NEW PALAEONTOLOGICAL (RADIOLARIAN) AGE CONSTRAINTS FOR THE SEDIMENTARY COVER OF OPHIOLITES IN THE LESSER CAUCASUS (ARMENIA)

DANELIAN T.1, ASATRYAN G.1,2, SOSSON M.3, GALOYAN G.2,3, AVAGYAN A.2, SAHAKYAN L.2, ROLLAND Y.3

1Université Pierre-et-Marie-Curie, Micropaléontologie, CNRS-UMR 5143 « Paléobiodiversité et Paléoenvironnements », C. 104, 4 place Jussieu, 75252 Paris Cedex, France, - Author: danelian@ccr.jussieu.fr - 2Institute of Geological Sciences, National Academy of Sciences of Armenia, 24a Baghramian avenue, Yerevan, 375019 Armenia - 3Université de Nice-Sophia Antipolis, CNRS-UMR Géosciences AZUR, Parc Valrose, 28 Avenue de Valrose, 06108 Nice Cedex 2, France

A suture zone and rests of the Neotethys oceanic crust are preserved in the Lesser Caucasus. The ophiolitic units correspond to the Sevan-Akera zone in Armenia. Radiolarian biochronology of radiolarites overlying ancient oceanic crust preserved in Armenia is of much importance for our understanding of the geodynamic evolution of the greater area between Eurasia and the South-Armenian Block (a microplate) that originated from Gondwana. We here present radiolarian ages for radiolarites associated with ophiolitic volcanic rocks from three ophiolite units in Armenia: Stepanavan (in the northern part of the country), Sevan (east of lake Sevan) and Vedi (situated about 80 Km southeast of Yerevan).

Considered as the northward extension of the Sevan-Akera ophiolitic zone, the Stepanavan ophiolite appears to represent an eastern extension of the Anatolian or Izmir-Ankara-Erzincan ophiolitic suture zone. According to previous works and new structural field observations and cartography south-west of Stepanavan a blueschists unit appears in small
(~2 km²-scale) tectonic windows below epidote-amphibolite facies meta-ophiolites. The latter constitutes the tectonic sole of an unmetamorphosed ophiolitic suite covered unconformably by brown siltstones and limestones.

The ophiolitic sequence is formed by serpentinitized peridotites (lherzolites, wehrlites and websterites) cross-cut by small (100 m-large) intrusive bodies, the composition of which evolved from wehrlites to laminated gabbros and plagiogranites. It is likely that these deep plutonic parts were exposed on the sea-floor and consequently hydrothermalized (occurrence of “listwenites”). They are unconformably overlain by doleritic pillow lavas and radiolarites. One of the two studied chert samples yielded a moderately well-preserved radiolarian assemblage, following successive leaching with low concentration (4%) hydrofluoric acid. The assemblage can be correlated with the Late Jurassic Unitary Association Zones (U.A.Z.) 9 to 11 (mid/late Oxfordian to late Kimmeridgian/early Tithonian) of the biozonation by Baumgartner et al. (1995). This is based on the co-occurrence of species *Ristola altissima* (Rüst) s.l., *Cinguloturris carpatica* Dumitrica and *Podocapsa amphitreptera* Foreman.

The studied outcrop of the **Sevan ophiolite** is situated near the northeastern coast of lake Sevan. Approximately 3 metres of radiolarites crop out above spilitic lavas, which are associated with gabbros and plagiogranites. Moderately well preserved Radiolaria were obtained, including species *P. amphitreptera* and *Archaeodictyomitra excellens* (Tan), allowing correlation of the assemblage with the U.A.Z. 11-18 (upper Kimmeridgian-Valanginian). The probable presence of *Ristola cretacea* (Baumgartner) suggests that these radiolarites may be of slightly younger age than at Stepanavan.

The **ophiolitic sequence of Vedi** is composed of serpentinites, gabbros and a thick pile of massive and pillowed lava flows and their sedimentary cover. The latter consists mainly of red and brown radiolarites, but in some areas pelagic limestones are also present, in which rare Ammonites, of Callovian-Oxfordian and Tithonian-Berriasian age, have been reported. Lavas consist of alkaline and tholeiitic basalts and subordinate trachyandesites. The ophiolitic rocks are weakly deformed, including some shear zones formed in greenschist facies metamorphic conditions. They occur within a folded klippe sequence that was thrust over a Lower Coniacian sedimentary melange reworking the ophiolites and deposited above Cenomanian-Turonian shallow water carbonate series of the South Armenian Block.

The studied outcrop is situated at the southern part of the Vedi ophiolitic unit, along the country road running parallel to the river Vedi, where three intervals of red-brownish carbonate-free radiolarites are intercalated between lavas. Radiolaria extracted from the upper and lower radiolite intervals yielded two distinct Middle Jurassic assemblages, typical of the Tethyan tropical bioprovince. The late Bajocian assemblage (U.A.Z. 4) is well-preserved, dominated by Nassellaria and characterized by the presence of species *Unuma echinatus* Ichikawa & Yao, *Cyrtocapsa mastoidea* Yao, *Gongylothorax oblongus* Yao and *Trilocapsa plicarum plicarum* Yao. The middle Bathonian-lower Callovian assemblage (U.A.Z. 6-7) is less well-preserved and contains species *Transshuum hisukyoense* (Isozaki & Matsuda) and *Stylocapsa catenarum* Matsuoka.

In conclusion, our data provide firm evidence for Middle and Upper Jurassic (and possibly Lower Cretaceous) submarine volcanic activity in the Lesser Caucasus branch of Neotethys ocean. This volcanic activity is considered to be related with the development of a slow spreading oceanic ridge that was formed in a back arc position (see Rolland et al. and Sossou et al. in this issue).