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PRESSURE TEMPERARTURE TIME PATH OF THE COL DEI BOVI METAMORPHIC UNIT (EASTERN SOUTHALPINE BASEMENT, SOUTH TYROL)

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The Sarentino/Sarnthein – Bressanone/Brixen metamorphic basement (SBMB) in the eastern Southern Alps belongs to the southern flank of the European Variscides and is characterized by a polyphase tectono-metamorphic evolution. Up to day low- to intermediate pressure greenschists facies metamorphism as well as contact metamorphism at the Brixen Granodiorite border has been described in this region (SCOLARI & ZIRPOLI, 1971; MORGANTE, 1974; HAMMERSCHMIDT & STÖCKHERT, 1987; MAZZOLI & SASSI, 1988; SASSI & SPIESS, 1993; RING & RICHTER, 1994). In the Col dei Bovi/Ochsenbichl area close to Bressanone/Brixen, a relatively small rock volume records a high temperature metamorphic imprint.

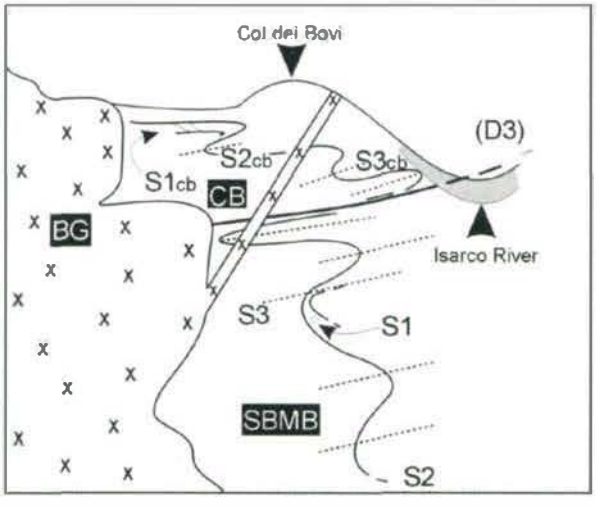

Fig. 1: Schematic relationships among the Sarentino/Sarnthein – Bressanone/Brixen metamorphic Basement (SBMB), Col dei Bovi metapelites (CB) and Brixen Granodiorite (BG). S1, S2, and S3: foliations within the SBMB; S1cb, S2cb and S3cb: foliations within the CB; grey: quaternay deposits.

Detailed structural and microstructural analisys has been carried out in the Col dei Bovi area on the relationships between High Temperature Col dei Bovi metapelites, greenschists facies SBMB basement and Bressanone granodiorite (fig. 1).

The structural and metamorphic evolution compounds four main phases: a) high temperature - intermediate pressure D1 phase: Quartz, Plagioclase, Biotite, K-feldspar and Garnet assemblage preserved within D1 microlithons; b) high temperature - low pressure D2 phase (Quartz, Plagioclase, K-feldspar, Biotite, Sillimanite, Andalusite, Cordierite and Corundum assemblage developed within the differentiated S2 layering; c) D3 retrogression phase (Sericite, Quartz, Chlorite and Albite) commonly developed in the whole eastern Southalpine basement; d) intrusion of the Bressanone granodiorite pluton at 282 ± 14 Ma, generating in the surrounding rocks the static growth of reddish-brown Biotite, Andalusite and Cordierite. D3 reveals the same structural and metamorphic features in the eastern Southalpine basement (e.g. SASSI & SPIESS, 1993) where 320 Ma cooling ages have been detected (HAMMERSCHMIDT & STÖCKHERT, 1987). On the contrary D1 and D2 events appear to be unconsistents with the metamorphic evolution of the surrounding basement (fig. 2). As a consequence, as also supported from structural relationships with the Bressanone Granodiorite intrusion at 282 Ma, D1 and D2 events in the Col dei Bovi area may represent pre-320 Ma events and may compared with coeval similar events in the European Variscan chain. We suggest that the

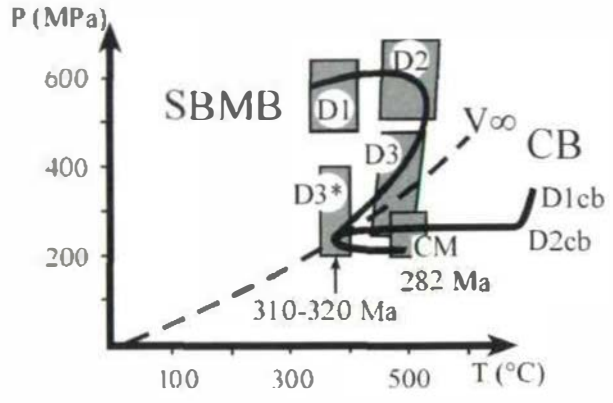

Fig. 2: P-T-t path of SBMB and CB units. D1, D2 and D3 (SBMB) as after Ring and Richter (1994); D3* after Hammerschmidt & Stöckhert, (1987); D1cb, D2cb and CM (= contact metamorphism): Col dei Bovi metapelites, this paper; V∞ geotherm as after Thompson & England (1984).

thermal evolution of the Col dei Bovi unit accounts for the post-collisional setting of the European Variscan chain and probably for the late orogenic collapse.

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