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# Identification: Target and Non-target Fish Species

*IOTC ROS SFO TR9*



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# Indian Ocean Tropical and Neritic Tuna Species

*IOTC ROS SFO TR9.3*

Category: Identification: Target and Non-target Fish Species

*[IOTC ROS SFO TR9]*



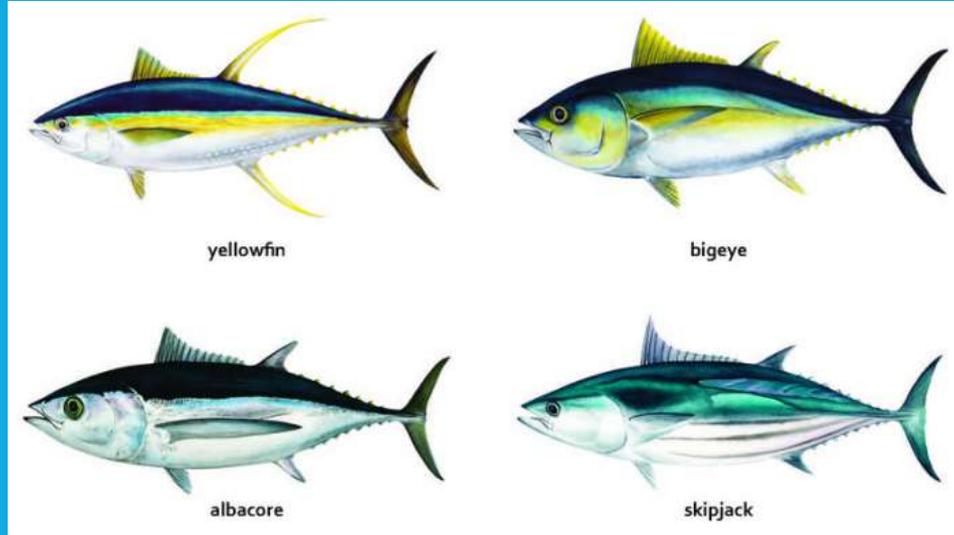
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## Course learning outcomes include:

- Capacity to differentiate between Indian Ocean tropical and neritic tuna species
  - ✓ Adult Indian Ocean tropical and neritic tuna species diagnostic anatomical features;
  - ✓ Juvenile yellowfin and bigeye tuna diagnostic anatomical features (external and internal).



## Tropical Tuna Species

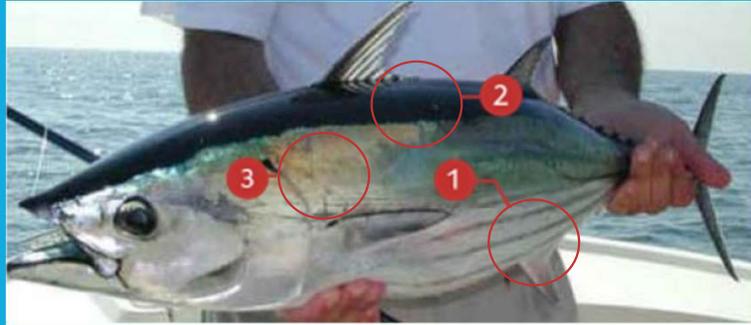


**Tropical tuna species** are the tuna species that inhabit warm-temperate tropical and subtropical waters, with temperatures generally greater than 18°C, (although they can dive in colder waters). This group includes skipjack, yellowfin, and bigeye tuna. In this training course you are going to learn how to differentiate these species based on their diagnostic anatomical features.

Identifying fresh tuna is a relatively easy matter compared to distinguishing frozen or iced fish. Even at small sizes, each species has distinct coloration, body markings and body morphologies that allow rapid visual keys to positive identification.



## SKIPJACK - *Katsuwonus pelamis* **SKJ**



- 1 Black horizontal stripes on the belly
- 2 Blue on the back
- 3 Silver on the sides

The **presence of stripes on the belly** and the **absence of markings on the back** are sufficient to **distinguish the skipjack tuna** from all similar species. The top of the fish is a dark purplish-blue, and the lower flanks and the belly are silvery and have four to six prominent, dark, longitudinal stripes. The first dorsal fin has 14 to 16 spines, and the pectoral and the ventral fins are short. The body is scale- less, except on the corselet and along the lateral line.

Skipjack tuna are cosmopolitan in tropical and subtropical seas, usually in deep coastal and oceanic waters. A pelagic, migratory, deep-water species, the skipjack tuna may form schools composed of 50,000 or more individuals, which makes it a prime target for commercial fishermen using purse seines.



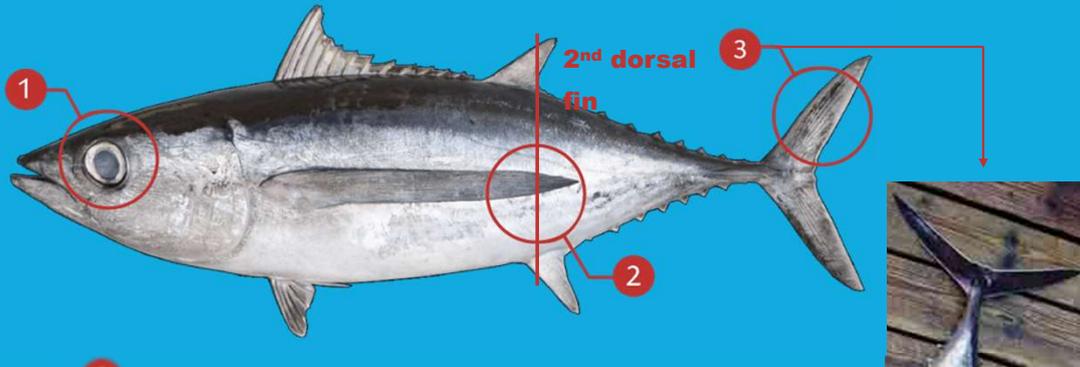
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## ALBACORE - *Thunnus alalunga*

ALB



- 1 Large eye
  - 2 Long pectoral fins that easily reach the base of the 2<sup>nd</sup> dorsal fin
  - 3 Edge of the caudal fin white or colorless unique to this species
- No stripes or spots
  - Metallic dark blue on the dorsal side and silvery white on the ventral side

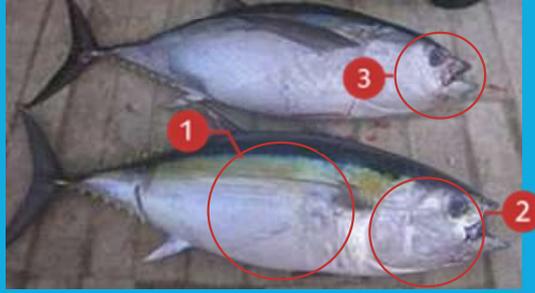


Albacore tuna, also called Longfinned tuna from its scientific name *Thunnus alalunga* (from Latin the tuna with long fins) it's a tropical tuna, that has an elongated fusiform and robust body, **long pectoral pointy fins** (up to 30% of fork length or longer in fishes longer than 50 cm), **reaching second dorsal finlets** (or beyond second dorsal fin). However, they are relatively short in individuals shorter than 30 cm. Often confused with juvenile *T. obesus* which also has long pectoral fins but with rounded tips. The **lack of stripes or spots distinguishes the albacore from other tuna**. The **caudal** fin relatively short, wide and strongly crescent-shaped, with a **narrow white posterior margin, which is unique to this species**.

The Albacore tuna is metallic dark blue on the dorsal side and silvery white on the ventral side; a faint lateral iridescent blue band runs along sides in live fish. First dorsal fin deep yellow, second dorsal and anal fins light yellow, anal finlets dark.



## BIGEYE TUNA - *Thunnus obesus* **BET**



- For adult fish >80 cm :

- 1 High stocky body
- 2 Head large and high
- 3 Big eyes
- 4 Finlets bright yellow with narrow black edges



Yellowfin

Bigeye



Big eye tuna is a tropical tuna that has a **stocky body**, a **large and high head** and **large eyes** (its Latin name *Thunnus obesus* translates as the fat tuna). Usually, irregular widely spaced vertical lines on sides of the body. The first dorsal fin is deep yellow. The **finlets are bright yellow with narrow black edges**. The tail does not have a white trailing edge like that of the albacore neither a distinct notch like that of the yellowfin. The pectoral fins may reach to the second dorsal fin. The caudal peduncle keel is black.



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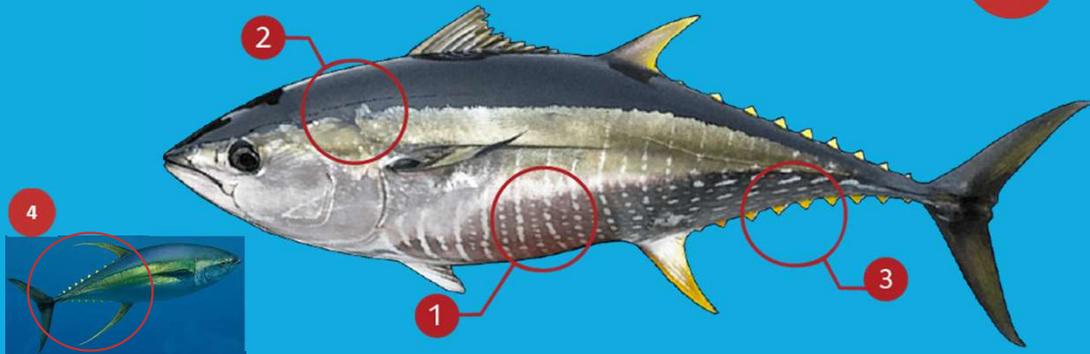


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## YELLOWFIN TUNA *Thunnus albacares*

YFT



1 Continuous and discontinuous vertical stripes on the belly and on the sides

2 Back is blue-black, fading to silver on the lower flanks and belly, a golden yellow or iridescent blue strip runs from the eye to the tail

3 Fins and finlets golden yellow or silver-edged with yellow

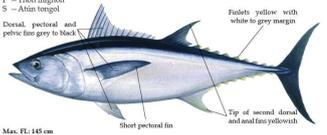
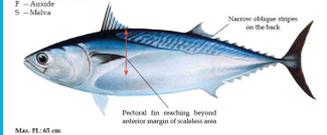
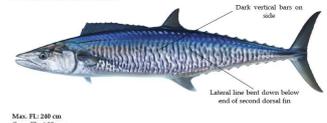
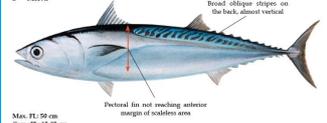
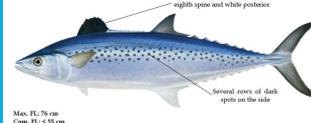
4 Adults (> 80cm FL): 2<sup>nd</sup> dorsal and anal fin very elongated



Most large yellowfins have overextended second dorsal and anal fins that may reach more than halfway back to the tail base in some large specimens. In smaller specimens under about 27 kg this may not be an accurate distinguishing factor. The pectoral fins in adults reach to the origin of the second dorsal fin, but never beyond the second dorsal fin to the finlets as in the albacore. This is probably the most colourful of all the tunas. The back is blue-black, fading to silver on the lower flanks and belly. A golden yellow or iridescent blue strip runs from the eye to the tail, though this is not always prominent. All the fins and finlets are golden yellow though in some very large specimens the elongated dorsal and anal fins may be silver edged with yellow. The finlets have black edges. The belly and the flanks frequently shows as continuous and discontinuous vertical rows or whitish spots.



# Neritic Tuna Species

<p><b>Longtail tuna</b> <span style="float: right;">LOT</span> <i>Thunnus tonggol</i></p> <p>           J — コシノボリ            C — 青千代松魚 / 長尾鰯            F — Thunnus tonggol            S — <i>Ahi</i> (tonggol)         </p>  <p>           Dorsal, pectoral and pelvic fins grey to black            Fins yellow with white to grey margin            Short pectoral fin            Tip of second dorsal and anal fins yellowish         </p> <p>Max. FL: 145 cm Com. FL: 40-70 cm</p>	<p><b>Frigate tuna</b> <span style="float: right;">FFI</span> <i>Auxis thazard</i></p> <p>           J — ヒロツツクサ            C — 半鰹魚 / 扁花鰹            F — <i>Auxis</i>            S — <i>Melva</i> </p>  <p>           Narrow oblique stripes on the back            Pectoral fin reaching beyond anterior margin of scapular area         </p> <p>Max. FL: 105 cm Com. FL: 25-60 cm</p>	<p><b>Kawakawa</b> <span style="float: right;">KAW</span> <i>Enthynnus affinis</i></p> <p>           J — スズキ            C — 巨鰹 / 巨鰹            F — <i>Thunnus orientalis</i>            S — <i>Bonetta orientalis</i> </p>  <p>           Broken oblique stripes on the back            In general 2 to 4 black spots above pelvic fin         </p> <p>Max. FL: 100 cm Com. FL: 60 cm</p>
<p><b>Narrow-barred Spanish mackerel</b> <span style="float: right;">NBM</span> <i>Scomberomorus commerson</i></p> <p>           J — シロシノボリ            C — 鰹 / 康氏馬加鰹            F — <i>Thunnus</i> (rare) Indo-pacificus            S — <i>Carré</i> (rare) Indo-Pacifico         </p>  <p>           Dark vertical bars on side            Lateral line bent down below end of second dorsal fin         </p> <p>Max. FL: 240 cm Com. FL: &lt; 90 cm</p>	<p><b>Bullet tuna</b> <span style="float: right;">BLT</span> <i>Auxis rochei</i></p> <p>           J — ノボリイサナ            C — 支那鰹鰹 / 圓花鰹            F — <i>Bonita</i>            S — <i>Melva</i> </p>  <p>           Broad oblique stripes on the back, almost vertical            Pectoral fin not reaching anterior margin of scapular area         </p> <p>Max. FL: 90 cm Com. FL: 15-25 cm</p>	<p><b>Indo-Pacific king mackerel</b> <span style="float: right;">IKM</span> <i>Scomberomorus guttatus</i></p> <p>           J — タイワンヤカラ            C — 長鰹花鰹 / 台灣馬加鰹            F — <i>Thunnus</i> (rare) Indo-pacificus            S — <i>Carré</i> (rare) Indo-Pacifico         </p>  <p>           First dorsal fin black up to the eighth spine and white posterior            Several rows of dark spots on the side         </p> <p>Max. FL: 76 cm Com. FL: &lt; 55 cm</p>



**Neritic tunas** (also called coastal tuna) are very important species group for commercial coastal fishing and / or the small-scale fisheries of most nations.

Neritic Tunas Species include: Longtail tuna (*Thunnus tonggol*), Frigate tuna (*Auxis thazard*), Bullet tuna (*Auxis rochei*), Kawakawa (*Enthynnus affinis*), Narrow-Barred Spanish mackerel (*Scomberomorus commerson*), Indo-Pacific King mackerel (*Scomberomorus guttatus*).

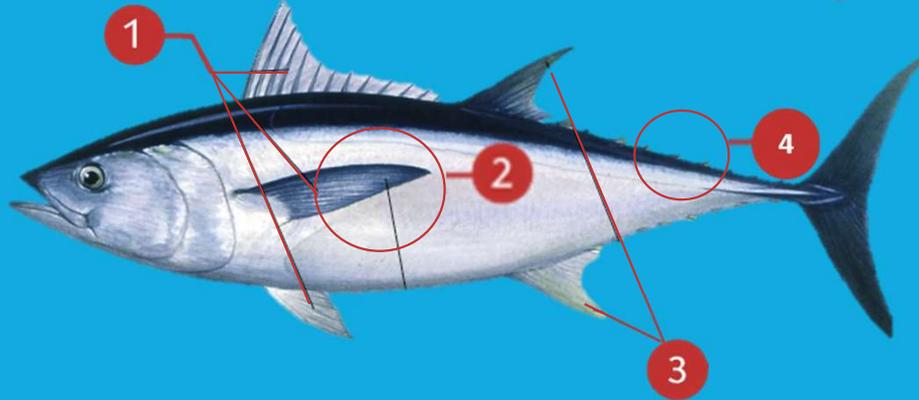


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# LONGTAIL TUNA *Thunnus tonggol* **LOT**



- 1 Dorsal, pectoral and pelvic fins grey to black
- 2 Short pectoral fin

- 3 Tip of second dorsal and anal fins yellowish
- 4 Finlets yellow with white to grey margin



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## FRIGATE TUNA *Auxis thazard* FRI



- 1 1<sup>st</sup> dorsal fin and 2<sup>nd</sup> dorsal fin spaced apart
- 2 Short pectoral fins, reaching past vertical line from anterior margin of scaleless area



- Head dark blackish purple fading to a blue coloured back. White ventral surface. Purple pectoral and pelvic fins with black inner sides.
- At least fifteen wavy lines found in area above lateral line where no scales are present.
- Corselet extends narrowly along lateral line with fewer than six scales deep below insertion of second dorsal fin
- Dorsal fins broadly separated (unlike kawakawa).
- Pelvic fins separated from one another by a large single flap (interpelvic process)
- Small, conical teeth found in a single series



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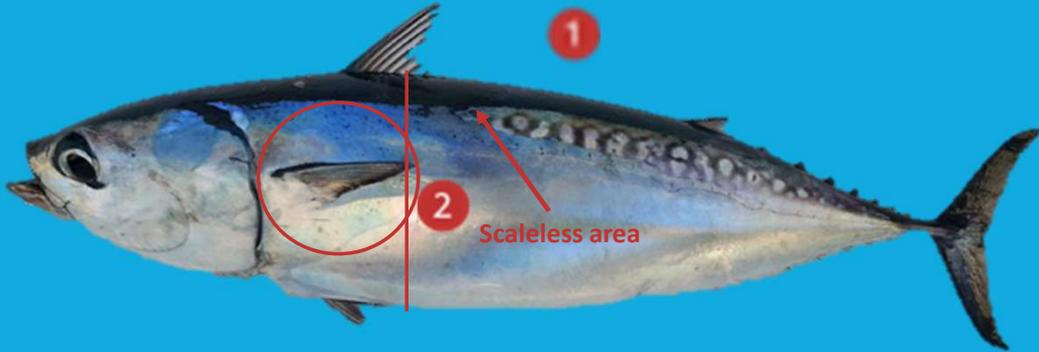


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## BULLET TUNA *Auxis rochei*

BLT



- 1 1<sup>st</sup> dorsal fin and 2<sup>nd</sup> dorsal fin spaced apart
- 2 Pectoral fins short, not reaching vertical line from anterior margin of scaleless area above corselet



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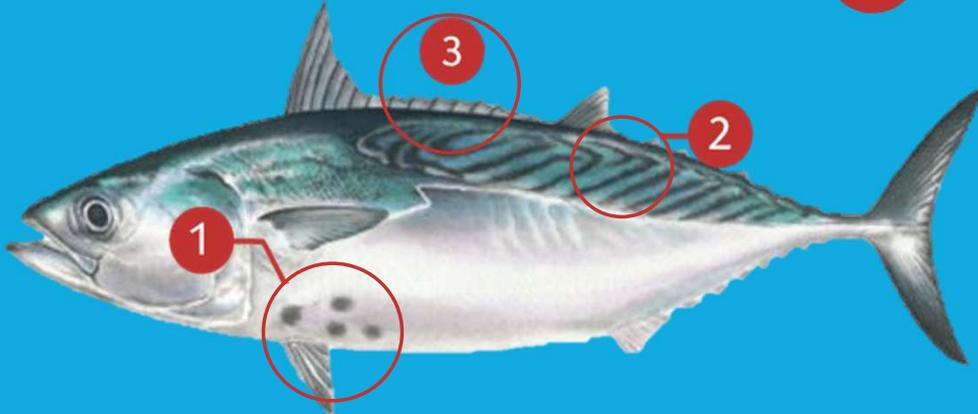
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## KAWAKAWA *Euthynnus affinis*

KAW



- 1 Extended 1st dorsal fin to 2nd dorsal fin
- 2 Broken oblique stripes
- 3 Black spots on the belly close to pelvic fin



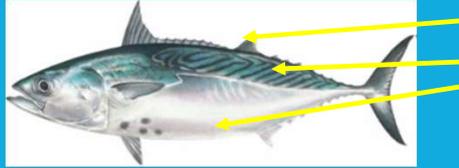
### Identifying characters

- Space between first and second dorsal fin very short - Extended 1<sup>st</sup> dorsal fin to 2<sup>nd</sup> dorsal fin
- Coloration: predominantly silver-gray, some dark spots can be found below pectoral fin
- Dorsal coloration: darker gray, rear half of back has a large patch of irregular wavy lines
- Dorsal and anal finlets present
- First dorsal fin spines very high in the front and much lower moving towards the tail



### SMALL NERITIC TUNA (compared):

KAWAKAWA  
*Euthynnus affinis*  
CODE: KAW



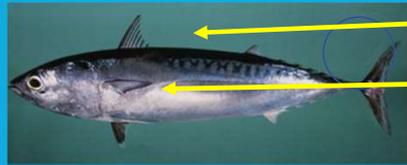
- Extended 1<sup>st</sup> dorsal fin to 2<sup>nd</sup> dorsal fin
- Broken oblique stripes
- Black spots on the belly close to pelvic fin

FRIGATE TUNA  
*Auxis thazard*  
CODE:FRI



- 1<sup>st</sup> dorsal fin and 2<sup>nd</sup> dorsal fin spaced apart
- Short pectoral fins, reaching past vertical line from anterior margin of scaleless area

BULLET TUNA  
*Auxis rochei*  
CODE: BLT



- 1<sup>st</sup> dorsal fin and 2<sup>nd</sup> dorsal fin spaced apart
- Short pectoral fins, reaching behind vertical line from anterior margin of scaleless area



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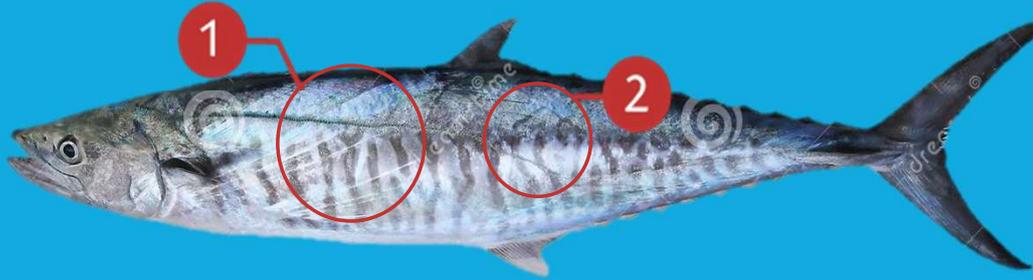


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## NARROW-BARRED SPANISH MACKEREL

*Scomberomorus commerson*

COM



1 Dark vertical bars on the side

2 Lateral line bents down below the end of the second dorsal fin



They can be distinguished from other Spanish mackerels by the dark vertical bars on the side and the lateral line bent down below the end of second dorsal fin.

A coastal, pelagic, schooling species, usually found in tropical and subtropical waters. Congregations often occur around wrecks, buoys, coral reefs, and other such areas where food is abundant. Schools vary in size and the largest individuals are usually loners.



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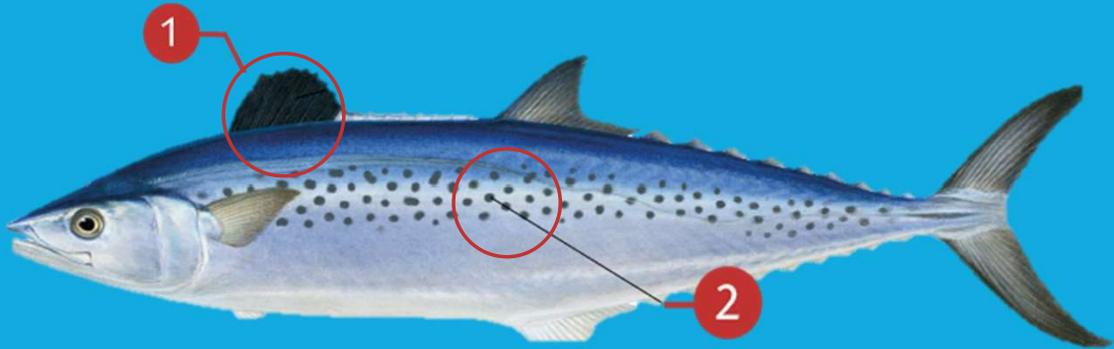
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## INDO-PACIFIC KING MACKEREL

*Scomberomorus guttatus*

GUT



- 1 First dorsal fin black up to the eighth spine and white posterior
- 2 Several rows of dark spots on the side



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## Yellowfin tuna vs. Bigeye tuna



Juvenile yellowfin and bigeye tuna in fresh condition can be reliably identified using a combination of the following features.

### Internal characteristics:

- liver appearance and morphology
- swim bladder morphology

### External characteristics

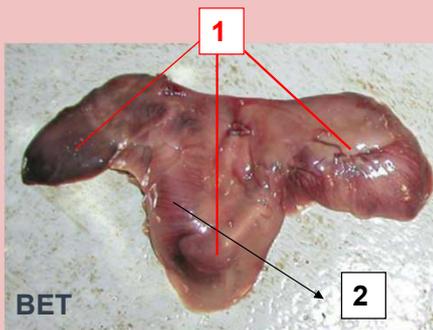
- body markings
- body morphology
- head and eye morphology
- pectoral fin characteristics
- caudal fin characteristics
- finlet coloration



## YFT vs BET - Liver Appearance and Morphology

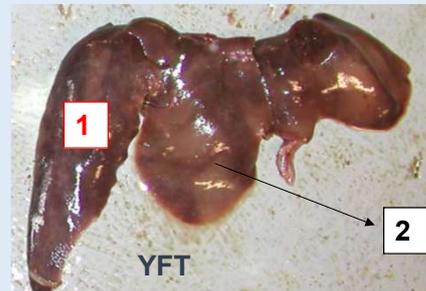
### Bigeye tuna

1. Three rounded lobes of about equal size
2. **Ventral surface striated**



### Yellowfin tuna

1. Right lobe longer & thinner than rounded medial & left lobes
2. Lobes smooth no striations.





## YFT vs BET - Swim Bladder Appearance

### Yellowfin tuna

1. only in anterior half of body cavity
2. inconspicuous, usually deflated or slightly inflated



### Bigeye tuna

1. occupies almost entire body cavity
2. large, conspicuous, often inflated

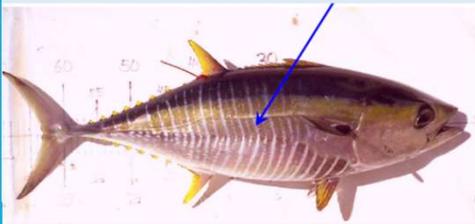




## YFT vs BET - Body markings

### Yellowfin tuna

- Conspicuous chevron pattern of closely spaced silvery lines
- Solid lines alternate with rows of dots
- Line pattern extends from tail, forward to beneath pectoral fin and to above mid-lateral line



### Bigeye tuna

- Irregular vertical, widely spaced white lines or marks
- Some rows of dots but few and irregular
- Line pattern irregular, broken, confined mostly to below mid-lateral line





## YFT vs BET - Body markings anterior under pectoral

### YELLOWFIN TUNA

- conspicuous alternating bands forward to below pectoral fin
- clear demarcation between marked and unmarked region



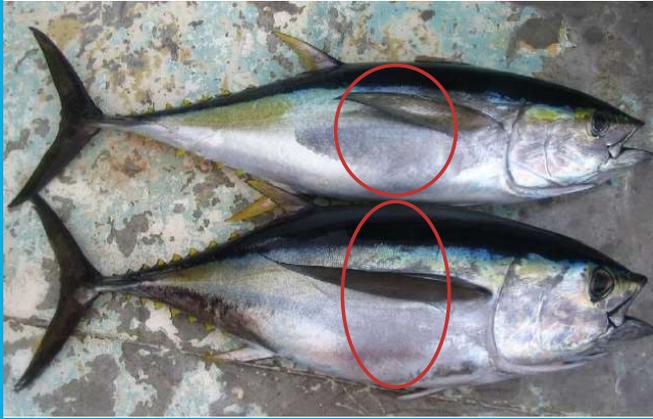
### BIGEYE TUNA

- markings more common on posterior half of body, few spots
- demarcation between marked and unmarked region not as clear





## YFT vs BET - Body morphology



### Yellowfin tuna

- body elongate, long tail
- body outline flat between 2<sup>nd</sup> dorsal and caudal fin and between anal and caudal fin

### Bigeye tuna

- body deep, rounded
- body outline rounded, forming a smooth dorsal and ventral arc between snout and caudal peduncle





## YFT vs BET -Head and eye morphology

**YFT**

- shorter head length and depth vs fork length than BET
- smaller eye diameter compared to BET of same fork length



**BET**

- greater head length and depth vs fork Length than yellowfin
- greater eye diameter compared to yellowfin of same Fork Length





## YFT vs BET - Pectoral fin

**BET**

- pectoral fin long, extending beyond the second dorsal fin base
- pectoral tapers to thin point, flexible, often curves ventrally at side



**YFT**

- pectoral fin short, extending to base of second dorsal fin
- pectoral fin thicker, stiff, blade-like



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## YFT vs BET - Pectoral fin



**Bigeye 96 cm**



**Yellowfin 104 cm**



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## YFT vs BET - Colour



**YFT**

- Bright yellow mid-lateral band
- Dark black back may be separated from the gold by a thin blue band
- Fins yellow to yellowish, anal fin sometimes tinged with silver
- Flanks and belly silvery white



**BET**

- Golden to brassy mid-lateral band
- Dark black back edged with bright metallic blue line
- Fins dusky yellowish with anal fin tinged with silver
- Caudal fin often dusky black
- Flanks and belly pearly white





## YFT vs BET – Caudal Fin



### Yellowfin

- Central portion of trailing edge forms distinct notch
- Two distinctly raised ridges present that form the “V” notch

### Bigeye

- Central portion of trailing edge forms a flat or slightly crescent shaped area
- Central area of caudal fin flat with 2 inconspicuous low mounds present.



## YFT vs BET – Caudal Fin – centre of trailing edge

YFT



Forms "V or M" shaped notch

BET



Forms flat or slightly rounded cup





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# THANK YOU FOR YOUR PARTICIPATION

## ANY QUESTIONS?



*send us a message via Talents LMS*



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