

DICIEMBRE DE 2022



ENSAYOS DE ABRASIÓN

LABORATORIO DE ENSAYOS AMBIENTALES Y TAFONÓMICOS

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01.

ENSAYOS DE ABRASIÓN

Los ensayos de abrasión nos permiten conocer la resistencia del material de las muestras analizadas.

Para evaluar las características de dureza de los distintos materiales, podemos simular distintas situaciones/ ensayos:

- Abrasión por arenas de desierto,
- Abrasión por rozamiento de materiales o
- Erosión por corrientes de agua.
- Fricción entre materiales

Tenemos varios equipos que nos permiten realizar este tipo de ensayos que se describen a lo largo del documento.

**CONSULTE NUESTRAS
TARIFAS.**



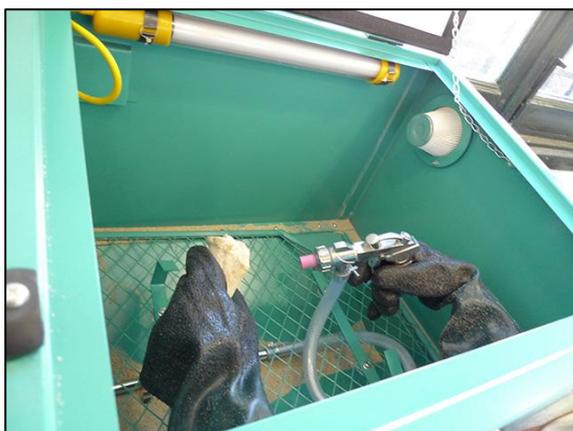
02.

CABINA DE PULIDO

Este equipamiento consta de chorro de arena y pistolas de aire comprimido. Sus dimensiones son:

- Dimensiones exteriores (Ancho X Fondo X Alto): 660 x 490 x 500 mm
- Dimensiones interior cabina (Ancho X Fondo X Alto): 575 x 450 x 280 frontal-350 fondo
- Peso: 20 Kg.

Construida en acero y equipada con una pistola, cuatro boquillas, guantes, iluminación y 5 láminas protectoras del visor.



Nos permite simular erosión por las arenas de desierto o por aire a presión.

**Se requiere ejecución
del técnico**

Tarifa: 1€/día

ENSAYOS REALIZADOS

El Laboratorio de Ensayos Ambientales y Tafonómicos ha llevado a cabo varios experimentos de abrasión mediante la cabina de pulido, alguno de ellos con resultados publicados. A continuación, se muestran algunos de ellos por si fuera de su interés (*podrán acceder al contenido completo de cada publicación pinchando sobre cada imagen*).

**Abrasion in archaeological fish bones from sand dunes.
An experimental approach**

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Abstract
Fish bones are still an unknown tool in taphonomic studies. We have carried out several experiments which have shown that fish bones may provide key taphonomic traits. Fossil fish bones in archaeological sites (from caves to riverbanks or seashores) are frequently result of predation by humans or any other predator, as well as abiotic agents. The original environment of fish is aquatic restricted to specific water contexts and the presence of fish in fossil sites provides relevant information regarding paleoenvironments, human/animal predatory behaviors, and site formation. In spite of the interest of fossil fish remains, most taphonomic experiments have been focused on mammalian fossil bones. This paper shows results obtained from experiments that help interpreting palaeoenvironmental changes, potential space-time mixtures, and site formation. Our experiments have provided distinct criteria to distinguish the action of sand projected by wind, friction of bones against sand substrates, or sand with or without water abrading the bone surface. Experimental results have been compared to an archaeological case: El Americano II site (middle Holocene, Argentina) to elucidate how the site was formed. Criteria obtained so far from each type of experiment described here greatly increase knowledge for interpreting other sites that yield fossil fish bones.

Keywords Sand abrasion · Fish bones · Sand dunes · Argentina · Experimental taphonomy



Además, se han llevado a cabo otros diseños experimentales con material óseo que serán publicados más adelante.

03.

TAMBORES DE PULIDO



Dispositivo enchufable con temporizador

Tambores de pulido motorizados

Los tambores de pulidos no permiten mantener un movimiento motorizado y programable en tiempo y velocidad gracias al dispositivo de enchufe con temporizador del que disponemos.

En el Laboratorio de Ensayos Ambientales y Tafonómicos tenemos varios tipos de tambores de pulido rotatorios:



Realiza movimientos constantes para simular:

- Abrasión por rozamiento
- Erosión por corrientes de agua con distintos sedimentos.

ENSAYOS REALIZADOS

Se han llevado a cabo diversos experimentos de abrasión mediante tambores de pulido dentro del Laboratorio de Ensayos Ambientales y Tafonómicos, algunos de ellos con resultados publicados. A continuación, se muestran algunos de ellos por si fuera de su interés (*podrán acceder al contenido completo de cada publicación pinchando sobre cada imagen*).

Digestion versus abrasion features in rodent bones

YOLANDA FERNÁNDEZ-JALVO, PETER ANDREWS, PALOMA SEVILLA AND VIRGINIA REQUEJO

Fernández-Jalvo, Y., Andrews, P., Sevilla, P. & Requejo, V. 2014: Digestion vs. abrasion features in rodent bones. *Lethaia*, Vol. 47, pp. 323–336.

The origin of most fossil small mammal assemblages is predation by avian or mammalian predators. Bone corrosion by gastric juices observed in these fossils is direct evidence of digestion, and traits of digestion indicate the type of predator involved. However, certain features observed in digested bones, such as rounding and polishing, are similar to the rounding and polishing produced by other processes, particularly abrasion, in which predation is not involved. Misidentification of digestion has major repercussions in palaeoenvironmental and palaeoclimatic interpretations as well as interpretations of biostratigraphy and potential reworking. Digestion is directional and progressive process, primarily affecting the most mineralized tissues (enamel) advancing from the tips to the centre of the anatomical element. In contrast, abrasion identically affects any type of osseous tissue homogeneously rounding the entire skeletal element. Microscopically, digested bones display a distinctive chemical corrosion ('tornlike' appearance), whilst abraded bones appear smooth with microstriations and pitting microwear. Here, we present the results of a series of experiments designed to establish new and clear criteria to distinguish bone rounding and polishing caused by digestion from that originating from abrasion. □ *Abrasion, digestion, experimental taphonomy, polishing, rounding, small mammals taphonomy.*

Experimental Effects of Water Abrasion on Bone Fragments

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Water transport is a frequent taphonomic agent in continental environments that may affect and disturb original bone associations. Fossil allochthony occurs as a result of resedimentation (before burial) and/or secondary deposition (after initial burial) altering palaeoenvironmental and palaeoecological indications provided by fossils. Skeletal element sorting or preferred orientations of fossils are evidence of fluvial transport as studied by several authors. Bone surface abrasion is another trait recorded on fossils that may provide evidence of water transport in a fossil association. Results of a preliminary experiment on the effects of abrasion have shown characteristic differences relating to the type of sediment (coarse to fine) and the type of bone involved (fresh, dry, weathered or fossil). This indicates that the effects and consequences of water transport on bone associations can be identified from traits of abrasion. This paper also considers other experiments involving abrasion on large and small mammal bones and owl pellets.

Keywords: TRANSPORT, SEDIMENT, WATER STREAM, EXPERIMENT, ABRASION, ROUNDING.

Rolling bones: A preliminary study of micromammal abrasion on different initial taphonomic stages

Sara García-Morato, María Dolores Marin-Monfort, and Yolanda Fernández-Jalvo

ABSTRACT

The identification of transport process is key to interpret the palaeoecology, the dating and the site formation. Apart from dispersal and size/shape selection, bone abrasion by water and sediment is an acquired taphonomic modification that makes transport recognizable in bone assemblages. Previous experiments with rodent bones used non-digested bones or emphasized abrasion on teeth to distinguish abrasion from digestion. Experiments with large mammals included different types of taphonomically modified bones. Following this procedure, two main aspects are here studied for the first time. On the one hand, we have focused on small mammal humeri and femora, which are also used to characterize digestion. We have also included different initial states or types of bones, such as digested, weathered or fossil bones to observe differences in abrasion behaviour that may help interpreting processes of water abrasion. On the other hand, we propose an easy test methodology to quantify the amount of surface loss. The resulting index to quantify surface loss shows light changes on bones abraded by clay and silts, in contrast to a more rapid and intense rounding of the salient angles by gravels. The latest yields a greater rounding and, therefore, surface loss, statistically significant. Cancellous tissues appear exposed after 72 hours of abrasion on proximal ends of femora and distal ends of humeri, mimicking corrosion produced by digestion. In this paper we describe key traits and quantify surface loss to distinguish between digestion and abrasion in postcrania, more specifically on proximal femora and distal humeri.

04.

DIRIGIDO A...

Los ensayos de abrasión han sido aplicados a estudios científicos de con material óseo, sin embargo, tiene múltiples aplicaciones para empresas o particulares que necesiten comprobar las dureza y resistencia de sus materiales tanto en el sector sanitario, de investigación u otros tipos de sectores.

ESTUDIOS CON MATERIAL FÓSIL/ÓSEO

Contamos con experiencia demostrable en el campo.

Para un **contexto de investigación** se pueden realizar experimentos totalmente repetibles y controlados, con la posibilidad de obtener informes tafonómicos con material fotográfico mediante microscopía electrónica de barrido gracias al Laboratorio de Ensayos No Destructivos con el que contamos en el Museo Nacional de Ciencias Naturales.

Dentro del **ámbito de colecciones** de material óseo y fósil, se pueden estudiar las propiedades de dureza del material mediante ensayos de las mismas características.

ESTUDIOS DE OTRAS MUESTRAS NO ÓSEAS

Sector sanitario-investigación:

Con el fin de valorar y analizar el grado de desgaste de materiales empleados en construcción de implantes y rellenos dentales, se pueden diseñar experimentos que simulen la fricción masticatoria o en procesos de bruxismos.

Otros sectores de fabricación de materiales:

- Análisis de dureza y resistencia de materiales de construcción para evaluar el desgaste.
- Caracterizar la abrasión y erosión de materiales vitreos, cerámicos, polímeros, etc. Empleados en fabricación.

Si tienes dudas de cómo podemos ayudarte
¡no dudes en consultarnos!

