Structural Deduction and Environmental Analysis of Novel Tirofiban and Coumarin Derivatives Originating from the Endophytic Isolate FM1005 (Xylaria sp.)

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This two part analysis method (emphasizing environmental viability and novel compound deduction) is indicative of the viability of marine based natural products to be used in pharmacology. Contextualization of environmental stressors on marine-based natural product sources containing high compound yields utilized data from NOAA Coral Reef Watch around the Papahanaumokuakea Marine National Monument. Innovation of an analysis and comparison technique based upon previous data in regards to prevalence of chemical moieties via statistical analysis and UV absorption utilized and placed in comparison to various published novel compounds derived via HPLC and NMR methods. Environmental risk analysis of bleaching episodes concluded that chronological progression correlates with increases in the time span of bleaching alerts, and the product viability analysis categorized calculations of effective isolation capabilities into six levels. The organism susceptibility ranking concluded that high-risk organisms fall within higher ranges of viability for usage in isolations and HPLC targeted research. Compounds 9 and 10 are classified as coumarin derivatives and possibly are the specific compounds within the strain FM1005 that previously exhibited antiproliferative action against prostate cancer cell lines. Compounds 1 and 2 showed similar antiplatelet activities to tirofiban due to their structural similarity and inhibition of the binding of fibrinogen to integrin IIb/IIIa. It was concluded that inhibition of glycoprotein IIb/IIIa by compounds 1 and 2 suggests the potential for mediating a thrombotic response, and are viable for further pharmaceutical-based studies due to a lack of an antiproliferative response against a non-cancerous cell line (HEK-293 Human Embryonic Kidney).

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