

Oviparous reproduction (Egg-laying Sharks)

- Sharks enclose their fertilised eggs in protective tough, leathery egg cases (mermaid purse).
- Egg cases with fertilised eggs deposited on or attached to substrate on ocean bottom.
- Embryos are nourished solely from yolk sac.
- No parental care is afforded to the young ones or egg case.
- The tough protective case protects from predators.
- Mostly these are demersal/benthic in habitat
- Zebra shark, catsharks, swellshark, hornshark and bambooshark exhibit oviparous reproduction.



Viviparous reproduction (Live bearing sharks)

- Embryos develop inside uterus.
- Umbilical cord connection to mother for nutrients and oxygen.
- Mother gives birth to live young ones.
- Exhibit nearly all forms of matrotrophy (yolk-sac placenta) support to young ones.
- Bull sharks, hammerheads and whaleshark exhibit viviparous reproduction

Ovo-viviparous reproduction

- The eggs are retained by the female until hatching, at which point the young are released alive.
- Rely solely on yolk sac for nourishment and receive no additional nutrients from the mother during gestation through placenta.
- Oophagy observed in these sharks.
- Thresher shark and tiger shark exhibit ovoviviparous reproduction.

Threats faced by sharks

- Overfishing
- Shark finning
- Habitat degradation
- Ghost fishing
- Pollution and climate change

How to save sharks?

- Follow regulations implemented by the government of India through the Wild Life (Protection) Act, 1972
- Try to release pregnant sharks to sea as far as possible
- Release pups to sea even if mother shark has died but pups are still alive
- Release whale sharks which are washed ashore alive or incidentally caught in nets
- Please release egg sac with embryos back to sea
- Avoid fishing in habitual aggregation and nursery areas of sharks

14
JULY

Shark Awareness Quiz

1. Which is the largest fish in the world?
a) Whale shark b) Basking shark c) Great white shark
2. Which among the following describe whale shark?
a) Carnivorous b) Planktivorous c) Predatory
3. Which organ of shark helps mostly to maintain buoyancy in ocean?
a) Swim bladder b) Fatty liver c) Fins
4. Which among the following mature late?
a) Toothed ponyfish b) Tiger shark c) Indian mackerel
5. Egg case is produced by?
a) Whale shark b) Bamboo shark c) Indian oilsardine
6. Which fish gives birth to young ones?
a) Cobia b) Milk shark c) Tiger shrimp
7. Which fish reproduce more than thousand young one per spawning?
a) Rabbitfish b) Tiger shark c) Whale shark
8. The most dangerous threat faced by shark is?
a) Over exploitation b) Climate change c) Pollution
9. The young one of shark is called as?
a) Spawn b) Pup c) Fry
10. Which trophic level is occupied by most of the sharks in the marine ecosystem?
a) Top b) Medium c) Low

Answer key: 1-a; 2-b; 3-b; 4-b; 5-b; 6-b; 7-a; 8-a; 9-b; 10-a

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Layout : www.dtpcentre.com

CMFRI Pamphlet Series No.106/22



Shark Awareness Day

14th July



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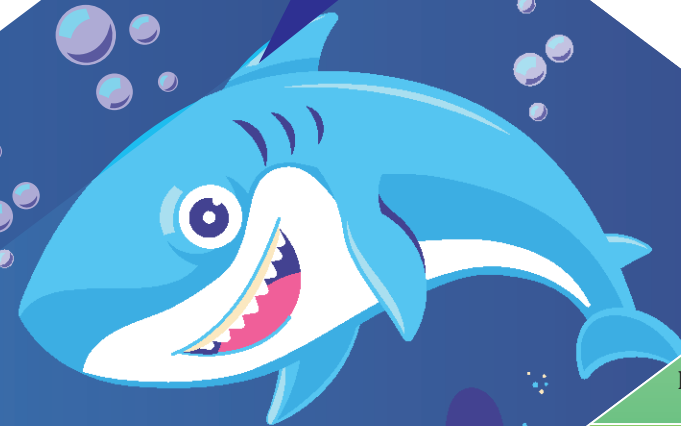


What is a shark?

- Shark is a fish with a cartilaginous skeleton
- It has 5 to 7 pairs of gills on either side of the head
- There are more than 500 living species of sharks
- Whale shark is the largest fish in the ocean (18 m total length)

Shark and marine ecosystem

- Most of us are apex predators.
- We occupy the highest trophic level
- We balance the marine food web
- We support maintaining a healthy marine habitat

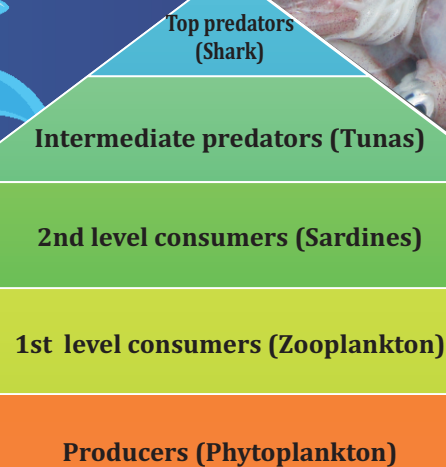


Whaleshark

- Don't panic seeing my size.
- I have a big mouth, but I am a filter feeder.
- I have flattened head and large blunt snout.
- It aids drinking / filtering of huge quantity of water.
- Gillrakers act as sieve for filtering seawater and support gas exchange.

Food habit of sharks

- The whale shark (*Rhincodon typus*) and the basking shark (*Cetorhinus maximus*) are giants that mostly subsist on plankton strained from the sea through gill rakers.
- All other sharks prey on smaller sharks, fish, squid, octopuses, shellfish and other invertebrates.
- One of the largest among the more predatory species is the voracious 6-metre white shark (*Carcharodon carcharias*) which attacks seals, dolphins, sea turtles, large fish, and occasionally humans.



How do sharks maintain buoyancy in the ocean?

Bonyfish



- I have swim bladder filled with oxygen
- It helps me to be buoyant
- My liver occupies 1-12% of body weight
- My bony endoskeleton is bulky
- My scales do not assist in buoyancy

Shark



- I do not have a swim bladder
- Fatty liver with low density oil helps me to be buoyant
- My liver occupies 20-35% of body weight
- My cartilaginous endoskeleton is very light
- Dermal denticles reduce drag while swimming

Why are sharks vulnerable to overfishing due to their biology?

Bonyfish



- Fast growth and early maturation
- Fertilization is external
- Ova development takes few months only
- Produce thousands to millions of eggs
- Reproduce several times in a year

Shark



- Mostly slow growth and late maturation
- Fertilization is internal
- Prolonged pregnancies
- Produce few young ones
- May not reproduce every year



Telephonic conversation between a shark and a dinosaur

- Shark : Hello Dino. How are you in heaven?
 Dinosaur : I am fine. What about you?
 Shark : Ohh! Not absolutely fine.
 Dinosaur : Why?
 Shark : I am threatened by overfishing.
 Dinosaur : Ohh! by whom?
 Shark : By none other than humans, but do you know - they are now threatened by corona virus!
 Dinosaur : Ooh! Corona! Corona! COVID19!
 Shark : Hmm...do you know another thing - I am older than you!
 Dinosaur : Hum! I know. Yet you are extant.... and I....no more!!!
 Shark : Perhaps due to evolutionary adaptations
 Dinosaur : Of course.. you are blessed.
 Shark : Wish me on July 14, that is shark awareness day.
 Dinosaur : Wow! A day for you?
 Shark : Yes! I can't wait to hear what stakeholders have to say about me. Wait for my call....Bye.
 Dinosaur : Sure. Be there in the ocean forever. All the best. Bye.

