

**PETROLOGICAL CLASSIFICATION OF REDEPOSITED RED SILICICLASTIC
SEDIMENTS FROM THE MIOCENE CONGLOMERATE SEQUENCE
OF THE WESTERN MECSEK MTS. (HUNGARY) – PRELIMINARY RESULTS**

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Abstract: In this study, the mineralogical and petrographic characteristics of pebbles and cobbles of recycled red siliciclastic rocks from the Miocene Szászvár Formation have been investigated to determine the provenance of these rocks. Five major categories of these sediments can be distinguished. The Lower Permian Korpád Sandstone F., the Upper Permian Kővágószőlős Sandstone F. and the Lower Triassic Jakabhegy Sandstone F. were identified by petrographic method from the redeposited rocks.

Key words: petrography, provenance, red sandstones, Late Carboniferous–Early Triassic, S Hungary

The Miocene conglomerate sequence called Szászvár Formation occurs in large territory of the Western Mecsek Mountains (Tisza Unit, S Transdanubia, Hungary). The most frequent types of pebbles and cobbles of this conglomerate are Mesozoic limestones, different granitoides, Palaeozoic rhyolite varieties, metamorphic rocks (gneisses, micaschists, phyllites) and clastic sedimentary rocks. Redeposited siliciclastic sediments consist of grey-coloured silstones, sandstones and conglomerates (Upper Carboniferous), and red clastic sedimentary rocks of different origin (Szakmány and Józsa 1994).

In this study, the mineralogical and petrographic characteristics of pebbles and cobbles of red siliciclastic rocks from the Szászvár Formation have been investigated to determine the provenance of these rocks.

In the territory of the Southern Transdanubia, the potential source formations of recycled red clastic sedimentary rocks belong to the Upper Carboniferous – Lower Triassic siliciclastic sequence. The Carboniferous and Permian formations are relatively subordinate in areal extent, but they have a great thickness. On the surface, the Upper Carboniferous rocks are not exposed in the area studied. On the other hand, the Permian crops out in the Western Mecsek Mountains only. Its cover

is the Lower Triassic Jakabhegy Sandstone, which entirely covered the Permian and, spreading over an even larger area, deposited directly onto the crystalline basement.

As a result of recent stratigraphical research, the possible source rocks of the recycled red sediments can be divided into seven lithostratigraphical formations:

1) Turony Formation (Upper Devonian? – Lower Permian?) is composed of violet- brown sericitic, foliated or thin-bedded fine grained sandstones, siltstones and claystones (Barabás and Barabás-Stuhl 1998).

2) Téseny Sandstone Formation (Upper Carboniferous) is an unstratified, or poorly stratified cyclic sequence consisting of the alternation of grey conglomerate, sandstone, siltstone and shale. Locally, the upper part of this formation is formed of red siltstones and litharenitic sandstones. Lithologically, they consist of poly- and monocrystalline quartz grains, metamorphic rock fragments and minor amounts of plagioclase and volcanic grains (Varga et al. 2001).

3) The fining-upward sequence of Korpád Sandstone Formation (Lower Permian) is composed of red siltstones, sandstones and conglomerates. In the upper part there are bioturbated siltstone and claystone beds with carbonate concretions. The clast lithologies of the conglomeratic beds can be grouped in two main classes: magmatic and metamorphic rocks. The magmatic class includes granitic pebbles and andesite–dacite–rhyodacite–(rhyolite?) volcanics, whereas the metamorphic one includes mainly plagioclase-gneiss fragments. The sandstones of this formation are composed of mono- and polycrystalline quartz grains, feldspars (more plagioclase than K-feldspar), and granitoid, volcanic, metamorphic and siliciclastic rock fragments (Fazekas 1987; Barabás and Barabás-Stuhl 1998).

4) Cserdi Formation (Upper Permian) is formed of reddish brown siltstone, sandstone and conglomerate beds. The pebbles are derived mainly from rhyolite and rhyodacite volcanics, less frequently granite or metamorphic rocks. Lithologically, the sandstones consist of mono- and polycrystalline quartz grains, feldspars (more plagioclase than K-feldspar), and granitoid, acidic volcanic, metamorphic and siliciclastic rock fragments (Fazekas 1987; Barabás and Barabás-Stuhl 1998).

5) Boda Aleurolite Formation (Upper Permian) is made up of red aleurolites, claystones and siliceous dolomite marls (Árkai et al. 2000).

6) Kővágószőlős Sandstone Formation (Upper Permian – Lower Triassic) consists of claystones, siltstones, gravelly and arkosic sandstones and conglomerates. These rocks are often cross-bedded. The pebbles are mainly of quartzite and rhyolite. The sandstones contain mono- and polycrystalline quartz grains, feldspars (more K-feldspar than plagioclase), and acidic volcanic, granitoid,

metamorphic and siliciclastic rock fragments (Fazekas 1987; Barabás and Barabás-Stuhl 1998).

7) Jakabhegy Sandstone Formation (Lower Triassic) is made up of red or greyish-red hard conglomerates, pebbly sandstones, pale-red–pale-violet, cross-bedded sandstones and reddish-brown siltstones and sandstones (Fazekas 1987). Dominant grains of sandstones of this formation are quartz fragments. They consist of mono- and polycrystalline quartz grains, K-feldspars and lithic fragments (Barabás and Barabás-Stuhl 1998).

The above described Upper Carboniferous – Lower Triassic siliciclastic succession shows upward increase in quartz and K-feldspar contents and decrease in plagioclase grains and metamorphic rock fragments.

According to our preliminary results, five major categories of pebbles and cobbles of redeposited red siliciclastic rocks from the Miocene conglomerate sequence can be distinguished:

Type I: litharenitic–subarkosic sandstones and fine-grained conglomerates which contain mono- and polycrystalline quartz grains, feldspars (more plagioclase than K-feldspar), andesitic volcanics, granitoid, metamorphic and siliciclastic rock fragments, detrital micas and accessories (tourmaline, zircon, opaque grains). All the samples studied have subangular–angular grains with moderate sorting. Type I sandstones can be interpreted as recycled rocks of the Korpád Sandstone Formation.

Type II: arkosic and subarkosic cross-laminated fine-grained sandstones which contain mono- and polycrystalline quartz grains, feldspars (more K-feldspar than plagioclase), acidic volcanic and metamorphic rock fragments, detrital micas and accessories (angular tourmaline, opaque grains). All the samples studied have subangular–angular grains with moderate or good sorting and locally, quartz cementation. Type II sandstones can be derived from the Kővágószőlős Sandstone Formation.

Type III: quartz-arenites and sub-arkosic sandstones (rarely cross-laminated) which are composed of mono- and polycrystalline quartz grains with admixture of K-feldspars and lithic fragments (acidic volcanics and clastic sedimentary rocks). Moreover, there are a few detrital micas and accessories such as tourmaline (usually greenish brown rounded grains with blue cores), zircon, apatite, rutile and opaque grains. All the samples studied have rounded–subrounded grains with good sorting and quartz cementation. Hematite and/or illite coating around sand grains is

generally observed. Type III sandstones can be interpreted as recycled rocks of the Jakabhegy Sandstone Formation.

Type IV: arkosic, subarkosic and sublitharenitic sandstones which contain mono- and polycrystalline quartz grains, feldspars (both K-feldspar and plagioclase), different types of lithic fragments, detrital micas and accessories. In these sandstones, there are a lot of altered feldspars and pseudomatrix. This type of red sandstones can be derived from the Permian sequence, but we can not determine the source formation of these recycled siliciclastic rocks exactly.

Type V: siltstones and claystones which contain monocrystalline quartz grains, feldspars and detrital muscovites. These rocks include concretions which contain carbonates, chlorites and vermiculites. Based on their petrographic composition, the source rocks of these fine-grained sediments can not be characterized.

For more exact information about the provenance of the redeposited red siliciclastic rocks we plan bulk rock chemical and X-ray diffraction analyses. This work has been supported by National Research Found OTKA No. T 034924.

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