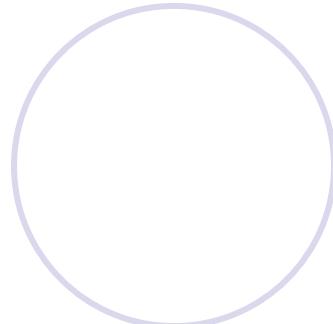
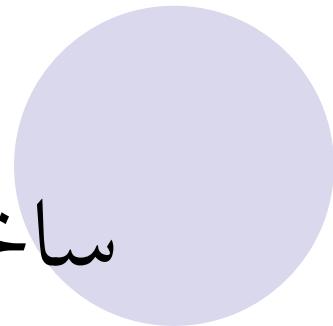
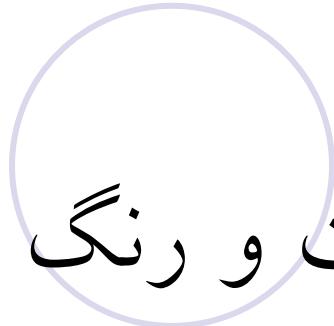
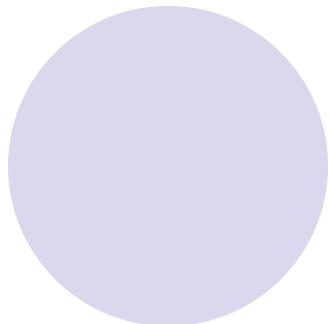
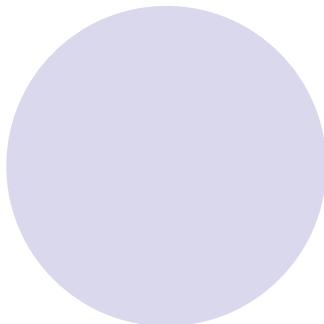


ساختمان پوست و رنگ در ماهیان



ساخته‌مان پوست ماهیان

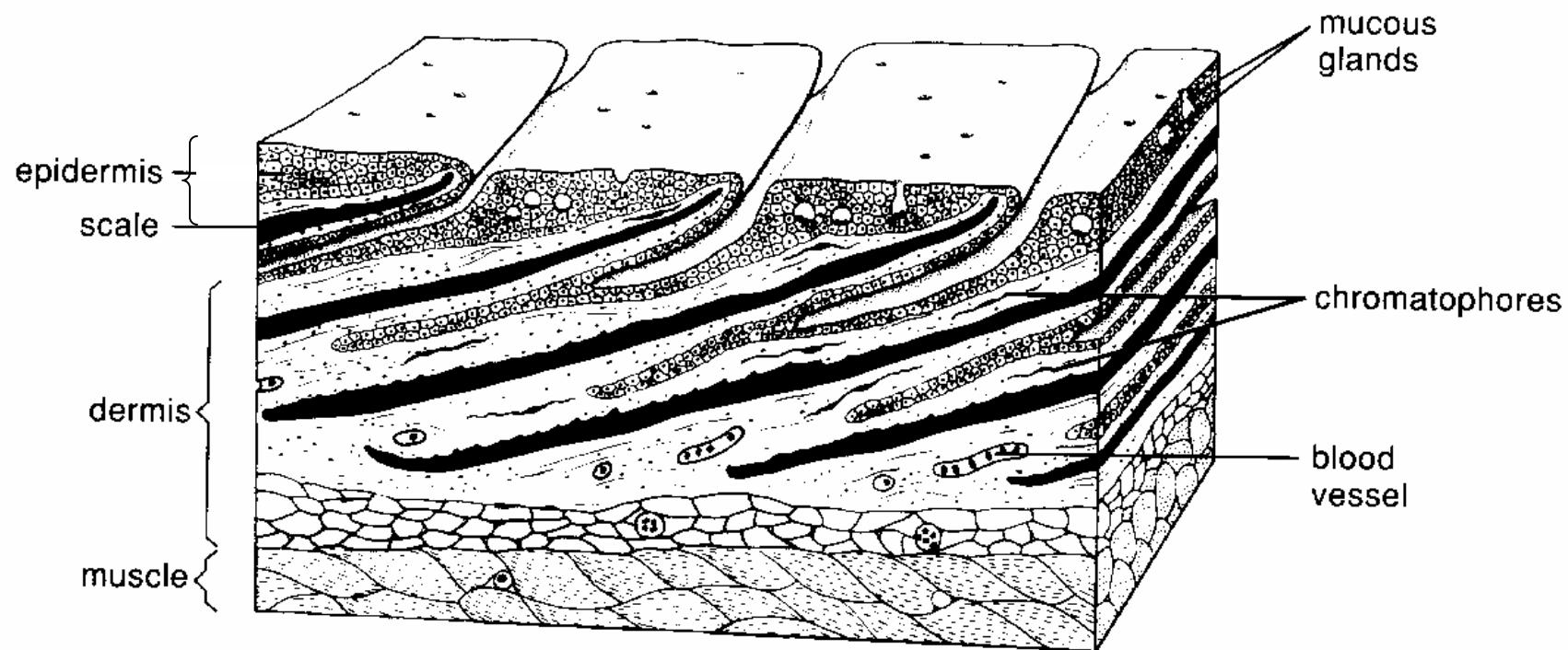
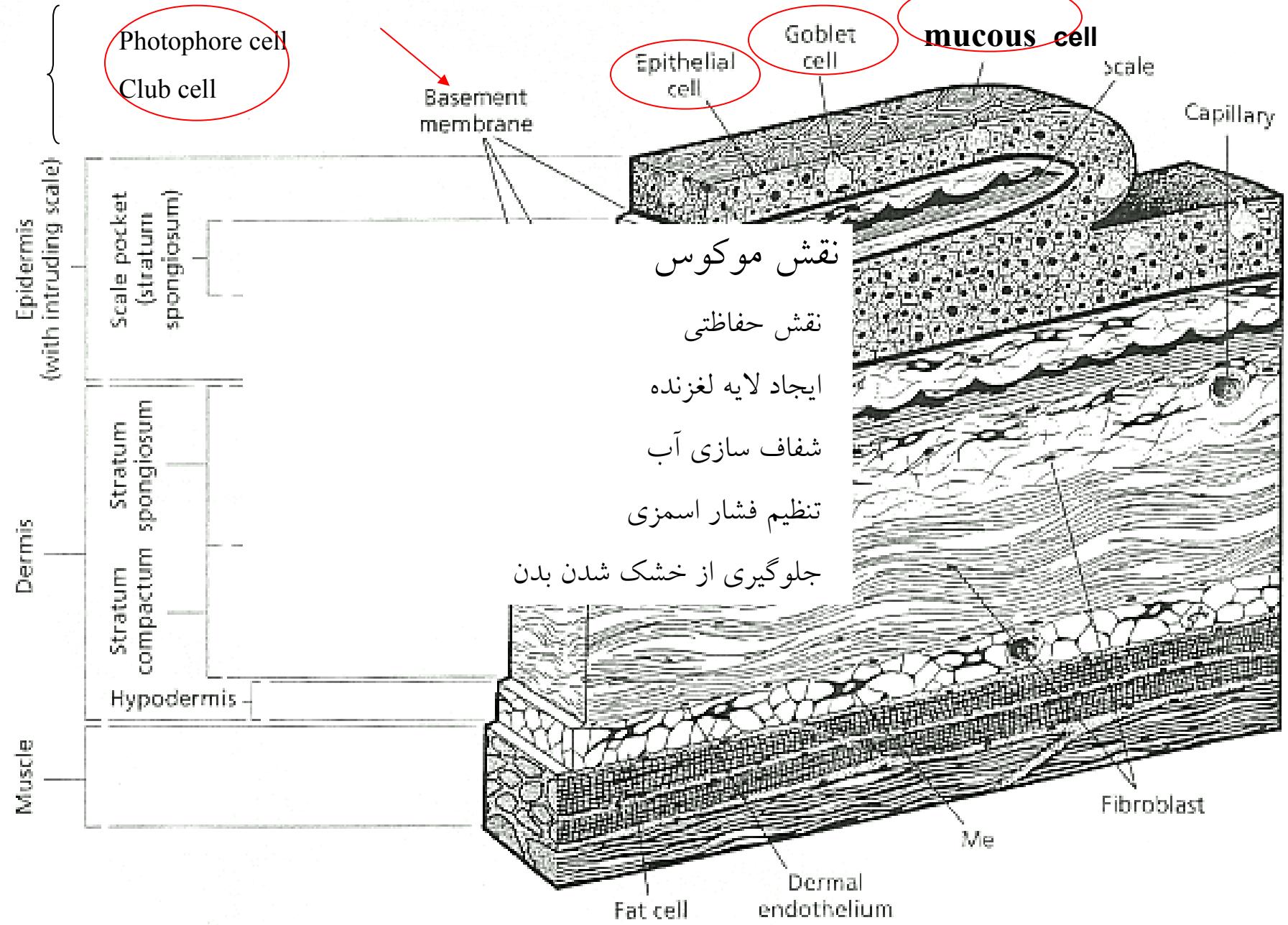


FIGURE 2–14 Section of fish skin. (Based on Wunder, 1936.)



رنگدانه های chromatophore

- 1. Xanthophores
- 2. erythrophores
- 3. Iridophores
- 4. leucophores
- 5. Melanophores
- 6. Cyanophores

وظایف پوست

حافظت

برقراری ارتباط

دریافت پیامهای حسی

تنفس

تنظیم اسمزی و حفظ تعادل آب

ترشح و دفع

تنظیم دما



Scales

Scale فلس

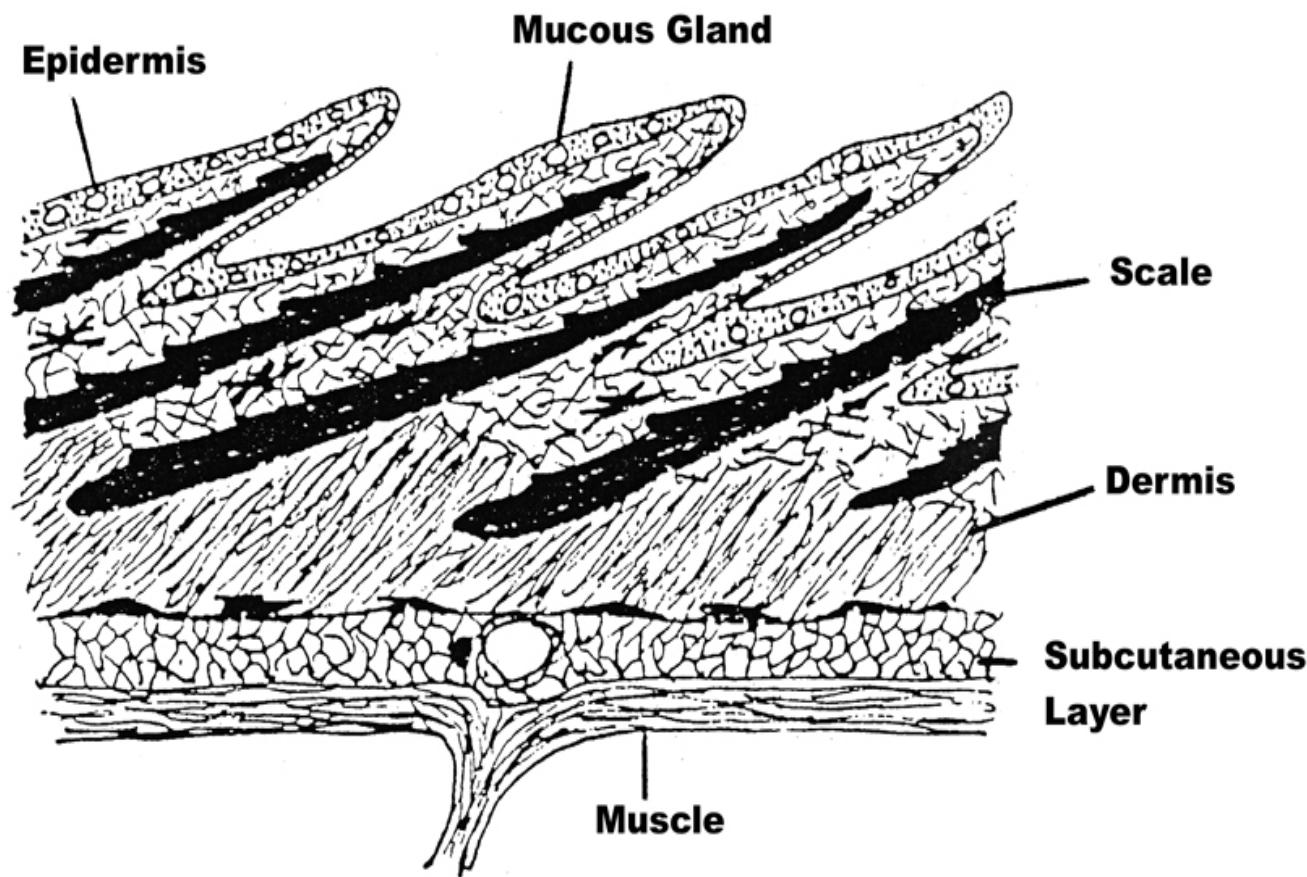
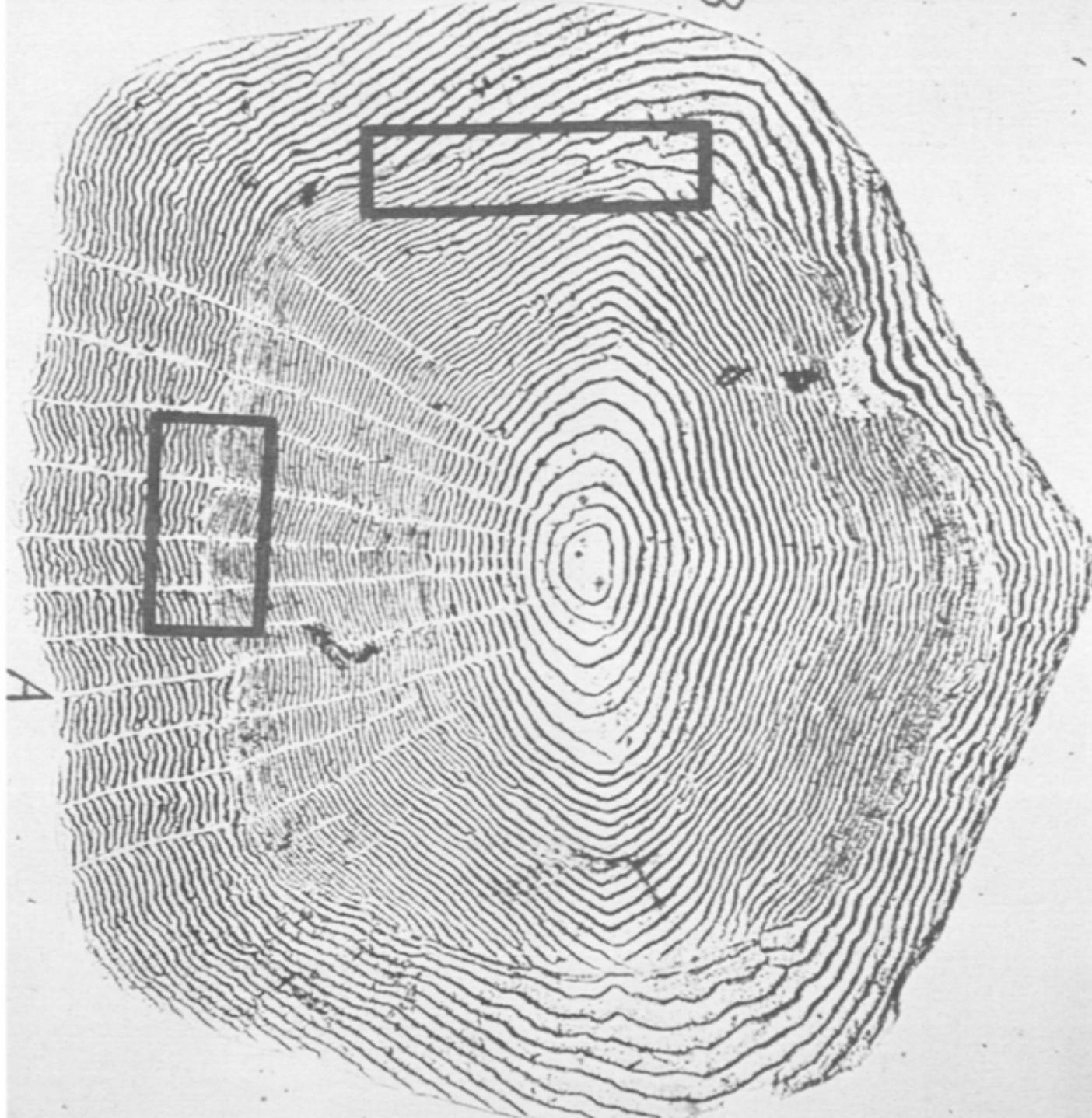


FIGURE 19. A one-ring scale from a barred surfperch 117 mm. standard length captured on May 21, 1954. At the winter ring note the crowding of circuli before assumption of spring growth (A), and the continuity of circuli through ring area (B). *Photograph by Jack W. Schott.*

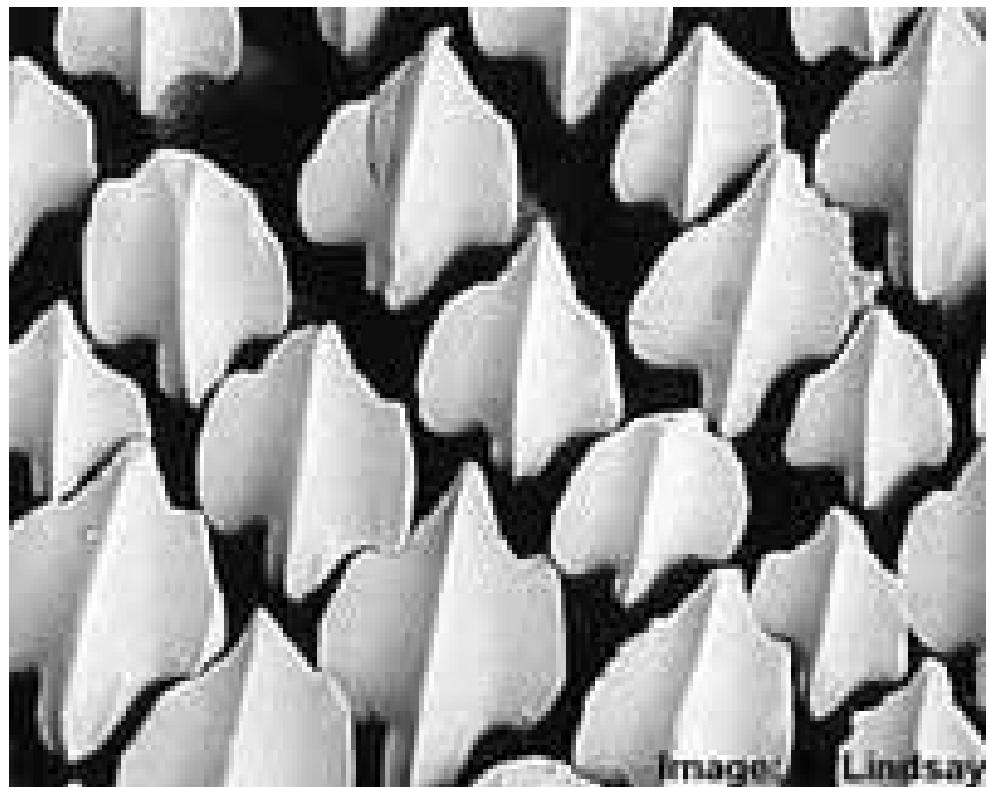


Placoid scales

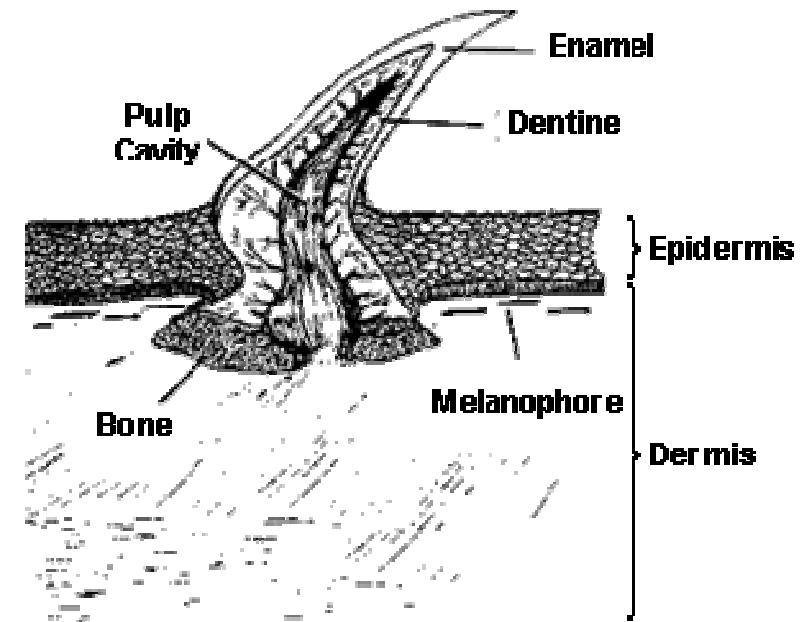
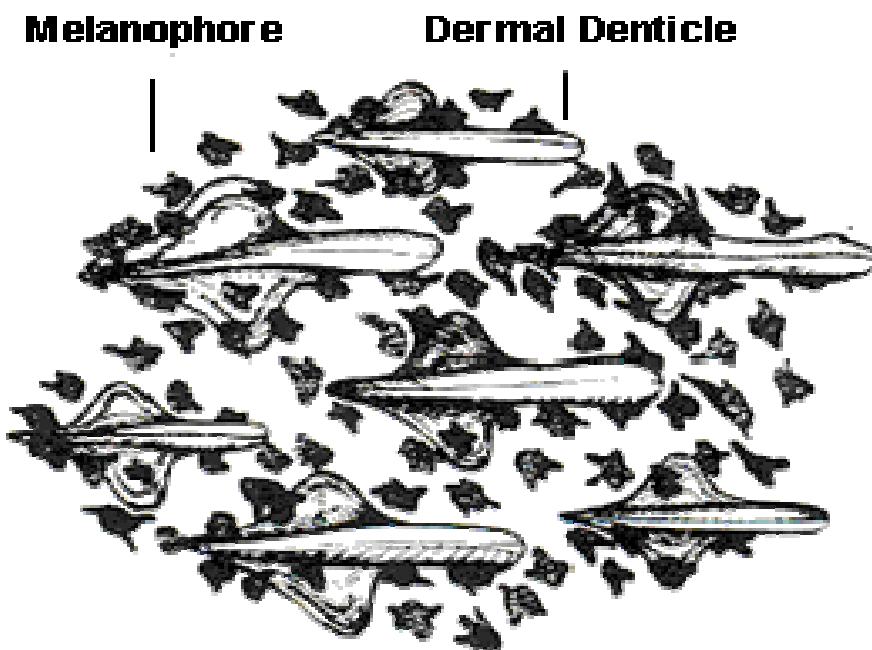
Found in sharks and rays, and can vary greatly in external appearance. They do not increase in size as the fish grows, instead new scales are added. Placoid scales are often referred to as denticles.

Placoid scales consist of a flattened rectangular base plate which is embedded in the fish, and variously developed structures, such as spines, which project posteriorly on the surface. The spines give many species a rough texture.

Placoid scales of the Broadnose Sevengill Shark.



Skin from Sharks



Cosmoid scales



Common to Lungfishes (family Ceratodontidae) and some fossil fishes.

Similar to placoid scales (Probably evolved from the fusion of placoid scales.)

Two basal layers of bone, a layer of dentine-like cosmine, and an outer layer of vitrodentine.

Scale becomes larger as fish grows and new bone is added to the basal layers.

Scanning electron micrograph of the cosmoid scales of a Queensland Lungfish (Krefft, 1870).

Ganoid Scales



Image: C. Bonito

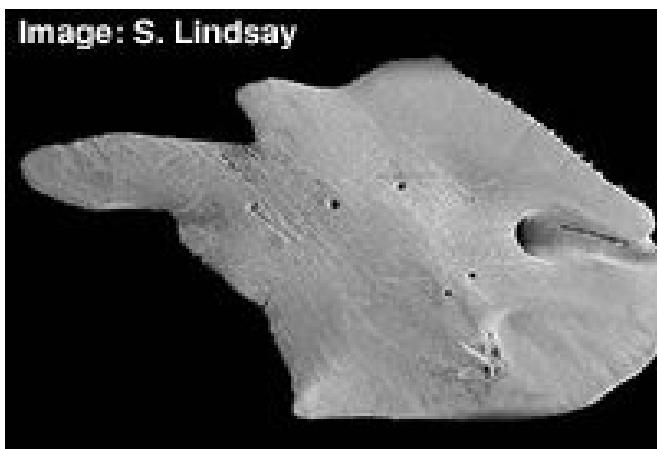
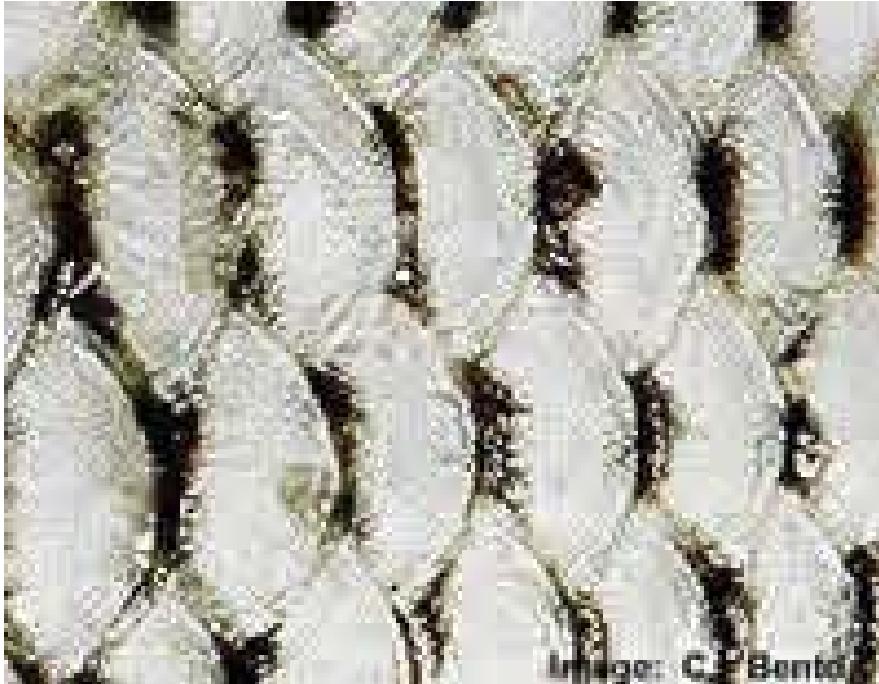


Image: S. Lindsay

Found in bichirs (Polypteridae), Bowfin (*Amia calva*), paddlefishes (Polyodontidae), gars (Lepisosteidae), and sturgeons (Acipenseridae) and some fossil paleoniscoid fishes.

Rhomboid shape with articulating peg* and socket joints between them. Actually, modified cosmoid scales with a bony basal layer, a layer of dentine, and an outer layer of ganoine (an inorganic bone salt).

Cycloid and Ctenoid Scales

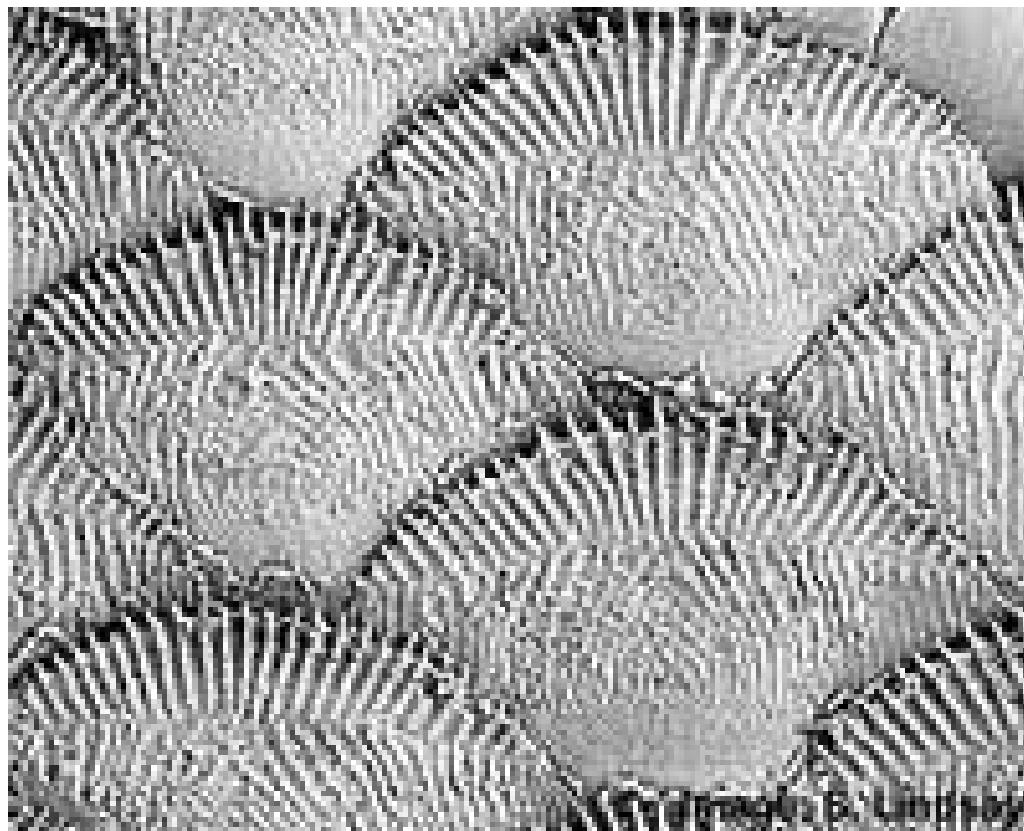


Found in bony fishes (the Teleostei).
Overlapping = flexibility, over cosmoid or ganoid scales.

Cycloid scales—smooth posterior margin, no ctenii. (Greek "cyclo" or circle.)

Ctenoid scales

Note: spiny posterior margins
(Greek "cteno", comb-like ctenii on the margin of the scale.)





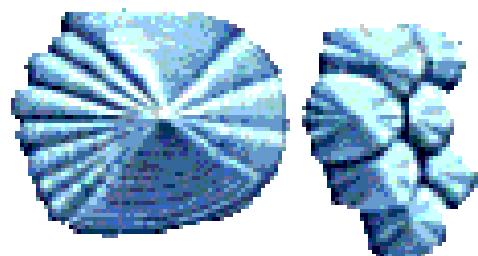
ctenoid scales



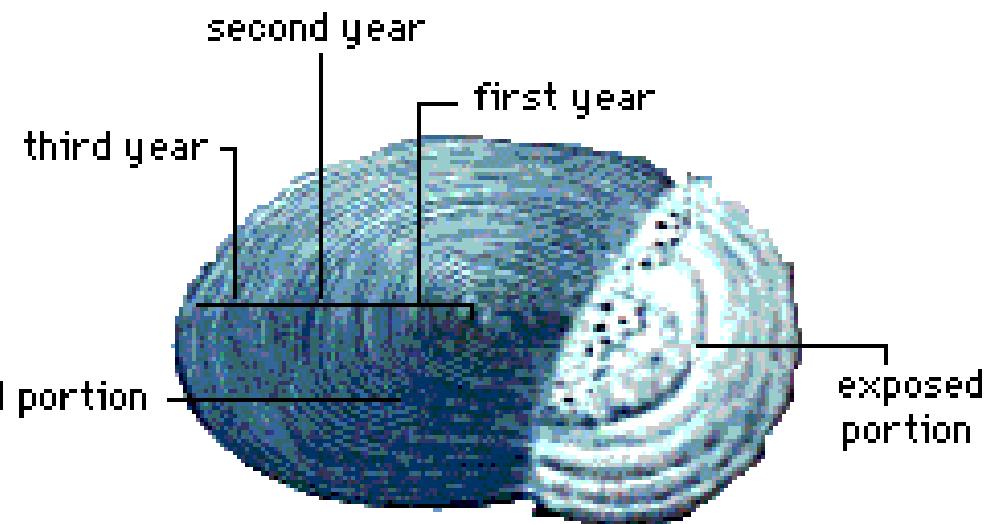
ganoid scales



placoid scales

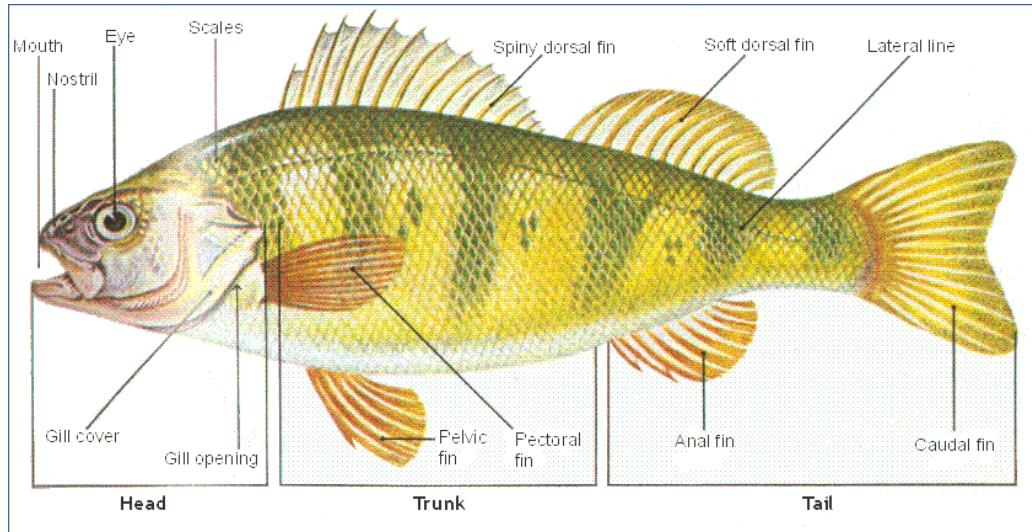


cycloid scales



باله ها

Fins (pinna)



باله های فرد

Dorsal fin باله پشتی

Anal fin باله مخرجی

Caudal fin باله دمی

Adipose fin باله چربی

باله های زوج

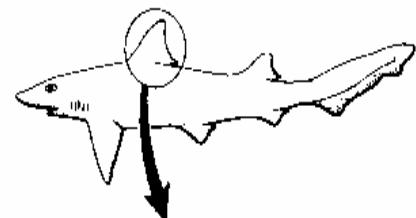
Pectoral fin باله سینه ای

Ventral or Pelvic fin باله شکمی یا لگنی

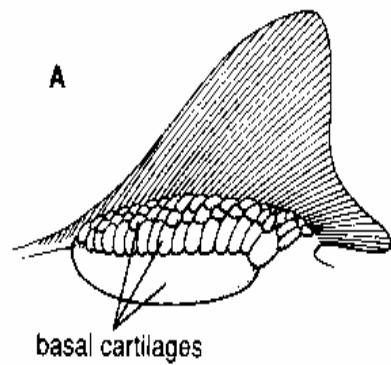
باله ها (pinna)

ساختارهای حمایتی باله ها (شعاع ها)

Ceratotrichia

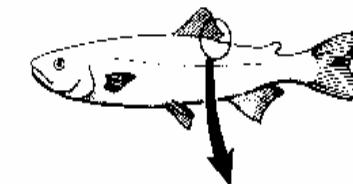


A



Lepidotrichia

Internal Support: The Skeletal System 51



pterygiophores:

distal

middle

proximal

B

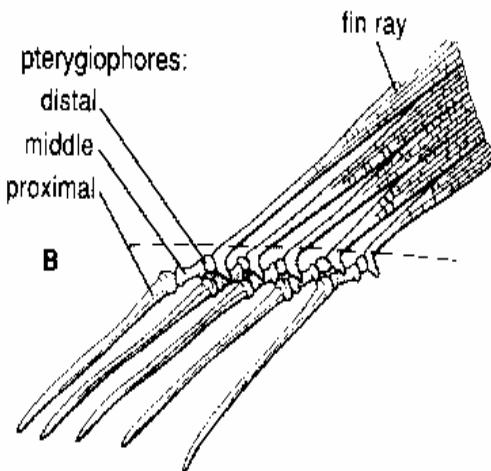


FIGURE 2-24 Skeletal supports of dorsal fin. **A**, Shark; **B**, bony fish (dashed lines show approximate body contour). (**A** based on Goodrich, 1930.)

باله ها
Fins (pinna)

ساختارهای حمایتی باله ها یا شعاع ها
ray and spine

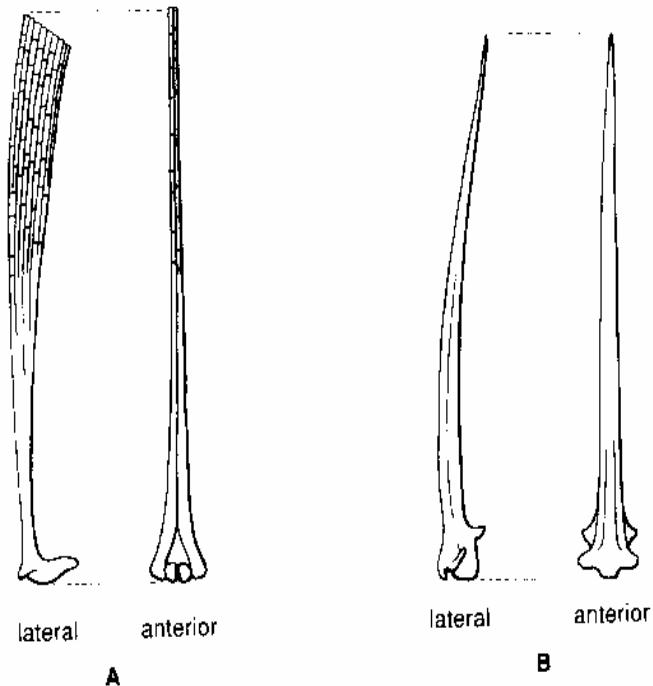
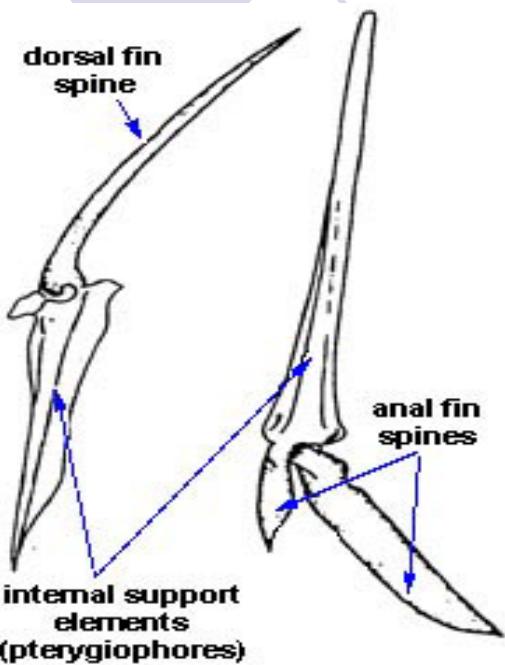


FIGURE 2-26 Comparison of soft and spinous rays. **A**, Lateral and anterior views of soft ray; **B**, same views of fin spine. Note branching, segmentation, and double construction of soft ray.

Spines vs. Rays

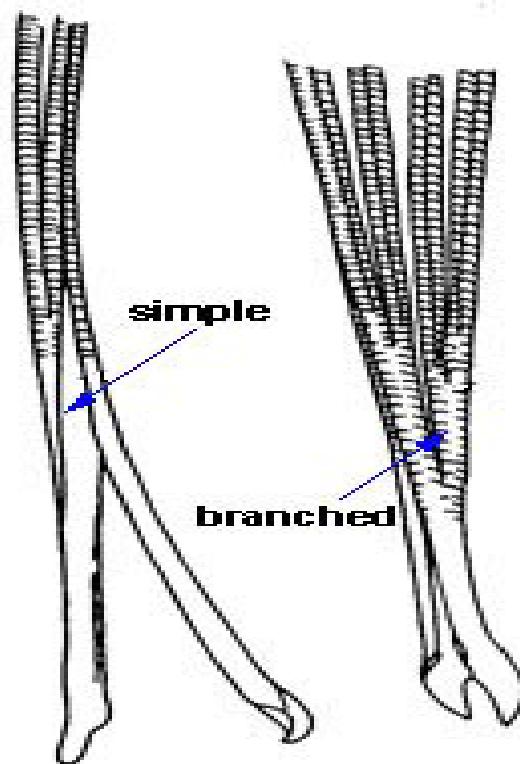


Spines

Hard, pointed tissue
Unsegmented
Unbranched
Solid

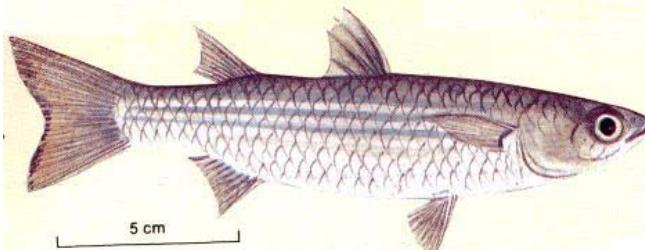
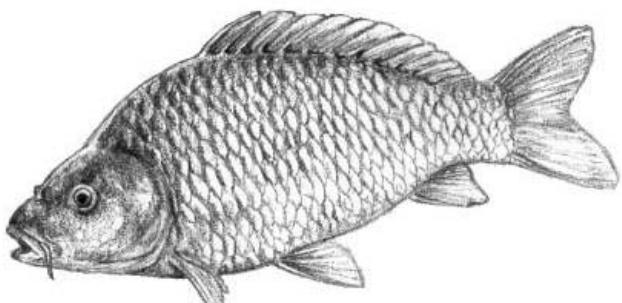
Rays

Soft, Segmented
Branched
Bilateral (lt. and rt. halves)

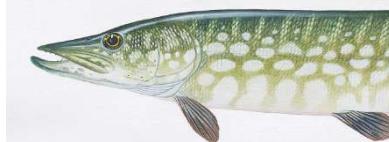
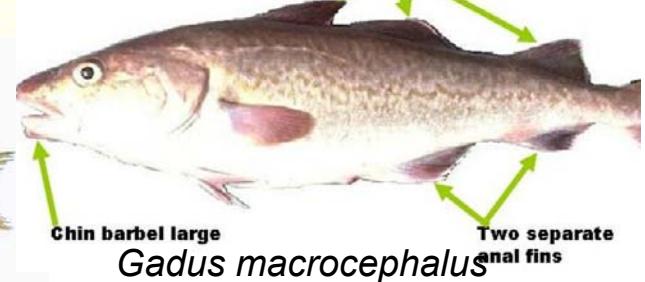


باله های فرد

باله پشتی



Sphyraena obtusata Cuvier, 1829



Esox lucius



Silurus glanis



Esox lucius



Silurus glanis



Scomberomorus commerson (Lacepede, 1801)



Echeneis naucrates

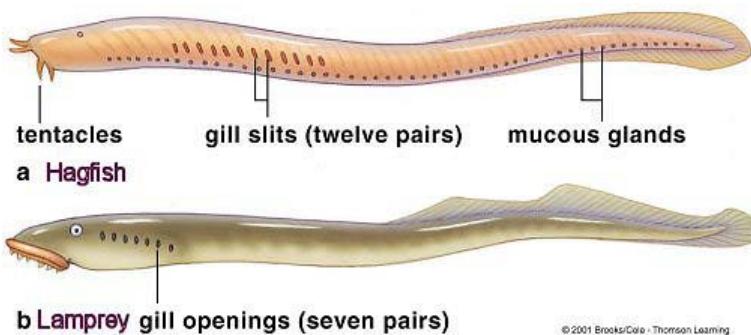
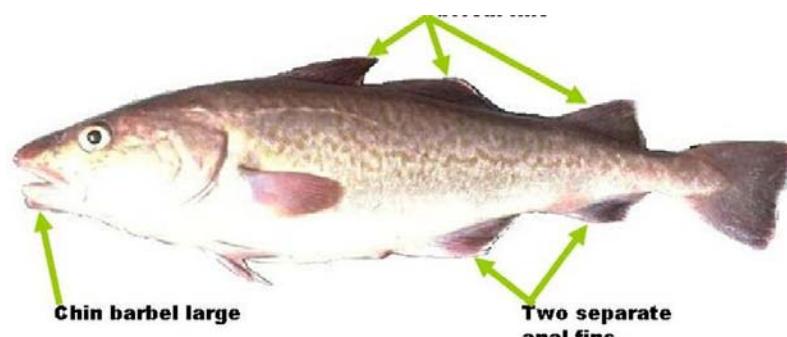


Polypterus

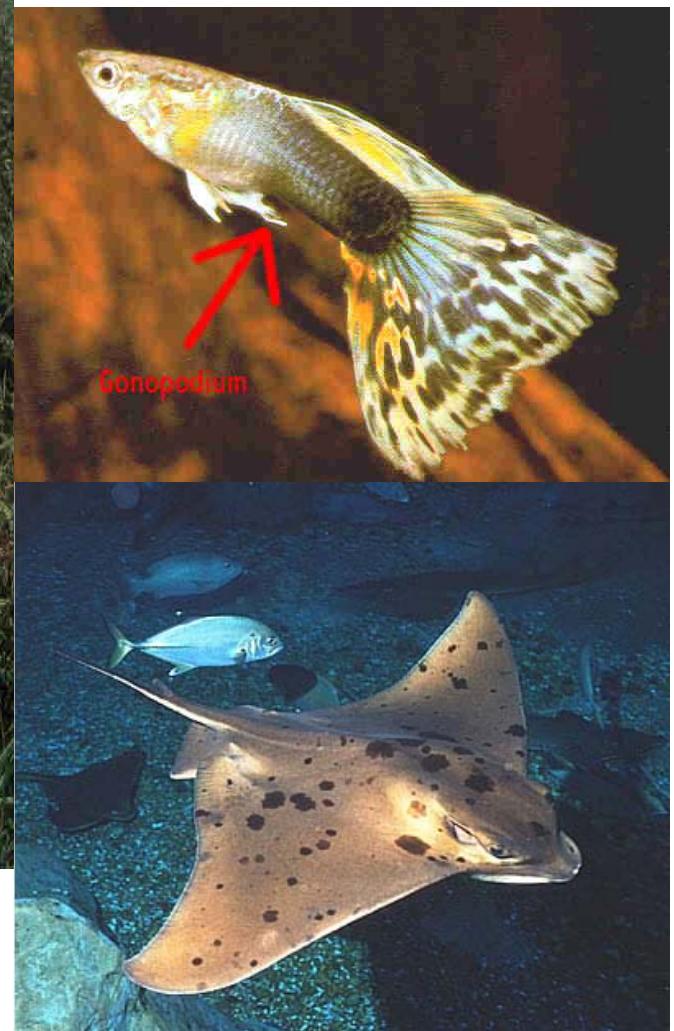
Scomberomorus commerson (Lacepede, 1801)



خانواده: تون ماهیان
نام فارسی: شیر ماهی



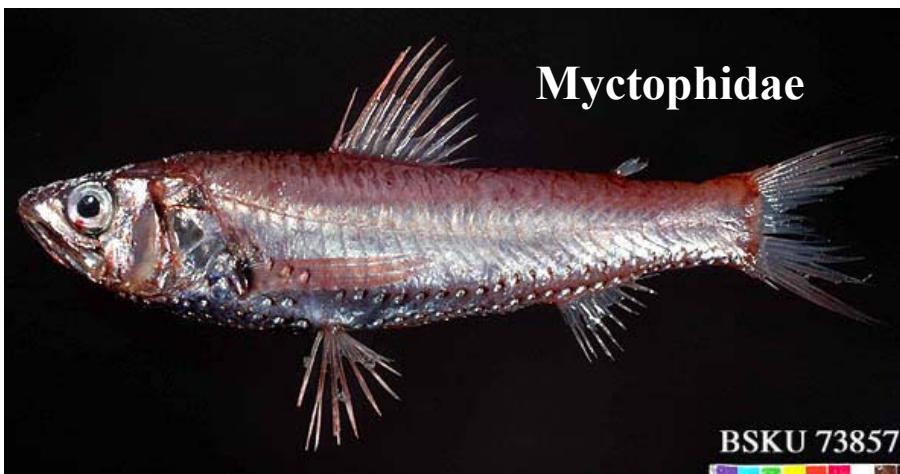
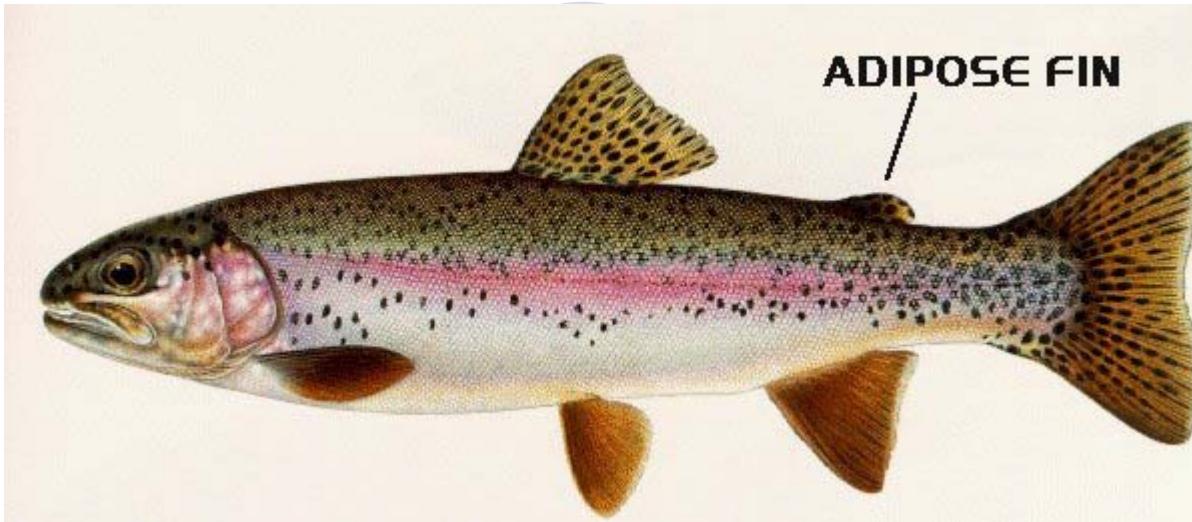
© 2001 Brooks/Cole - Thomson Learning



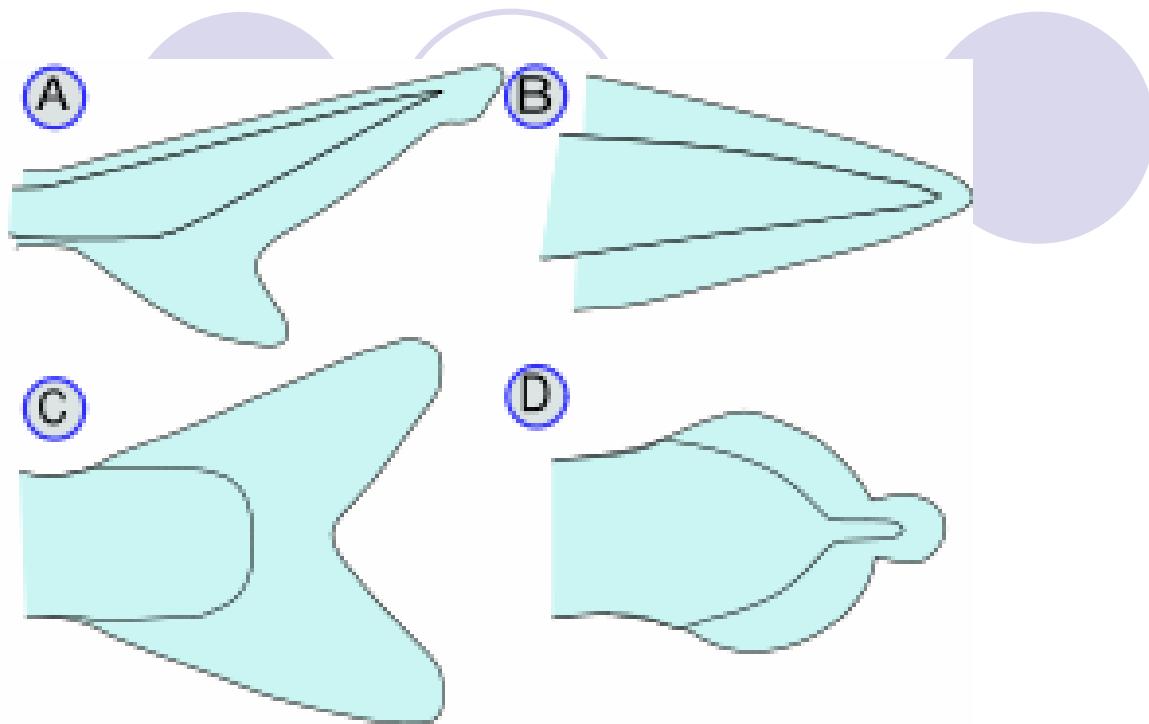
باله های فرد
باله مخرجی

Anal fin

باله های فرد
باله چربی



BSKU 73857



باله های فرد
باله دمی

Caudal fin

A) The tail can be **heterocercal**, which means that the vertebrae extend into a larger lobe of the tail or that the tail is asymmetrical.

Epicercal means that the upper lobe is longer (as in sharks)

Hypocercal means that the lower lobe is longer.

B) Protocercal means that the caudal fin extends around the vertebral column, present in embryonic fish and hagfish. This is not to be confused with a caudal fin that has fused with the dorsal and anal fins to form a contiguous fin.

C) Most fish have a homocercal tail, where the vertebrae do not extend into a lobe and the fin is more or less symmetrical. This can be expressed in a variety of shapes.

D) Diphycercal refers to the special, three-lobed caudal fin of the coelacanth and lungfish where the vertebrae extend all the way to the end of the tail.

باله های فرد
باله دمی Caudal fin

Isocercal—last vertebrae modified (cods)



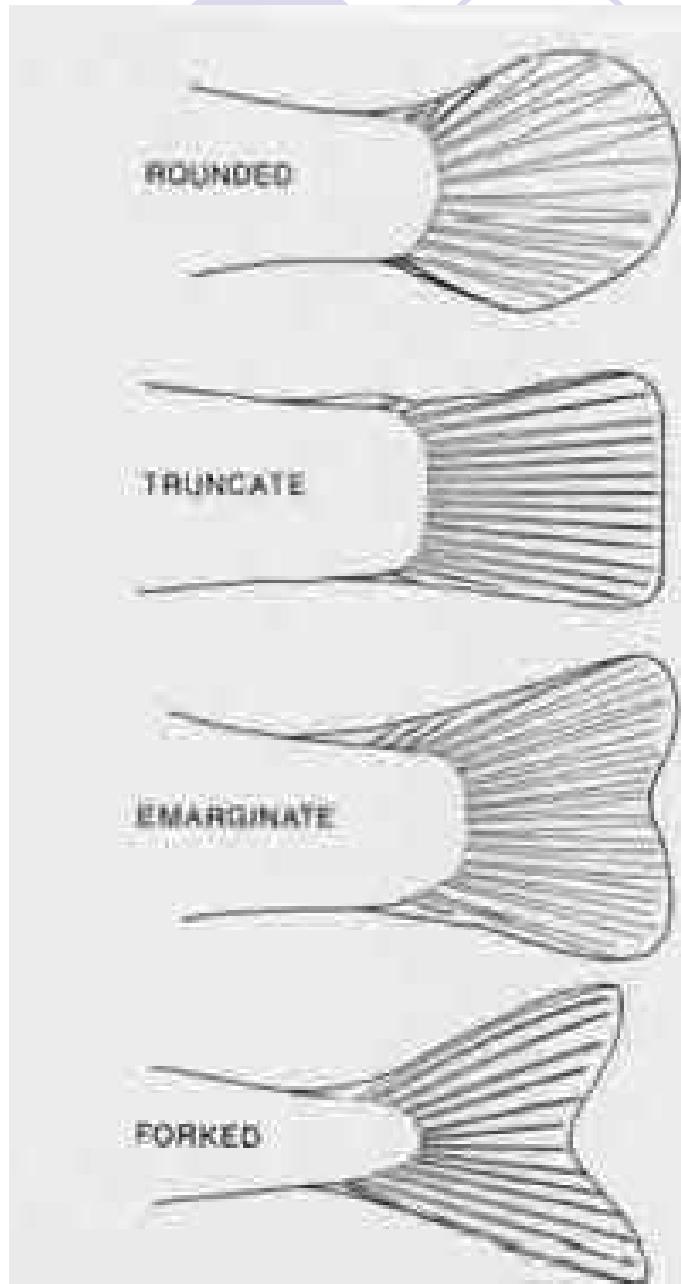
باله های فرد
Caudal fin

Gephyrocercal—"bridge tail"

Dorsal and anal fins have grown around
posterior end of fish. (Mola)



Copyright David Wrobel

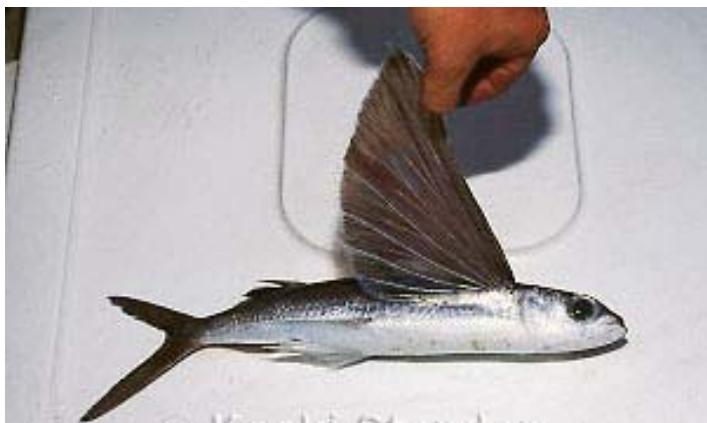
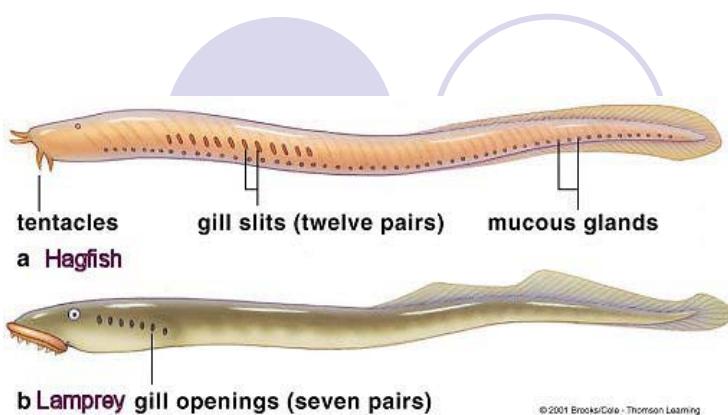


باله های فرد
باله دمی

Caudal fin

- The tail fin may be **rounded** at the end.
The tail fin may be **truncated**, or end in a more-or-less vertical edge (such as in salmon).
The fin may be **forked**, or end in two prongs.
The tail fin may be **emarginate**, or with a slight inward curve.
The tail fin may be **lunate**, or shaped like a crescent moon.

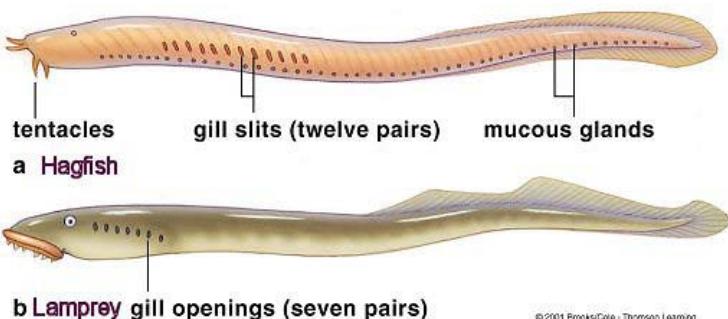
باله های زوج
باله سینه ای



نام فارسی: راشگو معمولی

باله های زوج
باله شکمی یا لگنی

Pelvic fins



Myxopterygium