

Fish Morphology and Identification in FishBase

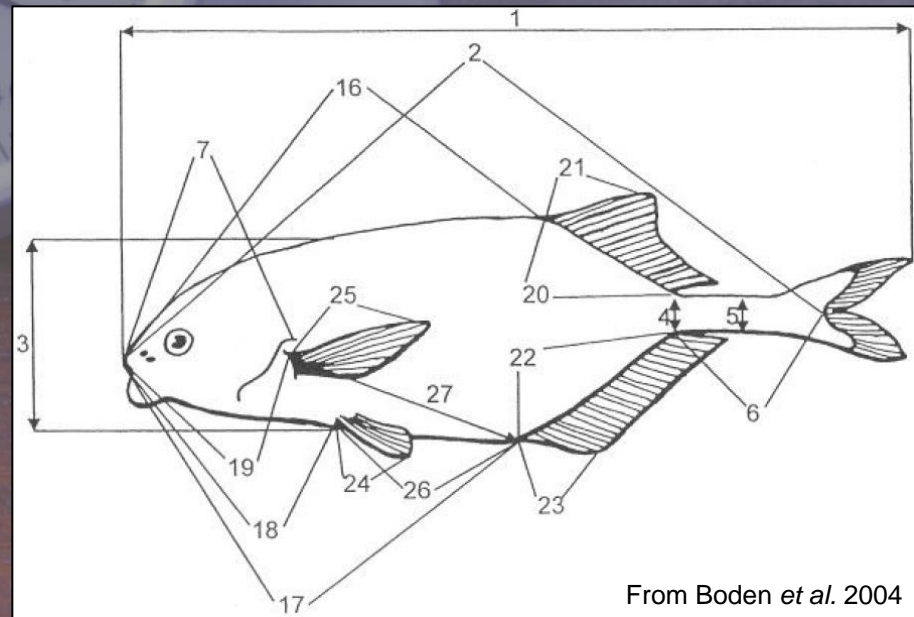
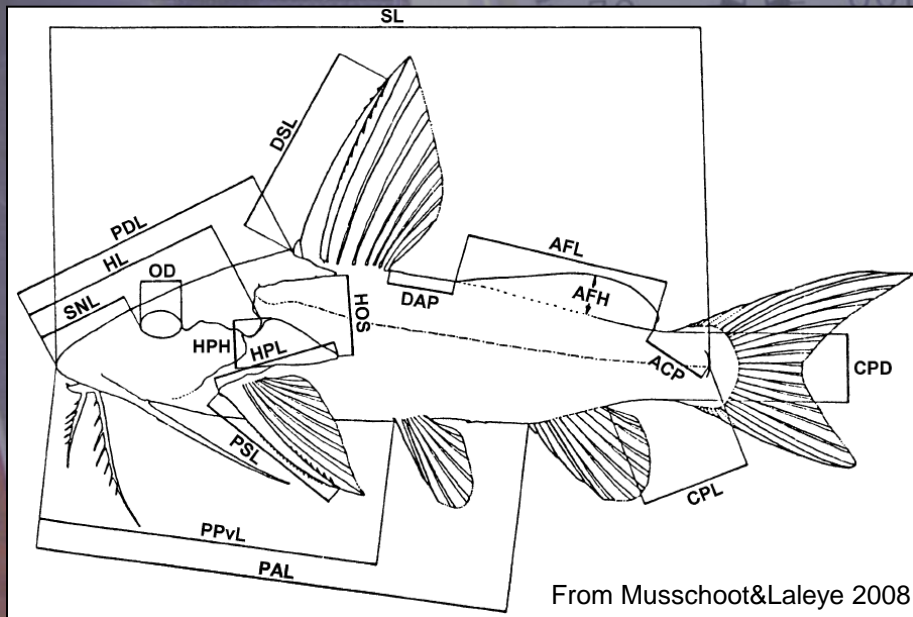


© Thad Zajdowicz

1. Fish Morphology

- Major characters for description and identification of fish:

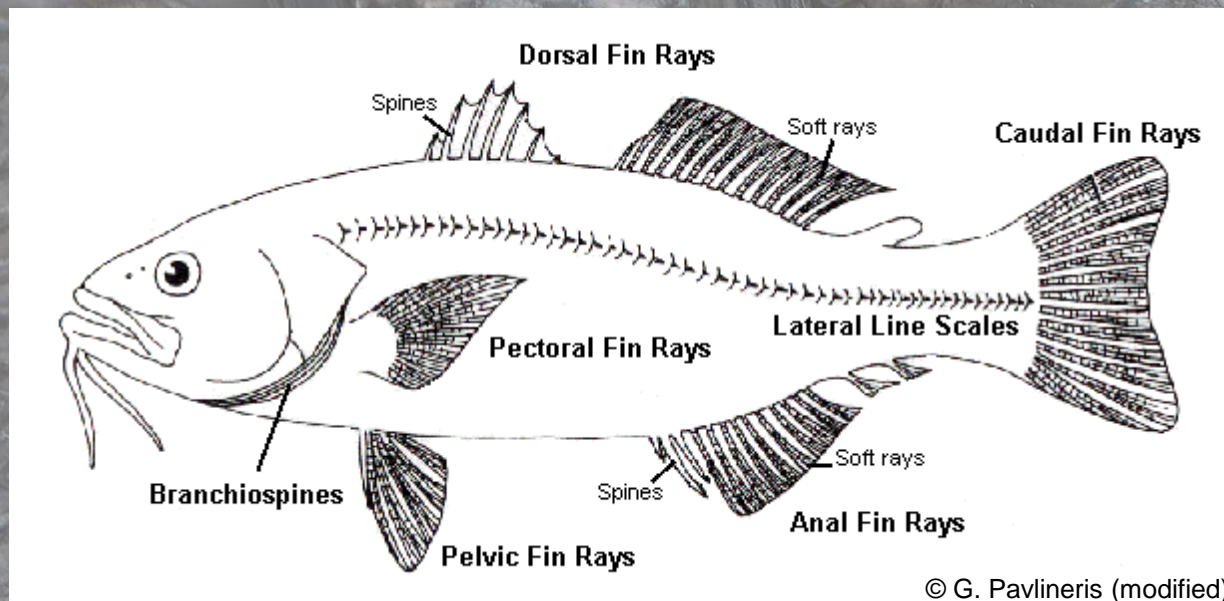
1. morphometric characters, referring to continuous variables



1. Fish Morphology

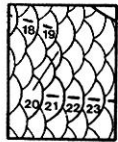
- Major characters for description and identification of fish:

2. meristic characters, referring to discontinuous variables



1. Fish Morphology

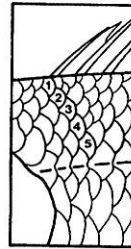
Some common meristics: scale counts



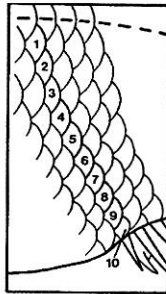
A



B



C



D



E

- A. Longitudinal scales
- B. Lateral scales
- C. Upper transversal scales
- D. Lower transversal scales
- E. Scales between pectoral and pelvic fins

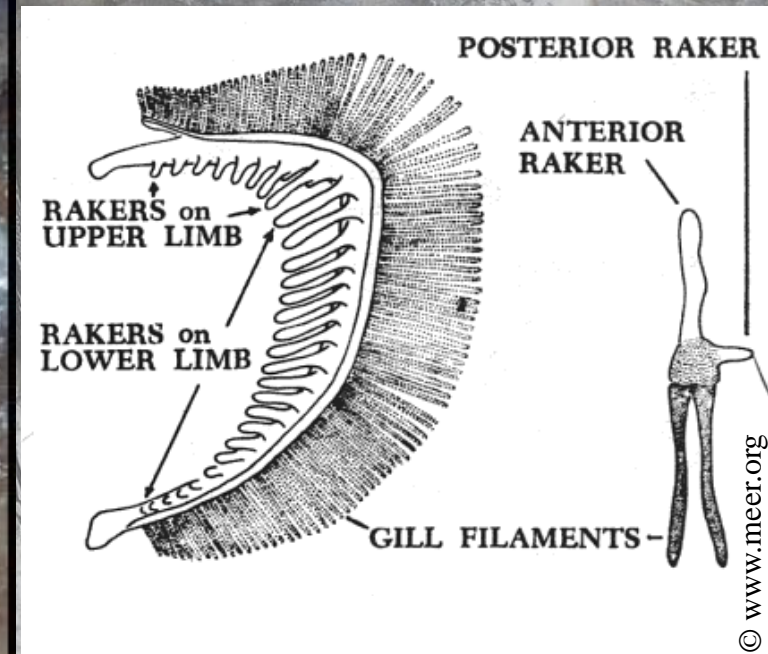
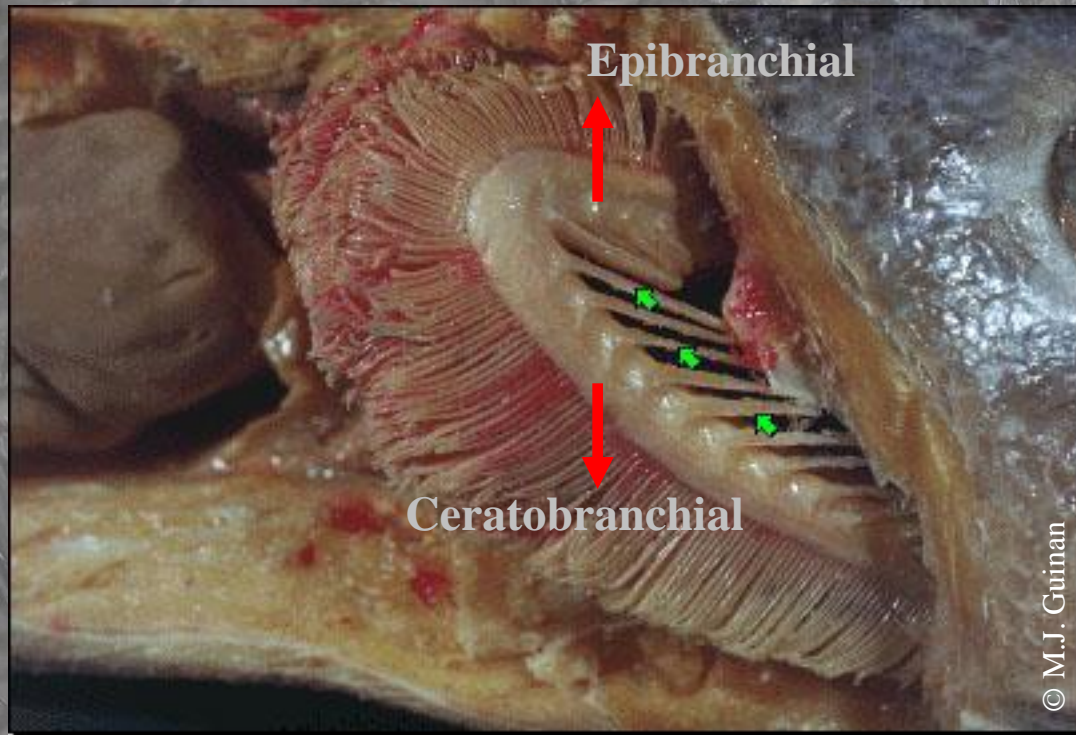
© J. Snoeks (2004)

Also predorsal scales, scales around caudal peduncle,...

1. Fish Morphology

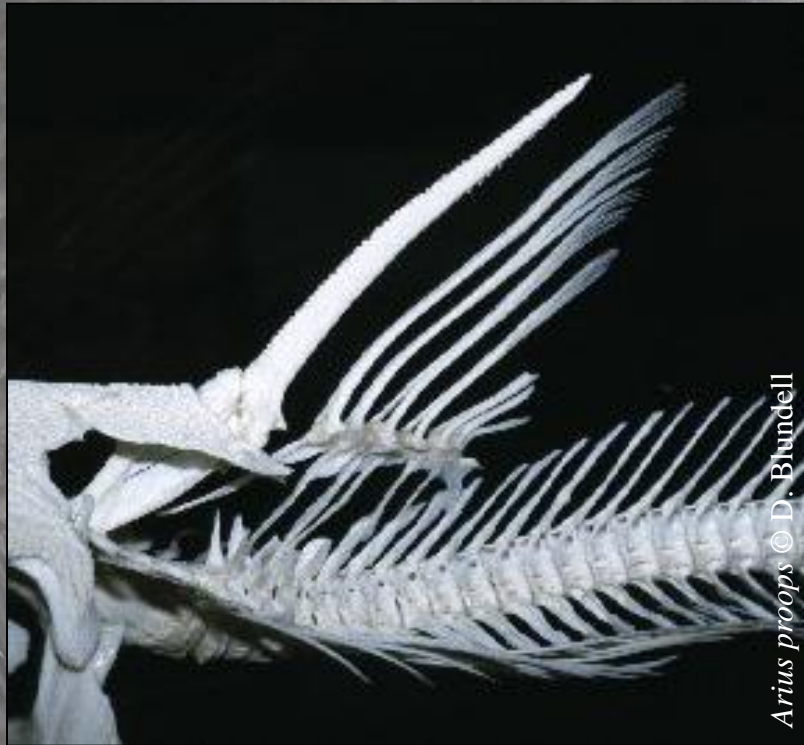
Some common meristics: gill rakers

Branchial arch - gill filaments – gill rakers

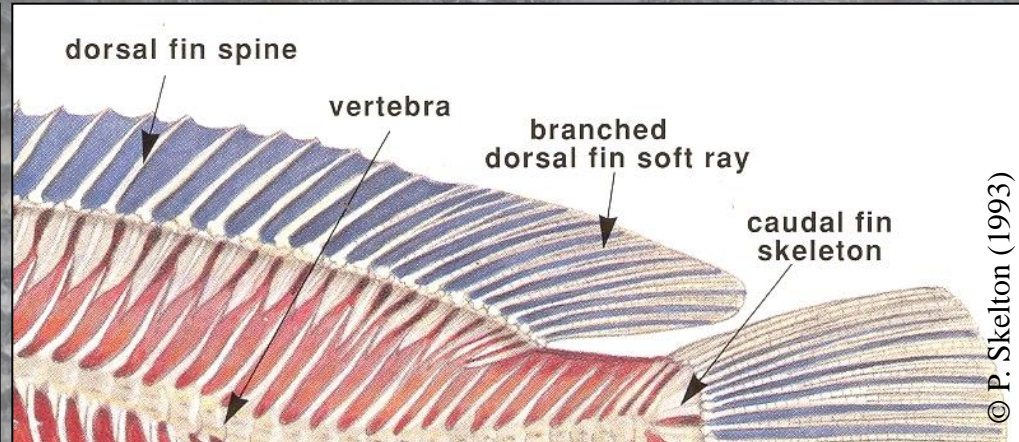


1. Fish Morphology

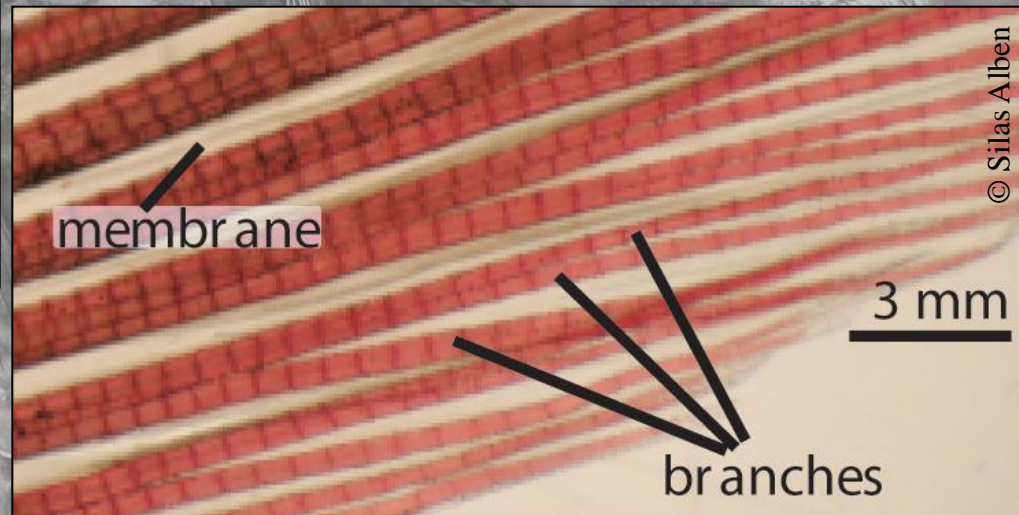
Some common meristics: fin rays



Arius proops © D. Blundell



© P. Skelton (1993)

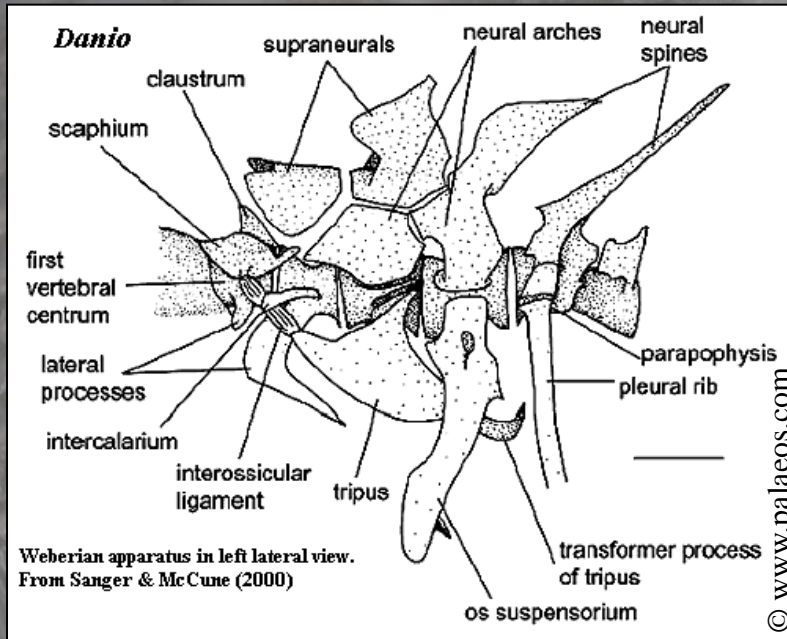


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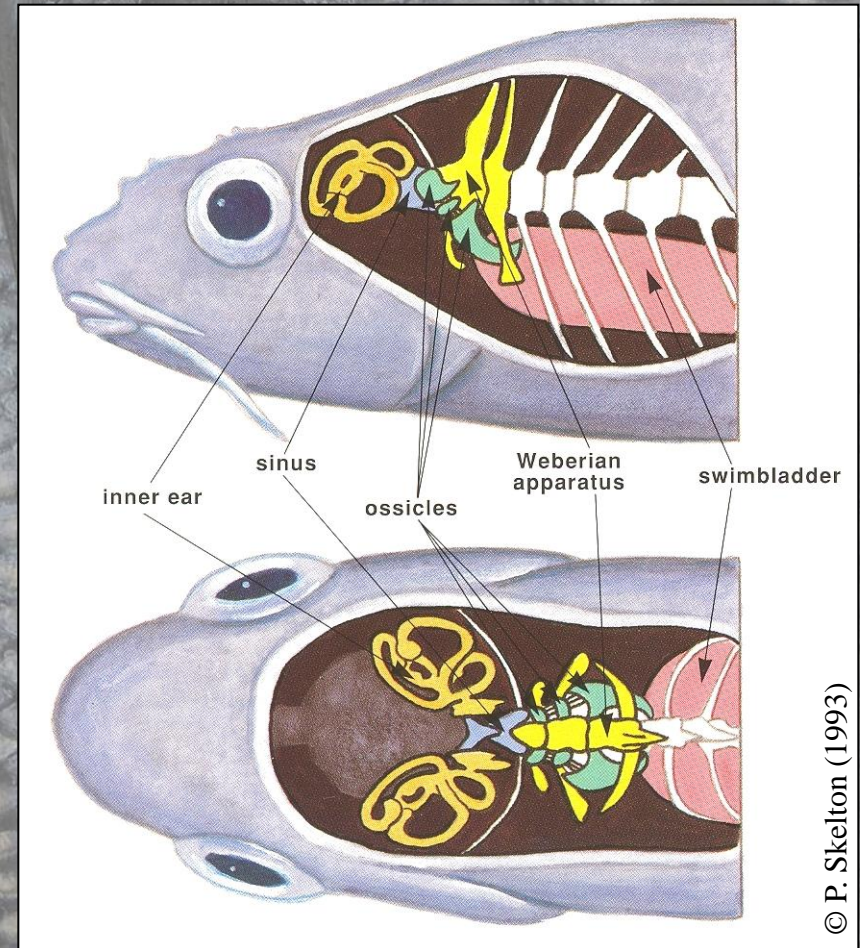
Spines, “spinelet”, soft rays
(branched or not),...

1. Fish Morphology

Some common meristics: vertebrae

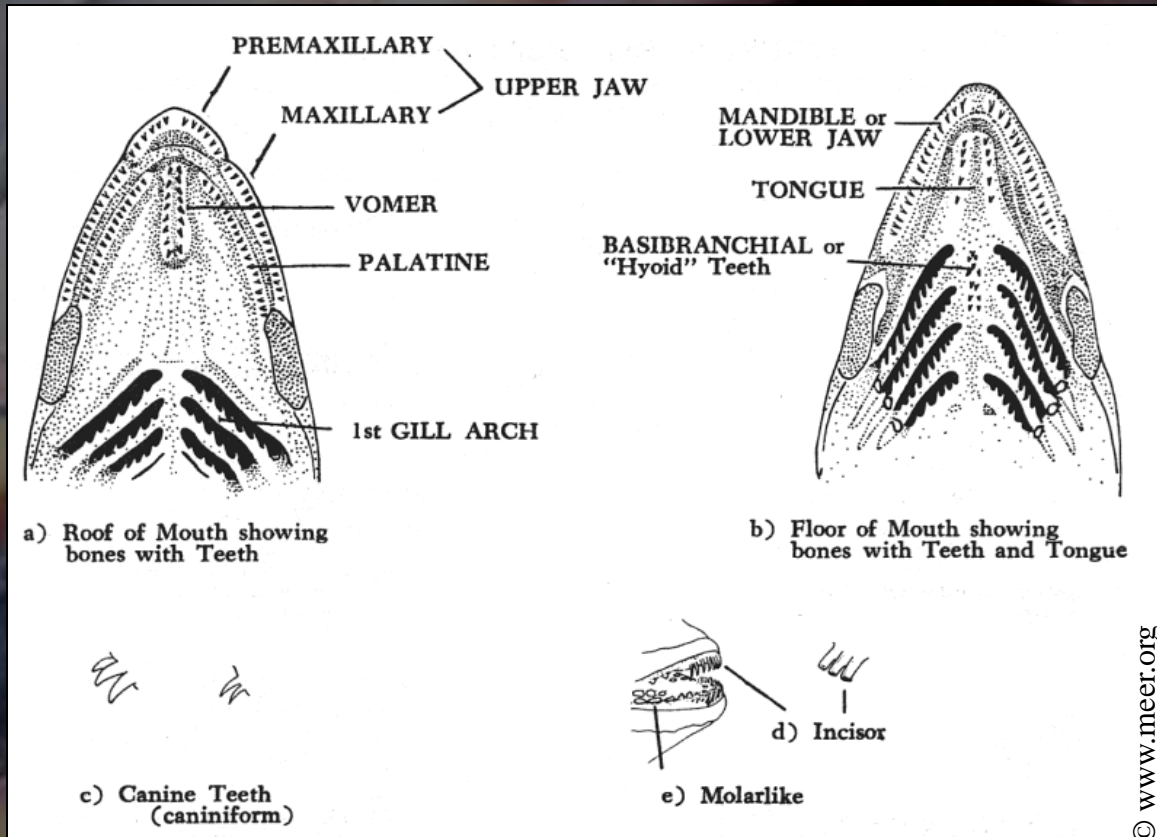


Number of precaudal - preanal - predorsal vertebrae, structure of the weberian apparatus,...



1. Fish Morphology

Some common meristics: teeth

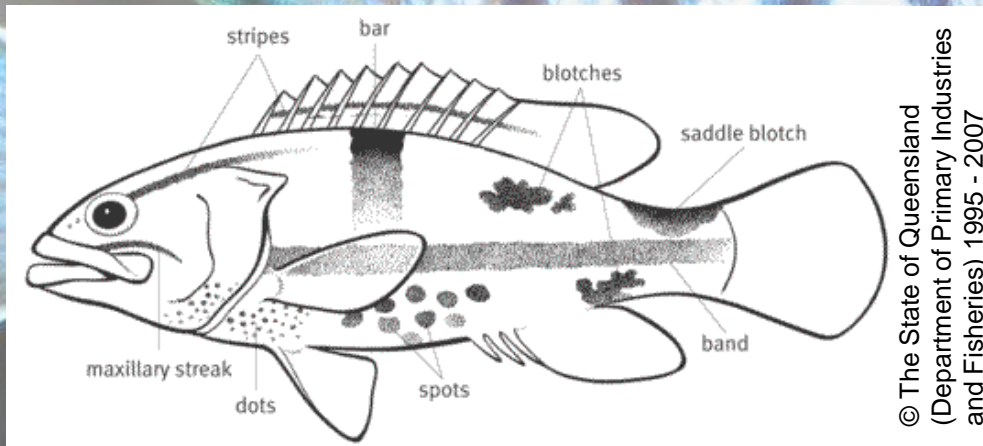


Premaxillary, vomerine and palatine teeth in *Chrysichthys* sp. © MRAC

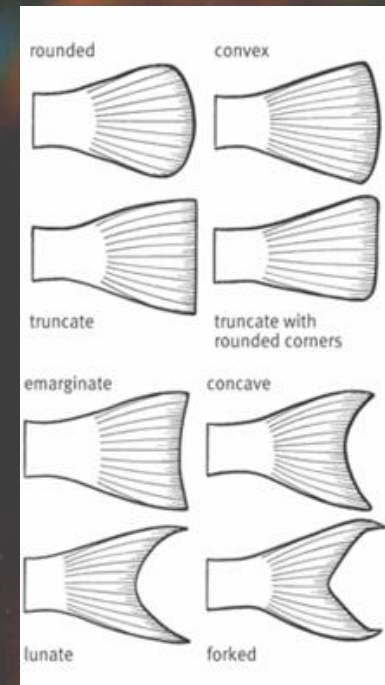
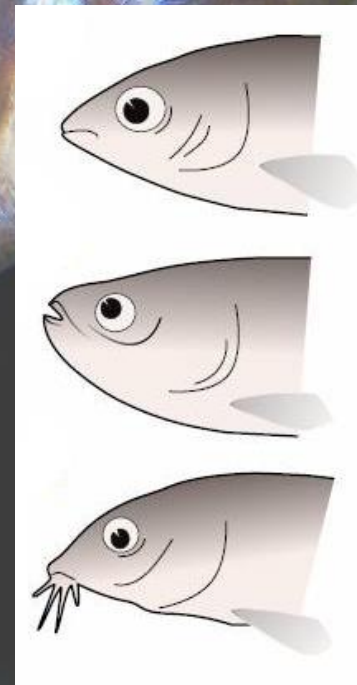
1. Fish Morphology

- Major characters for description and identification of fish:

3. descriptive characters, referring to distinguishable characters



Relative position of fins, length of barbels,...



2. The MORPHOMETRICS Table in FishBase

Data based on measurements of images in FishBase; morphometric data published in journals can be found in the MORPHOLOGY Table, but only if it has diagnostic value.

More information				
Countries	Common names	Age/Size	References	Collaborators
FAO areas	Synonyms	Growth	Aquaculture	Pictures
Ecosystems	Metabolism	Length-weight	Aquaculture profile	Stamps, Coins
Occurrences	Predators	Length-length	Strains	Sounds
Introductions	Ecotoxicology	Length-frequencies	Genetics	Ciguatera
Stocks	Reproduction	Morphometrics	Allele frequencies	Speed
Ecology	Maturity	Morphology	Heritability	Swim. type
Diet	Spawning	Larvae	Diseases	Gill area
Food items	Fecundity	Larval dynamics	Processing	Otoliths
Food consumption	Eggs	Recruitment	Mass conversion	Brains
Ration	Egg development	Abundance	Vision	

Species
Summary
Page

Morphometric Data for *Clarias gariepinus*

n = 2

Picture Name	Length		Lifestage	Aspect ratio
Clgar_u0.gif			unsexed	1.02
Clgar_u3.jpg	78	TL	unsexed	1.38

2. The MORPHOMETRICS Table in FishBase

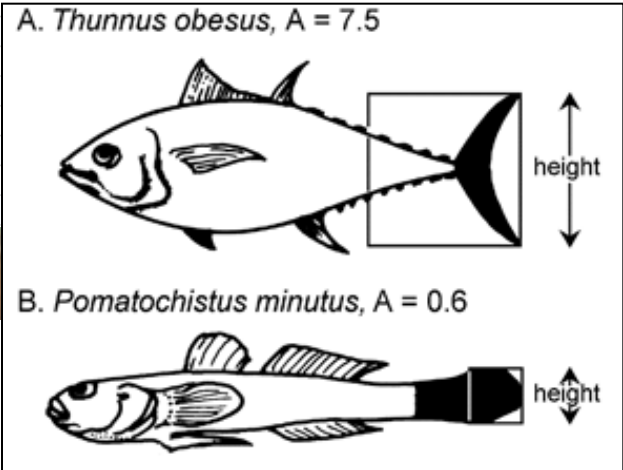
Morphometrics of *Clarias gariepinus*



Show Measurement

Picture Used	Clgar_u3.jpg
Size (cm)	78 TL
Sex	unsexed
Locality	
Total length (TL)	553 pixels
Standard length	90.2 % TL
Fork length	100.0 % TL
Pre-anal length	67.8 % TL
Pre-dorsal length	27.1 % TL
Pre-pelvic length	39.2 % TL
Pre-pectoral length	17.2 % TL
Body depth	13.4 % TL
Head length (HL)	16.6 % TL
Eye diameter	15.2 % HL
Pre-orbital length	21.7 % HL
Aspect ratio of caudal fin	1.37911 →
Remarks	

Aspect ratio ($A = h^2/s$, h = height of the caudal fin; s = surface area of fin) of a pelagic fish ($A = 7.5$) and a bottom dweller ($B = 0.6$). Note the correspondence between aspect ratios and modes of life.



3. The MORPHOLOGY Table in FishBase

1. Information on sex differences

2. Descriptive characters (including diagnostic morphometrics)

3. Meristic characters (lateral line, barbels, gill rakers, vertebrae)

4. Fins

1

2

3

4

Morphology Data of *Clarias gariepinus*

Identification keys

Main Ref.	Teugels, G.G., 1986	
Appearance refers to		
Sex attributes		
Specialized organs	no special organs	
Different appearance	males alike females	
Different colors	males alike females	
Remarks		
Descriptive characteristics of juvenile and adult		
Striking features		
Body shape lateral	elongated	
Cross section	oval	
Dorsal head profile	more or less straight	
Type of eyes	more or less normal	
Type of mouth/snout	more or less normal	
Position of mouth	sub-terminal/inferior	
Diagnosis	<p>Body depth is 6-8 times in standard length, the head 3-3.5 times (Ref. 34290). The head is somewhat between rectangular and pointed in dorsal outline; the snout is broadly rounded (Ref. 248). The eyes have a supero-lateral position and are relatively small (Ref. 248). Teeth on the premaxilla and lower jaw are small, fine and arranged in several rows (Ref. 34290). Nasal barbels from 1/5 to 1/2 times as long as the head in fishes longer than 12 cm, and from 1/2 to 4/5 of the head length in smaller individuals; maxillary barbels rarely shorter than the head, usually somewhat longer and reaching to a point midway between the origin of the dorsal fin and the insertion of the pelvic fins; outer mandibular barbel longer than the inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24 to 110, the number increasing with the size of the fish; these gill rakers are long, slender and closely set (Ref. 248, 34290). The distance between the occipital process and the base of the dorsal fin is short; the dorsal fin almost reaches the caudal fin (Ref. 248). The anal fin origin is closer to the caudal fin base than to the snout; it nearly reaches the caudal fin (Ref. 248). The pelvic fin is closer to the snout than to the caudal fin base (Ref. 248). The pectoral fin extends from the operculum to below the first dorsal fin rays; the pectoral spine is robust, serrated only on its outer face, the number of serrations increasing with age (Ref. 248). The lateral line appears as a small, white line from the posterior end of the head to the middle of the caudal fin base; the openings to the secondary sensory canals are clearly marked (Ref. 248). Two colour patterns can be discerned: the uniform and the marbled pattern (Ref. 248). In the uniform pattern, the dorsal surface and the flanks of the body and the dorsal parts of the pectoral and the pelvic fins are generally dark greyish-greenish black, while the belly and the ventral parts of the paired fins are lightly coloured (Ref. 248). In the marbled pattern, the specimens show irregular dark blotches on a light coloured background above and laterally; the belly and the ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of the lower surface of the head (Ref. 248). A series of light and dark bands may occur on the caudal fin; the proximal third of the fin is lightly coloured while its other part is dark; occasionally, irregular black spots may occur on the caudal fin (Ref. 248).</p>	
Ease of Identification		
Meristic characteristics of <i>Clarias gariepinus</i>		
Lateral Lines	1	Interrupted: No
Scales on lateral line		
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line		
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels		
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb		
on upper limb		
total	24 - 110	
Vertebrae		
preanal		
total	56 - 63	
Fins		
Dorsal fin(s)		
Attributes	extending over most of the back length	
Fins number	1	
Finlets No.	Dorsal 0	
	Ventral 0	
Spines total	0 - 0	
Soft-rays total	61 - 80	
Adipose fin	absent	
Caudal fin		
Attributes	more or less truncate; more or less normal	
Anal fin(s)		
Fins number	1	
Spines total	0 - 0	
Soft-rays total	43 - 65	
Paired fins		
Pectoral	Attributes: more or less normal Spines 1 Soft-rays 9 - 12	
Pelvis	Attributes: more or less normal Position: abdominal behind origin of D1 Spines Soft-rays 6 - 6	

3. The MORPHOLOGY Table in FishBase

Sex attributes

Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females
Remarks	

no special organs
protruding genital papilla (m)
genital papilla with tassels (m)
claspers (m)
gonopodium (m)
prolonged oviduct (f)
different shape of head (f,m)
other

Morphology Data of *Clarias gariepinus*

Identification keys

Main Ref.	Teuclès, G.G., 1986
Appearance refers to	
Bones in Osteobase	
Sex attributes	
Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females
Remarks	

Descriptive characteristics of juvenile and adult

		elongated
		oval
		more or less straight
		more or less normal
		more or less normal
		sub-terminal/inferior
	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3.5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>	
Ease of Identification		

Meristic characteristics of *Clarias gariepinus*

Lateral Lines	1	Interrupted: No
Scales on lateral line		
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line		
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb		
on upper limb		
total	24 - 110	
Vertebrae		
preanal		
total	56 - 63	

Fins

Dorsal fin(s)

Attributes	extending over most of the back length	
Fins number	1	
Finlets No.	Dorsal 0	
	Ventral 0	
Spines total	0 - 0	
Soft-rays total	61 - 80	
Adipose fin	absent	

Caudal fin

Attributes	more or less truncate; more or less normal	
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Anal fin(s)

Fins number	1	
Spines total	0 - 0	
Soft-rays total	45 - 65	

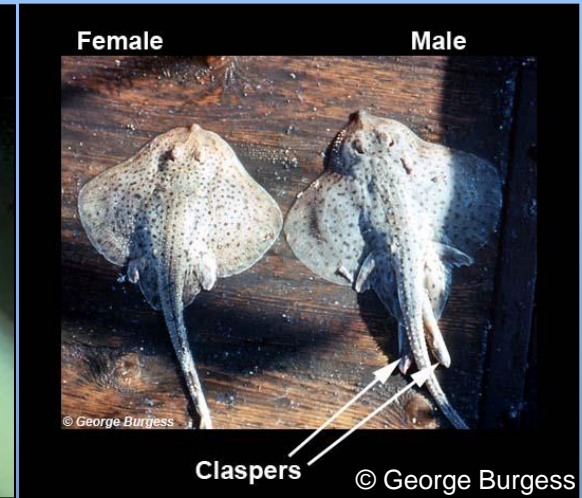
Paired fins

Pectoral	Attributes more or less normal	
	Spines 1	
	Soft-rays 9 - 12	
	Attributes more or less normal	
Pelvic	Position abdominal behind origin of D1	
	Spines	
	Soft-rays 6 - 6	

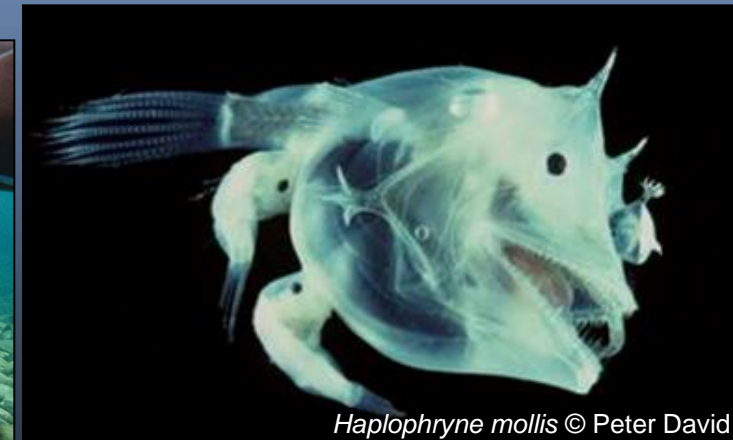


3. The MORPHOLOGY Table in FishBase

Specialized organs:



Different appearance/colors:



3. The MORPHOLOGY Table in FishBase

Morphology Data of <i>Clarias gariepinus</i>	
Identification keys	
Main Ref.	Teugels, G.G., 1986
Appearance refers to	
Bones in Osteobase	
Sex attributes	
Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females
Remarks	
Descriptive characteristics of juvenile and adult	
Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>
Ease of Identification	
Pectoral	Attributes: more or less normal Spines: 1 Soft-rays: 9 - 12
Pelvis	Attributes: more or less normal Position: abdominal behind origin of D1 Spines: Soft-rays: 6 - 6

Descriptive characteristics of juvenile and adult

Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>
Ease of Identification	



3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult

Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light background (Ref. 248). Most specimens show pigmentation band on proximal third of caudal fin lightly coloured white (Ref. 248).</p>
Ease of Identification	

Striking features:

none

none
 light organs
 striking shape of body
 striking fins
 striking eyes
 striking type of mouth
 striking barbel(s)
 flaps
 long whip-like tail
 other (see Diagnosis)
 flatfish



Melanostomias bartonbeani © www.pbs.org



Dibranchius cracens © California Acad. Sc.



Farlowella sp. © koti.kapsi.fi

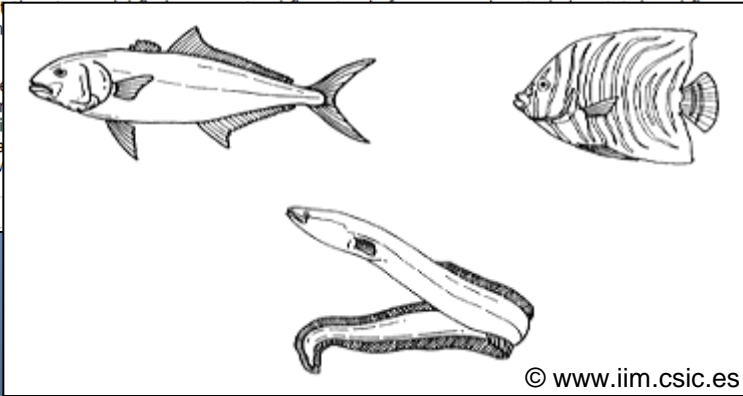


Remora © Havhest

3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult

Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than anal fin; pectoral spine robust, serrated only on its outer face, the head to middle of caudal fin base; openings</p> <p>Coloration: 2 colour patterns can be discerned: 1) marbled pattern, the pectoral and pelvic fins are generally dark grey or black, the rest of the body is whitish (Ref. 248). Most specimens show pigmentation based on the proximal third of caudal fin lightly coloured and dorsal parts of caudal fin dark (Ref. 248).</p>
Ease of Identification	



Body shape lateral:

short and / or deep

fusiform / normal

elongated

eel-like

short and / or deep

other (see Diagnosis)

modified by breeding

3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult	
Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mpath/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>
Ease of Identification	

Cross section:

compressed

circular

oval

compressed

flattened

angular

other (see Diagnosis)

Dorsal head profile:

clearly concave

more or less straight

clearly convex

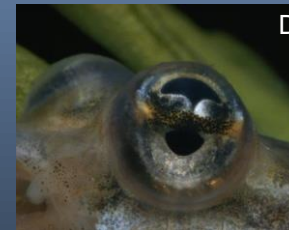
clearly concave



3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult

Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern specimens show irregular dark blotches (Ref. 248). Most specimens show pigmentation proximal third of caudal fin lightly coloured.</p>
Ease of Identification	



Type of eyes:

more or less normal

more or less normal

positioned on stalks, very prominent, or tubular

eyes absent

eyes with fixed fatty (adipose) tissue/eyelids

eyes divided into upper and lower part

asymmetric

other (see Diagnosis)

A. Mudskipper © Wiljo Jonsson - B. *Astyanax jordani* © National Park Service (NPS) U.S. Department of the Interior - C. Clupeiform adipose eyelid © Michigan Science Art - D. *Anableps anableps* © Paul Zahl/National Geographic/Getty Images - E. Flatfish © K. Telnes.

3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult

Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: one with dark spots on the pectoral and pelvic fins are generally dark; the other with light spots. Most specimens show irregular dark blotches on the body (Ref. 248). Most specimens show pigmentation on the proximal third of caudal fin lightly coloured.</p>
Ease of Identification	

Type of mouth/snout:

more or less normal

more or less normal

tube-like

funnel-like

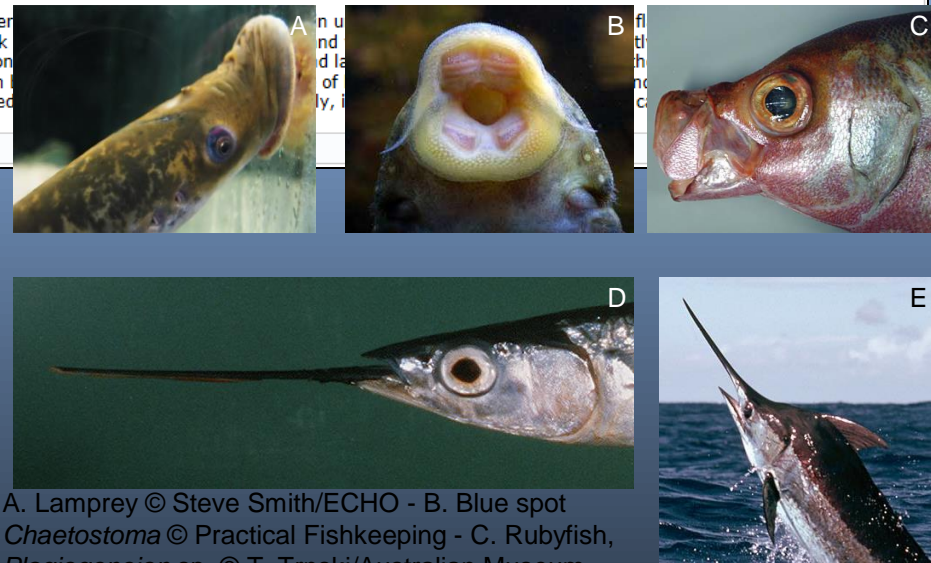
sucker-like

clearly protrusible

lower jaw greatly elongated

upper jaw greatly elongated

other (see Diagnosis)



A. Lamprey © Steve Smith/ECHO - B. Blue spot *Chaetostoma* © Practical Fishkeeping - C. Rubyfish, *Plagiogeneion* sp. © T. Trnski/Australian Museum - D. Halfbeak *Hemiramphus depauperatus* © J.E. Randall - E. Blue marlin, *Makaira* sp. © Tony Arruza/Corbis.

3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult	
Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3,5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, the number of gill rakers is varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and pointed; occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin almost reaches caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends almost to the snout; caudal fin is robust, serrated only on its outer face, the number of serrations increasing with age; laterally compressed; head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 34290).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, the dorsal fin and pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral fins are light greyish white. Specimens show irregular dark blotches on light coloured background above and laterally, and irregular dark blotches on light coloured background below and laterally (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular dark blotches on the caudal fin (Ref. 34290).</p>
Ease of Identification	



Position of mouth:	terminal
Diagnosis:	terminal
	sub-terminal/inferior
	superior

3. The MORPHOLOGY Table in FishBase

Descriptive characteristics of juvenile and adult

Striking features	none
Body shape lateral	short and / or deep
Cross section	
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	terminal
Diagnose	<p>Diagnosis: Adults: narrow preorbital bone (depth max. 21.5% of head length in fishes up to 21.3cm SL); lower pharyngeal jaw with short blade; no enlargement of the jaws in mature fish (lower jaw not exceeding and usually less than 36.8% head length) (Ref. 2). Caudal without regular dark vertical stripes (Ref. 2, 53405, 54467), but with a broad pink to bright red distal margin (Ref. 2). Breeding males assume an intense bright metallic blue on the head, a vermilion edge to the dorsal fin and a more intense pink on the caudal margin (Ref. 2, 54467). Breeding females with the edges of dorsal and caudal fins in a paler more orange color (Ref. 2). Juveniles: upper line of head profile running upward from snout at sharp angle; lower pharyngeal bone nearly triangular, teeth numerous but not densely crowded; dorsal and anal fin striped, with stripes running obliquely on the soft dorsal and longitudinally on the caudal fin; black <i>Tilapia</i>-mark on soft dorsal present; body dark; lower lip developed from beneath (Ref. 54566).</p> <p>Description: deep bodied; teeth very small, typical for an algae feeder (Ref. 52307), in 3-5 rows in the jaws, bicuspid in the outermost (Ref. 2, 53405, 54467), tricuspid in the others (Ref. 2, 54467). Lower pharyngeal bone with bicuspid teeth, its toothed part as long as anterior part (Ref. 53405). Scales cycloid (Ref. 367, 2756, 54408), with fringes of the embedded part almost straight (Ref. 54408). Scales on cheek in 2-3 horizontal series; 5-7 scales between base of pectoral and pelvic fin (Ref. 2, 54467). 13.5-14.5 scales below upper lateral line before the pelvic fins (Ref. 367). 2 scales between upper and lower lateral line (Ref. 367, 2756). Upper lateral line with 20-23 scales, lower with 14-18 scales (Ref. 367, 2756). Microbranchiospines present on outer sides of arches 2 to 4 (Ref. 2). Dorsal fin edge thickened and notches between lappets closed in fully ripe males (Ref. 364, 54467). Last dorsal spine the longest (Ref. 367, 2756). Third anal spine a little shorter than last dorsal spine (Ref. 2, 2756, 54467), but stronger (Ref. 2, 54467). Pelvics not greatly produced; caudal often with rounded corners, usually scaly only at the base and between rays on upper and lower parts of the fin; genital papilla of mature male conical or with narrow bifid flange (Ref. 2, 54467).</p> <p>Coloration: Juveniles: grey-brown to slightly golden (Ref. 52307), with vertical bars on sides (Ref. 53405). Specimens <10cm with well developed "Tilapia"-spot on soft dorsal fin (Ref. 2, 52307, 53405, 54467). Sometimes with vague vertical bars on caudal fin (Ref. 2, 3032). Adults: eye with red iris crossed by a black bar (Ref. 2). Ventral region pale silvery-grey (Ref. 2, 367, 3032, 52307). Lips often blackish (Ref. 367). Chin and chest may be blue-black (Ref. 2, 6465). Throat and belly sometimes yellowish but never reddish (Ref. 2756). Silvery and dark spots distributed all over the body (Ref. 52307). Sometimes with several vertical bars on body (Ref. 2, 3032, 31256, 52307), related to emotional state (Ref. 53405, 54467). Opercular spot generally present (Ref. 367, 2756, 54759), but may become totally invisible (Ref. 367). Pectoral fins greyish, pelvic fins blackish (Ref. 367, 2756). Dorsal fin (Ref. 2, 2756, 3032, 52307, 54467) and upper parts of caudal fin (Ref. 2, 367, 2756, 3023, 3032, 6465, 13851, 51850, 52307, 53405) with red margins. Soft dorsal and anal fin, and normally also the caudal fin, with numerous pale spots (Ref. 2, 2756, 3032, 31256, 52307, 54467, 54759). Spots on dorsal and anal fin in oblique rows (Ref. 367). Dorsal fin lappets dark, never red or pale (Ref. 51850). Adult males grey-blue, with head, from upper lips to eye, greenish-brown, becoming darker towards the back; courting males brilliant with metallic blue sparkles on the head (Ref. 52307), or intense metallic blue on the head, sometimes paler blue on the body, with a vermilion edge on the dorsal and a more intense pink caudal margin (Ref. 2, 6465, 54467). Breeding females with paler, more orange edges of dorsal and caudal fin (Ref. 2, 6465). Preserved specimens sometimes with black lateral band (Ref. 53405).</p>
Ease of Identification	likely to be confused with closely related species.

3. The MORPHOLOGY Table in FishBase

Morphology Data of <i>Clarias gariepinus</i>	
Identification keys	
Main Ref.	Teugels, G.G., 1986
Appearance refers to	
Bones in Osteobase	
Sex attributes	
Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females
Remarks	
Descriptive characteristics of juvenile and adult	
Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body depth 6-8 times in standard length, head 3-3.5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broadly rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face, the number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; openings to secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-greenish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>
Ease of Identification	

Meristic characteristics of <i>Clarias gariepinus</i>	
1	Interrupted: No
0	absent
24 - 110	
56 - 63	
extending over most of the back length	
1	
Dorsal 0	
Ventral 0	
0 - 0	
61 - 80	
absent	
more or less truncate; more or less normal	
1	
0 - 0	
45 - 65	
Attributes more or less normal	
Spines 1	
Soft-rays 9 - 12	
Attributes more or less normal	
Position abdominal behind origin of D1	
Spines	
Soft-rays 6 - 6	

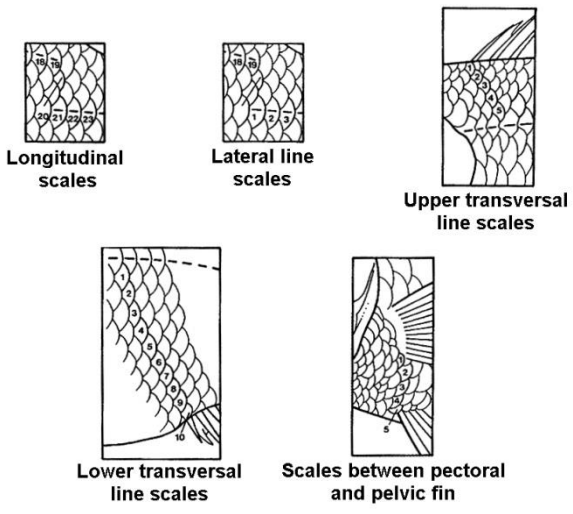
Meristic characteristics of *Clarias gariepinus*

Lateral Lines	1	Interrupted: No
Scales on lateral line		
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line		
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels		
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb		
on upper limb		
total	24 - 110	
Vertebrae		
preanal		
total	56 - 63	



3. The MORPHOLOGY Table in FishBase

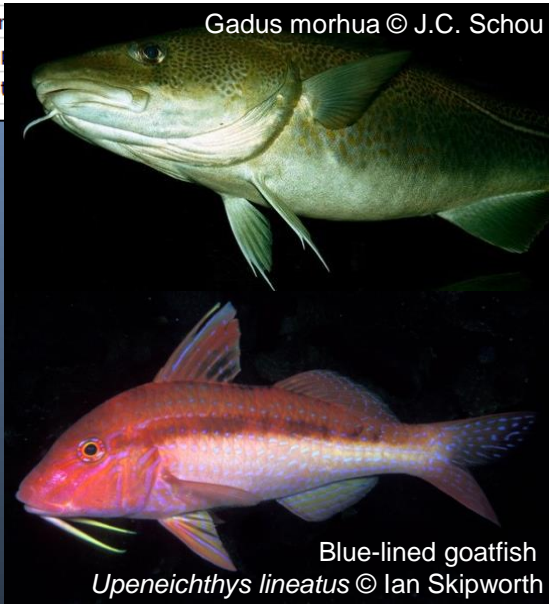
Meristic characteristics of <i>Oreochromis aureus</i>		
Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
preanal		
total		



Tylochromis sp. © MRAC

3. The MORPHOLOGY Table in FishBase

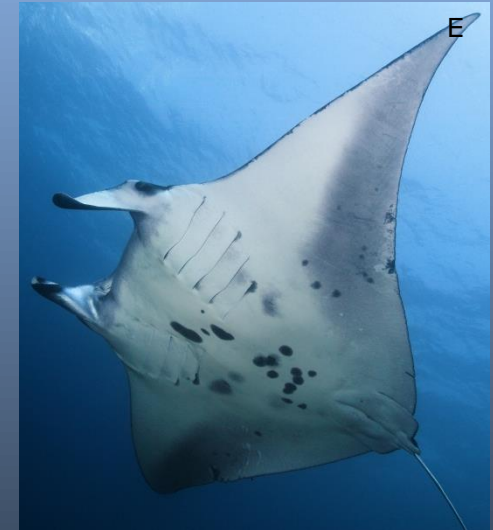
Meristic characteristics of Oreochromis aureus		
Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
total	28 - 31	



3. The MORPHOLOGY Table in FishBase

Meristic characteristics of *Oreochromis aureus*

Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
total	28	



A. Eagle ray © Yongala Dive - B. Grey nurse shark, *Carcharias taurus* © www.wallpaperfishtalk.com - C. Galapagos shark, *Carcharhinus galapagensis* © Doug Perrine - D. Scalloped hammerhead, *Sphyrna lewini* © Duiops - E. Manta ray, *Manta birostris* © www.yunphoto.net

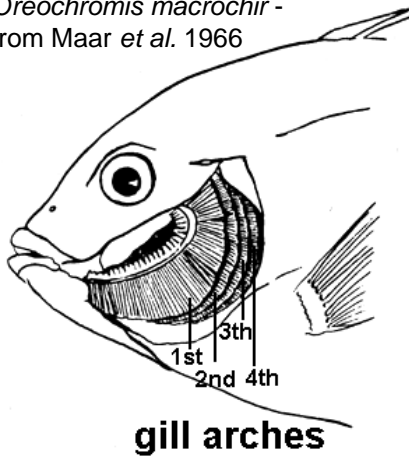
3. The MORPHOLOGY Table in FishBase

Meristic characteristics of *Oreochromis aureus*

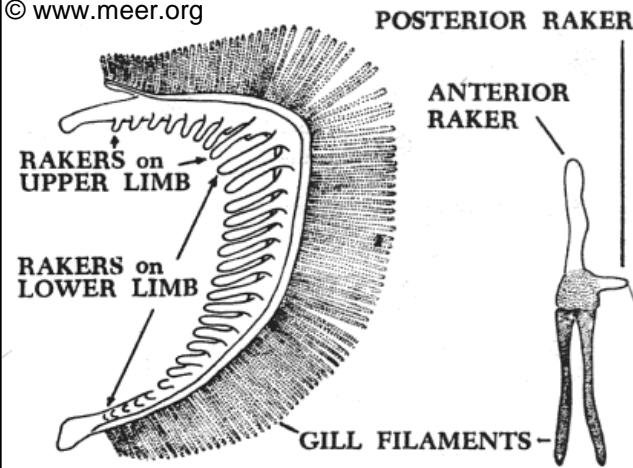
Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
preanal		
total	28 - 31	



Oreochromis macrochir -
from Maar et al. 1966



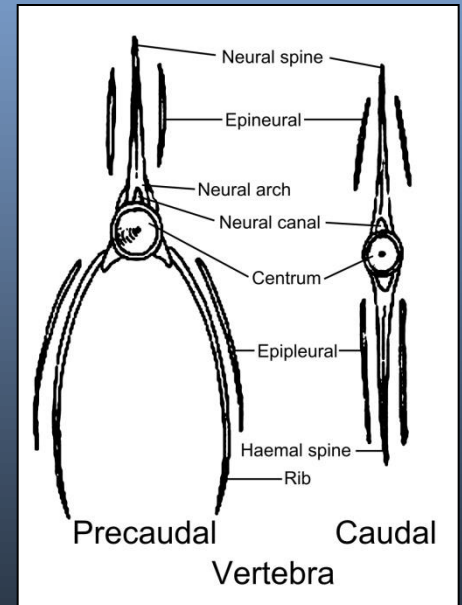
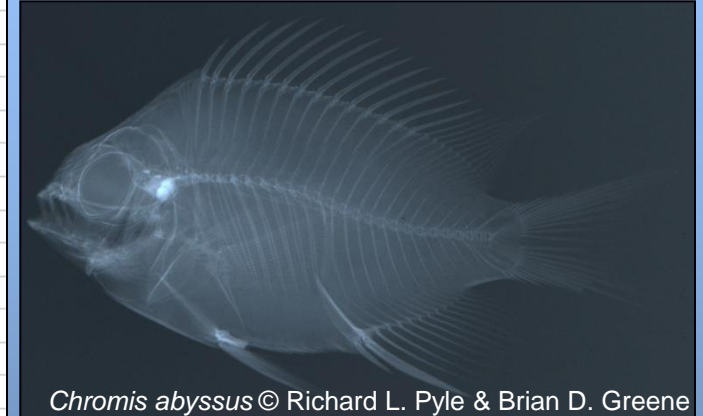
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3. The MORPHOLOGY Table in FishBase

Meristic characteristics of *Oreochromis aureus*

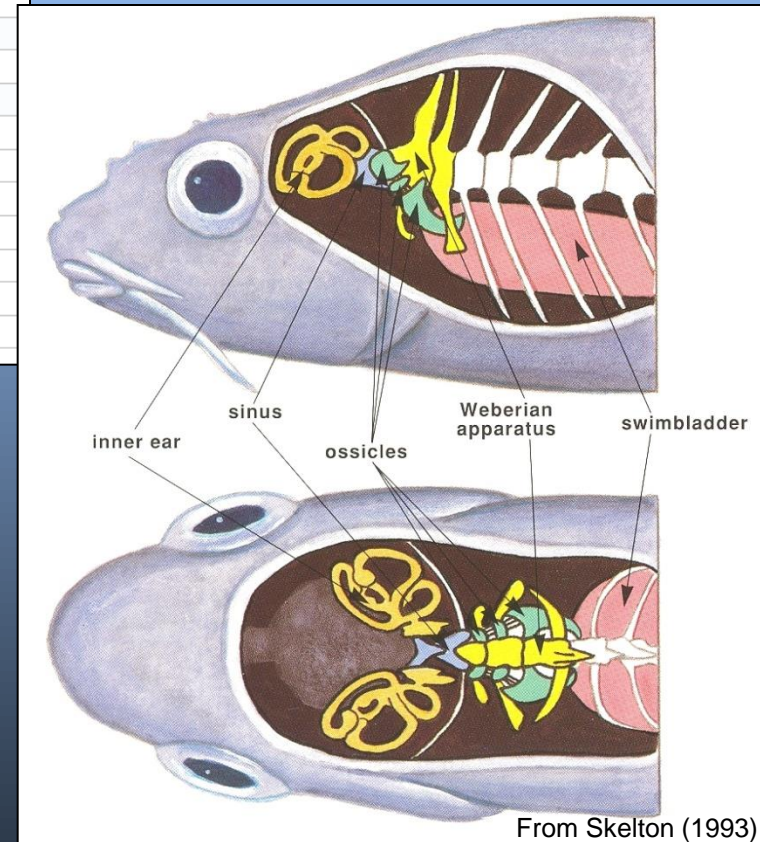
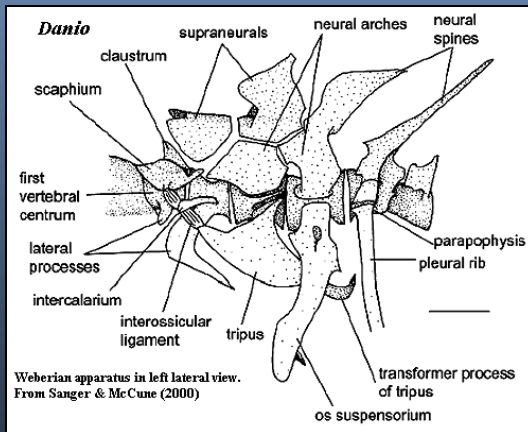
Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
preanal		
total	28 - 31	



3. The MORPHOLOGY Table in FishBase

Meristic characteristics of *Oreochromis aureus*

Lateral Lines	2	Interrupted: No
Scales on lateral line	29 - 33	
Pored lateral line scales		
Scales in lateral series		
Scale rows above lateral line	4 - 5.5	
Scale rows below lateral line		
Scales around caudal peduncle		
Barbels	0	
Gill clefts (sharks/rays only)		absent
Gill rakers		
on lower limb	18 - 30	
on upper limb	5 - 8	
total		
Vertebrae		
preanal		
total	28 - 31	



3. The MORPHOLOGY Table in FishBase

Fins	
Dorsal fin(s)	
Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent
Caudal fin	
Attributes	more or less truncate; more or less normal
Anal fin(s)	
Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65
Paired fins	
Pectoral	Attributes more or less normal
	Spines 1
	Soft-rays 9 - 12
Pelvics	Attributes more or less normal
	Position abdominal behind origin of D1
	Spines
	Soft-rays 6 - 6

Morphology Data of <i>Clarias gariepinus</i>	
Identification keys	
Help Ref.	Teugels, G.G., 1986
Appearance refers to	
Bones in FishBase	
Sex attributes	
Specialized organs	no special organs
Different appearance	males alike females
Different colors	males alike females
Remarks	
Descriptive characteristics of juvenile and adult	
Striking features	
Body shape lateral	elongated
Cross section	oval
Dorsal head profile	more or less straight
Type of eyes	more or less normal
Type of mouth/snout	more or less normal
Position of mouth	sub-terminal/inferior
Diagnosis	<p>Diagnosis: body length 6-8 times in standard length, head 3-3.5 times (Ref. 34290). Head somewhat between rectangular and pointed in dorsal outline; snout broad, rounded; eyes supero-lateral and relatively small (Ref. 248). Teeth on premaxilla and lower jaw small, fine and arranged in several rows; nasal barbels 1/5-1/2 times as long as head in fishes longer than 12 cm, and 1/2-4/5 of head length in smaller individuals; maxillary barbels rarely shorter than head, usually somewhat longer and reaching to a point midway between origin of dorsal fin and insertion of pelvic fins; outer mandibular barbel longer than inner pair (Ref. 34290). Contrary to other <i>Clarias</i> species, <i>Clarias gariepinus</i> has a high number of gill rakers varying from 24-110, the number increasing with size of the fish; gill rakers long, slender and closely set (Ref. 248, 34290). Distance between occipital process and base of dorsal fin is short; dorsal fin almost reaches caudal fin; anal fin origin closer to caudal fin base than to snout, nearly reaching caudal fin; pelvic fin closer to snout than to caudal fin base; pectoral fin extends from operculum to below 1st dorsal fin rays; pectoral spine robust, serrated only on its outer face. The number of serrations increasing with age; lateral line appears as a small, white line from posterior end of head to middle of caudal fin base; opening secondary sensory canals clearly marked (Ref. 248).</p> <p>Coloration: 2 colour patterns can be discerned: uniform and marbled pattern; in uniform pattern, dorsal surface and flanks of body and dorsal parts of pectoral and pelvic fins are generally dark greyish-brownish black, while belly and ventral parts of paired fins are lightly coloured; in marbled pattern, specimens show irregular dark blotches on light coloured background above and laterally, belly and ventral parts of the paired fins are whitish (Ref. 248). Most specimens show pigmentation bands on both sides of lower surface of head; a series of light and dark bands may occur on caudal fin; proximal third of caudal fin lightly coloured while other part is dark; occasionally, irregular black spots may occur on caudal fin (Ref. 248).</p>
Ease of Identification	
Meristic characteristics of <i>Clarias gariepinus</i>	
Lateral Lines	1 Interrupted: No
Scales on lateral line	
Pored lateral line scales	
Scales in lateral series	
Scale rows above lateral line	
Scale rows below lateral line	
Scales around caudal peduncle	
Barbels	0 absent
Gill clefts (sharks/rays only)	
Gill rakers	
on lower limb	
on upper limb	
total	24 - 110
Vertebrae	
preanal	
total	56 - 63
Fins	
Dorsal fin(s)	
Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent
Caudal fin	
Attributes	more or less truncate; more or less normal
Anal fin(s)	
Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65
Paired fins	
Pectoral	Attributes more or less normal
	Spines 1
	Soft-rays 9 - 12
Pelvics	Attributes more or less normal
	Position abdominal behind origin of D1
	Spines
	Soft-rays 6 - 6



3. The MORPHOLOGY Table in FishBase

Fins

Dorsal fin(s)

Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0 Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent

Caudal fin

Attributes	more or less truncate; more or less normal
------------	--

Anal fin(s)

Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65

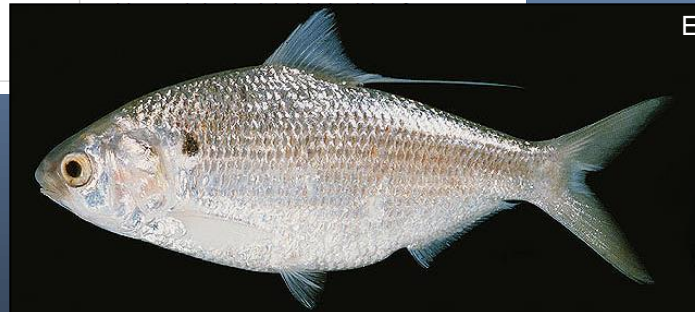
Paired fins

Pectoral	Attributes	more or less normal
	Spines	1
	Soft-rays	9 - 12
	Attributes	more or less normal

Attributes:

extending over most of the back length

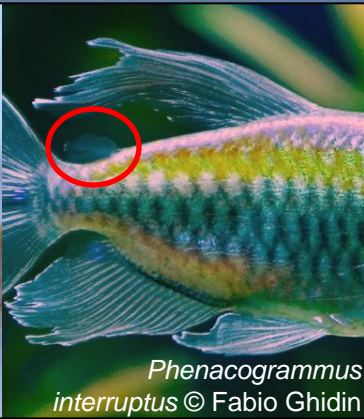
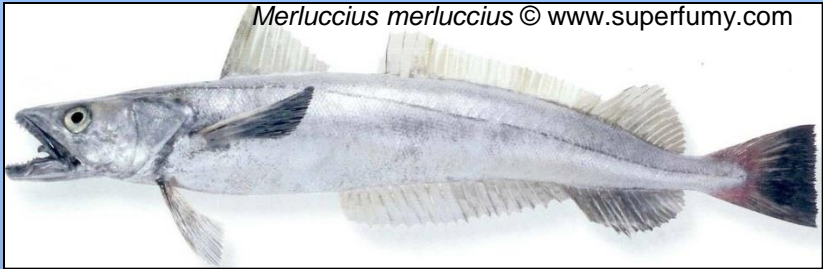
no striking attributes
 first fin ray very elongated
 first fin ray transformed to 'line and (luminous) bait'
 first rays forming locking device
 origin on head, nearly above eye
 extending over most of the back length
 continuous with caudal fin
 last fin rays very elongated
 modified to suction disc
 greatly reduced or absent
 other



A. *Stonogobiops yashia* © Underground Art Studio - B. *Mastacembelus armatus* © Balaram Mahalder - C. Oarfish, possibly *Trachipterus* © Orkney Marine Life Aquarium - D. *Melanocetus johnsonii* © E.A. Widder - E. *Nematalosa nasus* © J.E. Randall - F. *Remora* © Iprynne - G. Leatherjacket spine © J. King/Australian Museum

3. The MORPHOLOGY Table in FishBase

Fins	
Dorsal fin(s)	
Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent
Caudal fin	
Attributes	more or less truncate; more or less normal
Anal fin(s)	
Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65
Paired fins	
Pectoral	Attributes more or less normal
	Spines 1
	Soft-rays 9 - 12
	Attributes more or less normal



3. The MORPHOLOGY Table in FishBase

Fins

Dorsal fin(s)

Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent

Caudal fin

Attributes	more or less truncate; more or less normal
------------	--

Anal fin(s)

Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65

Paired fins

	Attributes more or less normal
Pectoral	Spines 1
	Soft-rays 9 - 12
	Attributes more or less normal

Caudal fin:

Attributes:

more or less truncate

more or less truncate

forked

pointed

heterocercal

other (see remark)

more or less normal

more or less normal

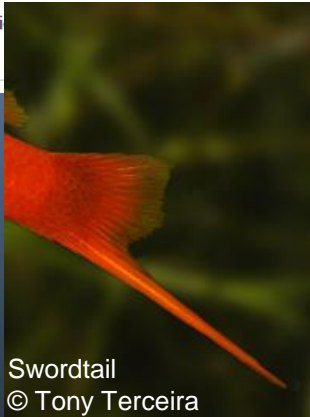
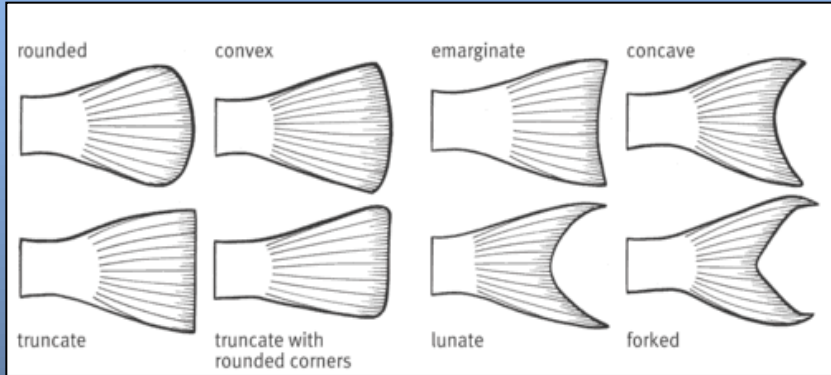
with dorsal filament

with dorsal and ventral filament

with medial filament

confluent

asymmetric



Swordtail
© Tony Terceira



Hemiancistrus pankimpuju © Nathan Lujan



Phenacogrammus interruptus © Fabio Ghidin



Porbeagle shark © Canadian Shark Research Lab

3. The MORPHOLOGY Table in FishBase

Fins

Dorsal fin(s)

Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0 Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent

Caudal fin

Attributes	more or less truncate; more or less normal
------------	--

Anal fin(s)

Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65

Paired fins

	Attributes more or less normal
Pectoral	Spines 1 Soft-rays 9 - 12
	Attributes more or less normal
	Position abdominal behind origin of D1
Pelvic	Spines
	Soft-rays



3. The MORPHOLOGY Table in FishBase

Fins	
Dorsal fin(s)	
Attributes	extending over most of t
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent
Caudal fin	
Attributes	more or less truncate; m
Anal fin(s)	
Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65
Paired fins	
Pectoral	Attributes more or less normal
	Spines 1
	Soft-rays 9 - 12
Pelvics	Attributes more or less normal
	Position abdominal behind origin of D1
	Spines
	Soft-rays 6 - 6

attributes:

more or less normal

more or less normal
 used for locomotion
 very large , lobe-like
 transformed to 'aerofoils'
 transformed to 'arms'
 rays very elongated
 several lower rays isolated
 1st ray hardened with locking structure
 absent
 other (see Diagnosis)

Periophthalmus modestus © Marli Tanabe



Eagle ray © Yongala Dive



Polynemus multifilis
 © www.aquadesignz.com



Flying gurnard © dic.academic.ru



Synodontis kogonensis
 © T. Müsschoot/MRAC

3. The MORPHOLOGY Table in FishBase

Fins	
Dorsal fin(s)	
Attributes	extending over most of the back length
Fins number	1
Finlets No.	Dorsal 0
	Ventral 0
Spines total	0 - 0
Soft-rays total	61 - 80
Adipose fin	absent
Caudal fin	
Attributes	more or less truncate; more or less normal
Anal fin(s)	
Fins number	1
Spines total	0 - 0
Soft-rays total	45 - 65
Paired fins	
Pectoral	Attributes more or less normal
	Spines 1
	Soft-rays 9 - 12
Pelvics	Attributes more or less normal
	Position abdominal behind origin of D1
	Spines
	Soft-rays 6 - 6



Bregmaceros maclellandi © Gloerfelt-Tarp

attributes:

more or less normal

more or less normal
rays very elongated
reduced to filaments
largely reduced to one ray
joint to one spine only
joint, cup-like
part of sucker-disc
asymmetric in size/position
suppressed/absent
aberrant
other (see Diagnosis)

position:

thoracic
abdominal
thoracic
jugular
absent

beneath origin of D1
behind origin of D1
beneath origin of D1
before origin of D1



Atopochilus savognani
© T.R. Vigliotta



Gadus morhua © J.C. Schou

4. Fish Identification

- taxonomy = the science of correctly naming species
- often confused with fish identification, which refers to the use of the latest taxonomic information to identify fishes.
- FishBase offers 3 ways to identify fish:
 - Quick Identification Routine
 - Identification by morphometrics
 - Identification Keys

4. Fish Identification

Quick Identification Routine

- if no data about the fish is available, pictograms can be used for quick comparison by eye; FishBase also provides an explanation of the groups to choose from
- once at the family level, a list of matching species with picture (if available) is generated
- further identification is done by checking the pictures and full species descriptions

4. Fish Identification

Quick Identification Routine

Search Page

Some information about the specimen to identify can be provided (FAO area, country, number of rays in dorsal and anal fin) to limit the search results

Tools

- ☒ Quick Identification
- ☐ Identification keys
- ☐ Identification by morphometrics
- ☐ Adverse introductions
- ☐ Global introductions
- ☐ Invasiveness
- ☐ Species by ecosystem
- ☐ Graphs
- ☐ SeaFood Advisory
- ☐ Shifting Baselines WP2 - Online Toolset

Fish Identification Find Class Other identification tools | FishBase

Glossary

To start, select a class by clicking on corresponding image or you may first select an area (and a country):

Select an area (ocean for marine/brackish, continent for freshwater):

Select Country (optional):

Ray-finned Fishes

This is the largest and most diverse group of fishes. Main traits, which may however be absent in some species, are the bony skeleton, swim bladder, and highly derived skeleton of the skull and the tail, allowing for protrusion of the jaws and flexible caudal fins, respectively. External identification characters are: Fins usually are supported by rays. Scales, if present, are ganoid, cycloid or ctenoid. There is no spiracle. Interpercle and branchiostegal rays are usually present. The nostrils are relatively high up on the head.

Sharks & Rays

Main traits of this group are cartilaginous skeleton, placoid scales, internal fertilization with claspers in males, serial replacement of teeth, multiple gill slits, no lungs or gas bladder but instead large, buoyant livers, and a spiral valve intestine. External identification characters are: Five to seven separate gill openings on each side of the head, the first often modified as a spiracle. Dorsal fins and spines, if present, are rigid and can not be folded.

Chimaeras

Main traits of this group are a cartilaginous skeleton, internal fertilization with claspers in males, no lungs or gas bladder but instead large, buoyant livers, and a spiral valve intestine. All chimaeras lay large eggs with a horny shell and development of embryos is direct, without a larval stage. External identification characters

Lobe-finned Fishes

This group shares a common ancestor with the tetrapods and includes six lung fishes and two coelacanths. External identification characters are: Paired fins are present and form lobes or filaments. The tail is

4. Fish Identification

Quick Identification Routine

Fish Identification: Find Order

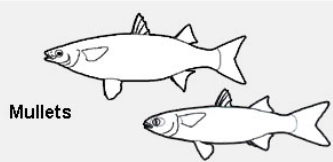
46 orders of ray-finned fishes

Glossary ?

Enter total number of spines in dorsal and anal fins (optional) and select order

Redo

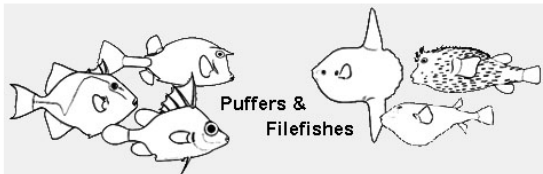
[FishBase](#)



Mullets

Mugiliformes - [mullets](#)

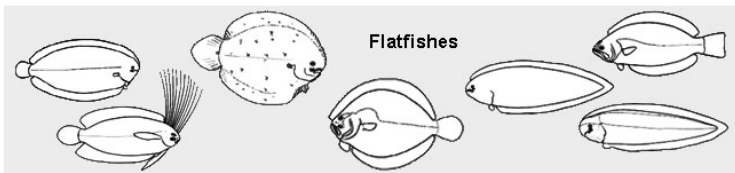
Distribution: All tropical and temperate seas. Chiefly marine (coastal) and brackish water; some in freshwater (*Liza abu* only in fresh and estuaries). Short description: Spinous (4 spines) and soft dorsal fins widely separated. Pelvic fins subabdominal; 1 spine, 5 soft rays. Lateral line hardly visible when present. Mouth of moderate size. Toothless or teeth small. Long gill rakers. Muscular stomach; extremely long intestine. Travel in schools and feed on fine algae, diatoms, and detritus of bottom sediments. Important food fishes. Taxonomy: Mugiliformes have been considered as a separate order like here, or as a Percomorpha (formes). They are either considered at the base of Acanthopterygii or Percomorpha. The consensus is to consider that they are close to Atherinids, Gasterosteids, Synbranchids, Elasmobranchs in an unresolved polytomy. See FoW (Nelson, 2006; Ref. 58010) for more details.



Puffers & Filefishes

Tetraodontiformes - [puffers and filefishes](#)

No parietals, nasals, or infraorbitals, and usually no lower ribs; posttemporal, if present, simple and fused with pterotic of skull; hyomandibular and palatine firmly attached with premaxilla; lateral line present or absent, sometimes multiple; swim bladder present except in molid; 16-30 vertebrae.



Flatfishes

Pleuronectiformes - [flatfishes](#)

Adults not bilaterally symmetrical, with one eye migrating to the other side of the cranium; dorsal and anal fins with long bases, dorsal fin base overlapping at least the neurocranium except in *Psettodes*; body highly compressed, somewhat rounded on eyed side and flat on blind side; eyes can protrude above body surface allowing fish to see when buried in the substrate; usually six or seven branchiostegal rays, rarely eight; body cavity small, adults almost always without swim bladder; scales cycloid, ctenoid, or tuberculate. About four species probably occur in freshwater, while another 20 species that are normally marine occasionally enter freshwater.



Use of the fin formulae method (based on Smith and Heemstra, 1986): counts of dorsal and anal fin rays relatively stable and easy to obtain; data derived from MORPHOLOGY Table

4. Fish Identification

Quick Identification Routine

Fish Identification: Find Family

Glossary

13 families of catfish in Africa-Inland Waters

FishBase

Amphiliidae - (Loach catfishes) Distribution: Africa. Barbels 3 pairs. No spine in dorsal fin; dorsal spine feeble in *Trachyglanis*. Most species lacking pectoral spine. Occasionally a short spine in adipose fin. No pterygoid and posttemporal.

Anchariidae - (Vaonae) Glaw & Vences, 1994: 380. Type genus: *Ancharius*. Suggested new common name for this family in a coming ref. following

Ariidae - (Sea catfishes) Chiefly marine; occasionally freshwater. Distribution absent. Bony plates present on head and near dorsal fin. A leading spine in the relatively large eggs in its mouth until hatching.

Austroglanididae - (Austroglanids) Southern Africa. Three pairs of barbels

Bagridae - (Bagrid catfishes) Distribution: Africa and Asia (to Japan and Sri Lanka). Serrated pectoral spine. Scaleless. Barbels usually four pairs; well-developed in Tanganyika (Ref. 7463). Family Clariidae (Berra 2001) was carved out of the Auchenoglanidinae, which together contain more than 90 species in 13 genera in east African lakes. Includes *Auchenoglanis*, *Chrysichthys*, *Leptoglanis*, *Austroglanis* and its three species (Ref. 36739).

Clariidae - (Airbreathing catfishes) Distribution: Africa, Syria and southern Asia. Leading spine. Dorsal fin discontinuous or united to caudal fin. Rounded caudal fin ('labyrinth catfishes'). Some species are capable of travelling over short

Fish Identification: Find Species

Family: **Amphiliidae** Loach catfishes

(See list of species below)

Select Class: Select Order:
Select Family: Subfamily: Select Genus:
Select Ocean (marine/brackish) or Continent (freshwater): Africa-Inland Waters [1]
Specify a country:
Total number of spines in dorsal and anal fins (optional)

93 species in Africa-Inland Waters (see list below)

1 of 1 Jump to:



Photo by Mody, K.
Amphilius atesuensis
[]

No picture found

Amphilius athiensis
[]

No picture found

Amphilius brevis
[]

No picture found

Amphilius caudesignatus
[]



Photo by Seegers, L.
Amphilius chalei
[]

No picture found

Amphilius cryptobullatus
[]

Outcome: list of matching species at the family level with pictures

4. Fish Identification

Identification by morphometrics

Tools

- ☐ Quick Identification
- ☐ Identification keys
- ☒ Identification by morphometrics
- ☐ Adverse introductions
- ☐ Global introductions
- ☐ Invasiveness
- ☐ Species by ecosystem
- ☐ Graphs
- ☐ SeaFood Advisory
- ☐ Shifting Baselines WP2 - Online Toolset

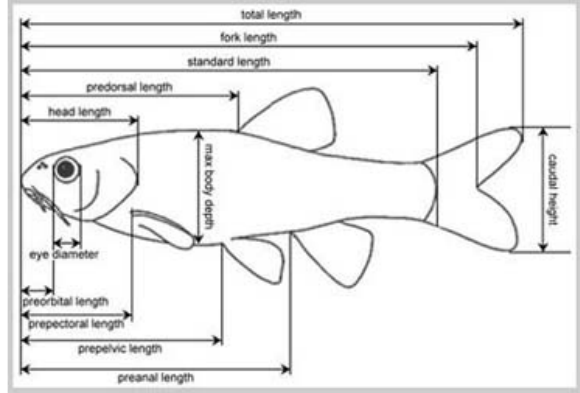
FishBase Advanced identification by morphometrics tool | Other identification tools | Search FishBase

Species Identification Using Morphometric Measurements

Select FAO Area : (Required Entry)
Select Class : (Required Entry)
Select Family : (Optional)

Measurement unit : ☒ cm ☐ inches ☐ pixels

Total Length (TL) : (Required Entry)
Head Length (HL) : cm (%TL)
Eye Diameter (ED) : cm (%TL)
Max. Body Depth (BD) : cm (%TL)



- User entries compared to morphometrics derived from measurements on species images

4. Fish Identification

Identification by morphometrics

FishBase

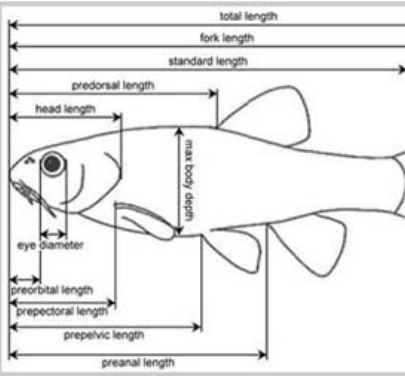
Basic identification by morphometrics tool | Other identification tools | Search FishBase

Advanced Species Identification Using Morphometric Measurements

Select FAO Area : Africa-Inland Waters (Required Entry)
Select Class : Actinopterygii (Ray-finned fishes) (Required Entry)
Select Family : (Optional)

Measurement unit : ☒ cm ☐ inches ☐ pixels

Total Length (TL) : 14 (Required Entry)
Standard Length (SL) : cm (0 %TL)
Fork Length (FL) : cm (0 %TL)
Head Length (HL) : 3 cm (21.43 %TL)
Pre-anal Length (PAL) : cm (0 %TL)
Pre-dorsal Length (PDL) : cm (0 %TL)
Pre-pectoral Length (PPEL) : cm (0 %TL)
Pre-pelvic Length (PPL) : cm (0 %TL)
Eye Diameter (ED) : 1.2 cm (8.57 %TL)
Pre-orbital Length (POL) : cm (0 %TL)
Max. Body Depth (BD) : 3 cm (21.43 %TL)
Caudal Height (CH) : cm (0 %TL)



[View Matching Photos](#) [View Possible Species](#)

FishBase


Search FishBase

List of Possible Species

<< Back Number of Matching Species 2

Alestidae | *Brycinus brevis* |
Max length : 25 cm TL Depth range : - m Size (cm) : none
Dorsal spines : - soft-rays : - Anal spines : 3 - 3 soft-rays : 13 - 15


Adults with no fontanel. Long snout, 3x head length, large head. Large adult size. No sexual dimorphism of anal fin. Deep body, < 3x SL for adults. Uniformly brown back, silvery sides and white belly. Affinities: B. macrocephalus



Morphometrics of *Brycinus brevis*
Brbre_u0.jpg / Hippocampus-Bildarchiv

Alestidae | *Brycinus nurse* | Nurse tetra
Max length : 25 cm TL Depth range : - m Size (cm) : none
Dorsal spines : - soft-rays : - Anal spines : 3 - 3 soft-rays : 10 - 15

Parietal fontanelle absent in adults, ponticiform in juveniles. Jaws equal. Sexual dimorphism on anal form of male adults. Humeral and precaudal spots black. Back greenish, sides silvery and ventral part white. Paired fins bright red, pectorals and ventral not colored or light orange. Part above eye red. Inhabit rivers, lakes, irrigation canals and fringing vegetation. Feed on zooplankton, *Caridina*, insects, snails and vegetation (Ref. 28714). Dwarf populations are described in lake basins: Lake Turkana, B. n. nana Pellegrin, 1935 and Lake Chad, B. n. dageti Blache and Milton, 1960 (see Ref. 2880).



Morphometrics of *Brycinus nurse*
Brnur_u0.jpg / Hippocampus-Bildarchiv

(Click on species name for more information. Click on the picture to view available pictures for the species)
Note : This list may be incomplete

4. Fish Identification

Identification Keys

- Digitized version of published keys
- Available keys listed by FAO area, order, family, country or ecosystem
- A total of 1668 keys is currently available, of which more than 300 for African inland waters

4. Fish Identification

Identification Keys

Search Page



Tools

- ☐ Quick Identification
- ☒ Identification keys
- ☐ Identification by morphometrics
- ☐ Adverse introductions
- ☐ Global introductions
- ☐ Invasiveness
- ☐ Species by ecosystem
- ☐ Graphs
- ☐ SeaFood Advisory
- ☐ Shifting Baselines WP2 - Online Toolset



Other identification tools | FishBase

Identification Keys List

n = 1651

☐ w/ Lucid Interface

Key Code:

FAO Area	Order	Family	KeyCode	KeyName
Pacific, Western Central			1	Key to the families of sharks in the Western Central Pacific.
	Petromyzontiformes		2	Key to the species of lampreys of the World (adults).
	Petromyzontiformes		3	Key to the species of lampreys of the World (ammocoetes).
Africa-Inland Waters			6	Key to the families of southern African freshwater fishes.
	Perciformes		16	Key to species of pomfrets (Bramidae) from Southwestern Central Atlantic
Africa-Inland Waters	Siluriformes		20	Key to the families of catfishes (Order Siluriformes, suborder Siluroidei) in southern Africa.
Pacific, Northeast			23	Key to elopomorph leptocephali in the Northeast Pacific.
Pacific, Southwest	Pleuronectiformes		37	Key to families of New Zealand bony fishes, section A, flatfishes.
Pacific, Southwest			45	Key to families of New Zealand bony fishes, section E.
Atlantic, Northeast			46	Key to the marine fish families of Europe.
Atlantic, Northeast	Pleuronectiformes		70	Key to the flatfishes (Pleuronectiformes) of Europe.
			71	Key to Orders, some families and genera of fishes.
Atlantic, Northeast			72	Key to the identification of fish larvae in the Northeast Atlantic.
America, North - Inland waters			97	Key to the families of fishes occurring in the fresh waters of Canada.
Pacific, Southwest			154	A key to the families of New Zealand bony fishes.
Pacific, Southwest			155	A key to the families of New Zealand bony fishes.
Pacific, Southwest			156	A key to the families of New Zealand bony fishes.
Pacific, Southwest			157	A key to the families of New Zealand bony fishes.
Pacific, Southwest			158	A key to the families of New Zealand bony fishes.
Pacific, Southwest			159	A key to the families of New Zealand bony fishes.
Pacific, Southwest			160	A key to the families of New Zealand bony fishes.
Pacific, Southwest			162	A key to the families of New Zealand bony fishes.
Pacific, Southwest			163	A key to the families of New Zealand bony fishes.
Pacific, Southwest			164	A key to the families of New Zealand bony fishes.
Pacific, Western Central			180	Key to the families of Batoid fishes occurring in the Western Central Pacific.
Pacific, Western Central	Scorpaeniformes		205	Key to the species of scorpionfishes (also, lionfishes, rockfishes, stingfishes, stonefishes, and waspfishes) (Scorpaenidae) occurring in the Western Central Pacific.
Atlantic, Antarctic	Perciformes		246	Key to the early stages of Antarctic fish.
Europe - Inland waters			269	Keys to the larval and juvenile stages of coarse fishes from fresh waters in the British Isles (Key to developmental stages).

4. Fish Identification

Identification Keys

[Identification keys](#) | [FishBase](#)

Key to the *Orthochromis* species of the Malagarasi, Luiche and Rugufu rivers.

De Vos, L. and L. Seegers, 1998. Seven new *Orthochromis* species (Teleostei: Cichlidae) from the Malagarasi, Luiche and Rugufu basins (Lake Tanganyika drainage), with notes on their reproductive biology. Ichthyol. Explor. Freshwat. 9(4):371-420. (Ref. 28906) [Key No. 1151]

Note:
Entered: [Yap Sheryl](#) - 07.03.05 | Modified: [Yap Sheryl](#) - 23.02.06 |
[Update](#) | [Add new key](#)



Please be patient while applet is loading. Use browser's Back button to return. Client machine must have the Java Runtime Environment (JRE) to view applet. You can download JRE [here](#).

Technical Terms and M...
Glossary

Key to the *Orthochromis* species of the Malagarasi, Luiche and Rugufu rivers.

De Vos, L. and L. Seegers, 1998. Seven new *Orthochromis* species (Teleostei: Cichlidae) from the Malagarasi, Luiche and Rugufu basins (Lake Tanganyika drainage), with notes on their reproductive biology. Ichthyol. Explor. Freshwat. 9(4):371-420. (Ref. 28906) [Key No. 1151]

Note: n = 14

Couplet	Character	Next	Prev	Link
1 a	Cheek scaleless anteriorly, postorbital part of cheek, opercle and occiput covered with well developed scales; no distinct lachrymal stripe; Upper Malagarasi drainage.	-	(1)	 Orthochromis mazimeroensis
1 b	Cheek completely scaleless or with some deeply embedded scales; if cheek scales are present a lachrymal stripe is fully developed and lower head, breast and belly are reddish.	2	(1)	
2 a	No black stripes or markings between eyes; 19-21 dorsal-fin spines; rapids of Middle Malagarasi River, Tanzania.	-	(1)	 Orthochromis uvivaze
2 b	Black stripes or markings between eyes present, 16 to 19 dorsal-fin	3	(1)	

Questions


[Color pattern on head greyish rather than black, stripes between eyes and upper lip V-shaped, dorsal fin with 16-18 spines and 9-10 soft rays; anal fin with 9-10 soft rays; Upper Malagarasi drainage.](#)


[Color pattern on head intense black, consisting of a distinct grid-like pattern of horizontal and vertical bars; dorsal fin with 19 spines and 7-8 soft rays; anal fin with 7 soft rays; Rugufu drainage, Tanzania.](#)

History


- Cheek completely scaleless or with some deeply embedded scales; if cheek scales are present a lach
- Black stripes or markings between eyes present, 16 to 19 dorsal-fin spines.
- Head with different color pattern.
- Basic body coloration greybrown, breast, belly and lower part of head never red; posterior part of dorsal
- Pending question


Entities Remaining: 2 (25%)

 Orthochromis mosoensis

 Orthochromis rugufuensis

Entities Discarded: 6 (75%)

 Orthochromis malagarazien

 Orthochromis kasuluensis

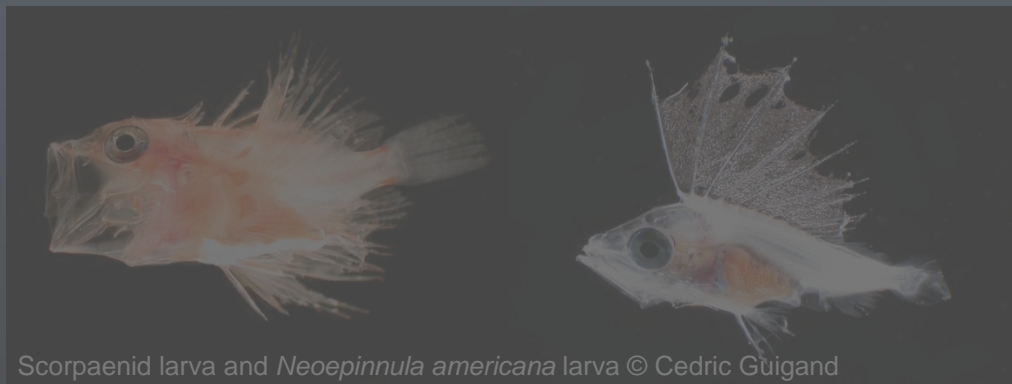
4. Fish Identification

Identification Keys



Identification of fish eggs and larvae:

www.larvalbase.org



Scorpaenid larva and *Neoepinnula americana* larva © Cedric Guigand

LarvalBase

2,228 species, 4,229 pictures, 4,513 references, 72 Collaborators, 120,000 Hits/month! (08/2006)

[Home](#) | [Comments & corrections?](#) | [Tech Problems?](#) | [Other links](#) | [Best Photos](#) | [FishBase](#) | [LarvalBase](#) | [Fish Forum](#)

Common Name

contains

Search

(e.g. halibut)

Alphabetic list

Scientific Name

Genus

is

Search

(e.g. Chanos)

Species

contains

Search

(e.g. chanos)

Alphabetic list

To search without Genus, change Genus option "is" to "contains"

Information by Family

Family info.

References

Identification

Species

Pictures

Note: Lists may be incomplete. Some lists may be very long and will take time to load.

Glossary

Search

(e.g. oophagy)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

Information by Topic

Allele frequency

Aquaculture profiles

Breedingstock

Collaborators

Culture Systems

Eggs

Egg dev't

Egg Nursery System

Fry Nursery System

GenBank

Genetics

Identification keys

Introductions

Larvae

Larval dynamics

Larval Nursery System

Maturity

Mini Essay

Documentation egg/larvae

Predators

Reproduction

Slide show

Spawning

Swim. speed

Water Advisory

Water Quality

References

Author

Search

(e.g. Leis)

[LarvalBase References](#)

Year

Title

(e.g. North Sea)

RefNo

[Fish Journals](#) | [ICES papers](#)

Note : LarvalBase is an online database module for FishBase to provide key information on fish larvae, juvenile stages and on propagation of fish. Most general tables (e.g. nomenclature, distribution, reproduction) are shared with FishBase. LarvalBase is maintained at the Leibniz-Institute for Marine Science in Kiel, Germany, in collaboration with the FishBase Team. LarvalBase was supported by EMZ/GTZ. At present, new funding opportunities are required. Partners are enjoined to help create an authoritative information system which is envisioned to include all known fish larvae of the world. Please [contact](#) us for more information.

BMZ

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Other Links

CephBase

CephBase

Ichthyoplankton Information System

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English to German

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Royal Museum for Central Africa (RMCA Tervuren)

FishBase and Fish Taxonomy Training
Session 2017

4. Fish Identification

Identification Keys

LarvalBase

Information by Topic

- ☐ Allele frequency
- ☐ Aquaculture profiles
- ☐ Broodstock
- ☐ Collaborators
- ☐ Culture Systems
- ☐ Eggs
- ☐ Egg dev't.
- ☐ Egg Nursery System
- ☐ Food Items
- ☐ Fry Nursery System
- ☐ GenBank
- ☐ Genetics
- ☐ Identification keys
- ☐ Introductions
- ☐ Larvae
- ☐ Larval dynamics
- ☐ Larval Nursery System
- ☐ Maturity
- ☐ Mini Essay
- ☐ Occurrence egg/larvae
- ☐ Predators
- ☐ Reproduction
- ☐ Slide show
- ☐ Spawning
- ☐ Swim. speed
- ☐ Water Advisory
- ☐ Water Quality

Identification keys for larvae are also present in FishBase

Identificaton Keys List

[n=41] Sort by <input checked="" type="radio"/> FAO area <input type="radio"/> Order <input type="radio"/> Family <input type="radio"/> KeyNo.			
FAO area	Order	Family	KeyName
	Perciformes	Sillaginidae	Key to species of <i>Silago</i> of the world. [Key No. 1324]
	Stomiformes	Phosichthyidae	Key to the larvae of the genus <i>Pinciguerria</i>. [Key No. 38]
America, North - Inland waters			Provisional Key to the families of Great Lakes Larval Fishes - (Yolk-sac larvae) (Excluding Anguillidae, Umbridae). [Key No. 332]
America, North - Inland waters			Provisional Key to the families of Great Lakes Larval Fishes - (Larvae). [Key No. 333]
America, North - Inland waters	Clupeiformes	Clupeidae	Provisional Key to Great Lakes Clupeid Larvae - (Yolk-Sac Larvae). [Key No. 336]
America, North - Inland waters	Clupeiformes	Clupeidae	Provisional Key to Great Lakes Clupeid Larvae (Hemings). [Key No. 337]
America, North - Inland waters	Cypriniformes	Catostomidae	Provisional Key to Lake Michigan Catostomid Larvae (suckers). [Key No. 343]
America, North - Inland waters	Cypriniformes	Cyprinidae	Key to species of larval cyprinids syntopic with <i>Pteronotropis hubbsi</i> in Chemin a haut Bayou and elsewhere. [Key No. 1177]
America, North - Inland waters	Esociformes	Esocidae	Provisional Key to Great Lakes Esocid Larvae (Pikes). [Key No. 338]
America, North - Inland waters	Perciformes	Centrarchidae	Provisional Key to Genera of Great Lakes Centrarchid Larvae (sunfishes) (1 late yolk-sac larvae and larvae). [Key No. 349]
America, North - Inland waters	Petromyzontiformes	Petromyzontidae	Provisional Key to Great Lakes Petromyzontid Larvae (Lampreys). [Key No. 334]
America, North - Inland waters	Petromyzontiformes	Petromyzontidae	Provisional Key to Great Lakes Petromyzontid Larvae (Lampreys). [Key No. 335]
America, North - Inland waters	Salmoniformes	Salmonidae	Provisional Key to Great Lakes Salmonid Larvae, (trouts) (Yolk-sac larvae less than 20 mm TL). [Key No. 340]