



## CONCEPTUAL AND CORRELATIVE STUDY OF JIHVA UTPATTI W.S.R. TO MODERNORGANOGENESIS

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## ABSTRACT

The process of formation and development of a foetus from two cells to a mature foetus is called Garbhavkranti.<sup>1</sup> Garbha Avakranti is described by all Ayurveda Acharya in Sharira Sthana of their respective classical texts. In the reference of Garbha, Acharya Sushruta defines the development of all the organs from Pancha Mahabhoota<sup>2</sup>, Tridosha, Sapta Dhaatu, Mala, Mana, Buddhi, Atma, etc. This process is called Avayava Utpatti in Ayurveda Sushruta Samhita. Acharya Sushruta describes the formation of Avayava or Organs as Avayava Utpatti in Sharira Sthana. Modern Embryology explains organogenesis as Trigeminal theory. Kapha is a raw material, Pitta is an enzyme, and Vata is the energy required or released to form the organ. Tongue originates from the essence of Kapha, Rakta and Mamsa.

**Keywords:** Ayurveda, Garbhavkranti, Mana, Buddhi, Avayava Utpatti, organogenesis

## INTRODUCTION

Ayurveda explains embryology and organ development from the viewpoint of Pancha Mahabhoota, Tridosha, Sapta Dhaatu, Mala, Mana, Buddhi, Atma, etc.<sup>3</sup> These elements combine to form distinct organs.

This theory of organ development is critical in Ayurveda and can be used in diagnosis and treatment. Embryology is the branch of medical science that deals with the study of the formation of the human

embryo and its development inside the uterus until the birth of a foetus.<sup>4</sup> According to modern embryological organ development, trigeminal layers (Ectoderm, Mesoderm, and Endoderm) are the basis of organogenesis, and hence, the different organs develop with different proportions and components of the germ layers cells. This article is an attempt to highlight the importance of the theory of organ development as explained in the Sushruta Samhita and to correlate it with modern medical science.

**AIM:** This study aims to understand the viewpoints of Ayurveda and modern science on the origin of the tongue.

## REVIEW OF LITERATURE

### AYURVEDIC REVIEW

- Jihva is a streevachi word which means rasna and rasgyanendriya.<sup>5</sup>
- The word Jihva is derived from the suffix “ft \$ “ksOkk ”.<sup>6</sup>
- In the Sharirikopanasad, the tongue is said to be dominated by the water element.<sup>7</sup>

- The Ancient texts such as the Brihadaranyakopanishada and the Naradkopanishad describe the tongue as the place of rasa aaswadan or ras swadanubhuti.<sup>8,9</sup>

- The description of the origin of the tongue is found in the Sushruta Samhita and Ashtanga Sangraha.

- Sushruta Samhita:-

The tongue is produced from the essence of kapha, rakta, and mamsa digested in the stomach. Just as the essence of the stomach remains intact when blown, the tongue is produced from the essence produced by the digestion of kapha, rakta, and mamsa in the stomach.<sup>10</sup>

- Ashtang Sangrah -

(1) Tongue is water dominated.<sup>11</sup>

(2) Tongue is produced from the prasad part of Mamsa, Rakta and Kapha.<sup>12</sup>

- Ashtanga Hridaya -

Ashtanga Hridaya has described it as the place of Kapha.<sup>13</sup>

## MODERN REVIEW

### DEVELOPMENT OF TONGUE (embryological phase)<sup>14</sup>

PART OF TONGUE	ORIGIN
mucosa, epithelium and connective tissue of the Anterior 2/3 of the tongue	1st pharyngeal arch
Mucosa, epithelium and connective tissue of Posterior 1/3 of the tongue.	3rd pharyngeal arch
Posterior most part near vallecule, epithelium and connective tissue	4th pharyngeal arch.
Musculature	Occipital myotomes
Papillae and taste buds _circumvallate	Hypobranchial eminence.

(TABLE -1)

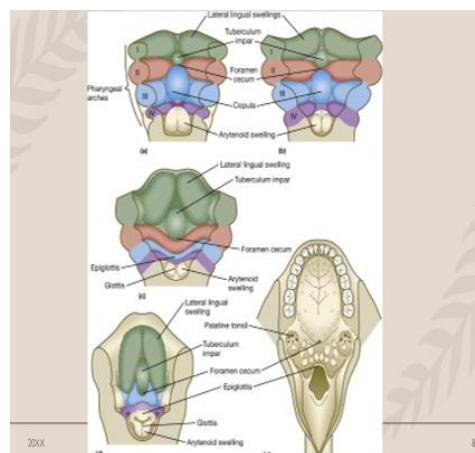


Figure 1

## EMBRYOLOGICAL DEVELOPMENT OF HISTOLOGICAL PARTS OF TONGUE<sup>15</sup>

1. **MUSCLE**- Muscles are made by occipital myotomes, which are made by mesenchymal cells. Mesenchymal cells are mesodermal in origin.
2. **BLOOD**- blood cells are derived from precursor of blood cell and these precursors are made by mesenchymal cell which is mesodermal in origin.
3. **FIBROAREOLAR STROMA** -mesoderm
4. **EPITHELIUM** – mesoderm
5. **MUCOSA/MUCOUS MEMBRANE**- mesoderm

## SENSORY PART

- Cranial nerves develop through Neuroectoderm.
- When pharyngeal arches are formed in the fourth week of the embryonic stage, nerve supply is derived from the Hindbrain.
- The nerve that runs in the cranial border of the nerve arch is the trochlear nerve, and the pre-trochlear branch runs on the caudal part.
- 1st pharyngeal arch - Pre trochlear chordatympani (facial), posttrochlear - mandibular nerve
- Rest of all arch- Pre-trochlear Tympanic branch of the glossopharyngeal
  - Articular branch of Vagus Nerve

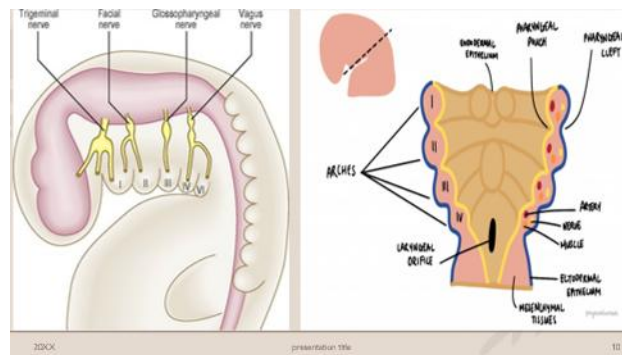


Figure 2

## DISCUSSION

- All the Acharyas (Acharya Sushruta and Vagbhata) have explained the origin of the tongue from the essence of Kapha, Rakta and Mamsa.
- Whenever a process of formation of another dhatu takes place from one dhatu, the raw material required for this is called Kapha. The enzymes or substances that help form other dhatu from these raw materials are called Pitta. Similarly, the energy required in the formation process or the energy that is produced from this process is called Vata. The tongue is formed from the essence of Kapha, Rakta, and Mamsa. Rakta and Mamsa dhatu are formed from Rasa dhatu. As mentioned earlier, the raw material required for the formation of dhatu is called Kapha, which

means Rasa( blood plasma) is Kapha in the formation of the tongue.

- The fibro areolar stroma of the tongue originates from mesenchyme<sup>16</sup>, which is mesodermal in origin. Fibro areolar stroma contains blood vessels. Nutrition is provided through blood, which is essential for the formation process. Hence, blood plays a major role in the formation of the tongue and all organs.

The breakdown of the haemoglobin forms heme and globin, which forms myoglobin. Myoglobin is essential for muscle formation. Thus, blood plays a role in the formation of the tongue by providing nutrition and globin protein.

- Tongue muscles are formed from occipital myotomes, which are mesodermal in origin. In Ayurveda, we call Peshi as muscle and muscle is formed from Mamsa. Since tongue muscles are formed from occipital myotomes, we can call oc-

cipital myotomes Mamsa. Thus, Mamsa, in the form of occipital myotomes, helps form the tongue.

- According to modern opinion, the tongue originates from the pharyngeal arch. The pharyngeal arch is formed in the foregut by the thickening of the mesoderm in the lateral wall. The anterior 2/3 of the tongue originates from the 1st arch, Posterior 1/3 of the tongue originates from the 3rd arch, and the posterior-most originates from the 4th arch.
- The mucus membrane of the tongue is formed from mesoderm.

## CONCLUSION

- The tongue is formed from the essence of Kapha, Rakta, and Mamsa. Rakta and Mamsa dhatu is formed from Rasa dhatu (blood plasma). As mentioned earlier, the raw material required for the formation of dhatu is called Kapha. That means blood plasma is Kapha in the formation of the tongue.
- Rakta is essential in tongue formation by providing globin to make myoglobin and provide nutrition.
- The muscles of the tongue are formed from the thread-like division of Mamsa. The Mamsa helps in the origin of the tongue in the form of occipital myotomes. In Ayurveda, we call it the Peshi muscle, and the muscle originates from Mamsa. Since the muscle of the tongue originates from the occipital myotome, we can call the occipital myotomes Mamsa. In this way, Mamsa helps in the origin of the tongue in the form of occipital myotomes.

In this way, the tongue originates from the essence of Kapha, Rakta and Mamsa.

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