

# 琉球大学学術リポジトリ

巨視的群体を形成する糸状シアノバクテリアを主体とした、沖縄沿岸産シアノバクテリアの多様性と分類

メタデータ	言語: 出版者: 琉球大学 公開日: 2021-10-06 キーワード (Ja): キーワード (En): 作成者: Nuryadi, Handung メールアドレス: 所属:
URL	<a href="http://hdl.handle.net/20.500.12000/49828">http://hdl.handle.net/20.500.12000/49828</a>

**Diversity and taxonomy of cyanobacteria from coasts of Okinawa, Japan,  
mainly in macroscopic colony forming filamentous cyanobacteria**

**Abstract**

Okinawa has an extensive coastline possessing extraordinary diversity of marine cyanobacteria. Cyanobacteria are a very important component of marine ecosystem due to their contribution to global primary production in the ocean. Beside their ecological importance, many species of marine cyanobacteria are well known as prolific producers of various kind of bioactive compounds with biomedical relevance. Due to their ecological importance and capability to produce natural products, marine cyanobacteria have become interesting subjects for various studies. In recent times, the studies of marine cyanobacteria have increased since the introduction of modern molecular methods. In this study, a metabarcoding technique was applied to investigate the seasonal composition of small unicellular cyanobacteria in two coral reef ecosystems around Sesoko Island. Moreover, characterization based on polyphasic approach was performed to investigate the diversity of marine macroscopic colony-forming filamentous (MMCFF) cyanobacteria from Okinawan coasts. In addition, phylogeny and secondary structure analyses were done to identify potentially undescribed species of Okinawan MMCFF cyanobacteria. The results of this study showed that two unicellular marine cyanobacteria (*Parasynechococcus* and *Prochlorococcus*) together with two species of pico-eukaryotic algae dominated the pico-phytoplankton communities in two coral reefs around Sesoko Island. In general, the abundance of these two cyanobacterial species increased in summer season. The pico-phytoplankton compositions between the two sampling sites had almost no significant differences. Our results also showed that based on the molecular phylogenetic analyses inferred from 16S rRNA gene sequences that Okinawan MMCFF cyanobacteria were very diverse. At least six genera were successfully identified from samples of MMCFF cyanobacteria from Okinawan coasts: *Moorena*, *Okeania*, *Neolyngbya*, *Dapis*, *Affixifilum* and *Caldora*. Furthermore, more detailed characterizations were performed for samples morphologically corresponding to the genera *Neolyngbya* and *Okeania*. The phylogeny of the 16S rRNA and ITS region indicated the presence of potentially undescribed species from these two genera. The ITS secondary structures of samples collected from Okinawa presented unique structure forms, and differed from other known species of *Neolyngbya* and *Okeania*. In this case, the ITS secondary structures provided additional evidence to identify cyanobacteria to species level. These undescribed species become the first species description of the genus *Neolyngbya* and *Okeania* from coasts of Okinawa. Overall, this study contributes to improving the knowledge of marine cyanobacteria, especially regarding their diversity, taxonomy and community structures.