

Seminario

Early Paleozoic HP-LT rocks from the Scandinavian and Svalbard Caledonides – what do they tell us?

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Abstract

Blueschists trace fossil subduction zones and provide information on the evolution of cold subduction systems. Early Paleozoic blueschists remain real rarities in the continuously increasing record of blueschists discoveries. Thus, they provide unique insight into relatively old, perhaps the earliest subduction systems that operated on Earth. Several localities of blueschists are identified in the Appalachians as well as the British, Scandinavian and Svalbard Caledonides. The latter two occurrences are especially spectacular and preserve Grt-bearing and Grt-free rocks from cold (c. 7-9°C/km) geothermal gradients. This allowed for stabilization of LT-HP phases such as carpholite and lawsonite. Thus, these rocks indeed serve as unique messengers from early Paleozoic subduction systems.

The late Cambrian to early Ordovician blueschists and eclogites from the Svalbard and Scandinavian Caledonides include metabasalts hosted in metasediments. Both units formed by subduction of continent-ocean transition zone lithosphere beneath an island arc and, interestingly, share many similarities such as the presence of lawsonite, the similar age of metamorphism, comparable lithological assemblages, corresponding P-T histories, and a record of probable, seismically induced fabrics. Were these two complexes connected in space and/or time? Notwithstanding the answer, it is apparent that one or more cold subduction systems, remarkably similar to Mesozoic and Cenozoic equivalents, were already active during the earliest stages of closure of the Iapetus Ocean. This observation, in turn, allows for investigation of mechanisms governing large-scale tectonic processes, of mass-transfer at the slab-mantle interface, and of possible triggers of intermediate depth earthquakes, active since the early Paleozoic.

Proponente: **Bernardo Cesare**