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MAGNETIC STRATIGRAPHY IN THE AUSTRIAN MIOCENE

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For Mesozoic to Quaternary times, the geomagnetic polarity record is central to the construction of geologic time scales, linking biostratigraphies, isotope stratigraphies and absolute ages (Opdyke & Channel, 1996). Changes of the polarity of the earth's magnetic field are world wide phenomena, enabling correlation and dating of geological material (Berggren et al., 1995). Global databases have been produced in paleomagnetism which have yielded significant benefits in providing coherent compilations of data related to plate motions and long-term geomagnetic field behaviour (McElhinny & Lock, 1990) and behaviour of the geomagnetic field during polarity reversals (Athanassopoulos et al., 1993). The strength of correlation of an observed magnetic polarity zonation to the GPTS depends on several factors including the quality of paleomagnetic data used to define the polarity of each sampled stratigraphic horizon and uniqueness of matching between the pattern of magnetic polarity zones and the sequence of magnetic polarity chrons of the GPTS.

We established a paleomagnetic database of various sedimentary sections from the Molasse zone and the Vienna-, Styrian- and Lavanttal basins in Austria to improve stratigraphic age determinations where the polarity patterns of the primary magnetizations provided a magnetostratigraphic zonation. Importantly, all investigated sites have been studied by means of other, independent stratigraphic methods at the same time. The success of this FWF research project was dependent on, and made possible by continuos interdisciplinary co-operation with partners from the Institut für Geologie und Paläontologie of the Universität Graz (W. Piller, C. Latal), the Institut für Paläontologie of the Universität Wien (S. Spezzaferri, S. Coric, J. Hohenegger, P. Pervesler) and the Institut für Geologie of the Universität Wien (M. Wagreich) in the frame of an FWF project bundle, as well as the Naturhistorisches Museum Wien (F. Rögl, G. Daxner-Höck) and the Geologische Bundesanstalt (A. Roetzel).

In the Molassezone, samples have been taken from sites in Eberschwang, Rödham, Schanze, Deponie Ort, Hartberg, Loderleiten and Bad Hall (all in the Western Molassezone), and Kuffern, Mailberg, Grund, Laa/Thaya, Goellersdorf, Karlstätten, Limberg, Eggenburg, Großrust, Breitenreich and Obernholz (all Eastern Molassezone). The data base for the Vienna Basin comprises re-processed sites in the Korneuburg Basin (Teiritzberg and Obergänserndorf), and new sites from the Northern Vienna Sub-Basin (Götzendorf, Obersulz, Nexing, Petronell, Siebenhirten, Kleinhadersdorf, Steinebrunn and the Wiener Neustädter Sub-Basin (Richardhof with an extended magnetostratigraphic profile, Leobersdorf and Gainfarn). The Easternmost part of the study area was covered by further sampling sites from the Hainburger Swell in Edelstal, Hundsheim and Deutsch-Altenburg, and the South Burgenland Swell in Sommerein, Waltra, Mannersdorf, Bairisch-Kölldorf, Stixneusiedl and Neusiedl, as well as from the Mattersburger Bucht in St. Margarethen and Rohrbach. Numerous results including magnetostratigraphic sections could be obtained also from the East-Styrian Sub-Basin in the localities Paldau, Münzgraben, Oedt, Neusafenau, Sieglegg, Eisengraben, Pinkafeld, Mitterdormbach, Löffelbach and Willersdorf and from the West-Styrian Sub-Basin in Stieflingtal, Weissenegg, Spielfeld, Lobmingbach, Weitendorf, Retznei, Wetzelsdorfberg, Wetzelsdorf, Lobmingberg, Katzengraben, and Wagna. Additional sites in the Gratkorn Basin (St. Stefan) and Fohnsdorf Basin (Spielberg) were sampled in order to complete the existing dataset of previously published paleomagnetic results from intramontane basins in Austria. As expected, only few localities in the Lavant Valley yielded suitable rocks for our studies. Samples have been taken in Niederhof, Mühldorf and Kollnitz.

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