

UV-absorbing properties in eight species of marine phytoplankton from the Gulf of Thailand

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Abstract: Solar ultraviolet radiation (UVR) causes many serious problems to our skin such as sunburn, ageing, DNA mutation and cancer. Nowadays, there are several UV-synthetic agents which are known to have toxic effects on human and environmental health. Therefore, the main purpose of this study was to investigate natural sources with UV-absorption properties. The 8 diverse species of marine phytoplankton, isolated from the Gulf of Thailand, were chosen in this study. *Alexandrium minutum*, *Gymnodanum catenatum*, *Scrippsiellasp.*, *Symbiodinium sp.* in *Pocilloporadamicornis*, *Symbiodinium sp.* in *Fungia fungites*, *Nannochloropsis sp.*, *Tetraselmis sp.* and *Chattonellasp.* were grown under 3,000-4,000 lux intensity at 25 °C (12:12 h, light:dark), harvested at day 11 and extracted with 100% methanol. *In vitro* absorption spectra indicated that only *Chattonellasp.* and *Nannochloropsis sp.* showed UV-A (320-400 nm) absorption properties. Since the extraction method used was contaminated with high amount of chlorophylls in extracts, four different-extraction methods were examined. The best method was to extract phytoplankton pellets with 25% methanol, sonicate for 2 minutes at 45°C, let it sit for 2 hours in water bath at 45 °C and centrifuge at 4,000 rpm for 5 minutes. The further study was to compare UV-absorption properties from four strains of *Chattonellasp.*, collected from different places in the Gulf of Thailand. The isolated strain of *Chattonellasp.* from the mouth of Mae Klong river, Samut Songkhram Province, exhibited the highest peak absorption in the UV-A range. Regarding to the growth curve of this strain of *Chattonellasp.*, it showed that cell numbers increased rapidly from day 0 to day 6 (exponential phase) and remained relatively constant from day 6 to day 30 (stationary phase). Along the growth curve, cell pellets were collected every two days for extraction. The results showed that the high amount of UV-A absorption properties was observed at day 10-24 and the highest amount of it was presented at day 26-30 when cells were almost going to decline phase. At last, the UV-A absorption compounds in the bioactive extracts have been further investigating.

Keywords: UV absorption, Phytoplankton, *Chattonellasp.*