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Fate of Li in pre-Variscan subduction of Western Bohemian Massif

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Lithium (Li) is mobile in subduction environment and can inform about dehydration processes and nature/transfer of fluids to mantle wedge segments [1]. It is also possible that differences in $^{7}Li/^{6}Li$ ratios of non-dehydrated to dehydrated lithologies could be linked with variable Li isotope signature of contemporary seawater because the extent of Li isotope fractionation during UHP metamorphism may be limited [2]. The metabasic Mariánské Lázně Complex (MLC), W part of the Bohemian Massif, hosts a range of lithologies, from serpentinites to amphibolites to eclogites. These rocks provide a near-complete record from altered ocean floor precursors to dehydrated UHP facies representing a subduction sequence including accretionary wedge lithologies. The MLC is thought to represent a possible equivalent of the Münchberg Massif (MM) in E Bavaria.

The analyzed eclogites from MLC and MM display a range of $d^{7}Li$ values from −15.6‰ to +3.6‰, paralleled by variable but negatively correlating Li contents (4.5–59.2 ppm), indicating an influx of isotopically light Li from metamorphic fluids. A similar range in Li contents and $d^{7}Li$ values has been reported for orogenic lamprophyres and lamproites of the Krušné hory Mts., thought to be derived from subduction-influenced metasomatized sub-continental mantle [3,4]. Only a limited possibility exists for eclogites to preserve the $d^{7}Li$ values of the original MORB-like protoliths, here exemplified by two eclogites from Weissenstein (MM) which might have escaped interaction with seawater and late fluids. Distinctive trends apparent for samples from both MLC and MM suggest different sources and/or extents of dehydration reactions. A complementary reservoir with a heavy Li isotope signature has yet to be revealed, which does not preclude pervasive seawater alteration of source rocks prior to subduction.

[1] Tomascak et al. (2016) Springer Verl., 195 pp. [2] Marschall et al. (2007) *EPSL* 262, 563-580. [3] Abdelfadil et al. (2014) *Lithos* 196-197, 14-26. [4] Krmíček et al. (2016) *Gond. Res.* 35, 198-219.

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