# OC25 - Is Lythrum thesioides a Mediterranean species? Consequences for conservation

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Mediterranean Temporary Ponds (MTP) are characterized by marked variation in water level under a Mediterranean climate. These environmental conditions have resulted in their highly specialized flora, dominated by annual species with high seed sets. Among these, *Lythrum thesioides* is a very rare annual plant, recorded from Russia, Italy, Hungary and Middle East, including some taxonomically controversial records. The species is currently known from two locations in Southern France, near Nîmes. Few is known about its biology and ecology, and the viability of its populations appears to be vulnerable.

In the context of a broader study aiming at the conservation of Lythrum thesioides, the objective of this work was to test whether the germination behaviour of L. thesioides differs from that of three other annual Lythrum species, L. tribracteatum, L. borysthenicum and L. thymifolia occurring in MTP. Indeed, seed dormancy is a key trait for MTPs plants that have important soil seed banks. Here, L. thesioides was hypothesized to have a higher temperature of germination because of the late flowering period observed in France. The effects of variation in temperature (10, 15, 20, 25 and 30°C), light and vernalisation on the rate and speed of germination in flooded conditions have been evaluated.

Lythrum species showed a wide range of responses to light and temperature conditions. L. thymifolia had an optimal germination rate at 15-20°C, and L. tribracteatum for 20°C. L. borysthenicum showed a high germination rate from 10-25°C while L. thesioides did not germinate below 25°C, and had low germination rate (about 40%, i.e. half of the rate of the three other species at optimal temperatures). Moreover, germination speed of L. thesioides was lower than for L. borysthenicum and L. thymifolia (but not than L. tribracteatum). Dry vernalisation and dark germination were not discriminatory.

In conclusion, compared to L. thymifolia, L. tribracteatum, or other species known optimum of temperature for germination in temporary ponds, L. thesioides seems to be less adapted to Mediterranean conditions than to continental climate (summer flooding). While L. borysthenicum appears more opportunistic with a broader germination niche. L. thesioides seems to have a complex germination ecology which may explain the rarity of the species and it also highlights the importance of continuing the study of its ecology to provide necessary information for its conservation.