




Article

A Geophysical-Geochemical Approach to the Study of the Paleogene Julian—Slovenian Basin “Megabeds” (Southern Alps—Northwestern Dinarides, Italy/Slovenia)

Kei Ogata ^{1,*}, Željko Pogačnik ², Giorgio Tunis ³, Gian Andrea Pini ³, Andrea Festa ⁴ and Kim Senger ⁵

¹ Faculty of Science, Vrije Universiteit, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands

² Georudeko, Geologija, Rudarjenje in Ekologija, (Private Limited Liability Company: Društvo sa Ograničenom Odgovornostću; D.O.O.), Anhovo 1, 5210 Deskle, Slovenia; zeljko.pogacnik@georudeko.si

³ Dipartimento di Matematica e Geoscienze, Università di Trieste, Via Weiss 2, 34100 Trieste, Italy; 2giorgio28@gmail.com (G.T.); gpini@units.it (G.A.P.)

⁴ Dipartimento di Scienze della Terra, Università di Torino, Via Valperga Caluso 35, 10125 Torino, Italy; andrea.festa@unito.it

⁵ Department of Arctic Geology, University Centre in Svalbard, P.O. Box 156, N—9171 Longyearbyen, Norway; kim.senger@unis.no

* Correspondence: k.ogata@vu.nl

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Abstract: The Paleogene “megabeds” of the Julian-Slovenian Basin are regional, basin-wide deposits, produced by catastrophic carbonate platform collapses. They record the emplacement of a bipartite slide mass behaving as a cohesive blocky/debris flow in the lower part, and as a grain to turbulent flow in the upper part. Several types of primary (sedimentary) soft sediment deformation structures testify fluid overpressure conditions during emplacement. Such structures are identified within a brecciated, fine grained matrix that encloses and intrudes slide blocks and clasts, characterized by NE-, NW- and SW-directed paleo-transport directions, indicating a depositional setting close to the basin margins. Here we present an updated review of some representative megabeds, exposed in the open-pit quarry outcrops of Anhovo (SW Slovenia). In particular, we here discuss new interpretations based on X-ray fluorescence spectrometry (XRF), thermo-gravimetry (TG) and electric resistivity tomography (ERT). Our results indicate that basal marly clasts of the megabeds are markedly different from the uppermost draping marls, suggesting two different coeval sources. The relationships with the underlying successions are strongly erosive, with deep localized scouring of the substrate and amalgamations between different megabeds, and the depositional units inside individual megabeds, supporting the geochemical differences.

Keywords: carbonate mass transport deposits; megabreccias; geoelectric profiling; geochemical fingerprinting

1. Introduction

The Paleogene carbonate “megabeds” or “megabreccias” of eastern Friuli (Italy) and western Slovenia are very thick (up to 260 m) and laterally extensive (up to 50 km wide) composite stratigraphic units that originated from the simultaneous accumulation of multi-sized carbonate debris from repeated catastrophic submarine landslide events [1,2]. These ancient mass transport deposits, identified in literature as sedimentary mélanges and olistostromes [3,4], testify that large