Zoological Studies **50**(1): 43-52 (2011)

Zoological Studies

Latitudinal Gradient of Morphological Variations in Zebra Coral *Oulastrea crispata* (Scleractinia: Faviidae) in the West Pacific

Kao-Song Chen[1,3], Hernyi Justin Hsieh[3], Shashank Keshavmurthy[1], Julia Ka Lai Leung[1,4], I-Ting Lien[5,6], Yoshikatsu Nakano[7], Sakanan Plathong[8], Hui Huang[9], Chaolun Allen Chen[1,2,10,*]

[1]*Biodiversity Research Center, Academia Sinica, Nangang, Taipei 115, Taiwan*
[2]*Institute of Oceanography, National Taiwan University, Taipei 106, Taiwan*
[3]*Fisheries Research Institute, Council of Agriculture, Executive Yuan, Keelung 200, Taiwan*
[4]*Department of Life Science, National Taiwan Normal University, Taipei 106, Taiwan*
[5]*Graduate School of Agriculture, Kyoto University, Kyoto 605-8502, Japan*
[6]*Field Science Education and Research Center, Kyoto University, Wakayama 649-2211, Japan*
[7]*Sesoko Station, Tropical Biosphere Research Center, University of Ryukyus, Okinawa 905-0227, Japan*
[8]*Department of Biology, Prince of Songkla University, Songkla 90112, Thailand*
[9]*South China Sea Institute of Oceanology, Chinese Academics of Science, Guangzhong 510301, China*
[10]*ARC Center of Excellence for Coral Reef Studies, James Cook University, Townsville Q4810, Australia*

(Accepted August 17, 2010)

Kao-Song Chen, Hernyi Justin Hsieh, Shashank Keshavmurthy, Julia Ka Lai Leung, I-Ting Lien, Yoshikatsu Nakano, Sakanan Plathong, Hui Huang, Chaolun Allen Chen (2011) Latitudinal gradient of morphological variations in zebra coral *Oulastrea crispata* (Scleractinia: Faviidae) in the West Pacific. *Zoological Studies* **50**(1): 43-52. Corals grow across latitudes throughout the tropics and subtropics where environmental factors, including the average annual temperature and seasonal changes in water clarity and temperature, substantially vary. These environmental factors could lead to latitudinal variations in coral skeletal morphology. In this study, morphometric variations of the zebra coral *Oulastrea crispata*, a small coral species with black and white septa and a colony diameter usually < 10 cm, were investigated. Previous studies reported that *O. crispata* can survive in extreme environmental conditions, such as low temperatures and turbid water. One hundred colonies of *O. crispata* were collected from sites spanning Thailand to Japan, across tropical, subtropical, and temperate regions. Five micro-characters of corallites were measured and examined using univariate and multivariate analyses. All micro-characters measured significantly differed among latitudinal regions (nested ANOVA, $p < 0.05$). A canonical discriminant analysis (CDA) indicated that corallite diameter was the most important character contributing to variations in *O. crispata* among the 3 latitudinal regions, although a plot of the 1st and 2nd canonical variables showed that *O. crispata* from different latitudinal regions could not be fully separated. Nevertheless, significant differences in the Mahalanobis distances between the CDA group centroids were detected, suggesting a latitudinal gradient of morphological variations in *O. crispata* in the West Pacific. http://zoolstud.sinica.edu.tw/Journals/50.1/43.pdf

Key words: Scleractinian, Morphometrics, Corallites, *Oulastrea crispata*, Latitudinal variation.

The coral reef environment is extremely heterogeneous and thus presents an adaptive challenge to sessile organisms that, beyond their larval stage, are incapable of escaping their surroundings. In order to improve fitness, many animals, especially scleractinian corals, have evolved diverse, environmentally relevant, morphologies (Wallace 1999, Veron 2000). Even within the same coral species, a striking degree of morphological variations along physical gradients

*To whom correspondence and reprint requests should be addressed. E-mail:cac@gate.sinica.edu.tw