

Phylogeographic Analysis of the Mediterranean *Hordeum marinum* Species Group (Poaceae)

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Abstract: *Hordeum marinum* Huds. is an annual grass of Eurasian origin, occurring in saline meadows or marshes along the coast lines and, much more rarely, in inland habitats. The species contains two clearly distinguishable subspecies. *Hordeum marinum* Huds. subsp. *marinum* (\equiv *H. marinum* s.str.) is mainly distributed in the western Mediterranean. The second taxon, *H. marinum* Huds. subsp. *gussoneanum* (Parl.) Thell. contains a di- and a tetraploid cytotype (\equiv *H. gussoneanum* 2x and 4x, respectively). The two cytotypes occur in the eastern Mediterranean with *H. gussoneanum* 2x stretching from there to the west, *H. gussoneanum* 4x reaching eastward into Afghanistan. The two subspecies co-occur in the central and eastern Mediterranean. Of special interest are the conflicting nuclear and chloroplast phylogenies of this species, indicating a monophyletic (nuclear) or a polyphyletic (chloroplast) status of the taxon. Using chloroplast sequences of the *trnL-F* region, chloroplast microsatellites, ecoclimatic data and the present distribution areas we reconstructed the phylogeography of *H. marinum*. The results of the combined data show that the two subspecies of *H. marinum* Huds. originated allopatrically about two million years ago. For *H. gussoneanum* we postulate an origin in easterly ice age refugia, probably in Turkey. Here originated also the tetraploid cytotype. Repeated range contractions caused a decrease in chloroplast diversity resulting in only one chloroplast haplotype per cytotype. *Hordeum marinum* s.str. originated during the ice ages in the western Mediterranean. Here we uncovered a clear subdivision between populations from the Iberian Peninsula and the remaining Mediterranean, indicating that a former population was divided and the two subpopulations evolved independently. The extant sympatric occurrence of the two subspecies in parts of the Mediterranean region is interpreted as a secondary contact.