

## **Geology of Ankara Region**

Ankara region is located at two suture zones which were accreted during Late Cretaceous to Eocene subduction and collision processes.

The older suture zone belongs to Karakaya Orogenic phase that lasted between the latest Permian to end of Triassic. It took place within the Sakarya Continent, a continental fragment detached from northern edge of Gondwana by the opening of Karakaya Ocean (a backarc basin of Paleotethys, Paleozoic Tethys) and collided with the Eurasian Plate by mid-Triassic. This resulted in development of Karakaya Orogen basement of which is characterized by Paleozoic metamorphic rocks imbricated with Karakaya oceanic material and basin deposits of Triassic age.

The younger one is the Upper Cretaceous Ophiolitic mélange belonging to Izmir-Ankara Suture Zone, which demarcates the former position of Neotethys Ocean. The Neotethys closed completely by northwards subduction below Pontides of Eurasian affinity. Terminal subduction and obliteration of the ocean in the Ankara region took place by the end of Cretaceous to Oligocene. This resulted in collision of fragments Taride- Anatolide Platform in the south with the Pontides in the North. During the collision, the Karakaya orogenic material, belonging to Pontides and Neotethyan accretionary prism material, is imbricated with a complex thrusting and associated strike-slip fault mechanism with the Ophiolitic Melange. This accreted material which includes the material from Karakaya ocean and Neotethys ocean is erroneously called as Ankara Melange previously. Nevertheless, recent studies have separated the mélanges belonging to Karakaya and Neotethys oceans.

### **Stop 1.**

In this stop, the thrust boundary between Karakaya Melange and Ophiolitic mélange. The fault has very high angle possibly due to strike-slip components. The overlying units are Paleozoic to Anisian limestone blocks set in slightly metamorphosed (Zeolite facies) graywackes of Karakaya Complex which underlying units are Jurassic(?) radiolites belonging to Ophiolitic mélange, chromite, and magnesite mines are visible about 1-2 km towards north along the main road.

### **Stop 2.**

Within the ophiolitic mélange, various material from the sea bottom has been accreted. One of the most prominent materials accreted into the mélange is the Late Cretaceous (possibly Cenomanian to Campanian) seamount chain material. The seamount material in this locality is characterized by pillow basalt with amygdaloidal structure (volcanic vesicles filled with material from seawater, mostly zeolites or carbonates).

### **Stop 3.**

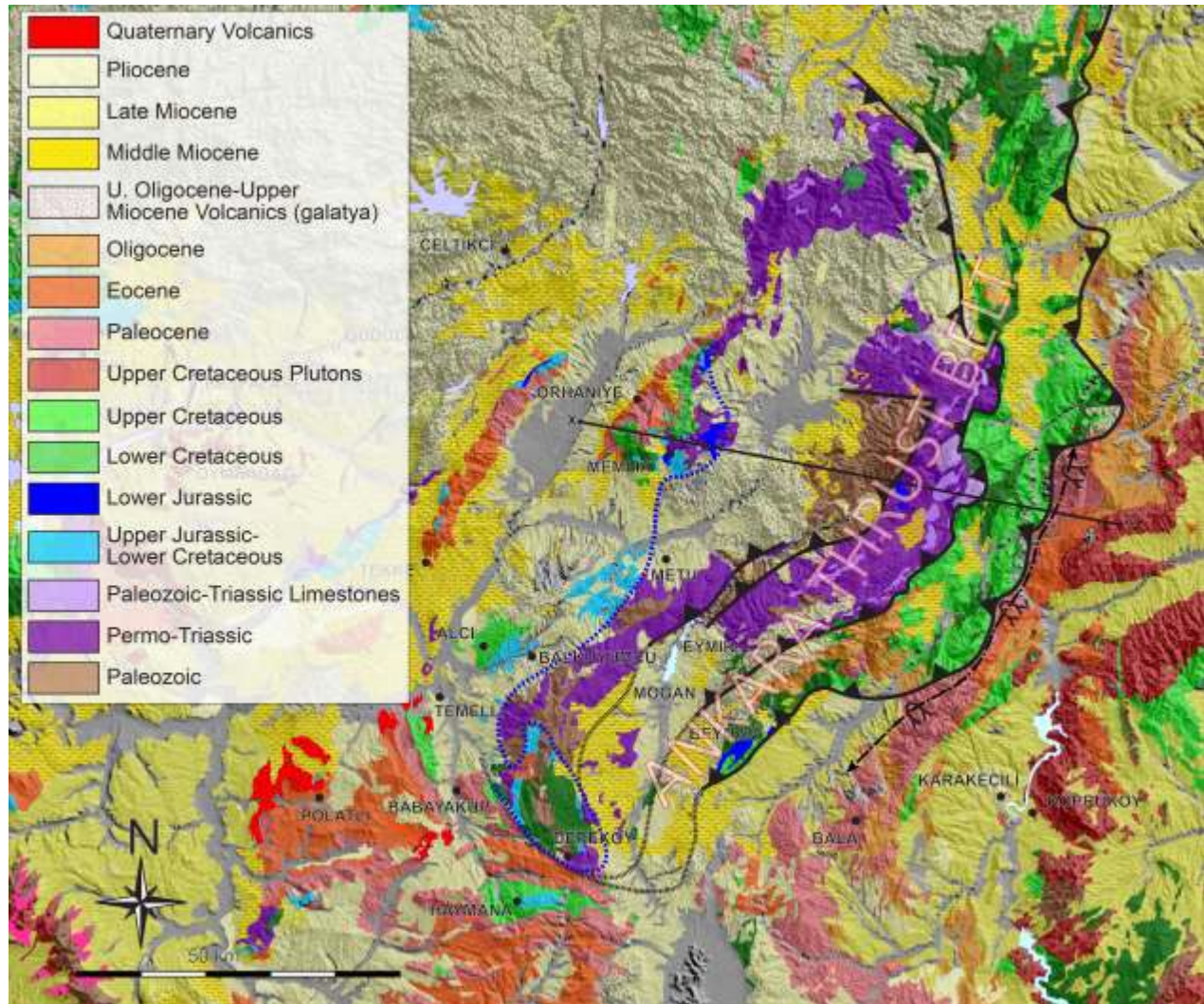
In this locality, chevron folded radiolarites, serpentinite, and various ultramafic rocks are observable. They are intensely folded and faults, fault gouge and locally asbestos and talc development can be seen. Over the hills the patches of relatively undeformed sedimentary sequences alternating with volcanic rocks related to fore- arc environment can be seen.

### **Stop 4.**

The Ankara Accretionary Belt is rotated during the Paleocene to Oligocene period due to collision and northwards convergence of Kırşehir Block. Therefore, the structural trends became N-S in this region. In

this locality the Pontides together with ophiolitic mélangé thrust over the Kırşehir Block belonging to Tauride- Anatolia platform. Kırşehir Block is represented by Metamorphics (peak metamorphism is ~82 Ma) and intruded

Plutonic rocks that range between 90-57 Ma. Collision and thrusting of Pontides gave way to the development of a foreland basin in front of the south verging thrust faults, on the Kırşehir Block. The exposed age of the foreland basin infill is Upper Paleocene to Oligocene. In this locality, the base of basin infill characterized by turbidites is overturned. Overturned beds are manifested by sedimentary bottom structures such as flute marks, groove marks, and various tool marks.



## Orhaniye-Kizilirmak River Section

