# CARBON METABOLISM OF CAROB YOUNG TREES UNDER LOW TEMPERATURE – DIFFERENT RESPONSES AMONG CULTIVARS

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Young trees of two carob (*Ceratonia siliqua* L.) cultivars, Mulata and Galhosa, , propagated *in vitro* and grown for 3-4 years in a greenhouse were moved into a growth chamber under environmental controlled conditions where they were exposed to 25/15 °C (control), 10/5 °C (chilling) and again to 25/15 °C (recovery). Each temperature treatment lasted one week. In both cultivars leaf photosynthesis, contents of starch and TP, Glc6P/Fru6P and SPS maximal activity were not affected by chilling, despite a lower activation state exhibited by the latter. In Mulata, chilling yielded high contents of sucrose, Fru6P and Fru1,6-bisP, a lower content of Glc1P, a lower activity of cFBPase and a 3-fold increase in ADPGlcPPase activity. Overall, sucrose pathway in Galhosa was slightly affected by the chilling exposure. Otherwise, results for Mulata suggest a more complex response comprising the down regulation of sucrose synthesis and simultaneously a lower sucrose export rate. In respect to starch metabolism, results for Mulata suggest the involvement of an enzymatic positive response to thermodynamic and kinetic restrictions imposed by low temperature, while the effects in Galhosa were only observed after chilling stress relief. Indeed, in this cultivar starch level at the end of the dark period decreased *circa* 6-fold and accumulated *circa* 4-fold by the middle of the photoperiod, suggesting a higher capacity for both remobilization and synthesis of starch. A similar approach was followed in a group of Mulata and Galhosa young trees, except that a week at 20/10 °C was introduced before the exposure to 10/5 °C. Comparison between these results and those obtained previously brings new insight on the eventual capacity of carob tree to cold-acclimate, and therefore on the role of suboptimal temperatures occurring in autumn on the permanent foliage photosynthetic response to forthcoming winter chilling days.

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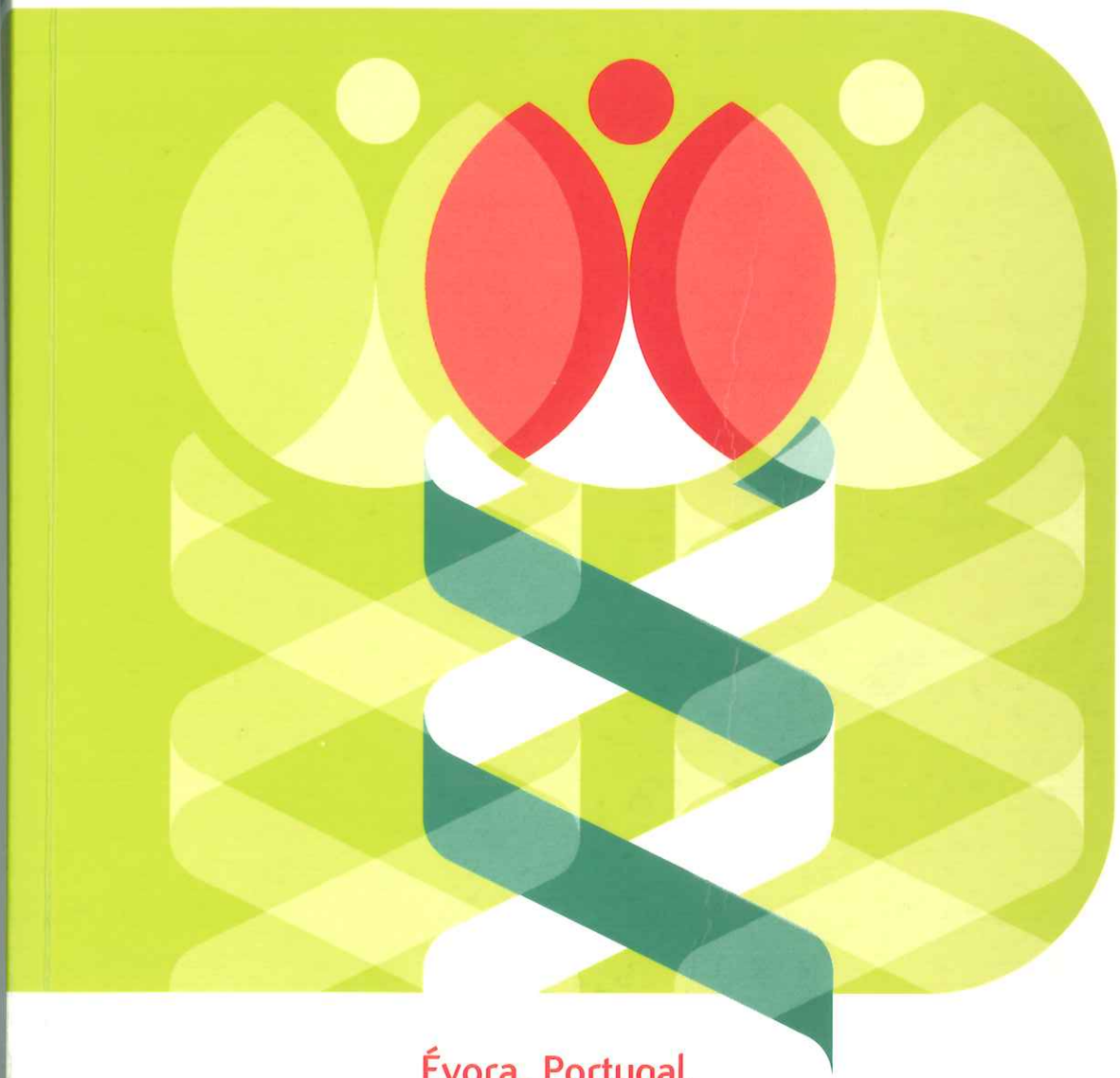

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