

Geochronology of the Sri Lanka Basement: I – U-Pb mineral systematics

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Precambrian high-grade terrains in Sri Lanka are regarded as parts of a former lower crust. We report U-Pb zircon and monazite systematics (work on rutile and garnet proceeding) from 13 locations all over the island. The aim is to show the time of crustal-formation events and to date the metamorphic evolution with special regard to the genetic relationship between the three crustal units of Sri Lanka, viz., Highland Series, Vijayan Complex and Wannu Complex (= West Vijayan).

Zircons of the Highland Series orthogneisses, paragneisses and one metabasite, show crystallisation ages from more than 2.3 Ga to 1.8 Ga. They appear to have suffered lead loss, but monazite analyses indicate mineral growth, both at 600 and 550 Ma. Vijayan orthogneiss zircons crystallized significantly later, at about 1.0 Ga. Lower discordia intercepts as well as concordant monazites give ages of 550 to 450 Ma, slightly younger compared to the Highland Series. The concordia-intercepts of two Wannu paragneisses show young ages, comparable to the Vijayan. All three units are intruded by late granitoids, 600 to 550 Ma ago.

From our results we conclude that:

- Vijayan and Wannu Complexes show apparent similarities, with formation ages up to 1.1 Ga;
- The Highland Series shows significantly higher crustal-formation ages and older sources, with ages up to 2.3 Ga;
- The three units have undergone high-grade metamorphism and been intruded by many granitoids at about 600 to 550 Ma ago. This suggests a common history from this time on.