OA2.8 - Ecophysiological properties of the terrestrial green alga, *Prasiola crispa*, under severe environments in Antarctica

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Prasiola crispa is one of the dominant terrestrial green alga in Antarctic region, and often forms a large colony on the soil surface. In the continental Antarctic region, photosynthetic organisms are exposed to severe stressful conditions such as low temperature, drought, strong visible (VIS) and UV light in summer. These environmental factors generally accelerate photoinhibition. It was reported that this alga shows great resistance against photonhibition, but understanding of the physiological and ecophysiological mechanisms are still insufficient. In this study, we determined the reaction coefficients (E_{pi}) of photo-inactivation and compared the wavelength dependency among a green alga (*Prasiola crispa*), a lichen (*Umbilicaria decussata*) and a bryophyte (*Ceratodon purpureus*) that were collected at Langhovde on the Sôya Coast in East Antarctica. *P. crispa* showed ten times higher sensitivity (E_{pi}) to UV-B light than the bryophyte, and the deduced rate coefficients (k_{pi}) of photo-inhibition under ambient sunlight suggested that *P. crispa* needs to pay a greater cost to recover from photo-damage than the lichen or the bryophyte in order to keep sufficient photosynthetic activity under the Antarctic habitat. In addition to the above properties, it was found that the alga has a unique antenna system which enables to utilize far-red light with high efficiency to photosynthesis. It is suggested that this system has a critical role for achieving an efficient photosynthesis as a whole colony under widely fluctuating light condition. (Supported by grant 24770030 from the Japan Society for the Promotion of Science and grant 151376 from the Sumitomo Foundation.)