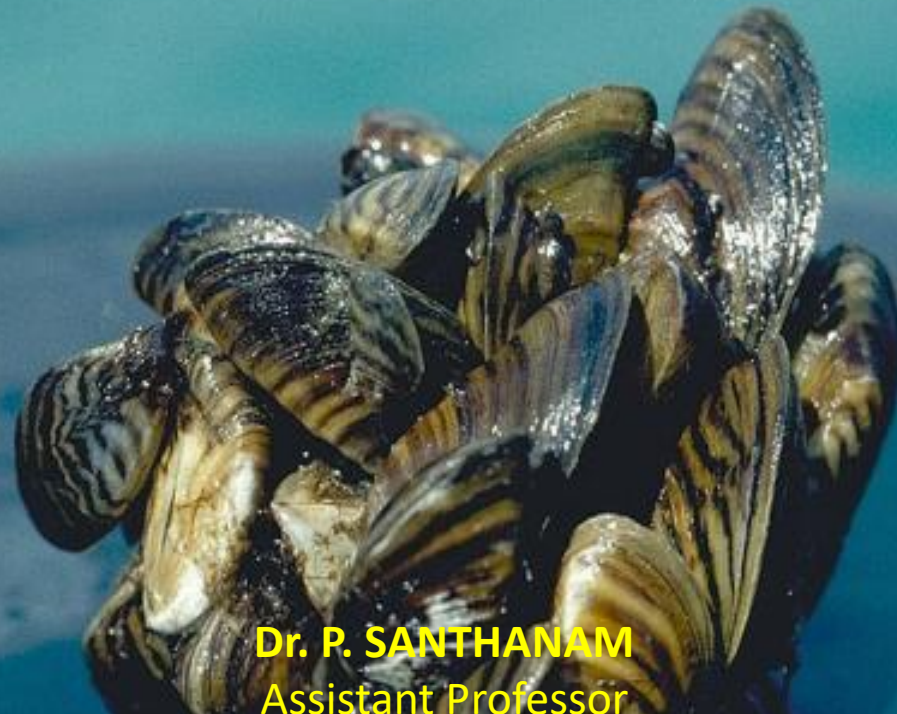


INVASIVE SPECIES



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INVASIVE ALIEN SPECIES

Invasive alien species are plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health.

In particular, they impact adversely upon biodiversity, including decline or elimination of native species - through competition, predation, or transmission of pathogens - and the disruption of local ecosystems and ecosystem functions.

Invasive alien species, introduced and/or spread outside their natural habitats, have affected native biodiversity in almost every ecosystem type on earth and are one of the greatest threats to biodiversity.

Since the 17th century, invasive alien species have contributed to nearly 40% of all animal extinctions for which the cause is known (CBD, 2006).

The problem continues to grow at great socio-economic, health and ecological cost around the world.

Invasive alien species exacerbate poverty and threaten development through their impact on agriculture, forestry, fisheries and natural systems, which are an important basis of peoples' livelihoods in developing countries. This damage is aggravated by climate change, pollution, habitat loss and human-induced disturbance.

ALIEN SPECIES

The abundance of alien or invasive species at the expense of native species.

Invasive species may displace native species through competition for limiting resources.

Introduced animal species may prey upon native species or they may alter the habitat so many native species not able to persist.

Invasive species caused threats to 49% of endangered species in U.S. cause damages and losses amounting to \$ 137 billion per year (2000).

ALIEN SPECIES

Many species introductions have occurred by the following means:

1. European colonization:

Settlers arriving at new colonies released hundreds of species of fish, Eg. Trout, bass, carp etc., have been widely released to provide food and recreation.







ALIEN SPECIES

2. Horticulture and Agriculture:

Large numbers of plant species introduced as ornamentals, agriculture, aquaculture or pasture grasses. Many of these escaped from cultivation and become established in local communities.

ALIEN SPECIES

3. Accidental transport:

Unintentionally transported the weeds, seeds, rats, snakes and insects carried by ships and air planes, diseases, parasites and insects travel along with their host species.

ALIEN SPECIES

4. Ballast water:

- Ships carry exotic species, weeds, soil arthropods, bacteria, viruses, algae, invertebrates, small fish.
- Large ships may hold up to 1,50,000 tons of ballast water contain and carry more marine species.
- Example: Ballast water being released by ships into Coos Bay, Oregon was contain 367 marine species originating in Japanese waters.
- Government regulation to avoid ballast water.

ALIEN SPECIES

5. Biological control:

- Exotic species becomes invasive, a common solution to control pest. Biological control agent itself become invasive, attacking native species.

Ex : *Gambusia affinis*, *Poecilia reticulata*.

- *Comb jelly (Mnemiopsis leidyi)* 95 % biomass of the black sea. This feed on fish larvae and zooplankton and collapse \$ 250 million fishing industry and entire ecosystem.
- *Caulerpa taxifolia* green algae spread in northwestern Mediterranean, competing native species of algae.









ALIEN SPECIES

- Over 120 fish species have been introduced throughout the world into marine, estuarine and inland seas.
- Invasive species are larger and more aggressive than the native fish fauna and they drive the local fish extinction.

Eg: Nile perch into Lake Victoria in East Africa.

- Invasion of sea lampreys into Great lakes of North America, damaged trout.
- In Madagascar, only 5 species of 28 known native fish of the island, with introduced fish dominating all of the freshwater habitats.





ALIEN SPECIES

- Introduction of freshwater prawn *Mysis relicta* into Flathead lake of Montana, USA, to food for salmon, instead, the shrimp competed with fish for zooplankton.
- Zebra mussel (*Dreissena polymorpha*) in Great lakes, native of Caspian sea within 2 years densities reached 7,00,000 individuals per square meter.
- Now its spread to entire Mississippi River-it causes economic damage to fisheries, dams, power plants, water treatments.





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