# Geochronological data from newly discovered or rediscovered rock units in the southern archipelago of Stockholm

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The bedrock of the southern archipelago of Stockholm contains some classical geological localities, most notably Utö with its iron deposit, well-preserved Svecofennian supracrustals and granitic pegmatites (Gavelin et al. 1976; Stålhös 1982), but also Ornö with its strongly sheared "banded series" outcropping along its western side. However, further east is a virtual geological "Terra incognita" that has, at least in part, apparently not been mapped geologically since Holst (1882).

The island of Fjärdlång, located E of Ornö and NNE of Utö, together with neighbouring islets and skerries, is marked as consisting of syn-orogenic Svecofennian granitoids on the digital bedrock map of SGU. However, during a visit some years ago, it was found to consist of metaturbidites similar to the greywackes on eastern Utö, but also some more massive units of possible volcanic or volcanoclastic origin, and monomict or polymict breccias. These rocks include rocks mapped as "helleflint gneiss" or "mica schist" as well as "red gneisses" by Holst (1882).

New detailed mapping of the island has revealed two fold phases and two metamorphic events, as well as numerous signs of incipient melting including pegmatitic veins and dykes (Högdahl et al. 2022). Further east, a NNE-trending belt of reddish felsic metavolcanic rocks occur, referred to as "red gneiss" by Holst (1882) and sampled by us on the islet of Marskär. This belt is apparently cut by a red granite intrusion mapped by Holst (1882) and sampled by us on the island of Villinge.

Three samples of the Fjärdlång supracrustals yield detrital zircon ages mainly between 1900 and 2060 Ma, similar to the detrital zircon data from Utö reported by Kathol et al. (2020). The red rhyolitic metavolcanic rock from Marskär yields a U-Pb zircon concordia age of 1900 ± 6 Ma, within error of the volcanism on Utö (1904 ± 4 Ma; Lundström et al. 1998), while the red granite on Villinge gives a virtually identical concordia age of 1898 ± 5 Ma.

The general NNE strike of the rock units suggests that the Fjärdlång supracrustals and the Marskär metavolcanites may represent two easterly branches of the well-known supracrustal units on Utö. These new discoveries and rediscoveries call for a more systematic regional mapping campaign of the outer part of the southern Stockholm archipelago.

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