The Bitlis complex forms an arcuate metamorphic belt, about 30 km wide and 500 km long, rimming the Arabian Platform in southeast Anatolia. It is separated from the Arabian Platform by a narrow belt of Upper Cretaceous to Eocene flysch and ophiolitic melange. Along the Northern front of the Arabian indenter a set of collisional autochthonous and allochthonous massifs is known. From South to North, these are: The Great Zap anticlinorium, the Eocene olistostromes of the Hakkari complex overlain by Cretaceous mélanges of the Yüksekova complex, the metamorphics of the Bitlis complex and finally the Quaternary volcanics north of Lake Van. The Bitlis metamorphic complex comprises Precambrian to Cretaceous rocks and builds up the uppermost tectonic unit of the area. It is covered by Tertiary sediments and Quaternary volcanics in the North and overlies Cretaceous (Yüksekovka complex) and Eocene to Miocene series, the Hakkari and Maden complexes (Baykan and Ziyaret Formations, S of Bitlis), as well as the sediments of the northern margin of the Arabian autochthon.

An early description by Tolun (1953) interpreted the metamorphic rocks of the Bitlis complex as forming the basement of the region. According to Göncüoğlu and Turhan (1984), in 1960, Kellogg interpreted the Bitlis metamorphics as equivalents of the Arabian autochthonous succession and assigned a Devonian – Upper Cretaceous depositional age to the metasediments. We investigated the sedimentary cover of the Bitlis complex in order to unravel its metamorphic history during closure of the Tethyan suture.

Starting from Van, the first observation of the Northern contacts of the Bitlis complex is exposed around Gevas. There, the so-called Gevas ophiolite composes an ophiolitic melange with serpentinites, gabbros, basaltic rocks, cherts and limestone blocks. This melange clearly dips below the metamorphic sediments of the Bitlis complex. Inspection of the contact at several locations revealed that between the ophiolitic melange and the Palaeozoic marbles a typical rock sequence consisting of meta-sandstones and reddish marly calcitic marbles as well as marbles with chert layers occur. A cross section east of Gevas exhibits radiolarites of the melange complex in direct steep contact with mylonitic marbles. These marble-mylonites a part of a metamorphic marble - schist sequence, that typically occurs at the base of the Triassic sequence. In the investigated area the metamorphic sequence comprises calcareous and dolomitic marble seams in a greyish chlorite albite schist sequence. In some metapelitic layers phengite and chloritoid occur. Upward in the sequence the amount of dolomitic marbles diminishes and thin tuffitic (?) mafic layers are intercalated with the schists. The mafic layers may also become more substantial and are composed of chlorite, epidote, amphibole and albite. In the uppermost part of the schist – marble sequence the mafic layers show a suspicious intercalation of greenschist and blueschists. The blue schists contain albite, chlorite, glaucophane and epidote. This metamorphic sequence does not represent a metamorphic sole as inferred by Yilmaz (1978) but points to a low grade high pressure metamorphism typical for cold geotherms only present in subduction related settings.

Entering the Çatak valley the first outcrops of the Palaeozoic marbles show strong cataclastic disruption and earlier ductile folding. Intercalated with these marbles, a sequence of black to silvery schist with mafic intercalations occur. In those schists, we identified the very first occurrence of carpholite relics in Eastern Anatolia. In these rocks carpholite has reacted to form chloritoid and quartz. The associated mafic rocks exhibit a bluish tint and
glaucophane was proved in thin section from these metabasic intercalations. N of Çatak spectacular chloritoid-bearing rocks with crystal sizes up to 2-3 cm are exposed. S of Çatak near Narli chloritoid-garnet-bearing parageneses occur in the metapelitic rocks. These higher-grade metapelites and their marble envelope are locally thrust on top of non metamorphosed Eocene pillow lavas. Below this tectonic sliver, the southern frontal part of the Bitlis complex is formed by steep and strongly folded Palaeozoic to Permo-Triassic marbles. Along the Çatak river, the marbles contain fresh carpholite without chloritoid. This proves, that the frontal part of the base of the western Bitlis complex experienced low-grade HP-LT metamorphism and that temperatures never exceeded 450 °C since carpholite remained stable. On the contrary, the northern portion of the basal thrust experienced a slight heating after the HP-LT overprint, as attested by the reaction of carpholite retrogressed into chloritoid and quartz. Petrologic investigations point to pressures around 1 Gpa at temperatures of 300 to 380 °C. The occurrence of blueschists and carpholite-bearing metasediments clearly shows that the Paleozoic to Mesozoic sediments of the Bitlis complex were involved in an Alpine type evolution. The mineral distribution map shows the regional aspect of this HP-LT metamorphic event.