

IMPACTITES AND RELATED LITHOLOGIES IN GERMANY – CURRENT STATE OF KNOWLEDGE

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Background: Germany, as the country of the Nördlinger Ries and pioneer impact studies [1], is of particular significance to impact research. The ~24 km and ~14.6 Ma Ries crater and the ~3.8 km Steinheim Basin in S Germany, both associated with a full suite of proximal impact ejecta (i.e., lithic impact breccias, suevites, and impact melt rocks), count among the best preserved impact structures on Earth [2;3]. Distal Ries ejecta comprise the Central European tektite ('moldavite') strewn field, parts of which extend into Lusatia/Saxony [4], as well as the 'Brockhorizont' layer in Bavaria and Baden-Württemberg [5]. Apart from the Ries and Steinheim craters, some enigmatic structures have been proposed to be of impact origin [6-10], however, all of these geologic features currently lack evidence for shock metamorphism and/or meteoritic matter as proof for impact.

New Discoveries: Fluidal, schlieren-rich, and vesicular silicatic glass containing abundant Fe-Ni spheres and ballen-textured α -cristobalite was recently discovered (W.M.) near Nalbach in the Saarland. The petrography and geochemistry of the glass revealed a striking resemblance to the Wabar impact glass found in Saudi Arabia and support a likely impact origin of the Nalbach glass [11;12].

Erratic boulders and cobbles of Fennoscandian impact melt rocks were found (L.F.) in Pleistocene glacial till near Sieversdorf and Braak in Schleswig-Holstein, as well as from the Baltic Sea coast near Sassnitz on Rügen Island, Mecklenburg-Western Pomerania. Shock petrographic investigations suggest that these rocks were glacially transported over distances of up to ~800 km from the ~19 km Dellen and ~9 km Mien impact structures, Sweden, as their source craters [13;14].

Magnetic Fe-Ni and silicatic spherules were reported from Neogene (Miocene) cave sediments of the Swabian Alb, Baden-Württemberg [15], which might suggest a link to the Ries-Steinheim event; similar magnetic spherules were found in Eocene-Oligocene clays in Hesse [16]. It will be worthwhile undertaking a first focused search for distal ejecta produced by large Paleozoic to Cenozoic terrestrial impacts in the German sedimentary record.

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