

The intertidal red alga *Porphyra haitanensis* Chang et Zheng is episodically desiccated and exposed to high levels of solar radiation at low tide during emersion. However, little has been documented on the relationship between the stresses during desiccation and related chemical compounds. We found that *P. haitanensis* thalli, when desiccated under indoor (artificial radiation) or outdoor (solar radiation) conditions, with or without UV radiation (UVR: 280–400 nm), contained significantly higher concentrations of UV-absorbing compounds (peak at 336 nm) than those maintained submerged (without desiccation). Solar UVR had no effect on the content of UV-absorbing compounds. Even though the concentration of these compounds decreased with time in all treatments, a slower decrease was observed in the desiccated samples. The samples with higher levels of UV-absorbing compounds showed higher photochemical efficiency of photosystem II (PS II) during the exposure or subsequent recovering process than samples with low concentration of UV-absorbing compounds, reflecting their protective role. The concentration of these compounds varied in different parts of the thallus, with the middle and marginal parts containing 60–80% more UV-absorbing compounds than the basal parts in both female and male plants. In addition, the marginal parts of male thalli contained more UV-absorbing compounds than the corresponding parts of female thalli. Our data suggest that desiccation plays a key role in this alga to maintain high concentration of UV-absorbing compounds, and that this might provide a beneficial advantage to compete in the intertidal zone where the organism is normally exposed to high levels of UVR.