



## Opportunity for hybridization between two oak species in mixed stands as monitored by the timing and intensity of pollen production

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*Q. rotundifolia*

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### ABSTRACT

The opportunity of cross-pollination in mixed stands of two oak species (cork oak and holm oak) was studied by characterizing individual phenologies of flowering. In the spring of 1998 at one stand consisting of 64 marked trees, there was a period of 19 days when maximal pollen release in one species and stigma receptivity in the other occurred simultaneously, enabling interspecific gene flow in either direction. This happened in spite of an average time separation of 22 days between the two species, reflecting a considerable intraspecific variation in the timings of flowering. Flowering intensities (as estimated from male flower abundance) were high, but fruiting intensities were comparatively low. Shortly after pollination, considerable abortion of female flowers and early fruits was recorded. In 2000, the interspecific overlap of phenologies was drastically reduced due to a delay in cork oak flowering. On the other hand, the individual timings were repeatable for most trees, at least in holm oak. Two other mixed stands were subject of parallel studies, with similar results in all traits except for a less dramatic reduction in fruiting intensities. In spite of the high opportunity for cross-pollination in 1998, and given the lack of hybrids among the progenies from the subsequent fruiting season [Oliveira, P., Custódio, A.C., Branco, C., Reforço, I., Rodrigues, F., Varela, M.C., Meierrose, C., 2003. Hybrids between cork oak and holm oak: isoenzyme analysis. *Forest Genet.* 10, 283–298], it can be concluded that the prerequisite of cross-pollination is clearly insufficient for hybridization to succeed. Post-pollination processes must play an important role in the maintenance of reproductive isolation between the two species.

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