Proceedings of the LXVI SIGA Annual Congress
Bari, 5/8 September, 2023
ISBN: **978-88-944843-4-2**

Oral Communication Abstract – 4.03

DIFFERENTIAL EXPRESSION PATTERNS OF CRYPTOCHROME AND CIRCADIAN CLOCK GENES BETWEEN ROOTS AND LEAVES IN MEDICAGO TRUNCATULA

DADDIEGO L.*, BIANCO L.*, ALAGNA F.*, LOPEZ L.*, PANARA F.*, FANTINI E.*, FACELLA P.*

*) Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), TERIN-BBC-PBE, Trisaia Research Center, 75026 Rotondella, Matera, Italy

light, cryptochromes, Circadian clock, Medicago truncatula

Cryptochromes are flavin-containing blue/UV-A light photoreceptors that play fundamental roles in regulating several light-induced physiological processes in plants and animals. In *Arabidopsis*, cryptochromes modulate de-etiolation, cotyledon opening and expansion, anthocyanin accumulation, photoperiodic control of flowering, entrainment of the circadian clock, and root growth. In *Medicago truncatula*, cryptochromes are encoded by a multi-gene family, comprising *CRY1*, *CRY2a*, *CRY2b*, and *CRY3*. We analysed the expression of these genes together with that of the "circadian clock" components *LHY*, *TOC1* and *GI* in *Medicago* leaves and roots, during day/night cycles in white light. Notably, our results showed that the expression patterns of cryptochrome and clock genes were different in root compared to leaf, revealing, for the first time in this important crop, a desynchronised regulation of photoreceptors and circadian machinery genes between roots and leaves.

We further performed expression analyses of the same genes under continuous white and blue light, confirming the different patterns between root and leaf: indeed, all genes included in our study displayed different peaks of expression during the presumptive day in these two organs. Our results lead to an inference that the root system of *Medicago truncatula* could exhibit autonomous mechanisms in the reception of the light stimulus and in the circadian clock machinery regulation, compared to the leaf photosynthetic apparatus.