

Growth and epiphytic behavior of three *Gambierdiscus* species (Dinophyceae) associated with various macroalgal substrates

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Abstract

Species of the benthic dinoflagellate *Gambierdiscus* produce polyether neurotoxins that caused ciguatera fish/shellfish poisoning in human. The toxins enter marine food webs by foraging of herbivores on the biotic substrates like macroalgae that host the toxic dinoflagellates. Interaction of *Gambierdiscus* and their macroalgal substrate hosts is believed to shape the tendency of substrate preferences and habitat specialization. This was supported by studies that manifested epiphytic preferences and behaviors in *Gambierdiscus* species toward different macroalgal hosts. To further examine the supposition, a laboratory-based experimental study was conducted to examine the growth, epiphytic behaviors and host preferences of three *Gambierdiscus* species towards four macroalgal hosts over a culture period of 40 days. The dinoflagellates *Gambierdiscus* *balechii*, *G. caribaeus*, and a new ribotype, herein designated as *Gambierdiscus* type 7 were initially identified based on the thecal morphology and molecular characterization. Our results showed that *Gambierdiscus* species tested in this study exhibited higher growth rates in the presence of macroalgal hosts. Growth responses and attachment behaviors, however, differed among different species and strains of *Gambierdiscus* over different macroalgal substrate hosts. Cells of *Gambierdiscus* mostly attached to substrate hosts at the beginning of the experiments but detached at the later time. Localized *Gambierdiscus*-host interactions, as

demonstrated in this study, could help to better inform efforts of sampling and monitoring of this benthic toxic dinoflagellate.

Keywords: Ciguatera; *Gambierdiscus balechii*; *Gambierdiscus caribaeus*; Habitat preference; Harmful algal blooms.

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