Can terrestrial orchids keep pace with a changing climate? A study case in Central Italy

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Many natural systems are being affected by global climate change, especially by temperature increase and drought. The effects on orchid populations are difficult to predict but evidence from our studies suggests that the recent climatic trend is already affecting the distribution and reproduction of many species in Central Italy and that some orchids are likely to be more vulnerable than others. In Northern Latium, a warming climate, together with ever more frequent and extreme droughts, is threatening with extinction some terrestrial orchids living in the so-called "*depressed beech forests*" (growing at a lower altitude than typical, 400-600 m a.s.l.). Here, the orchids with a late-spring/summer flowering result extremely vulnerable, as unable to survive the prolonged drought periods which have characterized the last years. In fact, our monitoring has highlighted a drastic loss of reproductive success in species like *Epipactis placentina*, *E. gracilis*, *E. helleborine*, *E. microphylla*, *Dactylorhiza maculata*, and *Cephalanthera rubra*, more and more often unable to reach the fruiting and seed dispersal phases, which should occur in summer. A significant biodiversity loss is foreseeable in such beech forests through local decline and extinction of orchid populations, due to the increasing temperatures and drought.