

## OUTLINES OF THE ÇAYIRBAĞI OPHIOLITES OF KONYA (CENTRAL ANATOLIA)

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### ABSTRACT

It is aimed to outline Neotethyan ophiolitic units in SW Konya on the basis of new field and mineralogical studies. Late Cretaceous Çayırbağı Ophiolites and Hatip Ophiolitic Mélanges crop out in SW Konya, Turkey. The Hatip Ophiolitic Mélange obducted onto the Tauride carbonates (Lorasdağı F., Midostepe F.), contains various blocks, namely; limestone, radiolarian cherts, mudstone, harzburgite, gabbro, basalt, diabase, phyllite and talc-schist within sedimentary and sheared serpentinite matrix. The mélange also contains a metamorphic sole at the bottom, which includes amphibolite and amphibole-bearing schists experienced a regional metamorphism in green-schist facies conditions. The mélange was obducted by Çayırbağı ophiolites, which is composed of serpentinitized peridotite (harzburgite, Iherzolite), carbonated serpentinites, silicified serpentinites, dunite, pyroxenite, hornblendite and banded gabbro, gabbro, with hydrothermal magnesite and chromite deposits. Accordingly, the ophiolitic units have a well-developed mantle section, but lack sheeted dyke complex, similar to Tauride ophiolites.

**Keywords:** Neotethyan, ophiolite, peridotite, magnesite, Konya, Turkey

### INTRODUCTION

Tauride platform is characterised by existence of many well-developed ophiolitic units, namely; Köyceğiz, Tekirova, Beyşehir-Hoyran, Çayırbağı, Mersin and Pozantı ophiolites [1], [2], [3], [4], [5], [6], [7]. The ophiolites were suggested to be formed in relation with evolution of Neotethyan ocean, with supra-subduction zone (SSZ) characteristics [8], [9], [10], [11]. Tauride ophiolites (TO) is made up of metamorphic sole at the bottom, ophiolitic mélange in the middle and ophiolitic rocks on the top [12], [13].

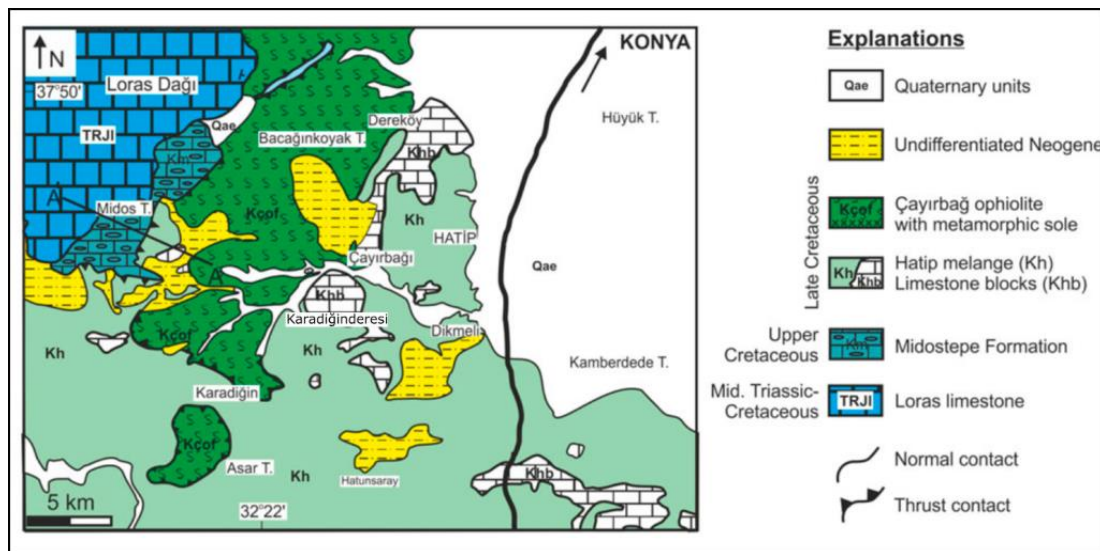
### MATERIALS AND METHODS

Rock samples taken from the Çayırbağı ophiolites are mainly harzburgites that shows serpentinitization in various degrees. Thin sections from these rocks were prepared and analysed at Konya Technical University. Microscope analyses were carried out using Meiji binocular microscope. Mineral percentages determined by image analysis software (ImageJ).

### Stratigraphy

Middle Triassic–Late Cretaceous Lorasdağı Formation is oldest in the area, and composed of grey/beige colored, middle/thick bedded neritic limestones and dolomites

[14]. The sequence continues with Late Cretaceous Midostepe formation, with pelagic thin/middle bedded limestones, mudstone and chert [14]. All of these units were overlaid by Hatip Ophiolitic Mélange, which is composed of Carboniferous to Late Cretaceous pelagic limestone, radiolarian cherts, mudstone, harzburgite, gabbro, basalt, diabase, phyllite and talc-schist. The metamorphic sole located at the base of the mélange, is composed of amphibolite, epidote-amphibolite, zoizit-amphibolite, garnet-amphibole schist, amphibole schist, plagioclase amphibole schist, plagioclase-epidote-amphibole schist and q-amphibole schist [13], [15]. and its age is 87-84 Ma [8]. The mélange is overlaid by Çayırbağı ophiolites, which is composed of serpentinized peridotite (harzburgite, lherzolite), carbonated serpentinites, silicified serpentinites, dunite, pyroxenite, hornblendite and banded gabbro, gabbro, with hydrothermal magnesite and chromite deposits [14], [16], [17] (Figure 2). Çayırbağı ophiolites can be divided into three sections as serpentinized peridotites, carbonated serpentinites and silicified serpentinites [16]. Some of the ophiolite crops show magnesite veins which has thickness of a few mm to cm. Thickness of these magnesites can even be a few meters [18]. Magnesites have two different formations in the area: veins and stockwork [18], [16].



**Figure 1:** Geological map of the Çayırbağı Area [8], [14].

## DISCUSSION AND CONCLUSIONS

Petrographic studies show that peridotites of Çayırbağı ophiolites show serpentinization in various degrees. The harzburgite shows euhedral olivine (17-41%) and subhedral orthopyroxene phenocrysts, with typical one-direction cleavage, and undergone intense serpentinization (up to 83 %) which caused crystallisation of mafic minerals, magnetite? and hematite, and bastite. The serpentine mineral is developed along joint of the olivine, and cleavage of ortho- and clinopyroxenes. The dunite, as expected, showed more serpentinization than the harzburgites. The amphibolite from the sole has amphiboles (73-85%), plagioclase (10-17 %), quartz (5-10 %) and orthopyroxene (5%).

Çayırbağı ophiolites have mélange, metamorphic sole and ophiolite, hence show similarity to TO, which was has SSZ affinity developed in relation with the evolution of the Neotethyan ocean.

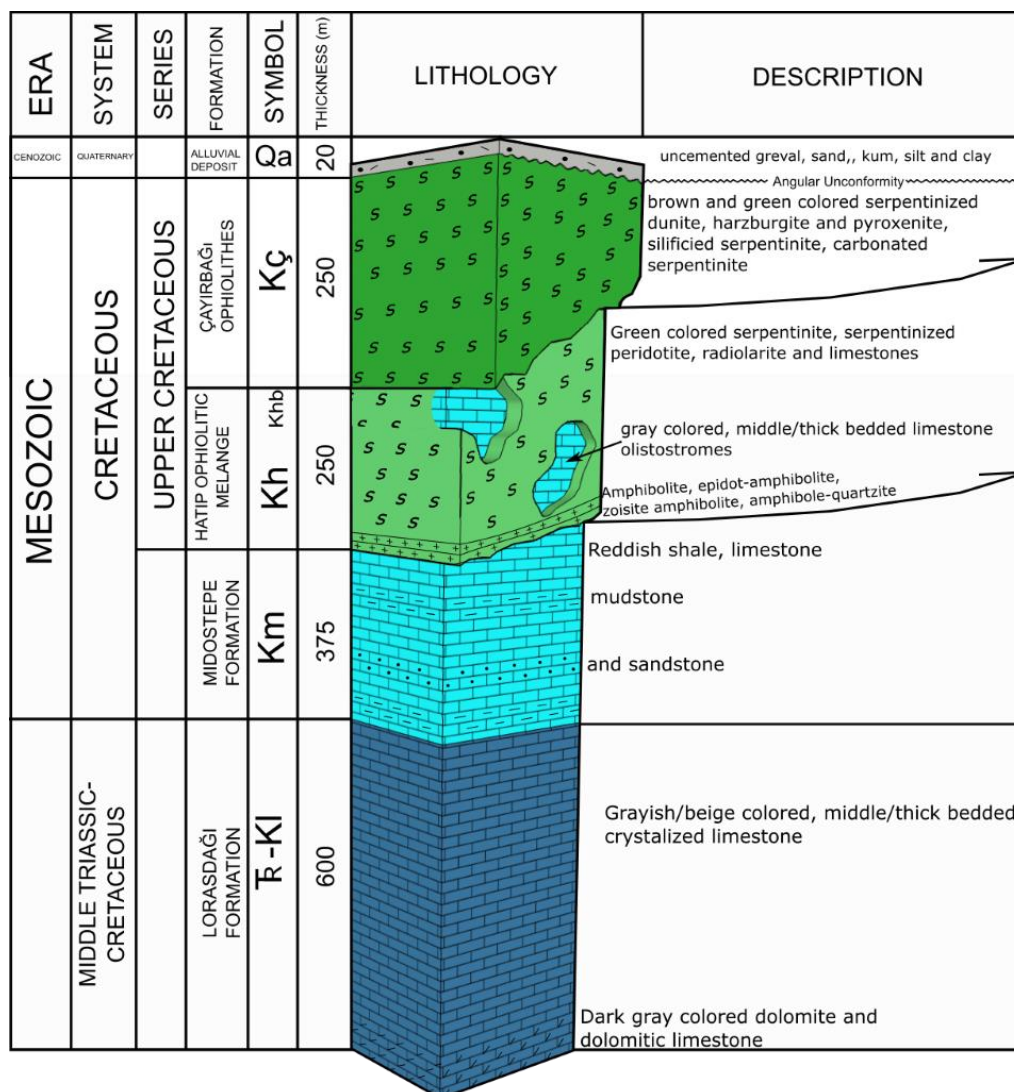


Figure 2: Generalised stratigraphical column of Çayırbağı Area (unscaled)

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