Herbarium Data Mining to Assess Invasion Risks and Trace Invasion Histories of Nuisance Algae in Tropical Pacific Islands

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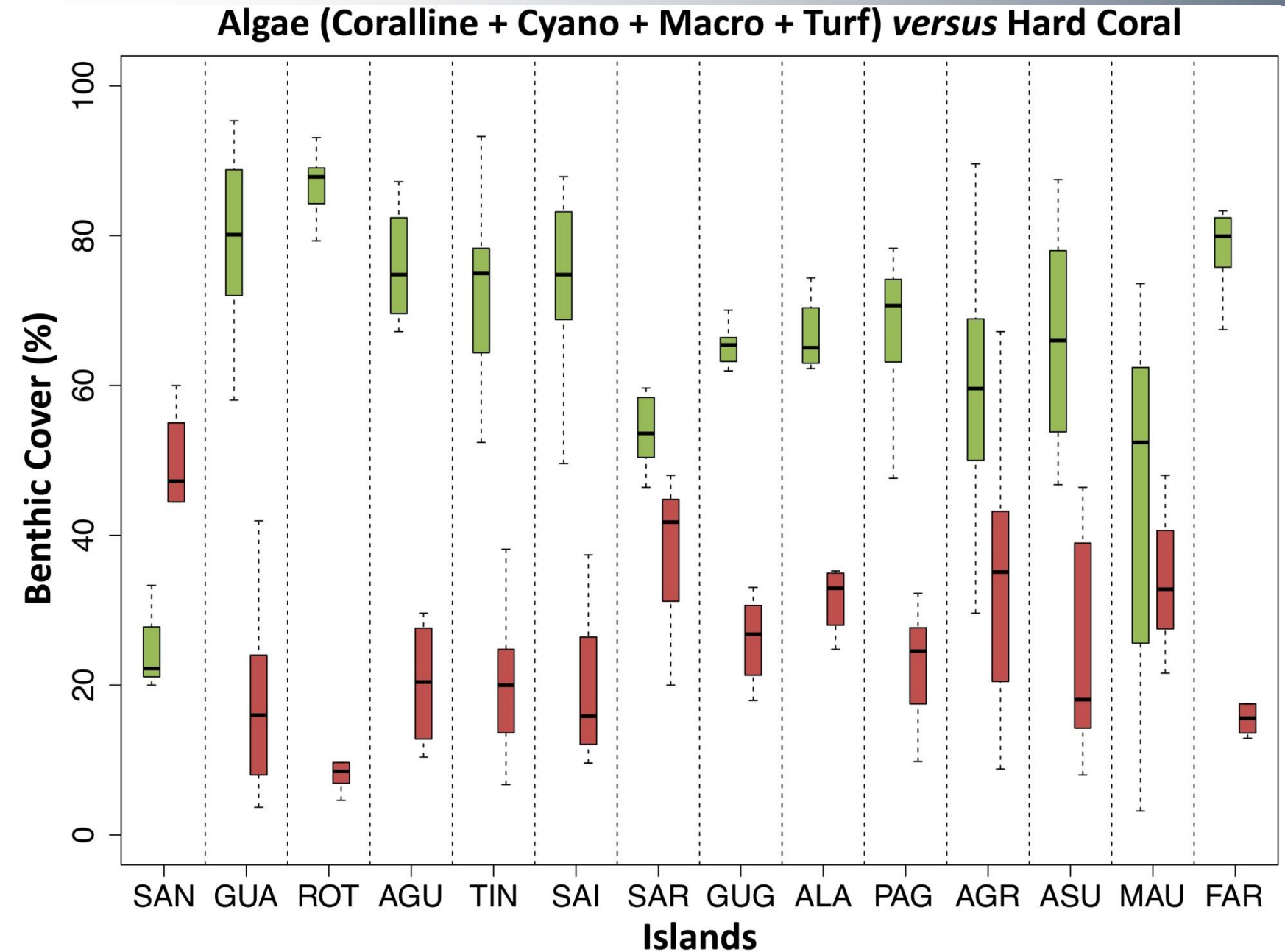
1. Intro: Algae on Tropical Reefs
2. Intro: Cryptic Diversity on Speed
3. NIMS Risk Assessments
4. Taxonomic Uncertainty in Managing Outbreaks of Nuisance Species

1. Intro: Algae on Tropical Reefs

Important Ecological Roles

Coral-Algal Reefs!



2. Intro: Cryptic Diversity Gone Wild

Diversity on speed

Micronesica 35-36, 2003

PEYSSONNELIACEAE

Cruoriella dubyi (Crouan & Crouan) Schmidt
Peyssonnelia conchicola Piccone & Grunow
(G) *Peyssonnelia corallis* (Agardh) Kylin
Peyssonnelia capensis Montagne [= *Peyssonnelia gunniana* J. Agardh]
* *Peyssonnelia inamoena* Pilger
Reported from Pohnpei I. and Ant Atoll by McDermid et al. (2002).
(G) *Peyssonnelia rubra* (Greville) J. Agardh

Diversity on speed

Collaboration with Fredericq Lab (UL)

- 33 COI sequences from Mariana Isls
  - → 19 Peyssonneliales spp.
  - → 3 Gigartinales spp.
- 73 samples from the western Pacific
  - → ± 39 Peyssonneliales spp.
  - → ± 6 Gigartinales spp.
- World: 12 Peyssonneliales genera, 95 species & 72 *Peyssonnelia* spp.

Micronesica 35-36, 2003

PEYSSONNELIACEAE

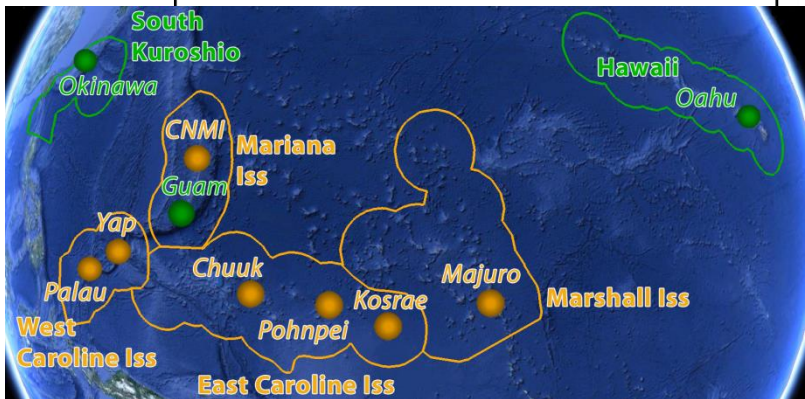
Type locality: Brittany, France	*Cruoriella dubyi*
Type locality: Eritrea, Red Sea	*Peyssonnelia conchicola*
(G) Nomenclatural error → *Lobophora variegata*	*P. corallis*
Type locality: Durban, South Africa	*Sonderophycus capensis*
Type locality: Cameroon, West Africa	*P. inamoena*
(G) Type locality: Ionian Islands, Greece	*P. rubra*

Diversity on speed

Portieria hornemannii

Okinawa Guam Hawaii Kosrae Pohnpei

In collaboration with Leliaert & De Clerck (Ghent University)



3. NIMS Risk Assessment

Acanthophora spicifera

NIMS Risk Assessment

548 PACIFIC SCIENCE, Vol. XV, October 1961

Acanthophora, a Possible Invader of the Marine Flora of Hawaii[1]

MAXWELL S. DOTY[2]

IN THE FALL OF 1952, a small algal fragment was brought to the author from Pearl Harbor[3] by Mr. Charles Cutress. In April, 1953, a much larger piece of the alga was brought in by Mr. Spencer Tinker, who had found it washed ashore near the Waikiki Beach Laboratory of the Uni-

side of Oahu that it has not often been preserved as an herbarium specimen.

Finally, during June, 1956, Dr. Otto Degener collected and sent in a specimen (his no. 24105) from Mokuleia on the windward shore of the island of Oahu, northwestward from Honolulu,

Micronesica 40(1/2): 245–252, 2008

Acanthophora spicifera (Rhodophyta: Rhodomelaceae) in the Marshall Islands

ROY T. TSUDA, STEVE L. COLES
ERIC B. GUINTHER
R. ANDREW O. FINLAY
FRANKIE L. HARRISS

Marine Biodiversity Records, page 1 of 7.
doi:10.1017/S1755267211000078; Vol. 4; e30; 2011 Published online

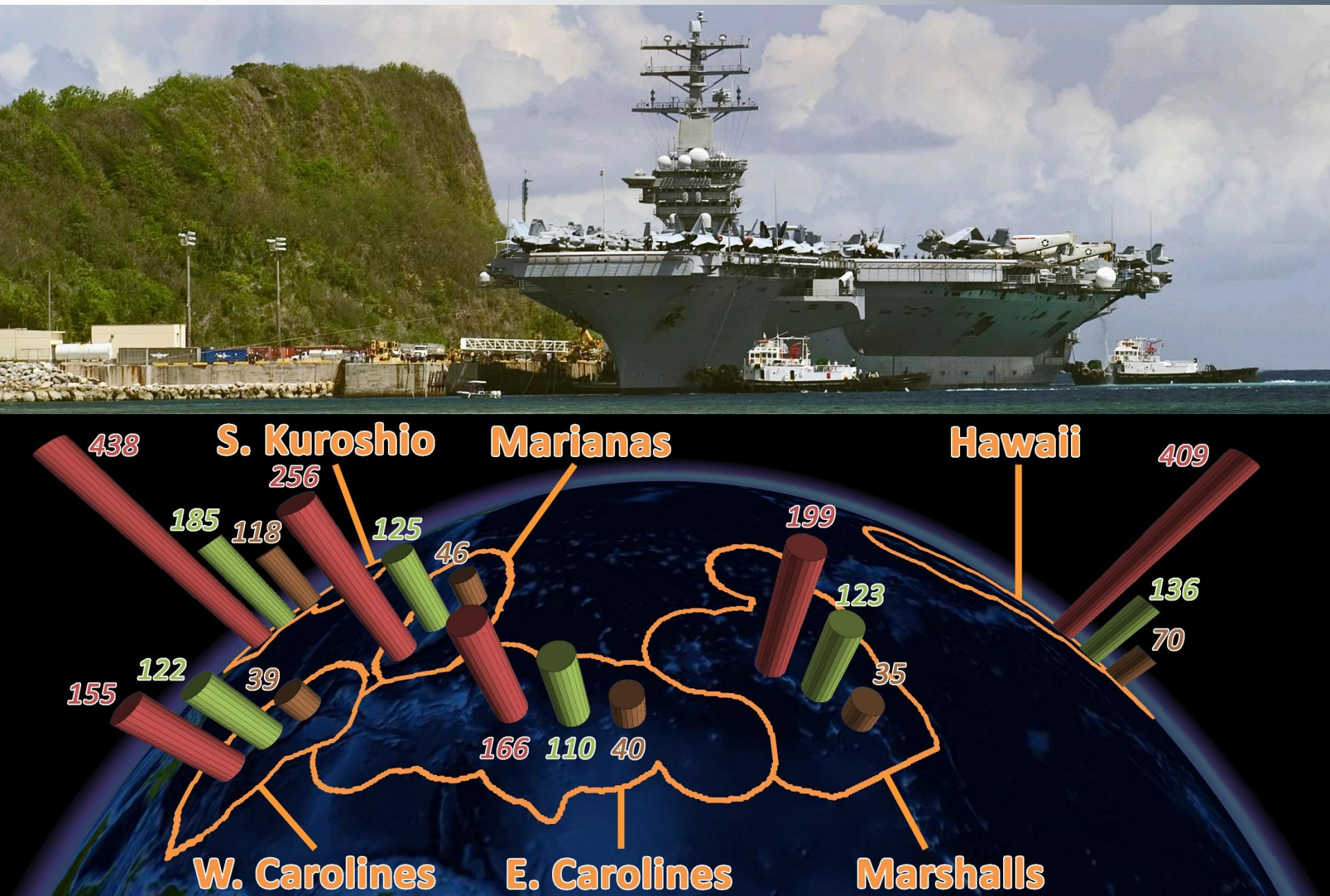
Records of non-indigenous marine species at Palmyra Atoll in the US Line Islands

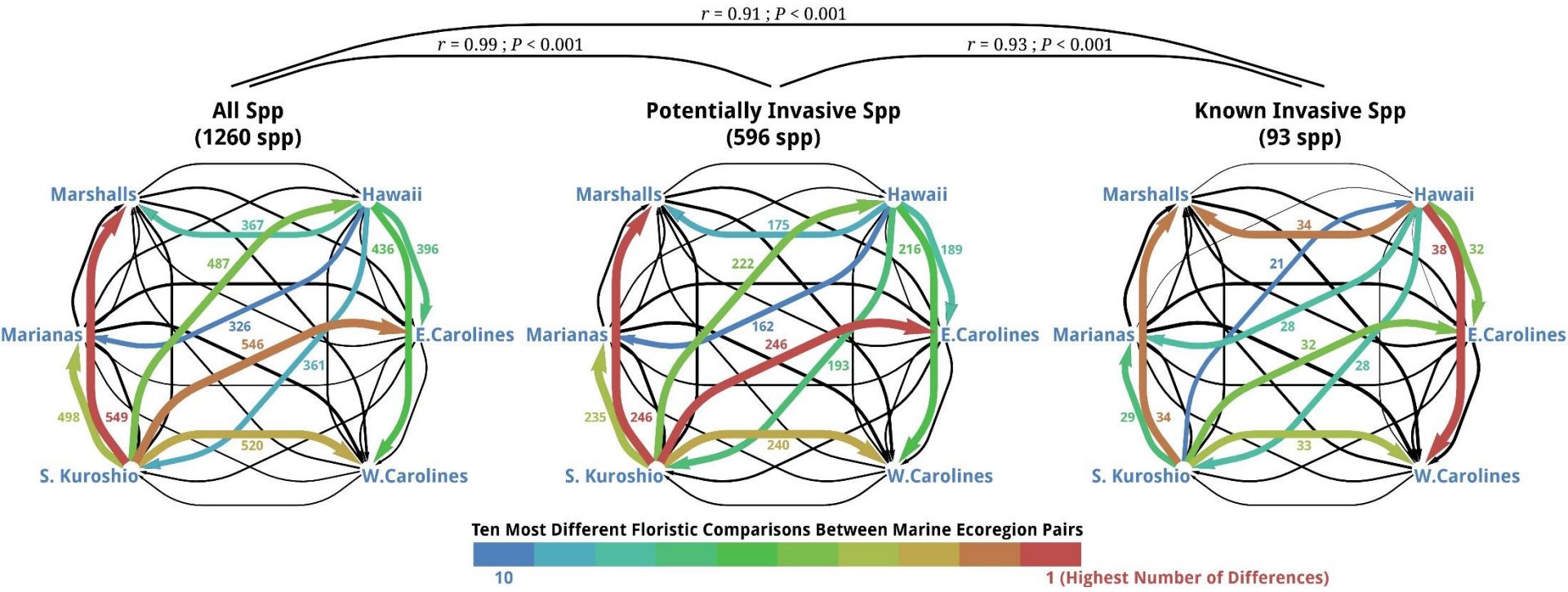
I.S. KNAPP[1], L.S. GODWIN[2], J.E. SMITH[3], C.J. WILLIAMS[3] AND J.J. BELL[1]

[1]Centre for Marine Environmental and Economic Research, School of Biological Sciences, Victoria University of Wellington, PO Box 600 Wellington, New Zealand, [2]Papahānaumokuākea Marine National Monument, National Oceanic and Atmospheric Administration, National Marine Sanctuaries, 6600 Kalaniana'ole Hwy Suite 300, Honolulu, HI 96825, [3]Scripps Institution of Oceanography, Center for Marine Biodiversity and Conservation, La Jolla, California, 92083, USA

Micronesia Biosecurity Plan

NIMS Risk Assessment




r = 0.91 ; P < 0.001
r = 0.99 ; P < 0.001
r = 0.93 ; P < 0.001
All Spp
(1260 spp)
Potentially Invasive Spp
(596 spp)
Known Invasive Spp
(93 spp)
Marshalls
Hawaii
Marianas
E.Carolines
S. Kuroshio
W.Carolines
367
487
436
396
326
546
361
498
549
520
175
222
216
189
162
246
193
235
246
240
34
21
38
32
28
32
28
29
34
33
Ten Most Different Floristic Comparisons Between Marine Ecoregion Pairs
10
1 (Highest Number of Differences)

NIMS

Galaxauraceae: Morphospecies

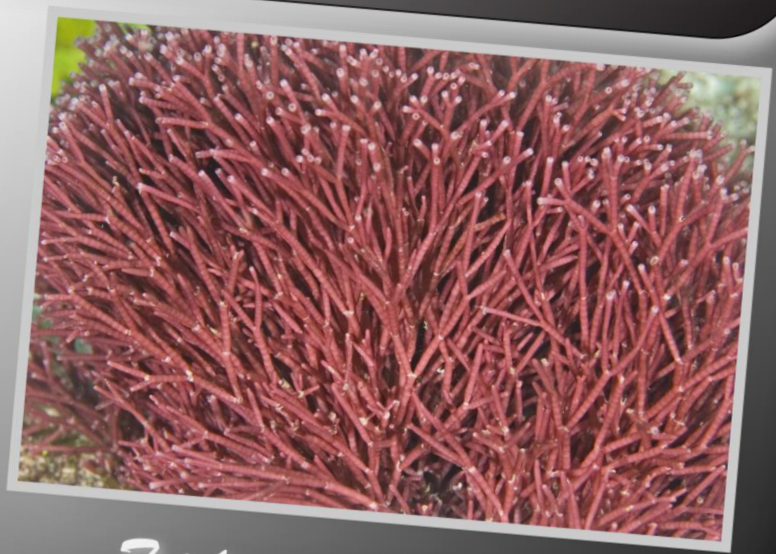
Red Algae

Actinotrichia fragilis
(Forsskål) Børgesen

Red Algae

Dichotomaria marginata
(Ellis & Solander) Lamarck

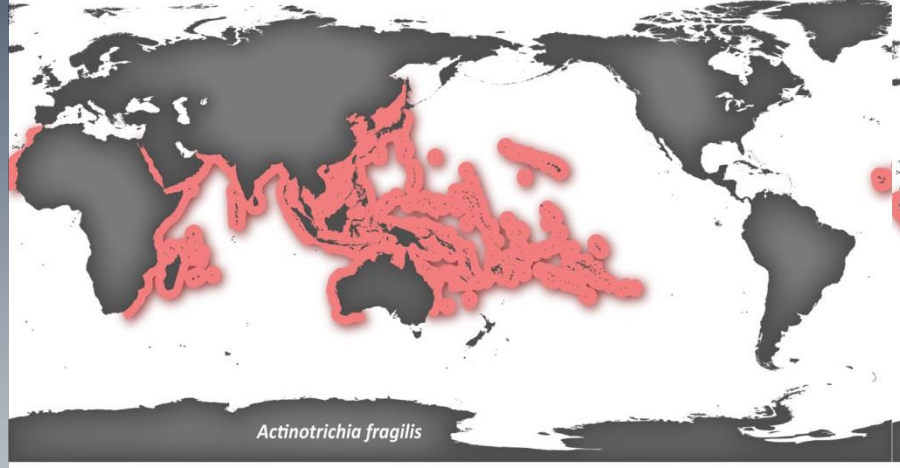
Galaxaura rugosa
(Ellis & Solander) Lamouroux

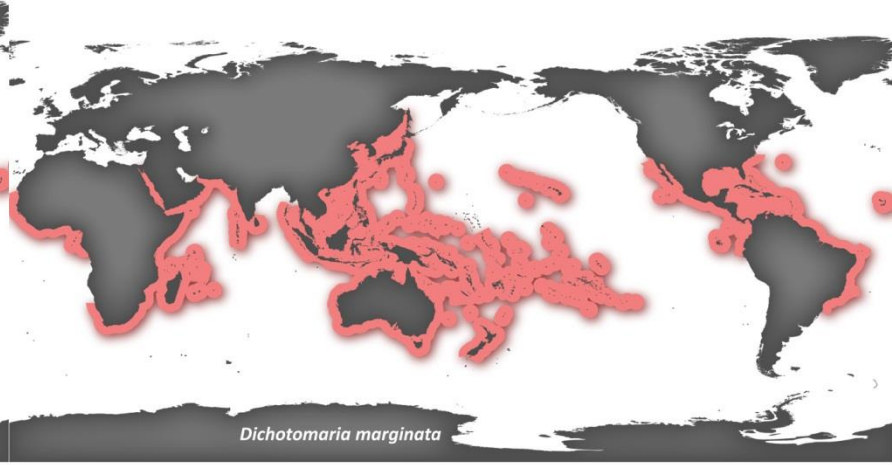


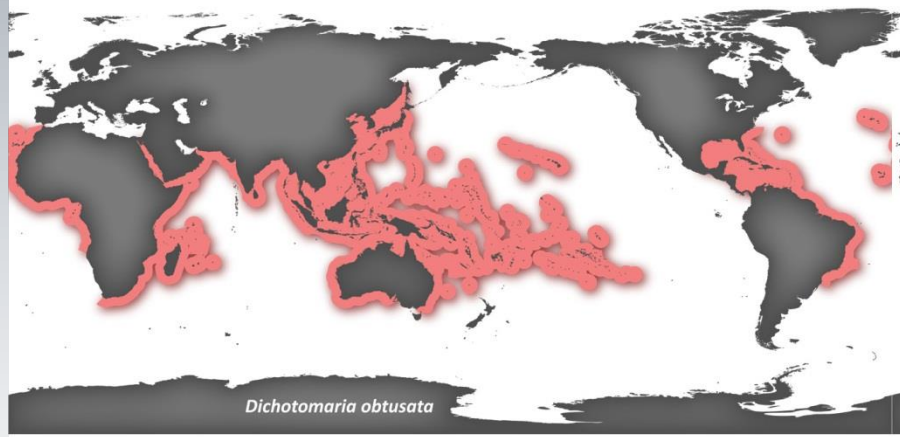
Tricleocarpa cylindrica
(Ellis & Solander) Huisman & Borowitzka

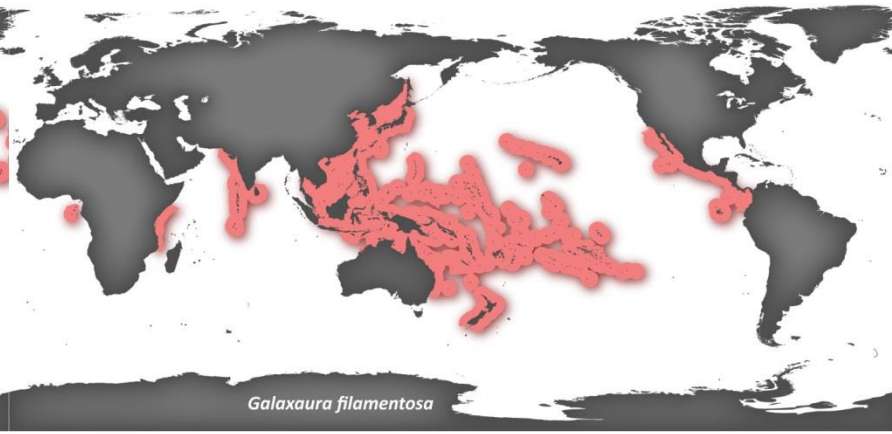
Galaxauraceae: Morphospecies

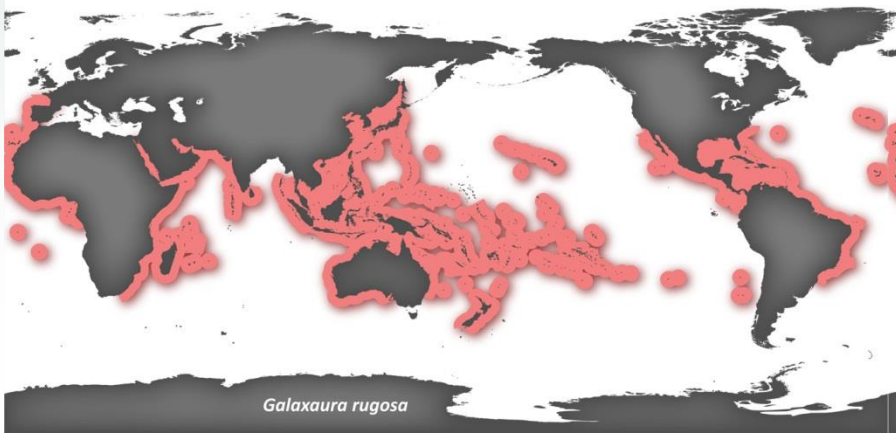
NIMS

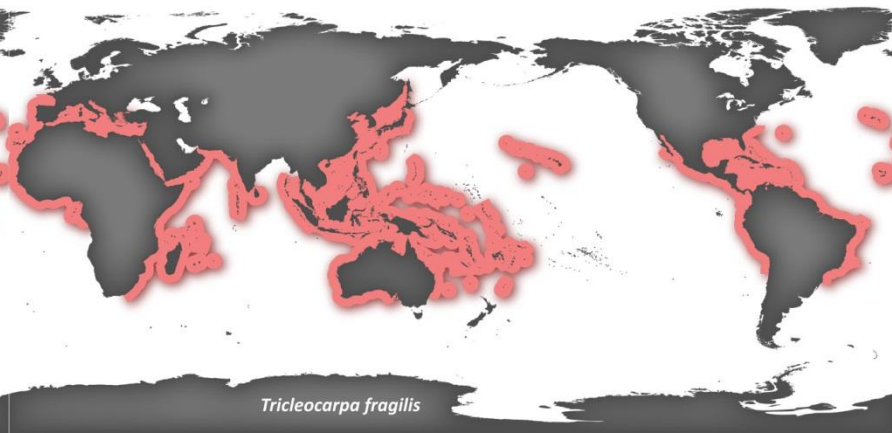












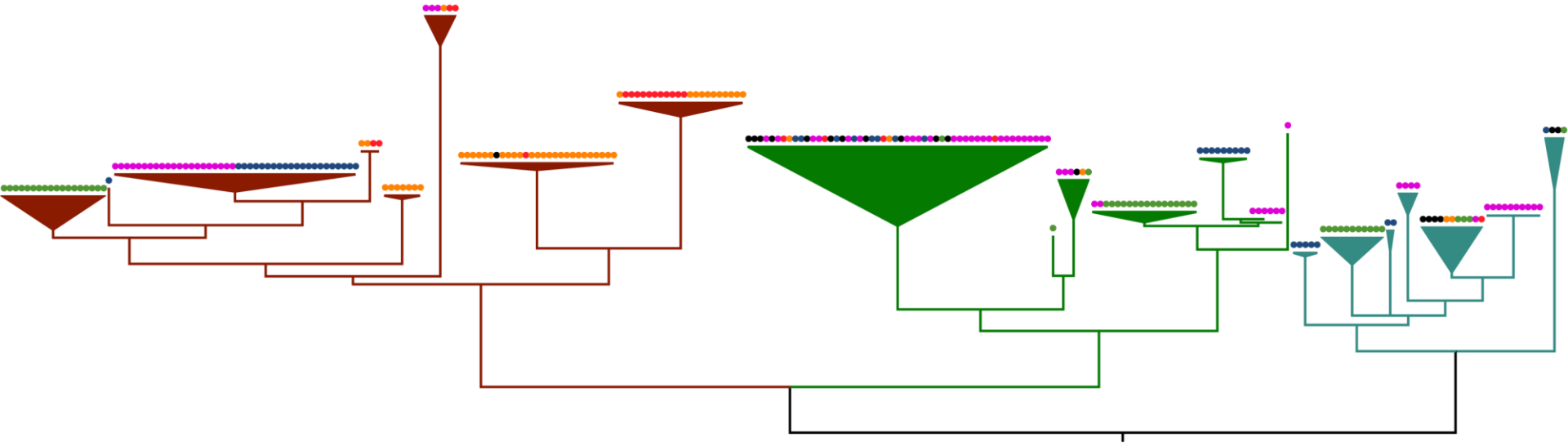
Galaxauraceae: DNA Barcoding

NIMS

Actinotrichia
8 spp.

Galaxaura
6 spp.

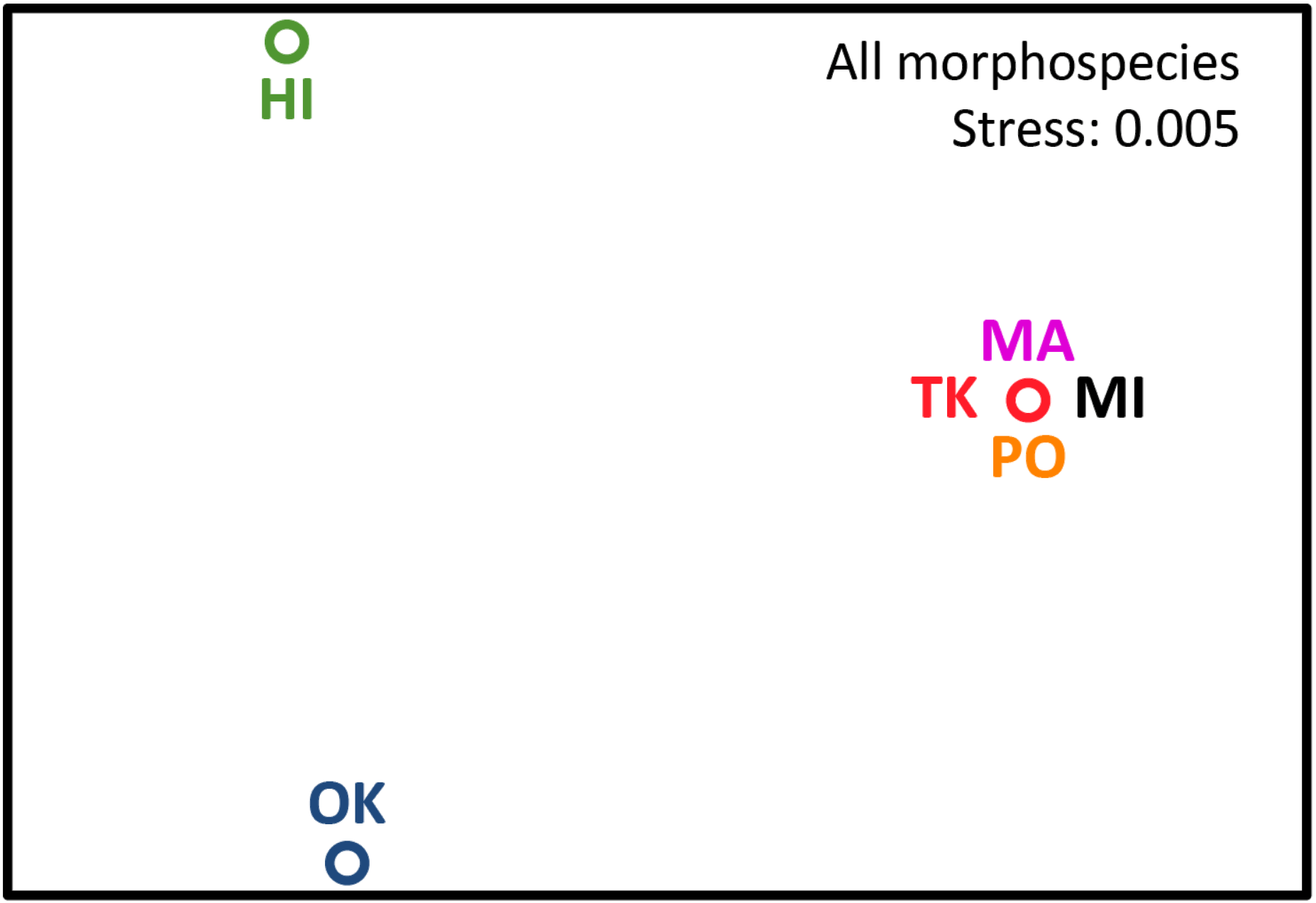
Dichotomaria
7 spp.



OK MA TK PO MI HI

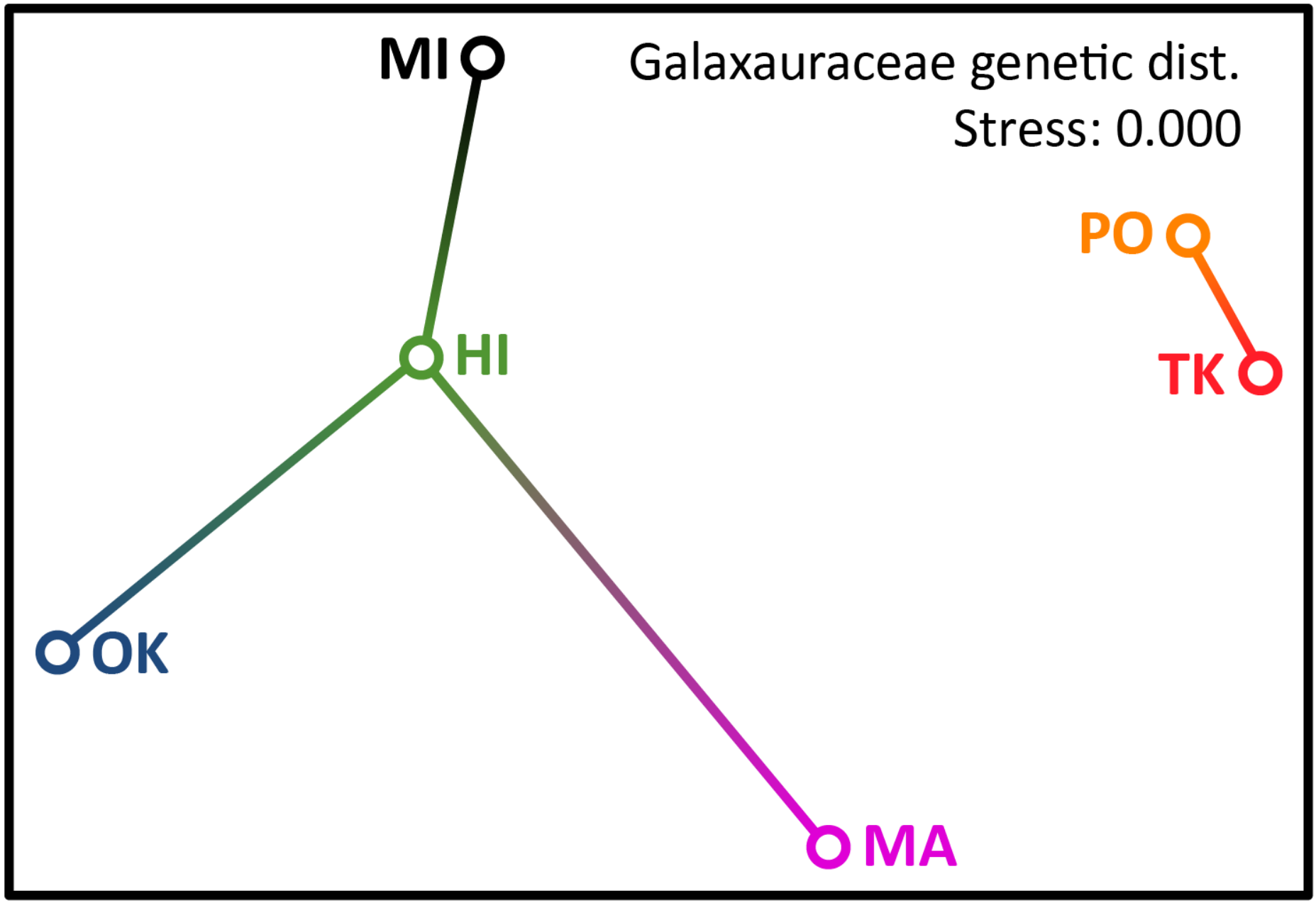
Galaxauraceae: MDS Morphospecies

NIMS



Galaxauraceae: MDS Morphospecies

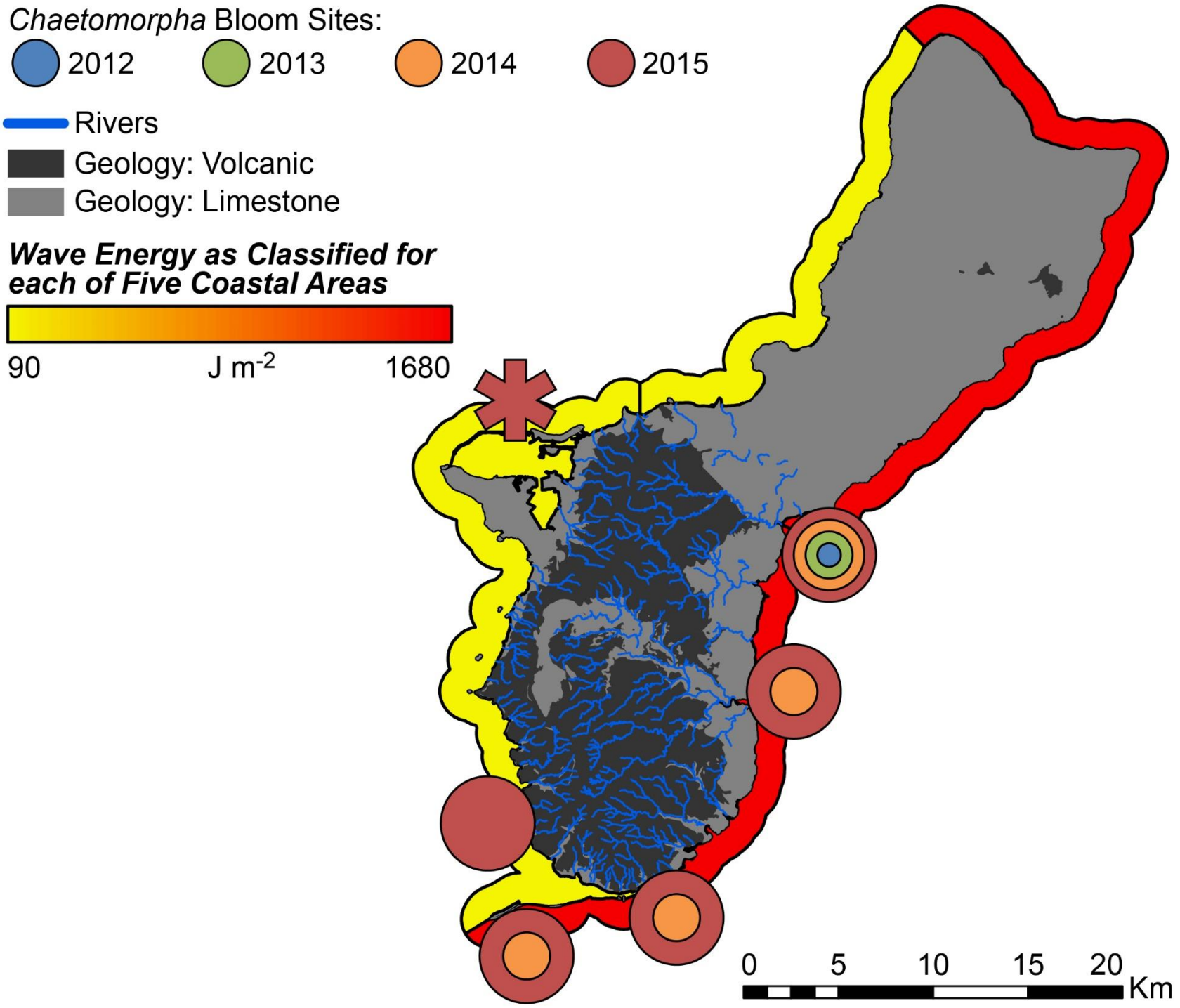
NIMS



4. Managing Outbreaks

Green Tide in Guam

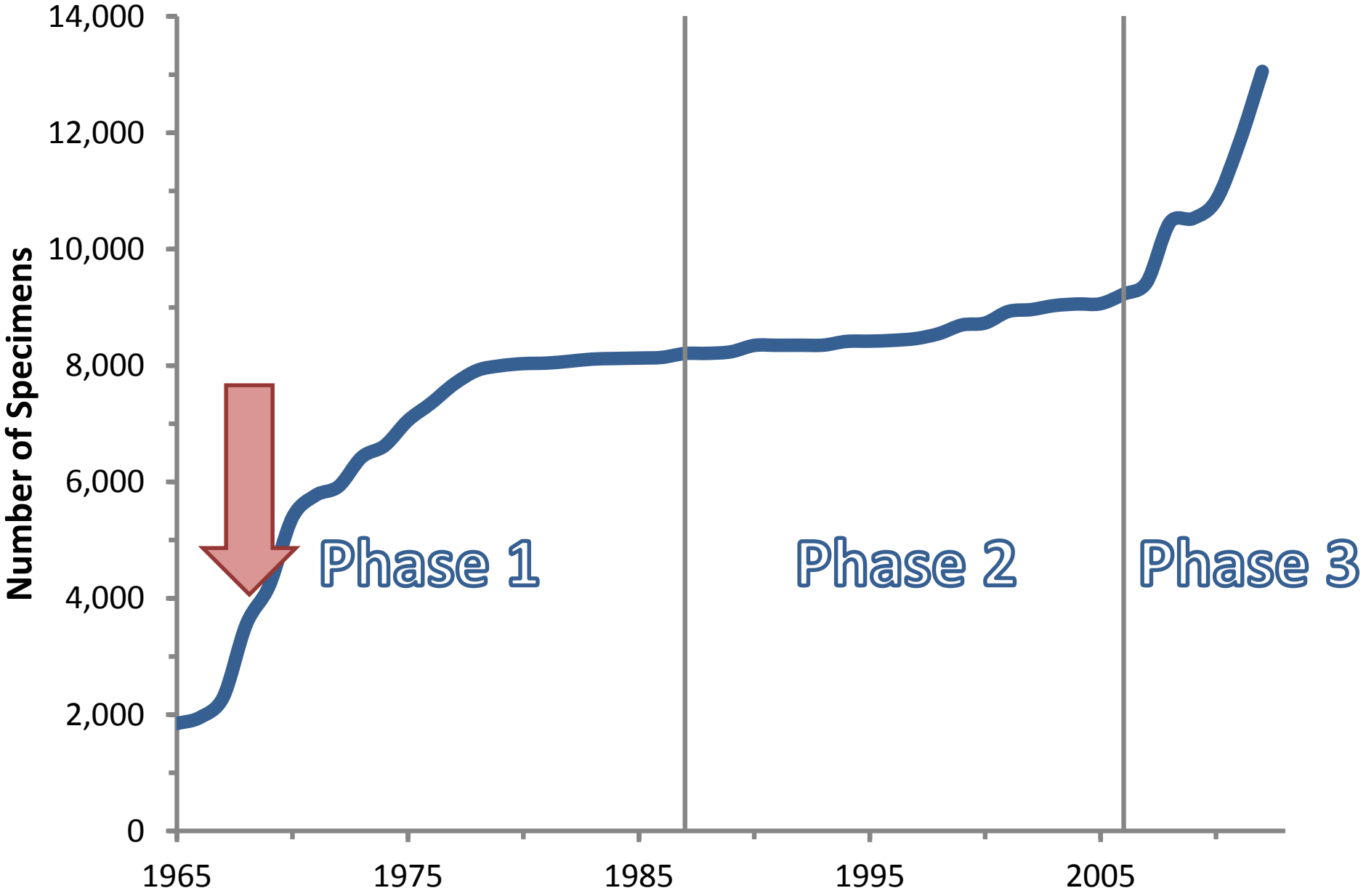
Reef Conservation



Green Tide

Green Tide

Collection Effort



Sudden massive blooms of green algae: why?

I. Natural dynamics in population density 

II. Large-scale climatic changes 

III. Anthropogenic disturbances at a local scale

a) Altered abiotic conditions 

b) Biological changes in community structure

→ Reduction in herbivores 

→ NIMS outbreaks 

Reef Conservation

NIMS?

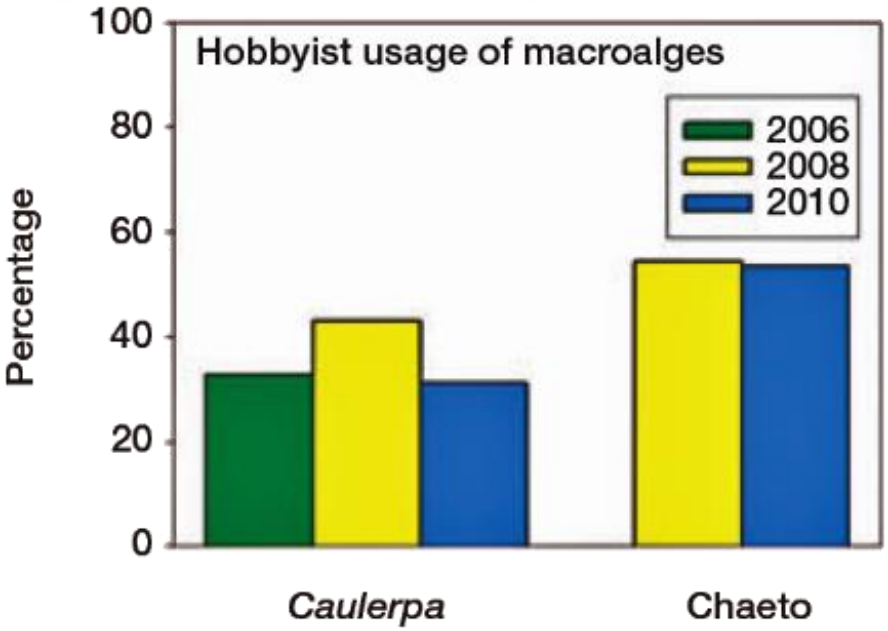
Biol Invasions (2014) 16:1589–1597
DOI 10.1007/s10530-013-0593-x

ORIGINAL PAPER

A safe alternative to invasive *Caulerpa taxifolia* (Chlorophtya)? Assessing aquarium-release invasion potential of aquarium strains of the macroalgal genus *Chaetomorpha* (Chlorophyta)

Rachel L. Odom · Linda J. Walters

Abstract Aquarium releases threaten the ecological integrity of aquatic systems by introducing non-native species. Following aquarium-release invasions by *Caulerpa taxifolia*, other genera of marine macroalgae were promoted by aquarists as alternatives for aquarium hobbyist use. The most popular, *Chaetomorpha*, was named a preferable alternative to invasive *Caulerpa* with desirable characteristics including rapid nutrient uptake, broad environmental tolerances and ease of acquisition. As these same characteristics are also associated with invasion success, we assessed the risk posed if aquarium release activities extend to *Chaetomorpha*. Here we address the propensity for vegetative fragmentation, a primary contributor to the breadth of the *Caulerpa* invasions, as a potential invasion risk for *Chaetomorpha*. We monitored fragment generation of 10 purchases of *Chaetomorpha* from aquarium hobby retailers and tested viability of fragments 0.5–10 mm in length at 5, 22 and 30 °C. We found that *Chaetomorpha* can survive from fragments as small as 0.5 mm (one live cell). Abundance of viable fragments generated during shipping ranged from 28 to 6,266 per purchase. In 9 of 10 trials, survival was independent of starting length, indicating that small size will not limit potential establishment. Fragments in these purchases had low survival at 5°, but one purchase showed high survival at all temperatures. With high survivorship of small fragments and large numbers of fragments generated, we caution that aquarium strains of *Chaetomorpha* may pose a threat if released into natural waterways and encourage educational outreach strategies which focus on changing releasing behaviors rather than promoting "safe" alternatives to invasive ornamentals.



NIMS: E-commerce

Reef Conservation

Hi! Sign in or register | Daily Deals | Gift Cards | Sell | Help & Contact — My eBay

ebay Shop by category — Search... — All Categories — Search — Advanced

Back to search results | Listed in category: Pet Supplies > Fish & Aquariums > Coral & Live Rock

Mouse over image to zoom

1/4# Chaetomorpha Algae FREE shipping Chaeto live macro coral reef saltwater

Item condition: **New**

Quantity: 1 — 7 available / **20 sold**

Price: **US $49.99**

Buy It Now

Add to cart

5 watching

Add to watch list

Add to collection

Add to watch list

100% positive Feedback | Free Shipping | Limited quantity remaining

Shipping: Expedited Shipping |
Item location: United State
Ships to: United States

Delivery: Varies

Payments: PayPal | VISA
Processed b

Returns: No returns or exchar
Guarantee.

Guarantee: ebay MONEY B
Get the item you order
Covers your purchase pr

Seller information
themacroman (849 ★)
100% Positive feedback

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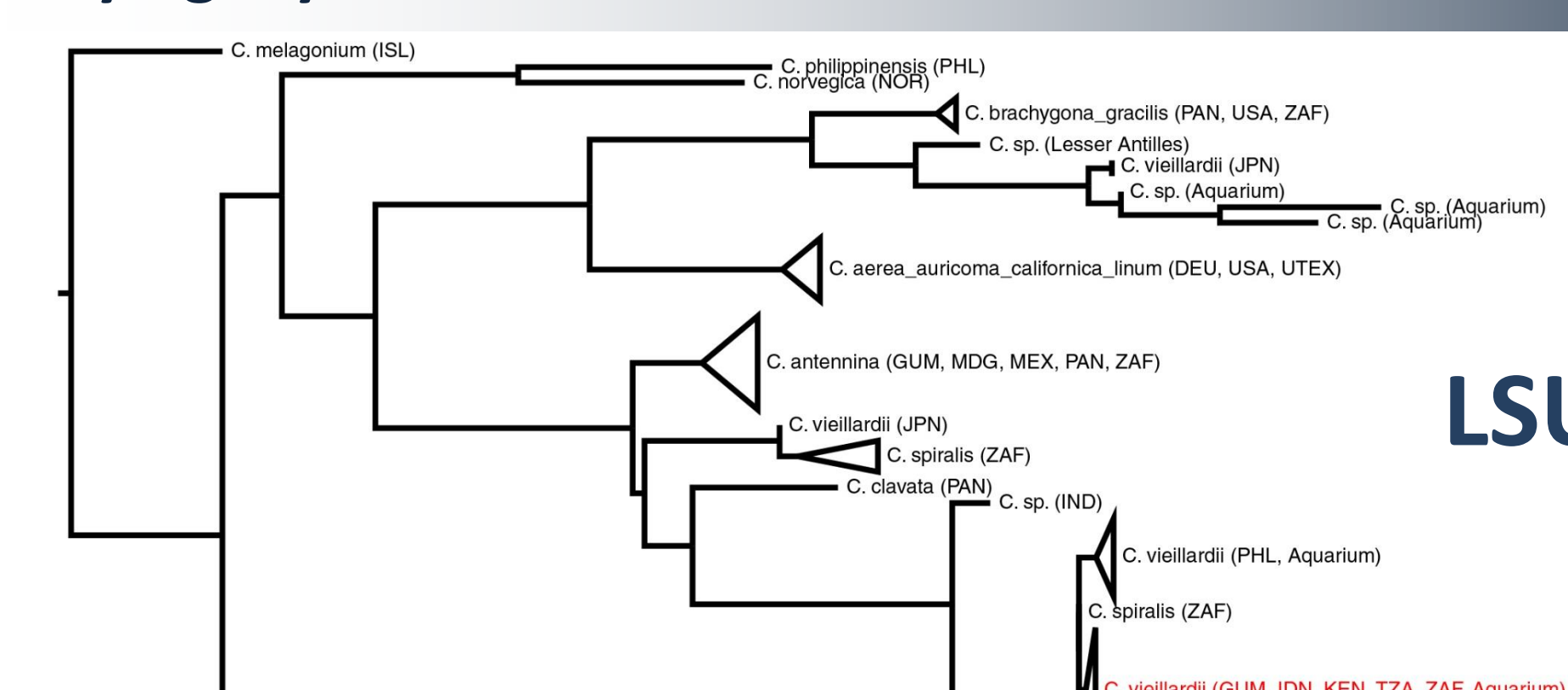
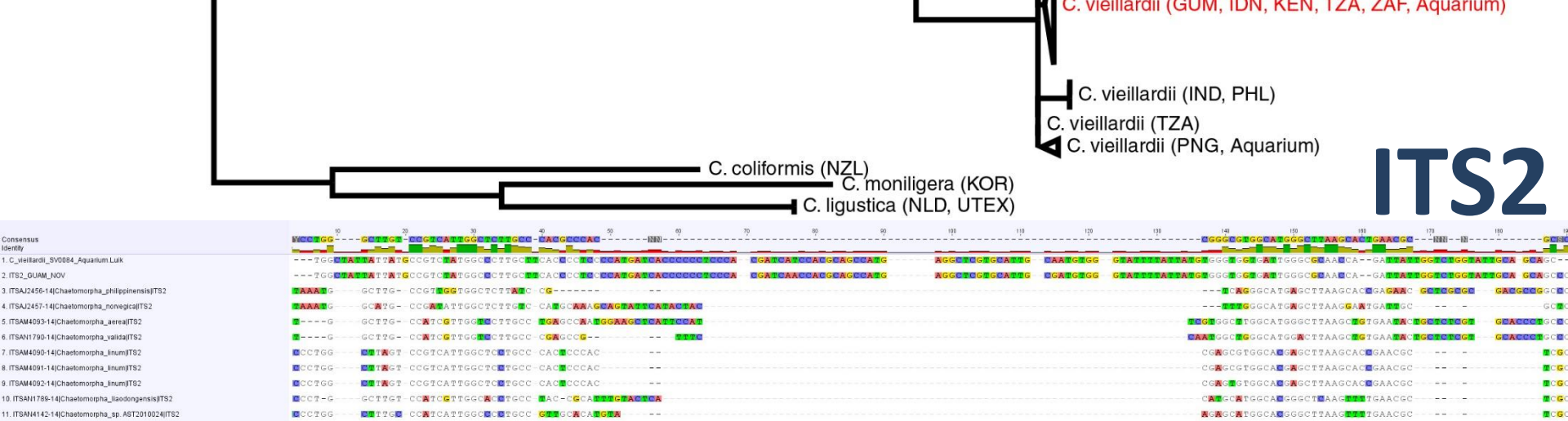
Phylogeny



LSU

ITS2



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