# Quadrant II – Transcript and Related Materials

**Programme: Bachelor of Science (Second Year)**

**Subject: Zoology**

**Paper Code: ZOC 103**

**Paper Title: Anatomy of Animal Body Systems**

**Unit: 03**

**Module Name: Dentition-Part II**

**Module No: 32**

**Name of the Presenter: Ms. Gautami Manakikar**

## NOTES:

**TYPES OF TEETH**: In heterodont condititon, there are four main types of teeth. They are incisors, canines, premolars and molars.

- **INCISORS:** They are single rooted and monocuspid. They are used for cutting and biting. Incisors may be completely absent (e.g. sloth) or partially absent only on the upper jaw (e.g. sheep, cow).Incase of carnivorous animals, the incisors are usually small. ` In rodents and lagomorphs, the incisors are open-rooted and continue to grow throughout their life. Also, the enamel is present only on the anterior surface of the incisors in these animals. Elephant tusks are also an example of rootless incisors.
- **CANINES:** They are present immediately after the incisors. They are conical, pointed with single-rooted crown. They are mainly used for piercing and tearing. In carnivorous animals, the canines are longer and stronger as it helps in piercing and tearing the flesh. The canines may be absent only on the upper jaw in some animals (e.g. cow). In rodents and lagomorphs, the canines are completely absent. So, these animals have a space between the incisors and molars called the diastema. In musk deer, the canines are present only on the upper jaws of the males. The male musk deer is known to exhibit sexual dimorphism through dentition.

- **PREMOLARS:** The canines are followed by the premolars. They have two roots and two cusps. The premolars are mainly used for grinding the food. They have ridges called cusps/ cones which help in crushing and grinding the food.
- **MOLARS**: They lie behind the premolars. They have two or more roots and several cusps. The molars are used for crushing the food. In humans, the last molar is termed as the wisdom tooth. In carnivorous animals, the upper fourth premolar and lower first molar form carnassials, which are specialized teeth that help to cut the muscles.

**CHEEK TEETH:** The premolars and the molars are collectively termed as the cheek teeth. The molars have tiny ridges on their surface which are termed as cusp or cones. The number of cusps varies in animals. Depending on the number, shape and arrangement of these cusps, there are various types of cheek teeth. There are six main types of cheek teeth:

1. **Triconodont**
2. **Trituberculate**
3. **Bunodont**
4. **Secodont**
5. **Selenodont**
6. **Lophodont**

1. **TRICONODONT :** In triconodont type of cheek teeth, the molars possess three cusps which are arranged in a linear line. E.g. fossil Mesozoic mammals.
2. **TRITUBERCULATE :** In trituberculate type, the three cusps are arranged in the form of a triangle. E.g. fossil mammals.
3. **BUNODONT:** In bunodont type, the cusps are separate and rounded. They are mainly used for grinding. E.g. Man, monkey.
4. **SECODONT**: In secodont type, the teeth have pointed cusps that form sharp crown. These mainly help in tearing flesh. E.g. Carnivorous mammals.
5. **SELENODONT:** In selenodont type, the cheek teeth are square in shape and have vertical crescent shaped cusps. E.g. cattle, horses.
6. **LOPHODONT:** In lophodont type, the cusps join to form a ridge called lophs. These cheek teeth are found in elephants and tapirs.

**DENTAL FORMULA:**

- The number of teeth in a particular species remains constant and is expressed by the dental formula.
- It is expressed as the number of different types of teeth in each half of the jaws.
- The number of different types of teeth on one half of the upper jaws is written as the **numerator** and the number of different types of teeth on one half of the lower jaws is written as the **denominator.**
- The teeth are indicated by their initial letters **i, c, pm, m** i.e. **Incisors, canines, premolars** and **molars,** respectively.
- The numerator and the denominator are separated by a horizontal line.
- When a certain type of tooth is absent, a zero is used .
- The number is then multiplied by two to get the total number of teeth present in a particular species.

$$\text{D.F.} = \frac{\text{Number of teeth in one half on the upper jaw}}{\text{Number of teeth in same half on the lower jaw}}$$

$$\text{D.F.} = \frac{\text{incisor}}{\text{incisor}}, \frac{\text{canine}}{\text{canine}}, \frac{\text{premolar}}{\text{premolar}}, \frac{\text{molar}}{\text{molar}} \times 2$$

**DENTAL FORMULA EXAMPLES:**

1. **Eutherian mammals have 44 teeth ( i=3, c=1, pm=4, m=3 )**

The dental formula is expressed as

i3/3, c1/1, pm4/4, m3/3 = 22 x 2 = 44

In simpler forms,

$$\frac{3.1.4.3}{3.1.4.3} = 22 \times 2 = 44$$

2. **Humans have 32 teeth (i=2, c=1, pm=2, m=3)**

The dental formula is expressed as

i2/2, c1/1, pm2/2, m3/3 = 16 x 2 = 32

$$\frac{2.1.2.3}{2.1.2.3} = 16 \times 2 = 32$$

3. **DOG:** $\frac{3,1,4,2}{3,1,4,3} = 42$

4. **SQUIRREL**: $\frac{1,0,2,3}{1,0,1,3} = 22$

5. **ELEPHANT:** $\frac{1,0,0,3}{0,0,0,3} = 14$