YOUNG AND FAST: THE HIGH-PRESSURE METAMORPHISM IN THE MIDDLE ADULA NAPPE (CENTRAL ALPS, SWITZERLAND)

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The Adula nappe belongs to the lower Penninic basement within the Lepontine area and is marked by relics of HP-metamorphism. HEINRICH (1986) reported increasing PT-conditions for this HP-event from 10–13 kbar at 450–550 °C in the north to 15–35 kbar at 600-900 °C in the south. This HP-metamorphism predates Barrovian-type regional metamorphism and is only preserved within eclogite boudins in the upper part of the Adula nappe. Within the underlying Simano nappe, no indications for HP-metamorphism have been reported until now. Regarding the overlying Tambo nappe, elevated but significantly lower pressures are reported by the Si-content of phengites (i.e. 10–13 kbar at 550 °C; BAUDIN & MARQUER 1993). Therefore, a pressure gap of ca. 10 kbar exists between Adula and Tambo nappes.

New PT constraints for the eclogite facies conditions in the middle Adula nappe are based on calculations of stable assemblages with the computer program DOMINO (DE CAPITANI, 1994). The non-ideal solution models for clinopyroxene (MEYRE et al., in prep.), garnet (BERMAN, 1990) and feldspar (FUHRMAN & LINDSLEY, 1988) were considered by using the updated database of Berman (1988). These calculations reveal minimum pressures of 22–23 kbar at 650–700 °C for the high-pressure climax and 19–21 kbar at 650°–700 °C for a re-equilibration event during decompression under still ecolgite facies conditions. The pressure-climax assemblage (Omp + Grt + Ky + Qtz + H_2O) is then overprinted by the assemblage Omp + Grt + Am + Qtz ± Ky ± Pg + H_2O. The sequence of retrograde assemblages due to the decompression of the Adula nappe can be modelled by calculated equilibrium phase diagrams. Geochronological data (GEBAUER, 1996; BECKER, 1993) as well as the geological context (PARTZSCH et al., ms) indicate an Eocene age for the high-pressure metamorphism.

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