Clonality, genetic diversity and connectivity of *Acropora* coral populations in the Lesser Antilles

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Context

Atlantic Acropora Status review
Acropora Biological Review Team 2005

Unique caribbean Acroporidae species
Emblematical
Essential in building and structuring Caribbean reefs
Objectives

Genetic diversity
Population connectivity
➢ Ensured by larval dispersal

Impossible to follow larval dispersal
➢ Genetic study

What are the spatial scales of larval dispersal?
What is the connectivity level among populations?
Which factors influence genetic structure?
Two reproduction modes

Sexual

Asexual (fragmentation)

Genotype multilocus = genetic individual = « genet »

➢ 14 microsatellite markers
Study area

PACOTILLES (PAtrons de diversité et COnnectivité des Petites AnTILLES) oceanographic field trip

- **A. palmata**
  - 1042 colonies

- **A. cervicornis**
  - 186 colonies (3 islands)
Intermediate morphology for 31 colonies

➢ Hybridization: *Acropora prolifera*
1259 colonies
\[\downarrow\]
761 genets

\[\Rightarrow\]

FCA (GENETIX)

Gene introgression

1259 colonies
\[\downarrow\]
761 genets

A. cervicornis
• 28 genets

A. prolifera
7 genets

A. palmata
726 genets

8 colonies

Gene introgression
For *Acropora palmata* > contrasted clonality among reefs
PCoA (GENALEX)
Isolation by distance

Limited larval dispersal

Genetic neighborhood size

SPAGEDi

Mantel test
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<th>SM</th>
<th>SB</th>
<th>Sa</th>
<th>An</th>
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Relative directional migration coefficient based on *Jost’s D index* (**DIVMIGRATE**)

Gene flows in agreement with ocean surface currents
Main results and discussion

For *Acropora cervicornis*:
- Low abundance
- Low genetic diversity
  - Low resilience capacity

For *Acropora palmata*:
- Lower genetic diversity in the Lesser Antilles
- Isolation by distance pattern
- Limited larval dispersal likely in agreement with ocean surface currents

*Acropora prolifera* and gene introgression
Conclusions and perspectives

- **Threatened *Acropora cervicornis*** in the Lesser Antilles
  - Associated communities?
  - Other habitats to prospect

- **Limited larval dispersal**
  - Conservation of *Acropora* populations *at the local scale*
  - Study the larval behavior

- **Gene introgression** between *A. palmata* and *A. cervicornis*
  - Evolutionary potential for the genus *Acropora*
  - Study the hybridization process
Thank you for your attention