Sessione

# **Paleoantropologia**

*poster*

# On the traces of the Phylum. Neotenic Macroevolution, in light of the explanatory scope of Paleolaringology

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Context: The report develops the discourse on neotenic macroevolution, proposed by me at Congress AAI 2003 (Bertocchi A.: "Il ruolo della Neotenia umana, nella variabilità genetica e culturale" report presented at the XV Congresso A.A.I. on the theme: "Variabilità umana e storia del popolamento in Italia"-Università di Chieti, 28-30 September 2003 ACTS published by Edigrafital, Teramo. 2005).
Object The topics covered are based on the neotenic descent of the larynx. An event that "does not in itself entail any advantage, but rather, the risk of suffocation, and that allows to overturn the hypothesis that the development of the brain has allowed the man to speak. On the contrary, it would have been precisely the possibility of refined sound production, given to us by the neotenic lowering of the larynx, to shift the selective push in favor of those who possess a brain capable of understanding and building language".
This approach results in a methodology which allows:
1)-the solution to the problem of language ability in Neanderthals. 2) consideration of the role of the dimensions of the pelvis and the birth canal, as contexts of localization, temporal range and geographical area in which the initial moments of the ancestral neotenic scene took place.
3-) Two scenarios of the so-called "Cradle of Humanity" are compared: one in South West Africa (Svarktrans) and one in the Rift Valley (in a probable area isolated by tectonic phenomena. in which two species: one of the genus Paranthropus and one of the genus Homo have been found to coexist.
Objective ' The weaving of a "Neotenic hypothesis of human evolution" for which writing and verification, I invite colleagues to a collective and transdisciplinary work.
I hope that this contribution will arouse interest in the academic institution of Paleolaryngology (a discipline still neglected) as it seems to be able to provide the innovative methodology, whose high explanatory scope, allows innovative excursions in the field of paleoanthropological research, here open to reflection and discussion.

# The derived facial morphology of Neanderthals in the light of cranial and cervical constraints

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A critical review of the scientific literature show how masticatory and respiratory constraints may have contributed to the Neanderthals' distinctive facial architecture. Clinical studies on modern humans demonstrate that maximal mouth opening involves not only a downward and backward rotation of the mandible, but also cranial retro-extension and accentuation of the cervical lordosis. This compensates for the posterior movement of the mandible, optimizes the alignment of the upper airway, and reduces the risk of compression on the neurovascular structures of the retromandibular region. In Neanderthals, by contrast, several studies indicate a reduction in the degree of cervical lordosis and a more limited range of flexion-extension in the cervical spine (as evidenced by Coletti et al., 2025). This reduced cervical mobility may have constrained the extent to which cranial retro-extension could assist in maximal mouth opening. Consequently, the mandible appears to have undergone compensatory adaptations: more elongated mandibular body, presence of a pronounced retromolar space, and reduced gonial angle collectively enhance gape efficiency while minimizing reliance on cervical extension. This preserves temporo-mandibular joint function and suggest an integrated adaptation of the masticatory system to a more rigid neck. At the same time, respiratory constraints likely played a significant role. The presence of a large nasal cavity, increasing both the internal volume and surface area, contributed to the overall forward projection and enlargement of the midface. Thus, the combined influence of masticatory, respiratory, and postural demands provides a comprehensive functional framework for understanding the distinctive anatomy of the Neanderthals.

Coletti B., A. Papini, M. Boggioni, F. Di Vincenzo and G Manzi (2025). Reduced neck mobility in Neanderthals: anatomical constraints and biomechanical implications. 26° Congress A.A.I., Cagliari.

# Reduced neck mobility in Neanderthals: anatomical constraints and biomechanical implications

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The Neanderthal cervical spine displays a specialized morphology that prioritizes stability over mobility. This study presents a critical review and synthesis of the scientific literature concerning Neanderthal cervical morphology. Our analysis aims to provide a comprehensive and integrated perspective on the evolutionary trajectory of this taxon (compare Boggioni et al., 2025), with particular emphasis on the distinctive features of the cervical spine. Compared to modern humans, Neanderthal cervical vertebrae exhibit distinct features: a shorter cervical column, longer and more horizontally oriented spinous processes, broader articular facets, and significantly reduced cervical lordosis. These traits indicate increased neck stability, likely to support robust cranial and upper limb mechanics within a tightly integrated pectoral girdle system. In addition, Neanderthal inner ear morphology provides complementary evidence: smaller anterior and posterior semicircular canals, associated with reduced sensitivity to flexion-extension and lateral bending, contrast with a relatively enlarged lateral canal, linked to enhanced rotational detection. Other anatomical features – such as absence of the tubercle for the transverse ligament of the atlas, reduced mastoid process and modified ligamentum nuchae morphology – further align with a functional complex optimized for head and neck stabilization under high mechanical loads. Taken as a whole, this combination of features highlights a cervical spine tailored for stability within a broader morpho-functional framework, distinct from the more flexible cervical architecture of Homo sapiens.

Boggioni M., A. Papini, F. Di Vincenzo, B. Coletti, and G Manzi (2025). The derived facial morphology of Neanderthals in the light of cranial and cervical constraints. 26° Congresso della A.A.I., Cagliari.

# Early LSA Homo sapiens lithic technology in Eastern Africa: Insights from the Naisiusiu Beds type section, Oldupai Gorge, Tanzania.

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This study investigates the behavioral aspects of lithic tools production by Late Stone Age (LSA) Homo sapiens at the Naisiusiu Beds type section in Oldupai (Olduvai) Gorge, Tanzania. By integrating historical assemblages with newly acquired data, the research re-evaluates the site's significance within the broader LSA framework and explores human behavioral variability during the Late Pleistocene.

We combined data from lithic collections gathered by the Leakeys in 1931 and 1969 with new materials recovered during a 2024 surface survey by the THOR (Tanzania Human Origins Research) team.

Our technological analysis included the reconstruction of reduction sequences and the systematic recording of discrete and metric attributes on both cores and products. In addition, a 2D Geometric Morphometric (2DGM) approach was applied to a subset of 105 complete blanks and retouched tools to investigate patterns of shape variability. Comparative PCA was also performed to assess potential regional affinities.

The results provide new insights, particularly regarding patterns of lithic volume exploitation, highlighting a clear preference for narrow-sided and wide-faced volumetric cores used for the concurrent production of blades and bladelets. A limited, but still evident use of the bipolar technique was also observed, almost exclusively on wide-faced cores. 2DGM analysis revealed significant shape variation related to blank type and retouch intensity, supporting hypotheses of consistent hafting orientations. Furthermore, the backed microliths' metrics from the Naisiusiu Beds closely align with those from Enkapune Ya Muto (Kenya) in the PCA space, suggesting broader regional connections within LSA technological traditions and pointing toward a distinctive Central Rift Valley trajectory.

In conclusion, this study highlights the technological dimensions of the LSA occupation at Oldupai in the Late Pleistocene. The modern reanalysis of historical lithic collections demonstrates the value of integrating historical and new data, offering a renewed perspective on the technological behavior of LSA population at Oldupai, shedding light on Homo sapiens adaptations in Eastern Africa during the Late Pleistocene.

# Taxonomic assessment of a human deciduous molar found in the Lower Palaeolithic layer from the Observatoire Cave (Principality of Monaco)

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The Liguro-Provençal corridor, spanning southeastern France and western Italy, shows continuous human occupation from the Lower to Upper Palaeolithic, testified by lithic, faunal and human fossil finds. Among its sites, Observatoire Cave, in Monaco's Exotic Garden, holds the earliest archaeological evidence of human presence in the Principality. First excavated (1916-1920) by Léonce de Villeneuve under Prince Albert I, it was then investigated by Louis Barral and Suzanne Simone in the 1950s and 1980s, alongside restoration and musealization. Since 2016, Olivier Notter and Elena Rossoni-Notter have resumed excavating the lowest levels. The site's stratigraphy comprises three techno-cultural macro-complexes: an upper complex (Proto-Aurignacian, Aurignacian, Gravettian), a middle complex (Mousterian), and a lower complex (Acheulean-Clactonian, Pre-Mousterian). In 2020, when excavating the lowest levels, a human tooth (Obs1) was found in sieved sediments coming from the site's surface and wall. To date, this is the only human fossil from a Palaeolithic context in Monaco, potentially dating back to the Lower Palaeolithic, due to its context of recovery. Here, we share a morphological description and 2D geometric morphometric (GM) analysis, aimed at clarifying its taxonomic attribution, aided by a pathological and taphonomic study. A 2D GM analysis of the crown outline was performed. A genetic analysis of Obs1 was also conducted. Obs1 is an upper right second deciduous molar, with four main cusps and a pronounced Carabelli's trait. A deep tooth-pick groove filled with concretion is visible on the distal cervical margin. GM results show that Obs1 differs from Neanderthals and early *H. sapiens*, but aligns with Upper Palaeolithic and recent *H. sapiens*. Obs1's DNA revealed contamination with exogenous human genetic material. Microscopic analysis of the tooth-pick groove suggests intentional cleaning or pain-relief behaviour, consistent with known Middle and Upper Palaeolithic cases. Our results support its attribution to *H. sapiens*, likely an Upper Palaeolithic child, as no later occupation of the site is known. Evidence suggests its accidental displacement from an Upper Palaeolithic layer into an older one during earlier restoration works. Thus, we could reject the initial hypothesis of an earlier hominin, as assumed by stratigraphy. Obs1 is the oldest human fossil found to date in Monaco, likely from the Proto-Aurignacian, Aurignacian, or Gravettian period.