

## STRUCTURAL FEATURES OF THE ALADAĞ MOUNTAINS IN THE NİĞDE - ÇAMARDI REGION (EASTERN TAURIDES)

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**Key Words:** Eastern Taurides, Aladağ mountains, nappe tectonics, structural geology.

**ABSTRACT** *The Aladağ mountains exhibit a napped structure in the west end of the Eastern Taurides that occurred during the Late Cretaceous – Paleocene period. The tectono-stratigraphic units of the Aladağ mountains are called from bottom to top as Yahyalı, Siyah Aladağ, Çobandağ, Minaretepeler, Çataloturan, Beyaz Aladağ, ophiolitic melange and Aladağ ophiolite nappes. The study area consists mainly of lithological units of Siyah Aladağ and Çobandağ nappe that have an age range of Carboniferous to Late Cretaceous. It is bounded by the Beyaz Aladağ nappe in the south and Ecemiş fault in the west. Two distinct fold-axes investigated in the study area. The first-one, which occurred in Late Triassic – Lower Jurassic period shows a N-S trend. The second-one, has a NE-SW trend that occurred in the Late Cretaceous – Paleocene time interval. In this time interval, the Jurassic – Cretaceous units thrust over the Middle Triassic or older units. The base of thrust units is characterized by a brecciated zone.*

### INTRODUCTION

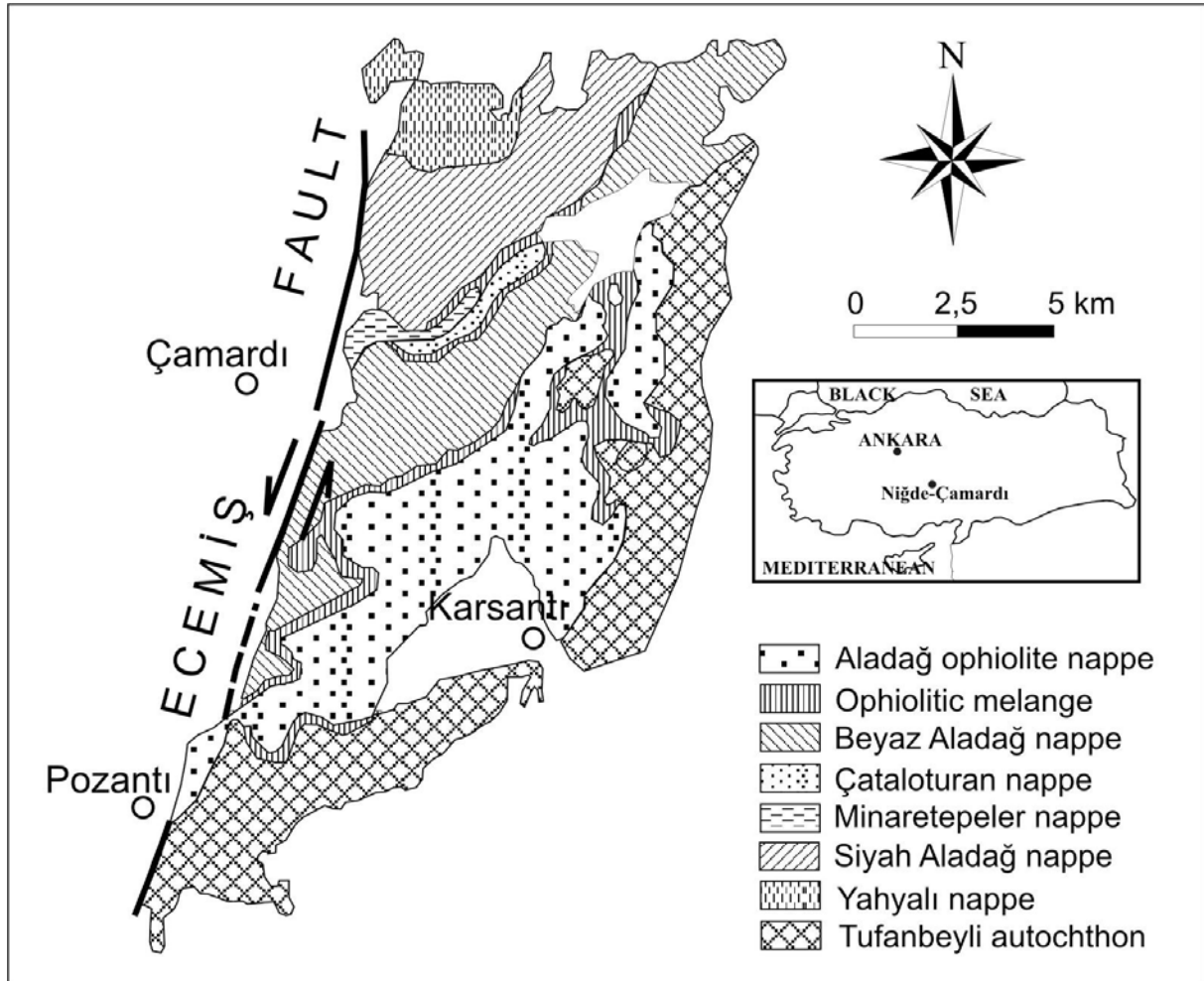
The Aladağ mountains are the highest massif of the Tauride belt in southern Turkey. It has a napped structure in the western part of the Eastern Taurides that developed during the Late Cretaceous – Paleocene time interval. The major tectonostratigraphic units of this belt are summarized in Figure 1.

The study area is located 150 km north of Adana city and 16 km SE of Çamardı town of Niğde city and remained in the 1/25.000 scaled topographic map of Kozan M34-a2 sheet. The investigated area is bounded by sinistral Ecemiş fault in the west and the Siyah Aladağ nappe in the east and in the north. The ophiolitic melange of the Beyaz Aladağ nappe is located in the south of the region. Lithological units of the Siyah Aladağ nappe have an age range from Devonian to Late Cretaceous. In the study area Upper Devonian units do not crop out whereas lithologic units of Carboniferous to Late Cretaceous age can be observed. In this study, the stratigraphy and structural features of the Aladağ nappe investigated in the Niğde – Çamardı area.

### STRATIGRAPHY

The base of the lithostratigraphic units in the study area comprise brown-red colored sandstone of Carboniferous aged Köşkdere formation (Ayhan et al., 1984). This units contains *Fusinella sp.*, *Mediocris sp.*, *Monotaxinoides sp.*, *Glyhostemall sp.*, *Schubertella sp.*, *Paleotextularia sp.*, *Tetrataxis sp.*, *Eutuberitina sp.*, *Ovinella sp.*

The Sarioluk formation (Ayhan et al., 1984) is conformably overlies the Köşkdere formation and accepted as a guide layer because of its fossil content. The carbonate rocks of the Sarioluk formation contains *Pseudoschwagerina sp.*, *Girvenalla sp.*, *Tricites sp.*, *Oaleotextularia sp.*, *Tetrataxis sp.*



**Figure-1.** The map of structural units of the Aladağ mountains (modified from Tekeli, 1980).

The Sarioluk formation is conformably overlain by the Late Permian Zindandere formation (Ayhan et al., 1984). This formation is gray-black in color and consist of bedded limestone that contains abundant amount of Mizzia.

Early – Middle Triassic aged Dişdöken formation which overlies the Zindandere formation is composed of Kapızdere oolitic limestone and Mezargedik marl-mudstone members (Tekeli et al., 1981).

The Dişdöken formation (Ayhan and Langeranlı, 1986) is tectonically overlain by the Jurassic Alagöl formation which is composed of dolomitic limestone. This unit is deposited in high energetic tides level and in low energetic lagoon. Tha Alagöl formation consists of

*Pseudosyslamimina sp.*, *Litnosepta sp.*, *Signovalvulina sp.*, *Textularia sp.*, *Epperalla sp.*, *Trochammina sp.*, *Kurnubia sp.*, *Pfenderia sp.*, *Ostracode sp.*, *Glomospira sp.*, *Haurania sp.*, *Miliolidae* fossils.

Tha Alagöl formation is conformably overlaid by the Onbaşının Yurdu formation that is represented by gray-beige stramatolitic limestone.

The limestones of Late Cretaceous Yarpızlık formation conformably overlies the Alagöl formation. The Yarpızlık formation contains *Chrysalidina gradata* (D'orbigny), *Nezzazinella picardi* (Heuson), *Cuneoline pavania* (D'orbigny), *Nezzazata sp.*, *Miliolidae*, *Ophthalmididae*, *Globotruncana cf. arca* (Cushman), *Globotruncana gr. linneiana* (D'orbigny), *Rosita cf. stuartiformis* (Dalbiez), *Globotruncana sp.*, *Globigerinidae* fossils. The Yarpızlık formation is overlain by the ophiolitic melange (Tekeli et al., 1981).

## STRUCTURAL FEATURES

The Siyah Aladağ nappe have two distinct fold-axes in the study area. The first one which was occurred during the Late Triassic – Early Jurassic time interval has N-S trend. The second one that occurred during the Late Cretaceous – Paleocene period presents NE-SW trend. The formation of latter folding and nappe structure in the region were occurred during this period. The affects of this folding observed in the Çobandağ nappe which overlies the Siyah Aladağ nappe. Today, in the region E-W folding-axes is abundant as a result of N-S compressional regime in the Taurides.

The systematics of faults in the study area were developed mainly by the two compressional tectonic regimes that mentioned above. The faults which observed in the study area are gathered under four groups.

In the first group, the orientations of the faults are approximately in the direction of N-S and the gradients are 68 – 88°. The faults that trending in N20 – 50E collected under the second group and have gradients between 59 – 69°. In the third group, the faults have orientations of N35-65W and gradients of 56 – 69°. The N70-75E trending faults gathered under the fourth group which have gradient values of 69 – 83°.

Tha major faults in the study area are Yazıpınar, Onbaşının Yurdu, Karagüney, Madentepe and Gökgöl faults. These faults are mainly form the boundaries between the formations. One of the important faults in this region is the Gökgöl fault which has a length of 20 km. This fault has a minimum vertical offset of 300 m and lateral offset of 250-350 m.

Our measurements for the joints from different geological formations of the region exhibit that the strikes and gradients of the joints of Paleozoic – Triassic formations are N87-89E/80-90SE, N62-72E/89NW or 77SW, N67W/80NE, N4-9E/77SW, 89SW or 79NE. The strikes and gradients of the joints of Jurassic – Cretaceous formations are N54W/72NE, N3-10W/80-88NE or SW, N36E/78SW, N39W/60NE.

## CONCLUSIONS

In the Late Triassic time, the region was controlled by E-W trending compressional regime generating N-S trending fold-axis. The region was affected by NW-SE compressional regime during the Late Cretaceous – Paleocene time interval. In this time, the Jurassic – Cretaceous Çobandağı nappe was thrust over the Carboniferous – Triassic units of Siyah Aladağ nappe. The area was affected by compressive stress in Laramic phase. The region has not been folded more further because of thickening of the crust and occurring of the faults such as Ecemiş and Gökgöl. Lastly, the region is controlled by compressional regime in the direction of N-S.

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