Study of Placoid, Cycloid & Ctenoid scale in Fish

A scale is a small rigid plate that grows out of animal's skin to provide protection. Fish scales are dermal in origin. There are four types of scales in fishes, namely Cosmoid, Ganoid, Placoid, and Leptoid.

Leptoid scales are found in most bony fishes. As they grow they add concentric layers and are arranged so as to overlap in a head-to-tail direction, allowing a smoother flow of water over the body. These are of two types: Cycloid and Ctenoid.

Cycloid scales have a smooth outer edge, and are most common on fish with soft fin rays, such as salmon and carp (Example: Rohu, Catla, Mrigel etc.). Ctenoid scales have a toothed outer edge, and are usually found on fish with spiny fin rays, such as bass and perches (Example: Bhetki, Koi, Tilapia etc.)

Placoid Scales are found in cartilaginous fishes, like sharks. These scales, also called denticles, are microscopic, similar in structure to teeth and have one median spine and two lateral spines.

Preparation of Placoid scales

i) A small piece of skin is cut from the dorsal surface of a shark (*Scoliodon sp*).

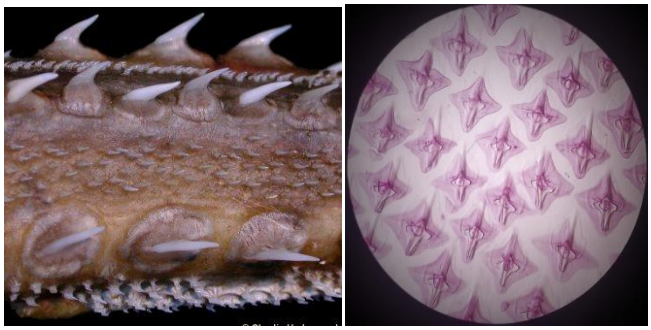
ii) It is then put in a hard glass test tube containing 5 to 10% potassium Hydroxide (KOH) solution and is boiled with constant stirring till the skin dissolves.

iii) The contents of the test tube are poured in a watch glass and are allowed to cool.

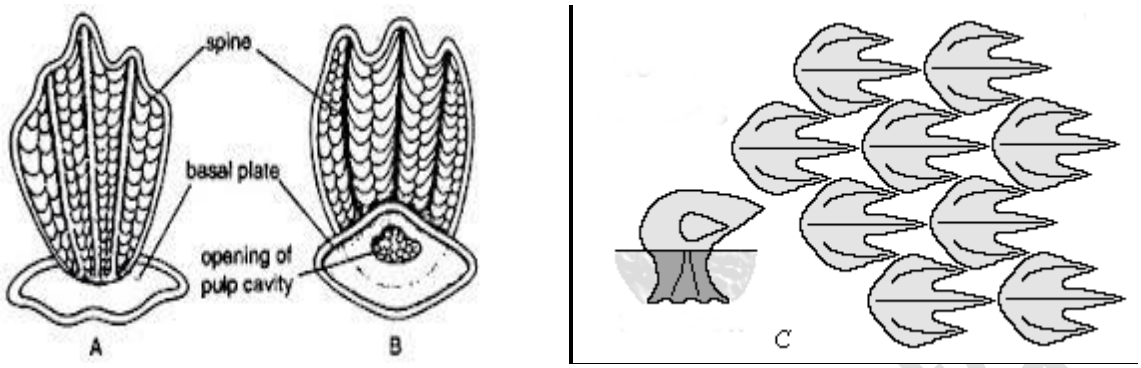
iv) The scales settle at the bottom and the fluid is removed by decantation (if required, with water) till the last trace of KOH is removed.

v) With the help of a pipette, little amount (preferable one drop) of fluid with the scales are put on a slide.

vi) The excess water is removed with a piece of blotting paper, stained, if required and is mount in glycerin, followed by microscopic observation.



Photograph of Placoid scales under microscope



Placoid scale A: Dorsal view; B: Ventral view: C: Side view

Structural Features:

i. The scale has a base and a body.

ii. The basal plate is somewhat diamond shaped with a pulp cavity on the ventral surface, at the centre.

iii. The proximal end of the body attached to the basal plate is narrow. It widens distally.

iv. A few spines are present in the body which project a little beyond the distal margin.

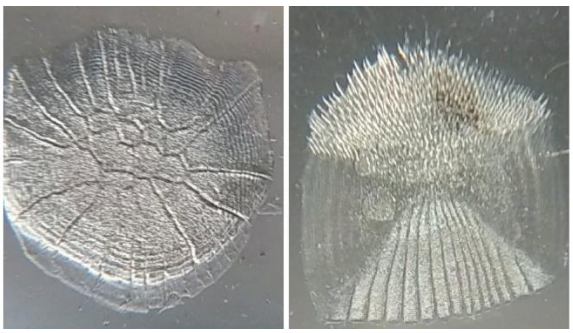
Preparation of Placoid, Cycloid & Ctenoid scales

i) A few scales is removed from the fish. For cycloid, the fish may be a carp, but for ctenoid, it may be a perch like Koi or Tilapia.

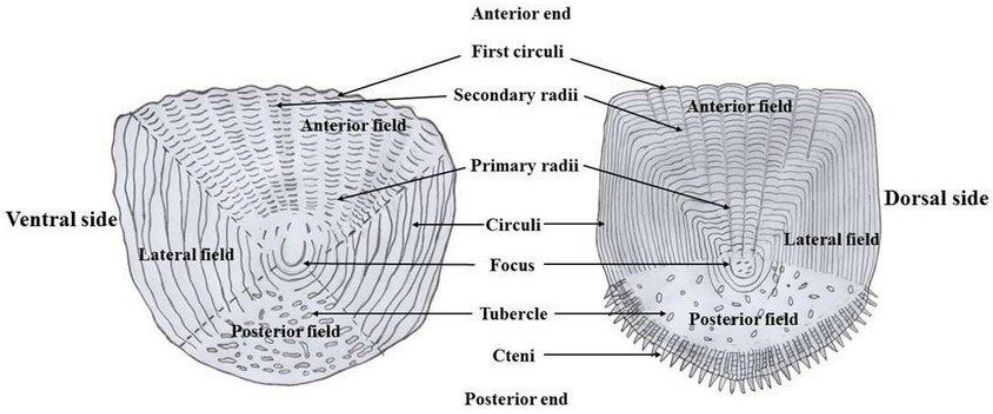
ii) The scales are put in a watch glass containing 10% KOH solution.

iii) The scales are stirred slowly with a needle or brush till the covering epithelium dissolves.

iv) The scales are now washed thoroughly with water to remove the last trace of KOH, followed by staining, mounting in glycerin and microscopic observation.



Photograph of Cycloid (Left) and Ctenoid (Right) scales under microscope



Different parts of Cycloid (Left) and Ctenoid (Right) scales

Structural Features:

Cycloid Scale	Ctenoid Scale
i. A thin, nearly rectangular plate of bone with a semicircular free border.	
ii. Concentric rings representing annual growth present.	
iii. The free end smooth.	iii. The free end bears numerous short, bony spines.

References

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