SCALES IN FISHES

Scales are modification of skins in fishes. There are different types of scales such as cosmoid, ganoid, placoid, cycloid and ctenoidhaving various modifications. All types scales evolved from cosmoid scales. Scales serve various purposes in fishes.

Types of scales: There are different types of scales as follows:

Cosmoid scales: This scale is found in crossopterygian fishes and also present inostracoderms, placoderms and extinct Sarcopterygii. They are virtually boney plates.

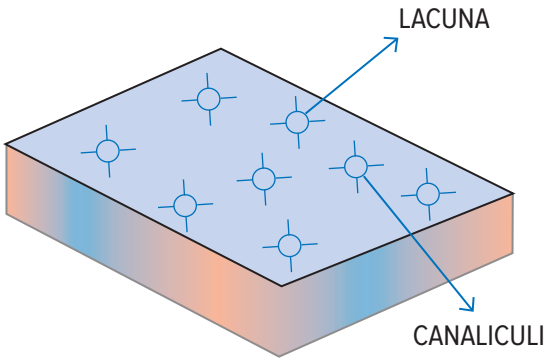


Fig: ▲ Cosmoid scale.

Gandiod scales (ancient ray fin): Found in ganoid fishes, e.g. Polypterous and lepidosteans. These ganoidal scales are rhomboidal in shape and comparatively thinner.

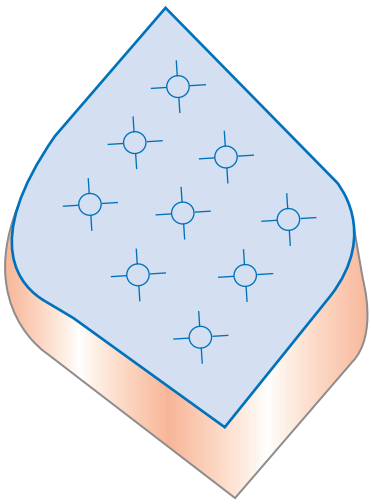


Fig: ▲ Ganoid scale.

Cycloid and Ctenoid scales: They are very thinner and flexible, but still harder, during evolution, fishes lost thicker intermediate types between cycloid and ctenoid scales also occur. Certain fishes such as founders may bear both types ctenoid scales dorsally and cycloid ventrally. Scales evolve towards thinner in order to gain more flexibility scales which is conducive for faster movement.

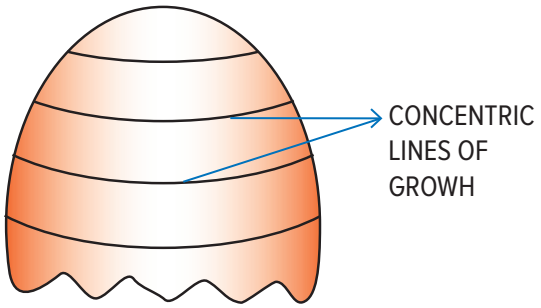


Fig: ▲ Cycloid scales

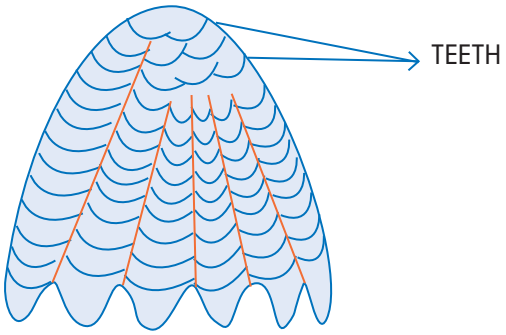


Fig: ▲ Ctenoid scale.

Placoid scales: It is microscopic structure and hardly 2mm long. It has a spine; basal plate and it is very hard.

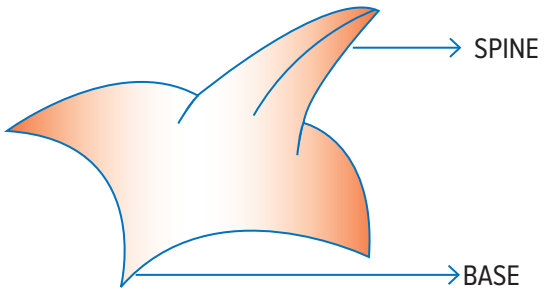
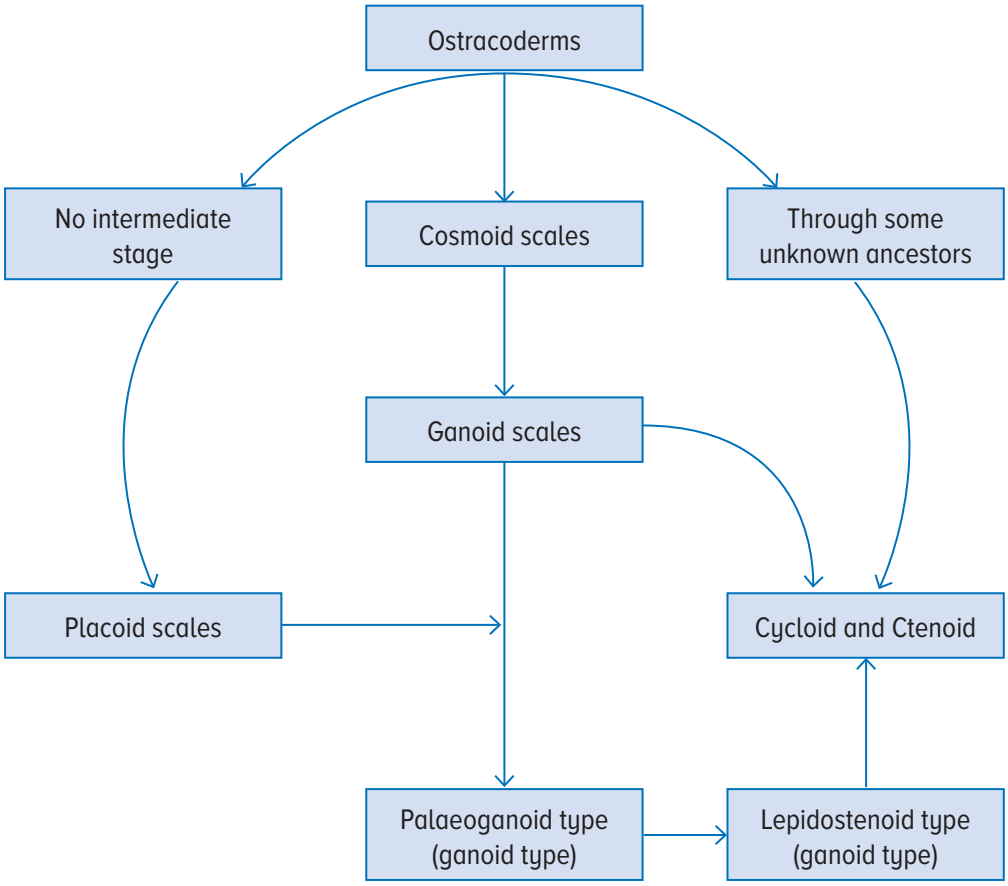
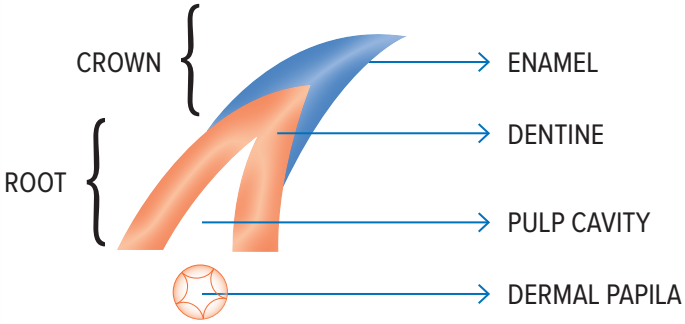


Fig: ▲ Placoid scale.

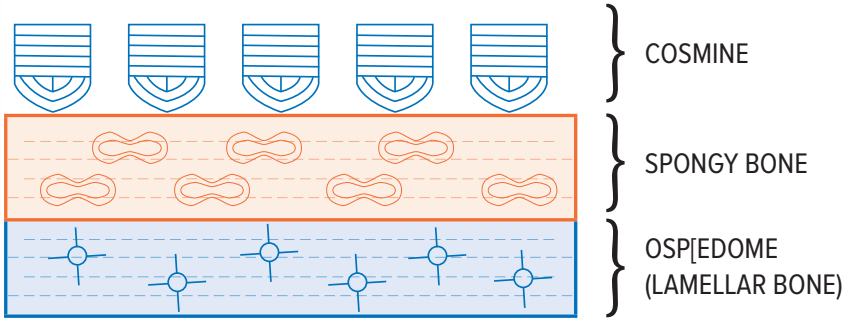
Evolution of scales in fishes: Fish scales are dermal and mesodermal in origin.Ostracoderms are the first vertebrates having dermal boney armour or covering on the whole body from which scales evolved as follows:



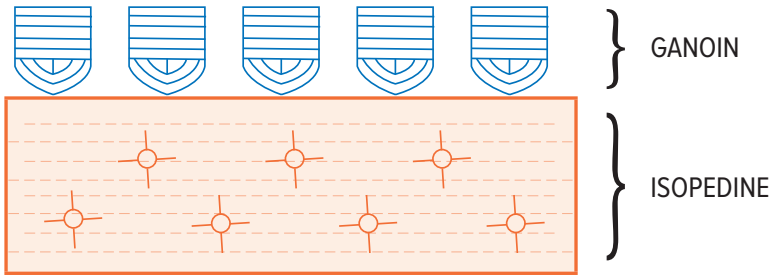
Placoid scales:



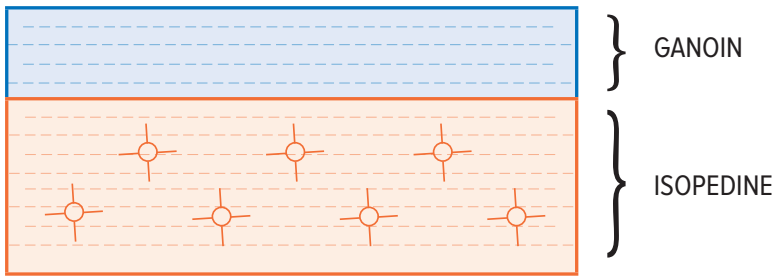
Cosmoid scales:



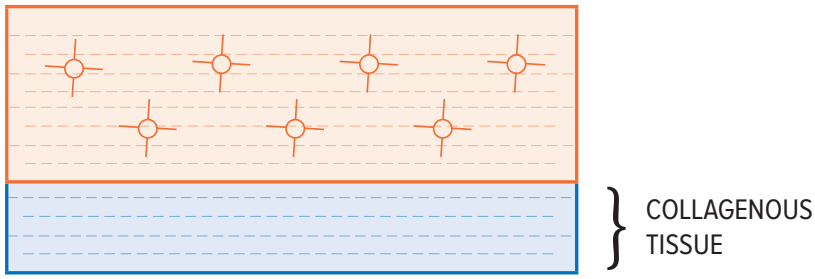
Ganoid scales (Palaeoganoid type):



Ganoid scales (Lepidosteoid type):



Cycloid and Ctenoid type:



Modification of scales: Some fishes are totally scale less or naked such as torpedo (electric ray) and catfishes. Shark teeth are modified large placoid scales. Stingbarb of a sting ray is modified placoid scales. In basking shark (Cetorhinus) myriads of placoid scales become gill rakers.

Uses of scales: As given below

1. Scales form a protective covering of exoskeleton on the body.
2. Scales grow throughout life in size with the fish. Growth result in concentric lines which make age determination possible in salmon, trout, brass and several other species. For every species, scales pattern is rather constant.
3. Taxonomical significance: arrangement, number, form and structure of scales play important role in identification and classification of fishes.

   Thus, scales are distinguishing features in fishes which gives protection and flexibility in aquatic environment, consequently this group of vertebrates has been able to survive and evolve throughout the ages.