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# GEOLOGICAL AND MINERALOGICAL SCIENCES

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## NEW HOLOCENE ICHTHYO-FOSSIL ASSEMBLAGE FROM EXTRUDED LAGOONAL OUTCROPS, CURONIAN SPIT, LITHUANIA

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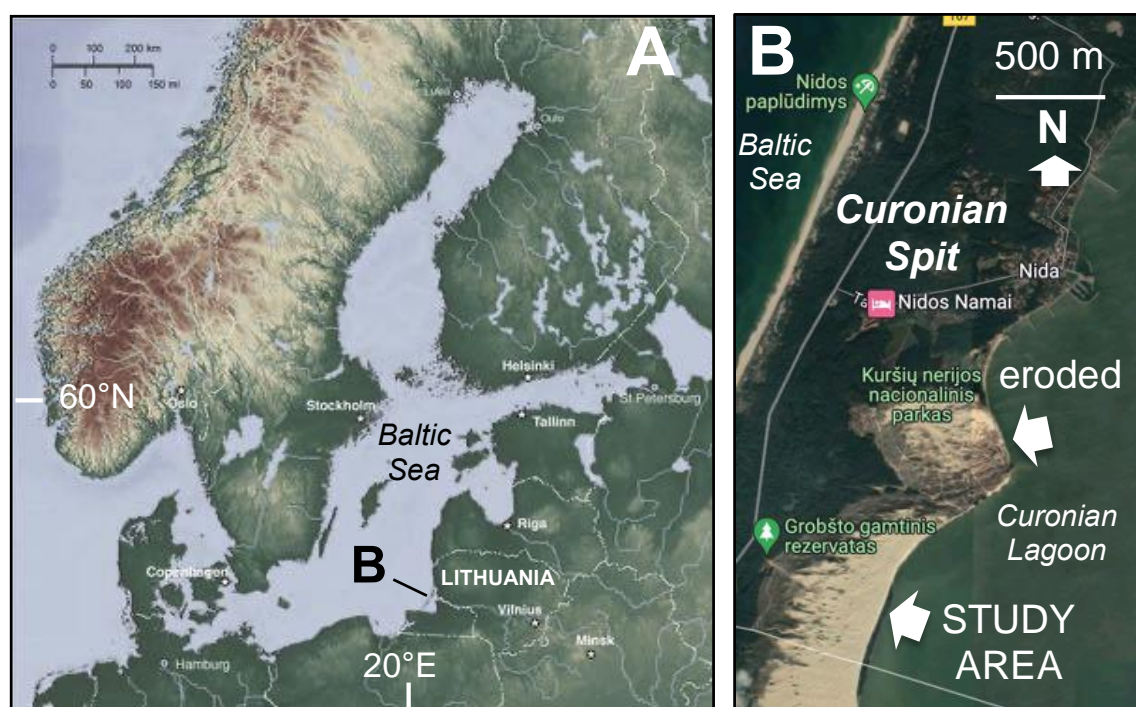
Curonian Spit National Park, Neringa, Lithuania

**Abstract:** Fish remains (ichthyo-fossil assemblages) offer important information about past ecosystems and serve as taphonomic indicators of sedimentation and burial history. In recent years, several sets of fish remains have been collected from lagoonal mark outcrops exposed along the shores of the Curonian Lagoon, Lithuania. Unfortunately, due to ongoing erosion, most of the fossiliferous deposits have disappeared in recent years. Here we present new finds of three separate fish bone accumulations from a previously unsampled outcrop. Based on previous data, these (bream-like) fish are likely mid-Holocene in age and have been buried in a thanatocoenosis, as reflected by the grouping and delicate nature of the fossils, especially the scales.



**Keywords:** marl, vertebra, preopercle, Curonian Lagoon, Baltic Sea

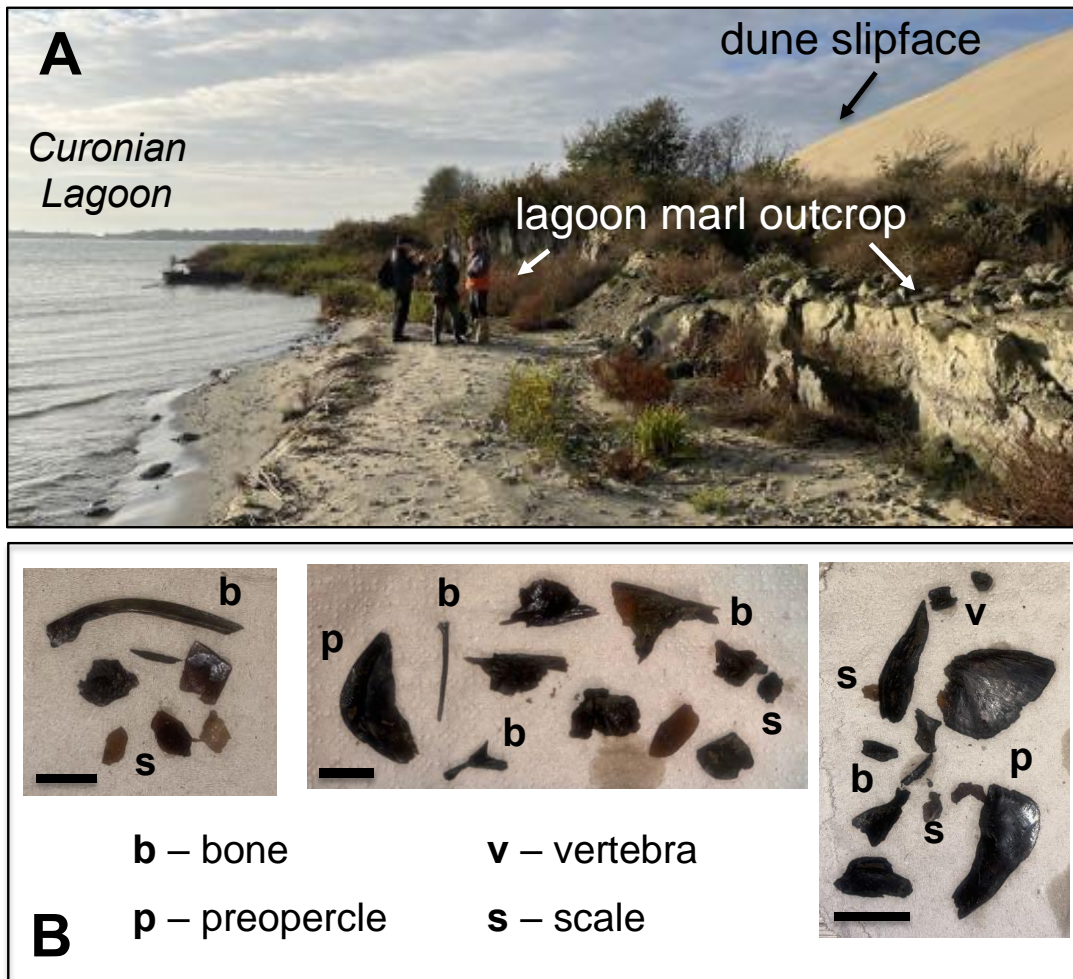
**Introduction:** In ancient sedimentary sequences, fish remains provide important information about past ecological conditions, trophic composition, and potential food source for inhabitants, with additional applications as taphonomic indicators. In recent years, lagoonal marl outcrops along the Curonian Spit, Lithuania (Fig. 1) yielded a set of fish fossils dating to mid-Holocene [1,2].



**Figure 1. A) Location map of the study area along the central part of the Curonian Spit, Lithuania. B) Location of marl outcrops sampled in this study. Older fossiliferous localities have disappeared due to erosion (GoogleMaps™).**

The outcrops are the result of loading by migrating dunes [3] and provide a rich archive of vertebrate and invertebrate fossils. In recent years, fossiliferous marl sections have been eroded by wave action and sea ice Fig. 1B). Remaining outcrops to the south, within 500-600 m of the southern border of Lithuania, were investigated for vertebrate fossils. This paper presents the results of these surveys that yielded a rich new assemblage, as part of a growing database that contributes to reconstructing the paleo-environmental context in this coastal region [3,5].

**Methodology:** Fossils were collected during field surveys along the lagoon shoreline in October 2022 (Fig. 2A). They are stored at Temple University, USA, for future analysis and radiocarbon dating.



**Figure 2. A) Field photograph of fossil collection surveys. B) Fish fossils collected from three sites along the outcrop. Scale bars are 1 cm.**

**Results and Summary:** More than 30 skeletal elements were collected from three distinct sites along the outcrop and include: bones of various shapes and sizes, preopercles, vertebrae, and scales of a bream-like fish (Fig. 2B). Based on previous dating results [2], these remains are likely to be in the range of 4,500-6,500 years old. They provide a good independent dataset for radiocarbon ages, which are not likely affected by fractionation common for carbonate remains, such as shells [4]. The proximity of most skeletal elements within a group (Fig. 2B) and their fragile nature, especially fish scales, suggest a thanatocoenosis with minimal reworking. Along with

native and invasive species found in these outcrops [5, 6], this new ichthyo-assemblage sheds light on Holocene paleoenvironmental conditions along this part of the Baltic Sea basin.

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