

Dostal, J., Murphy, J.B., and Shellnutt, J.G., 2019, Secular isotopic variation in lithospheric mantle through the Variscan orogen: Neoproterozoic to Cenozoic magmatism in continental Europe: *Geology*, <https://doi.org/10.1130/G46067.1>

Table DR 1. Sm-Nd isotopic data of the mafic rocks of continental Europe

Table DR 2. References for Nd isotopic data (for Table DR 1)

Abdelfadil, K.M., Romer, R.L., Seifert, T., Lobst, R., 2013. Calc-alkaline lamprophyres from Lusatia (Germany)-evidence for a repeatedly enriched mantle source. *Chemical Geology* 353, 230–245.

Abdelfadil, K.M., Romer, L.R., Glodny, J., 2014. Mantle wedge metasomatism revealed by Li isotopes in orogenic lamprophyres. *Lithos* 196-197, 14-26.

Ackerman L., Špaček P., Magna T., Ulrych J., Svojtka M., Hegner E. and Balogh K. 2013. Alkaline and carbonate-rich melt metasomatism and melting of subcontinental lithospheric mantle: Evidence from mantle xenoliths, NE Bavaria, Bohemian Massif. *Journal of Petrology* 54, 2597-2633.

Alibert, C., 1985. A Sr-Nd isotope and REE study of late Triassic dolerites from the Pyrenees (France) and the Messejana Dyke (Spain and Portugal). *Earth Planetary Science Letters* 73, 81-90.

Alibert, C., Michard, A., Albarede, F. 1983. The transition from alkali basalts to kimberlites: Isotope and trace element evidence from melilitites. *Contributions to Mineralogy and Petrology* 82, 176-186.

Alibert, C., Leterrier, J., Panasiuk, M., Zimmermann, J.L., 1987. Trace and isotope geochemistry of the alkaline Tertiary volcanism in southwestern Poland. *Lithos* 20, 311–321.

Altherr, R., Henes- Klaiber, U., Hegner, E., Satir, M., Langer, C. 1999a. Plutonism in the Variscan Odenwald (Germany): from subduction to collision. *International Journal of Earth Sciences* 88, 422–443.

- Altherr, R., Henjes-Kunst, F., Langer, C., Otto, J. 1999b. Interaction between crustal-derived felsic and mantle-derived mafic magmas in the Oberkirch pluton (European Variscides, Schwarzwald, Germany). *Contributions to Mineralogy and Petrology* 137, 304–322.
- Altherr, R., Holl, A., Hegner, E., Langer, C., Kreuzer, H. 2000. High-potassium, calc-alkaline I-type plutonism in the European Variscides: northern Vosges (France) and northern Schwarzwald (Germany). *Lithos*, 50, 51–73.
- Awdankiewicz, M., 2007. Late Palaeozoic lamprophyres and associated mafic subvolcanic rocks of the Sudetes (SW Poland): petrology, geochemistry and petrogenesis. *Geologia Sudetica* 39, 11–97.
- Awdankiewicz, M., Rapprich, V., Míková, J., 2016. Magmatic evolution of compositionally heterogeneous monogenetic Cenozoic Strzelin volcanic field (Fore-Sudetic Block, SW Poland). *Journal of Geosciences* 61, 425-450.
- Bankwitz, P., Bankwitz, E., Kramer, W., Pin, C. 1994. Early Paleozoic bimodal volcanism in the Vesser area, Thuringian Forest, eastern Germany. *Zbl. Geol. Paläont. Teil I*, 1992, 1113-1132.
- Beard, B.L., Medaris, L.G., Johnson, C.M., Jelínek, E., Tonika, J., Riciputi, L.R., 1995. Geochronology and geochemistry of eclogites from the Mariánské Lázně Complex, Czech Republic: implications for Variscan orogenesis. *Geologische Rundschau* 84, 552–567.
- Ben Othman, D., Fourcade, S., Allegre, C.J. 1984. Recycling processes in granite-granodiorite complex genesis: the Querigut case studied by Nd-Sr isotope systematics. *Earth Planetary Science Letters* 69, 290-300.
- Bendl, J., Vokurka, K., Sundvoll, B., 1993. Strontium and Neodymium isotope study of Bohemian basalts. *Mineralogy and Petrology* 48, 35-45.
- Berger, J., Féménias, O., Ohnenstetter, D., Bruguier, O., Plissart, G., Mercier, J.C.C., Demaiffe, D., 2010. New occurrence of UHP eclogites in Limousin (French Massif Central): age, tectonic setting and fluid–rock interactions. *Lithos* 118, 365–382.
- Bernard-Griffiths, J., Cornichet, J. 1985. Origin of eclogites of South Brittany: A Sm-Nd isotopic and REE study. *Chemical Geology Isotope Section* 52, 185-201.
- Bernard-Griffiths, J., Carpenter, M.S.N., Peucat, J.J., Jahn, B.M. 1986. Geochemical and isotopic characteristics of blueschist facies rocks from the Ile de Groix, Armorician Massif (Northwest France). *Lithos* 19, 235-253.
- Blusztajn, J., Hart, S.R., 1989. Sr, Nd and Pb isotopic character of Tertiary basalts from southwest Poland. *Geochimica et Cosmochimica Acta* 53, 2689-2696.

- Bogaard, P.J.F., Worner, G. 2003. Petrogenesis of basanitic to tholeiitic volcanic rocks from the Miocene Vogelsberg, Central Germany. *Journal of Petrology* 44, 569-602.
- Bosse, V., Feraud, G., Ruffet, G., Ballevre, M., Peucat, J.J., De Jong K. 2000. Late Devonian subduction and early-orogenic exhumation of eclogite-facies rocks from the Champtoceaux Complex (Variscan belt, France). *Geological Journal* 35, 297-325.
- Brandl, P. A., Genske, F. S., Beier, Ch., Haase, K. M., Sprung, P., Krumm, S. H., 2015. Magmatic evidence for carbonate metasomatism in the lithospheric mantle underneath the Ohře (Eger) rift. *Journal of Petrology* 56, 1743–1774.
- Caroff, M., Labry, C., Le Gall, B., Authemayou, C., Grosjean, D. B. & Guillong, M., 2015. Petrogenesis of late-Variscan high-K alkali-calcic granitoids and calc-alkalic lamprophyres: the Aber-Ildut/North-Ouessant complex, Armorican Massif, France. *Lithos* 238, 140–155.
- Caroff, M., Le Gall, B., Authemayou, C., Grosjean, D.B., Labry, C., Guillong, M. 2016, Relations between basalts and adakitic-felsic intrusive bodies in a soft-substrate environment: the South Ouessant Visean basin in the Variscan belt, Armorician Massif, France. *Canadian Journal of Earth Sciences* 53, 441-456.
- Chauvel, C., Jahn, B.M., 1984. Nd-Sr isotope and REE geochemistry of alkali basalts from the Massif Central, France. *Geochimica et Cosmochimica Acta* 48, 93–110.
- Crowley, Q.G., Timmermann, H., Noble, S.R., Holland, J.G., 2002. Palaeozoic terrane amalgamation in Central Europe: a REE and Sm-Nd isotope study of the pre-Variscan basement, NE Bohemian Massif. *Geological Society, London, Special Publication* 201, 157-176.
- Denele, Y., Paquette, J.L., Olivier, P., Barbey, P. 2011. Permian granites in the Pyrenees: the AyA pluton (Basque Country). *Terra Nova* 24, 105-113.
- Dostal, J., Patočka, F., Pin, C., 2001. Middle/Late Cambrian intracontinental rifting in the central West Sudetes, NE Bohemian Massif (Czech Republic): geochemistry and petrogenesis of the bimodal metavolcanic rocks. *Geological Journal* 36, 1-17.
- Dostal, J. Shellnutt, J.G., Ulrych J., 2017. Petrogenesis of the Cenozoic alkaline volcanic rock series of the České Středohoří complex (Bohemian Massif), Czech Republic: a case for two lineages. *American Journal of Science* 317, 677-706.
- Downes, H., 1984. Sr and Nd isotope geochemistry of coexisting alkaline magma series, Cantal, Massif Central, France. *Earth Planetary Science Letters* 69, 321–334.
- Downes, H., Bodinier, J.L., Dupuy, C., Leyreloup, A., Dostal, J. 1989. Isotope and trace-element heterogeneities in high-grade basic metamorphic rocks of Marvejols: Tectonic

implications for the Hercynian suture zone of the French Massif Central. *Lithos* 24, 37-54.

Furnes, H., Kryza, R., Muszyński, A., Pin, C., Garman, L.B., 1994. Geochemical evidence for progressive rift-related volcanism in the eastern Variscides. *Journal of the Geological Society of London* 151, 91-109.

Galan, G., Pin, C., Duthou, J.L. 1996. Sr-Nd isotopic record of multi-stage interactions between mantle-derived magmas and crustal components in a collision context-The ultramafic-granitoid association from Vivero (Hercynian belt, NW Spain). *Chemical Geology* 131, 67-91.

Gerdes, A., Wörner, G., Finger, F., 2000. Hybrids, magma mixing and enriched mantle melts in post-collisional Variscan granitoids: the Rastenberg pluton, Austria. *Geological Society, London, Special Publications* 179, 415-431.

Gilbert, J.S., Bickle, M.J., Chapman, H.J. 1994. The origin of Pyrenean Hercynian volcanic rocks (France-Spain): REE and Sm-Nd isotope constraints. *Chemical Geology* 111, 207-226.

Haase, K.M., Goldschmidt, B., Garbe-Schonberg, C.D., 2004. Pertogensis of Tertiary continental intra-palte lavas from the Westerwald region, Germany, *Journal of Petrology*, 45, 883-905.

Haase, K.M., Renno, A.D., 2008. Variation of magma generation and mantle sources during continental rifting observed in Cenozoic lavas from the Eger Rift, Central Europe. *Chemical Geology* 257, 192-202.

Hegner, E., Kröner, A., 2000. Review of Nd isotopic data and xenocrystic and detrital zircon ages from the pre-Variscan basement in the eastern Bohemian Massif: speculation on palinspastic reconstructions. *Geological Society, London, Special Publications*, 179, 113-129.

Hegner, E., Chen, F., Hann, H.P., 2001. Chronology of basin closure and thrusting in the internal zone of the Variscan belt in the Schwarzwald, Germany: evidence from zircon ages, trace element geochemistry and Nd isotopic data. *Tectonophysics* 332, 169-184.

Hegner, E., Walter, H.J., Satir, M., 1995. Pb-Sr-Nd isotopic composition and trace element geochemistry of megacrysts and melilitites from the Tertiary Urach volcanic field: source composition of small volume melts under SW Germany. *Contributions to Mineralogy and Petrology* 122, 322-335.

Hegner, E., Kölbl-Ebert, M., Loeschke, J. 1998. Post-collisional Variscan lamprophyres (Black Forest, Germany): $^{40}\text{Ar}/^{39}\text{Ar}$ phlogopite dating, Nd, Pb, Sr isotope, and trace element characteristics. *Lithos* 45, 395–411.

Holub, F.V., Rapprich, V., Erban, V., Pécskay, Z., Mlčoch, B., Míková, J., 2010. Petrology and geochemistry of the Tertiary alkaline intrusive rocks at Dourov, Dourovské hory volcanic complex (NW Bohemian Massif). *Journal of Geosciences* 55, 251-278.

Ilnicki, S., Szczepanski, J., Pin, C. 2013. From back-arc to rifted margin: Geochemical and Nd isotopic record in Neoproterozoic?-Cambrian metabasites of the Bystrzyckie and Orlickie Mountains (Sudetes, SW Poland). *Gondwana Research* 23, 1104-1121.

Innocent, C., Brihuega, L., Cabanis, B. 1994. Sr-Nd isotope and trace element geochemistry of late Variscan volcanism in the Pyrenees: magmatism in post-orogenic extension? *Tectonophysics* 238, 161-181.

Janoušek, V., Rogers, G., Bowls, D. R., 1995. Sr-Nd isotopic constraints on the petrogenesis of the Central Bohemian Pluton, Czech Republic. *International Journal of Earth Sciences* 84, 520-534.

Janoušek, V., Vrána, S., Erban, V., Vokurka, K., Drábek, M., 2008. Metabasic rocks in the Varied Group of the Moldanubian Zone, southern Bohemia-their petrology, geochemical character and possible petrogenesis. *Journal of Geosciences* 53, 31-46.

Jourdan, F., Marzoli, A., Bertrand, H., Cosca, M., Fontignie, D. 2003. The Northernmost CAMP: 40Ar/39Ar age, petrology and Sr-Nd-Pb isotope geochemistry of the Kerforne dike, Brittany, France. In: The Central Atlantic Magmatic Province: Insights from Fragments of Pangea. *Geophysical Monograph* 136, American Geophysical Union, 209-226.

Jung, S., Masberg, P., 1998. Major- and trace-element systematics and isotope geochemistry of Cenozoic mafic volcanic rocks from the Vogelsberg (central Germany): Constraints on the origin of continental alkaline and tholeiitic basalts and their mantle sources. *Journal of Volcanology and Geothermal Research* 86, 151-177.

Jung, C., Jung, S., Hoffer, E., Berndt, J. 2006. Petrogenesis of Tertiary mafic alkaline magmas in the Hocheifel, Germany. *Journal of Petrology* 47, 1637-1671.

Jung, S., Mezger, K., Hauff, F., Pack, A., Hoernes, S. 2013. Petrogenesis of rift-related tephrites, phonolites and trachytes (Central European Volcanic province, Rhön, FRG): Constraints from Sr, Nd, Pb and O isotopes. *Chemical Geology* 354, 203-215.

Jung, S., Hoernes, S., 2000. The major- and trace-element and isotope (Sr, Nd, O) geochemistry of Cenozoic alkaline rift-type volcanic rocks from the Rhön area (central Germany): petrology, mantle source characteristics and implications for asthenosphere-lithosphere interactions. *Journal of Volcanology and Geothermal Research* 99, 27-53.

Jung, S., Pfander, J.A., Brugmann, G., Stracke, A., 2005. Sources of primitive alkaline volcanic rocks from the Central European Volcanic Province (Rhön, Germany) inferred from Hf, Os and Pb isotopes. *Contributions to Mineralogy and Petrology* 150, 546–559.

Jung, S., Vieten, K., Romer, R.L., Mezger, K., Hoernes, S., Satir, M., 2012. Petrogenesis of Tertiary alkaline magmas in the Siebengebirge, Germany. *Journal of Petrology* 53, 2381–2409.

Kolb, M., Paulick, H., Kirchenbaur, M., Müunker, C., 2012. Petrogenesis of mafic to felsic lavas from the Oligocene Siebengebirge Volcanic Field (Germany): implications for the origin of intracontinental volcanism in Central Europe. *Journal of Petrology* 53, 2349–2379.

Krmíček, L., Romer, R.L., Ulrych, J., Glodny, J., Prelević, D., 2016. Petrogenesis of orogenic lamproites of the Bohemian Massif: Sr-Nd-Pb-Li isotope constraints for Variscan enrichment of ultra-depleted mantle domains. *Gondwana Research* 35, 198–2016.

Kröner, A., Hegner, E., Hammer, J., Haase, G., Bielicki, K.H., Krauss, M., Eidam, J., 1994. Geochronology and Nd-Sr systematics of Lusatian granitoids: significance for the evolution of the Variscan orogeny in east-central Europe. *International Journal of Earth Sciences (Geologische Rundschau)* 83, 357–376.

Kryza, R., Pin, C., 2010. The Central-Sudetic ophiolites (SW Poland): petrogenetic issues, geochronology and palaeotectonic implications. *Gondwana Research* 17, 292–305.

Kryza, R., Pin, C., 2002. Mafic rocks in a deep crustal segment of the Variscides (the Góry Sowie, SW Poland): evidence for crustal contamination in an extensional setting. *International Journal of Earth Sciences (Geologische Rundschau)* 91, 1017–1029.

Kryza, R., Mazur, S., Pin, C., 1995. Leszczyniec meta-igneous complex in the eastern part of the Karkonosze–Izera Block, Western Sudetes: trace element and Nd isotope study. *Neues Jahrbuch für Mineralogie Abhandlungen* 170, 59–74.

Kryza, R., Pin, C., 2002. Mafic rocks in a deep crustal segment of the Variscides (the Góry Sowie, SW Poland): evidence for crustal contamination in an extensional setting. *International Journal of Earth Sciences* 91, 1017–1029.

Kryza, R., Pin, C., 2010. The Central-Sudetic ophiolites (SW Poland): petrogenetic issues, geochronology and palaeotectonic implications. *Gondwana Research* 17, 292–305.

Lenoir, X., Dautria, J.M., Briquet, L., Cantagrel, J.M., Michard, A., 2000. Nouvelles données géochronologiques, géochimiques et isotopiques sur le volcanisme du Forez: relation avec l'évolution cénozoïque du manteau du Massif Central. *C. R. Acad. Sci. Paris*

330, 201–207.

Linnemann, U., Romer, R.L. 2002. The Cadomian Orogeny in Saxo-Thuringia, Germany: geochemical and Nd-Sr-Pb isotopic characterization of marginal basins with constraints to geotectonic setting and provenance. *Tectonophysics* 352, 33-64.

Lustrino, M., Wilson, M. 2007. The circum-Mediterranean anorogenic Cenozoic igneous province. *Earth-Scince Reviews* 81, 1-65.

Patočka, F., Dostal, J., Pin, C., 1997. Early Palaeozoic intracontinental rifting in the central west Sudetes, Bohemian Massif: geochemical and Sr–Nd isotopic study on felsic-mafic meta-volcanics of the Rýchory Mts Complex. *Terra Nova Abstracts Supplement 1*, 144–145.

Patočka, F., Pin, C., 2005. Sm-Nd isotope and trace element evidence for heterogeneous igneous protoliths of Variscan mafic blueschists in the East Krkonoše Complex (West Sudetes, NE Bohemian Massif, Czech Republic). *Geodinamica Acta* 18, 363-374.

Paquette, J.L., Monchoux, P., Couturier, M. 1995. Geochemical and isotopic study of a norite-eclogite transition in the European Variscan belt: Implications for U-Pb zircon systematics in metabasic rocks. *Geochimica et Cosmochimica Acta* 59, 1611-1622.

Pin, C., Paquette, J.L., 2002. Le magmatisme basique calcoalcalin d'âge dévono-dinantien du nord du Massif Central, témoin d'une marge active hercynienne: arguments géochimiques et isotopiques Sr/Nd: Sr-Nd isotope and trace element evidence for a Late Devonian active margin in northern Massif-Central (France). *Geodinamica Acta* 15, 63–77.

Pin, C., Waldhausrová, J., 2007. Sm-Nd isotope and trace element study of Late Proterozoic metabasalts (“spilites”) from the Central Barrandian Domain (Bohemian Massif, Czech Republic). In: Linnemann, U., Nance, R.D., Kraft, P., Zulauf, G., (Eds.), *The evolution of the Rheic Ocean: from Avalonian-Cadomian Active Margin to Alleghenian-Variscan Collision*. Geological Society of America, Special Paper 423, 231-247.

Pin, C., Kryza, R., Oberc-Dziedzic, T., Mazur, S., Turniak, K., Waldhausrová, J., 2007. The diversity and geodynamic significance of Late Cambrian (ca. 500 Ma) felsic anorogenic magmatism in the northern part of the Bohemian Massif: A review based on Sm-Nd isotope and geochemical data. In: Linnemann, U., Nance, R.D., Kraft, P., Zulauf, G. (Eds.), *The evolution of the Rheic Ocean: from Avalonian-Cadomian Active Margin to Alleghenian-Variscan Collision*. Geological Society of America, Special Paper 423, 209-229.

Pin, C., Paquette, J. L. 1997. A mantle-derived bimodal suite in the Hercynian Belt: Nd isotope and trace element evidence for a subduction-related rift origin of the Late

Devonian Brévenne volcanics, Massif Central (France), Contributions to Mineralogy and Petrology 129, 222 – 238.

Pin, C., Martini, F. 1993. Early Ordovician continental break-up in Variscan Europe: Nd–Sr isotope and trace element evidence from bimodal igneous associations of Southern Massif Central, France. *Lithos*, 29, 177-196.

Pin, C., Majerowicz, A., Wojciechowska, I., 1988. Upper Paleozoic oceanic crust in the Polish Sudetes: Nd–Sr isotope and trace element evidence. *Lithos* 21, 195–209.

Pin, C., Monchoux, P., Paquette, J.L. Azambre, B., Wang, R. C., Martin, R. F. 2006. Igneous albitite dikes in orogenic lherzolites, Western Pyrenees, France: A possible source for corundum and alkali feldspar xenocrysts in basaltic terranes, II. Geochemical and petrogenetic considerations. *Canadian Mineralogist* 44, 843-856.

Roberts, M. P., Pin, C., Clements, J.D., Paquette, J.L. 2000. Petrogenesis of mafic to felsic plutonic rocks associations: the Calc-alkaline Querigut Complex, French Pyrenees. *Journal of Petrology* 41, 809-844.

Romer, R.L., Förster, H.-J., Breitkreuz, C., 2001. Intracontinental extensional magmatism with a subduction fingerprint: the late Carboniferous Halle Volcanic Complex (Germany). *Contributions to Mineralogy and Petrology* 141, 201–221.

Rossy, M., Azambre, B., Albaréde, F., 1992. REE and Sr–Nd isotope geochemistry of the alkaline magmatism from the Cretaceous North Pyrenean Rift Zone (France-Spain). *Chemical Geology* 97, 33–46.

Schmädicke, E., Mezger, K., Cosca, M.A., Okrusch, M., 1995. Variscan Sm–Nd and Ar–Ar ages of eclogite facies rocks from the Erzgebirge, Bohemian Massif. *Journal of Metamorphic Geology* 13, 537–552.

Schmidberger, S.S., Hegner, E. 1999. Geochemistry and isotope systematics of calc-alkaline volcanic rocks from the Saar-Nahe basin (SW. Germany)-implications for Lat-Variscan orogenic development. *Contributions to Mineralogy and Petrology* 135, 373–385.

Schubert, S., Jung, S., Pfänder, J.A., Hauff, F., Garbe-Schönberg, D., 2015. Petrogenesis of tertiary continental intra-plate lavas between Siebengebirge and Westerwald, Germany: constraints from trace element systematics and Nd, Sr and Pb isotopes. *Journal of Volcanology and Geothermal Research* 305, 84-99.

Skála, R., Ulrych, J., Ackerman, L., Krmíček, L., Fediuk, F., Balogh, K., Hegner, E. 2015. Upper Cretaceous to Pleistocene melilitic volcanic rocks of the Bohemian Massif: petrology and mineral chemistry. *Geologica Carpathica*, 66, 3, 197-216.

- Skrzypek, E., Tabaud, A.-S., Edel, J.-B., Schulmann, K., Cocherie, A., Guerrot, C. and Rossi, P. 2012. The significance of Late Devonian ophiolites in the Variscan orogen: a record from the Vosges Klippen Belt. *International Journal of Earth Sciences*, 101, 951–972.
- Slaby, E., Martin, H. 2008. Mafic and felsic magma interaction in granites: the Hercynian Karkonosze pluton (Sudetes, Bohemian Massif). *Journal of Petrology* 49, 353-391.
- Soder, C.G., Romer, R.L., 2018. Post-collisional Potassic - Ultrapotasssic Magmatism of the Variscan Orogen: Implications for Mantle Metasomatism during Continental Subduction. *Journal of Petrology* 59, 1007-1034.
- Soejono, I., Žačková, E., Janoušek, V., Machek, M., Košler, J. 2010. Vestige of an Early Cambrian incipient oceanic crust incorporated in the Variscan orogeny: Letovice Complex, Bohemian Massif. *Journal of Geological Society, London*, 167, 1113-1130.
- Solgadi, F., Moyen, J.F., Vanderhaeghe, O., Sawyer, E.W., Reisberg, L. 2007. The role of crustal anataxis and mantle-derived magmas in the genesis of synorogenic Hercynian granites of the Livradois area, French Massif Central. *Canadian Mineralogist*, 45, 581-606.
- Stille, P., Oberhänsli, R., Wenger-Schenk, K., 1989. Hf-Nd isotopic and trace element constraints on the genesis of alkaline and calc-alkaline lamprophyres. *Earth and Planetary Science Letters* 96, 209-219.
- Stosch, H. G., Lugmair, G. W. 1990. Geochemistry and evolution of MORB – type eclogites from the Müncberg Massif, southern Germany. *Earth and Planetary Science Letters*, 99, 230–249.
- Tabaud, A.-S., Whitechurch, H., Rossi, P., Schulmann, K., Guerrot, C. & Cocherie, A. (2014). Devonian–Permian magmatic pulses in the northern Vosges Mountains (NE France): result of continuous subduction of the Rhenohercynian Ocean and Avalonian passive margin. *Geological Society, London, Special Publications* 405, 197–223.
- Tabaud, A.-S., Janoušek, V., Skrzypek, E., Schulmann, K., Rossi, P., Whitechurch, H., Guerrot, C., Paquette, J.-L. (2015). Chronology, petrogenesis and heat sources for successive Carboniferous magmatic events in the Southern–Central Variscan Vosges Mts (NE France). *Journal of the Geological Society, London* 172, 87–102.
- Tasáryová, Z., Janoušek, V., Frýda, J., 2018. Failed Silurian continental rifting at the NW margin of Gondwana: evidence from basaltic volcanism of the Prague Basin (Teplá-Barrandian Unit, Bohemian Massif). *International Journal of Earth Sciences* 107, 1231-1266.
- Teipel, U., Eichhorn, R., Loth, G., Rohrmüller, J., Höll, R., Kennedy, A., 2004. U-Pb SHRIMP and Nd isotopic data from the western Bohemian Massif (Bayerischer Wald,

Germany): Implications for Upper Vendian and Lower Ordovician magmatism. International Journal of Earth Sciences 93, 782-801.

Teichmann, F., Basu, A.R., 1996. Nd-Sr isotopic and trace element study of rocks and fluids from the continental deep drilling project (KTB), Germany. International Journal of Earth Sciences 85, 162-171.

Timmermann, H., Štědrá, V., Gerdes, A., Noble, S.R., Parrish, R.R., Dörr, W. 2004. The problem of dating high-pressure metamorphism: a U-Pb isotope and geochemical study on eclogites and related rocks of the Mariánské Lazně Complex, Czech Republic. Journal of Petrology 45, 1311-1338.

Trubač, J., Vrána, S., Haluzová, E., Ackerman, L. 2015. Petrology and geochemical characteristics of phlogopite pyroxenite related to durbachites, Moldanubian Zone, Bohemian Massif. Journal of Geosciences 60, 73-90.

Turpin, L., Velde, D., Pinte, G., 1988. Geochemical comparison between minettes and kersantites from the Western European Hercynian Orogen - trace-element and Pb- Sr-Nd isotope constraints on their origin. Earth and Planetary Science Letters 87, 73–86.

Ubide, T. 2013. The Cretaceous alkaline magmatism in northeast Iberia: igneous processes and geodynamic implications. PhD thesis, University of Zaragoza, Spain. 223 p.

Ulrych, J., Svobodová, J., Balogh, K., 2002a. The source of Cenozoic volcanism in the České středohoří Mts., Bohemian Massif. Neues Jahrbuch für Mineralogie, Abhandlungen 177, 133-162.

Ulrych, J., Štěpánková, J., Novák, J.K., Pivec, E., Prouza, V., 2002b. Volcanic activity in Late Variscan Krkonoše Piedmont Basin: petrological and geochemical constraints. Slovak Geological Magazine 33, 219-235.

Ulrych, J., Fediuk, F., Lang, M., Martinec, P., 2004. Late Paleozoic volcanic rocks of the Intra-Sudetic Basin, Bohemian Massif: Petrological and geochemical characteristics. Chemie der Erde 64, 127-153.

Ulrych, J., Dostal, J., Hegner, E., Balogh, K., Ackerman, L., 2008. Late Cretaceous to Paleogene melilitic rocks of the Ohre/Eger rift in northern Bohemia, Czech Republic: Insights into the initial stages of continental rifting. Lithos, 101, 141-161.

Ulrych, J., Jelínek, E., Řanda, Z., Lloyd, F.E., Balogh, K., Hegner, E., Novák, J.K. 2010. Geochemical characteristics of the high- and low-Ti basaltic rocks from the uplifted shoulder of the Ohře (Eger) rift, Western Bohemia. Chemie der Erde 70, 319-333.

Ulrych, J., Ackerman, L., Balogh, K., Hegner, E., Jelínek, E., Pecskay, Z., Přichystal, A., Upton, B. G. J., Zimák, J., Foltýnová, R., 2013. Plio-Pleistocene basanitic and melilitic

series of the Bohemian Massif: K-Ar ages, major/trace element and Sr–Nd isotopic data. *Chemie der Erde* 73, 429–450.

Ulrych, J., Krmíček, L., Tomek, Č., Lloyd, F.E., Ladenberger, A., Ackerman, L., Balogh, K., 2016. Petrogenesis of Miocene alkaline volcanic suites from western Bohemia: whole rock geochemistry and Sr-Nd-Pb isotopic signatures. *Chemie dr Erde*, 76, 77-93.

Vila, M. Pin, C. 2016. Geochemistry and Nd isotope signature of the Collserol Range Palaeozoic succession (NE Iberia): Gondwana heritage and pre-Mesozoic geodynamic evolution. *Geological Magazine* 153, 643-662.

Vila, M., Pin, C., Enrique, P. Liesa, M., 2005. Telescoping of three distinct magmatic suites in an orogenic setting: Generation of Hercynian igneous rocks of the Alberta Massif (Eastern Pyrenees). *Lithos* 83, 97-127.

Vokurka, K., Frýda, J., 1997. The neodymium isotopes in Lower Paleozoic basalts from the Barrandian (Teplá-Barrandian Unit, Bohemian Massif). *Geoscience Research Report* 1996, p. 87 (in Czech).

von Quadt, A., Gebauer, D., 1993. Sm-Nd and U-Pb dating of eclogites and granulites from the Oberpfalz, NE Bavaria, Germany. *Chemical Geology*, 109, 317-339.

von Seckendorff, V., Arz, C., Lorenz, V. 2004. Magmatism of the late Variscan intermontane Saar-Nahe Basin (Germany): a review. *Geological Society, London, Special Publications*, 223, 361-391.

von Seckendorff, V., Timmerman, M.J., Kramer, W., Wrobel, P., 2004. New $^{40}\text{Ar}/^{39}\text{Ar}$ ages and geochemistry of Late Carboniferous–early Permian lamprophyres and related volcanic rocks in the Saxothuringian Zone of the Variscan Orogen (Germany). *Geological Society of London, Special Publications*, 223, 335–359.

Wedepohl, K.H., Gohn, E., Hartmann, G., 1994. Cenozoic alkali basaltic magmas of western Germany and their products of differentiation. *Contributions Mineralogy and Petrology* 115, 253–278.

Wilson, M., Rosenbaum, J.M., Dunworth, E.A., 1995b. Melilitites: partial melts of the thermal boundary layer? *Contributions Mineralogy and Petrology* 119, 181-196.

Witt-Eickschen, G., Seck, H.A., Mezger, K., Eggins, S.M., 2003. Lithospheric mantle evolution beneath the Eifel (Germany): constraints from Sr–Nd–Pb isotopes and trace element abundances in spinel peridotite and pyroxenite xenoliths. *Journal of Petrology* 44, 1077–1095.

Wörner, G., Zindler, A., Staudigel, H., Schmincke, H.U., 1986. Sr, Nd and Pb isotope geochemistry of Tertiary and Quaternary volcanics from West Germany. *Earth Planetary Science Letters* 79, 107–119.

Zangana, N.A., Downes, H., Thirlwall, M.F., Hegner, E. 1997. Relationship between deformation, equilibration temperatures, REE and radiogenic isotopes in the mantle xenoliths (Ray Pic, Massif Central, France): an example of plume-lithosphere interaction? Contributions to Mineralogy and Petrology 127, 187-203.