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Transect from near- to offshore in Devonian-Carboniferous Boundary sections of the stratotype area (Montagne Noire, Southern France)

Raimund FEIST¹, Jean-Jacques CORNÉE², Carlo CORRADINI³, Sven HARTENFELS⁴, Markus ARETZ⁵ & Catherine GIRARD¹

¹ISEM, UMR 5554, CNRS, IRD, Université Montpellier, Montpellier, France, raimund.feist@umontpellier.fr, Catherine.Girard@umontpellier.fr

²Géosciences Montpellier, CNRS-Université de Montpellier-Université des Antilles, Pointe à Pitre, (FWI), France, jean-jacques.cornee@gm.univ-montp2.fr

³Dipartimento di Scienze Chimiche e Geologiche, Università di Cagliari, via Trentino 51, 09127 Cagliari, Italy, corradin@unica.it

⁴University of Cologne, Institute of Geology and Mineralogy, Zùlpicher Str. 49a, 50674 Cologne, Germany, shartenf@uni-koeln.de

⁵Université Paul Sabatier, Géosciences Environnement Toulouse (OMP), 14 Avenue Edouard Belin, 31400 Toulouse, France, markus.aretz@get.omp.eu

The Montagne Noire offers the unique opportunity to compare and potentially correlate distal basinal settings with contemporaneous near-shore carbonate deposits across the Devonian-Carboniferous Boundary that allow to build a virtual transect from shoreline to deep basin. Nearshore facies characterise the D-C Boundary stratotype and neighbouring sections at La Serre in the Cabrières klippen domain and offshore facies are present at the Col de Tribes and Puech de la Suque sections in the Mont Peyroux nappe domain. Both domains exhibit equivalents of the Hangenberg Black Shale (HBS). At La Serre, an initial regressive trend is indicated by the presence of oculated trilobites in the topmost pre-HBS *Wocklumeria* Limestones. Above the HBS level, regressive depositional conditions characterise oolitic deposits that comprise lithic erosional flows with an admixture of transported shallow-water biota. Maximum regression is recognised with the deposition of coarse breccias and local features of emergence prior to the first appearance of *Protognathodus kockeli*. The oolites are superseded by the transgression of outer shelf deposits. In the nappe domain, the HBS is intercalated in outer ramp nodular limestones, and it exhibits detrital elements pointing to its regressive nature. Thin-sections and X-ray analysis of the silty greyish to black shales, devoid of carbonates, reveal the presence of detrital quartz and muscovite grains that make up to 80 % of the whole rock as well as berlinite grains, a high temperature mineral. The allochthonous origin of the sand indicates erosion of distant emergent areas and emphasises the regressive nature of this level. Using the maximum and minimum amounts of quartz and muscovite (easily transportable), two minor regressive/transgressive cycles can be interpreted from Beds PS 89 to HJt1 (Fig. 1). The regressive trend culminates, then reverses when post-HBS carbonate sedimentation resumes. *Protognathodus kockeli* appears in the post HBS carbonates. Associated oculated trilobites indicate shallower bathymetric conditions than those of the pre-HBS *Wocklumeria* Limestones. Thereafter, replacement of sighted trilobites by blind ones and the protognathodid biofacies by facies dominated by siphonodellids indicate a deepening trend. The near- and offshore sites of the D-C transition permit correlation of short-term bathymetric fluctuations with faunal turnovers and entries of biostratigraphic markers.

The D-C Boundary sections of the Montagne Noire emphasise the importance of the Hangenberg Event affecting marine biota in both near- and offshore domains. As in the Rhenish Slate Mountains and Carnic Alps for example, the biotic turnover is particularly marked in the outer shelf domain; it seems the same in the nearshore domain of La Serre, though the evidence is obscured by reworking processes during deposition of detrital input. As elsewhere, the Hangenberg Event in the Montagne Noire is characterised mainly by eustatic perturbations, notably regressive trends in the topmost *Wocklumeria* Limestones and during the HBS, followed up by a global transgression above. Among level-bottom biota with light receptors, trilobites are most sensitive to changing conditions in the degree of light penetration to their habitats. With the onset of the HBS regression they lost all lower-rank taxa (genera and species) and none of them survived the crisis.

The taxonomic origination rate following the HBS/HSS regression in both domains is outstanding. As such, the position of the D-C Boundary at the base of the post-event transgression is favoured, as it coincides with a marked faunal overturn that permits tracing a time-line from shore to offshore domains.

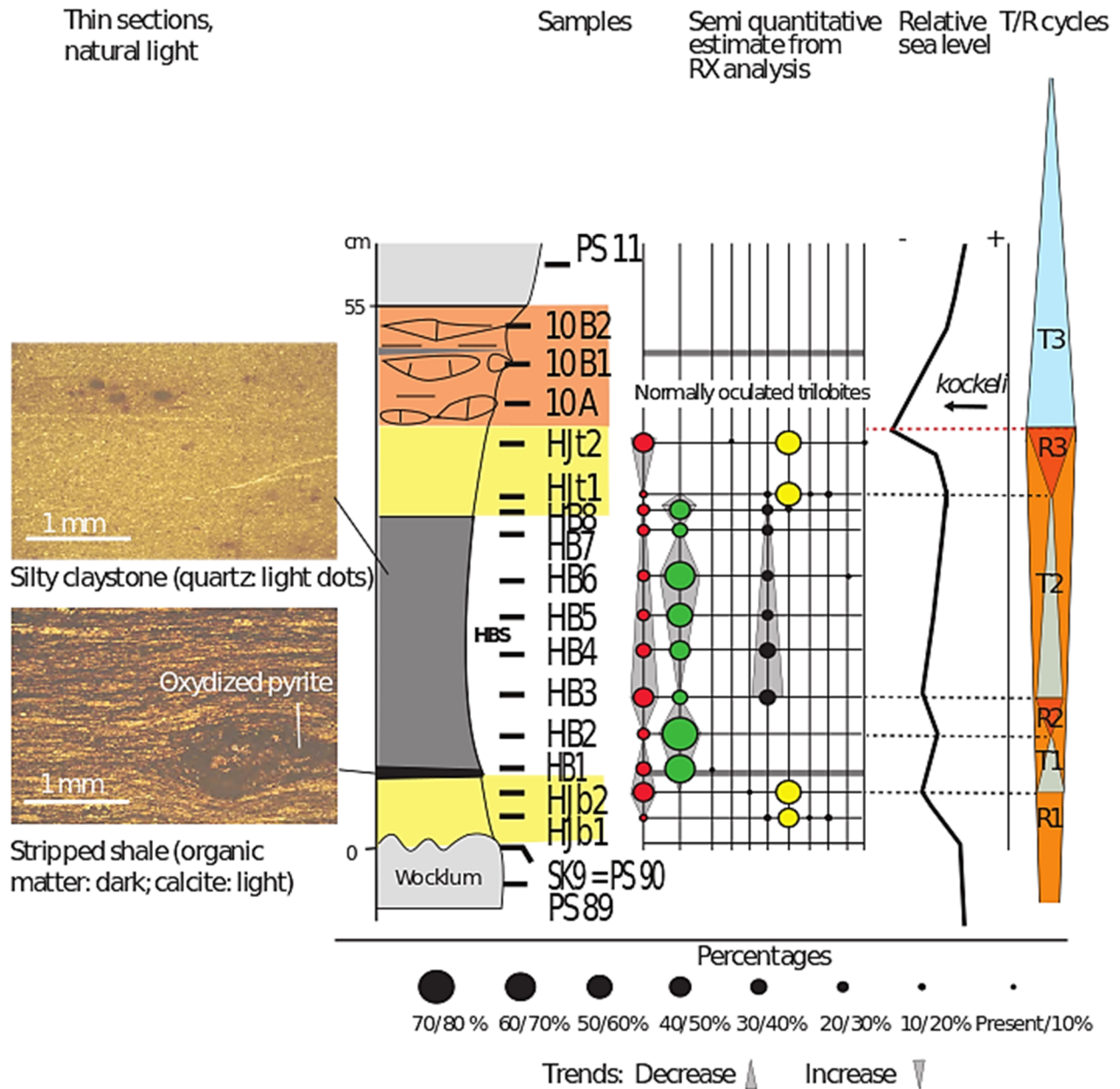


Fig. 1: X-ray analysis of the Hangenberg Black Shale (HBS) equivalent at Puech de la Suque section. The undulated surface at top of bed PS90 is locally coated by iron hydroxides. This surface probably results in post-depositional fluid circulations and dissolutions because of contrasting lithologies (limestones/shales) in the inverted and compacted succession. T/R: transgression/regression. HBS: Hangenberg Black Shale equivalent.

FEIST, R. CORNÉE, J.-J., CORRADINI, C., HARTENFELS, S., ARETZ, M. & GIRARD, C. (in review): The Devonian-Carboniferous boundary in the stratotype area (SE Montagne Noire, France). - In: ARETZ, M. & CORRADINI, C. (Eds.), Global review of the Devonian-Carboniferous Boundary. - Palaeoenvironments and Palaeobiodiversity.