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Lithium-Caesium-Tantalum-Mineralised Granitic Pegmatite Systems in the Palaeoproterozoic Bedrock of Sweden

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The Palaeoproterozoic bedrock of Sweden is a core component of the Fennoscandian Shield in northernmost Europe. It is well known for its granitic pegmatites after several centuries of research and discovery of both new metals (e.g., lithium in 1818 and many of the rare earth elements, starting with “yttria” in 1794) and minerals (e.g., gadolinite, spodumene, petalite, tantalite minerals) as well as in the development of scientific characterization and understanding of these fascinating and potentially economically relevant rocks. Of the presently known different rare element-enriched pegmatites and pegmatite fields, primary interest today is focused on those of a lithium-caesium-tantalum-enriched type (LCT-pegmatites).

The most important provinces hosting LCT-pegmatites are the eastern part of the Skellefte district in northern Sweden (including the classic, previously mined Varuträsk pegmatite), the Bothnian Basin pegmatite fields together with the Räggen and Mårdsjön areas in west central Sweden, and the Stockholm region, including its archipelago, in southeast central Sweden. The recent discovery of an LCT-pegmatite near Bergby in east central Sweden led to the recognition of this region as a new prospective area, and exploration there with a focus on lithium (± tantalum) is on-going, with significant new discoveries made during the past year. All major LCT-pegmatite fields in Sweden are located within low- to medium-grade metamorphosed metasupracrustal successions, and typically associated with late-orogenic, c. 1.8 Ga S-type granites such as the Stockholm, Härnö, and Skellefte granite suites. In addition to these areas, less-evolved LCT-type pegmatites occur sparsely in northernmost Sweden (e.g., at Suorravaara and Kluntarna), as well as in southwest Sweden (e.g., at Skuleboda-Essljung and Skantorp). Presently, all major provinces in Sweden known to have significant evolved granitic pegmatite systems of LCT type are seeing exploration work on various scales, mainly for lithium, but to some extent also for tantalum and other commodities.