JAW SUSPENSION

Jaw suspension means attachment of the lower jaw with the upper jaw or the skull for efficient biting and chewing. There are different ways in which these attachments are attained depending upon the modifications in visceral arches in vertebrates.

**AMPHISTYLIC**

In primitive elasmobranchs there is no modification of visceral arches and they are made of cartilage. Pterygoqadrate makes the upper jaw and meckel’s cartilage makes lower jaw and they are highly flexible. Hyoid arch is also unchanged. Lower jaw is attached to both pterygoqadrate and hyoid arch and hence it is called amphistylic.

**AUTODIASTYLIC**

Upper jaw is attached with the skull and lower jaw is directly attached to the upper jaw. The second arch is a branchial arch and does not take part in jaw suspension.

**HYOSTYLIC**

In modern sharks, lower jaw is attached to pterygoquadrate which is in turn attached to hyomandibular cartilage of the 2nd arch. It is the hyoid arch which braces the jaw by ligament attachment and hence it is called hyostylic.

**HYOSTYLIC (=METHYSTYLIC)**

In bony fishes pterygoquadrate is broken into epipterygoid, metapterygoid and quadrate, which become part of the skull. Meckel’s cartilage is modified as articular bone of the lower jaw, through which the lower jaw articulates with quadrate and then with symplectic bone of the hyoid arch to the skull. This is a modified hyostylic jaw suspension that is more advanced.

**AUTOSTYLIC (=AUTOSYSTYLIC)**

Pterygoquadrate is modified to form epipterygoid and quadrate, the latter braces the lower jaw with the skull. Hyomandibular of the second arch transforms into columella bone of the middle ear cavity and hence not available for jaw suspension.

**MONIMOSTYLIC**

This type of suspension is a modification of autosystylic suspension in which quadrate is immovable and not flexible as in amphibia and many reptiles. Hyomandibular is modified as columella bone of the middle ear cavity.

**STREPTOSTYLIC**

This type is found in snakes, lizards and birds, in which quadrate bone is movable and flexible at both ends making the jaw highly flexible. Columella is single bone in the middle ear cavity and is sometimes called stapes.

**HOLOSTYLIC** type is found in lung fishes and Holocephali. Upper jaw is fused with the skull and the lower jaw is attached directly with it. Hyoid arch does not participate in jaw suspension and is a typical branchial arch. There is no columella bone.

**AUTOSTYLIC (=CRANIOSTYLIC)**

Found in mammals, in this type of jaw suspension, pterygoquadrate is transformed into alisphenoid and incus, while meckel’s cartilage is changed into malleus and not available for jaw suspension. Lower jaw is directly attached to the skull bone called squamosal. Monotremes also possess this type of jaw suspension.

