

# Biodiversity, ecosystem services and ecosystem network in protected areas of Okinawa

Makoto Tsuchiya

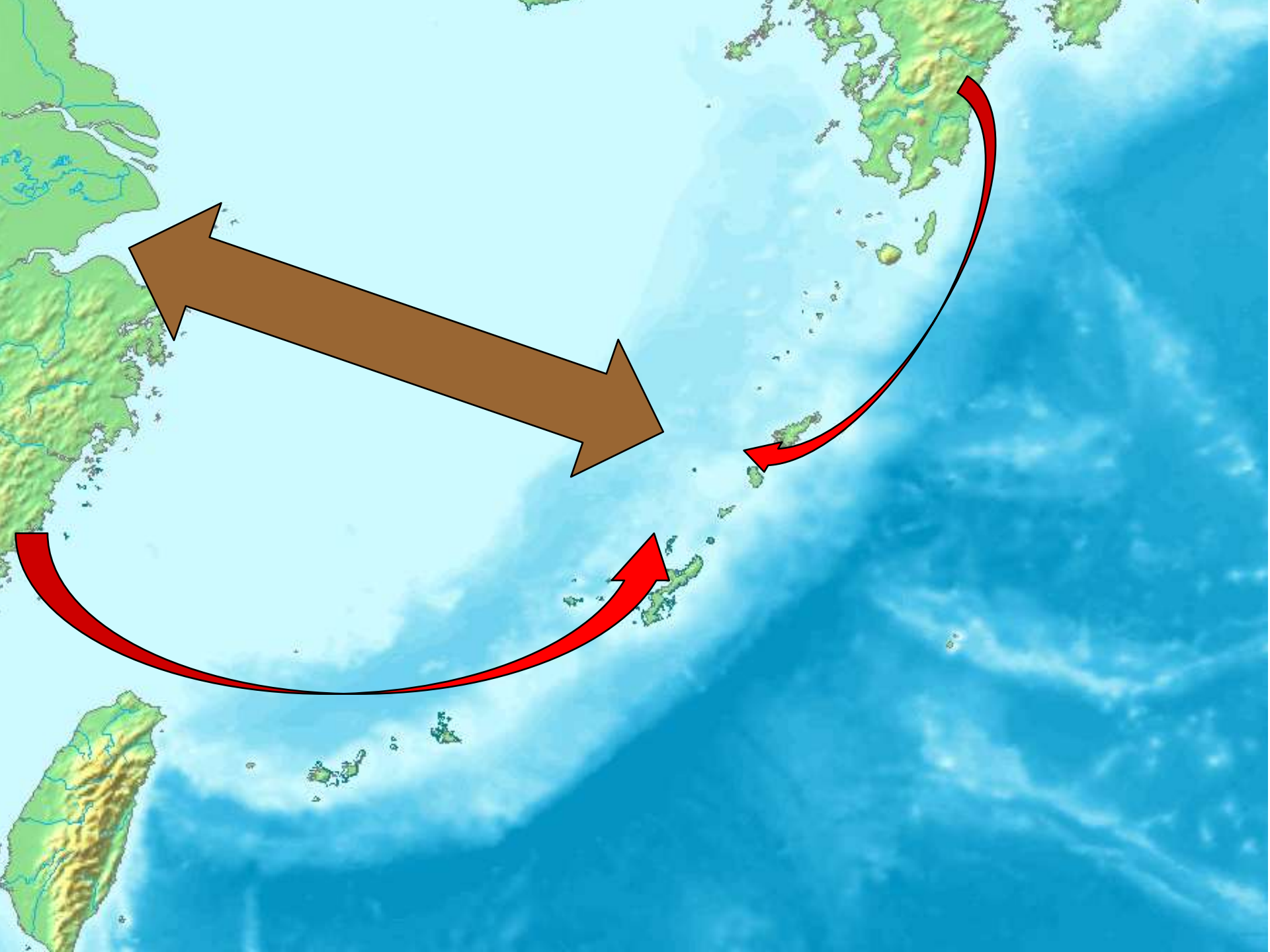
Faculty of Science, University of the Ryukyus, Japan

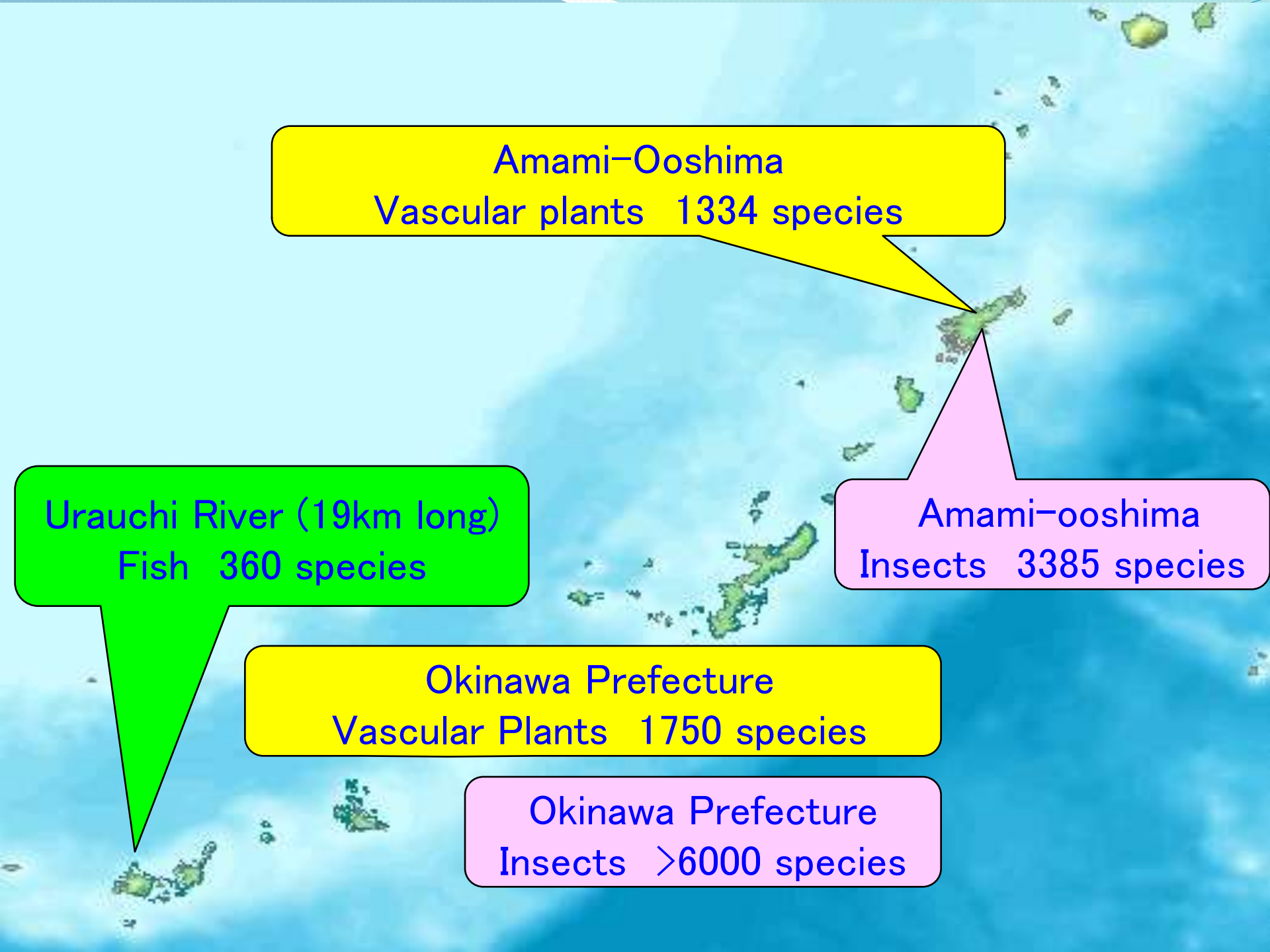
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Nature Conservation Section, Okinawa Prefecture, Japan





Amami-Ooshima  
Vascular plants 1334 species

Urauchi River (19km long)  
Fish 360 species

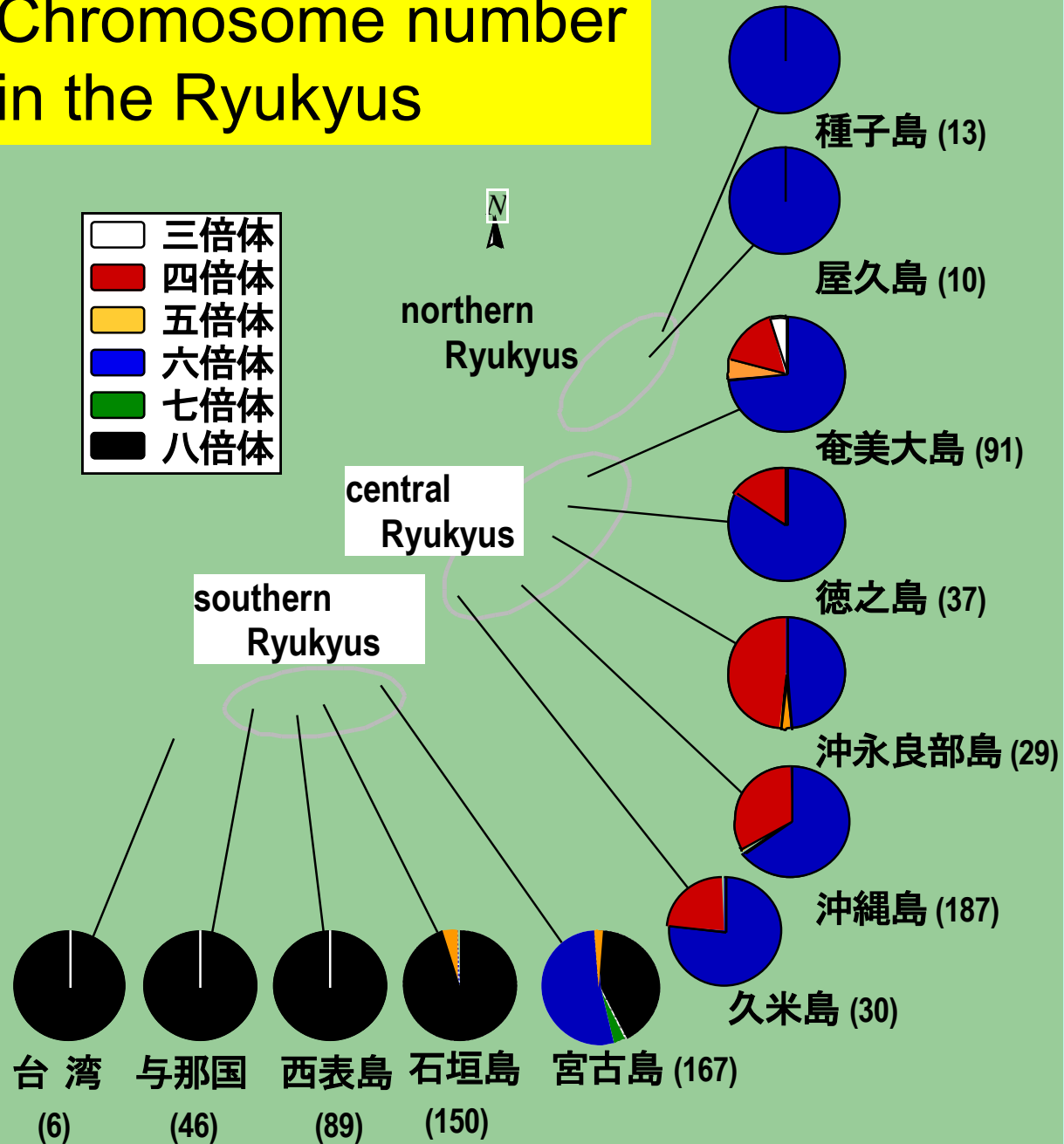
Amami-ooshima  
Insects 3385 species

Okinawa Prefecture  
Vascular Plants 1750 species

Okinawa Prefecture  
Insects >6000 species



# Chromosome number in the Ryukyus



Polyhaploids of  
*Ixeris nakazonei*

$2n=32$

⋮

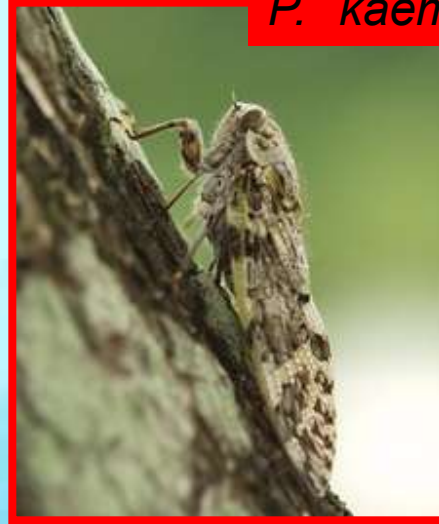
$2n=64$

# Closely related cicada species of the genus *Platypleura*

*P. yayeyamana*



*P. kaempferi*



*P. kuroiwae*



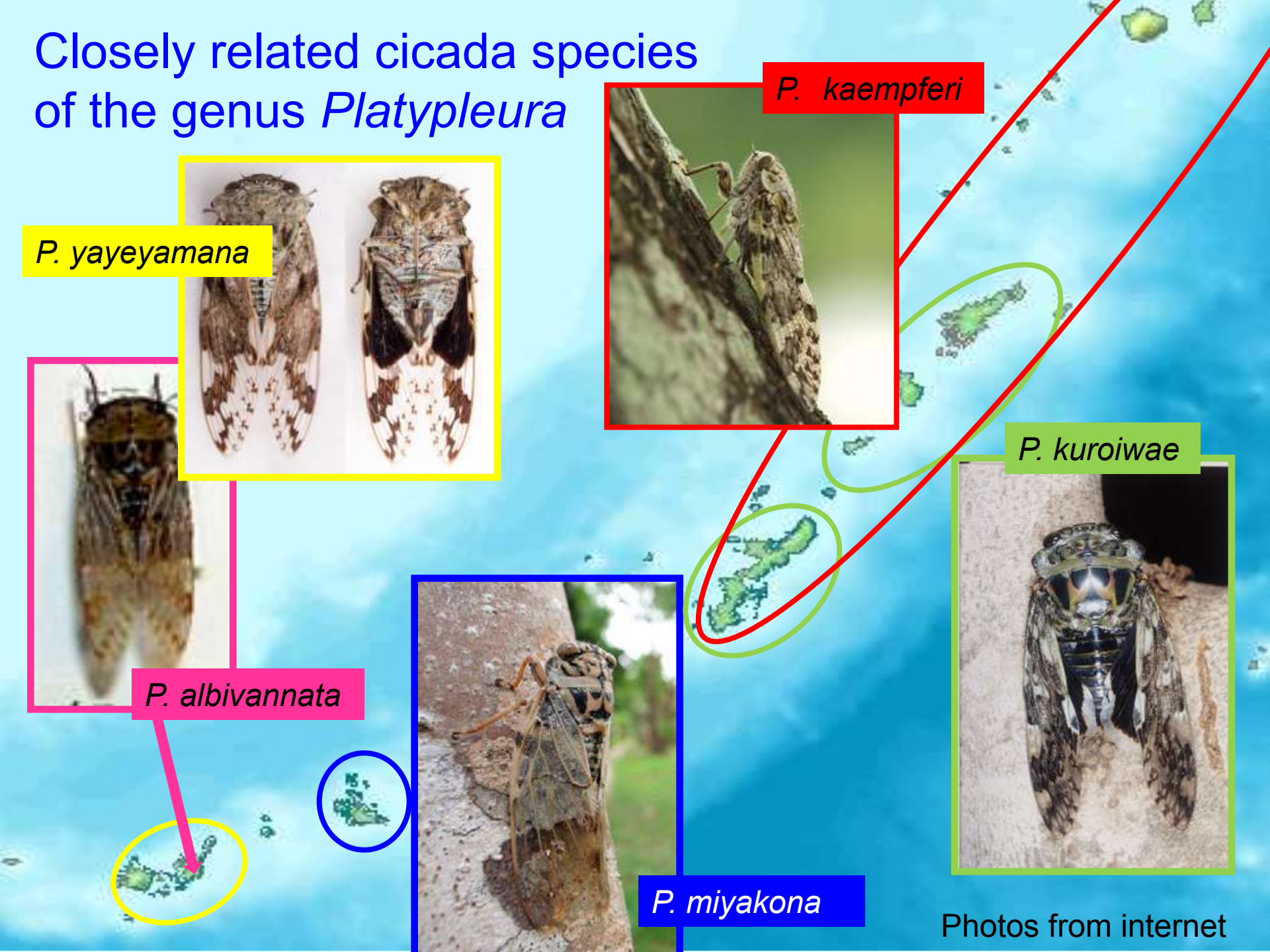
*P. albivannata*



*P. miyakona*



Photos from internet



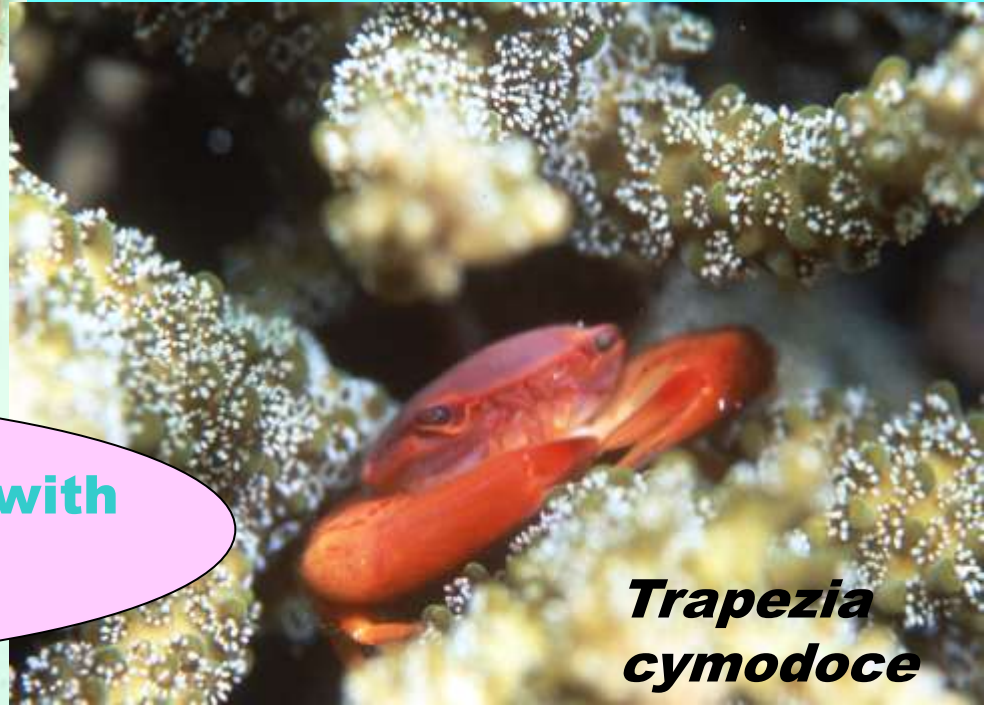
***Pocillopora damicornis***



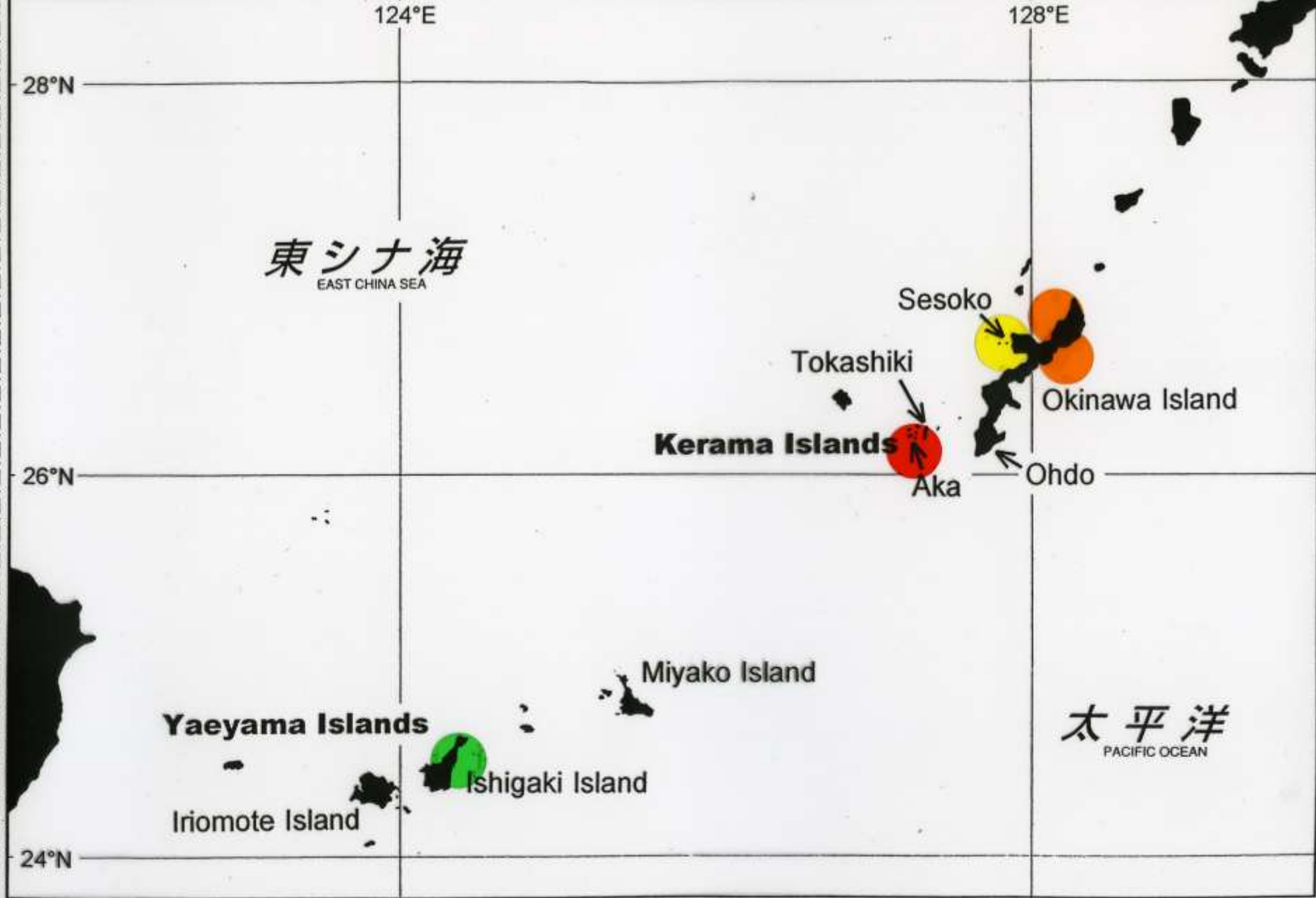


**Several *Trapezia* species are coexisting in a large colony**  
**Why and how can several closely related species coexist?**

**Small animals associated with *Pocillopora damicornis***

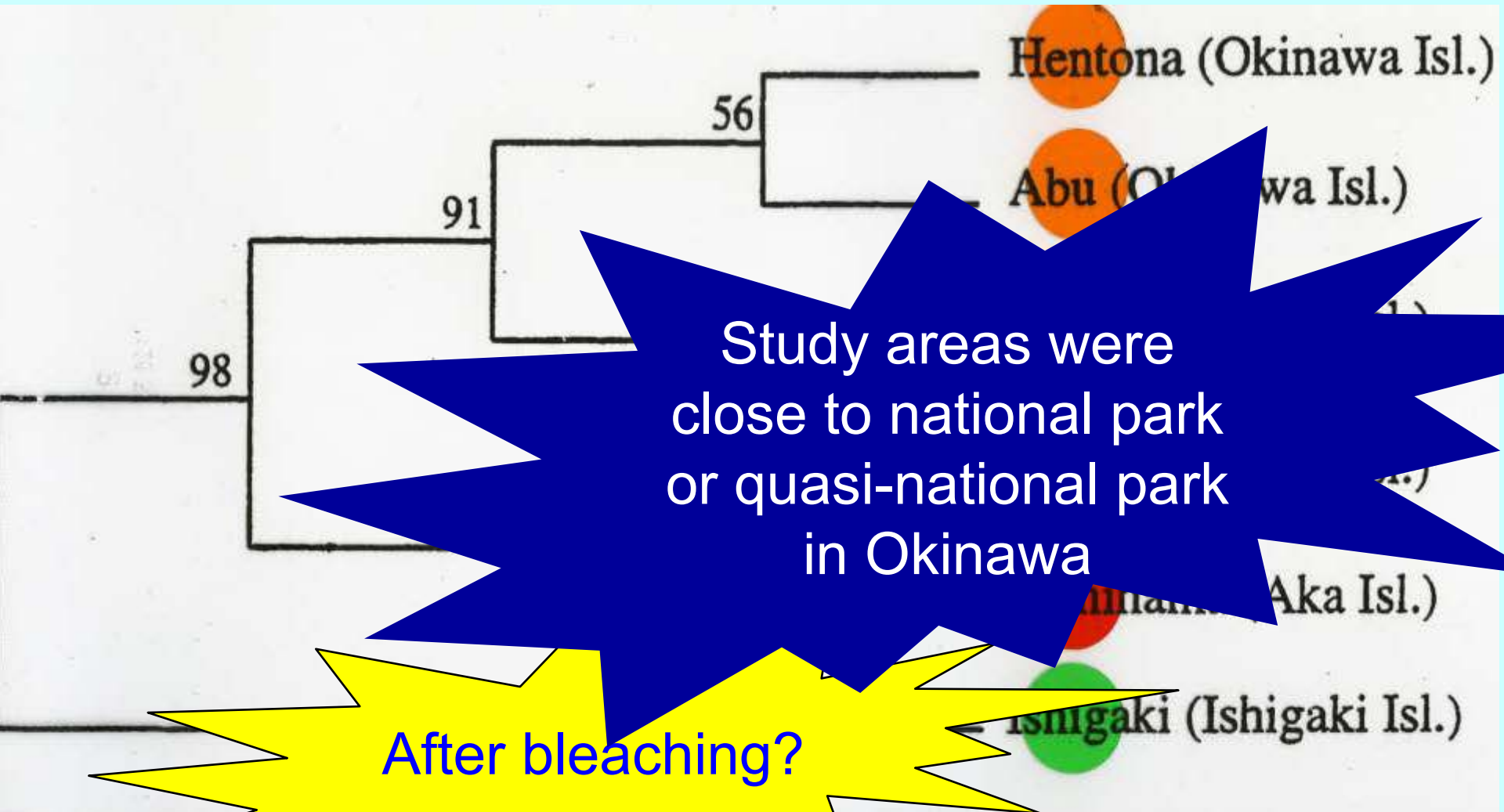


***Trapezia cymodoce***



*Pocillopora damicornis* collected in the several sites in Okinawa for genetic study.





Study areas were close to national park or quasi-national park in Okinawa

After bleaching?

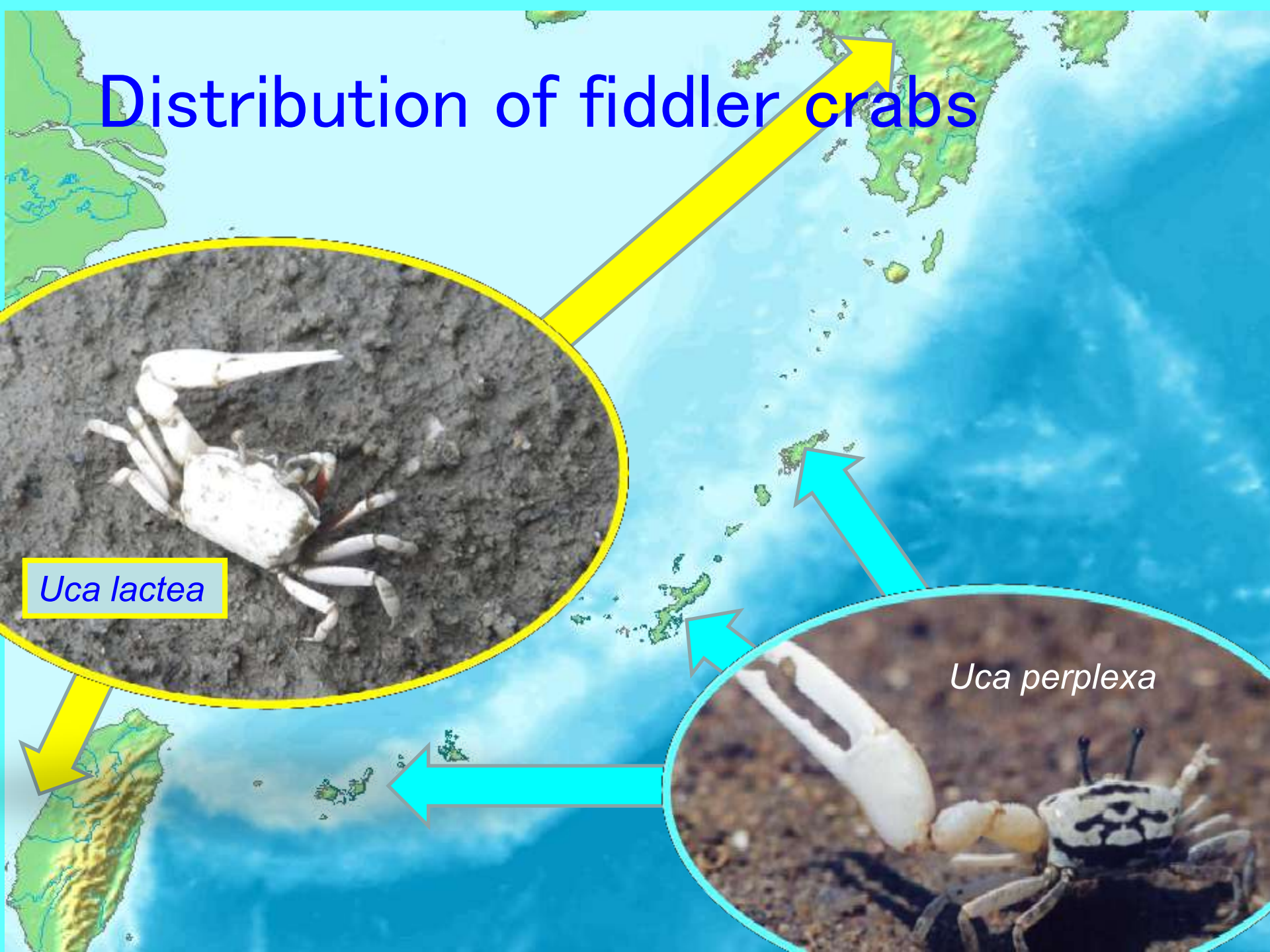
Fig. 2 *Pocillopora damicornis*. Neighbor-joining tree showing pattern of similarity expressed by Nei's unbiased genetic distance among six populations collected around four islands. Bootstrap values are from a consensus tree

A new soldier crab species in Okinawa described in 2010  
*Mictyris brevidactylus* → *Mictyris guinotae*

**Protected area in  
Taiwan**



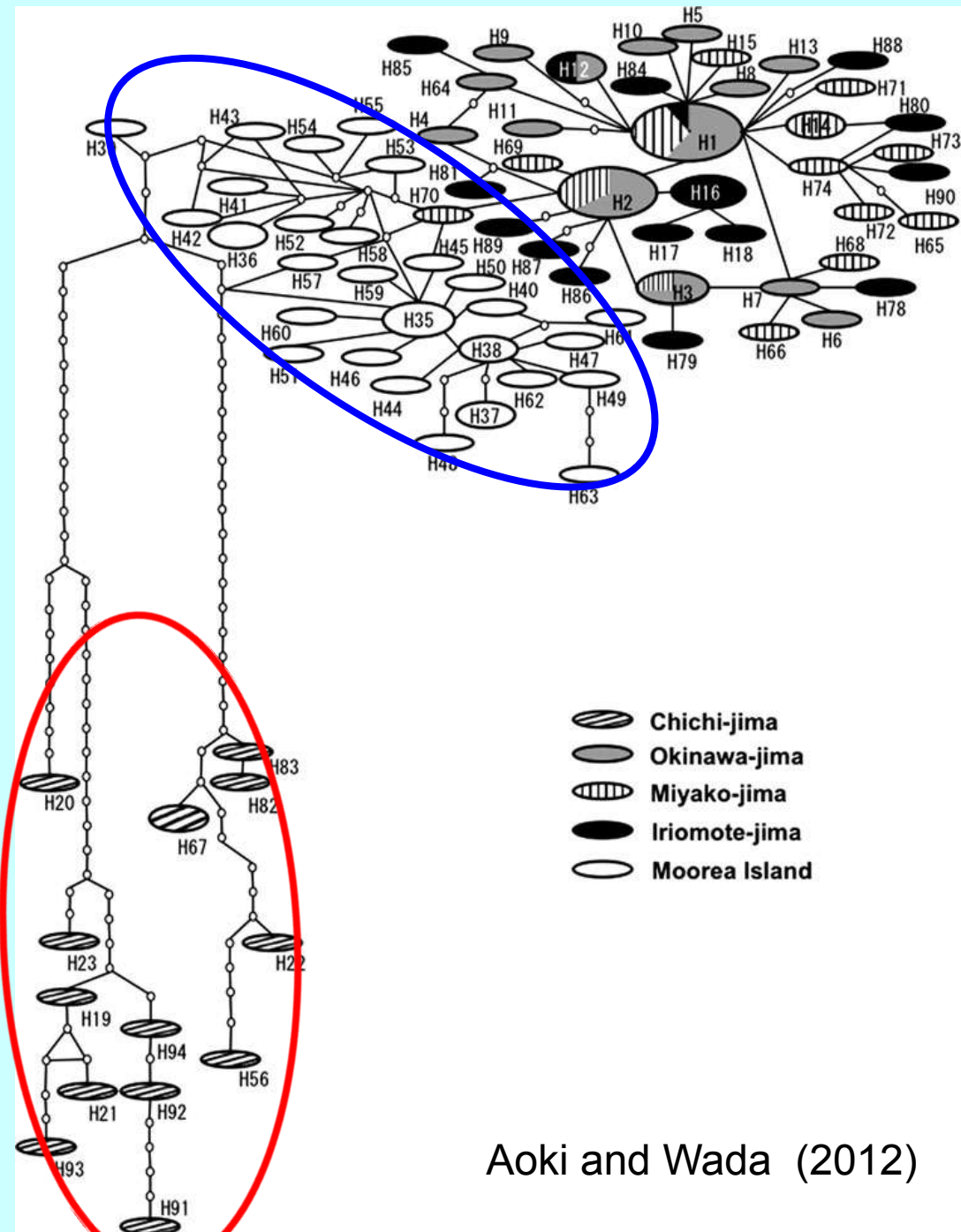
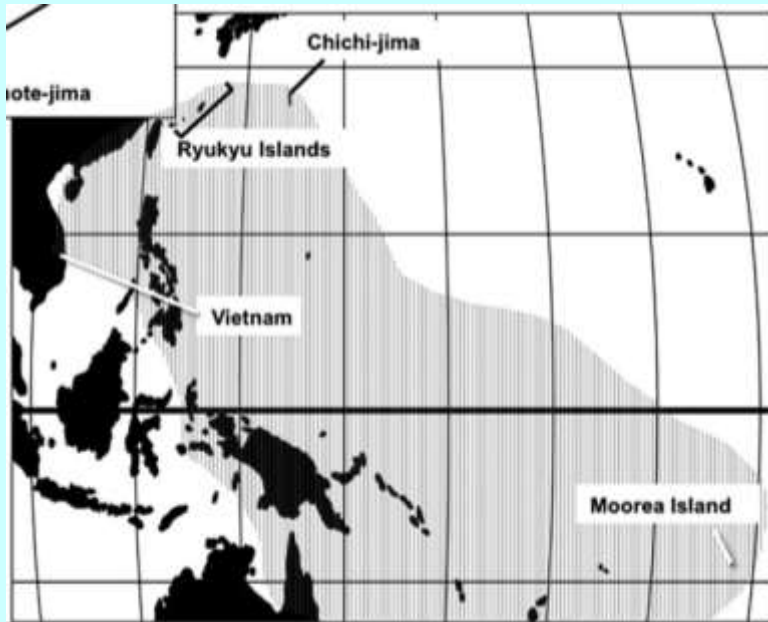
# Distribution of fiddler crabs



*Uca lactea*

*Uca perplexa*

# Distribution of a fiddler crab species



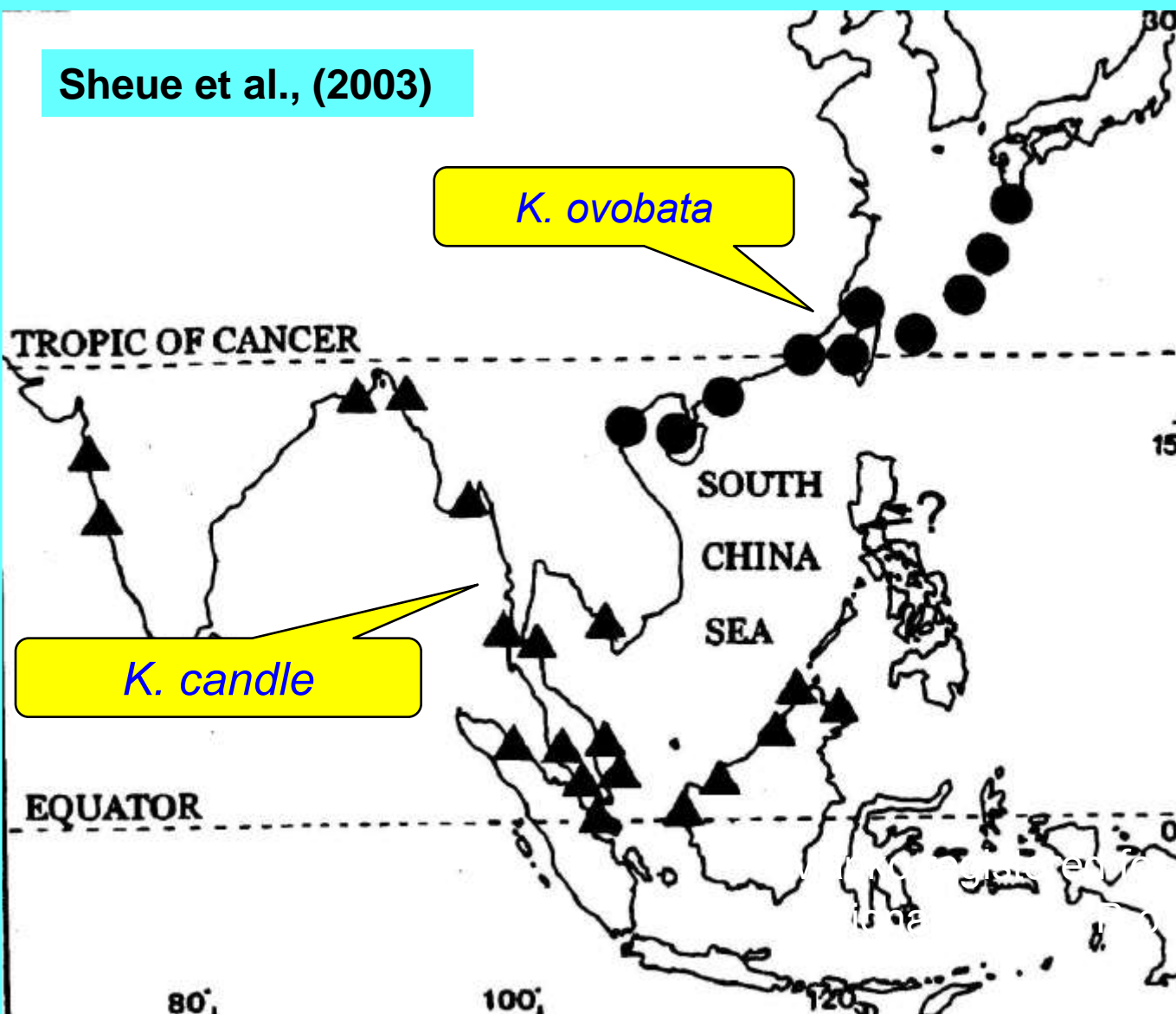
Aoki and Wada (2012)

# Mangrove

Sheue et al., (2003)

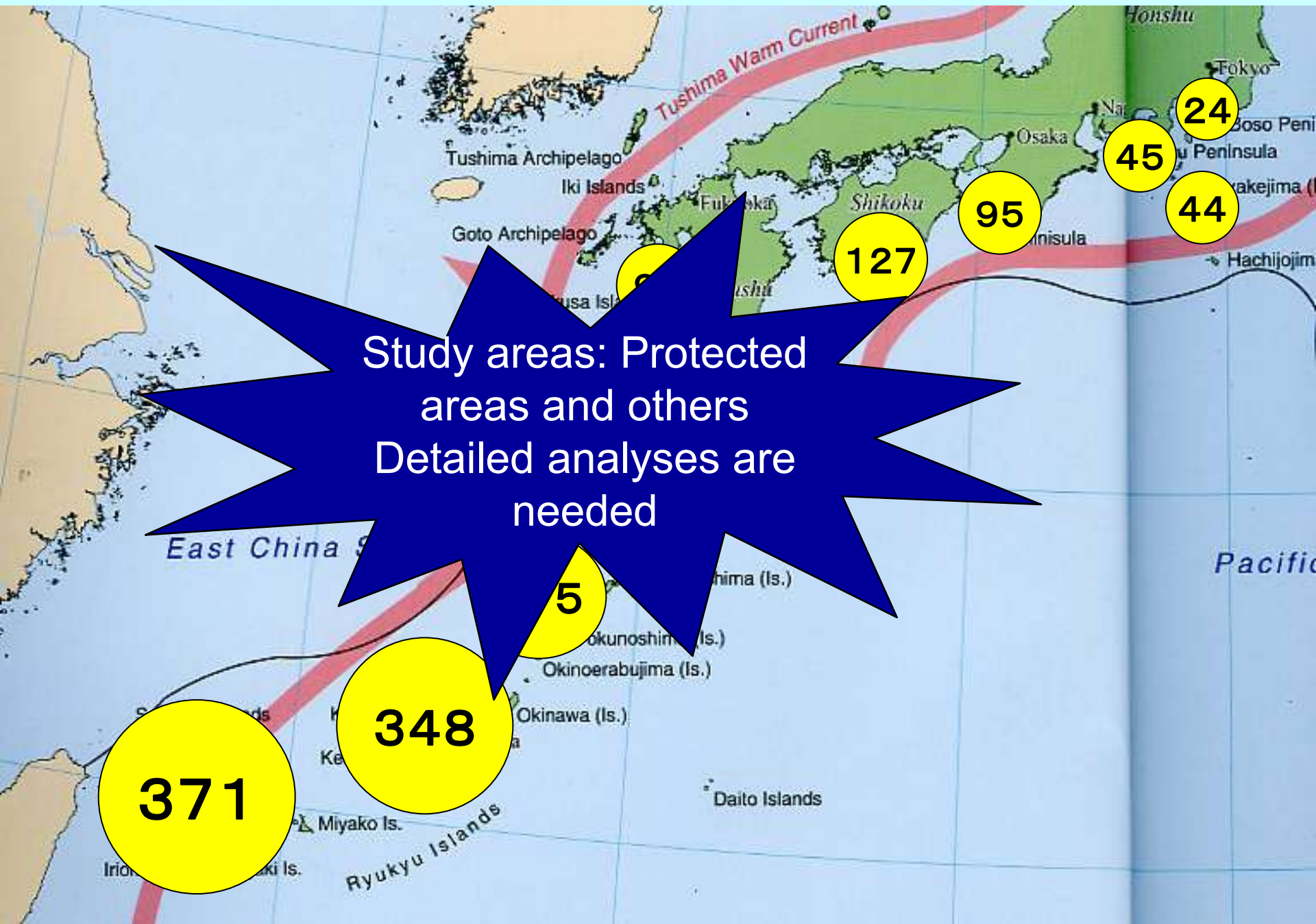
*K. ovobata*

*K. ovobata* (2003)



the Ramsar Convention:  
Protection Area

Species richness of hermatypic corals in Japan (Nishihira and Veron, 1995)

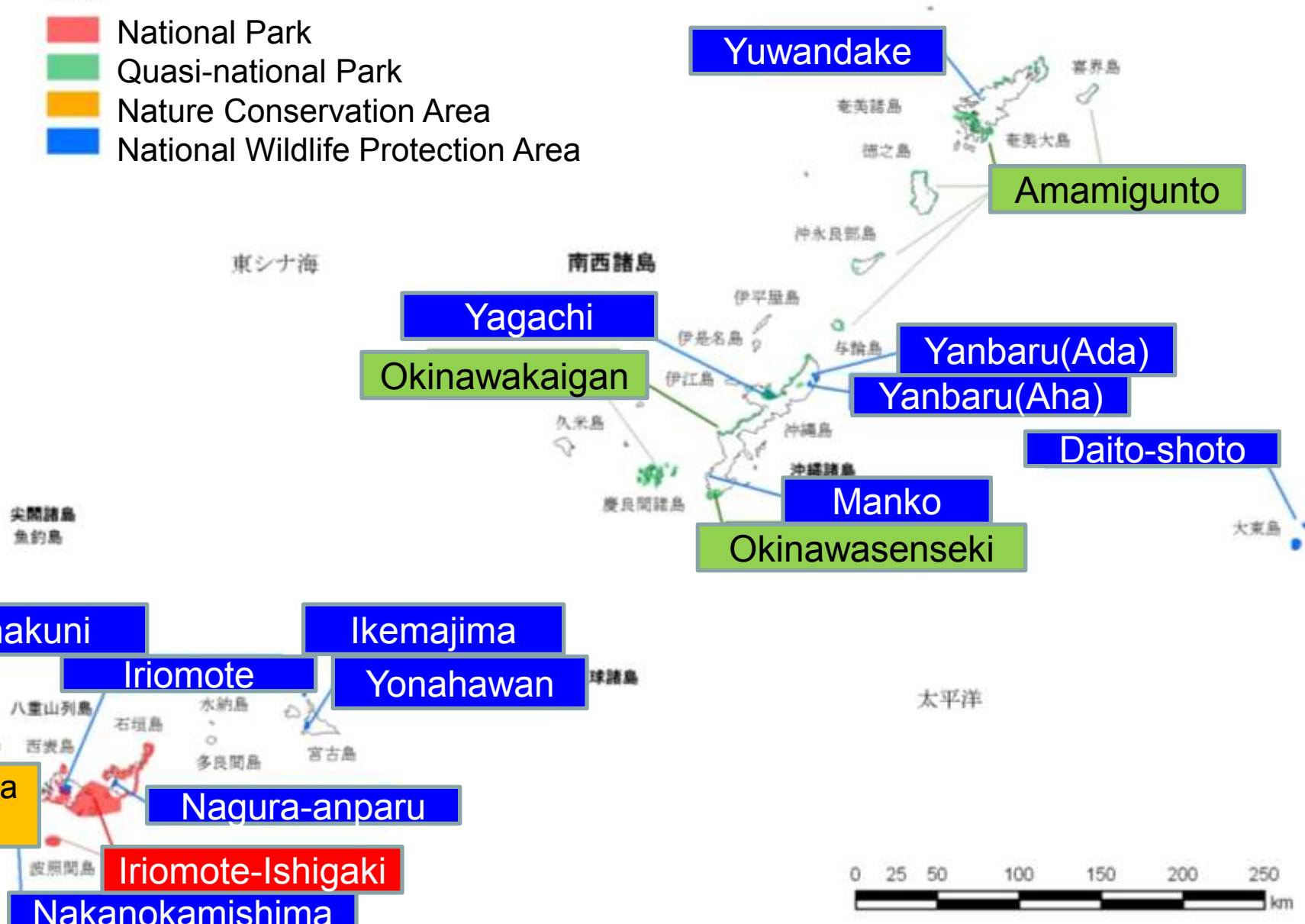


# Protected areas in the Ryukyus



凡例

- National Park
- Quasi-national Park
- Nature Conservation Area
- National Wildlife Protection Area



# Conclusion

- Biodiversity has been an important research topic in any protected areas in Okinawa and surrounding areas
- However, researches on biodiversity in protected areas are insufficient
- Future keyword: Ecosystem networks among protected areas and accumulation of scientific information in protected areas
- International networks