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Evidences of subduction and exhumation of the External Continental Units of "Alpine Corsica" (Northern Corsica, France)

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The Alpine belt in Corsica is characterised by the occurrence of a continental units stack (External Continental Units - ECU), located along the boundary between two main geological domains, referred as Hercynian (to the west) and Alpine Corsica (to the east) respectively. These units represent a slice of the Corsican/European continental margin, involved in the Alpine orogeny. The investigated area is located in the Northern Corsica, from Lozari to Francardo villages, where five main units have been recognised: Palasca-Moltifao Unit (PMU), Fuata-Pedanu Unit (FPU), Popolasca-Castiglione Unit (PCU), Croce d'Arbitro Unit (CAU) and Piedigriggio-Prato Unit (PPU). The ECU consist of slices of a Palaeozoic continental crust mainly formed by Permo-Carboniferous granitoids, associated to a Late Carboniferous to middle Eocene meta-sedimentary cover. From the deformational point of view, these units record a polyphase deformation history of Alpine age, characterised by superimposed foliations and fold structures well developed in the meta-sedimentary cover. The basement rocks are characterized by a heterogeneous deformation with development of shear zones, where granites show a cataclastic-mylonitic deformation, wrapping around undeformed granitoids. In the ECU the three main deformation phases (D1, D2 & D3) can be regarded as ranging in age from Late Eocene (the age of the Bocca Capanna Flysch involved in the D1 deformation phase) to Early Miocene (the age of the oldest deposits found in the Francardo–Ponte Leccia Basin). The occurrence of Alpine polyphase deformation suggests that all the ECU extending between the Upper Units (Bas-Ostriconi Unit, Balagne Nappe and Pineto Unit), the Francardo–Ponte Leccia Basin and the "autochthonous" domain were involved in the Alpine Orogeny. More-

over, the occurrence of the peak metamorphism characterised by epidote-blueschist mineral assemblages indicates that Alpine HP/LT metamorphism also affected these continental slices derived from the Corsica/Europe continental margin (previously regarded as weakly metamorphosed or non-metamorphosed, with the exception of the PCU), with estimated P–T conditions of T=300–380 ˚C and P=0.60–0.90 GPa for the granitoid rocks of the PCU and CAU, T=270-380 ˚C and P=1.00-1.25 GPa for the FPU and P$>$0.40 GPa for the PMU and PPU. Therefore, this study provides new quantitative data about the peak metamorphism in the Corsican Alpine belt, where also the eastern margin of the "autochthonous" domain (referred to as Belgodere-Asco Unit) is affected by Alpine deformation and metamorphism, as testified by the development of localised cataclastic-mylonitic shear zones in the granitoids (observed in the area between the Asco and Golo valleys) and by the occurrence of peak metamorphism characterised by P-T conditions close to the greenschist / blueschist facies transition, with pressures between 0.55 and 0.70 GPa and temperatures lower than 450 ˚C. The structural features and metamorphic conditions of the D1 phase, recognised in the ECU, can be interpreted as related to the deformations achieved during their underplating at different depth into the accretionary wedge (as testified by development of HP/LT metamorphic mineral assemblages), while the D2 and D3 phases can be related to the exhumation history. Particularly the D2 phase was associated to the first stage of exhumation driven by a syn-contractional westward thrusting onto the eastern margin of the Hercynian basement and the D3 phase can be interpreted as related to the last stage of exhumation during the Oligo-Miocene extensional tectonics. As a whole, a continuous belt of continental slices characterised by HP/LT metamorphism of Tertiary age can be identified from the Tenda Massif (NE of studied area) to the Corte area (S of studied area). This picture supports the hypothesis that large portions of the Corsican/European continental margin were deformed under HP/LT metamorphic conditions during their involvement in the tectonics connected with Alpine subduction and were subsequently juxtaposed against the metamorphic and non-metamorphic oceanic units during a complex exhumation history.