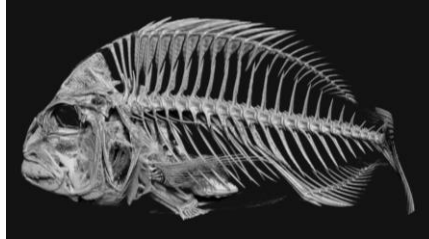# Introduction to Analyses of Fish Remains: Environmental, Ecological, and Anthropological Perspectives

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The study of fish remains from lacustrine and archaeological deposits plays a crucial role in paleoenvironmental and ecological reconstruction. By analyzing fish bones, scales, and otoliths (ear stones), scientists can infer past water temperatures, salinity levels, and aquatic habitat conditions, offering insights into historical climate patterns. The species composition and abundance of fish remains provide information on ancient biodiversity, food webs, and human subsistence practices, revealing how past societies interacted with their environment. Stable isotope analysis of fish remains further allows the reconstruction of past diets and migration patterns. Altogether, the study of fish remains contributes to a nuanced understanding of historical ecological changes and their impacts on both natural ecosystems and human cultures.

Aims of the course

This course aims to introduce students to major themes and methods of analysis in aquatic zooarchaeology and to teach the principles of fish bone identification, lacustrine taphonomy, zooarchaeological methods, and to explore issues of calculations and interpretation.

The course will introduce students to the practical and analytical aspects of fish remains, encourage discussion and critique of current approaches, and explore how fish remains can be analyzed and interpreted. The course includes **practical and laboratory experience**, where students learn identification and observation skills for a selected range of fish from different aquatic habitats.

Topics to be included in laboratory sessions: fish taxonomy, fish bone identification, sexual dimorphism, body part analysis, osteometrics, quantification methods, bone modification, lacustrine taphonomy, the use of databases and recording systems, analysis and interpretation of data.

Syllabus

- Overview of current approaches to practical zooarchaeology during excavation and afterwards.
- Principles and methods of identification for selected fish remains.
- Observational and analytical approaches for assessing taphonomy and potential for assemblage analysis.
- Statistical approaches to quantification of vertebrate archaeological assemblages.
- Recording protocols and databases for zooarchaeological analysis.
- Biometrical methods in zooarchaeology.
- Body part analysis and estimation of fish body size.
- Interpretating potential of ichthyo-archaeological data.
- The roll of aquaculture in ancient cultures.

Teaching Methods

Teaching consists of five full days which will include oral sessions, lab work and a field trip

In the lab the student will learn the external and anatomical characteristics of bony and cartilaginous fish, the methodology used for their taxonomic identification, and how to prepare their skeleton. Afterwards they will learn to identify the different skeletal elements, perform measurements for body size estimation and will exercise their identification based on samples obtained from archaeological sites.

The field trip will take place along the Jordan Rift Valley, examining different aquatic habitats, fishing methods and the fish captured. We will also visit aquaculture farm, and archaeological sites.

The emphasis is on students learning not just identification methods, but also how to make observations, and to apply and critique analytical methods.

Assignments:

The student will be asked to:

1. Skeletonize a complete fresh fish, identify each bone and summerise the osteological characteristic of the selected fish.
2. To analyze fish remains from a selected archaeological site: identify the remains, measure them and estimate their past body size.
3. Each student will have to prepare a short paper based on the literature and the identified remains.