Circadian fluctuation of gene expression along a bathymetric cline in the marine angiosperm *Posidonia oceanica*

Dattolo Emanuela*, Lauritano Chiara, Ruocco Miriam, Procaccini Gabriele

Stazione Zoologica Anton Dohrn, Napoli, Italy

* dattolo@szn.it

Plants developed several mechanisms to sense light and to cope with its natural diel and seasonal fluctuation. Many species use an endogenous clock to predict signals from the environment and to anticipate circadian light change. Changes in circadian clock genes allow plants to synchronize their physiology with local light and temperature conditions and to adapt to changes in light regimes occurring across environmental gradient (e.g. across latitudes). Understanding the genetic and physiological basis of plants response to the seasonal and daily variation in environmental conditions, could allow to predict the effects on plant physiology of environmental perturbations that could happen in the future, due to anthropogenic pressure and climatic changes. Most of the recently identified genes, associated with endogenous clock in plants, are themselves circadian regulated, with expression peaks phased to occur at a specific time of the day. Here we explore daily variations in the expression of clock genes in the marine angiosperm *Posidonia oceanica* along its bathymetric distribution, where plants are exposed to a natural cline of light and temperature. To do that, we measured genes expression (by RT-qPCR) of photoreceptors and components of the plant clock at two target depths (5 and 25 meter depth) and at six time points during the day. Sampling was performed in a continuous meadow located in the Bay of Calvi, Corsica (thanks to the ESF Cost Action 0906). We discuss the effects of the influence of the distinct light environments on the peak expression occurring at a specific time of the day between the two depths. Further, we discuss the potential adaptive relevance of these results on *P. oceanica* fitness and survival.

PeerJ PrePrints | https://dx.doi.org/10.7287/peerj.preprints.1058v1 | CC-BY 4.0 Open Access | rec: 12 May 2015, publ: 12 May 2015