



New lithostratigraphic sub-division of the Seckau Complex, Eastern Alps, based on U-Pb zircon ages

Magdalena Mandl (1), Walter Kurz (1), Christoph Hauzenberger (1), and Urs Klötzli (2)

(1) Institute of Earth Sciences, University of Graz, NAWI Graz Geocenter, Graz, Austria (m.mandl@uni-graz.at), (2) Department of Lithospheric Research, University of Vienna, Vienna, Austria

The magmatic-metamorphic and tectonic evolution of the Seckau Complex, as part of the Austroalpine Silvretta-Seckau Nappe System, has been almost disregarded concerning detailed structural, petrological and geochronological analyses in the last few decades. The crystalline basement of the Seckau Complex comprises paragneisses, (garnet-)micaschists and a large number of different types of metagranitoids. Despite the absence of precise geochronological ages these metagranitoids were generally assumed to be part of the widely distributed magmatic intrusions related to the Variscan orogeny. In this study we present new U-Pb zircon ages in order to examine previous hypotheses on the magmatic evolution of the Seckau metagranitoids. Based on geochronological and geochemical data we propose a new lithostratigraphic sub-division of the Seckau Complex into (1) the Ingering Suite (2) the Hochreichhart Suite and (3) the Hintertal Suite.

The Ingering Suite is composed of metapsammites and metapelites (locally migmatized paragneisses and (garnet-) micaschists) and minor amphibolites and quartzites. Zircon ages from the metapelites cluster from 570 ± 8 Ma to 557 ± 14 Ma and the inherited cores of these zircons yield occasionally ages around 2 Ga.

The Hochreichhart Suite comprises metagranites and granite- to granodiorite gneisses with zircon ages in the range between 484 ± 11 and 508 ± 9 Ma. These granitic intrusive rocks show mainly S-type characteristics and are predominantly found in the northeastern and eastern part of the Seckau Complex.

The Hintertal Suite comprises basic to acidic intrusion bodies with U-Pb zircon ages between 343 ± 12 Ma and 365 ± 8 Ma, clearly indicating Variscan orogeny related origin. The Hintertal Suite covers the central and western part of the Seckau Complex and can be subdivided into (a) the Pletzen Lithodem and (b) the Gamskogel Lithodem. The Pletzen Lithodem, mainly situated in the central part of the Seckau complex, is dominated by a basic to intermediate intrusion sequences of foliated monzodiorites, tonalities, granodiorites as well as granites, showing predominant I-type characteristics. With an average U-Pb zircon age of around 355 ± 10 Ma the Pletzen Lithodem represents the "older" intrusion sequence within the Hintertal Suite. The Gamskogel Lithodem is located in the western part of the Seckau Complex and comprises metagranites and granite gneisses with a predominant S-type signature and slightly younger zircon ages of about 345 ± 5 Ma.

U-Pb zircon ages of a wide variety of metagranitoids of the Seckau Complex indicate that besides magmatism, related to the Variscan orogeny, massive pre-Variscan magmatic events have taken place during Early to Mid-Cambrian times.