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New sedimentological data from Triassic to Jurassic boreholes and sections from Southern Belgium and Luxembourg

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New sedimentological data from Triassic to Jurassic boreholes
(Bonnert, Haebicht, Grouft, Grund, Consdorf)
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from Southern Belgium and Luxembourg

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NEW SEDIMENTOLOGICAL DATA FROM TRIASSIC TO JURASSIC BOREHOLES (BONNERT, HAEBICHT, GROUFT, GRUND, CONSDORF) AND SECTIONS (TONTELANGE, DIFFERDANGE, RUMELANGE) FROM SOUTHERN BELGIUM AND LUXEMBOURG

by Frédéric BOULVAIN¹, Isabelle BELANGER², Robert COLBACH³, Sylvain DECHAMPS¹, Dominique DELSATE⁴, David DELIGNY¹, Pierre GHYSEL², Jonathan MICHEL^{1,5}, Simon PHILIPPO⁴ & Benjamin RAMLOT¹

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Abstract

This study offers a detailed description of a series of Triassic to Jurassic representative boreholes (Bonnert, Haebicht, Grouft, Grund, Consdorf) and sections (Tontelange, Differdange, Rumelange) from southern Belgium and the Grand-Duchy of Luxembourg. Investigations provide information about microfacies, paleoenvironments and magnetic susceptibility (MS). Three sets of microfacies, corresponding to three different sedimentary systems were needed in order to address the complexity of the paleoenvironments: a transgressive mixed siliciclastic-carbonate ramp system for the Triassic to Lower Jurassic (Toarcian) interval (microfacies TT1-8), and, for the Middle Jurassic, an early transgressive low productivity mixed ramp system for the Aalenian (microfacies A1-2) and a transgressive carbonate ramp for the Lower Bajocian (microfacies B1-3). A comparison of the MS and microfacies curves shows a clear correlation between the two, suggesting that the MS signal is primary. Moreover, the MS values regularly decrease from the marine distal (TT1) to the marine proximal microfacies (TT5), with relatively weak mean MS values for sandstones and limestones, and high mean MS values for marls, argillites and ironstone. This relationship is interpreted as the consequence of local water agitation in the shallower parts of a ramp, preventing the detrital particles from settling down and to the higher sedimentation rate that dilutes the magnetic and/or paramagnetic minerals.

Keywords: Microfacies, magnetic susceptibility, paleogeography, Triassic, Jurassic, Belgium, Luxembourg.

1. Introduction

This work follows up previous professional papers dedicated to major boreholes in Belgian Lorraine, the Latour borehole (Boulvain & Monteyne 1993, revised by Boulvain *et al.* 1995), the Neulimont, Aubange, Saint-Mard and Toernich boreholes (Boulvain *et al.* 1995), and the Villers-devant-Orval borehole (Boulvain *et al.* 1996). These studies, together with data resulting from the ongoing geological mapping project for Wallonia (Belanger *et al.* 2002; Ghysel *et al.* 2002; Belanger 2006a-b; Ghysel & Belanger 2006), led to a synthesis formalized by a new lithostratigraphical scheme for Belgian Lorraine (Boulvain *et al.* 2001a-b). Besides stratigraphical data, the borehole survey provided

results for petrography, clay mineralogy, palynology and paleontology (Boulvain *et al.* 2001a).

The purpose of the current work is to present new data from a series of boreholes (Bonnert, Haebicht, Grouft, Grund, Consdorf) and sections (Tontelange, Differdange, Rumelange) representative of the Triassic to Jurassic of southern Belgium and Grand-Duchy of Luxembourg (fig. 1). Data include lithology, petrography, microfacies, paleoenvironments and magnetic susceptibility (MS). Two types of graphics are used: a detailed bed-by-bed description of lithology, fossils, sedimentary structures and sample position (scale 1/20 or 1/50), and a synthesis log (scale 1/400) for lithostratigraphy, chronostratigraphy, petrography, lithofacies,

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