



HOKKAIDO UNIVERSITY

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Abstract of Doctoral Dissertation

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Title of Doctoral Dissertation

Influence of host association and biogeography on Pacific marine gregarine speciation
(宿主との関連性と生物地理学が太平洋産グレガリナの種分化に与える影響)

Marine gregarines, a diverse group of single-celled parasitic protists within Apicomplexa, are widespread in marine invertebrates yet remain poorly understood at the molecular level. This project investigates patterns of speciation among marine gregarines using an integrative approach that synthesizes morphological traits (via light and electron microscopy), molecular phylogenetics (18S and ITS rRNA), host association (COI), and biogeographical data. Collectively, these results show that both host phylogeny and biogeography shape gregarine evolution, with host identity often playing the dominant role.

Chapter 2 explores the biodiversity and host associations of archigregarines from polychaete hosts in Japan, revealing novel clades within *Lunidium*, *Metzidium*, and *Devanium*. Chapter 3 investigates biogeographic and cryptic diversity in paleocudinid gregarines from Pacific polychaetes, uncovering new *Ferraria* and *Paralecudina* clades. Chapter 4 focuses on early-branching lecudinids, describing one novel *Difficilina* clade and three novel Lecudinidae clades—including likely the first known gregarine from an ostracod host. Chapter 5 reconstructs the phylogeny of *Lankesteria* gregarines from ascidian hosts and finds a strong link between gregarine biodiversity and the evolution of tunicates. Chapter 6 examines *Lecudina* gregarines from lumbrinerid polychaetes, demonstrating cryptic speciation and morphological diversity in *Lecudina* Clade B. Finally, Chapter 7 analyzes *Lecudina* parasites from nereidid polychaetes, identifying multiple novel clades as well as a *Lecudina tuzetae* species complex.