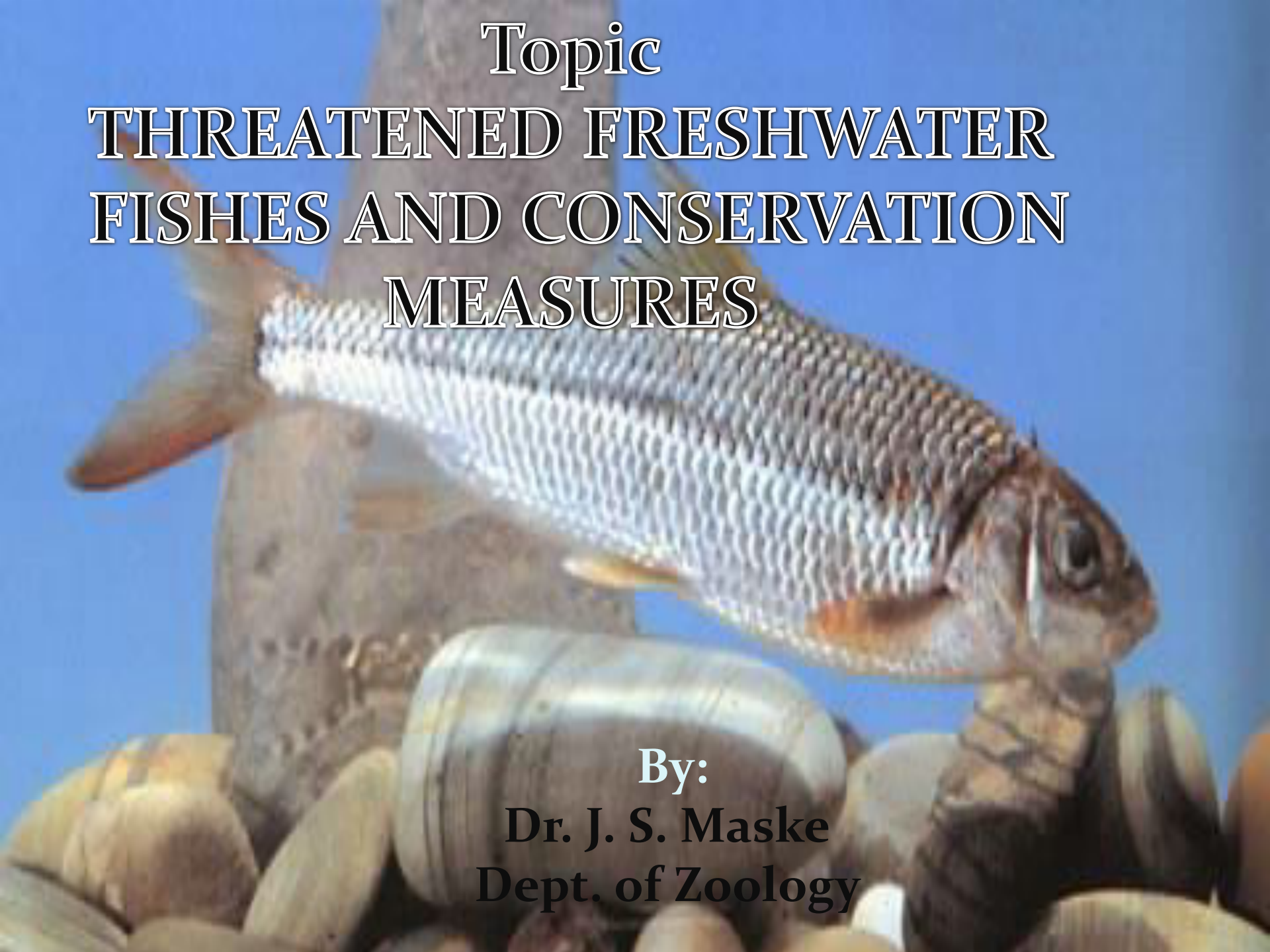

Topic
THREATENED FRESHWATER FISHES AND CONSERVATION MEASURES

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INTRODUCTION

- The approximate ecosystem wise distribution of fish germplasm resources of India is : cold water (3.32%), warm water of plain (24.73%), brackish water (6.50%) and marine water (65.45%).
- During recent years decrease in the diversity and abundance of fishes have been reported in aquatic environment.
- Therefore Fishery as a renewable resource should be properly managed and conserved in order to have sustainable yield.

Threatened Fresh Water Fishes:-

- The Fresh Water fishes which are about to be extinct in the near future.
- More than 725 fishes are observed in India
- Outreach organization of **IUCN**

(**International Union for Conservation Nature**)coimbatore assessed the status of 320 fresh water fishes species as per new IUCN red list guidlines

- As a result, 43 species identified as a **critically endengered** (CE) which include species like *P. branchysoma', Horaglanis krishnia, Tor muhullah, Pungasius.*

- Under the category **Endengerd** (EN), 90 species where included .Some of which are *Hypselobarkus curmuca, Clarias dayii, Tor mosal , Tor pitutora .*

- The species *Gymnocypris biswai* was assessed as **Extint** (EX)

Characteristics of Endangered Fish :-

A fish may become endangered due to over exploitation, habitat destruction and other similar factors responsible for shifting of vulnerable species into endangered category

- Its growth rate is gradually reduced over the years.
- Its fecundity is decreased.
- The index of species average size decreased.
- Fish are more prone to the parasitic attack and diseases.

Conservation Measures:-

- The measure concerned with the protection and preservation of fish and other aquatic life, particularly in sea waters.

- Two convenient approaches for conservation of fish diversity are in-situ conservation and ex-situ conservation

In-Situ Conservation :-

In-Situ Conservation means the conservation of fishery resources through their maintenance within the natural ecosystem in which they occur.

- In-Situ conservation of threatened fishes recently a survey has been made by **NBFGR** (National Bureau of Fish Genetic Resources) to collect information on habitat diversity in Kumaun hills.

- The survey indicated that **Golden mahseer** brooders were restricted to deeper pools of the rivers such as Ladhiya, Sharda, Ramganga, Gomti and Kosi.

- Conservation of fish in temple tanks is a part of fish conservation ethics in our country.

- For example Har-ki-paudi, Haridwar where fish catching is completely prohibited by religious sentiments.

Ex-situ Conservation :-

It means conservation outside the natural habitats.

Ex-Situ Conservation

some of the most important technique for ex-situ conservation are Cryopreservation of gamet cell :

Steps of cryopreservation :-

1)Collection of milt and pre-freezing sperm quality
2)Extenders
3)Cryoprotection
4)Equilibrium period
5)Cooling and thawing
6)Storage

Collection of milt and pre-freezing sperm quality:-

- Milt collected for cryopreservation should be of the best possible quality.
- During collection milt is usually contaminated by fish urine, mucous and water, which may affect the quality of cryopreserved spermatozoa.

Extenders :-

- The cryopreservation efficacy is greatly enhanced if the pre-frozen milt is diluted with a suitable extender.
- Simpler extenders, some containing only NaCl, $NaHCO_3$ and lecithin have been useful.

Cryprotection :-

To minimize the stress on cells during cooling and freezing, cryoprotectant are added to extenders. In many cases, glycerol, dimethyl sulfoxide and methanol are the most widely used.

Equilibrium period :-

The time required for cryoprotectnt to enter the cell.

Cooling and Thawing :-

Cooling rates affect the success of cryopreservation.
In salmonid, use dry ice block as a coolant.
The optimum for salmonid spermatozoa may lie between 30 and 160^{0}C/min.

Storage :-

- Diluted sperm samples have been successfully stored in polypropylene vials (1-2 ml) as pellets and in 0.25ml and 0.5 ml plastic straws.
- The vials may be stored in racks. Pellets of diluted semen are usually made by using a dry ice block (-79^{0}C) as the coolant.
- Holes are drilled into a block of dry ice into which a fixed volume of diluted semen is added. Frozen pellets are removed and stored in vials.
- Plastic straws are now more readily available and are also used for the cryopreservation of fish spermatozoa.

- Diluted semen is drawn into the colour-coded straws and heat sealed or plugged.
- The sealed and frozen straws are stored under liquid nitrogen.
- The liquid nitrogen (-196^{0}C) is the most commonly used cryogen.


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