

# Molecular phylogeny of *Porites* (Poritidae, Scleractinia, Anthozoa) from Japan

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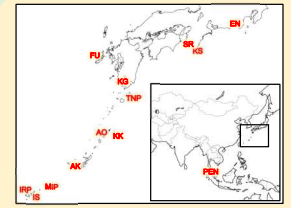


## Background

*Porites* = too small morphological characters, highly variable within colony = taxonomic studies at the species level have been extremely challenging...

20 out of about 70 nominal species of *Porites* had been analyzed molecularly, which revealed that they were divided into 12 clades (Forsman et al. 2009).

However, many *Porites* species still remain unanalyzed molecularly, and none of the Japanese *Porites* specimens were sequenced.



Sampling sites

## Summary

Samples were collected from tropical to temperate regions of Japan.

Four species (*P. australiensis*, *P. heronensis*, *P. horizontalata*, and *P. nigrescens*) were analyzed here for the first time.

291 sequences of ribosomal ITS, 67 sequences of Histone, and 85 sequences of mitochondrial COI from 172 samples were used for reconstructing ML trees.

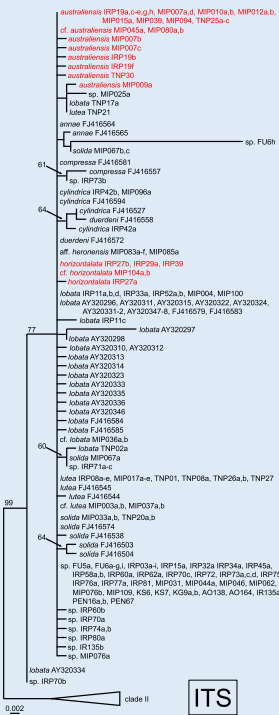
A total of 13 clades were recovered, including 12 clades that had been previously reported.

*P. okinawensis* formed a new monospecific clade.

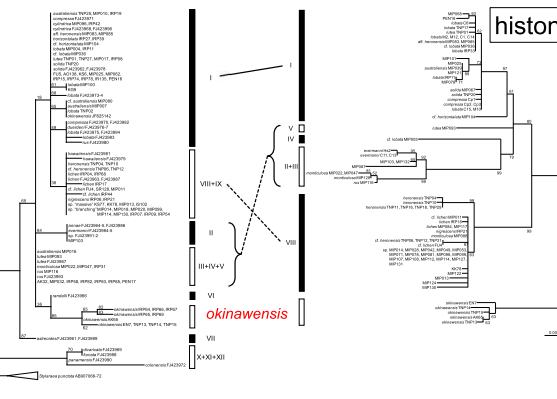
## Clade I

*P. australiensis* and *P. horizontalata* belong to clade I.

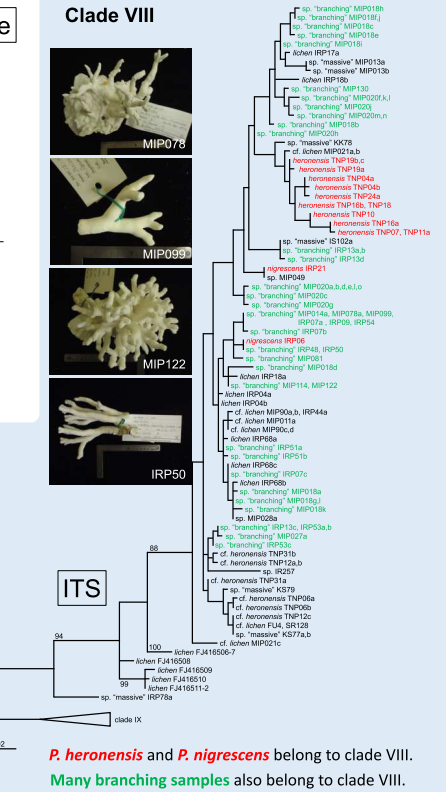
Clade I is the most complex clade and total 8 species were included and scattered within this clade.



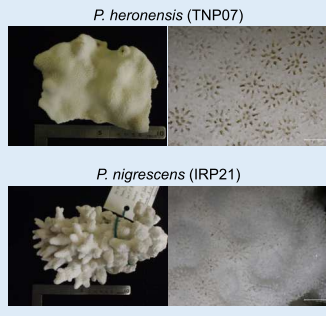
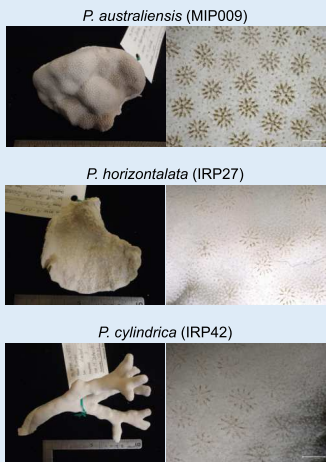
## COI



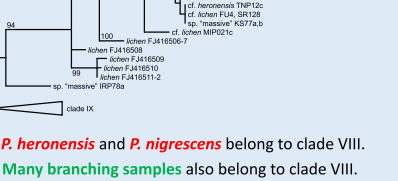
## histone



## Clade VIII

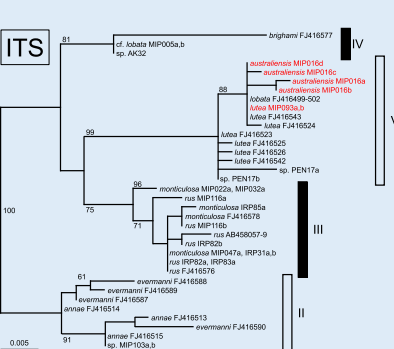


## ITS



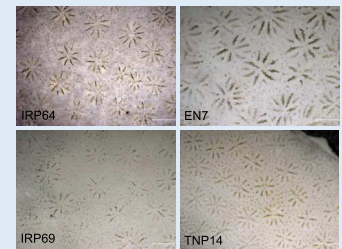
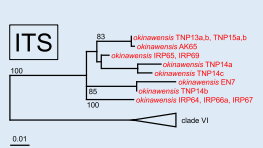
*P. heronensis* and *P. nigrescens* belong to clade VIII. Many branching samples also belong to clade VIII.

## Clade II - V



one sample of each *P. australiensis* (MIP016) and *P. lutea* (MIP093) belong to clade V not clade I. (= cryptic species !?)

## *P. okinawensis*



*P. okinawensis* formed a monospecific lineage in all reconstructed trees using different markers. The sequence of "*P. okinawensis*" from Taiwan deposited in GenBank (FJ825142) was likely to be misidentified since this sequence belonged to clade I according to COI. Size and depth of calices of *P. okinawensis* were highly variable, and the number of septa was also reduced as little as 8 (most of calice had 10 septa) in *P. okinawensis*, while other *Porites* species had 12 septa.

## Methods

DNA sequences were aligned with MAFFT 7. MEGA 7 was used to assume a model, reconstruct a ML tree, and bootstrap analyses (500 replicates).

## Future studies

RAD-seq: to resolve species within a clade. Cross-experiment: check the reproductive isolation between species within same clade. Micromorphology: to detect the cryptic species and find clade-specific morphological characteristics.

## Acknowledgements

We thank the members of the Japan Society for Coral Taxonomy for collecting samples. This research was supported by Okinawa Churashima Foundation.