Black abalone translocation as a strategy for population recovery in Baja California, Mexico

Abadía-Cardoso A., Bauer J., Lorda J., Beas-Luna R., Malpica-Cruz L., Searcy-Bernal R., Lafarga-De La Cruz F., Bracamontes-Peralta M.
Black abalone (*Haliotis cracherodii*)

- 56 species of *Haliotis* worldwide
- 7 species in the Northeast Pacific

Historical (1990) distribution, modified from Geiger, 2000
Black abalone (*Haliotis cracherodii*)

- 56 species of *Haliotis* worldwide
- 7 species in the Northeast Pacific
- Black abs are intertidal
- Distribution reduction

Santa Cruz Island, CA circa 1986
Black abalones fishery in Mexico

50 years of abalone fishing

1860 Commercial abalone fishing begins

1922 Reports of sporadic black abalone captures

1940 Starts commercial fishing of black abalone

1950 High mortalities of all abalone species

1970 Maximum captures of black abalone

1980s Warming events

Withering syndrome

Casandra Delgadillo

Evaluation of Candidatus Xenohaliotis californiensis (CXc) and its associated phage pCXc in black abalone of Baja California

Wednesday 11:15

Black abalones fishery in Mexico

Black abalone 2018-19 survey in Baja California

Ibarra-Macías et al. in prep

Mex
USA

Juvenile
Sub-adult
Adult
Size limit

Ibarra-Macías et al. in prep
Explore the potential of a translocation strategy to recover black abalone in historically abundant reefs
Translocations

Three translocations led by coop.

2018 (n=43)
2019 (n≈100)
2021 (n=63)
Collection

1. Find the collection spot

2. Locate the black abalones

3. Pick up the black abs
Collection

4. Store them in a cooler

5. Drive them across kilometers of desert

6. Put them in lobster cages

7. Hang them in longlines for acclimation

Rodrigo Beas
Abalone Mariculture in Baja California: a conservation aquaculture project

Wednesday 14:30
Characterization of release sites

Isla San Jerónimo

2018
2019
2021

Punta Baja

2021
Characterization of release sites

• 3 transects
• ~50 m long
• 0.5 m² quadrants every 2 meters

• Percent cover of algae and colonial invertebrates
• Substrate
Results: site characterization

Isla San Jerónimo

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
<th>Species Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 species of colonial inverts</td>
<td>12%</td>
<td>6</td>
</tr>
<tr>
<td>7 species of algae</td>
<td>76.1%</td>
<td>14</td>
</tr>
<tr>
<td>Bare rock</td>
<td>11.9%</td>
<td>7</td>
</tr>
</tbody>
</table>

Punta Baja

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
<th>Species Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 species of algae</td>
<td>54.8%</td>
<td>11.9%</td>
</tr>
<tr>
<td>6 species of colonial inverts</td>
<td>27.4%</td>
<td>5</td>
</tr>
<tr>
<td>Bare rock</td>
<td>12%</td>
<td>7</td>
</tr>
</tbody>
</table>
Processing before release

Measured, swabbed, tagged, etc...
Results: withering syndrome

None of the abalones had visual symptoms of withering syndrome.

Genetic detection:
- 68 abs were positive (55.3%)
- 82 abs were positive for phage (66.7%)
Black abalones release
Monitoring 10 months later

Isla San Jerónimo
21/63 = 33% recovery
78% aggregated

Punta Baja
19/62 = 31% recovery
94% aggregated
Conclusions

- Good survival rate after 10 months.
- Acclimation in cages before release can reduce stress.
- Preliminary evidence of successful translocation.
- However, we will only know if this is a real success when we observe recruitment.
- This is a continuous effort to restore the species.
Acknowledgements

John Hyde
Oriana Arauz
Chumy
Casandra Delgadillo
Daniel Diaz
Julia Lara
Lucía Rodríguez
Ilse Padilla
Paulina Pérez

Karina Cerda
Alfonso Ferreira
Mónica Peralta
Tere Tavera
Mariana Ferrara
Ariel Beas
Luis Malpica
Coop Ensenada

¡GRACIAS!