

Estimating an efficient spatial arrangement for the future network of Marine Protected Areas (MPA) around Madagascar, based on the connectivity of marine population

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INTRODUCTIONS

- Madagascar is ranked as the **9th poorest country** in the world
- 80% of the population are **entirely dependent on natural resources**
- However, it is well known as a **biodiversity hotspot**;
- In 2003, **Madagascar took the engagement to triple the total area of its protected area** by 2012 (79% of that goal were achieved but **only 0.1% was assigned to the Marine part**;
- In Nov. 2014 Madagascar took the engagement to **triple the total area of its Marine Protected Area (MPA)**;
- ➔ It is suggested that the **spacial arrangement of MPAs should match the dispersal potential/degree of connectivity of marine population.** And for its success, management approach is a very important key.

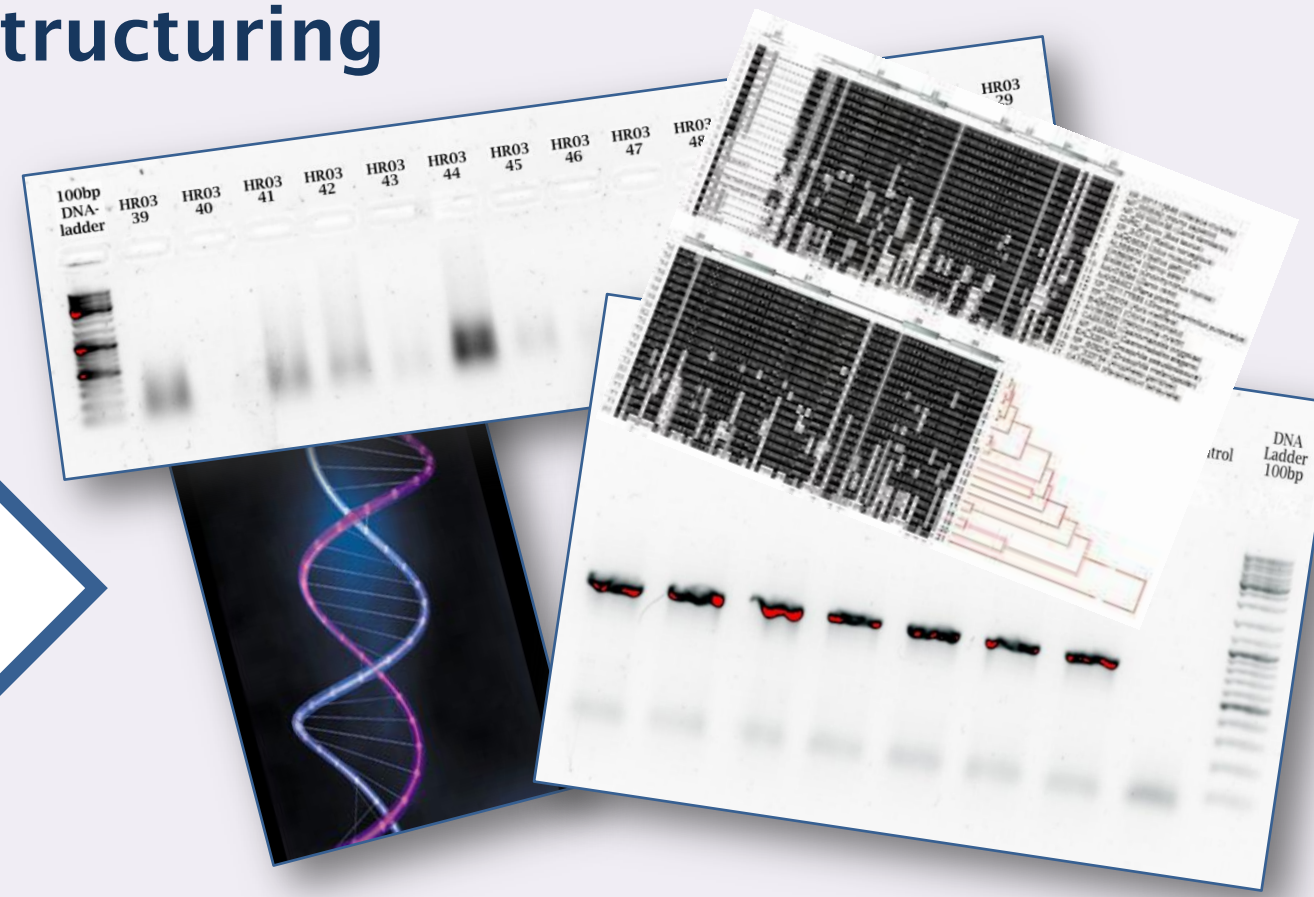


METHODOLOGY

- **Sample collection:** Small tissue sample is collected from individuals of *Linckia laevigata*, *Octopus cyanea*, *Pocillopora damicornis* and *Penaeus indicus* and stored (in Ethanol 96°) waiting for DNA extraction.



- **DNA extraction, amplification and analysis**
- **Investigation of Genetic diversity, Historical demography and Population structuring**



- **Investigation of the level of connectivity**
- **Estimation of the parent population**
- **Assessment of historical management regime of the existing MPAs**

• **ESTIMATE OF BEST SPACIAL ARRANGEMENT OF MPA NETWORK**

• **ESTIMATE OF THE IDEAL GOVERNANCE SYSTEM (using DELPHI method)**

RESULTS

- For each different locations and per targeted species, information about respective genetic diversity, genetic diversity hotspot will be highlighted;
- From the investigation of the level of connectivity as well as population structuring, location of gene barrier will be scoped along with the estimated parent population and the migration rate;
- ➔ Such information can be used as proxy for other species that have similar biological feature and are crucial and should be taken into account for the spatial arrangement of a network of Marine protected area.
- consensus is expected to be reached between specialists among the stakeholders, governmental experts and university professors in identifying the ideal management system and governance of the existing MPAs as well as the ideal approach for the setting of a new MPA using the "Delphi" method.
- ➔ Many organisations has failed setting an MPA due to GOVERNANCE matter.

