Pancreatic cancer is the fifth leading cause of cancer death with the lowest 5-year survival rate of all cancers. It is largely resistant to conventional forms of chemotherapeutic agents. Therefore there is dire need to search alternative drug candidates to minimize the loss of human life. Among different forms of cancer cells, pancreatic cancer cells have marked tolerance to nutrient starvation that enables them to survive for a prolonged period of time. Thus the agent that retards the cancer cells tolerance to nutrient starvation (anti-austerity agent) was considered as a novel approach in anti-cancer drug discovery. Under this hypothesis, we have screened the medicinal plants used in Myanmar traditional medicine for their preferential cytotoxicity against human pancreatic cancer PANC-1 cells under nutrient-deprived conditions. Recently we discovered that the CHCl₃-soluble fraction of 70% EtOH extract of the flower of *Kayea assamica* King & Prain collected in Myanmar exhibited 100% preferential cytotoxicity (PC₁₀₀) against PANC-1 cancer cells under nutrient-deprived conditions at 1 μg/mL. Thus, detailed bioassay-guided fractionation and isolation was carried out, which afforded nine new coumarins, kayeassamins A-1 (1–9), together with nine known coumarins. All the isolates were evaluated for their in vitro preferential cytotoxicity against PANC-1 cells in nutrient-deprived medium. Among them, the novel coumarins, kayeassamins A (1), B (2), D (4), E (5), and G (7) exhibited the most potent preferential cytotoxicity (PC₁₀₀ 1 μM) in a concentration- and time-dependent manner and induced apoptosis-like morphological change of PANC-1 cells.

References