ALPINE BIOGEOGRAPHY RECONSIDERED: COMPARING PHYLOGEOGRAPHIC AND BIOGEOGRAPHIC LINES IN THE EUROPEAN ALPS


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There is a long history of studying the flora in the European Alps and its biogeography. Since the early 19th century, scientists have attempted to localize floristically similar regions and its delimitations and to explain these with geological or climatic factors. A most widely discussed biogeographic line is the one between the eastern and western Alps. However, this hypothesized line between the two flora regions has never been statistically tested. Here, we propose a new approach to geographically identify biogeographic lines. We use an exhaustive dataset of the distribution of alpine plant species, compiled in the frame of the project IntraBioDiv. Data on species occurrences refer to a regular spatial grid laid over the whole range of the European Alps. On the same grid, we assessed the genetic structure of several widely distributed alpine plant species to identify common phylogeographic lines in the Alps. We expect that biogeographic and phylogeographic lines are largely congruent in the Alps due to historical processes acting at both the genetic and the species level in the same direction. Such processes, e.g. isolation, regional extinction or range-expansion are related to Quaternary ice ages, which had a substantial influence on present alpine biota.