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ABSTRACT VOLUME

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The uppermost Famennian Hangenberg Event in the Namur–Dinant Basin (southern Belgium)

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The uppermost Famennian succession of southern Belgium consists of a relatively thick series of shallow water siliciclastic-carbonate deposits, which locally include stromatoporoid biostromes. This thick series permits a better understanding of the Famennian and Tournaisian transition than the condensed basinal sections, which are investigated usually. However, difficulties are encountered for the precise dating of the sections on the basis of the conodonts as the current guide (*Siphonodella sulcata*) for the Devonian–Carboniferous (D–C) boundary has never been discovered in southern Belgium. Consequently, in this area, the D–C boundary was drawn on the basis of conodonts of the *praesulcata* Zone and the extinction of the so-called Devonian fauna (e.g. quasiendothyrid foraminifers and 'Strunian' rugose corals) (CONIL et al., 1986; POTY et al., 2014).

In the Namur-Dinant Basin, the Hangenberg Black Shale Event (e.g. KAISER et al., 2011) is generally not marked lithologically, as is the case in the Anseremme section, which is the neostratotype of the base of the Hastarian Substage (HANCE & POTY, 2006). This absence was interpreted by MAZIANE et al. (1999) as a stratigraphic gap on the basis of the non-recognition of the LN spore Zone but these anoxic facies, corresponding to a high sea-level event, more probably never spread or only exceptionally into the shallow-water environments of the Namur-Dinant Basin, where carbonate facies rich in benthic fossils continued to develop. Indeed, few sections (e.g. Pont de Scay) show dm to m-thick black shale horizons with impoverished marine faunas in the uppermost part of the Comblain-au-Pont Formation (Strunian) which can be considered as inputs of dysoxic–anoxic waters from deeper areas where Hangenberg Shale developed. Contrarily, the following Hangenberg Sandstone Event, which most probably reflects a strong sea-level drop, is easily recognizable and traceable from the Aachen (Germany) to the Dinant areas. In the Stolberg section near Aachen (POTY, 1986), in the proximal Vesdre-Aachen sedimentation area, a 2-m thick sandstone–siltstone bed, corresponding to the Hangenberg Sandstone Event, sharply overlies argillaceous to more or less dolomitized limestones (Dolhain Formation) which include numerous Strunian rugose corals and stromatoporoids. It is overlain by a 5-m thick massive unit of dolomitized limestone that is correlated with the Hastière Formation, a well-known lithostratigraphic unit from the Belgian Condroz (CSA) and Dinant sedimentation areas. Here, except for some bioturbations, no marine fauna was recorded in the sandstone bed and therefore the extinction event occurred between it and the underlain deposits.

In the Royseux section (CONIL et al., 1986) (CSA), a 80 cm-thick calcareous sandstone bed (bed 104) is correlated with the Hangenberg Sandstone. It includes several horizons rich in dissociated valves of brachiopods, notably the Strunian guides *Sphenospira julii* and *Araratella moresnetensis*, which are interpreted as freshly reworked material (corals are almost completely absent in the underlying Strunian part of the section).

In the Anseremme and Gendron-Celles railway sections, situated in the more distal Dinant sedimentation area, the 2 m-thick limestone bed marking the base of the Hastière Formation sharply overlies the limestone and shale alternations of the Strunian Comblain-au-Pont Formation that are rich in foraminifers (*Quasiendothyra*), rugose corals and stromatoporoids. Its base contains reworked *Quasienthothyra* and rugose corals (*Campophyllum gosseleti*).

Therefore, in the Namur-Dinant Basin, the extinction event perfectly fits the sudden sea-level drop reflected by the deposition of sandstone and more or less sandy limestone, but not the development of black shale facies as usually observed in deeper water settings and absent here. This sea-level drop and the extinction event may be related to a single short ice-age as suggested by some authors (e.g. BREZINSKI et al., 2010). The diachronic Hangenberg Black Shale (corresponding to the whole of the Middle *praesulcata* Zone or only to a thin bed of short duration) caused only local, but not definitive, extinctions, as was also the case with the diachronic development of the Upper Frasnian dysoxic–

anoxic Matagne Black Shale, whose range spans the interval of the Early *rhenana* Zone to the *linguiformis* Zone, and caused local extinctions before the end Frasnian Upper Kelwasser Event.

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