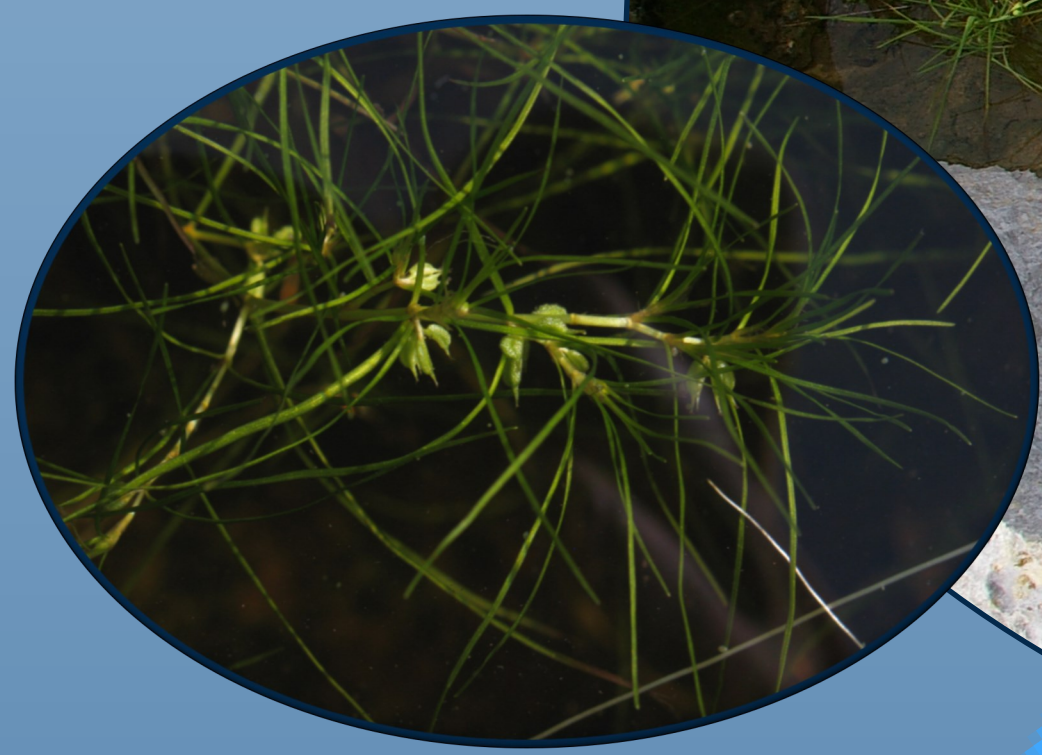
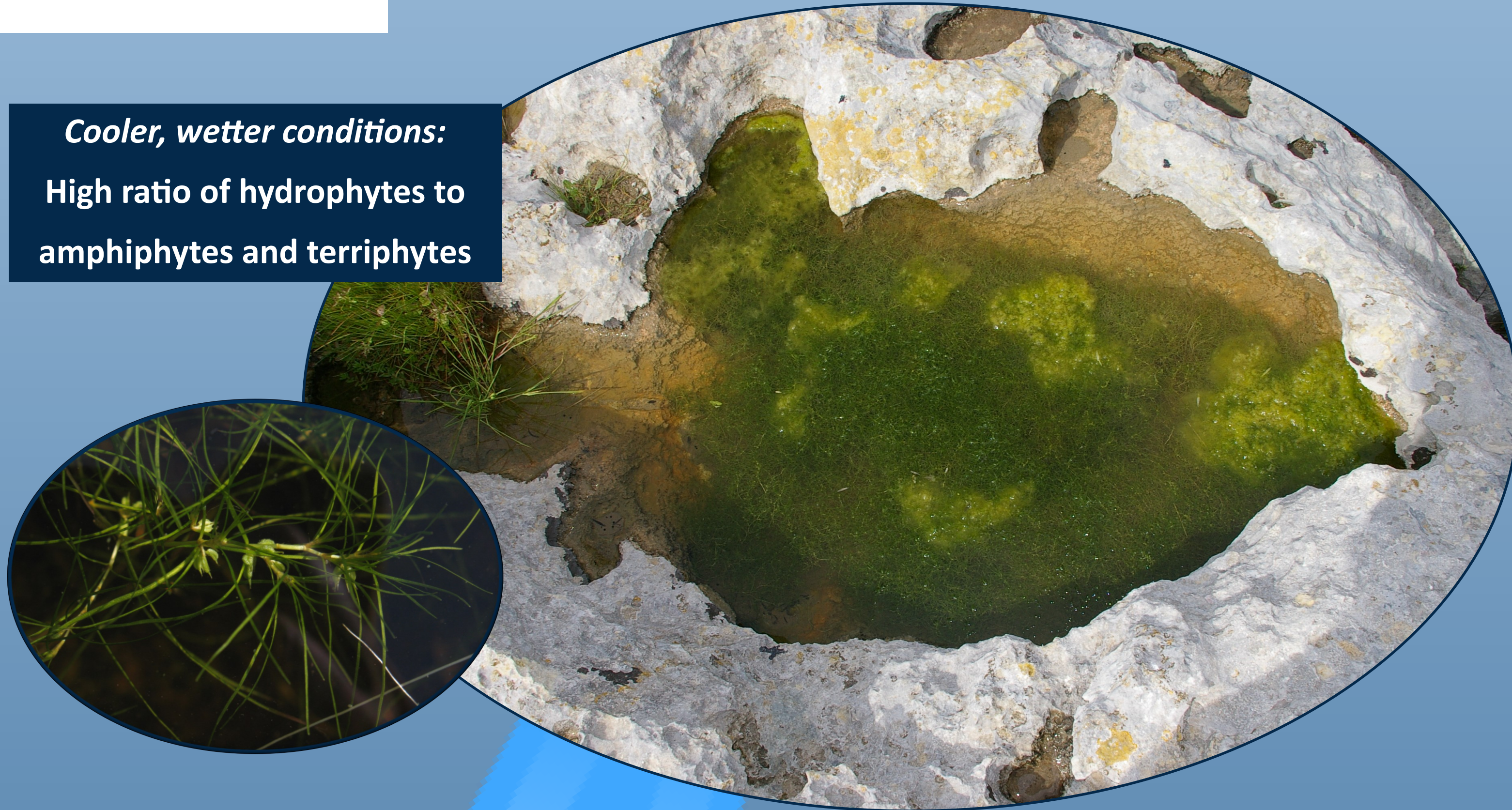


Temporary freshwater rockpools as sentinel systems for climate change

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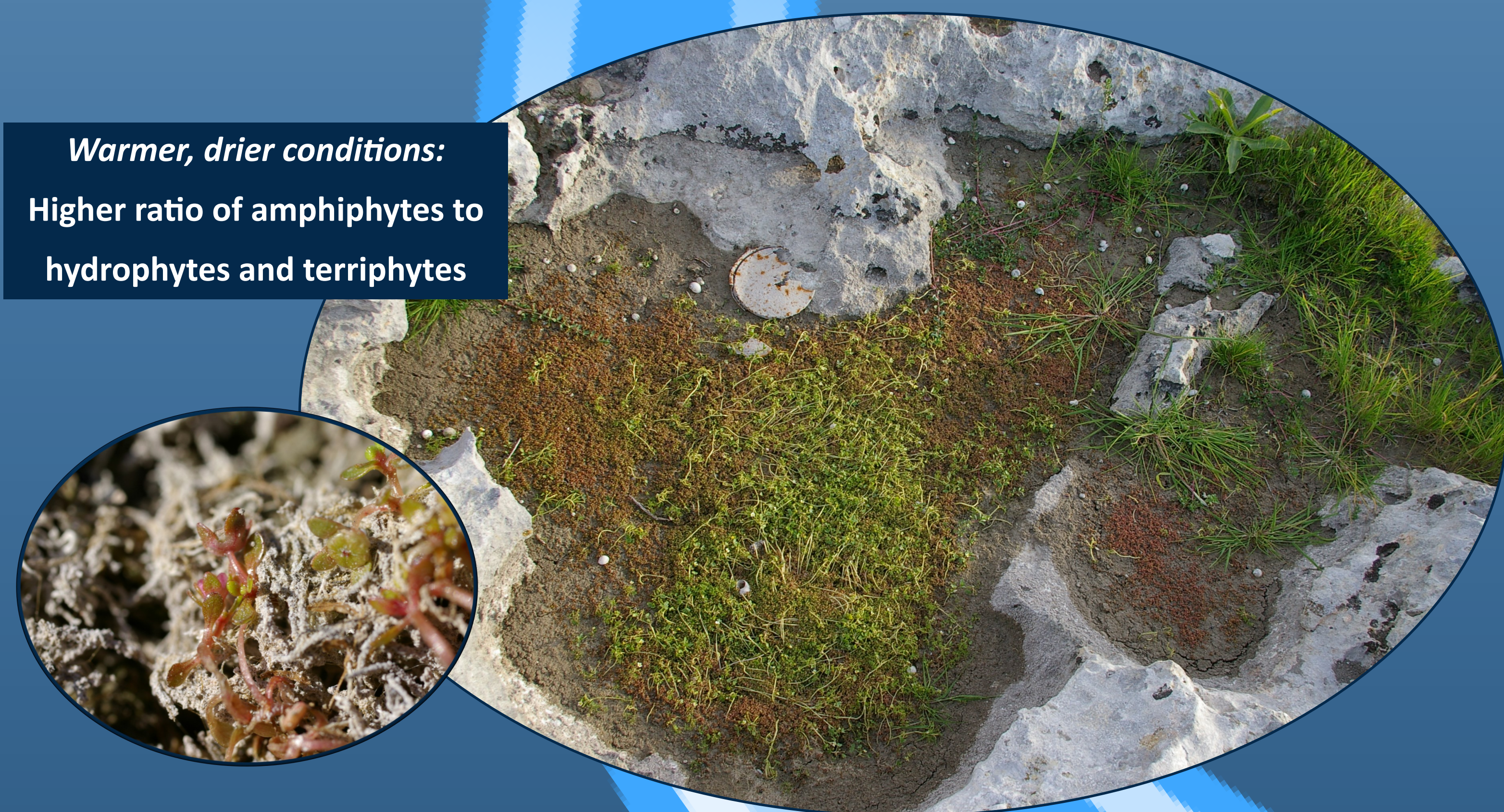


Hypothesis

The ratio of hydrophytes, amphiphytes and terriphytes in temporary freshwater pools may be used as an early sentinel for detection of climate change.

Method

Three future climatic scenarios ('Most Optimistic', 'Optimistic' and 'Pessimistic'), based on IPCC data for Southern Europe and the Mediterranean, were constructed using a model and the projections were used to predict the hydroperiod characteristics of a generalised temporary freshwater rockpool under each scenario.

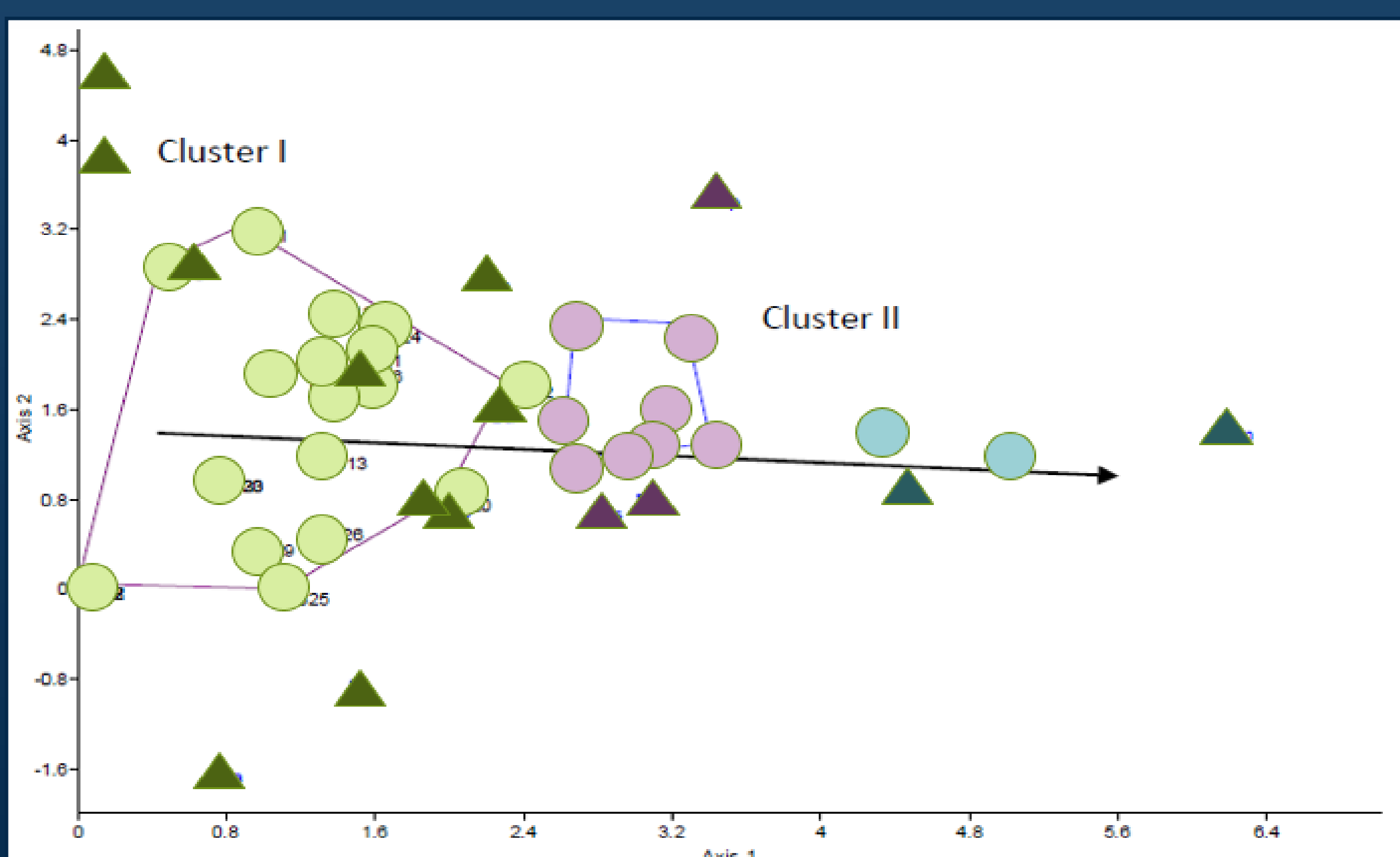
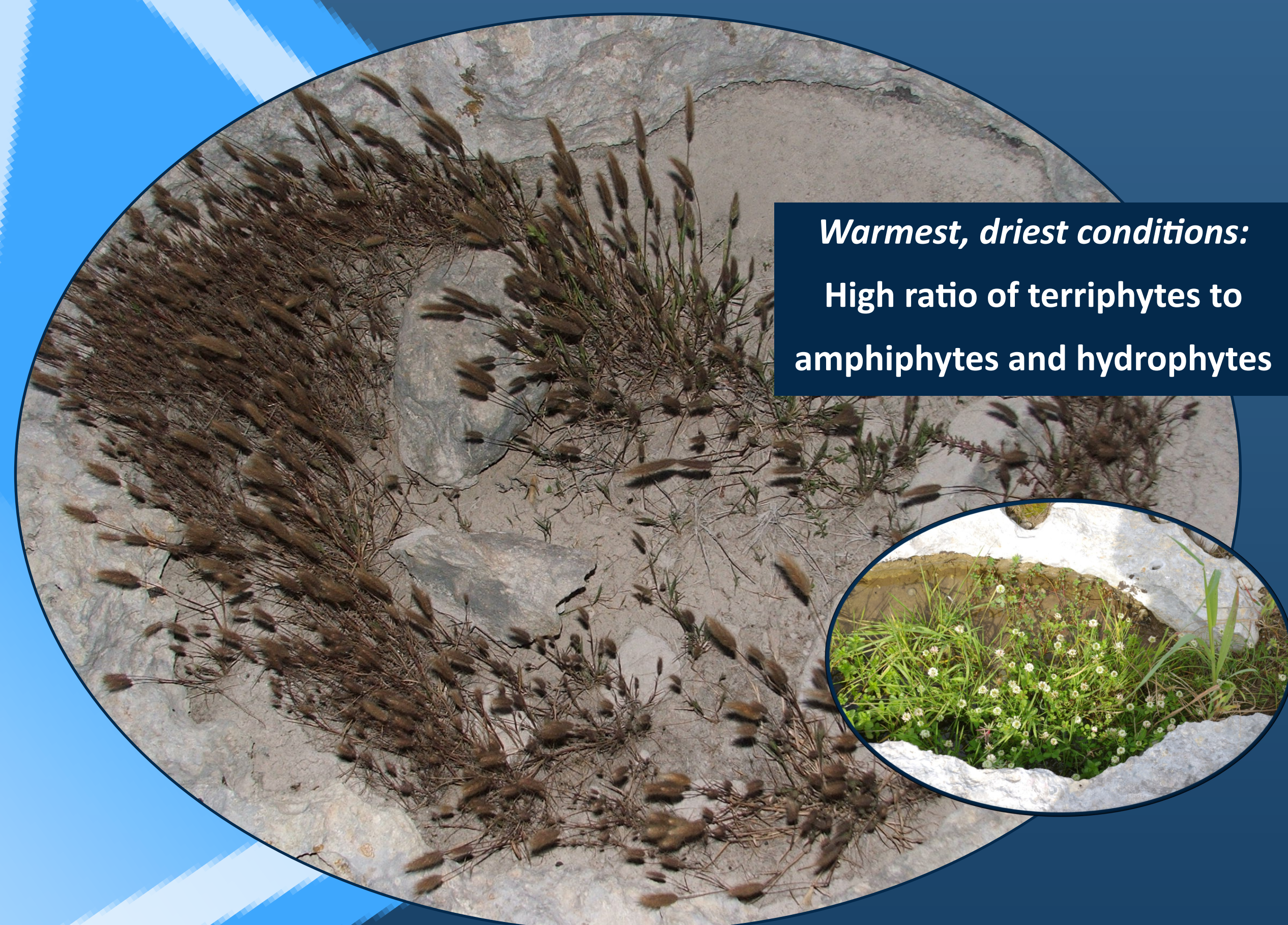


Results

- The fragmentation of the hydroperiod in all three climatic scenarios was significantly higher than that observed for the reference hydroperiod ($P < 0.05$).
- The duration of the longest hydroperiod, an important constraint for life-cycle completion, was significantly shorter in a warmer and drier climate ($P < 0.05$).

Conclusions

- Pools are likely to be subject to increased infiltration by 'opportunistic' terriphytes from the surrounding habitat.
- Pool communities dominated by hydrophytes would be expected to decline in abundance.
- Warmer and drier climatic conditions favour a compositional shift away from hydrophytes and towards amphiphytes and terriphytes.



DCA plot showing community composition in 30 pools in 2008/09. Scores on Axis 1 for each pool were correlated with hydroperiod index. Cluster I: Pools with very brief hydroperiods, rich in 'opportunistic' terriphytes (green circles). Cluster II: Pools with longer hydroperiods and mainly colonised by amphiphytes (purple circles) and hydrophytes (blue circles). Triangular symbols represent the individual species on which the analysis was based. The arrow represents a vector corresponding to increasing hydroperiod duration. Figure adapted from Sammut, S., Briffa, K., Camilleri, J. & Lanfranco, S. (2014). Pools, plants and people: challenges for wetland conservation in Malta. Wetlands 2014, Huesca, Spain.

