

Bioactivities of Lyngbyabellins from Cyanobacteria of Moorea and Okeania Genera

ABSTRACT

Cyanobacteria are reported as rich sources of secondary metabolites that provide biological activities such as enzyme inhibition and cytotoxicity. Ten depsipeptide derivatives (lyngbyabellins) were isolated from a Malaysian Moorea bouillonii and a Red Sea Okeania sp.: lyngbyabellins G (1), O (2), P (3), H (4), A (7), 27-deoxylyngbyabellin A (5), and homohydroxydolabellin (6). This study indicated that lyngbyabellins displayed cytotoxicity, antimalarial, and antifouling activities. The isolated compounds were tested for cytotoxic effect against human breast cancer cells (MCF7), for antifouling activity against Amphibalanus amphitrite barnacle larvae, and for antiplasmodial effect towards Plasmodium falciparum. Lyngbyabellins A and G displayed potent antiplasmodial effect against Plasmodium, whereas homohydroxydolabellin showed moderate effect. For antifouling activity, the side chain decreases the activity slightly, but the essential feature is the acyclic structure. As previously reported, the acyclic lyngbyabellins are less cytotoxic than the corresponding cyclic ones, and the side chain increases cytotoxicity. This study revealed that lyngbyabellins, despite being cytotoxic agents as previously reported, also exhibit antimalarial and antifouling activities. The unique chemical structures and functionalities of lyngbyabellin play an essential role in their biological activities.