Marine Alien & Invasive species

By: S. Miza, P. Majiedt & K. Sink
Overview of marine alien and invasive species

Vectors

Impact
  - Ecological
  - Economical

Monitoring Initiatives & Aims
Marine alien species

What are Marine alien & invasive species?

• introduced intentionally or accidentally.

• “invasive” as soon as they reproduce, multiply and become tolerant.

• Found in the beach, rocky shores, inshore & offshore.
Globally

• They are globally recognised as threats to native marine species & drivers of environmental change.

Lowe et al., 2000
In South Africa

Griffiths et al., 2005 listed 22 introduced 18 cryptogenic species

Griffiths et al., 1992 listed 15 introduced 2 invasive species.

Mead et al., 2011 list 86 introduced 39 cryptogenic species 12 considered invasive

- Cryptogenic referring to species that cannot be reliably demonstrated as being introduced or native.
Vectors

- Shipping, Petroleum sector, mariculture & aquarium trade.

**Shipping** - plays a major role in world trade, carrying internationally traded goods.
- Plays a role in marine alien species introduction
  - ballast water & fouling
Ballast water – stability of the ship when partially or completely empty of cargo.

- Marine alien species introduction through discharge of ballast water.
  - e.g. the Brooding anemone which originates from Europe
**Fouling** - long-distance slow dispersal of common organisms through hitch-hiking, hanging-on and/or rafting on ships.

- E.g. **Shell worm**; origin: Pacific coast of North America and Japan

- a “fouling organism”.
• Petroleum industry - explore, extract, refine, transport & market petroleum products.

• Plays a potential role in the introduction, hosting & spreading of MAS

• The feather duster anemone from the North Atlantic

• Through petroleum infrastructure was introduced here in SA.
Mariculture - ie.

- Aquaculture - the farming of marine organisms for food.

- Through which the spread of the Pacific oyster introduced the Black sea urchin *Tetrapygus niger*.
Aquarium trade - the removal and collection of marine ornamental organisms for aquarium display.

- **Australian seaweed** introduced unintentionally into the Mediterranean sea in 1984.

- It replaces native sea grasses and limits natural habitat for larval fish and invertebrates.
Impacts of invasions

Ecological change

• Compete with native species

• Alter trophic structure & physical appearance of invaded area

• E.g the Mediterranean mussel
Economic loss

• Direct economic losses

• Dramatic alteration of ecosystem

• For example, the Green crab

• In SA it has not yet proven economic loss
Examples of marine invasive species in SA

Bisexual mussel
Semimytilus algosus

Origin: Chile & Namibia

Habitat: Rocky shores

Impacts: Compete with shellfish for food & space
Sea vase ascidian
Ciona intestinalis

Origin: North east Atlantic

Habitat: Subtidal bathyal or deep water down to 500m & shallow waters

Impacts: coats marine structures killing mussels
Black coral worm
*Dodecaceria fewkesi*

**Origin:** Pacific USA

**Habitat:** Hard substrata like harbour wharfs.

**Impacts:** forms hard coral-like colonies
Reef worm
Ficopomatus enigmaticus

Origin: Australia

Habitat: low-salinity sections of estuaries, attached to rocks, jetties, boats and any other hard surface.

Impacts: constrict pipes & channels as fouling organisms
Monitoring Initiatives

- Updating the MIS list
- Compiling species dossiers
- Taxonomy- to define “cryptogenic species”
- Raise awareness to the general public, eg iSpot
- Develop a Marine Alien Species field guide
- Workshops underway
- Collaboration in projects towards monitoring and Rapid Response
THE END
Marine Alien & Invasive species

By: S. Miza, P. Majiedt & K. Sink

s.miza@sanbi.org.za