
Preface

The Cenozoic volcanism in the Tyrrhenian Sea region shows a very wide range of petrological, geochemical and isotopic compositions, which cover almost entirely the field of igneous rock occurring worldwide. Volcanic activity took place contemporaneously with the opening of the Ligurian-Provençal and Tyrrhenian Sea basins, and with the formation of the Apennine-Maghrebian chain. Its occurrence in the hearth of the Mediterranean Sea and the spectacular eruptions of active volcanoes such as Etna and Vesuvio, attracted the attention of scholars since ancient times. Modern science has been interested to this volcanism because of its compositional complexity and the variety of volcanological processes taking place at the active and dormant centres. My book published by Springer in 2005 and entitled *Plio-Quaternary Volcanism in Italy. Petrology, Geochemistry, Geodynamics* summarised the state of knowledge of Tyrrhenian Sea volcanism at the time of publication. However, studies have been enormously expanding in the last 10 years, and huge amounts of data and ideas have been published on various aspects of this complex subject.

The present work is an extensively rewritten and expanded version of my 2005 book. Its objective is to update and integrate previous knowledge by reporting on the voluminous body of data and ideas published in the last 10 years and to elucidate some aspects of volcanism, which had not been adequately considered in the previous book. Therefore, information on volcanological and geophysical aspects of magmatism has been considerably increased, and some topics such as the Oligo-Miocene orogenic activity from Sardinia, Ligurian Sea and Provence are more fully treated. Moreover, a very short summary is provided of the Alpine stage magmatic activity that took place from Upper Cretaceous-Eocene to Miocene along the Alps and at some localities of the Adriatic and Pelagian blocks. Such magmatism shares many compositional characteristics with the Tyrrhenian-Apennine activity, but also exhibits significant differences. The comparison between the two magmatic suites is briefly discussed in Appendix 1, with the aim of stimulating further comparative studies that may provide a better insight into petrogenesis and geodynamics along the Africa-Europe converging boundaries.

The book is subdivided into thirteen chapters. The first one provides an introduction to the main petrological and geochemical characteristics and gives the rationale for subdivision of the magmatism into several distinct igneous provinces. The last chapter is a summary of the petrological,

volcanological and structural characteristics of the magmatic provinces and of the most popular hypotheses that have been proposed to explain the relationship between geodynamics and volcanism. The other chapters are devoted to the volcanology, geochemistry, petrogenesis and geodynamic significance of single magmatic provinces into which the Tyrrhenian Sea magmatism has been subdivided.

The data discussed in the text have been generally taken from the most recent literature. They have been carefully checked, and some have been discarded because clearly incorrect. This, however, does not guarantee that the resulting files are free of errors. A few representative analyses for the single magmatic provinces have been reported in the tables attached to each chapter. More data can be found at the publisher website or can be obtained by the author on request (angelo.peccerillo@unipg.it; lathebiosas46@tiscali.it).

In most diagrams, especially those showing major and trace elements, a limited number of representative data have been plotted. Such a choice has been dictated by the need of avoiding excessive crowding, which would make diagrams difficult to read. It goes without saying that, in the choice of data points, care has been taken to select representative compositions, in order to preserve all necessary information.

Figures have been all drawn by the author, which explains the quality of diagrams and maps. Photos are partly by the author and partly by colleagues and friends. I thank Giampiero Poli, James T. Kirk, Federico Lucchi, Gianfilippo De Astis, Luciano Giannini and Giovanni Marano for providing some nice and informative images. The aerial photograph of Campi Flegrei has been downloaded from the NASA website.

For classification and nomenclature of volcanic rocks, the IUGS scheme of Le Maitre (2002) has been consistently adopted through the book. For rocks related to volcanic arcs, the classification scheme of Peccerillo and Taylor (1976) has been used. These classification schemes, together with a few notes on the classification of potassium-rich rocks, have been explained in Appendix 2. Rocks' names not reported in these schemes and eventually used through the book have been defined in footnotes or through the text. Notes on classification and nomenclature of igneous rocks are trivial for petrologists and geochemists, but may be useful for other potential readers who are not familiar with petrological-geochemical issues and jargon. Acronyms are unavoidable in modern petrology and geochemistry, but I have tried to keep them to a minimum.

Papers cited through the text are reported in the attached reference lists. These consist of about 1200 bibliographic entries, but are far from being comprehensive of the large quantity of papers and books published on magmatism and geodynamics of the Tyrrhenian Sea area. The bibliography on this subject is enormous and would deserve a book by itself. Therefore, many important contributions, especially in the field of mineralogy, physical volcanology, geophysics and geodynamics, have been omitted. While apologies are due to authors whose papers and books have not been cited, a somewhat more extended list of papers has been reported on the publisher website.

Several colleagues reviewed the various chapters and made important suggestions, corrections, and modifications, which significantly improved the style of writing and quality of science. It is obvious, however, that the responsibility for the contents of this book leans entirely on the author. I wish to express my gratitude to Michele Lustrino, Alba Santo, Laura Pinarelli, Gianfilippo De Astis and Marco Malusà for their help. I am also indebted to Donatella De Rita, Danilo Palladino, Paola Marianelli and Aidamaria Conte for providing precious information on Vulsini, Tolfa, Pontine Islands and Ischia volcanoes. Aidamaria Conte, Danilo Palladino and Attilio Giacobbe also allowed the use of their unpublished data on the Pontine Islands, Vulsini and Etna.

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Professor Caterina Petrillo, Head of the Department of Physics and Geology of the University of Perugia, was extremely helpful for kindly allowing access to the library at the University of Perugia. Without the use of such a facility, writing this book would have been a mission impossible.

This effort is dedicated to my wife, my daughter and to the memory of my parents.

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