# *Il primo popolamento dell'Europa*

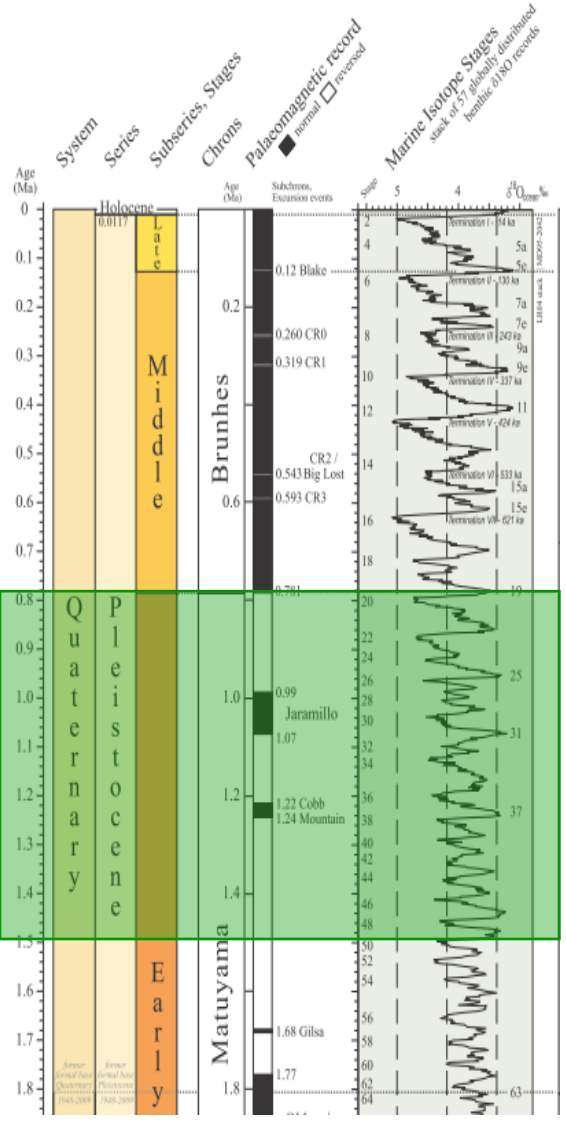
Julie Arnaud
*julie.arnaud@unife.it*

# Origine


Dmanisi
Atapuerca
Beijing
Riwat
Ubeidiya
Longgupo
Hadar
Turkana
Kanapoi
Olduvai
Java


(Cavalli Sforza & Pievani, 2012)

# Origine : Prime testimonianze del popolamento europeo

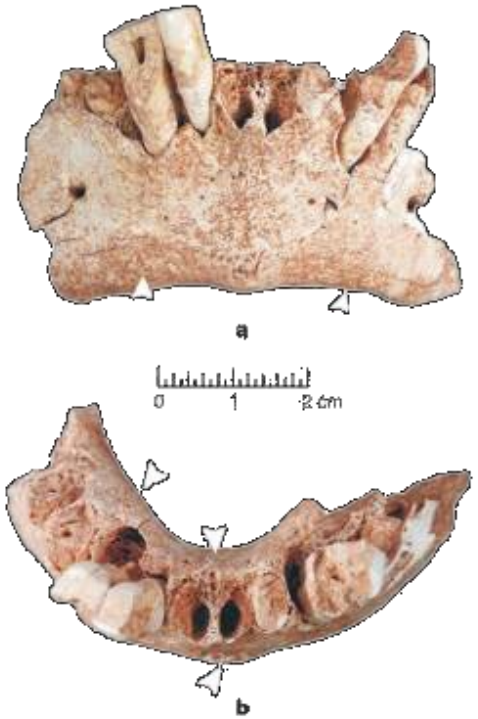



(Cohen & Cibbard, 2010)

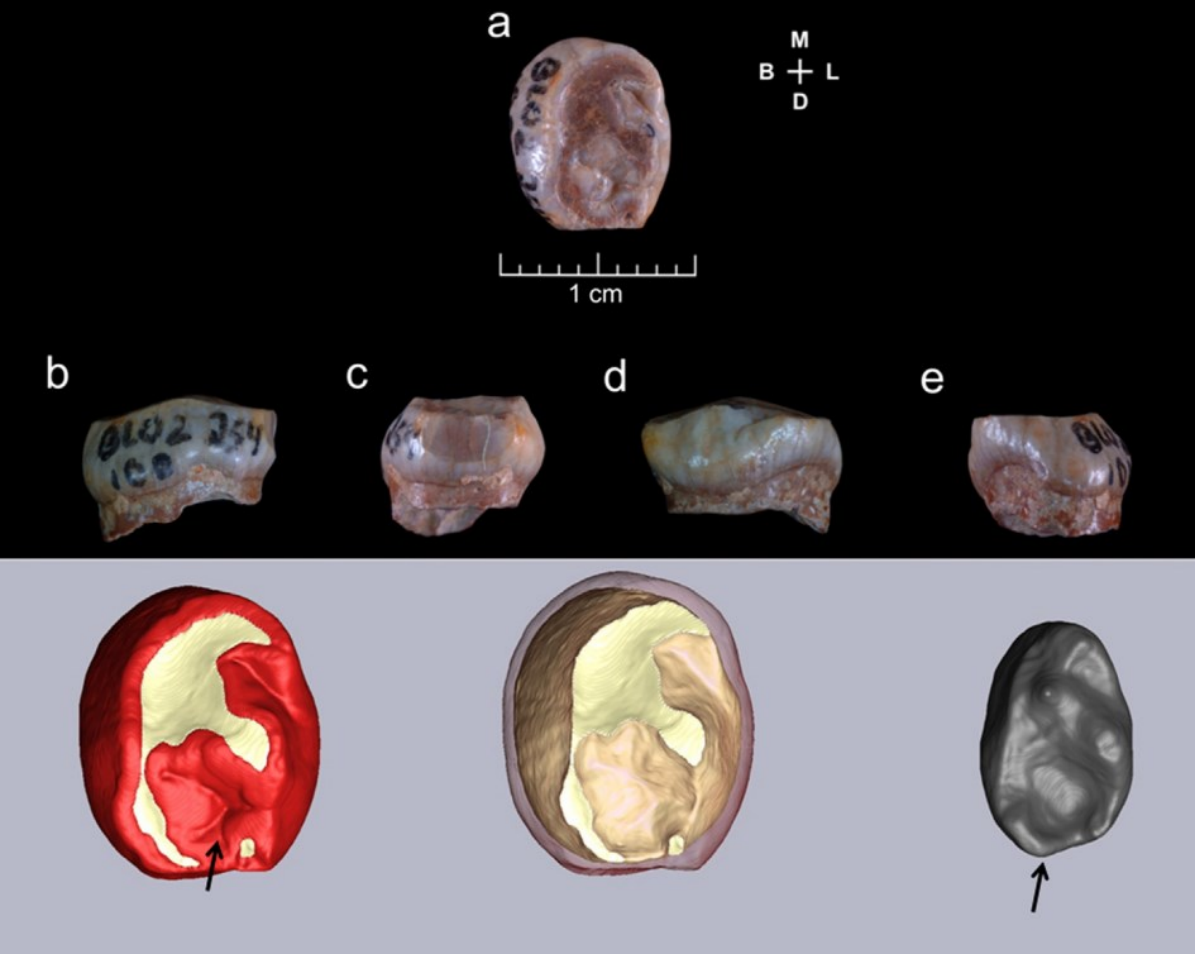
# Le prime testimonianze

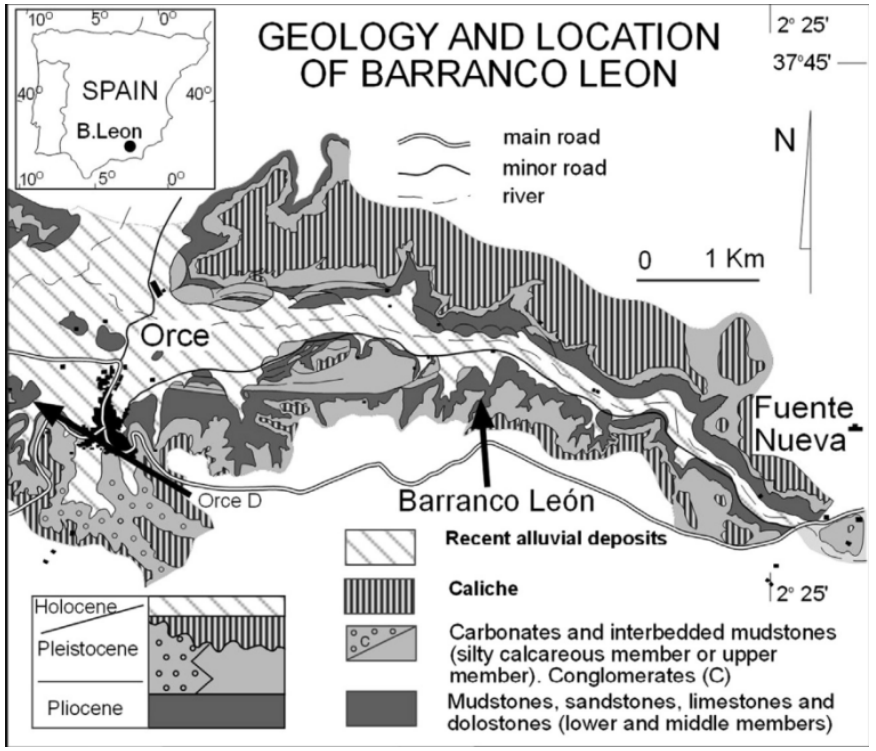
Anteneandertaliani : non hanno acquisito nessuna delle apomorfie dei neandertaliani

Gran Dolina
*Homo antecessor* 0,8
Myr (TD6)




Sima del Elefante
*Homo* sp.
1,3 Myr *(*Mandible ATE9-1)




dm1 di Barranco Leon BL02-J54-100
ESR: 1.02 e 1.73 Ma
Paleomagnetismo: 1.07 – 1.77 Ma
Biocronologia: 1.4 Ma

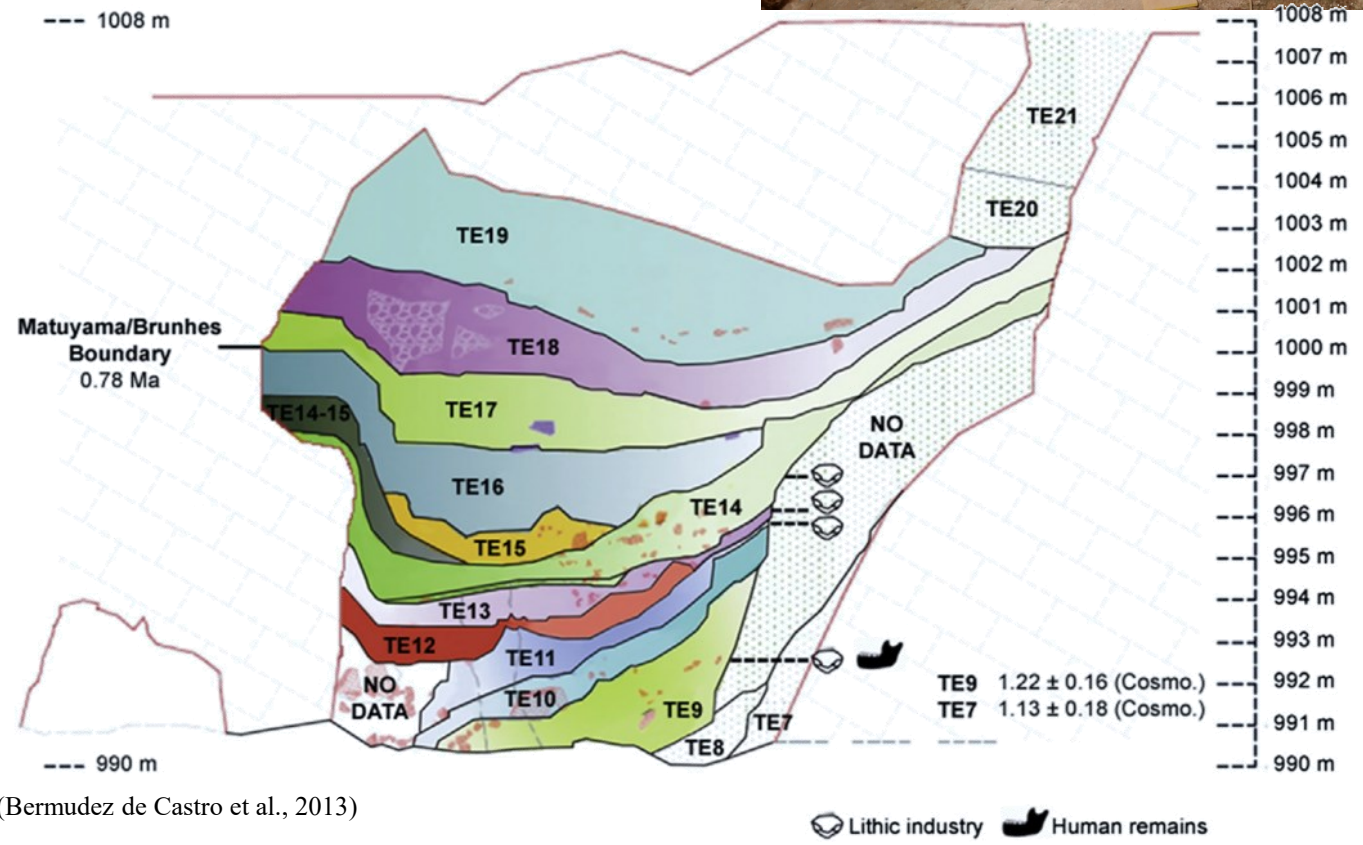
Questo ritrovamento associato ad un importante insieme litico conferma che l'Europe occidentale è stata colonizzata poco dopo la prima espansione out of Africa, documentata da Dmanisi.

*This discovery associated to an important lithic assemblage confirms that Western Europe was colonized soon after the first out of Africa documented in the site of Dmanisi.*

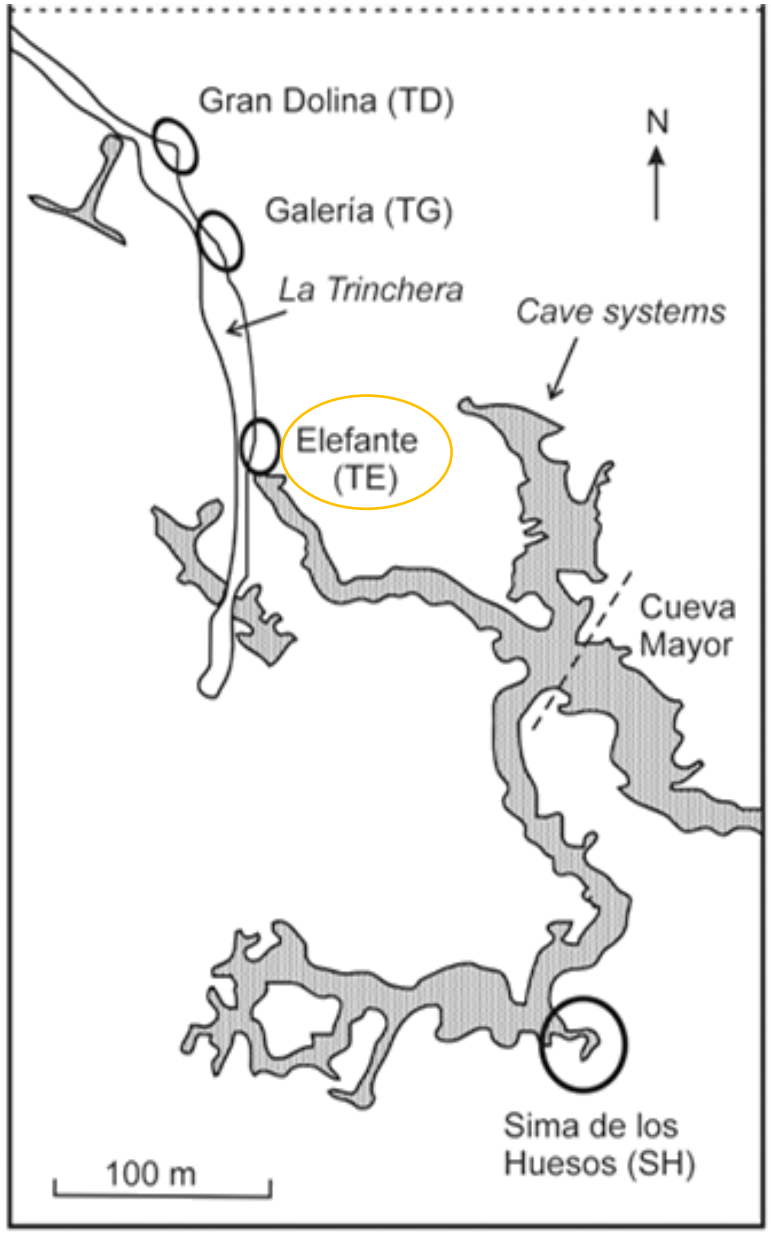
Toro-Moyano, 2013. JHE 65

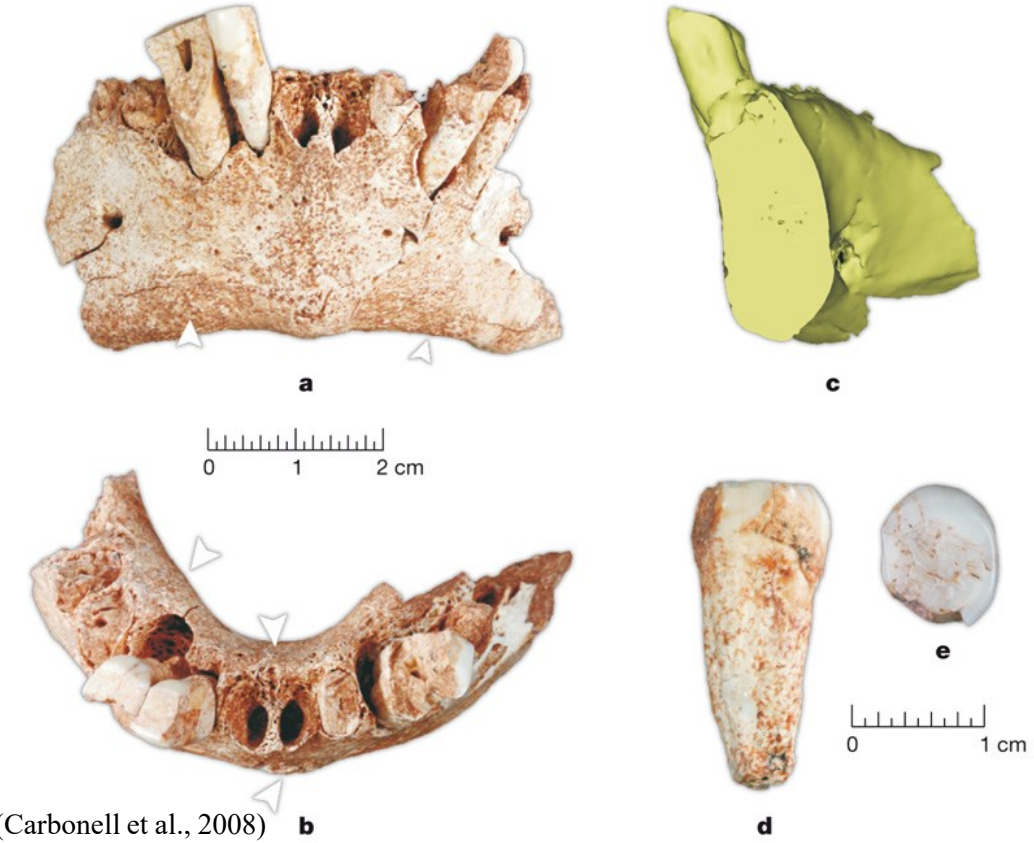
*Sierra de Atapuerca – The goldmine of Paleoanthropologist…*

# Sima del Elefante


(Bermudez de Castro et al., 2013)






(Carbonell et al., 2008)

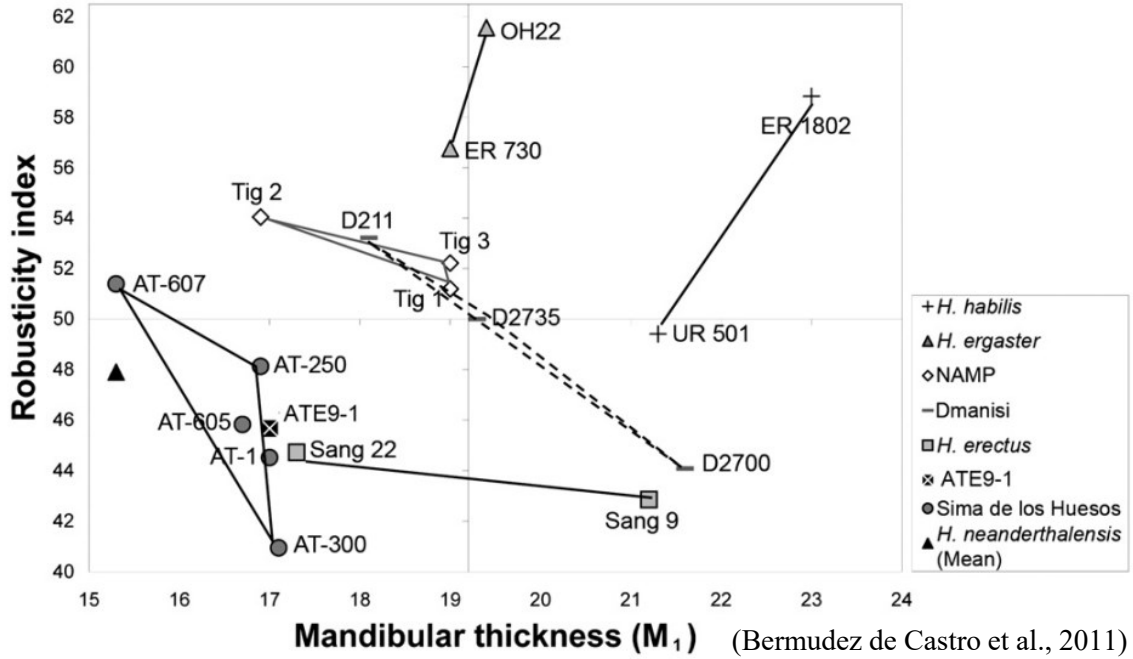
ATE9-1 presenta alcuni caratteri morfologici che dimostrano una discrepanza con la variabilità osservata nei fossili di Dmanisi e del Pleistocene africano, implicando una comparsa precoce di un "identità europea" nei gruppi di ominini che hanno popolato il continente europeo.

Caratteri primitive per il genere *Homo:*

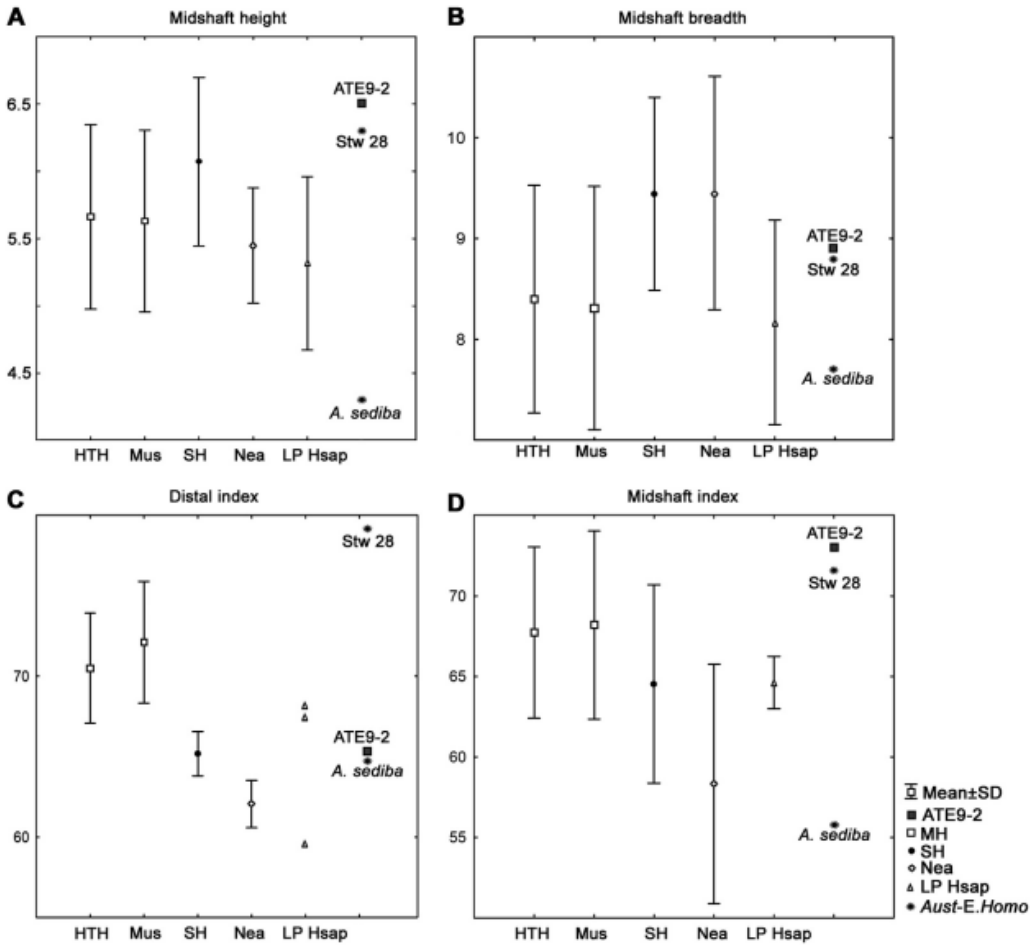
- Tubercolo marginale anteriore sotto C/P3
- *Mentum osseum* poco marcato
- Trigono mentoniero distinto
- Presensa di uno *incisura submentalis*
- Morfologia dei premolari

Caratteri derivati rispetto ai primi *Homo* africani:

- Planum alveolare poco inclinato
- Assenza di uno toro trasverso superiore
- Corpo mandibolare poco spesso

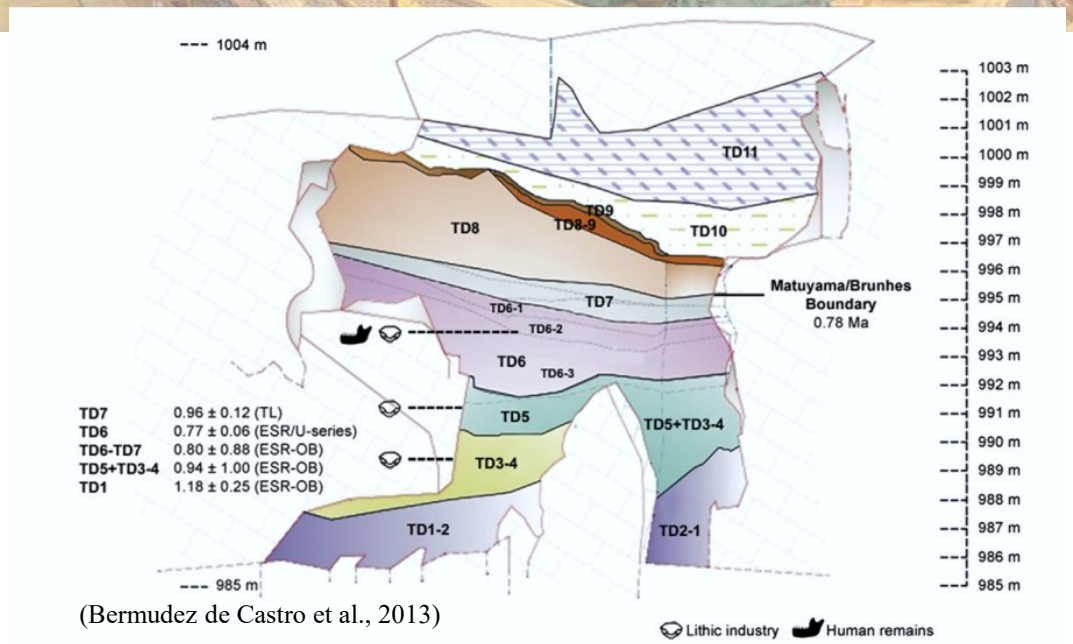



(Bermudez de Castro et al., 2011)

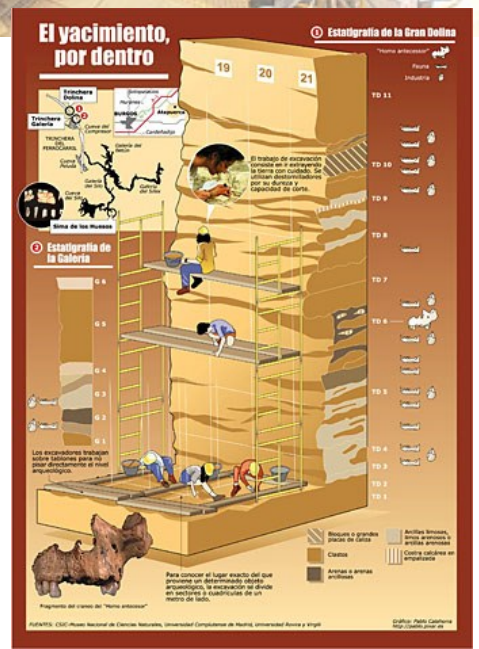



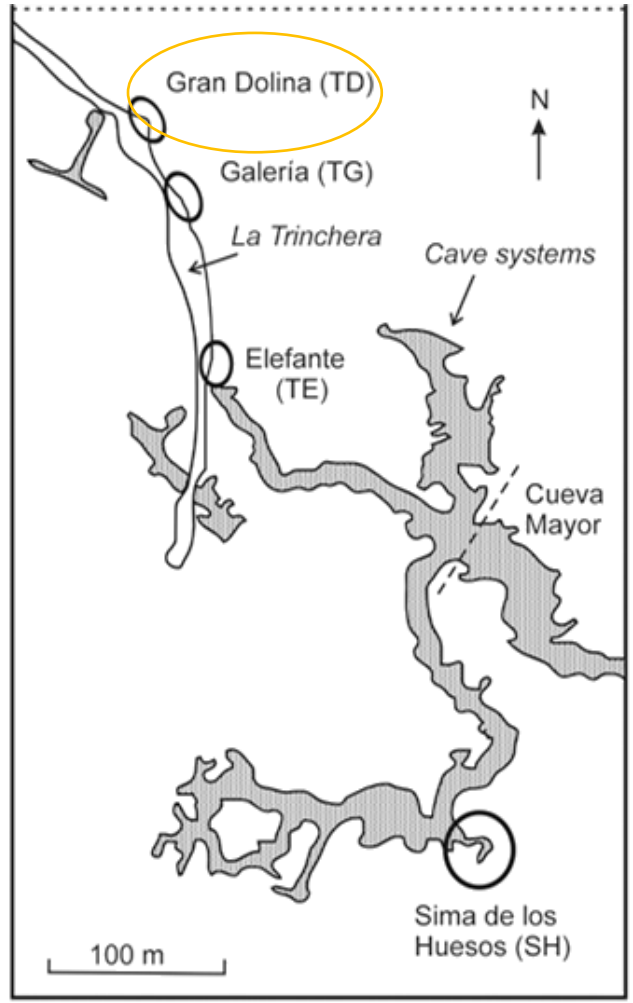

La falange ATE9-2, attribuita a *Homo* sp. non presenta particolare differenze con la collezione di confronto. Questo suggerisce che la morfologia della mano nel genere *Homo* è rimasta invariata da 1.2-1.3 Ma (Lorenzo et al., 2014).

# Gran Dolina and the *Homo antecessor* hypodigm




(Bermudez de Castro et al., 2013)



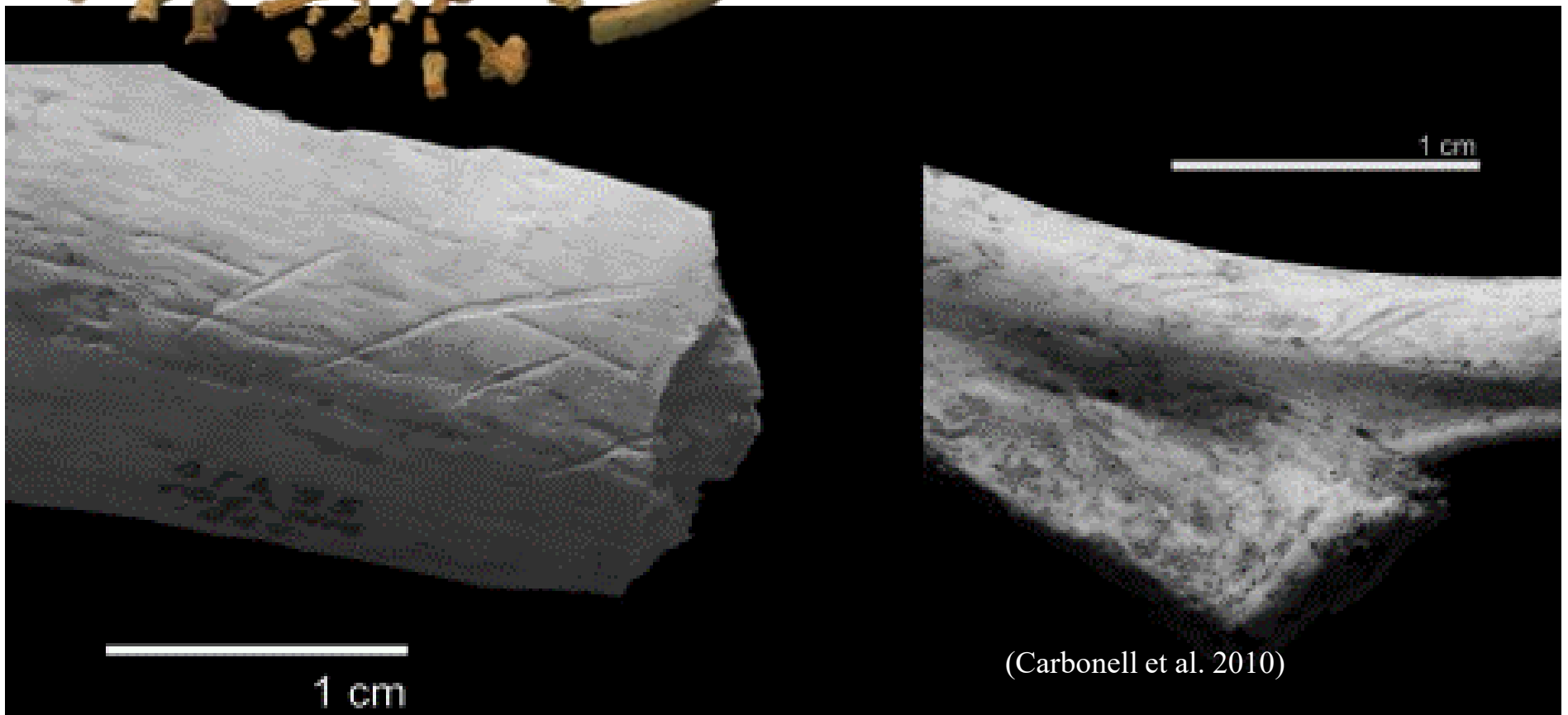



Livello TD6 – *c.* 800 ka BP

NMI: 2 adulti, 3 adolescenti, 6 bambini

Interpretazione
- cannibalismo gastronomico (Fernandez-Jalvo et al. 1999)
- Cannibalismo culturale (Carbonell et al., 2010)
- Violenza e cannibalismo intergruppo; excocannibalismo (Saladié et al., 2012)

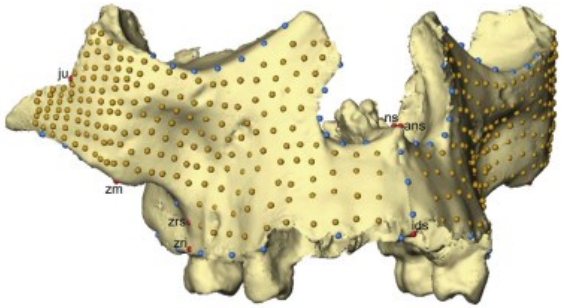
Tracce di macellazione su la diafisi di una tibia, interpretate come tracce di scarnificazione

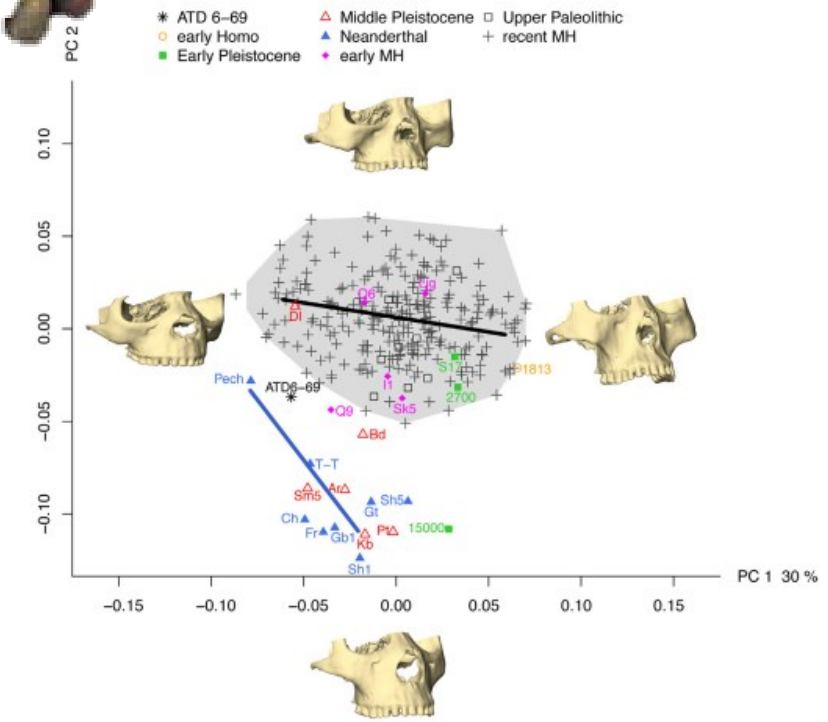


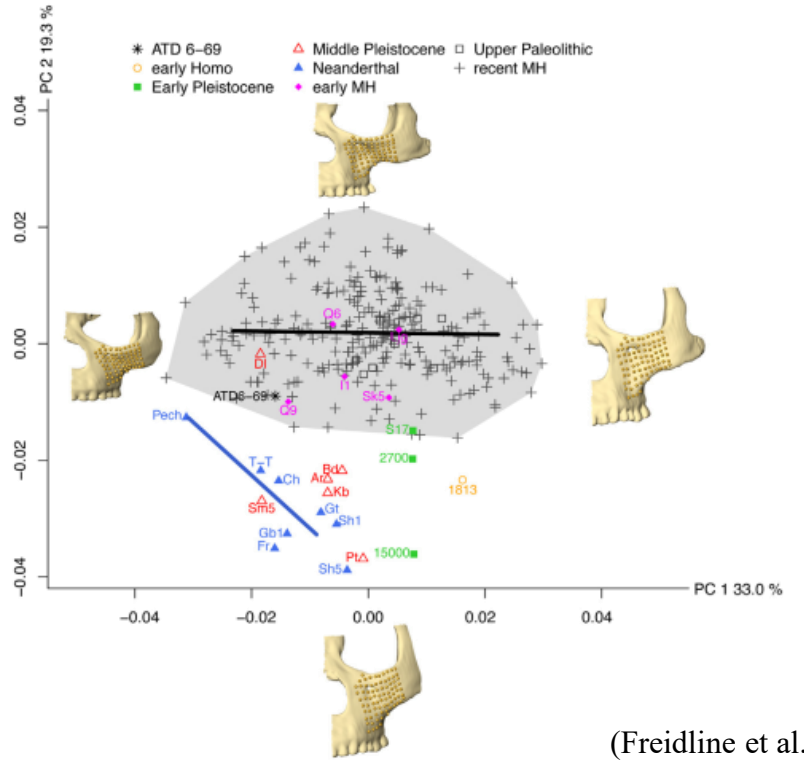

(Carbonell et al. 2010)

Costola umana con incisione

The fossil ATD6-69 has been suggested to mark the earliest appearance of modern human facial features. However, this specimen is a subadult and the interpretation of its morphology remains controversial, because it is unclear how developmental shape changes would affect the features that link ATD6-69 to modern humans.




(Freidline et al., 2013)

Accepted: 27 June 2017
DOI: 10.1002/evan.21540

ARTICLE

WILEY

# Twentieth anniversary of *Homo antecessor* (1997-2017): a review

José María Bermúdez de Castro[1,2*] | María Martinón-Torres[2,3*] | Juan Luis Arsuaga[4] | Eudald Carbonell[5,6]

**TABLE 1** List of some of the features observed in *Homo antecessor*

| |
|---|
| • *Plesiomorphic (primitive) features for the* Homo *clade* |
| -Fusion of the styloid process to the basicranium |
| -Nasal floor showing a level and sloping configuration |
| -Position of the mental foramen at the level of mandibular $P_3$-$P_4$ |
| -Low position of the mylohyoid line in relation to the alveolar margin at the mandibular $M_3$ level |
| -Parallel trajectory of the mylohyoid line in relation to the alveolar margin |
| -Shallow relief of the pterygoid fossa |
| -Lateral intersection between the mandibular notch and the condyle |
| -Absence of retromolar space |
| -$M_3$ partially covered by the mandibular ramus |
| -Strong tuberculum molare on the deciduous $dm^1$ |
| -Presence of mesial and lingual styles on the deciduous upper canine |
| -Buccal faces of the mandibular premolars showing mesial and distal marginal ridges and grooves, which connect with the shelf-like cingulum |
| -Crown shape of the mandibular $P_3$ is strongly asymmetrical, with a remarkable talonid and a large occlusal polygon |
| -Mandibular $P_4$ showing an asymmetrical outline, with a mesially displaced metaconid extended talonid, and a broad occlusal polygon |
| -Mandibular $P_3$ and $P_4$ showing a complex root system (2R: MB+DL)[1] formed by a mesiobuccal (MB) plate-like root with two pulp canals and a distolingual (DL) root with a single canal |
| -M1<M2 for both upper and lower molar series. |
| -Mandibular $M_1$ and $M_2$ exhibiting a Y-pattern of the buccal and lingual grooves separating the five principal cusps |
| -Enamel of the occlusal surface of the postcanine teeth is moderately or remarkably crenulated |
| -Absolutely and relatively long radial neck |

| |
|---|
| • *Apomorphic (derived features), shared with later hominins* |
| -Doubled arched supraorbital torus |
| -Parietals showing parasagittal flattening of the upper surfaces |
| -Position of the lateral prominence at the level of the talonid of mandibular $M_2$ |
| -Absence of alveolar prominence |
| -Oblique inclination of the trigonum postmolare |
| -Shallow relief of the masseteric fossa |
| -Moderately hollowed posterior subalveoloar fossa |
| -Regular gonion profile |
| -Length/width index of the mandibular alveolar arcade clearly below 100 (following Rosas and Bermúdez de Castro[47]) |
| -Permanent mandibular incisors buccolingually expanded with respect to *H. habilis* s.s. and other African and Eurasian Early Pleistocene hominins such as KNM ER 992 or Dmanisi |
| -P3>P4 size sequence for the crown area of the maxillary and mandibular premolars |
| -Postcanine teeth smaller than those of *H. habilis* s.s. and within the range of *H. ergaster* (or African *H. erectus*), *H. erectus* s.l., and European Middle Pleistocene hominins. |
| -Mandibular $M_3$ noticeably reduced with respect to $M_1$ and $M_2$ |
| -Antero-medially facing radial tuberosities |

• *Derived features, shared with Neandertals and modern humans*

-Convex superior border of the temporal squama[2]

-Anterior position of the incisive canal, which is nearly vertical

- Absence (or weak) planum alveolare

• *Derived features shared with modern humans*

-Modern-like mid-facial topography: infraorbital surface coronally oriented and sloping downward and backward (true canine fossa) with a horizontal and high rooted inferior border

- Medial position of the deepest point of the mandibular notch

-Relatively narrow patellae with high patellar indices

• *Derived features shared with Neandertals and the SH hominins*

-Presence of a medial pterygoid tubercle

-Rhomboidal and compressed occlusal polygon and a skewed external outline of the permanent $M^1$ with a bulging protrusion of the hypocone

-Permanent upper incisors showing a shovel shape,[3] particularly marked in $I^2$

- Large olecranon fossa and very thin medial and lateral pillars

-Clavicle absolutely very long (maximum length), relatively slender (low robusticity index), with pronounced shaft curvature and relatively small ephiphyses[4]

- Relatively narrower trochlea of the talus[4]

- Presence of middle trigonid crest

All these features have been studied by some authors.[1,5,23,27,34,35,40,45,46,48,49,54,57,59,63,65,67,123] In these studies, more detailed descriptions and discussions of the polarity of the TD6 features can be found.

1. According to the Wood et al.[124] classification.[124]

2 This feature as also present in African and later Asian Middle Pleistocene fossils.[27]

3. This feature is also common in other Middle Pleistocene Eurasian hominins.

4. These features are found in Neandertals, but not in the SH hominins.[67]

Journal of Human Evolution 127 (2019) 93–117

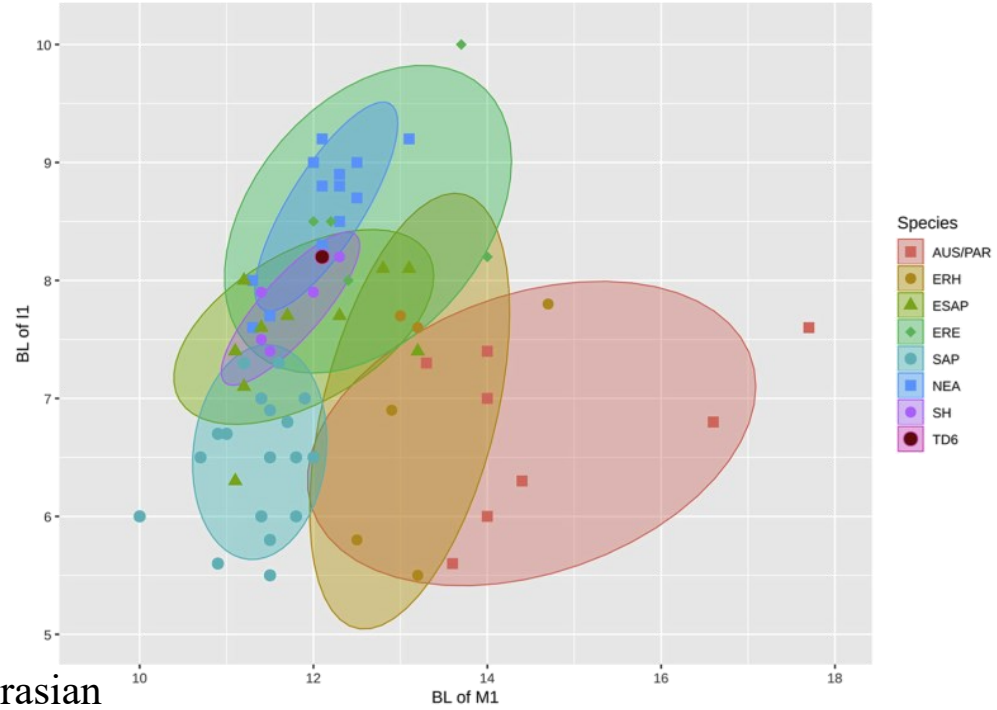
Contents lists available at ScienceDirect

Journal of Human Evolution

journal homepage: www.elsevier.com/locate/jhevol

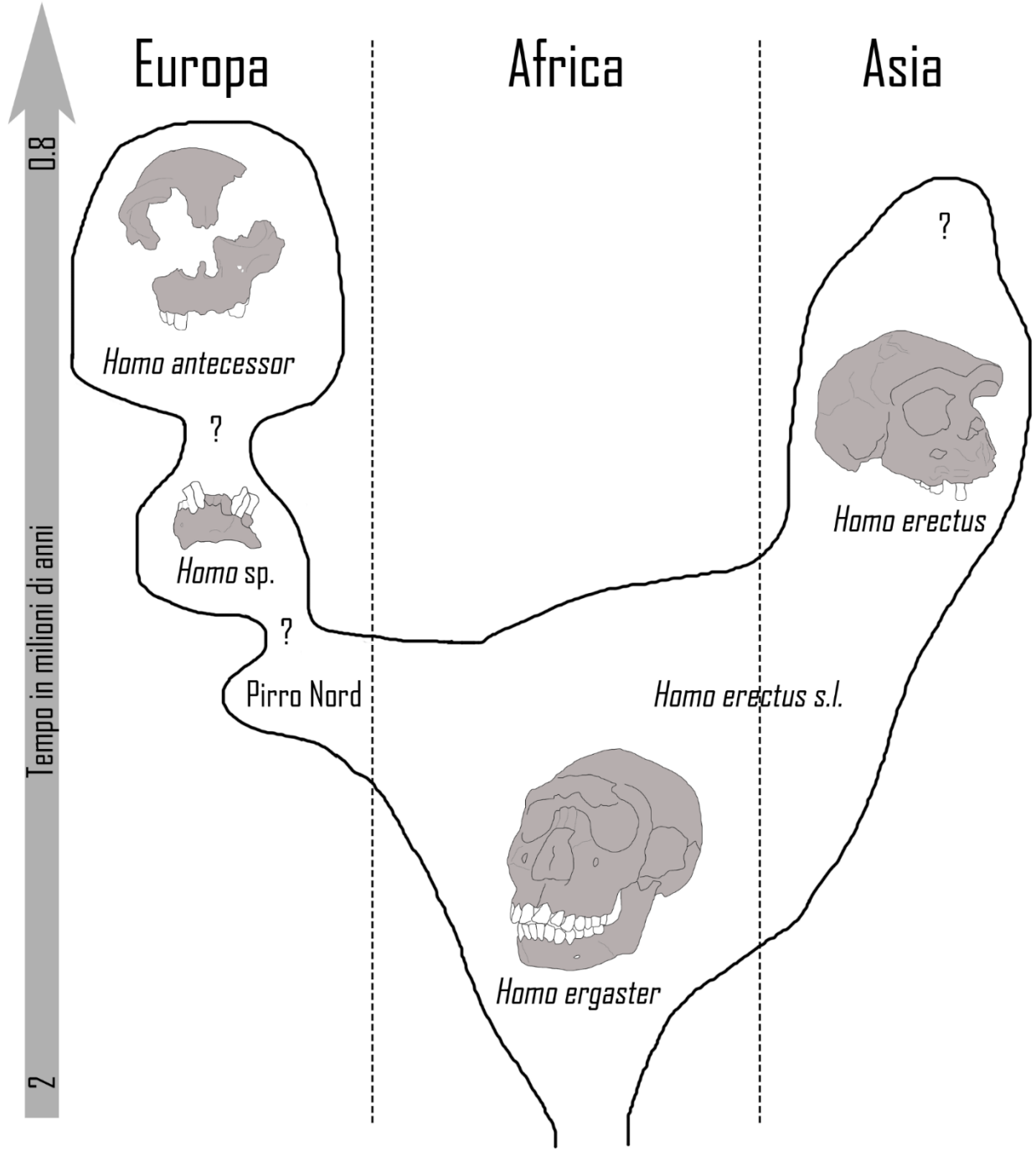
# New permanent teeth from Gran Dolina-TD6 (Sierra de Atapuerca). The bearing of *Homo antecessor* on the evolutionary scenario of Early and Middle Pleistocene Europe

María Martinón-Torres [a, b, *, 1], José María Bermúdez de Castro [a, b, *, 1], Marina Martínez de Pinillos [a], Mario Modesto-Mata [a, b], Song Xing [c, d], Laura Martín-Francés [e, a], Cecilia García-Campos [a], Xiujie Wu [c], Wu Liu [c]




- Support the **taxonomic validity** of the *Homo antecessor*
- Unic mosaic of features:
  - Presence of **primitive traits** for the genus *Homo*
  - Presence of features **exclusively shared** with Early and Middle Pleistocene Eurasian hominins.
  - Some of these traits were retained by the MP hominins of Europe and became **the typical condition** of the Neanderthal lineage.
  - Teeth do not show **any synapomorphy** of modern humans and are **different** from Asian *Homo erectus*.

Compatible with the hypothesis about *H. antecessor* belonging to the **basal population** from which *H. sapiens*, *H. neanderthalensis*, and Denisovans emerged.


Europa
Africa
Asia
Tempo in milioni di anni
2
0.8
Homo antecessor
?
Homo sp.
?
Pirro Nord
?
Homo erectus
Homo erectus s.l.
Homo ergaster

# I « Preneandertaliani »

I Preneandertaliani : Si cominciano ad individuare alcune apomorfie.
Le prime caratteristiche morfologiche di tale popolazione si osservano attorno a 350-400.000 anni fa, sui fossili dell'Arago (Francia) e di Sima de los Huesos (Spagna).
*Some apomorphies start to be individualized. The first morphological features of this kind of population are observed around 350-400 000 years.*

Arago 21

Atapuerca 5

*L'Homo heidelbergensis* presenta un mosaico di caratteri.
I caratteri derivati compaiono in un modo discontinuo, ma sono sistematicamente rappresentati negli ultimi Neanderthal.
*The* Homo heidelbergensis *presents a mosaic of features.*
*The derived features appeared in an discontinued mode, but they are systematically represented in the last neandertal.*

Principali siti con resti umani attribuiti ad *Homo heidelbergensis*

# I PRIMI INSEDIAMENTI UMANI IN EUROPA


**PRIME "INCURSIONI" DEL GENERE HOMO IN EUROPA.**



1 **Atapuerca Gran Dolina** (1 200 000-780 000 anni fa)
*Homo antecessor*

2 **Atapuerca Sima de los Huesos** (500 000 anni fa)
*Homo heidelbergensis*

3 **Arago** (300 000-200 000 anni fa)
*Homo heidelbergensis*

4 **Terra Amata** (400 000 anni fa - le prime capanne)
*Homo heidelbergensis*

5 **Mauer** (600 000-500 000 anni fa)
*Homo heidelbergensis*

6 **Steinheim** (350 000-250 000 anni fa)
*Homo heidelbergensis*

7 **Bilzingsleben** (370 000 anni fa)
*Homo heidelbergensis*

8 **Boxgrove** (524 000-478 000 anni fa)
*Homo heidelbergensis*

9 **Pakefield** (700 000 anni fa)
*Homo heidelbergensis*

10 **Swanscombe** (300 000-200 000 anni fa)
*Homo heidelbergensis*

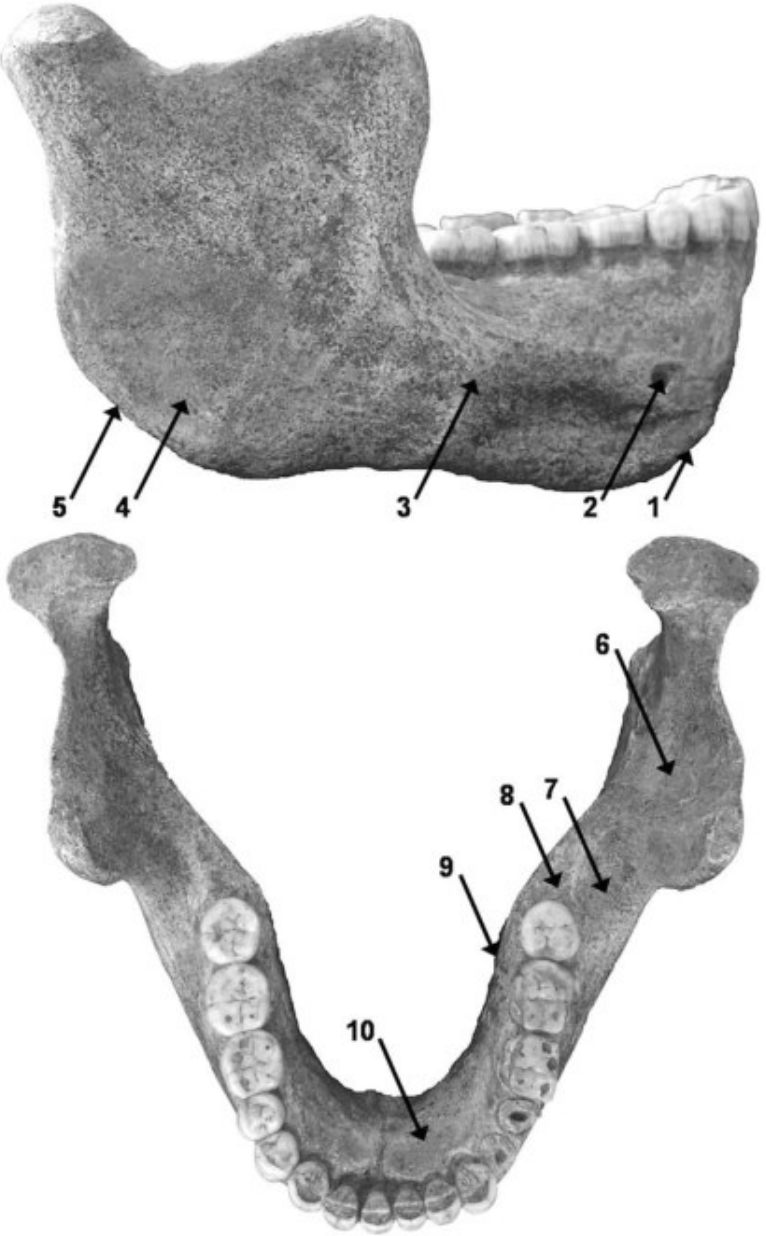
11 **Petralona** (350 000-200 000 anni fa)
*Homo heidelbergensis*

12 **Vértesszőllős** (350 000 anni fa)
*Homo heidelbergensis*

13 **Ceprano** (430 000-385 000 anni fa)
*Homo heidelbergensis*

* Norfolk (UK) Happisburgh prints (850 ka)

Mauer – Olotipo della specie *Homo heidelbergensis* (600 ka)




(Mounier et al. 2009)

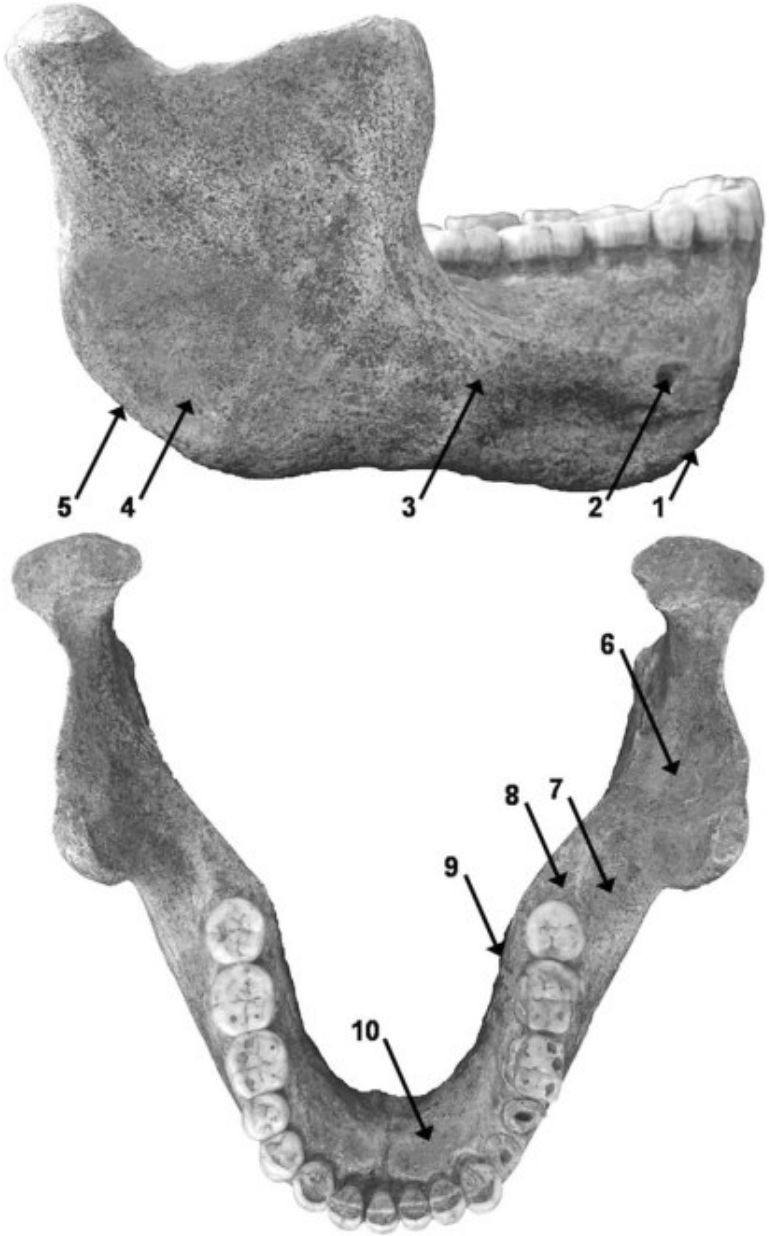
**Derived Neandertal-like traits**

- foramina mentale posteriorly positionned (2)
- prominentia lateralis posteriorly positionned (3)
- truncated gonion (5)
- horizontal retromolar area (8)

**Plesiomophies**

- incisura submentalis (1)
- deep fossa masseterica (4)
- strongly developed planum triangulare (6)
- gutterlike extramolar sulcus (7)
- parallel mylohyoid line (9)
- extensive planum alveolare (10)

***Homo heidelbergensis*** definizione della specie




(Mounier et al. 2009)

**Caratteri derivati neandertaliani**
Ovvero tratti morfologici che caratterizzanno la specie neandertaliana

+

**Plesiomorfie**
Ovvero tratti morfologici condivisi con le specie arcaiche

=

Definizione della specie *Homo heidelbergensis*
Moisaico unico di plesiomorfie associate, nelle forme Europee, alla comparsa di caratteri derivati neandertaliani

# Sima de los Huesos: 430 ka

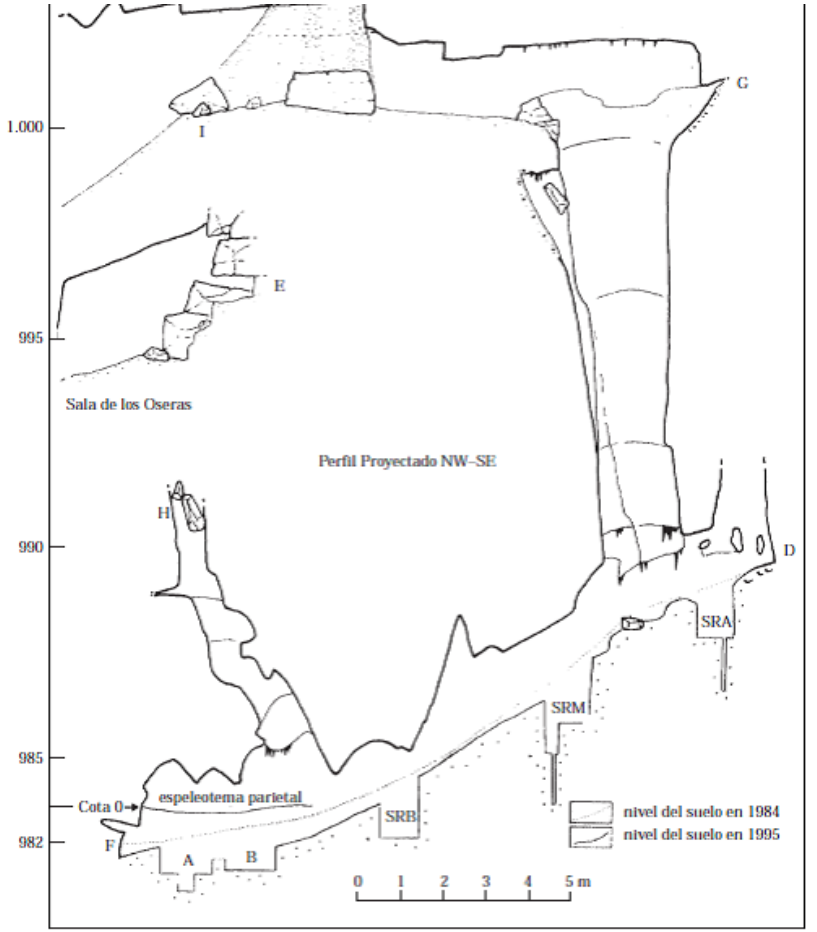
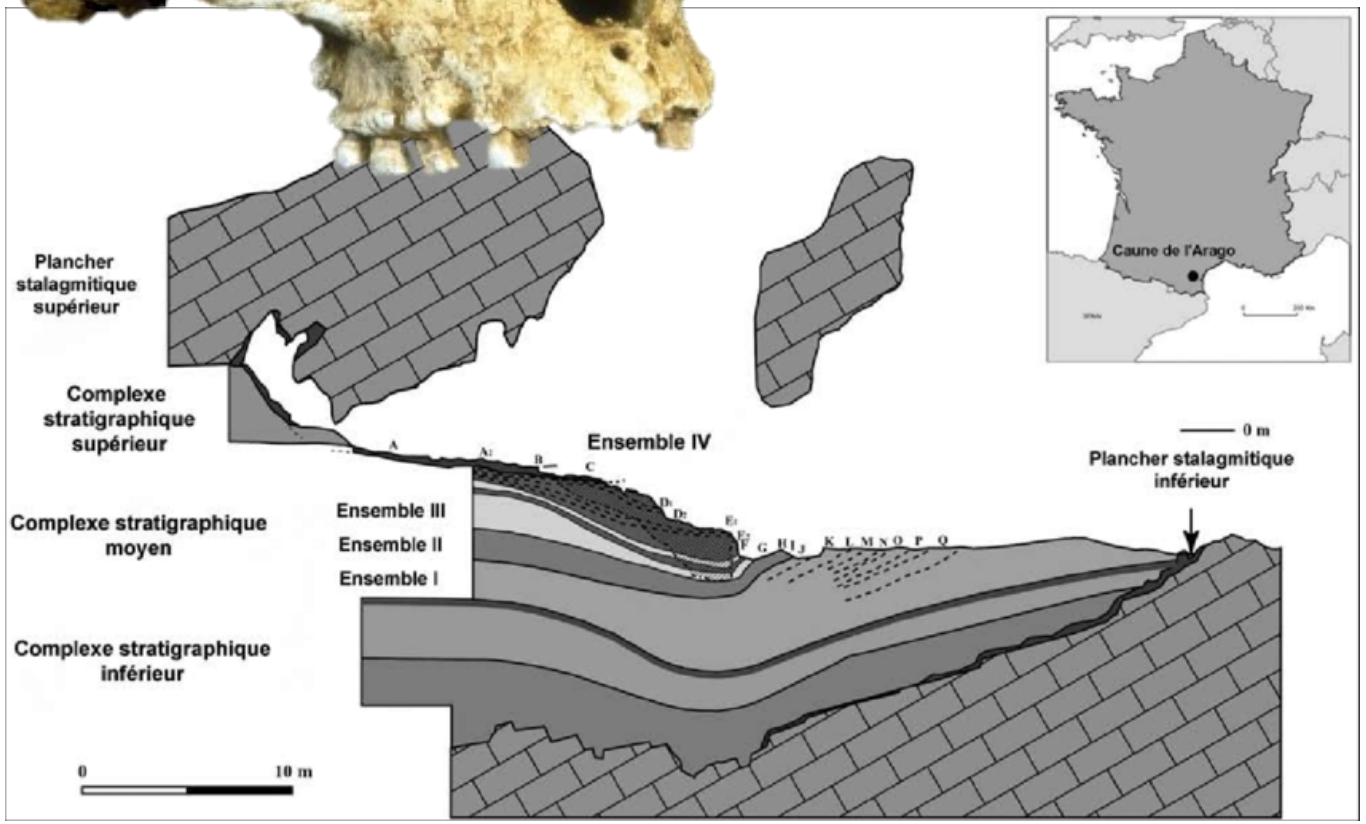


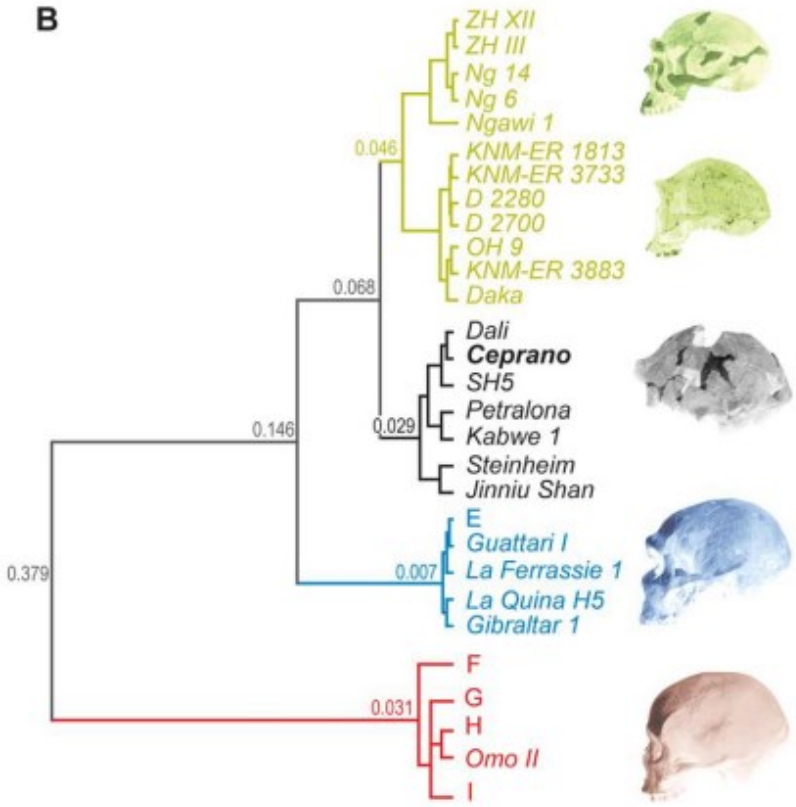

Figure 9. Sima de los Huesos profile (by G. E. Edelweiss, 1992–1996). Projection as in Figure 5. "Tapón de margas" indicates a cone of Neogene white marls coming from the outside. The levels of 1984 and 1995 floors are indicated, as well as a wall speleothem. The blind chimney in Sima de los Huesos behind (to the right of) the shaft, has not been completely drawn.

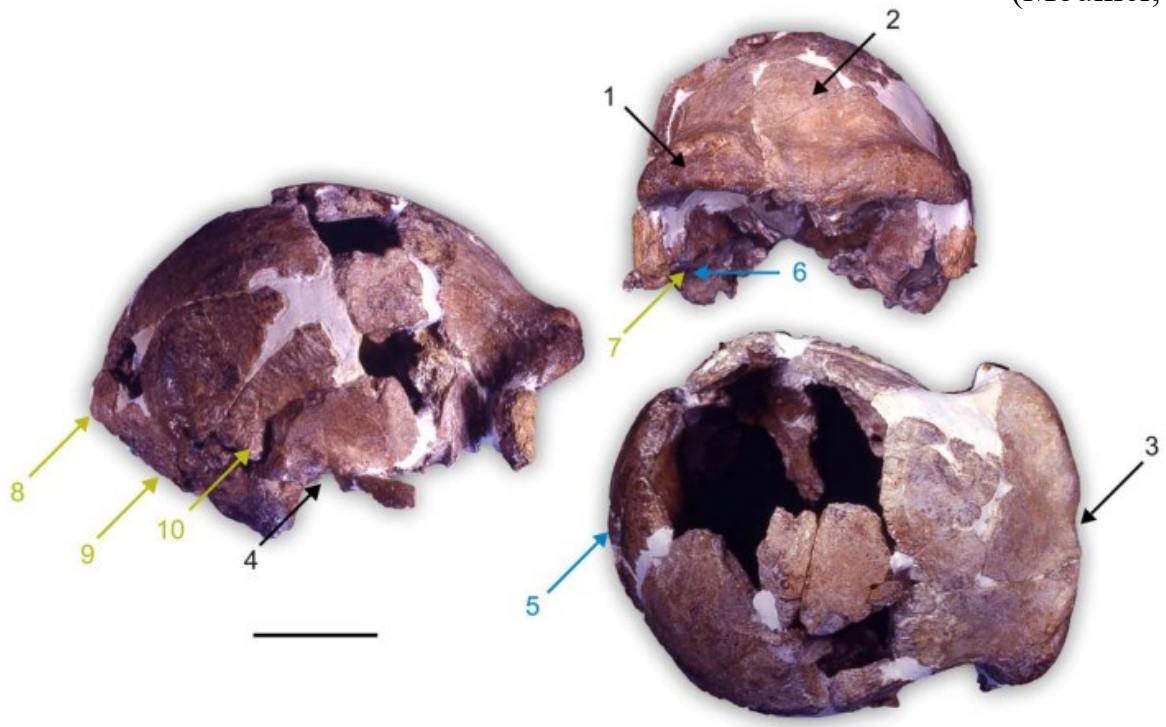
# Caune de l'Arago – Tautavel (Francia) – 450 ka




# Ceprano : 430 - 385 ka

(Mounier, 2012)

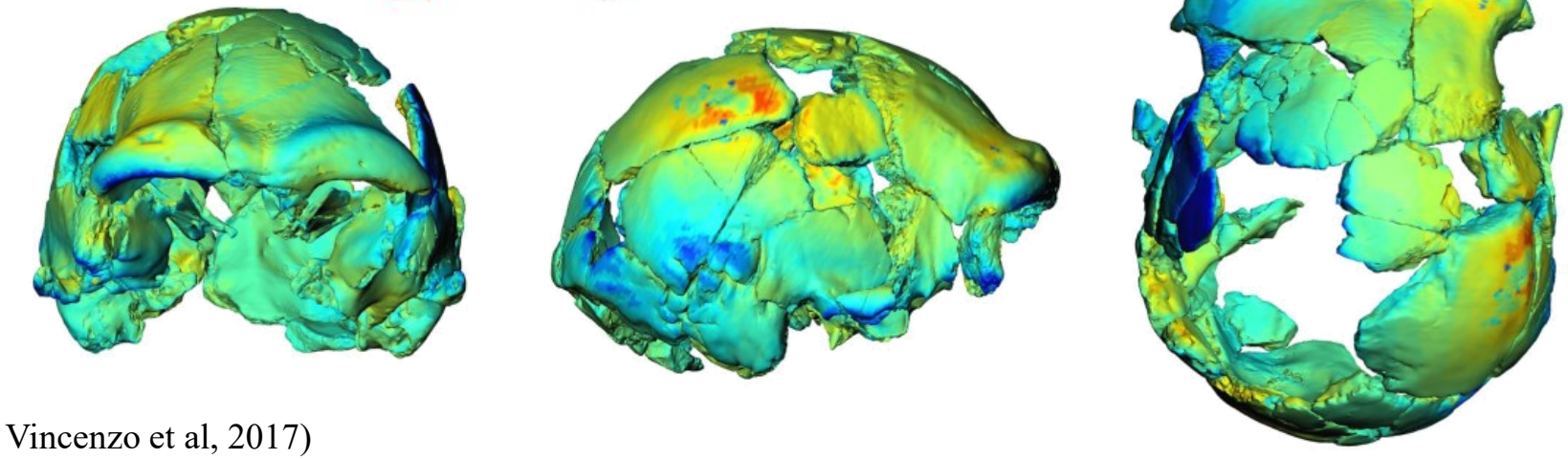



1 a 4
Tratti esclusivamente trovati nei specimen del P. medio

5 & 6
Tratti derivati

7 a 10
Tratti primitivi



(Di Vincenzo et al, 2017)

Quaternary Science Reviews xxx (xxxx) xxx

Contents lists available at ScienceDirect

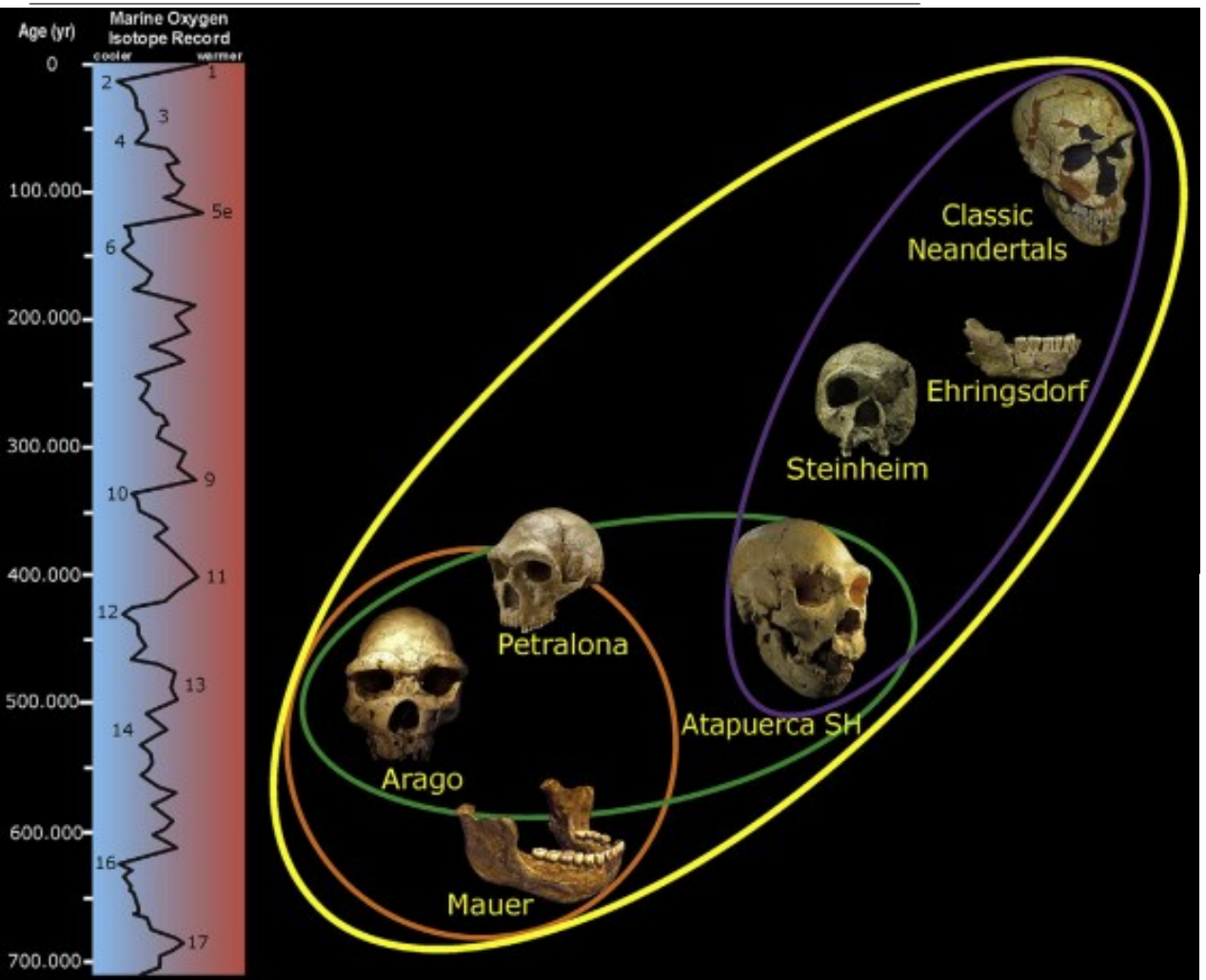
Quaternary Science Reviews

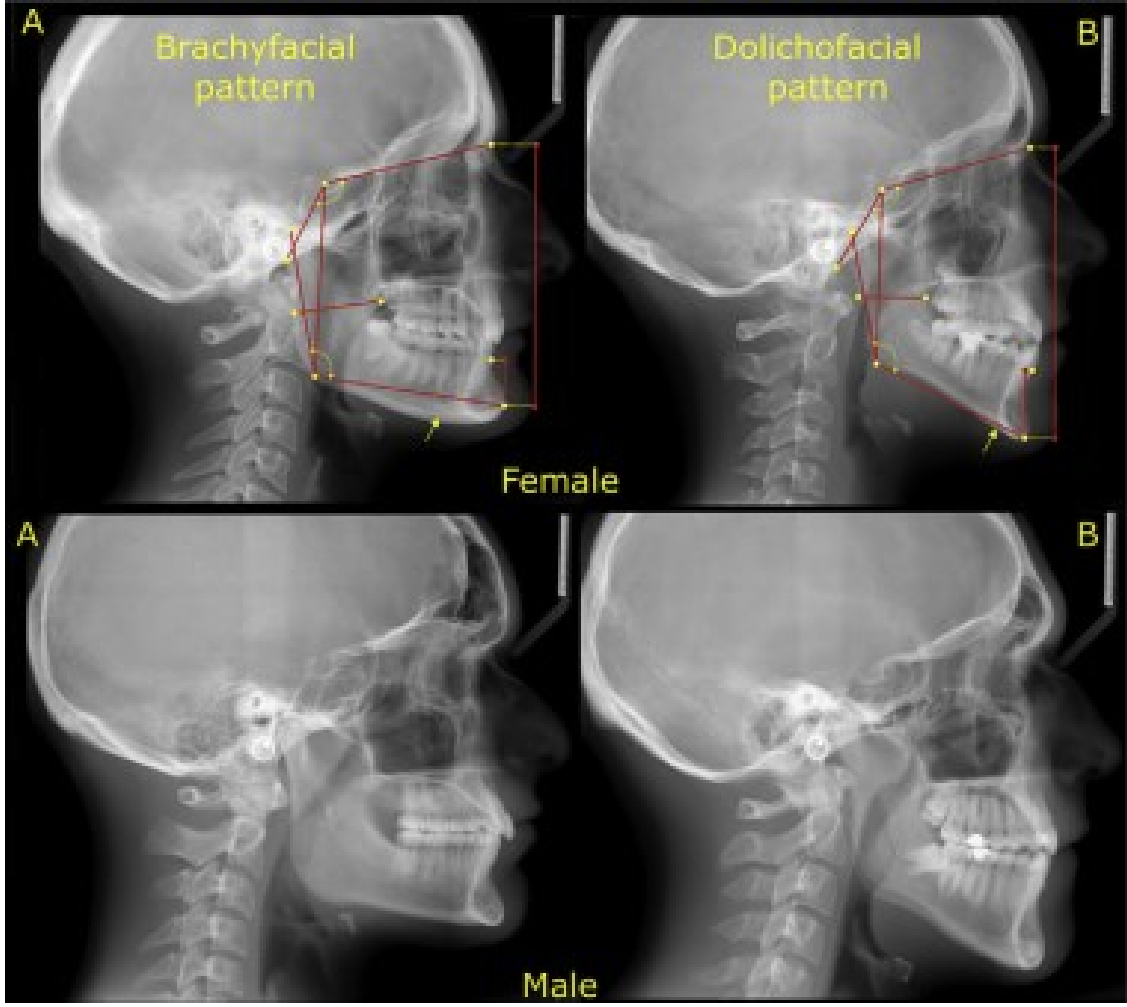
journal homepage: www.elsevier.com/locate/quascirev

# *Tempo* and mode in the Neandertal evolutionary lineage: A structuralist approach to mandible variation

Antonio Rosas [a, *], Markus Bastir [a], Jose Antonio Alarcón [b]

[a] Paleoanthropology Group, Department of Paleobiology, Museo Nacional de Ciencias Naturales, CSIC, Madrid, Spain
[b] Department of Stomatology, Section of Orthodontics, Faculty of Odontology, University of Granada, Granada, Spain

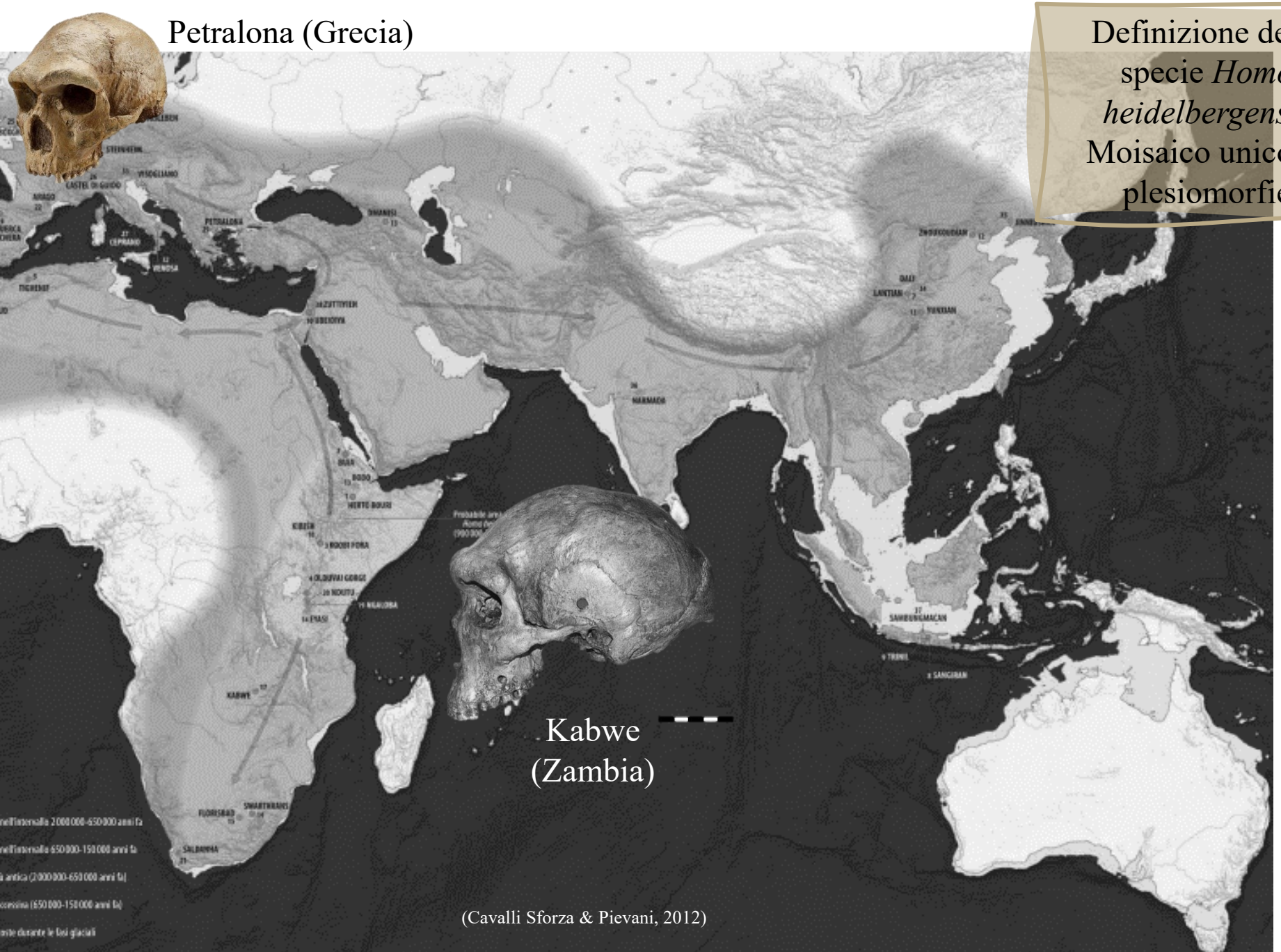



Mauer and Arago = single deme and the presence of Neandertal derived traits represent the begining of their evolutionary process.

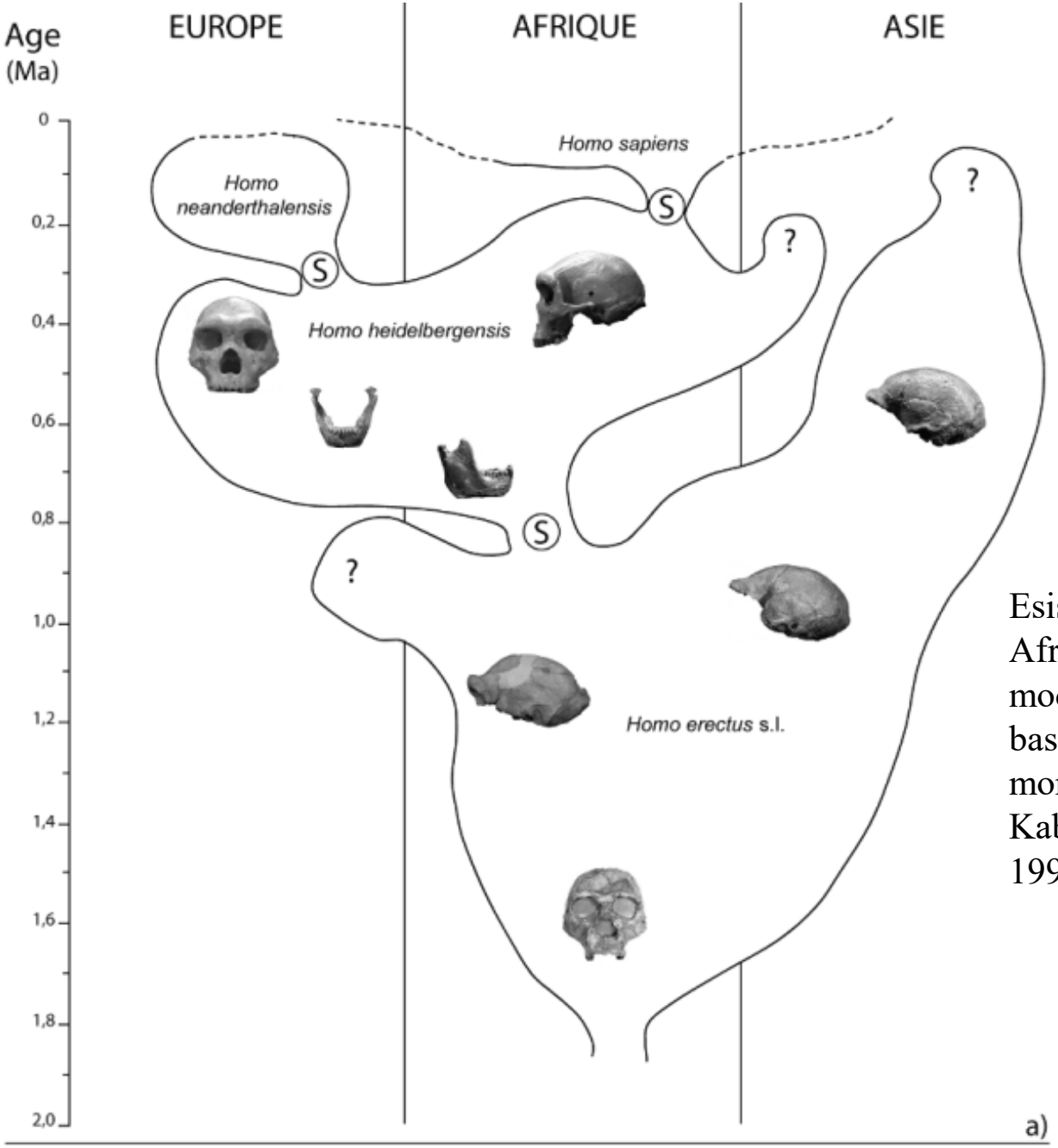
Atapuerca-SH have similarities with Mauer and Arago which allows linking of them to this group. Then Atapuerca-SH are considered members of Neandertal lineage.

***Homo heidelbergensis*, origine**



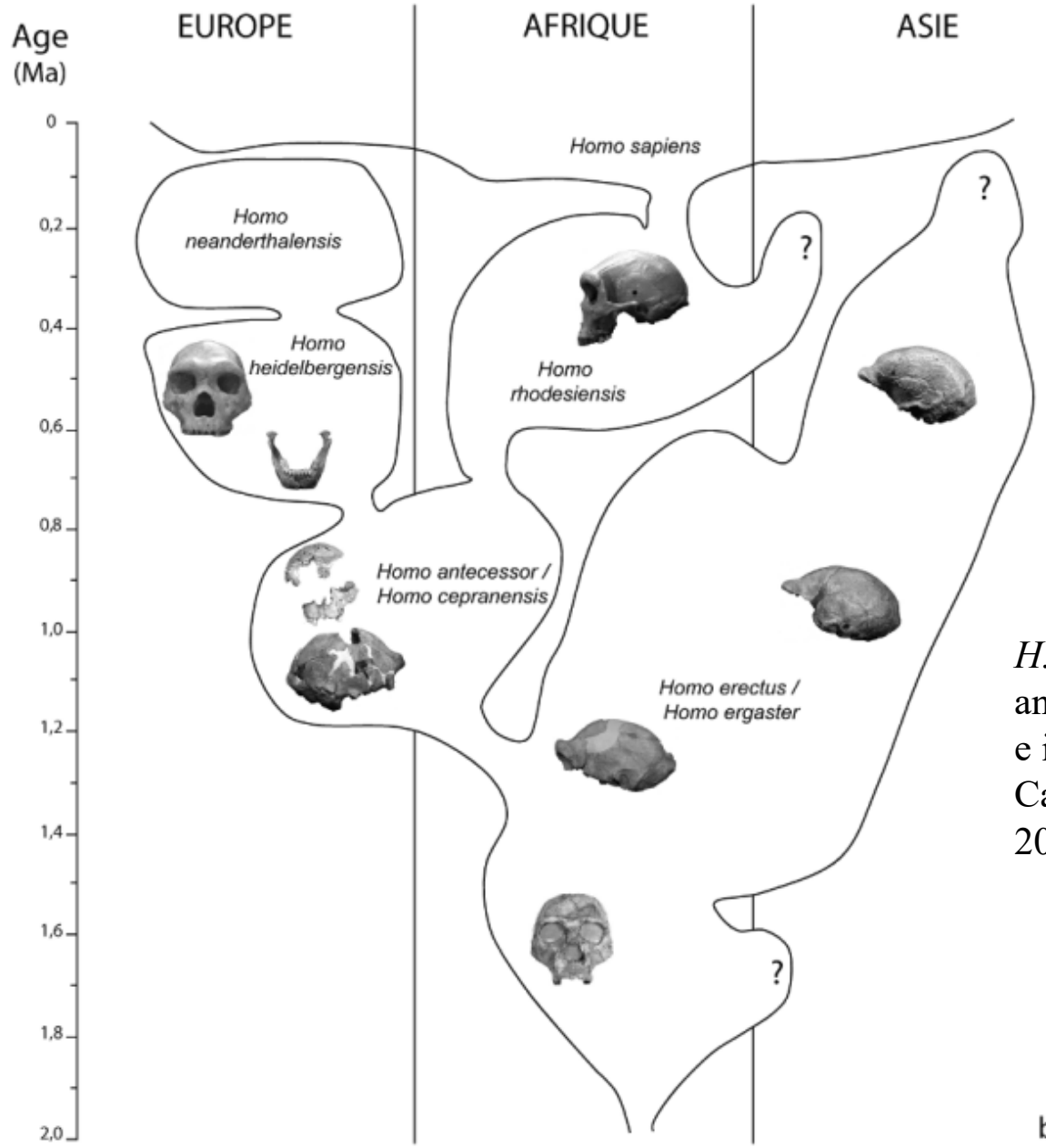

Definizione della specie *Homo heidelbergensis*
Moisaico unico di plesiomorfie

# Ipotesi Evolutive: Origine Afro-europea

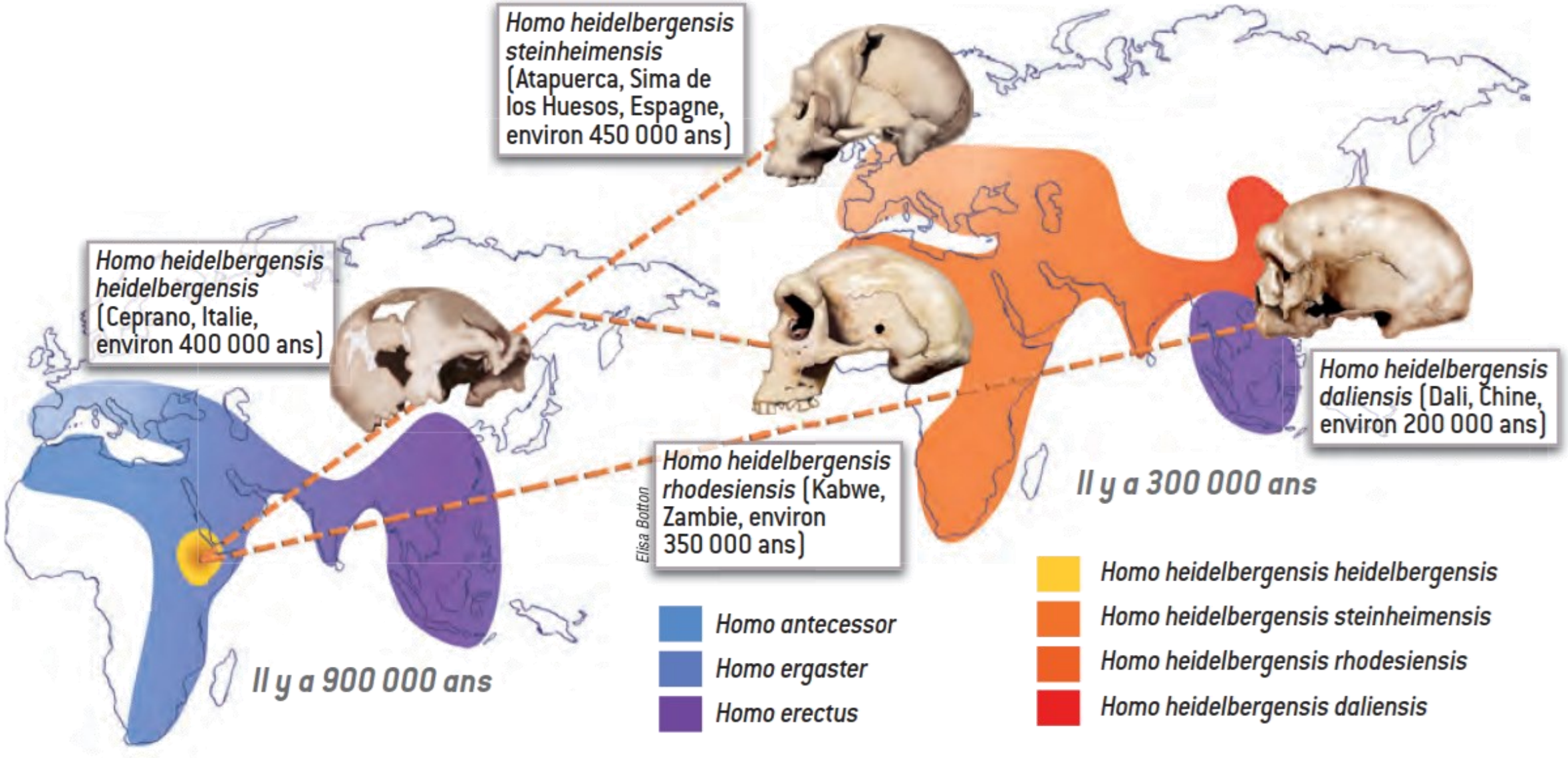



Esistenza nel P. medio di un taxa Afro-europeo ancestrali ai uomini moderni e ai Neandertaliani = basato sulle assomiglianze morfologiche tra Petralona Kabwe e Mauer. (Rightmire, 1998)

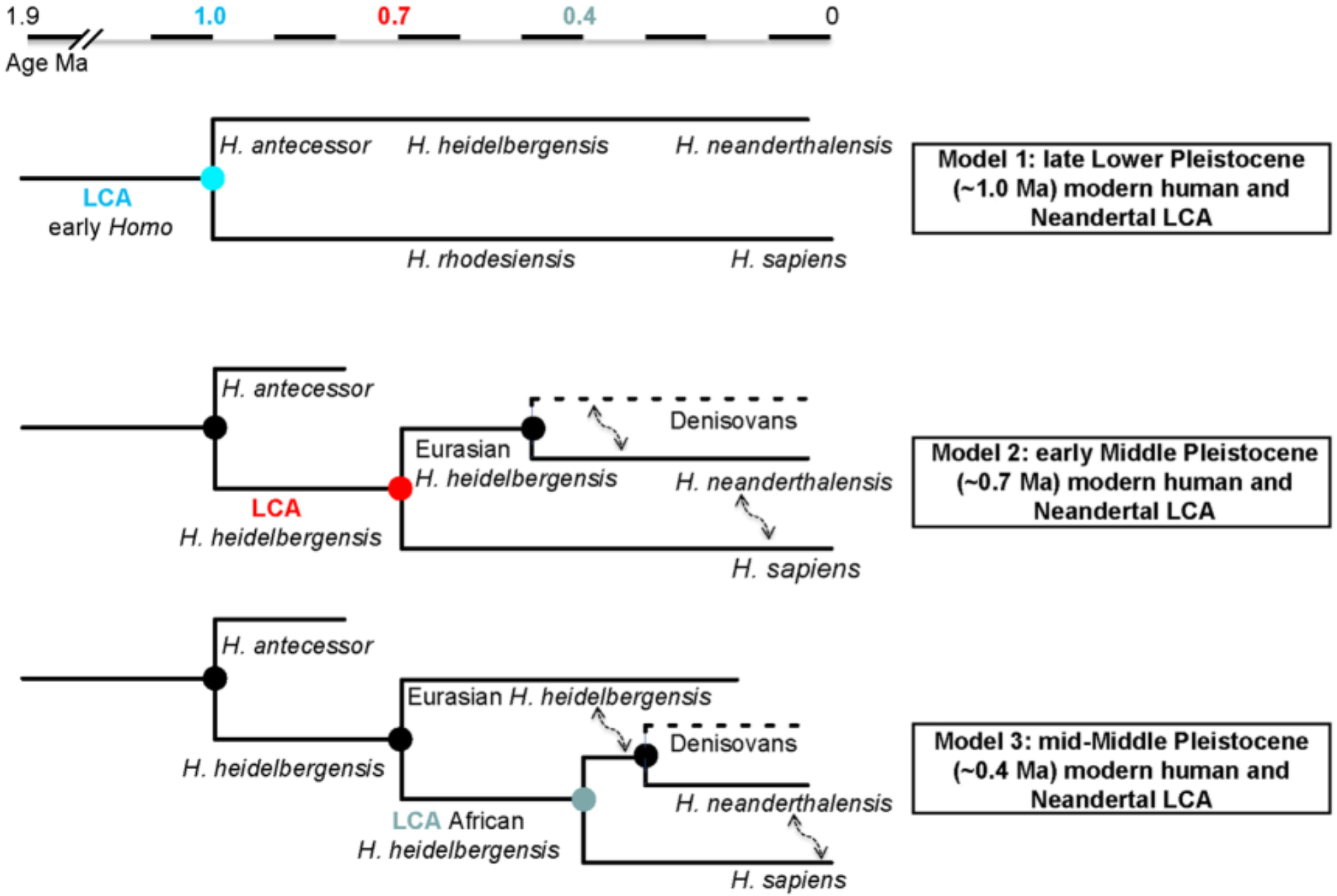
# Ipotesi Evolutive: Origine esclusivamente Europea



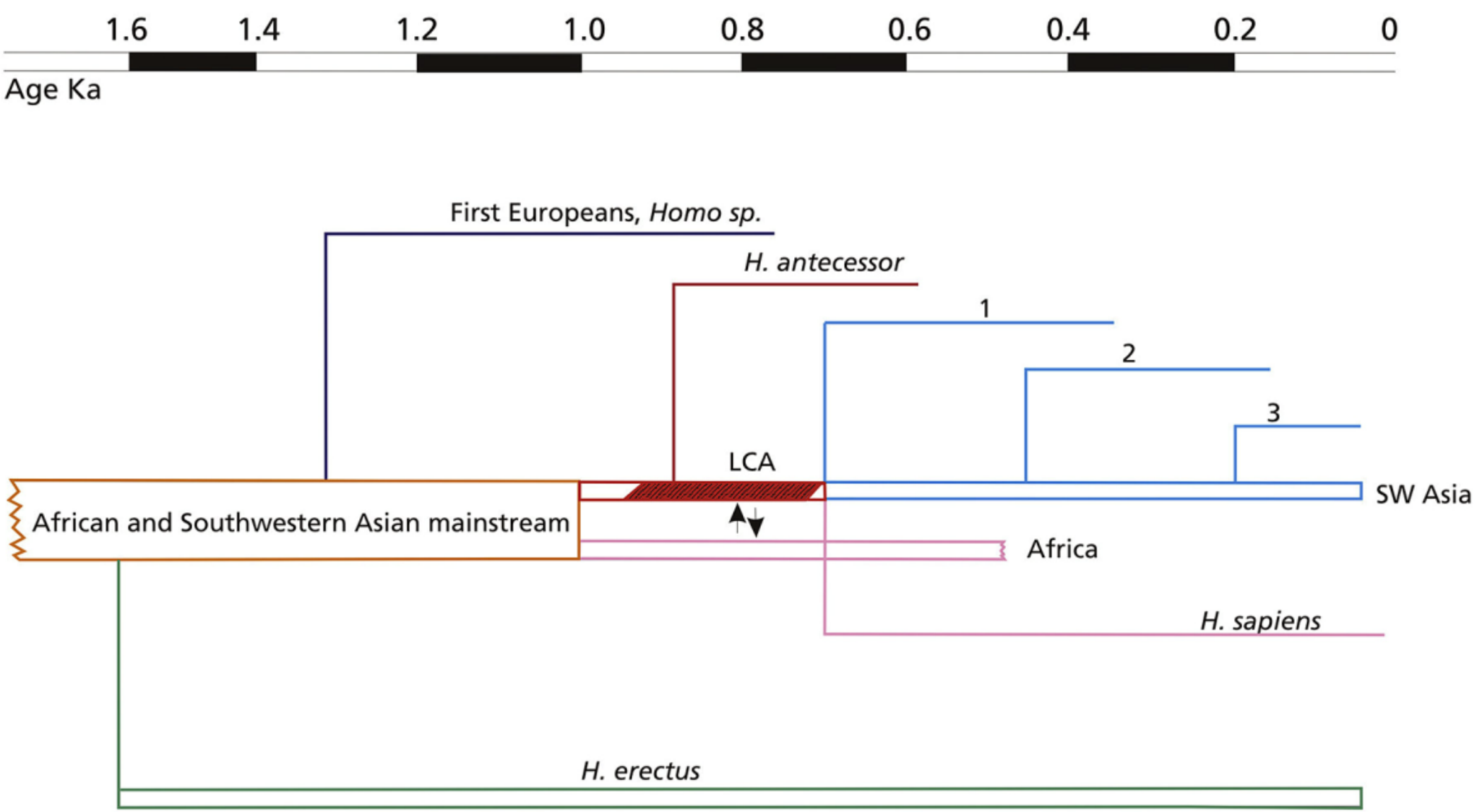

*H. antecessor* sarebbe l'ultimo antenato comune tra i neandertaliani e i uomini moderni (Bermudez de Castro et al., 1997; Mallegni et al., 2003)




(Manzi & di Vincenzo, 2012)



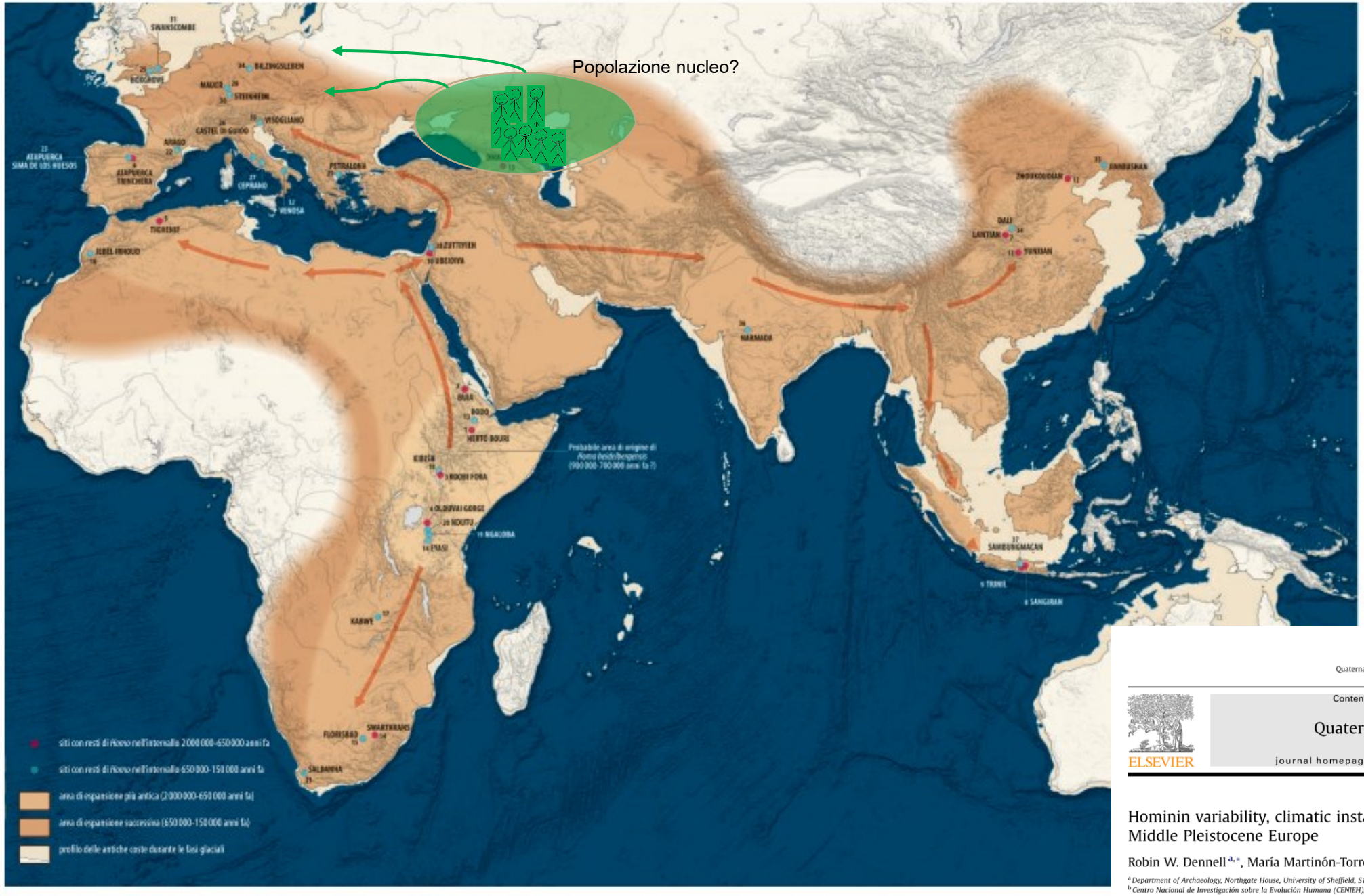

(Mounier and Lahr, 2016)




*H. antecessor* = European branch closely related to the LCA Neandertal and MH
*H. heidelbergensis* removed of the hominin phylogeny
European Middle Pleistocene specimens could be included in two or more branches of the Neanderthal clade

Bermudez de Castro et al. (2016)

# LA SECONDA DIASPORA: ESPANSIONE DI HOMO HEIDELBERGENSIS E DELLE SUE VARIETÀ




OUT OF AFRICA 2. LA SECONDA DIASPORA, COMPIUTA QUESTA VOLTA DA HOMO HEIDELBERGENSIS.



Quaternary Science Reviews 30 (2011) 1511–1524

Contents lists available at ScienceDirect

Quaternary Science Reviews

journal homepage: www.elsevier.com/locate/quascirev

## Hominin variability, climatic instability and population demography in Middle Pleistocene Europe

Robin W. Dennell [a,*], María Martinón-Torres [b], José M. Bermúdez de Castro [b]

[a] Department of Archaeology, Northgate House, University of Sheffield, S1 4ET, UK
[b] Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), Avd. La Paz 28 Entreplanta 1, 00904 Burgos, Spain

Received: 24 February 2021 | Revised: 15 September 2021 | Accepted: 8 October 2021
DOI: 10.1002/evan.21929

ISSUES

Evolutionary Anthropology ISSUES, NEWS, AND REVIEWS WILEY

# Resolving the "muddle in the middle": The case for *Homo bodoensis* sp. nov.

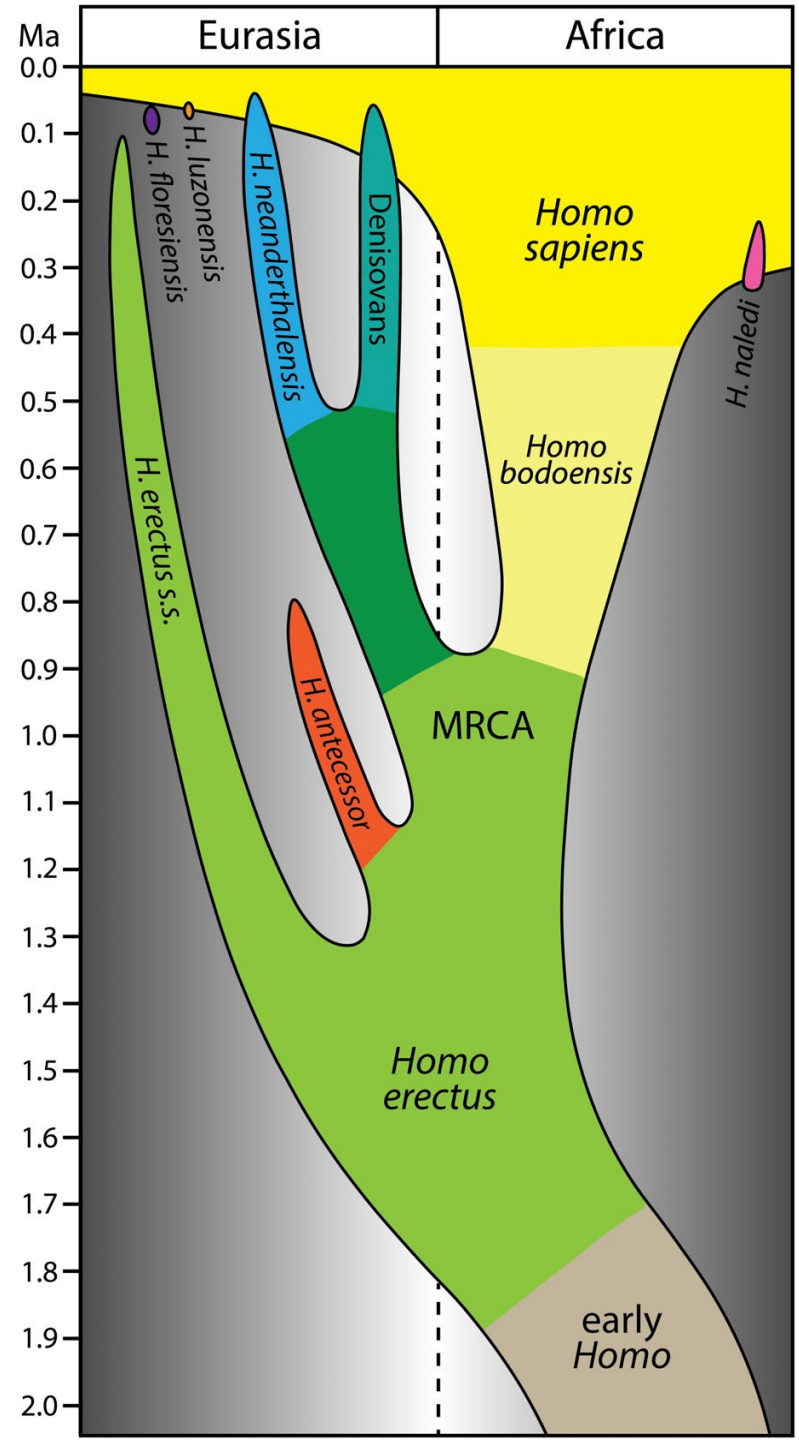
Mirjana Roksandic[1,2] | Predrag Radović[3,4] | Xiu-Jie Wu[5] | Christopher J. Bae[6]


Recent developments in the field of palaeoanthropology necessitate the suppression of two hominin taxa and the introduction of a new species of hominins to help resolve the current nebulous state of Middle Pleistocene (Chibanian) hominin taxonomy. In particular, the poorly defined and variably understood hominin taxa Homo heidelbergensis (both sensu stricto and sensu lato) and Homo rhodesiensis need to be abandoned as they fail to reflect the full range of hominin variability in the Middle Pleistocene.

Instead, we propose: (1) introduction of a new taxon, *Homo bodoensis* sp. nov., as an early Middle Pleistocene ancestor of the *Homo sapiens* lineage, with a pan-African distribution that extends into the eastern Mediterranean (Southeast Europe and the Levant)

(2) that many of the fossils from Western Europe (e.g. Sima de los Huesos) currently assigned to *H. heidelbergensis* s.s. be reassigned to *Homo neanderthalensis* to reflect the early appearance of Neanderthal derived traits in the Middle Pleistocene in the region;

(3) that the Middle Pleistocene Asian fossils, particularly from China, likely represent a different lineage altogether.



Received: 24 February 2021 | Revised: 15 September 2021 | Accepted: 8 October 2021
DOI: 10.1002/evan.21929

ISSUES

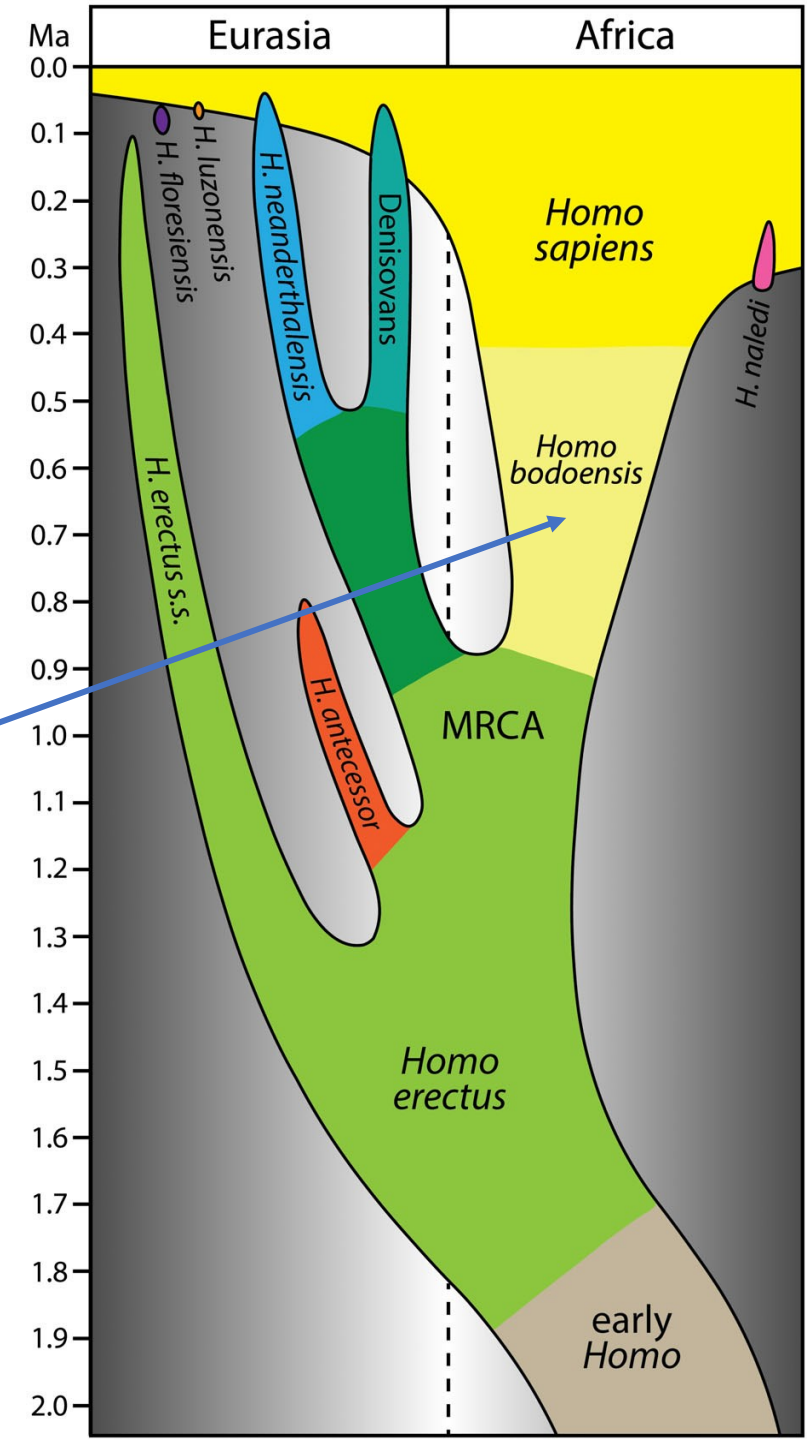
Evolutionary Anthropology ISSUES, NEWS, AND REVIEWS WILEY

# Resolving the "muddle in the middle": The case for *Homo bodoensis* sp. nov.

Mirjana Roksandic[1,2] | Predrag Radović[3,4] | Xiu-Jie Wu[5] | Christopher J. Bae[6]


- *H. bodoensis* species ancestral to *H. sapiens* but has not to be considered the MRCA (Most Recent Common Ancestor) of Eurasian (Neanderthals, Denisovans) and African (*H. sapiens).*

- The species was potentially present in Europe during the Middle Pleistocene (as evidenced by the Ceprano specimen) and may have contributed to a mixed morphology seen in Arago, Petralona, and possibly other fossils in Western Europe.



doi 10.4436/jass.94019

JASs Proceeding Paper
Journal of Anthropological Sciences
Vol. 94 (2016), pp. 41-63

# Filling the gap. Human cranial remains from Gombore II (Melka Kunture, Ethiopia; ca. 850 ka) and the origin of *Homo heidelbergensis*

**Antonio Profico[1], Fabio Di Vincenzo[1], Lorenza Gagliardi[1], Marcello Piperno[2] & Giorgio Manzi[1]**

*1) Sapienza Università di Roma, Dipartimento di Biologia Ambientale, P.le Aldo Moro 5, 00185 Roma, Italy*
e-mail: giorgio.manzi@uniroma1.it

*2) Sapienza Università di Roma, Dipartimento di Scienze dell'Antichità, P.le Aldo Moro 5, 00185 Roma, Italy*