Diversity of symbiotic algae (Symbiodiniaceae) from Palythoa tuberculosa across different spatial and environmental scales

（様式第５－２号）課程博士

令和２年２月３日

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学位（博士）論文審査及び最終試験の終了報告書

学位（博士）の申請に対し，学位論文の審査及び最終試験を終了したので，下記のとおり報告します。

記

申請者	専攻名　海洋環境学　氏名 WEE HIN BOO　学籍番号 [redacted]	
指導教員名	James Davis REIMER	
成績評価	学位論文　合格　不合格	最終試験　合格　不合格
論文題目	Diversity of symbiotic algae (Symbiodiniaceae) from *Palythoa tuberculosa* across different spatial and environmental scales (異なる空間・環境に生息するイワスナギンチャク(*Palythoa tuberculosa*)の共生藻(Symbiodiniaceae)の多様性に関する研究)	

審査要旨（２０００字以内）

Bleaching and the diversity of Symbiodiniaceae are important research topics to understand how coral reef organisms will respond to ongoing global warming. In general, Symbiodiniaceae in zoantharians have received little research attention compared with those in their hard coral cousins. Recent research using hypervariable DNA markers has suggested the diversity of Symbiodiniaceae may be even higher than previously thought. Thus, a clear understanding of their diversity is needed across a variety of different environmental and geographical scales.

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審査要旨

In his thesis, the candidate examined the diversity of Symbiodiniaceae using hypervariable DNA marker combined with environmental data, utilizing specimens from Okinawa, Palau, Malaysia, and the Red Sea, in order to learn more about how diversity can be affected by different environments. He focused on one generalist species common to coral reefs, the zooxanthellate zoantharian *Palythoa tuberculosa*. His results showed many new findings, including the clear demonstration of various small-scale environmental variations at the scales of meters are important for Symbiodiniaceae diversity, including differences in temperature and pH (Chapters 2-5). As well, larger scale investigations showed the presence of one widespread generalist Symbiodiniaceae lineage in *Palythoa tuberculosa* across the Indo-Pacific, with different radiations of specialist lineages in the Red Sea and West Pacific (Chapter 6).

These results are of academic importance as our understanding of the scales of diversity of Symbiodiniaceae from meters to thousands of kilometers has been greatly advanced by his work. The candidate's work can therefore be judged as being of an excellent academic level.

The candidate's publication history related to this thesis meets graduation requirements, with two first author peer-reviewed papers, both in international journals. The candidate gave a final thesis presentation (=final examination) on February 3, 2020, in the Science Collaborative Building Room 102, from 11:00 a.m. to 12:00 noon in front of all three members of the Committee. This presentation was open to the public, and attended by many people from both inside and outside the university. In his presentation he discussed his major results. Overall, the candidate talked for approximately 40 minutes, and then appropriately answered numerous questions related to his thesis and research field for 20 minutes. The Committee then met on February 3, 2020, from 3:10 p.m. to 3:45 p.m., and discussed and judged the candidate's thesis, and his final presentation and answers to questions, as meeting graduation requirements. Thus, based on the above results, for these reasons, the Committee unanimously recommended "Pass" for the candidate.