedom* and *Graha Bhedom* have some technical differences.<sup>[1]</sup>

## Definition

Modal shift of the Tonic note to higher notes of a rāgam, while retaining the note's positions (*swara sthānas* – *sthāna* means position/ pitch), results in different rāgams. This is called *Graha Bhedom*.

### Practical demo

A simple practical demonstration of *Graha Bhedom* can be taken up by playing the structure of a rāgam with the drone set to Sa (*Shadjamam*). Then if we keep playing the same keys/ notes, while shifting the drone to another note in the rāgam, to form the new *śruti*/ tonic note, the result is a different rāgam.

### Example Illustration

When *Graha bhedom* is applied on *Shankarabharanam*'s notes, it yields 5 other major *Melakarta* rāgams, namely, *Kalyani*, *Hanumatodi*, *Natabhairavi*, *Karaharapriya* and *Harikambhoji*.

Rāgam	Mela #	Śruti Tonic	C	D	E	F	G	A	B	C	D	E	F	G	A	B	C
<i>Shankarabharanam</i>	29	C	S	R2	G3	M1	P	D2	N3	S'	R2'	G3'	M1'	P'	D2'	N3'	S'
<i>Karaharapriya</i>	22	D		S	R2	G2	M1	P	D2	N2	S'						
<i>Hanumatodi</i>	08	E			S	R1	G2	M1	P	D1	N2	S'					
<i>Kalyani</i>	65	F				S	R2	G3	M2	P	D2	N3	S'				
<i>Harikambhoji</i>	28	G					S	R2	G3	M1	P	D2	N2	S'			
<i>Natabhairavi</i>	20	A						S	R2	G2	M1	P	D1	N2	S'		
Invalid <i>Melakarta</i>	–	B							S	R1	G2	M1	M2	D1	N2	S'	
<i>Shankarabharanam</i>	29	C	S	R2	G3	M1	P	D2	N3	S'	R2'	G3'	M1'	P'	D2'	N3'	S'

#### Notes on above table

- C as the base for *Shankarabharanam* is chosen for above illustration only for convenience, as Carnatic music does not enforce *strict* frequency/pitch structure. The *Shadjam* (S) is fixed by the artist as per the vocal range or the instrument's tonic note. All the other *swarams* are relative to this *Shadjam*, falling into a Geometric progression-like frequency pattern. This note is applicable to all tables that are illustrated further below in this page.
- The 6th *Graha Bhedom* of *Shankarabharanam* has both *Madhyamams* (Ma) and no *Panchamam* (Pa) and hence will not be considered a valid *Melakarta* (ragam having all 7 swarams and only 1 of each). This is only a classification issue with respect to *Melakarta*, while this structure could be theoretically used well to create good music. Hindustani classical raga Lalit has 2 Ma and no Pa, however it has different Ga and Ni than this structure
- The gaps in the above table are for the missing *swara* positions in these ragams, which happens to be the Sharp / Flat notes in western music.
- The 6 Melakarta ragams in above table in graha bhedom are equivalent to the western Major Scale (Ionian mode) and it's 5 consequent modes with the exception of 7th mode (Locrian) as it doesn't correspond to any valid Melakarta ragam.

## Melakarta Rāgams

*Graha Bhedom* can be applied on most *Melakarta* rāgams to yield other *Melakarta* rāgams (16 of the 72 do not yield any valid *Melakarta* scale). When applying such modal shift of tonic note, some results are not valid *Melakarta* rāgams (rules of the definition of *Melakarta* are violated). Example scenarios are missing *Panchamam* (Pa) or two of particular note (*Rishabham* (Ri), *Gandharam* (Ga), *Madhyamam* (Ma), *Dhaivatam* (Da) or *Nishadam* (Ni)).

### Shankarabharanam

See [Example Illustration](#) in previous section.

### Kanakangi

The *Graha Bhedom* derivative of *Kanakangi* is *Kamavardhini* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D
<i>Kanakangi</i>	01	S	R1	G1			M1		P	D1	N1			S'	R1'	G1'
<i>Kamavardhini</i>	51		S	R1			G3		M2	P	D1			N3	S'	

### Mayamalavagowla

The *Graha Bhedom* derivatives of *Mayamalavagowla* are *Rasikapriya* and *Simhendramadhyamam*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
<i>Mayamalavagowla</i>	15	S	R1			G3	M1		P	D1			N3	S'	R1'			G3'	M1'
<i>Rasikapriya</i>	72		S			R3	G3		M2	P			D3	N3	S'				
<i>Simhendramadhyamam</i>	57						S		R2	G2			M2	P	D1			N3	S'

### Ragavardhini

The *Graha Bhedom* derivative of *Ragavardhini* is *Varunapriya* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
<i>Ragavardhini</i>	32	S			R3	G3	M1		P	D1		N2		S'			R3'	G3'	M1'
<i>Varunapriya</i>	24						S		R2	G2		M1		P			D3	N3	S'

### Vachaspati

The *Graha Bhedom* derivatives of *Vachaspati* are *Charukesi*, *Gourimanohari* and *Natakapriya*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F		G		A
<i>Vachaspati</i>	64	S		R2		G3		M2	P		D2	N2		S'		R2'		G3'		M2'	P'		D2'
<i>Charukesi</i>	26			S		R2		G3	M1		P	D1		N2		S'							
<i>Gourimanohari</i>	23								S		R2	G2		M1		P		D2		N3	S'		
<i>Natakapriya</i>	10									S	R1		G2		M1		P		D2	N2			S'

### Shanmukhapriya

The *Graha Bhedom* derivatives of *Shanmukhapriya* are *Shoolini*, *Dhenuka* and *Chitrambari*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F		G		A
Shanmukhapriya	56	S		R2	G2			M2	P	D1		N2		S'		R2'	G2'			M2'	P'	D1'	
Shoolini	35				S			R3	G3	M1		P		D2		N3	S'						
Dhenuka	09								S	R1		G2		M1		P	D1			N3	S'		
Chitrambari	66									S		R2		G3		M2	P			D3	N3	S'	

## Keeravani

The *Graha Bhedom* derivatives of *Keeravani* are *Hemavati*, *Vakulabharanam* and *Kosalam*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F		G		A
Keeravani	21	S		R2	G2		M1		P	D1			N3	S'		R2'	G2'		M1'		P'		D1'
Hemavati	58						S		R2	G2			M2	P		D2	N2		S'				
Vakulabharanam	14								S	R1			G3	M1		P	D1		N2		S'		
Kosalam	71									S			R3	G3		M2	P		D2		N3		S'

## Ratnangi

The *Graha Bhedom* derivatives of *Ratnangi* are *Gamanashrama* and *Jhankaradhwani*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
Ratnangi	02	S	R1	G1			M1		P	D1		N2		S'	R1'	G1'			M1'
Gamanashrama	53		S	R1			G3		M2	P		D2		N3	S'				
Jhankaradhwani	19						S		R2	G2		M1		P	D1	N1			S'

## Ganamurti

The *Graha Bhedom* derivatives of *Ganamurti* are *Vishwambari* and *Shamalangi*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
Ganamurti	03	S	R1	G1			M1		P	D1			N3	S'	R1'	G1'			M1'
Vishwambari	54		S	R1			G3		M2	P			D3	N3	S'				
Shamalangi	55						S		R2	G2			M2	P	D1	N1			S'

## Vanaspati

The *Graha Bhedom* derivative of *Vanaspati* is *Mararanjani* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
Vanaspati	04	S	R1	G1			M1		P		D2	N2		S'	R1'	G1'			M1'
Mararanjani	25						S		R2		G3	M1		P	D1	N1			S'

## Manavati

The *Graha Bhedom* derivative of *Manavati* is *Kantamani* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
Manavati	05	S	R1	G1			M1		P		D2		N3	S'	R1'	G1'			M1'
Kantamani	61						S		R2		G3		M2	P	D1	N1			S'

## Sooryakantam

The *Graha Bhedam* derivatives of *Sooryakantam* are *Senavati* and *Latangi*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
<i>Sooryakantam</i>	17	S	R1			G3	M1		P		D2		N3	S'	R1'			G3'	M1'
<i>Senavati</i>	07					S	R1		G2		M1		P	D1	N1			S'	
<i>Latangi</i>	63						S		R2		G3		M2	P	D1			N3	S'

## Kokilapriya

The *Graha Bhedam* derivative of *Kokilapriya* is *Rishabhapriya* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
<i>Kokilapriya</i>	11	S	R1		G2		M1		P		D2		N3	S'	R1'		G2'		M1'
<i>Rishabhapriya</i>	62						S		R2		G3		M2	P	D1		N2		S'

## Gayakapriya

The *Graha Bhedam* derivative of *Gayakapriya* is *Dhatuwardani* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D
<i>Gayakapriya</i>	13	S	R1			G3	M1		P	D1	N1			S'	R1'	
<i>Dhatuwardani</i>	69		S			R3	G3		M2	P	D1			N3	S'	

## Dharmavati

The *Graha Bhedam* derivatives of *Dharmavati* are *Chakravakam* and *Sarasangi*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F		G
<i>Dharmavati</i>	59	S		R2	G2			M2	P		D2		N3	S'		R2'	G2'			M2'	P'
<i>Chakravakam</i>	16			S	R1			G3	M1		P		D2	N2		S'					
<i>Sarasangi</i>	27								S		R2		G3	M1		P	D1			N3	S'

## Hatakambari

The *Graha Bhedam* derivative of *Hatakambari* is *Gavambhodi* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
Hatakambari	18	S	R1			G3	M1		P			D3	N3	S'	R1'			G3'	M1'
Gavambhodi	43					S	R1		G2			M2	P	D1	N1			S'	

## Naganandini

The *graha bhedam* derivatives of *Naganandini* are *Bhavapriya* and *Vagadheeshwari*.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F		G
Naganandini	30	S		R2		G3	M1		P			D3	N3	S'		R2'		G3'	M1'		P'
Bhavapriya	44					S	R1		G2			M2	P	D1		N2		S'			
Vagadheeshwari	34								S			R3	G3	M1		P		D2	N2		S'

## Gangeyabhooshani

The *graha bhedom* derivative of *Gangeyabhooshani* is *Neetimati* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E	F
<i>Gangeyabhooshani</i>	33	S			R3	G3	M1		P	D1			N3	S'			R3'	G3'	M1'
<i>Neetimati</i>	60						S		R2	G2			M2	P			D3	N3	S'

## Chalanata

The *graha bhedom* derivative of *Chalanata* is *Shubhapantuvarali* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E
<i>Chalanata</i>	36	S			R3	G3	M1		P			D3	N3	S'			R3'	G3'
<i>Shubhapantuvarali</i>	45					S	R1		G2			M2	P	D1			N3	S'

## Shadvidamargini

The *graha bhedom* derivative of *Shadvidamargini* is *Nasikabhooshani* and vice versa.

Rāgam	Mela #	C		D		E	F		G		A		B	C		D		E
<i>Shadvidamargini</i>	46	S	R1		G2			M2	P		D2	N2		S'	R1'		G2'	
<i>Nasikabhooshani</i>	70				S			R3	G3		M2	P		D2	N2		S'	

## Janya rāgams

*Graha bhedom* can be applied to some of the *janya* rāgams to yield other *janya* rāgams. Unlike *Melakarta* rāgams, where strict rules are adhered to, in terms of which *swaras* can be chosen in a rāgam, *janya* rāgams do not have such rules. Hence, such modal shift of tonic note is valid on all *swaras*, but may not have been chosen as a rāgam, experimented with, elaborated and composed with. Hence they lead to theoretical rāgams, which have not yet been discovered (all combinations of notes exist, but one may never have been used or exposed to the world at large).

## Mohanam

*Mohanam* rāgam and its *graha bhedom* derivatives are one of the key scales in use all over the world, especially East and South Asia. The other four derivatives are *Hindolam*, *Shuddha Saveri*, *Shuddha Dhanyasi* and *Madhyamavathi*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D		E	F		G		A		B	C
<i>Mohanam</i>	C	S		R2		G3			P		D2			S'		R2'		G3'			P'		D2'			S'
<i>Madhyamavathi</i>	D			S		R2			M1		P			N2		S'										
<i>Hindolam</i>	E					S			G2		M1			D1		N2		S'								
<i>Shuddha Saveri</i>	G								S		R2			M1		P		D2			S'					
<i>Shuddha Dhanyasi</i>	A										S			G2		M1		P			N2		S'			
<i>Mohanam</i>	C													S		R2		G3			P		D2			S'

**Notes** on above table

- C as the base for *Mohanam* is chosen for above illustration only for convenience, as Carnatic music does not enforce *strict* frequency/note structure. The *Shadjam* (S) is fixed by the artist as per the vocal range or the instrument's tonic note. All the other *swarams* are relative to this *Shadjam*, falling into a Geometric progression-like frequency pattern. This note is applicable to all tables that are illustrated further below.
- The gaps in the above table are for the missing *swara* positions in these ragams, which happens to be the Sharp and Flat notes along with F and B notes, in western music.

- If a Sharp / Flat key is chosen as tonic note and ONLY the black keys are played in a piano/ organ/ keyboard/ harmonium, then these 5 are the ragams played successively. That is if you have only black keys, with tonic note from C#, it is *Shuddha Saveri*. From D# it is *Udayaravichandrika*, from F# it is *Mohanam*, from A-flat it is *Madhyamavathi* and from B-Flat it is *Hindolam*.
- This statement is true for simplified ragam structure only. Ragams though are more complex in that there are phrases to use and phrases to avoid, *gamakas*, elongation of notes, a specific mood/ bhava/ *rasa* to be evoked while singing/ playing, etc. These cannot be captured well in scientific notations.

## Shivaranjani

*Shivaranjani* rāgam and its *Graha Bheda* derivatives are *Revati* and *Sunadavinodini*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D	
<i>Shivaranjani</i>	C	S		R2	G2				P		D2			S'		R2'	G2'
<i>Revati</i>	D			S	R1				M1		P			N2		S'	
<i>Sunadavinodini</i>	D#				S				G3		M2			D2		N3	S'

**Notes** on above table

- The difference between this set and *Mohanam* set shown above it, is that the 3rd note differs between E and D# (reference note purpose only). Hence, *Shivaranjani* differs from *Mohanam* by one note – G2 in place of G3, *Revati* differs from *Madhyamavathi* by one note – R1 in place of R2, while *Sunadavinodini* differs from *Hindolam* in all notes other than S (as that step is equivalent of shifting down tonic note, Sa, by one note while retaining all other notes of *Hindolam*).

## Hamsadhwani

*Hamsadhwani* rāgam and its *graha bheda* derivative is *Nagasvaravali*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D		E	F		G
<i>Hamsadhwani</i>	C	S		R2		G3			P				N3	S'		R2'		G3'			P'
<i>Nagasvaravali</i>	G								S				G3	M1		P		D2			S'

## Abhogi

*Abhogi* rāgam and its *graha bheda* derivative is *Valaji*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D		E	F
<i>Abhogi</i>	C	S		R2	G2		M1				D2			S'		R2'	G2'		M1'
<i>Kalāsāveri</i>	D			S	R1		G2				P			N2		S'	R1'		G2'
<i>Valaji</i>	F						S				G3			P		D2	N2		S'

## Amritavarshini

*Amritavarshini* rāgam and its *graha bheda* derivative is *Karnataka Shuddha Saveri*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D		E	F
<i>Karnataka Shuddha Saveri</i>	C	S	R1				M1		P	D1				S'	R1'				M1'
<i>Amritavarshini</i>	C#		S				G3		M2	P				N3	S'				G3'

## Gambhiranata

*Gambhiranata* rāgam and its *graha bheda* derivative is *Bhupalam*.

Rāgam	Śruti Tonic	C		D		E	F		G		A		B	C		D		E	F
Gambhīranata	C	S				G3	M1		P				N3	S'				G3'	M1'
Bhupalam	E					S	R1		G2				P	D1				S1	R1'
Hamsanadam	F						S		R2				M2	P				N3	S