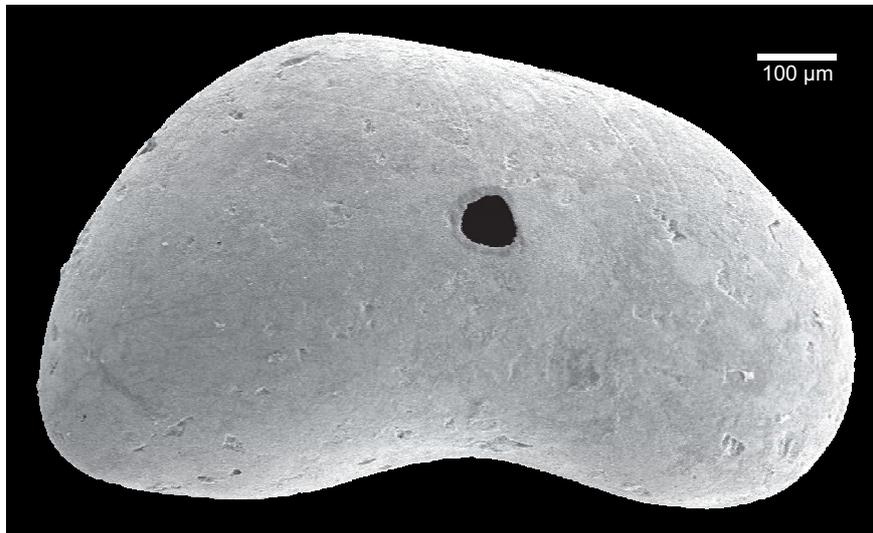


### **Predatory Drill Holes on Ostracods from the Upper Miocene Long-lived Lake Pannon at the Locality St. Margarethen (Burgenland, Austria)**

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Predatory drill holes are well known from Cenozoic marine molluscan assemblages, where they can mostly be attributed to the activity of muricid and naticid gastropods. Similar drill holes are also reported from marine ostracods, but to our knowledge have not been described yet from a lake ecosystem. We studied the ostracod assemblages from the Upper Miocene Lake Pannon at the outcrop "Altes Zollhaus" at St. Margarethen, Burgenland. The sediments of this outcrop belong to the Lower Pannonian ("Pannon B-D"; local stage corresponding to the Lower Tortonian mammal zones MN8 and MN9), and consist of silts, sands and gravels, deposited in a mixo-mesohaline lake environment. Ostracods were abundant throughout the studied transect with a thickness of 20 m and are represented with typical Pannonian assemblages, consisting mainly of *Cyprideis*, *Hemicytheria*, *Amplocypris* and candonids. Drilled valves occurred in gravelly and sandy layers in the uppermost part of the section ("Pannon D"; Fig. 1).



*Fig. 1:* Drill hole on an adult *Candonina* sp. from St. Margarethen ("Pannon D").

Drill holes were only found on three valves of *Amplocypris recta* (length 1.16 mm), *Candona* sp. (1.04 mm) and an unidentified cyclocypridid specimen (0.56 mm). *Amplocypris* and *Candona* are most likely autochthonous, the cyclocypridid species is a freshwater form that was probably transported from a deltaic system to the west into Lake Pannon. The perforations in the valves are single, almost circular in plan view, drilled from the outside and have bevelled edges; they are therefore interpreted as predatory in origin. All drilled specimens are adult; the drill holes are very small (outer drill hole diameters range from 0.07 to 0.23 mm).

The producers of the drill holes are unknown, drilling gastropods do not occur in Lake Pannon and nothing is known about potential other drillers in this fossil long-lived lake.

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