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Perković, Ivor

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Clay mineralogy and geochemistry of upper Jurassic bauxites and their immediate cover, Istria, Croatia

Ivor Perković¹, Goran Durn¹, Darko Matešić¹

¹Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Zagreb 10000, Croatia



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Introduction and deposit overview

- ◆ The aim of this study was to determine the **mineralogy** and **geochemistry** of the Rovinj deposit (Fig. 1.) and of the clays/marls overlying the deposit
- ◆ Obtained results regarding the mineralogy, of clays especially, and the geochemical variations in the bauxite and overlying clays should allow the **reconstruction of the paleoenvironment and paleoclimate** in which the bauxite and its cover were forming
- ◆ The bauxite in the Rovinj deposit is of Upper Jurassic age,
- ◆ It formed during the emersion which lasted between **3 to 5 Ma**, in the the succession of the **Western Istrian anticline**
- ◆ On a large scale, the anticline is a part of the **Adriatic carbonate platform**
- ◆ The Rovinj deposit is the **only open bauxite mine in Croatia**
- ◆ The size of the deposit is estimated to be larger than 15 Mt, making it **one of the largest bauxite deposits in Croatia**

Figure 1. Rovinj bauxite deposit

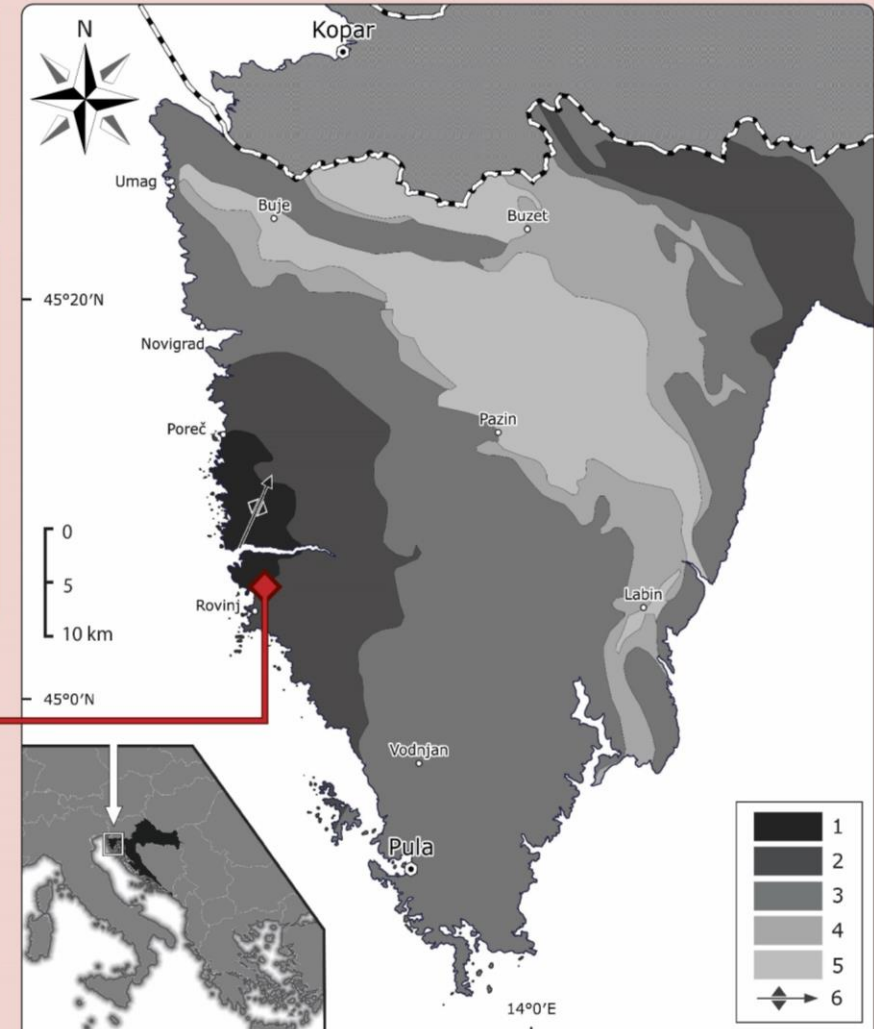


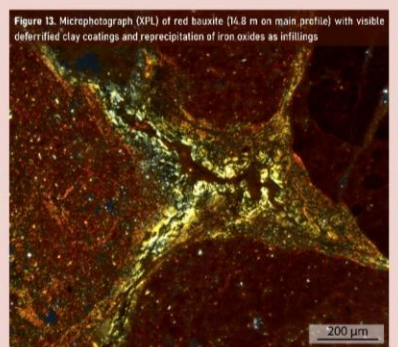
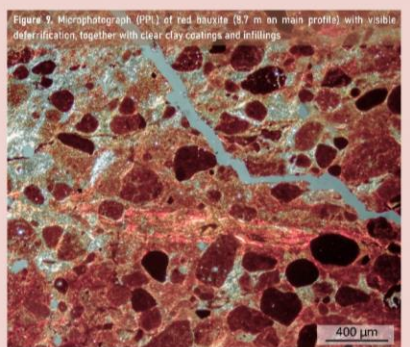
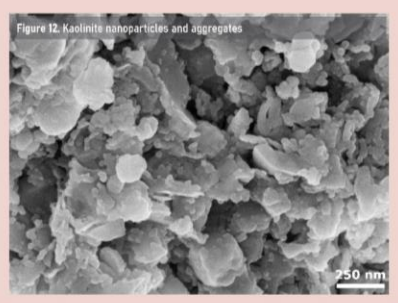
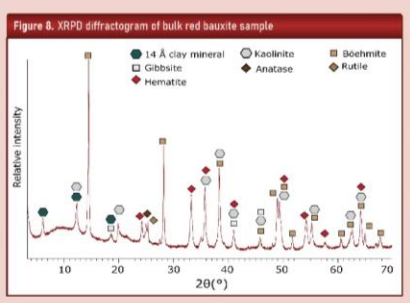
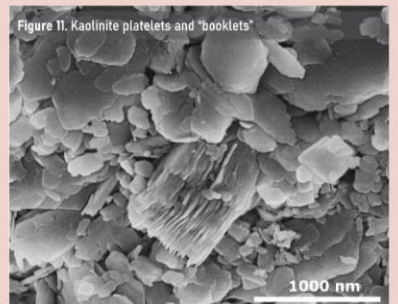
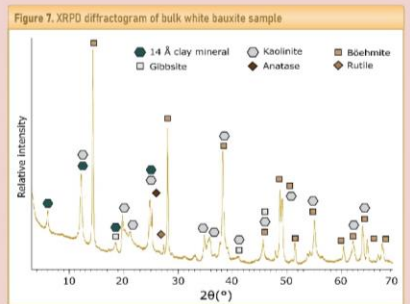
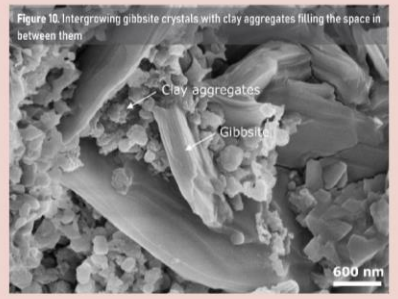
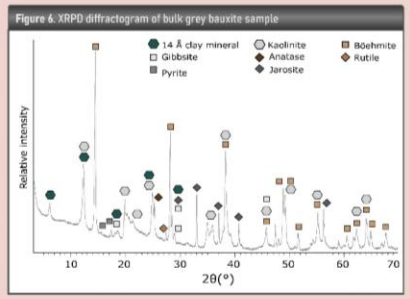
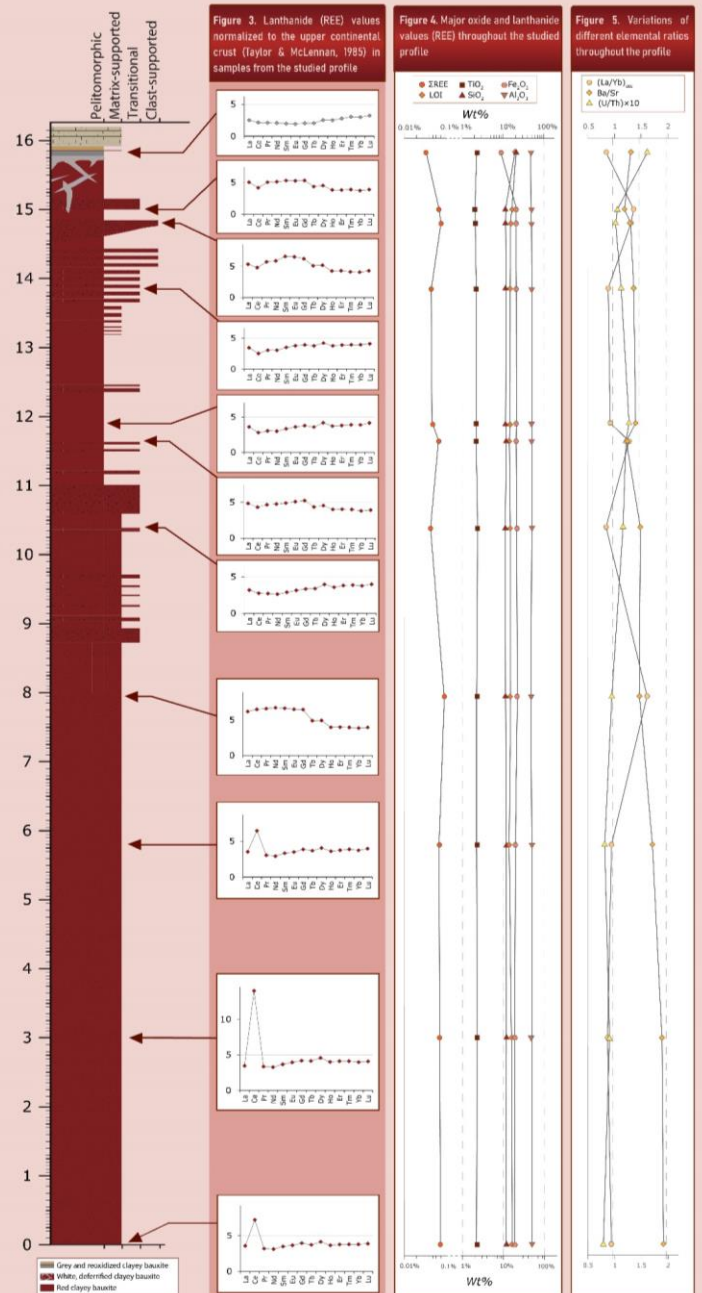
Figure 2. Simplified geological map of Istria modified after Velić (1995). 1 - 1st megasequence (Jurassic), 2 - 2nd megasequence (Lower Cretaceous), 3 - 3rd megasequence (Upper Cretaceous), 4 - 4th megasequence (Lower Eocene), 5 - 4th megasequence (Middle to Upper Eocene), 6 - Western Istrian anticline

Methods

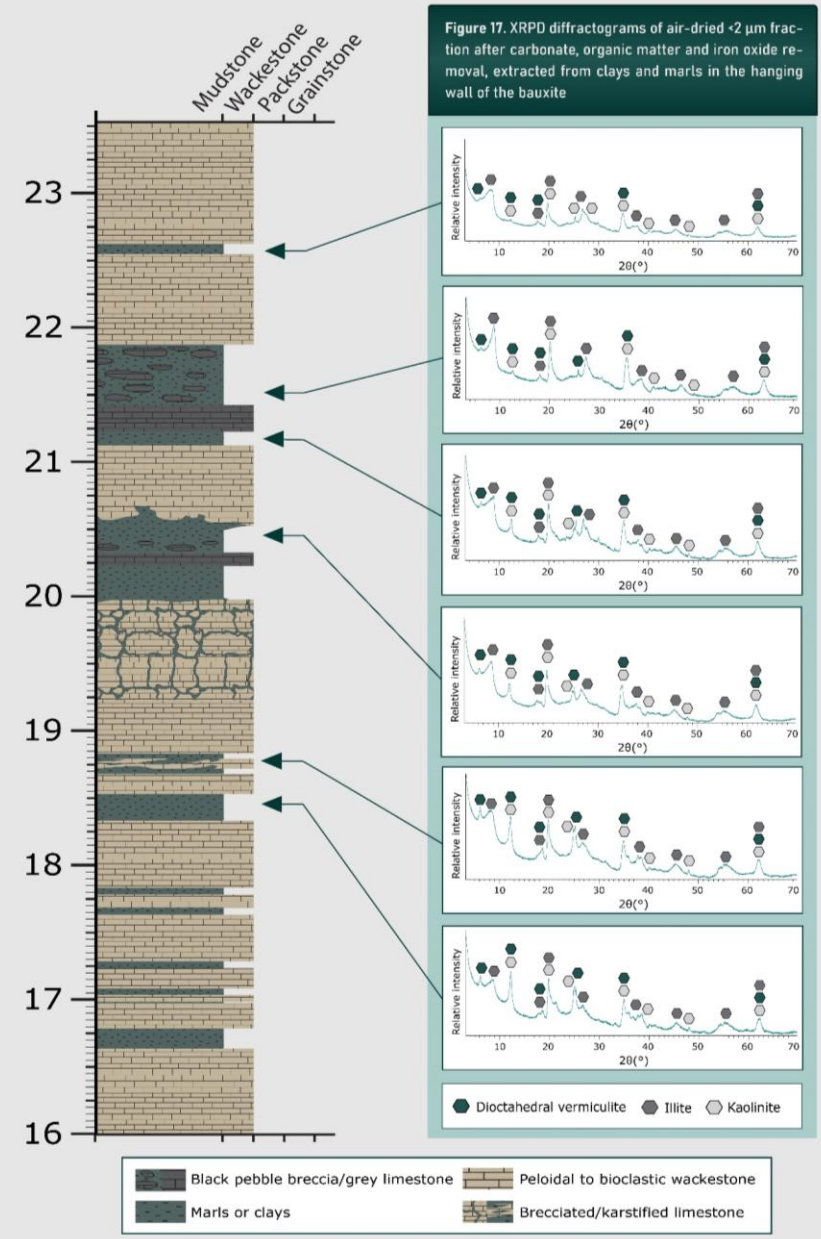
- ◆ Samples were collected from the selected profile on the bauxite outcrop
- ◆ In this research, data for 11 bauxite samples and 6 clays/marls is shown
- ◆ On bauxite samples, several analytical methods have been performed:
 - ◇ **XRPD** on bulk samples
 - ◇ **XRF**
 - ◇ **ICP-MS**
 - ◇ **SEM-EDS**
 - ◇ **Petrography**
 - ◇ **Micropedology** according to Stoops (2021.)

- ◆ On clay/marl samples only **XRPD** of bulk and <2 μm fraction was performed
- ◆ the <2 μm was extracted through gravitational separation after the removal of carbonates, organic matter and iron oxides
- ◆ **XRPD** patterns of non-oriented <2 μm fraction samples were taken after the following treatments:
 - ◇ **Air-drying**
 - ◇ **Ethylen glycol** solvation
 - ◇ **Glycerol** solvation
 - ◇ Dissolution in **1:1 HCl**
 - ◇ Heating to **550°C**

Rovinj bauxite profile



Bauxite cover succession





Thank you for your attention!

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