

Excursion to Ukrainian obsidian localities

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(Participants of the Ukrainian tour will receive a more detailed field guide on spot)

Obsidian from Rokosovo (Rakasz, Transcarpathian Ukraine)

The geological source of the Carpathian 3, i.e. Rokosovo obsidian can be located at the Hust and Irsava districts of Transcarpathian Ukraine between the villages Rokosovo and Maliy Rakovets' (in Hungarian: Rakasz and Kisrákóc). It is part of the Vihorlat-Gutai mountain range at the central part of the Velikiy Sholes mts. (**Map 1.**). The utilisation of the rock for chipped stone artefacts is confirmed by archaeological research for the Lower and Middle Palaeolithic.

The geological environment of the obsidian is outlined on **Map 2.** According to recent radiometric dating of the series (by K-Ar method) obtained on andesite and dacite, the series cannot be younger than Pannonian, dated to 10.61 ± 0.49 Ma (**Pécskay et al., 2000**).

The formation of the obsidian is related to the last acidic phase of the Carpathian Neogene volcanism, that took place in the Pannonian phase of the Miocene period (**Pécskay et al., 2000**). The volcanic activity produced rhyolite, dacite, andesite as well as basalt and their tuffs.

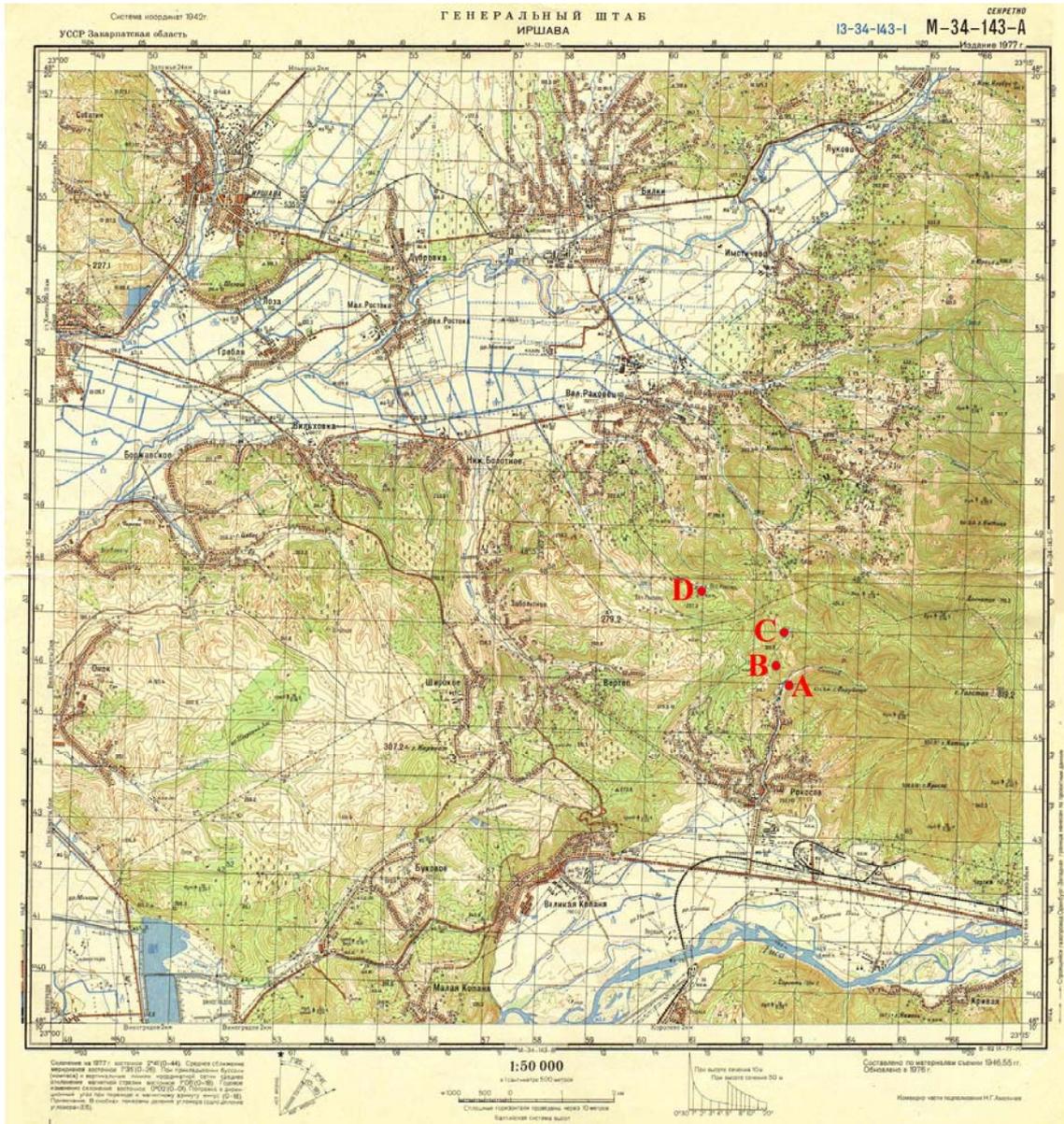
In the times of the formation of the Rokosovo obsidian, the area was covered by a lake where rhyolitic lava gushed in from the eruption centre (**Sobolev et al., 1955**). The quenched lava solidified as volcanic glass, i.e. obsidian. Rhyolitic obsidian occurs in agglomerate tuffs between the two villages (GPS: N48°13'54.0" E23°11'03.4" – N48°13'44.0" E23°11'15.2") in the form of bombs, boulders ranging between a few cm till a few dozen cms. Boulders can be collected West of the road connecting Rokosovo and Maliy Rakovets'. It is often occurring together with blocks of perlite. The natural pieces of obsidian are often accompanied by worked pieces, i.e., artefacts.

Carpathian 3 (C3) obsidian was recently described by **Rosania et al., 2008**. Its detailed description has been the subject of several studies (**Rats, 2009; Rácz, 2012, 2013; Ryzhov, 2014; Suda et al., 2014; Rácz et al., 2016**). Natural pieces of C3 obsidian typically have a light or darker grey weathering crust, with often weathered mineral inclusions. The fresh broken surface is black with glassy lustre, with macroscopically observable mineral inclusions. The fracture of the rock is conchoidal. It is non-transparent, even in thin flakes. Two sub-types can be separated within C3 obsidians, with more or less grey stripes. (**Rácz, 2013**).

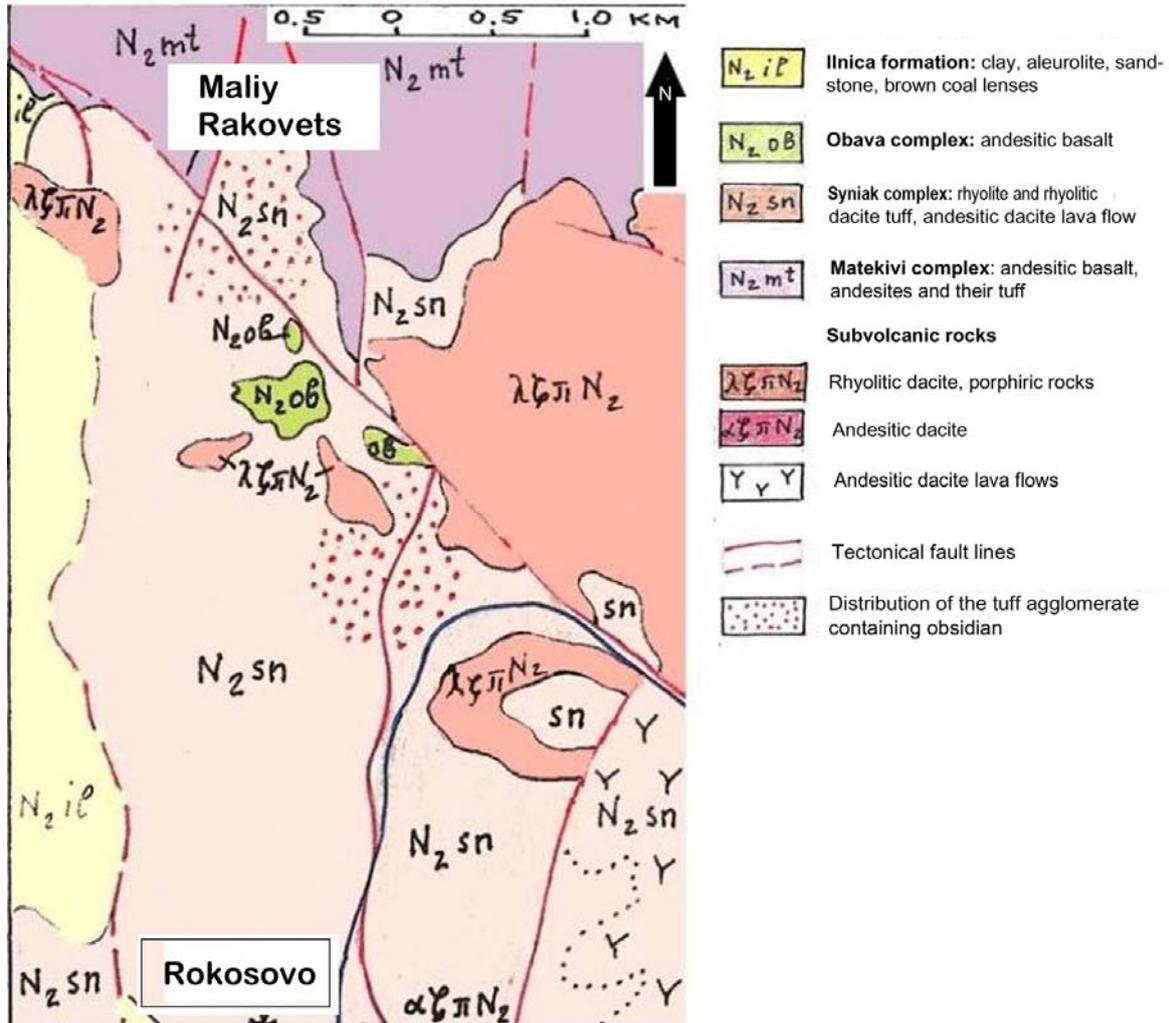
In this section, both varieties have a vitrophyric texture with visible fluidal character. The matrix contains lighter and darker stripes with microliths and phenocrysts often clustered in aggregates. They comprise plagioclase, orthorhombic and monoclinic pyroxene, amphibole and biotite (**Rácz, 2013**).

Apart from petrographical microscopy, the C3 obsidians were investigated by electron microprobe, ICP-OES and ICP-MS as well as Prompt Gamma Activation analysis. Analysis of geological and archaeological obsidians confirmed that they are of the same source.

The archaeological research of the C3 obsidian started with the work of V. F. Petrun' who separated the 'Rokosovo type' from the obsidian of the Tokaj-Prešov mts. (Petrun', 1972). Archaeological excavations were performed only at the settlement Maliy Rakovets IV (**Ryzhov, 1999, 2003; Ryzhov et al., 2009**). More localities are known from surface collections. The collected items were classified as Lower and Middle Palaeolithic.



Map 1.: Topographical map in 1:50 000 scale with planned route of the excursion
 A – Parking possibility to the North of Rokosovo by the stream ‘Falusi-patak’.
 B – Wooded area with eroded surface with collectable C3 obsidian
 C – Road junction to Malij Rakovets tuff quarry and the Tupoj-Mt. – viewpoint
 D – Tuff quarry with stratigraphical sequence.



Map 2.: Simplified geological map of Rokosovo and Maliy Rakovets environs, based on data by **B. Matskiv and V. Kuzovenko (2003)**

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