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**Mid Ordovician contact metamorphism in arc rocks (SW Sardinia, Italy):  
new paleogeographic constraints**

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In the early-Cambrian Bithia Fm. (Variscan foreland of Sardinia) a mid Ordovician granitoid and the HT overprinted marly sediments were addressed by a detailed structural - petrographic transect in the Settiballas-Filau area. The field and the intersection relationships of HT/LP assemblages in the metasediments (Grt+Wo+Ves in carbonatic lenses, and And in pelites) demonstrated that a Mid Ordovician, well-preserved HT/LP aureole pre-dates the Variscan orogeny in Sardinia.

The succession of events can be summarised as follows:

- 1) Early Cambrian: deposition of the Bithia Formation (BF);
- 2) Mid-Ordovician: intrusion of the Mt. Filau Granitoid ( $457 \pm 0.17$  Ma) into the BF sediments, originating the And bearing Settiballas Spotted Schists (SSS), with Wo+Grt+Di bearing Marble Lenses (ML). A P-T pseudosection was calculated for the marly system in the T range 400°-700°C and P 0.1-0.4 GPa. The PT conditions of HT event 1, Mid-Ordovician, are in the T range 520°-620°C at  $x\text{CO}_2 = 0.1$  in the P interval 0.2-0.4 GPa. A T increase occurred to develop a Grt 2 + Wo 2 + Ves + Di assemblage at T 600° to 670°C at  $x\text{CO}_2 = 0.1$  in the P interval 0.2-0.4 GPa.
- 3) Early to Late Carboniferous: development of the Variscan orogeny under low T (<400°C) and low P (<0.25 GPa). Folds and thrusts deformed the BF, at places transposed the And layering in the SSS, preceding the emplacement of Late Carboniferous granitoids.
- 4) Late Carboniferous-Permian: emplacement of Mt. Cogoni and Chia Beach granitoid bodies, with development of contact aureoles in the BF. The contact aureole contains randomly oriented small-sized andalusite neoblasts. In the ML, spraying epidote overgrows and cuts the previous HT wollastonite+vesuvianite+garnet assemblage.

In the Eastern Pyrenees, Montagne Noire and Internal Massifs (NW Alps), orthogneisses and metasediments, with relics of Mid Ordovician intrusions in a BF-analogous sedimentary host, are deciphered in spite of their Variscan and Alpine foreland amphibolitic/granulitic or low-grade metamorphic overprint respectively.

On this ground, a common origin, and in part evolution, can be envisaged for these perigondwanan [1][2] terranes.

Example.....

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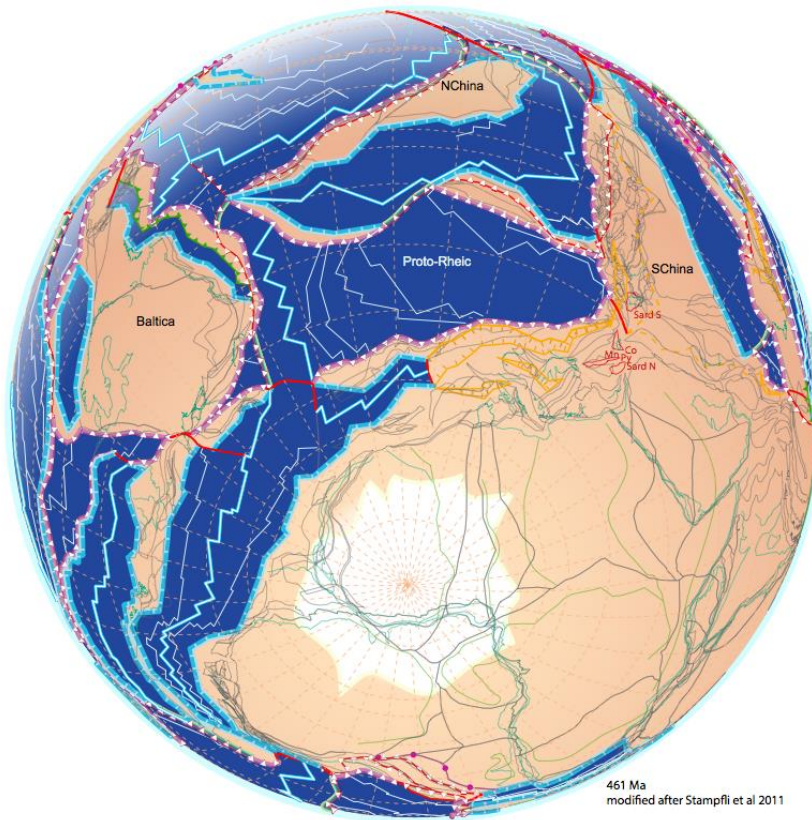


Figure 1: Paleogeography at 461 Ma (courtesy of Jurgen von Raumer)

**References:**

- [1] Hochard GM et al. (2013) Tectonophysics 593: 1-19
- [2] Von Raumer J et al (2013) GSA Bull 125: 89–108

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