

## Ancient Science of India 8: 'Y' Chromosome of Human Beings: The *Gotra* Factor of Vedic Indians

Sachidananda Padhy

Vedic Science Research Centre, Bhaba Nagar 1, Brahmapur 760 004, Odisha, India  
E-mail: sachi\_padhy@rediffmail.com

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**ABSTRACT** Ancient Indians were aware of the male human genetic factor, the 'Y' chromosome of modern science. It is designated as *Gotra*, the name of the original sage who was the primary father of the first family. Females do not enjoy a specific *Gotra*, as it changes after their marriage from their paternal lineage to their in-laws'.

### INTRODUCTION

Vedic age Indians were aware of genetic traits (Padhy 2010). In the Indian scenario, the four-fold classification of the society is very much misunderstood and misinterpreted (Murty 1994). It is belittled as a source to propagate caste and class heartedness. Saint Manu (the formulator of epic Manusmruti (MS) is blamed for the presentation of *Chaturvarna* (four-fold) classification. In fact the four-fold classification is based on *Guna* and *Karma* a natural phenomenon (MS I/87-91) and attributed to divine creation in Gita (4/13).

*Gun*as (quality) are the property and essence of all things. The variegated arrangement of the *Gun*as accounts for all the diversified manifestations of the nature. The existence of nature cannot be realised in the absence of the *Gun*as.

Similarly, *Karma* means 'to do, perform or action', which obeys the organic laws of cause and effect, which is neither arbitrary nor whimsical. As one sows, he reaps accordingly. The power of the *Gun*as indulges someone to perform *Karma*, the resultant action. Every living being is helplessly driven to action (*Karma*) by nature born qualities (*Guna*), which is the basis of four-fold classification (Padhy 2014).

Genetic studies (pattern of 'Y' chromosome inheritance) on 250 individuals from different castes (*Varnas*) have shown that men have tended to remain within the caste in which they are born. On the other hand, mtDNA pattern of closely related castes show that women have been socially more mobile than men, moving up in the social ladder by marrying to castes higher than their own. All these work support the genetic relevance of *Chaturvarna* classification (Bamshad et al. 1996, 1998).

The aim of the present communication is to explore the relation between the human 'Y' chromosome and *Gotra* of a person.

### METHODOLOGY

This study was carried out following the literary research methodology in ethno-biological research techniques (Padhy et al. 2015).

### OBSERVATIONS AND DISCUSSION

#### Social Importance of *Gotra*

In India, every family carries a specific surname as per the concept of binomial nomenclature system of Manu (Mohapatra et al. 2001). In addition to name and surname each family has a *Gotra*. The *Gotra* is the name of the original sage or ancestor who gave name to a family being the primary father. The *Gotra* marker of any person (taxon) is equal with the genetic concept of biology and associated with him in every daily rituals of life performed from birth to death and posthumously (*Shraadh*) afterwards. From social point of view, one is expected to announce their *Gotra* while introducing themselves, in addition to their name, father's name, birthplace and profession, if necessary.

In marriage rituals, at the time of *Hastagrathi* (joining the hands of the couple) the priests loudly pronounce (three times) the *Gotra* and names of forefathers up to three generations of the bridegroom and bride. This announcement is to make the public and relatives clearly aware that the marriage is not within *Sapinda* (same *Gotra*) kins.

### Prohibition of Intra-Gotra Marriage

The marriage with a damsel who is a *Sapinda* (relative on the mother's side or belongs to the same *Gotra* on the father's side) is prohibited in Manusmriti (MS) as follows:

The damsel should not be a close relative (*Sapinda*) on the mother's side, nor belong to the same family on the father's side (MS III/5).

*A Wiseman should not accept as his wife to any of these three:*

*Daughter of his father's sister;*

*Daughter of his mother's sister;*

*Daughter of his mother's brother.*

(Because they are *Sapinda* relatives)

*He who marries any one of them sinks low* (MS XI/172,173)

This shows that marriage in blood relations was prohibited, which is true from a genetic point of view as traced out by modern science.

In all these above cases the source of autosomes and 'X' chromosome of the boy and girl remains same. In certain Indian communities, the daughter of the maternal uncle is considered to be the first choice as bride, as well the uncle himself gets married to the daughter of his own sister. All these abnormalities have come up due to different social factors, and are not at par with the Vedic concept.

The concept of *Gotra* is applicable to a male person only while in case of females she adopts the *Gotra* of her in-laws after marriage. Since her *Gotra* changes its integrity, it seems to be meaningless for a female. Before marriage she was in her father's *Gotra* and after marriage of in-laws'. However, she acts as a genetic bridge between two families (clans). As observed by the author, similar *Gotra* are found among different castes (*Varna*), which indicates the origin of *Gotra* before *Varna* division of society. Even the pronunciation of surnames gets changed within the human community. For example, Pandaa, Paanda, Pandi, Pandit, Pandiya and Pandian, or sometimes the same surname is used in different castes.

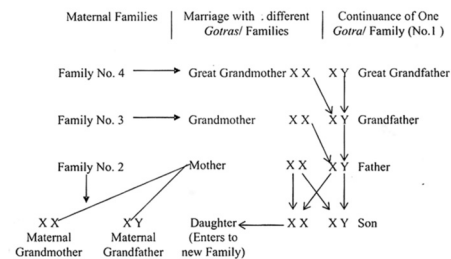
The *Gotra* concept from modern genetic point aims towards the male factor 'Y' chromosome that remains unaffected through generations. In contrast the autosomes and 'X' chromosome gets admixed in every new marriage (Fig. 1). May be the ancient Indians were not aware of the modern chromosome theory, but were conscious of some factor responsible to determine the sex of a child as well genetic inheritance through sex chromosomes.

### Conjugal Union for Desirable Offspring

Manusmriti says (Buhler 1886):

Sixteen (days and) nights (in each month), including four days (of menstrual period) differ from the rest and are censured by the virtuous (are called) the natural season (*Rootu Kaala*: ovulation period) of a woman (III/46). It is evident that the ancient Indians were conscious of the ovulation period. But among these the first four, the eleventh and the thirteenth are declared to be forbidden (for conjugation), and the remaining nights are recommended (III/47). On the even nights (counted from the occurrence of menstrual date, that is, 6,8,10,12, 14 and 16) sons are conceived and daughters on the uneven ones (5, 7, 9 and 15). Hence a man that desires to have sons should approach his wife in due season on the even nights. This version gives the clue that the body physiology of the women controls the triggering of fertilisation activity by the X or Y chromosome bearing sperms on specific nights.

A male child is produced by a greater quantity of male seed, a female child by the prevalence of the female, if (both are) equal, a hermaphrodite or a boy or girl, and if (both are) weak or deficient in quantity, a failure of conception (results) (III/49). The male seed and female seed refer to triggering activity of Y and X bearing sperms, respectively. The hermaphrodite is a product of an inter-sexual condition and the boy and girl refers to Klinefelter's syndrome (XXY chromosomes) and Turner's syndrome (simple X chromosome) respectively, due to abnormal fertilisation. Scanty sperm (deficit sperm count) usually leads to failure of conception.



**Fig. 1. The secured flow of Y chromosome (the *Gotra* factor) and admixing of X chromosome and Autosomes in a family (No. 1) in succeeding generations (Mother, Grandmother, Great Grandmother are from different families (No. 2, 3, 4) come with new set of Autosomes and X chromosomes received from their respective maternal sources) (Padhy 2010)**

**Sex Chromosome Determines Varnassankar Status**

In Indian society Braahmana (BRA), Kshatriya (KSH), Vaissya (VAI) and Ssudra (SUD) are considered pure line *Varnas* arranged on the trend of superiority. The children of such parents, in the direct order of wedded wives, equal in caste as their parents. The mixed origin (*Varnassankaras*) resulted out of males of higher *Varna* on females of lower *Varna* are considered *Anuloma*, and out of females of higher *Varna* and males of lower *Varna* considered *Pratiloma*, the former being considered superior socially than the later. However any *Varnassankara*, either *Anuloma* or *Pratiloma* is considered as lower social status than the parents.

*Varnassankara* up to three steps lower were included in the society with an occupation different than their parents, except the one step lower *Anuloma* all most possessed an occupation similar to father. Probably it is a chance given to conserve themselves to avoid further lowering. The eugenic concept of ancient Indians was discussed elsewhere (Padhy 2010) where the elimination of *Anuloma* *Varnassankar* character through suitable backcrossing with respective males of higher *Varna* as suggested in *Manusmriti* (X/64,65) is elaborated. *Bhagavadgita* (I/41-44) has also not encouraged the production of *Varnassankaras* and focused over the bad consequences of the society.

*Manusmriti* says:

“If (a female of the caste) sprung from a Braahmana male and Sudra female, bear (children) to one of the highest caste, the inferior (tribe) attain the highest caste within seventh generation” (X/64) (Buhler 1886).

In this process, up to the 6<sup>th</sup> generation, the male offsprings (XY) are ignored and female (XX) are married to pure breed Braahmana males in each generation. On the 7<sup>th</sup> generation both male and female are declared as Braahmana. This philosophy of Manu clearly focuses on the concept of genetic conservation of male offsprings (they are rejected) and mobility of genetic mental through females as suggested by Bamshad et al. (1996).

Other two interesting examples is presented in *Manusmriti* (X/19) where the interaction between *Anulomas* and *Pratilomas* leads to still lower products such as:

1. The interaction product of BRA male and VAI, female is *Anuloma* ‘Amboshtha’ and the

reverse BRA female and VAI male product is *Pratiloma* ‘Vaideha’.

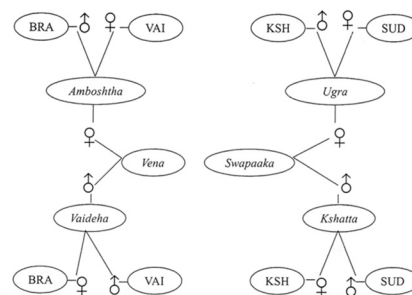
2. Similarly KSH male + SUD female = ‘Ugra’ and SUD male + KSH female = ‘Swapaaka’.

Chances of marriage between ‘Amboshtha’ and ‘Vaideha’ and ‘Ugra’ and ‘Swapaaka’ are more because of similarity of parental sources. However, the products will be still lower like ‘Vena’ (lives by drum beating) in the former and ‘Swapaaka’ (equivalent as that of ‘Chandaala’) in the latter case. It is to be noted that ‘Amboshtha’ and ‘Vaideha’ are included in Aaryan Society while, ‘Vena’ and ‘Swapaaka’ are considered as outcast. The role of sex chromosomes in such inheritance is clear (Fig. 2).

It can be marked that in both the cases (Fig. 1) the *Varnassankar* boy and girl prefer to marry the counterpart of the lower cast parent but not higher cast. Such as, ‘Amboshtha’ girl (Mother VAI) + ‘Vaideha’ boy (Father VAI) and ‘Ugra’ girl (Mother SUD) + (‘Kshatta’ boy (Father SUD), while the ‘Amboshtha’ boy (Father BRA), ‘Vaideha’ girl (Mother BRA), ‘Ugra’ boy (Father KSH) or ‘Kshata’ girl try to maintain their social integrity being the same sex of their higher cast parents.

**Prabara an Extraordinary Source of ‘Y’ Chromosome**

In addition to *Gotra*, each family has a set of *Prabaras*. According to Boudhayana *Samhita* the number of *Gotra* is countless in the country, but the *Prabara* number is fixed, that is, 49 only. *Prabara* is the name of a sage who has contributed to the continuance of family or tribe (Prarahaja 1937) may be at some hard time when a family tree could not bloom up properly. Each



**Fig. 2. Products of Anuloma and Pratiloma interaction (Padhy 2010)**

*Gotra* is followed by more than one fixed number of *Prabara* and the same person may be *Prabara* for different *Gotras*. For example, Kaassya is a *Gotra* himself and he is also a *Prabara* for self (with Abachhaara, Naidhruba) and other *Gotras* like Naidhurba, Reava and Saandiliya. The same name as *Gotra* and *Prabara* reflects on the use of *Niyoga* process (a natural process of artificial insemination) (Padhy 2010). Interestingly, the *Gotra* and *Prabaraship* of Kaassya and Naidhruba are interchanged. The author enjoys Bachhasa *Gotra* with *Prabaras*, namely, Yamadagni, Ourba, Aapnubaana, Chyabana and Bhrgu. Surprisingly, Bachhasa is not reflected as *Prabara* in any of the *Gotras* recorded earlier (Padhy 2010) but included in Bhrgu *Gana*. The latter concept will be discussed afterwards.

To understand the *Prabara* concept some examples from epic Mahabharat can be taken into account (Padhy 2016, 2021):

1. Dhritarastra and Pandu are *Niyoga* products of Vyasadeva but they are called Kauraba.
2. Bidura being a product through Vyasa is not considered Kshatriya due to his mother's position as a maidservant.
3. The Pandabas were born through some unknown source (Dharma, Vaayu, Indra, Aswini Kumaras) and were known as sons of Pandu.
4. Kamathe *Kanina Putra* (child before marriage) of Kunti from some unknown source (Sun God) could not be considered as Pandaba because he was brought up by a non-Kshatriya couple.

It is clear from the above examples that the genetic contribution of the *Prabara* was not reflected on the social status of the child with due respect to the original *Gotra* sage. However, the *Prabara* was respected keeping associated with the *Gotra*.

#### ***Gana* (Group): Restriction for Certain Inter-*Gotra* Marriages**

Further, some of the *Gotras* are classified into a different group called *Gana*. The *Gana* is named after a *Prabara* who is common for the *Gotras* included in the *Gana*. The importance of *Gana* division is that marriage is prohibited among the different *Gotras* included in the *Gana*. Also, in most cases more than one common *Prabara* can be marked in a *Gana*. The *Gana* division is one

step ahead to emphasise on the commonness of a specific *Prabara* to prohibit inter-*Gotra* marriage. All these *Gotra*, *Prabara* and *Gana* classifications significantly point out that the ancient Indians were conscious of some genetic trait, which was negatively affective for positive eugenics.

Some of the *Ganas* are as follows:

1. Bhrgu *Gana-7 Gotras* (common *Prabara* Bhrgu)
2. Aangirasa *Gana-10 Gotras* (Aangirasa common)
3. Attri *Gana-7 Gotras* (Attri common)
4. Kaassya *Gana-4 Gotras* (Kaassya common)
5. Bisswaamitra *Gana-10 Gotras* (Bisswaamitra common)
6. Bassishtha *Gana-5 Gotras* (Bassishtha common)
7. Agasthya *Gana-4 Gotras* (Agasthya common)

It is clear from the above facts that restriction for intra-*Gotra* marriage in ancient India was not blindly followed.

#### ***Shraaddha* - A Grand Respect to the Source of the Sex Chromosome**

The word '*Shraaddha*' has an etymological origin from *Shraaddha*, which means affection. This is the yearly celebration of the death anniversary of father, mother or any other relative with specific rituals to remember them.

In a family, the person who offers *Shraaddha* (*Pinda*) is the living generation (G-1), as forefathers the late father (*Pitaa*) (G-2), grandfather (*Pitaa-maha*) (G-3) and great grandfather (*Prapitaa-maha*) (G-4) are the three generations to whom *Shraaddha* is offered. As well, the old great grandfather (*Brud-dha Prapitaa-maha*) (G-5), too old great grandfather (*Atibrud-dha Prapitaa-maha*) (G-6) and too much old great grandfather (*Ati Atibrud-dha Prapitaa-maha*) (G-7) are also offered *Shraaddha* in a minor form. These seven generations are considered as *Sapinda*. The three generations before the *Sapinda* (that is, G-8, 9, 10) are called *Sooudaka*, expected to receive water in *Tarpana* (Padhy 2008) and any generation before the latter is called *Gotraja* (G-11 or its predecessors born out of one *Gotra*).

Manusmriti prohibits for marriage with a damsel who is a *Sapinda* and its relative on the mother's side or belongs to the same *Gotra* on the father's side, as discussed earlier. According to Nirnaya



Sindhu (one Smruti book), the *Sapinda* concept is applicable for the seven generations of the father's side (existing generation plus late six generations) and up to five generations of mother's side.

*Shraaddha* is performed to remember the forefathers/mothers and expression of affection and love for their unadulterated contribution of the genetic trait (Fig. 1). It is offered with every sincerity up to past three generations of late father's side and mother's side (Padhy 2008).

### CONCLUSION

Vedic knowledge since time immemorial was the greatest indigenous institute, which has guided the society in the right perspective. The Indian culture is enriched with ancient science, but unfortunately often underestimated and wrongly interpreted as full of myth. This may be due to the barrier of Sanskrit language with which the facts are presented in symbolic form. Study of such hidden knowledge may be under any faculty, is certainly a herculean task to bridge up the gap between the past *Gotra* concept and present 'Y' chromosome inheritance, though it is enriched with reality.

### RECOMMENDATIONS

One should be conscious to maintain the integrity of their own *Gotra* by avoiding intra *Gotra*, intra *Gana*, *Sapinda* and inter-caste marriage.

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