

REFERENCES

- Aide, M., Smith-Aide, C., 2003. Assessing soil genesis by rare-earth elemental analysis. *Soil Sci. Soc. Am. J.* 67, 1470–1476.
- Alonso, E., Sherman, A.M., Wallington, T.J., Everson, M.P., Field, F.R., Roth, R., Kirchain, R.E., 2012. Evaluating rare earth element availability: A case with revolutionary demand from clean technologies. *Environ. Sci. Technol.* 46, 3406–3414.
- Altschuler, Z.S., Berman, S., Cuttitta, F., 1967. Rare earths in phosphorites—geochemistry and potential recovery 125–135.
- Amalan, K., Ratnayake, A.S., Ratnayake, N.P., Weththasinghe, S.M., Dushyantha, N., Lakmali, N., Premasiri, R., 2018. Influence of nearshore sediment dynamics on the distribution of heavy mineral placer deposits in Sri Lanka. *Environ. earth Sci.* 77, 737.
- Athurupane, B.M.B., 2014. Rare earth mineral resources in sri lanka.
- Balaram, V., 2019. Rare earth elements: A review of applications, occurrence, exploration, analysis, recycling, and environmental impact. *Geosci. Front.* 10, 1285–1303.
- Bao, Z., Zhao, Z., 2008. Geochemistry of mineralization with exchangeable REY in the weathering crusts of granitic rocks in South China. *Ore Geol. Rev.* 33, 519–535.
- Barakos, G., Mischo, H., Gutzmer, J., 2016. An outlook on the rare earth elements mining industry. *AusIMM Bull.* 62–66.
- Barnes, R., Jaireth, S., Mieuzitis, Y., Suppel, D., 1999. Regional mineral potential assessments for land use planning; GIS-based examples from eastern Australia: publication series, in: *Australas. Inst. Min. Metall.* pp. 4–99.
- Batapola, N., Dushyantha, N., Ratnayake, N., Premasiri, R., Abeysinghe, B., Dissanayake, O., Rohitha, S., Ilankoon, S., Dharmaratne, P., 2021. Rare earth element potential in the beach placers along the southwest coast of Sri Lanka, in:

2021 Moratuwa Engineering Research Conference (MERCon). IEEE, pp. 415–420.

Batapola, N.M., Dushyantha, N.P., Premasiri, H.M.R., Abeysinghe, A., Rohitha, L.P.S., Ratnayake, N.P., Dissanayake, D., Ilankoon, I., Dharmaratne, P.G.R., 2020. A comparison of global rare earth element (REE) resources and their mineralogy with REE prospects in Sri Lanka. *J. Asian Earth Sci.* 200, 104475.

Berger, A., Janots, E., Gnos, E., Frei, R., Bernier, F., 2014. Rare earth element mineralogy and geochemistry in a laterite profile from Madagascar. *Appl. geochemistry* 41, 218–228.

Binnemans, K., Jones, P.T., Blanpain, B., Van Gerven, T., Yang, Y., Walton, A., Buchert, M., 2013. Recycling of rare earths: a critical review. *J. Clean. Prod.* 51, 1–22.

Cassidy, K.F., Towner, R.R., Ewers, G.R., 1997. Rare earth elements in Australia. AGSO Confid. Rep.

center for Strategic International Studies, 2022. Does China Pose a Threat to Global Rare Earth Supply Chains? [WWW Document].

Černý, P., Ercit, T.S., 2005. The classification of granitic pegmatites revisited. *Can. Mineral.* 43.

Černý, P., London, D., Novák, M., 2012. Granitic pegmatites as reflections of their sources. *Elements* 8, 289–294.

Chakhmouradian, A.R., Zaitsev, A.N., 2012. Rare earth mineralization in igneous rocks: sources and processes. *Elements* 8, 347–353.

Chandrajith, R., Dissanayake, C.B., Tobschall, H.J., 2000. The Stream Sediment Geochemistry of the Walawe Ganga Basin of Sri Lanka - Implications for Gondwana Mineralization 189–204.

Chandrakumara, G.T.D., Balasooriya, N.W.B., Mantilaka, M., Lottermorser, B.G., Pitawala, H., 2021. Geochemical and mineralogical characterization of phosphatic crusts developed on the basement carbonatites of Sri Lanka: towards

- a better understanding of the weathering process. *Ceylon J. Sci.* 50.
- Chen, W.T., Zhou, M.-F., 2015. Mineralogical and geochemical constraints on mobilization and mineralization of rare Earth elements in the Lala Fe-Cu-(Mo, Ree) deposit, SW China. *Am. J. Sci.* 315, 671–711.
- Cocker, M.D., 2014. Lateritic, supergene rare earth element (REE) deposits.
- Coomáraswámy, A.K., 1904. VII.—Contributions to the Geology of Ceylon: III. The Balangoda Group. *Geol. Mag.* 1, 418–422.
- Cooray, P.G., 1994. The precambrian of Sri Lanka: a historical review. *Precambrian Res.* 66, 3–18.
- Cooray, Percival Gerald, 1984. An introduction to the geology of Sri Lanka (Ceylon). National museums of Sri Lanka publication.
- Cooray, P. G., 1984. An Introduction to The Geology of Sri Lanka, 2nd Revise. ed. National Museums of Sri Lanka Publication, Colombo.
- Cox, C., Kynicky, J., 2018. The rapid evolution of speculative investment in the REE market before, during, and after the rare earth crisis of 2010–2012. *Extr. Ind. Soc.* 5, 8–17.
- Dahanayake, K., Subasinghe, S.M.N.D., 1991. Mineralogical, chemical and solubility variations in the Eppawala phosphate deposit of Sri Lanka - a case for selective mining for fertilizers. *Fertil. Res.* 28, 233–238. <https://doi.org/10.1007/BF01049756>
- Dharmapriya, P.L., Disanayaka, D.W.M., Martin, R.F., Pitawala, H., Malaviarachchi, S.P.K., 2021. Granitic pegmatites in Sri Lanka: A concise review leading to insights and predictions. *Ore Energy Resour. Geol.* 6, 100011.
- Dinalankara, D., 1995. Eppawala phosphate deposit of Sri Lanka-present status. *Direct Appl. phosphate rock Appr. Technol. Fertil. Asia—what hinders growth. Inst. Fundam. Stud. Sri Lanka* 153–163.
- Dissanayaka, C.B., 1982. The geology and geochemistry of the Uda Walawe

- serpentinite. Sri Lanka. *J Natn Sci Coun Sri Lanka* 10, 13–34.
- Dostal, J., 2017. Rare earth element deposits of alkaline igneous rocks. *Resources* 6, 34.
- Dostal, J., 2016. Rare metal deposits associated with alkaline/peralkaline igneous rocks.
- Dushyantha, N., Batapola, N., Ilankoon, I., Rohitha, S., Premasiri, R., Abeysinghe, B., Ratnayake, N., Dissanayake, K., 2020. The story of rare earth elements (REEs): Occurrences, global distribution, genesis, geology, mineralogy and global production. *Ore Geol. Rev.* 122, 103521.
- Dushyantha, N., Weerawarnakula, S., Premasiri, R., Abeysinghe, B., Ratnayake, N., Batapola, N., Ranasinghe, M., 2021. Potential ecological risk assessment of heavy metals (Cr, Ni, and Co) in serpentine soil at Ginigalpelessa in Sri Lanka. *Arab. J. Geosci.* 14, 1–12.
- Dushyantha, N.P., Hemalal, P.V.A., Jayawardena, C.L., Ratnayake, A.S., Ratnayake, N.P., 2019. Application of geochemical techniques for prospecting unconventional phosphate sources: A case study of the lake sediments in Eppawala area Sri Lanka. *J. Geochemical Explor.* 201, 113–124.
- Fernando, G., Pitawala, A., Amaraweera, T., 2011. Emplacement and evolution history of pegmatites and hydrothermal deposits, Matale district, Sri Lanka.
- Fernando, L.J.D., 1986. *Mineral Resources of Sri Lanka*.
- Fernando, L.J.D., 1954. Progress of the Geological Survey of Ceylon. *Bull. Ceylon geogr. Soc* 8, 1–10.
- Filippelli, G.M., 2011. Phosphate rock formation and marine phosphorus geochemistry: the deep time perspective. *Chemosphere* 84, 759–766.
- Filippelli, G.M., 2008. The global phosphorus cycle: past, present, and future. *Elements* 4, 89–95.
- Folger, T., 2011. The secret ingredients of everything. *Natl. Geogr. Mag.* 6.

- Garnett, R.H.T., Bassett, N.C., 2005. Placer deposits.
- Goodenough, K.M., Schilling, J., Jonsson, E., Kalvig, P., Charles, N., Tuduri, J., Deady, E.A., Sadeghi, M., Schiellerup, H., Müller, A., 2016. Europe's rare earth element resource potential: An overview of REE metallogenetic provinces and their geodynamic setting. *Ore Geol. Rev.* 72, 838–856.
- Goodenough, K.M., Wall, F., Merriman, D., 2018. The rare earth elements: demand, global resources, and challenges for resourcing future generations. *Nat. Resour. Res.* 27, 201–216.
- Groves, D.I., Bierlein, F.P., Meinert, L.D., Hitzman, M.W., 2010. Iron oxide copper-gold (IOCG) deposits through Earth history: Implications for origin, lithospheric setting, and distinction from other epigenetic iron oxide deposits. *Econ. Geol.* 105, 641–654.
- GSMB, 2001. Sri Lanka 1:100 000 Geology (Provincial Map Series) Sheet 7 and 8 [WWW Document]. Geol. Surv. mines Bur. (GSMB), Sri Lanka.
- Gupta, C.K., Krishnamurthy, N., 2005. Extractive metallurgy of rare earths CRC press. Boca Raton, Florida 65, 70–75.
- Hampel, C.A., Kolodney, M., 1961. Rare metals handbook. *J. Electrochem. Soc.* 108, 248C.
- Haxel, G.B., Hedrick, J.B., Orris, G.J., Stauffer, P.H., Hendley II, J.W., 2002. Rare earth elements: critical resources for high technology.
- Hein, J.R., Conrad, T., Koshinsky, A., 2011. Comparison of land-based REE ore deposits with REE-rich marine Fe-Mn crusts and nodules. *Miner. Mag* 75, 1000.
- HERATH, J.W., 1980. Mineral Resources of Sri Lanka. Geological Survey Econ. Bull 1–72.
- Hewawasam, T., 2013. Tropical weathering of apatite-bearing rocks of Sri Lanka: Major element behaviour and mineralogical changes. *J. Geol. Soc. Sri Lanka* 15, 31–46.

- Hewawasam, T., Fernando, G., Priyashantha, D., 2014. Geo-vegetation mapping and soil geochemical characteristics of the Indikolapelessa serpentinite outcrop, southern Sri Lanka. *J. Earth Sci.* 25, 152–168.
- Hoatson, D.M., Jaireth, S., Mieзитis, Y., 2011. The major rare-earth-element deposits of Australia: geological setting, exploration, and resources. *Geoscience Australia*.
- Hoshino, M., Sanematsu, K., Watanabe, Y., 2016. REE mineralogy and resources. *Handb. Phys. Chem. Rare Earths* 49, 129–291.
- Ilanakoon, I., Dushyantha, N.P., Mancheri, N., Edirisinghe, P.M., Neethling, S.J., Ratnayake, N.P., Rohitha, L.P.S., Dissanayake, D., Premasiri, H.M.R., Abeysinghe, A., 2022. Constraints to rare earth elements supply diversification: Evidence from an industry survey. *J. Clean. Prod.* 331, 129932.
- Ilanakoon, I.M.S.K., Tang, Y., Ghorbani, Y., Northey, S., Yellishetty, M., Deng, X., McBride, D., 2018. The current state and future directions of percolation leaching in the Chinese mining industry : Challenges and opportunities. *Miner. Eng.* 125, 206–222.
- IPO Future Earth Coasts, 2009. R&S 32. LOICZ Global Change Assessment and Synthesis of River Catchment -Coastal Sea Interaction and Human Dimensions. <https://doi.org/10.13140/RG.2.1.2300.0804>
- Jackson, W.D., Christiansen, G., 1984. International Strategic Minerals Inventory Summary Report--rare-earth Oxides. US Government Printing Office.
- Jaireth, S., Hoatson, D.M., Mieзитis, Y., 2014. Geological setting and resources of the major rare-earth-element deposits in Australia. *Ore Geol. Rev.* 62, 72–128.
- Jaques, A.L., Jaireth, S., Walshe, J.L., 2002. Mineral systems of Australia: an overview of resources, settings and processes. *Aust. J. Earth Sci.* 49, 623–660.
- Jayawardena, D., 2011. Assessment of rare earth elements in SL For use in hi-tech products and strategic defence systems. *Isl. Editor. Anal. Comment.* 8.
- Jayawardena, D.E. de S., 1978. The Eppawala carbonatite complex in north-west Sri Lanka (Ceylon). Geological Survey Department.

- Jayawardena, D.E. de S., Carswell, D.A., 1976. The geochemistry of 'charnockites' and their constituent ferromagnesian minerals from the Precambrian of south-east Sri Lanka (Ceylon). *Mineral. Mag.* 40, 541–554.
- Jordens, A., Cheng, Y.P., Waters, K.E., 2013. A review of the beneficiation of rare earth element bearing minerals. *Miner. Eng.* 41, 97–114.
- Jowitt, S.M., Medlin, C.C., Cas, R.A.F., 2017. The rare earth element (REE) mineralisation potential of highly fractionated rhyolites: A potential low-grade, bulk tonnage source of critical metals. *Ore Geol. Rev.* 86, 548–562.
- Kanazawa, Y., Kamitani, M., 2006. Rare earth minerals and resources in the world. *J. Alloys Compd.* 412, 1339–1343.
- Kato, Y., Fujinaga, K., Nakamura, K., Takaya, Y., Kitamura, K., Ohta, J., Toda, R., Nakashima, T., Iwamori, H., 2011. Deep-sea mud in the Pacific Ocean as a potential resource for rare-earth elements. *Nat. Geosci.* 4, 535.
- King, H.M., 2015. Pegmatite [WWW Document]. *Geology.com*. URL <https://geology.com/rocks/pegmatite.shtml> (accessed 12.10.21).
- Kingsnorth, D.J., 2010. Rare earths: facing new challenges in the new decade, in: Presented by Clinton Cox, SME Annual Meeting.
- Kreuzer, O.P., Markwitz, V., Porwal, A.K., McCuaig, T.C., 2010. A continent-wide study of Australia's uranium potential: Part I: GIS-assisted manual prospectivity analysis. *Ore Geol. Rev.* 38, 334–366.
- Kroner, A., 1991. Lithotectonic subdivision of the Precambrian basement in Sri Lanka. In *The Crystalline Crust of Sri Lanka, Part I. Summary and Research of the German-Sri Lanka Consortium*. *Geol. Surv. Dep. Sri Lanka, Prof. Pap. 5*, 5–21.
- Kröner, A., Cooray, P.G., Vitanage, P.W., 1991. Lithotectonic subdivision of the Precambrian basement in Sri Lanka., In: ed, *The crystalline crust of Sri Lanka, Part 1, Summary of Research of the German-Sri Lankan Consortium*. *Geol. Surv. Dept. Prof. Paper 5*, Sri Lanka.
- Lanka Mineral Sands Ltd, 2022. Products & Annual Production [WWW Document].

URL <https://lankamineralsands.com/products/> (accessed 9.17.22).

- Li, M.Y.H., Zhou, M.-F., 2020. The role of clay minerals in formation of the regolith-hosted heavy rare earth element deposits. *Am. Mineral. J. Earth Planet. Mater.* 105, 92–108.
- Li, M.Y.H., Zhou, M.-F., Williams-Jones, A.E., 2019. The genesis of regolith-hosted heavy rare earth element deposits: Insights from the world-class Zudong deposit in Jiangxi Province, South China. *Econ. Geol.* 114, 541–568.
- Li, X.-C., Zhou, M.-F., 2018. The nature and origin of hydrothermal REE mineralization in the Sin Quyen deposit, northwestern Vietnam. *Econ. Geol.* 113, 645–673.
- Li, X., Li, H., Yang, G., 2017. Electric fields within clay materials: How to affect the adsorption of metal ions. *J. Colloid Interface Sci.* 501, 54–59.
- Long, K.R., Gosen, B.S. Van, Foley, N.K., Cordier, D., 2012. The principal rare earth elements deposits of the United States: a summary of domestic deposits and a global perspective, in: *Non-Renewable Resource Issues*. Springer, pp. 131–155.
- Lottermoser, B.G., 1990. Rare-earth element mineralisation within the Mt. Weld carbonatite laterite, Western Australia. *Lithos* 24, 151–167.
- Mahmoud, S.A.E.A., 2019. Geology, mineralogy and mineral chemistry of the NYF-type pegmatites at the Gabal El Faliq area, South Eastern Desert, Egypt. *J. Earth Syst. Sci.* 128, 1–24.
- Mancheri, N.A., Sprecher, B., Bailey, G., Ge, J., Tukker, A., 2019. Effect of Chinese policies on rare earth supply chain resilience. *Resour. Conserv. Recycl.* 142, 101–112.
- Manthilake, M., Sawada, Y., Sakai, S., 2008. Genesis and evolution of Eppawala carbonatites, Sri Lanka. *J. Asian earth Sci.* 32, 66–75.
- Marks, M.A.W., Hettmann, K., Schilling, J., Frost, B.R., Markl, G., 2011. The mineralogical diversity of alkaline igneous rocks: critical factors for the transition from miaskitic to agpaitic phase assemblages. *J. Petrol.* 52, 439–455.

- Mazdab, F.K., Johnson, D.A., Barton, M.D., 2008. Trace element characteristics of hydrothermal titanite from iron-oxide-Cu-Au (IOCG) mineralization. *Geochim. Cosmochim. Acta* 72, A609.
- McDonough, W.F., Sun, S.-S., 1995. The composition of the Earth. *Chem. Geol.* 120, 223–253.
- McLemore, V.T., 2015. Rare earth elements (REE) deposits in New Mexico: Update. *New Mex. Geol.* 37, 59–69.
- Mertzman, S., 2019. What are rare earths, crucial elements in modern technology? 4 questions answered [WWW Document]. *Conversat.* URL <https://theconversation.com/what-are-rare-earths-crucial-elements-in-modern-technology-4-questions-answered-101364> (accessed 10.21.19).
- Migdisov, A.A., Williams-Jones, A.E., 2014. Hydrothermal transport and deposition of the rare earth elements by fluorine-bearing aqueous liquids. *Miner. Depos.* 49, 987–997.
- Moldoveanu, G.A., Papangelakis, V.G., 2016. An overview of rare-earth recovery by ion-exchange leaching from ion-adsorption clays of various origins. *Mineral. Mag.* 80, 63–76.
- Nawaratne, S.W., 2009. Feldspar and vein quartz mineralization in Sri Lanka: a possible post metamorphic mid-Paleozoic pegmatitic-pneumatolitic activity. *J Geol Soc Sri Lanka* 13, 83–96.
- Nawaratne, S.W., Wijeratne, G.N., 1995. The source of placer gold in the Walawe Ganga basin, Sri Lanka.
- Novák, M., Škoda, R., Gadas, P., Krmíček, L., Černý, P., 2012. Contrasting origins of the mixed (NYF+ LCT) signature in granitic pegmatites, with examples from the Moldanubian Zone, Czech Republic. *Can. Mineral.* 50, 1077–1094.
- Oreskes, N., Einaudi, M.T., 1990. Origin of rare earth element-enriched hematite breccias at the Olympic Dam Cu-U-Au-Ag deposit, Roxby Downs, South Australia. *Econ. Geol.* 85, 1–28.

- Orris, G., Grauch, R., 2002. Rare earth element mines, deposits, and occurrences.
- Pell, R.S., Wall, F., Yan, X., Bailey, G., 2019. Applying and advancing the economic resource scarcity potential (ESP) method for rare earth elements. *Resour. Policy* 62, 472–481.
- Pitawala, A., Lottermoser, B.G., 2012. Petrogenesis of the Eppawala carbonatites, Sri Lanka: A cathodoluminescence and electron microprobe study. *Mineral. Petrol.* 105, 57–70.
- Pitawala, A., Schidlowski, M., Dahanayake, K., Hofmeister, W., 2003. Geochemical and petrological characteristics of Eppawala phosphate deposits, Sri Lanka. *Miner. Depos.* 38, 505–515.
- Pohl, J.G., Emmermann, R., 1991. Chemical composition of the Sri Lanka Precambrian basement, In: Kröner, ed, *The Crystalline Crust of Sri Lanka, Part I. Summary of Research of the German–Sri Lankan Consortium*. Geol. Surv. Dept., Sri Lanka.
- Rajakaruna, N., Bohm, B.A., 2002. Serpentine and its vegetation: a preliminary study from Sri Lanka. *J. Appl. Bot.* 76, 20–28.
- Ratnayake, A.S., Dushyantha, N., De Silva, N., Somasiri, H.P., Jayasekara, N.N., Weththasinghe, S.M., Samaradivakara, G.V.I., Vijitha, A.V.P., Ratnayake, N.P., 2017. Sediment and physicochemical characteristics in Madu-ganga Estuary, southwest Sri Lanka. *J. Geol. Soc. Sri Lanka* 18, 43–52.
- Sameera, K.A.G., Wickramasinghe, W., Harankahawa, S.B., Welikanna, C.R., De Silva, K., 2020. Radiometric surveying for Th and U mineralization in southwestern, Sri Lanka: radiological, mineralogical and geochemical characteristics of the radioactive anomalies. *J. Geol. Soc. Sri Lanka* 21.
- Sanematsu, K., Watanabe, Y., 2016. Characteristics and genesis of ion adsorption-type rare earth element deposits.
- Schmid, M., 2019. Mitigating supply risks through involvement in rare earth projects: Japan's strategies and what the US can learn. *Resour. Policy* 63, 101457.

- Schüler, D., Buchert, M., Liu, R., Dittrich, S., Merz, C., 2011. Study on rare earths and their recycling. *Öko-Institut eV Darmstadt* 49, 30–40.
- Senaratne, A., RUPASINGHE, M.S., DISSANGAYAKE, C.B., 1987. Rare earth elements in some residual, alluvial and inter-tidal sediments of Sri Lanka. *Chemie der Erde* 47, 31–40.
- Sengupta, D., Van Gosen, B.S., 2016. Placer-type rare earth element deposits: Chapter 4.
- Siegel, K., Vasyukova, O. V, Williams-Jones, A.E., 2018. Magmatic evolution and controls on rare metal-enrichment of the Strange Lake A-type peralkaline granitic pluton, Québec-Labrador. *Lithos* 308, 34–52.
- Simandl, G.J., 2014. Geology and market-dependent significance of rare earth element resources. *Miner. Depos.* 49, 889–904.
- Simandl, G.J., Paradis, S., 2018. Carbonatites: related ore deposits, resources, footprint, and exploration methods. *Appl. Earth Sci.* 127, 123–152.
- Sinclair, W.D., Jambor, J.L., Birkett, T.C., 1992. Rare earths and the potential for rare-earth deposits in Canada. *Explor. Min. Geol.* 1, 265–281.
- Singh, Y., 2020. Rare earth element resources: Indian context. Springer.
- Skirrow, R.G., Bastrakov, E.N., Barovich, K., Fraser, G.L., Creaser, R.A., Fanning, C.M., Raymond, O.L., Davidson, G.J., 2007. Timing of iron oxide Cu-Au-(U) hydrothermal activity and Nd isotope constraints on metal sources in the Gawler craton, South Australia. *Econ. Geol.* 102, 1441–1470.
- Skirrow, R.G., Jaireth, S., Huston, D.L., Bastrakov, E.N., Schofield, A., Van der Wielen, S.E., Barnicoat, A.C., 2009. Uranium mineral systems: processes, exploration criteria and a new deposit framework. *Geosci. Aust. Rec.* 20, 44.
- Smith, M.P., Moore, K., Kavecsánszki, D., Finch, A.A., Kynicky, J., Wall, F., 2016. From mantle to critical zone: A review of large and giant sized deposits of the rare earth elements. *Geosci. Front.* 7, 315–334.

- Spandler, C., Morris, C., 2016. Geology and genesis of the Toongi rare metal (Zr, Hf, Nb, Ta, Y and REE) deposit, NSW, Australia, and implications for rare metal mineralization in peralkaline igneous rocks. *Contrib. to Mineral. Petrol.* 171, 1–24.
- Statista, 2020. Rare earth oxide demand worldwide from 2017 to 2025 [WWW Document].
- Taylor, S.R., McLennan, S.M., 1985. The continental crust: its composition and evolution.
- Thilakanayaka, T., 2015. Quantification of Radioactive and Heavy Minerals in Uswetakeiyawa area (Sri Lanka) 5.
- Timofeev, A., Williams-Jones, A.E., 2015. The origin of niobium and tantalum mineralization in the Nechalacho REE Deposit, NWT, Canada. *Econ. Geol.* 110, 1719–1735.
- Udarika, R.M.L., Udayakumara, E.P.N., Amalan, K., Ratnayake, N.P., Premasiri, H.M.R., 2016. Comparison of heavy mineral composition along Mahaweli River with placer deposits at North East Coast of Sri Lanka, in: *International Symposium on Agriculture and Environment*.
- Ugbe, F.C., 2011. Basic engineering geological properties of lateritic soils from Western Niger Delta. *Res. J. Environ. Earth Sci.* 3, 571–577.
- United States Geological Survey (USGS), 2022. *Mineral Commodity Summaries 2022*.
- United States Geological Survey (USGS), 2021. *Mineral Commodity Summaries*.
- United States Geological Survey (USGS), 2011. *Mineral Commodity Summaries 2011*.
- Van Gosen, B.S., Verplanck, P.L., Long, K.R., Gambogi, J., Seal II, R.R., 2014. The rare-earth elements: vital to modern technologies and lifestyles. *US Geological Survey*.

- Vithanage, M., Rajapaksha, A.U., Oze, C., Rajakaruna, N., Dissanayake, C.B., 2014. Metal release from serpentine soils in Sri Lanka. *Environ. Monit. Assess.* 186, 3415–3429.
- Wadia, D.N., Fernando, L.J.D., 1945. Gems and semi-precious stones of Ceylon. *Ceylon Dep. Mineral. Prof. Pap.* 2, 13–44.
- Wall, F., Mariano, A.N., 1995. Rare earth minerals in carbonatites: a discussion centred on the Kangankunde Carbonatite, Malawi. *Mineral. Soc. Ser.* 7, 193–226.
- Walters, A., Lusty, P., 2010. Rare earth elements. British Geological Survey.
- Wang, L., Liang, T., 2016. Anomalous abundance and redistribution patterns of rare earth elements in soils of a mining area in Inner Mongolia, China. *Environ. Sci. Pollut. Res.* 23, 11330–11338.
- Wang, X., Yao, M., Li, J., Zhang, K., Zhu, H., Zheng, M., 2017. China's rare earths production forecasting and sustainable development policy implications. *Sustainability* 9, 1003.
- Weng, Z., Jowitt, S.M., Mudd, G.M., Haque, N., 2015. A detailed assessment of global rare earth element resources: opportunities and challenges. *Econ. Geol.* 110, 1925–1952.
- Wickremeratne, W.S., 1986. Preliminary studies on the offshore occurrences of monazite-bearing heavy-mineral placers, southwestern Sri Lanka. *Mar. Geol.* 72, 1–9.
- Williams-Jones, A.E., Migdisov, A.A., Samson, I.M., 2012. Hydrothermal mobilisation of the rare earth elements—a tale of “ceria” and “yttria.” *Elements* 8, 355–360.
- Williams, P.J., Barton, M.D., Johnson, D.A., Fontboté, L., De Haller, A., Mark, G., Oliver, N.H.S., Marschik, R., 2005. Iron oxide copper-gold deposits: Geology, space-time distribution, and possible modes of origin.
- Winter, J.D., 2013. Principles of igneous and metamorphic petrology. Pearson education.

- Woolley, A.R., Kjarsgaard, B., 2004. Carbonatites of the world: map and database.
- Zepf, V., 2013. Rare earth elements: a new approach to the nexus of supply, demand and use: exemplified along the use of neodymium in permanent magnets. Springer Science & Business Media.
- Zhou, B., 2017. Global Potential of Rare Earth Resources and Rare Earth Demand from Clean Technologies. *Minerals* 7, 203–217. <https://doi.org/10.3390/min7110203>