

A geoarchaeological perspective on the rise and fall of the ancient capital of Anuradhapura (Sri Lanka)

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Anuradhapura, the ancient capital of the Ceylonese kings (4th century BCE - 11th century CE) is located in the north-central Dry Zone of Sri Lanka. Covering an area of c. 40 km² Anuradhapura is one of the key sites for the development of an urban civilisation in South Asia. The settlement history of Anuradhapura can be traced back to the beginnings of the Protohistoric Iron Age (c. 900–500 BCE). During its existence, the centre of the ancient capital, the so-called Citadel, accumulated c. 10 meters of cultural sediments. Although archaeological research dated back to the beginning of the 20th century, none of the numerous excavations succeeded to extract an undisturbed archaeological sequence covering all periods of the city history. The objective of the presented study is to reconstruct natural surface processes, which went along with the formation and abandonment of the Citadel; possibly even triggering it.

Based on sediment analysis (bulk parameters, magnetic susceptibility and mineralogical composition) and the application of dating techniques (radiocarbon, OSL) environmental conditions during and after the abandonment of the Citadel were reconstructed. The results reveal information about four phases of the city history: i) Lower Early Historic Period (500–250 BCE), ii) Mid-Early Historic Period (250–0 BCE), iii) the end of the Anuradhapura period (11th century CE) and iv) after its abandonment (after the 11th century CE). In the first phase mainly wattle and daub constructions characterise the architecture of the site. The facies of correlate sediment layers point to eolian and fluvial facies with intercalated occupation layers. It is concluded, that these layer reflect a typical mix of natural processes and processes induced by humans as typical for rural settlements. With the beginning of the 1st century BCE human made terraces seem to build the base for stone and brick constructions in order to protect them from surface runoff during the rainy seasons. Between the beginning of the Common Era and the 10th century CE the archaeological and sedimentological records show a sequence of backfilled pit horizons. This can be explained by vivid construction activities as well as deterioration, which must have occurred in the Citadel. Thick layers of levelled debris of collapsed buildings and extracted building material give witness of these activities. The last phase is represented by fluvial deposits, dated to 920 – 1290 CE (end of the Anuradhapura period), intersecting the sediment layers of the already described phases. The deposition of this fluvial layer can be explained as follows: During heavy precipitation events streets were destroyed by surface runoff. Consequently the fluvial deposits (well sorted sands, with sherd and brick fragments up to 5 cm Ø) are correlate sediments of these runoff events.

It is concluded, that with the abandonment of the city and the cessation of maintenance measures the infrastructure decayed, accelerated by severe runoff-events during the rainy-season.