Papaver occidentale (Papaveraceae) Arctic-alpine glacial relict endemic to Western Prealps: genetic analyses and conservation status assessment

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Papaver alpinum subsp. *occidentale* (Papaveraceae) has been first identified in 1954. Hereinafter referred to as *P.* occidentale, this taxon belongs to the alpine poppy complex. *Papaver occidentale* is a poorly studied glacial relict endemic to the Western Prealps. Glacial relicts are remnants of cold-adapted flora that experienced Quaternary glaciations and post-glacial warming and are thus good models for studying persistence and conservation. In this study, we aimed to deliver the first detailed appraisal on distribution, number of populations and individuals, ecology and genetic diversity of *P. occidentale* across its entire range. Conservation implications and the phylogeographic processes that drove to the current distribution are discussed. We used double digest Restriction-site Associated DNA (ddRADseq) to investigate the genetic structure. Altogether native *P. occidentale* was found in 19 populations in six different regions. The distribution area forms a line from Haute-Savoie (France) to Canton of Bern (Switzerland). The introduction of *P. occidentale* in one region as well as a misidentification of *P. occidentale* have been genetically identified. The taxon counts globally ca. 31000 individuals. Our study shows that *P. occidentale* has clear arctic-alpine ecological requirements. It grows mostly on screes with steep slopes and northern exposition in the alpine zone between 1800 and 2100 m a.s.l. Despite its narrow distribution and its specialized environmental requirements, *P. occidentale* is not directly threatened. Results of the genetic analyses suggest that some regions are highly isolated and diversified while other are more related and less differentiated. The long-term survival is difficult to predict. Likewise, the historical processes that led to the current distribution and genetic differentiation are complex and cannot be assure. Clearly more research is needed on conservation and phylogeography in the whole Alps and even other surrounding regions.

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