Geographic Society, an articulated skeleton was collected of a tetraodontiform fish characterized by a strikingly peculiar morphology. Tetraodontiforms are a monophyletic group of teleost fishes comprising more than 350 extant species exhibiting a wide variety of body forms and skeletal structures (Tyler, 1980) and inhabiting tropical to temperate waters worldwide in a broad spectrum of environmental contexts from shallow to deep waters (mainly marine; some freshwater). Since the original definition of the group by Cuvier (1817), the ten extant tetraodontifom families have been arranged into two lineages; the scleroderms for those species with separate individual teeth protruding from the jaws, and the body covered by thick scales or carapace plates; and the gymnodonts for those species with highly modified teeth incorporated into the beak-like jaws, and scales modified into prickly spines. The new earliest Eocene fossil tetraodontiform from Gerpegezh has the teeth incorporated into beak-like jaws and a dermal covering of prickly scales, thereby demonstrating its gymnodont affinities.

The unique set of morphological features that defines this earliest Eocene gymnodont clearly indicates that it belongs to a new family. The most remarkable features that characterize this new gymnodont include an extremely well-developed spiny dorsal fin containing six exceptionally long, cylindrical, slender spines situated over the top of the rear half of the skull; jaws massive and beak-like, with numerous coalesced small teeth fully incorporated therein; upper jaw with fused left and right premaxillae and lower jaw with fused left and right dentaries; anterior portion of the neurocranium angled anteroventrally; basisphenoid present; 18 (7+11) vertebrae; neural spines of anterior six abdominal vertebrae bifid; pelvic girdle (probably) present; fifth hypural autogenous; caudal fin with 12 rays, with one upper procurrent ray and 11 principal rays (i,I, 6+3,I); caudal rays finely serrated proximally; and body covered with sparse, short, non-erectile four-rooted stellate scale spinules.

To assess the phylogenetic placement of the new family, we conducted two separate analyses using: (a) a morphological dataset for 57 species (20 extant and 37 fossils) consisting of 210 morphological characters; and (b) a combined dataset with morphological and molecular data for 132 species (95 extant and 37 fossils), including DNA sequences from 16 loci. These datasets were analyzed under parsimony, maximum likelihood, and Bayesian inference producing similar results about the placement of the new family, which is found to be the sister taxon of all the other fossil and extant diodontids.

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FRESHWATER TELEOST FISHES FROM THE EARLY PLEISTOCENE AALAT SUCCESSION, DANDIERO BASIN, ERITREA

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Along the Eritrean Rift margin, in the northernmost sector of the African Rift Valley, a remarkable Early to Middle Pleistocene continental succession is extensively exposed in the Dandiero Basin (Abbate et al., 2004). This succession exhibits a complex stratigraphic architecture resulted from lateral and vertical stacking of lacustrine and fluvial deposits, in places affected by poor soil development or interlayered with hardpan calcretes. Fossil vertebrates are extremely abundant in certain portions of the Dandiero Basin fill, particularly in the Aalat Formation, where also human remains and artefacts pertaining to *Homo erectus/ergaster* were found in several sites (Abbate et al., 1998; Rook et al., 2013). The Aalat succession records repeated shifts from fluvial to lacustrine depositional settings that occurred in the final part of the Early Pleistocene. Terrestrial vertebrate assemblages are dominated by taxa characterized by strong water dependence (crocodiles, Nile monitor lizards, African Rock pythons, pelomedusid chelonians, hippopotamuses, waterbucks, and sitatungas).

Fluvial and deltaic deposits of the Aalat succession also include remains of a poorly diversified freshwater fish assemblage (e.g., Rook et al., 2013). Moderately well-preserved isolated and partially articulated fish bones are locally accumulated in muddy layers of shoalwater delta deposits, in some cases associated with rich assemblages of freshwater snails of the genus *Melanoides*; isolated fish bones can be also found in the sandy channel deposits associated with tetrapod remains. More than 95% of the fish remains collected in the deposits of the Aalat succession consist of cranial bones, vertebrae and fin spines of clariid catfishes belonging to an indeterminate species of the genus *Clarias*. In some cases, partially articulated skulls of relatively large individuals can be found in the muddy lacustrine desposits. Subordinately, rare median-fin spines and vertebrae of cichlids and pharyngeal teeth of barbine minnows can be also found.

The fish assemblage of the continental deposits of the Aalat succession likely represents a residue of the original fish fauna the inhabited the Dandiero Basin and it is consistent with the shallow water fluvio-lacustrine paleobiotopes evidenced by the stratigraphic and sedimentological analyses (Ghinassi et al., 2009). The sharp dominance of the thick, heavy and strongly resistant *Clarias* bones possibly results from a sedimentary selection that occurred during the deposition of the fluvial or deltaic deposits, implying that taphonomic loss was probably responsible for the rarity of absence of smaller or less robust species.

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THE FIRST LOOK INTO THE SKULL OF *ACINONYX PARDINENSIS* (MAMMALIA, FELIDAE) THROUGH SYNCHROTRON LIGHT

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The recent diffusion of x-ray-based tomographic methods has opened new frontiers in paleontology. For the first time fossils can be virtually extracted from their host matrix and dissected, thus achieving a plenty of information on their external and internal morphology down to the micrometer scale. 3D images can be easily achieved through computed tomography (CT) medical scanners, but these devices can provide limited spatial resolution (i.e. not smaller than 0.5 mm). Laboratory tomographs have also been used in recent years for the study of fossils. However, despite the very good resolution of some of these machines, their polychromatic x-ray source is not suitable for analyzing some fossils, such as highly mineralized samples with very low absorption contrast. The top technology available today for this kind of study is the scanning of fossils with synchrotron radiation (SR). The physical properties of the hard x-rays used for synchrotron microtomography (i.e., monochromaticity, high beam intensity and partial coherence) allow increasing significantly the data quality and imaging possibility compared to any other x-ray-based scanner (Tafforeau et al., 2006).
In this work we present the preliminary results of a recent experiment carried out in the ID17 beamline of the European Synchrotron Radiation Facility (ESRF) in Grenoble. We scanned two skulls of the cheetah-like felid *Acinonyx pardinensis*, one of the most striking but puzzling large carnivorans in the Old World continental fossil record. Despite the long chronologic and geographic range (it is known from China to Spain from the middle-late Pliocene to the middle

Pleistocene, i.e., more than 3 Ma), this species is represented by very scanty fossil remains (Cherin et al., 2014). The Italian record of *A. pardinensis* is relatively rich, especially for cranial material. Our experiment was focused on two Early Pleistocene skulls discovered in central Italy: a complete cranium with disarticulated mandible from Pantalla (Umbria) and a splanchnocranium with articulated mandible from Monte Argentario (Tuscany). SR-CT with phase contrast analysis allowed the acquisition of exceptionally detailed images of these outstanding Italian fossils, with a resolution of 46 µm.
Preliminary analyses of the tomographic images allowed observing the internal anatomy of the skull of an extinct felid as never before.
Despite the massive external morphology (which has led in the past to different taxonomic determinations; see Sardella, 2006), we refer the skull from Monte Argentario to *A. pardinensis*. Recognizing some pantherine-like characters in this specimen's teeth, as well as recent results based on the overall musculoskeletal skull anatomy (Cherin et al., 2014), reinforce the hypothesis that *A. pardinensis*' hunting strategy was more similar to pantherine cats than to the living cheetah. These hypotheses could lead in future to review the taxonomy of this taxon and rewrite its phylogenetic history.

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"CETIOSAUR" STRIKES BACK: MORPHOMETRIC AND COMPARATIVE ANALYSIS OF THE TAIL OF *TATAOUINEA HANNIBALIS* (DINOSAURIA: SAUROPODA)

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In 1841, Richard Owen erected *Cetiosaurus* ('whale lizard') for a series of giant vertebrae he interpreted as the remains of a marine reptile similar to cetaceans. Further discoveries revealed that such material were the first remains ever collected of fully terrestrial animals, now known as sauropod dinosaurs.