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World Geomorphological Landscapes

Catherine Kuzucuoğlu
Attila Çiner
Nizamettin Kazancı *Editors*

Landscapes and Landforms of Turkey

 Springer

World Geomorphological Landscapes

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Abstract

Approximately, 40% of Turkey's landmass consists of soluble rocks (limestone, dolomite, and gypsum) highly suitable for karstification. While presenting different lithological composition, lithostratigraphic and structural characteristics, these rocks reach in some places up to 4000 m in elevation. Tectonic movements since the middle Miocene have played, together with climate, a major role in the processes of karst development. Several factors intervene in the formation processes and history of the karstic landscapes of Turkey: structural dynamics (mainly extensional tectonics and block faulting) and its spatial distribution, relief rejuvenation responding to the combination of uplift intensity and sea-level changes and the stratigraphic/lithologic context. Resulting from the various combinations possible, there are large-scale differences in the evolution of the karstic landscape within short distances. Consequently, six karstic regions and eleven distinct sub-karstic areas can be identified on the basis of their different morphogenetic and morphometric characteristics.

Keywords

Karst • Limestone • Doline • Neotectonic • Turkey

5.1 Introduction

Turkey is located between Eurasia, Africa, and Arabian plates and on the Alpine-Himalayan Mountain Belt. It is a transcontinental country forming a bridge between Asia and Europe. Among the impressive landscapes and landforms produced by the complex interaction of earth movements, climatically controlled geomorphic processes and volcanic eruptions are karst terrains and forms. These landscapes and landforms have been mainly shaped by extensional, contractional, and strike-slip-related tectonics since the mid-Miocene terminal collision between the Arabian and Eurasian plates (Şengör and Yılmaz 1981; Robertson and Dixon 1984; Şengör et al. 1985; Göncüoğlu et al. 1997). Soluble rocks of carbonates and evaporites, consisting of limestone, dolomite and gypsum, represent 40% of the country's landmass. They occur as thick successions in the geological formations of various ages ranging from Paleozoic to Late Cenozoic and they form mainly suitable grounds for karstification and spectacular karst landscape in the mountain ranges, the Taurus Mountains (Taurides) in the south and the Black Sea Mountains (Pontides) in the north, characterized by well-developed active and paleo-karst terrains and impressive cave systems. However, due to considerable variations in relief, bedrock composition and structure, climate and sea-level changes, fluvial dissection (rejuvenation) and tectonic history, the nature and evolution of karst landscapes and landforms display considerable spatial differences (Nazik 2004; Nazik and Tuncer 2010; Günay et al. 2015; Öztürk 2018).

5.2 Outline of the Karst Geomorphology of Turkey

Six karst regions and eleven subregions have been identified within the karst landscape of Turkey (Fig. 5.1 and Table 5.1). The recognition of these regions and subregions is based on morphogenetic and morphometric characteristics of surface and subterranean karst forms (including location,

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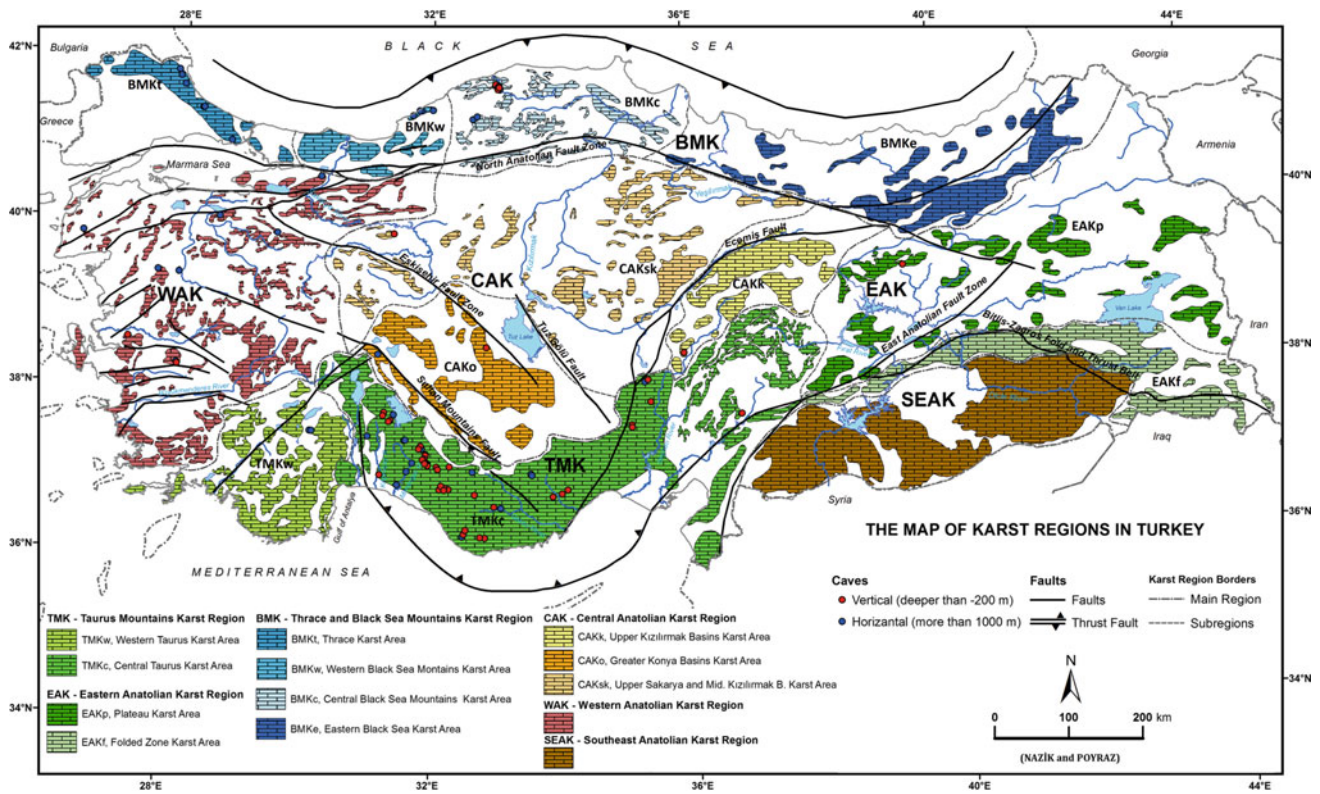


Fig. 5.1 Map of karst regions in Turkey (modified from Nazik and Tuncer 2010)

Table 5.1 Karst regions and subregions in Turkey

Regions	Subregions
The Taurus Mountains Karst Region	Western Taurus Mountains Karst Area
	Central Taurus Mountains Karst Area
Western Anatolian Karst Region	
Thrace and the Black Sea Mountains Karst Region	Thrace Karst Area
	Western Black Sea Mountains Karst Area
	Central Black Sea Mountains Karst Area
	Eastern Black Sea Mountains Karst Area
Central Anatolian Karst Region	Greater Konya Basin Karst Area
	Upper Kızılırmak Basin Karst Area
	Upper Sakarya and Central Kızılırmak Basins Karst Area
Eastern Anatolian Karst Region	Plateau Karst Area
	Folded Zone Karst Area
Southeastern Anatolian Karst Region	

shape, dimension, distribution, intensity, and development models), which have originated and developed through the interactions between primary factors (tectonic units, lithostratigraphy, and structural features) determining original karst environment, the driving mechanisms and controls on the karst forming processes (relief, porosity and permeability, paleogeography, climate, vegetation, biogenic CO₂, and

time) and physicochemical agents that control the degree of dissolution (Nazik 2004; Nazik and Tuncer 2010).

However, despite the fact that the presence of the Central Black Sea, the Greater Konya Basin, and the Central Taurus Mountains subregions is geographically considered in different karst regions, they will be regarded here as parts of the Central Anatolian Plateaus Karst Zone since they have been

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