Stop 13: Soeginina cliff

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Location: Coordinates of the terminal points of the cliff: north-east - 58°17'20.22" N, 21°50'30.05" E; south-west - 58°55.96" N and 21°49´54.73" E; Saare County, Estonia.
Stratigraphy: Homerian–Gorstian, Rootsiküla Fm, Rootsiküla RS.
Status: Cliff is under nature protection; no hammering, but loose material may be collected.
More information: https://geoloogia.info/en/locality/12650

The following text is modified from Meidla et al. (2014).

The Soeginina cliff (Figs 13.1–13.3) is located in western Saaremaa, in the south part of the Vilsandi National Park. In this section upper Vesiku, Anikaitse and Soeginina Beds of the Rootsiküla Formation are exposed.

The Soeginina cliff is about 1000 m long escarpment along the western coast of Saaremaa. Its maximum height reaches almost 4 m. It is actively abraded by the sea and, from time to time, some collapses may occur.

Description of the section

Description of the section (58°17'5.68" N, 21°50'18.06" E; from base; Fig. 13.1) is modified from Viira & Einasto (2003):

Vesiku Beds

I (0.8 m) – laminated argillaceous dolomitic mudstone with large (over 1 m in diameter) *Stratifera*-type stromatolites and fragments of eurypterids, cephalopods and leperditiid arthropods. The upper boundary is marked by a distinct pyritized discontinuity surface.

II (up to 1.8 m) – yellowish-brown mottled bioturbated argillaceous *Eurypterus* dolostone with spots of fine dispersed pyrite. Lamination is preserved locally only. The upper boundary is a distinct pyritized discontinuity surface.

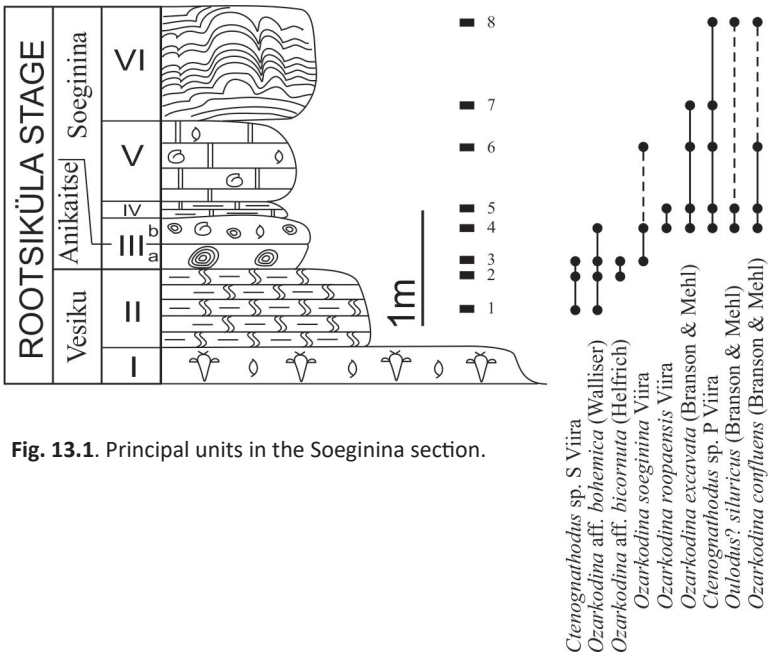

Fig. 13.1. Principal units in the Soeginina section.

Anikaitse and Soeginina beds

IIIa (up to 0.2 m) – brownish-grey dolomitic bioturbated bioclastic wackestone with relatively large irregular oncoids, and stromatolitic encrustations on bedding planes. Viira and Einasto (2003) described this interval as the Anikaitse Beds (in Fig. 13.1, beds IIIa and IIIb are merged together), according to Nestor (1997), this interval corresponds to the basal part of the Soeginina Beds.

IIIb (up to 0.3 m) – light brown dolomitic unsorted bioclastic packstone to grainstone with oncoids, leperditiid arthropods, gastropods, nautiloids, bivalves, bryozoans and calcareous algae (*Solenopora*). A lens-like interbed of flat-pebble conglomerate occurs at the base of the bed.

IV (0.2–0.5 m) – light grey massive unfossiliferous(?) dolomitic mudstone;

V (0.3–1.0 m) – light brownish-grey vuggy thin-bedded fine-grained bioclastic-pelletal dolomitic grainstone with occasional accumulations of leperditiid arthropods and gastropods. The upper boundary is a distinct discontinuity surface.

VI (up to 1.2 m) – dark brown vuggy varygrained pelletal-bioclastic dolomitic floatstone with oolites, small pebbles of light grey dolomitic mudstone and (moulds of) bivalves, gastropods and leperditiid arthropods, intercalated with light grey dolomitic mudstone. Vugs are occasionally filled with sparry calcite. On three levels, 0.3–0.4 m high *Stratifera*-type stromatolites are present.

The uppermost Vesiku Beds exposed in this section represent one of the shallowest water/lagoonal facies in the Silurian succession of Estonia; the overlying Anikaitse and lower Soeginina Beds correspond to the lower, transgressive part of the uppermost cycle in the Rootsiküla Formation.

Fig. 13.2. Soeginina Cliff. Photo: Peep Männik.

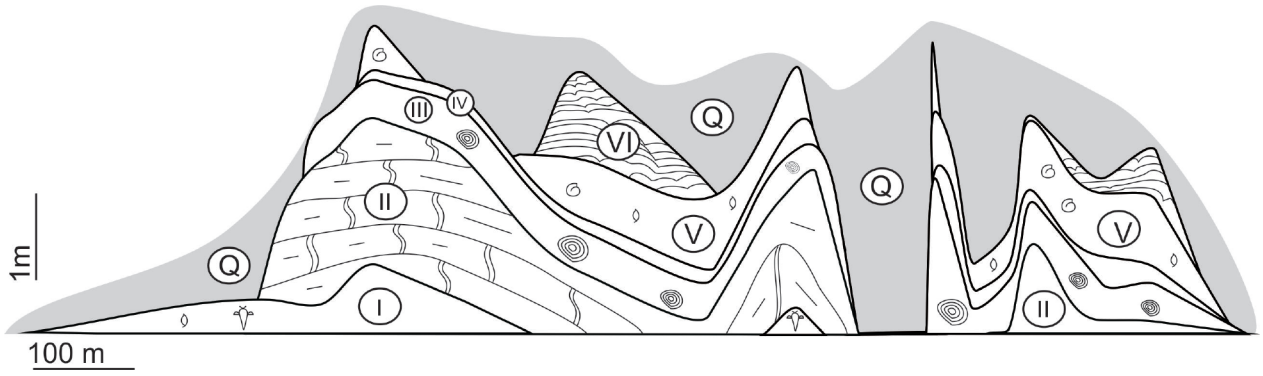

Fig. 13.3. Profile of the Soeginina Cliff. The principal units distinguished in the succession are shown in Fig. 13.1 and described in the text.

Stratigraphy

Due to rare occurrences of age-diagnostic fauna in the Rootsiküla Stage, its age has been debated for a long time, and its correlation with the global stratigraphical scheme has been repeatedly revised. Tentatively, Kaljo et al. (1970) attributed the stage to Ludlow. H. Nestor (1997) correlated the Rootsiküla Stage with the upper Wenlock. V. Nestor (2007) identified the *Sphaerochitina lycoperdoides* Chitinozoan Zone, the global topmost Wenlock zone, in the Viita Beds in the Ohesaare drill core and, based on analysis of chitinozoan distribution in several sections in Estonia and western Latvia, concluded that the Soeginina Beds might be of Ludlow in age and probably should be attributed to the Paadla Regional Stage. According to Märss & Männik (2013), the Soeginina Beds yield the *Paralogania martinssoni* Vertebrate Zone fauna and might correlate with the (lowermost part of) early Ludlow *Kockelella crassa* Conodont Zone.

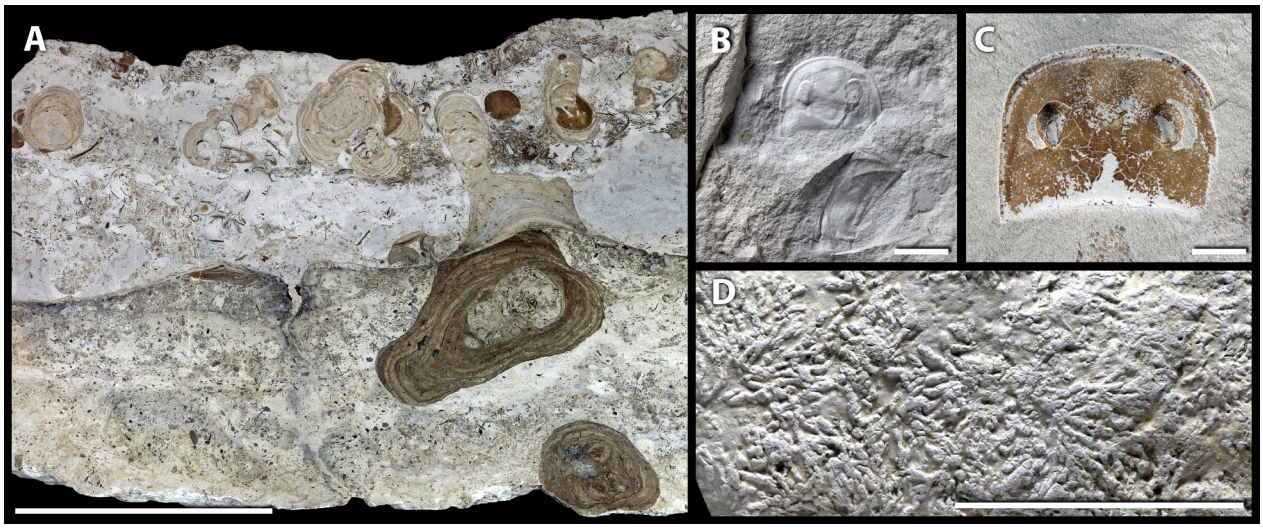

Fig. 13.4. Selected fossils from the Soeginina cliff, Rootsiküla Regional Stage. Scale bars A, D – 5 cm; B – 1 cm; C –5 mm. **A** – dolomitic limestone with oncoids, boundary between Anikaitse and Soeginina Beds; GIT 378-243. **B, C** – *Eurypterus tetragonophthalmus* Fischer, Vesiku Beds; **B** – GIT 200-128, **C** – TUG 1763-4. **D** – trace fossil *Chondrites* isp., Vesiku Beds; GIT 362-696.

Fossils

The Soeginina section is palaeontologically poorly characterised. The lower part of the succession contains fragments of *Eurypterus remipes tetragonophthalmus* Fischer. Complete specimens are extremely rare. Oncoids in the middle part of succession are often formed around coralline alga *Solenopora* sp. and contain cyanobacterial fragments (genus *Bevocastria* according to Kõrts 1991). Moulds of bivalves and gastropods, common in the upper part of the succession, are too poorly preserved to be identified. The leperditiid arthropods recorded in this section are tentatively attributed to *Herrmannina* (Viira & Einasto 2003). Märss (1986) identified *Thelodus laevis* (Pander 1856) and *Paralogania martinssoni* (Gross 1967) in this section. According to Viira & Einasto (2003) conodonts in the Vesiku and Anikaitse Beds are dominated by *Ctenognathodus* sp. S Viira (occurs in this interval only), also *Ozarkodina* aff. *bohemica* (Walliser) is quite common. In the lowermost Soeginina Beds, in the unit IIIb (Fig. 13.1), several new taxa (*Ctenognathodus* sp. P Viira, *Oulodus*? *siluricus* (Branson & Mehl), *Ozarkodina confluens* (Branson & Mehl), *Wurmiella excavata* (Branson & Mehl), etc.) appear. No taxon in these faunas is age-diagnostic, but the appearance of *O. confluens* and *W. excavata* in the lowermost Soeginina Beds suggests some improvement in environmental conditions.

References

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