Table of contents

SECTION 1. INTRODUCTION

Chapter 1.1 The continental crust’s involvement in the orogenic processes 9
Chapter 1.2 Studying the Alpine Orogeny in Corsica 10
Chapter 1.3 Thesis outline 12

SECTION 2. THE CORSICA ISLAND AND THE WESTERN MEDITERRANEAN SEA

Chapter 2.1 The Corsica Island within the Alpine Orogeny setting 15
Chapter 2.2 The syn- to post-orogenic extension in the western Mediterranean Sea 20

SECTION 3. THE ARCHITECTURE OF THE EUROPEAN MARGIN AND THE PIEDMONT-LIGURIA OCEAN IN CORSICA

Chapter 3.1 Lithostratigraphic framework 23
  3.1.1 The Hercynian Corsica 23
  3.1.2 The Lower Units: the European-derived metamorphic units of the Alpine Corsica 25
  3.1.3 Other groups of units of the Alpine Corsica: from the ocean-continent transition to the Piemont-Liguria Ocean 27
Chapter 3.2 The state of art 29
  3.2.1 Overview of the tectono-metamorphic data 29
  3.2.2 Geochronological constraints 30

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
SECTION 4. GEOLOGICAL OVERVIEW OF THE STUDY AREAS

Chapter 4.1 Cima Pedani area 35
Chapter 4.2 Corte area 40
Chapter 4.3 Venaco area 46
Chapter 4.4 Noceta and Ghisoni areas 49

SECTION 5. THE ALPINE OROGENY IN CORSICA: INSIGHTS FROM THE LOWER UNITS, THE HERCYNIAN CORSICA AND THE SCHISTES LUSTRÉS COMPLEX

Chapter 5.1 Pre-subduction deformation of the lower plate: middle to late Eocene forebulge’s formation 51
Chapter 5.2 The Lower Units deformation history: from map- to microscale 54
  5.2.1 Cima Pedani 56
  5.2.2 Corte 62
  5.2.3 Venaco 74
  5.2.4 Noceta and Ghisoni 76

Chapter 5.3 The metamorphic history of the Lower Units: evidence from the Permo-Carboniferous metagranitoids and the metagabbros and from the Permian and Tertiary metapelites 80
  5.3.1 Cima Pedani 81
  5.3.2 Corte 85
  5.3.3 Noceta and Ghisoni 92

Chapter 5.4 The Alpine ductile deformation and the metamorphic imprint in the foreland: insights from Asco-Castirla, Razzo Bianco and Noceta-Ghisoni shear zones 93
  5.4.1 Asco-Castirla shear zones 93
  5.4.2 Razzo Bianco shear zones 97
  5.4.3 Noceta-Ghisoni shear zones 100

Chapter 5.5 Tectono-metamorphic history of the tectonic slices belonging to the Schistes Lustrés Complex associated to the studied Lower Units 104
  5.5.1 Cima Pedani and LEU 105
  5.5.2 Corte and IZU 105
  5.5.3 Noceta-Ghisoni and IZU 109

Chapter 5.6 The post-D3 deformation 109
SECTION 6. AGE CONSTRAINTS: MAGMATIC AGES AND THE PERMO-TRIASSIC HEATING EPISODE

Chapter 6.1 Petrographic features of the metagranitoids and the epidote-bearing metagabbros 115

Chapter 6.2 U-Pb geochronology on zircons 117
   6.2.1 Zircon texture 117
   6.2.2 The magmatic ages of metagranitoids and metagabbros: petrological implications on the batholith’s intrusion 120

Chapter 6.3 U-Pb geochronology on allanites 122
   6.3.1 Allanite texture 122
   6.3.2 Zircons vs. allanite ages: pre-Alpine rifting 124

SECTION 7. GEODYNAMIC IMPLICATIONS

Chapter 7.1 Middle to late Eocene history of the European margin: insights from the stratigraphy 128

Chapter 7.2 Tectono-metamorphic history of the Lower Units, the Alpine shear zones of the Hercynian Corsica and of the associated tectonic slices belonging to the Schistes Lustrés Complex 131
   7.2.1 Exhumation during compression: the D1 and D2 phases of the Lower Units 131
   7.2.2 Syn-convergence deformation of the Hercynian Corsica 137
   7.2.3 The post-D2 coupling with the Schistes Lustrés Complex 139
   7.2.4 The D3 phase: extrusion vs. beckthrusting 143

Chapter 7.3 The post-D3 phase: further exhumation during transtension? 144

Chapter 7.4 From data to model: extrusion tectonics 147
   7.4.1 The perturbation of the geothermal field as consequence of the involvement of cold lithosphere into the subduction zone 147
   7.4.2 From subduction to the wedge: toward a new geothermic equilibrium 149
   7.4.3 Extrusion vs. erosion 151

SECTION 8. CONCLUSIONS 157
SECTION 9. SUPPLEMENTARY MATERIALS

Chapter 9.1 Thermobarometry on metapelites 161
  9.1.1 Chlorite 163
  9.1.2 Phengite 164

Chapter 9.2 P estimates based on sodic amphibole 170

Chapter 9.3 Calcite twins 174

Chapter 9.4 LA.ICP.MS dating 175
  9.4.1 U-Pb zircon dating on separates 175
  9.4.2 U-Pb allanite in-situ dating 180

References 185