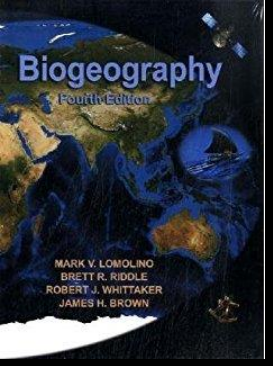
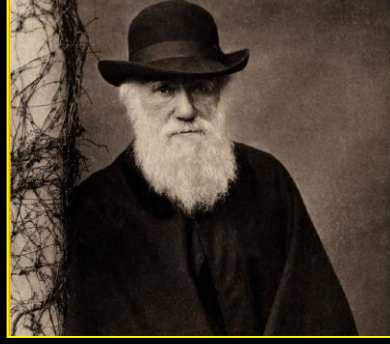
Evolución humana

FCEN
FACULTAD DE CIENCIAS
EXACTAS Y NATURALES



Temas clave



- 1. Arqueología: su aporte a la evolución humana. Concepto de cultura
- 2. Evolución humana: síntesis e hitos
- 3. Concepto de especie a nivel biológico y fósil: el caso de *Homo sapiens* y otras especies
- 4. Aún evolucionamos: lactasa y domesticación animal

1. Arqueología y evolución humana

- La evolución humana es el campo de estudio de la *Paleoantropología* y la *Arqueología*
- Arqueología: es una rama de la Antropología que busca comprender la diversidad biológica y cultural humana
- Su objeto de estudio es el *registro arqueológico*: la suma de artefactos, contextos geológicos, indicadores paleoecológicos
- La presencia de cultura material marca el inicio del campo arqueológico…

Cultura y evolución

- Existen múltiples conceptos de cultura. Algunos son antropocéntricos (transmisión lingüística)
- El estudio interdisciplinario de la cultura lleva a enfoques más amplios:

"a cultural behaviour is one that is transmitted repeatedly through social or observational learning to become a population-level characteristic" (Whiten et al. 1999)

Cultures in chimpanzees

A. Whiten*, J. Goodall†, W. C. McGrew‡, T. Nishida§, V. Reynolds‖, Y. Sugiyama¶, C. E. G. Tutin#*, R. W. Wrangham** & C. Boesch††

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Una arqueología más amplia…

- Arqueología de primates más allá del linaje humano
- Estudio de la conducta pasada de chimpanzés, bonobos, gorilas, monos capuchinos, etc.
- Divergencia y convergencia en la cultura

Vol 460|16 July 2009|doi:10.1038/nature08188 nature

REVIEWS

Primate archaeology

Michael Haslam[1], Adriana Hernandez-Aguilar[1], Victoria Ling[1], Susana Carvalho[1], Ignacio de la Torre[2], April DeStefano[3], Andrew Du[3], Bruce Hardy[4], Jack Harris[3], Linda Marchant[5], Tetsuro Matsuzawa[6], William McGrew[1], Julio Mercader[7], Rafael Mora[8], Michael Petraglia[1], Hélène Roche[9], Elisabetta Visalberghi[10] & Rebecca Warren[4]

Figure 4 | Primate site creation. **a**, Selective transport of a stone hammer and anvil by an adolescent male chimpanzee (Bossou, Guinea). Over time, this behaviour accumulates artefacts in preferred tool-use sites. **b**, Stone anvil pitted by capuchin nut-cracking activity (Boa Vista, Brazil). Two stone hammers were found on the anvil, and nut debris was removed from the anvil before recording. Image from ref. 30.

Figure 2 | Primate stone-tool use. **a**, Three ~1.7–1.6-Myr-old Oldowan pounding tools from Olduvai Gorge, Tanzania. Provenance (left to right): FLK North level 1–2; FLK North level 5; FLK North sandy conglomerate. Scale bars, 1 cm. **b**, Chimpanzee cracking nuts with a stone hammer and anvil (Bossou, Guinea). The full social complexity of this activity cannot be reconstructed from the archaeological record alone. **c**, Adult male capuchin cracking nuts using a stone hammer and wood anvil (Boa Vista, Brazil). Note erect body position and relatively large (1.44-kg) hammer.

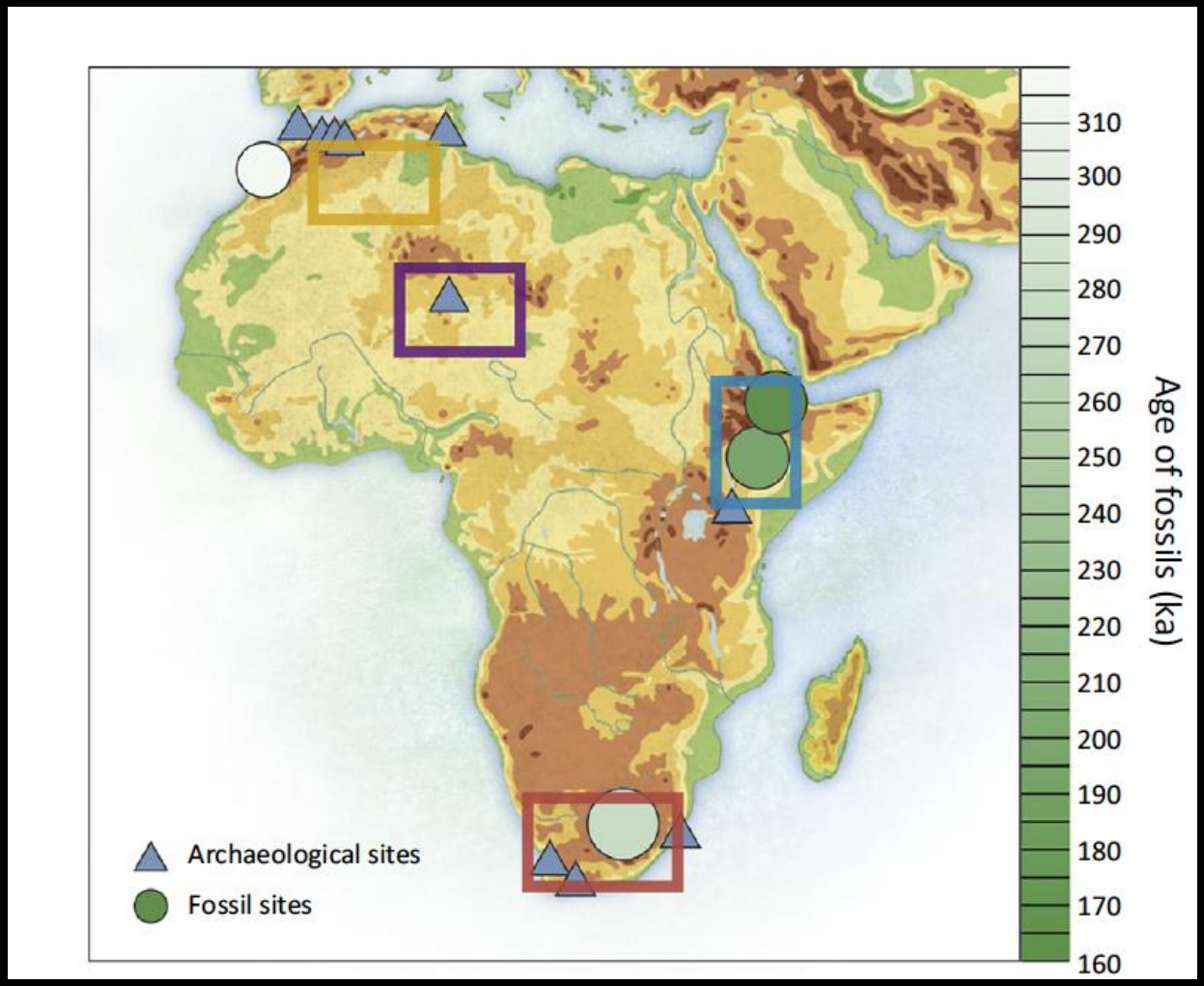
2. Evolución humana: evidencias clave

- Cuatro etapas clave en el proceso de evolución:

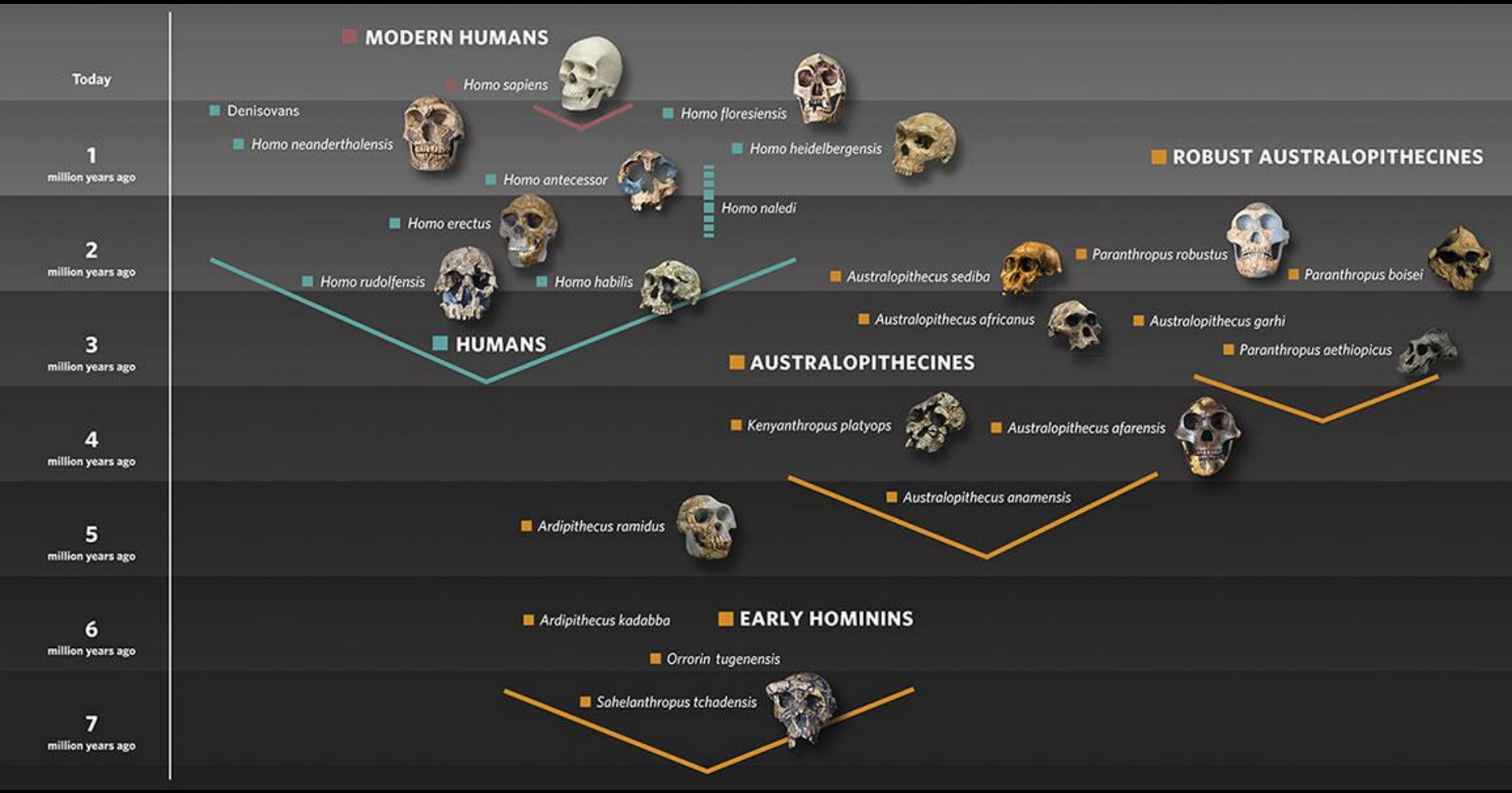
1. Aparación de los primeros hominínos: 4-7 MA (*Ardipithecus ramidus*, *Sahelantropus t.*, *Orrorin t.*)
2. Género *Australophitecus*: 4-2.7 MA (gráciles y robustos)
3. Género *Homo*: 2.5.1.8 MA (primeros artefactos?)
4. Homo heidelbergensis (800 ky) y humanos anatómicamente modernos (200 ky)

Principales líneas de cambio: capacidad craneana, postura y locomoción, capacidad manual

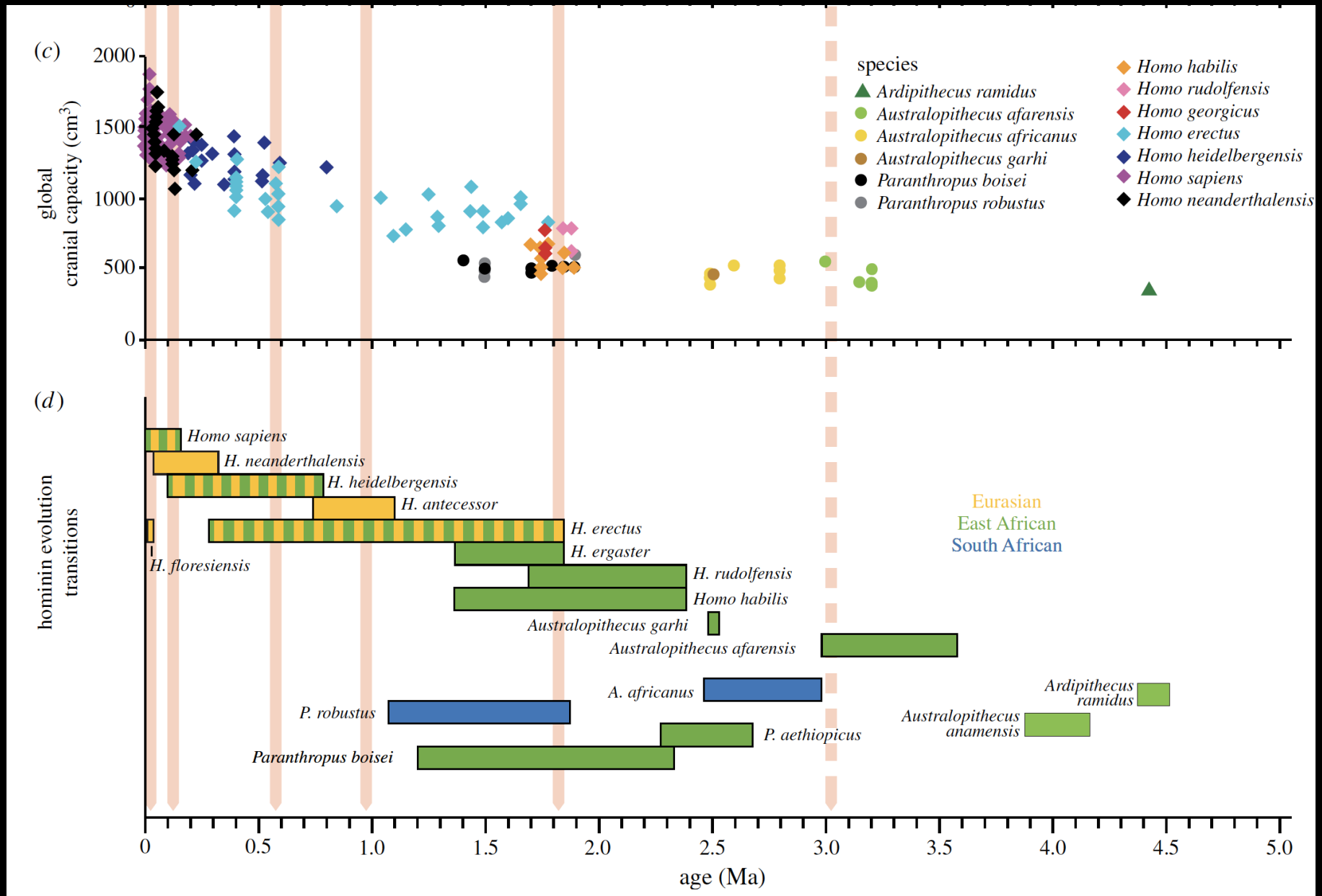
2. Evolución humana: evidencias clave



2. Evolución humana: evidencias clave

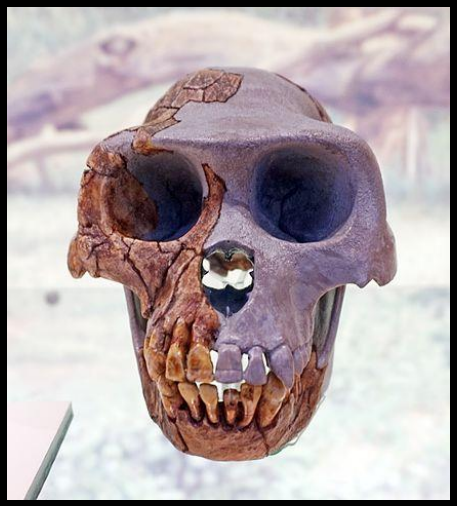


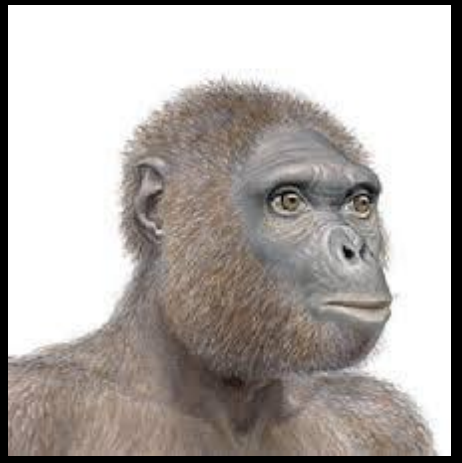
- Arbol filogenético: capacidad craneana



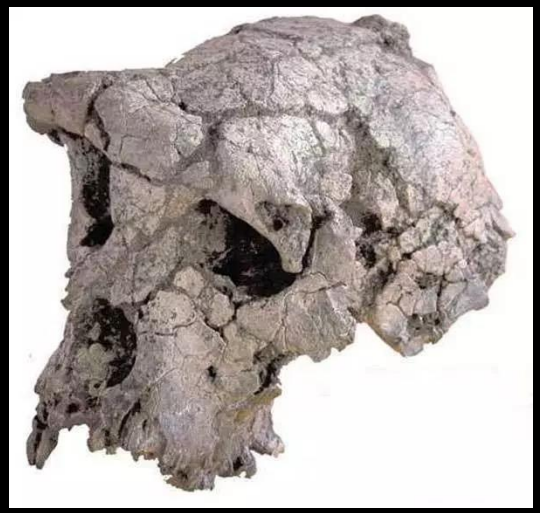
Hominínos tempranos

Sahelantrophus tchadensis
(6-7 MA)





Ardipithecus ramidus
(4,4 MA)



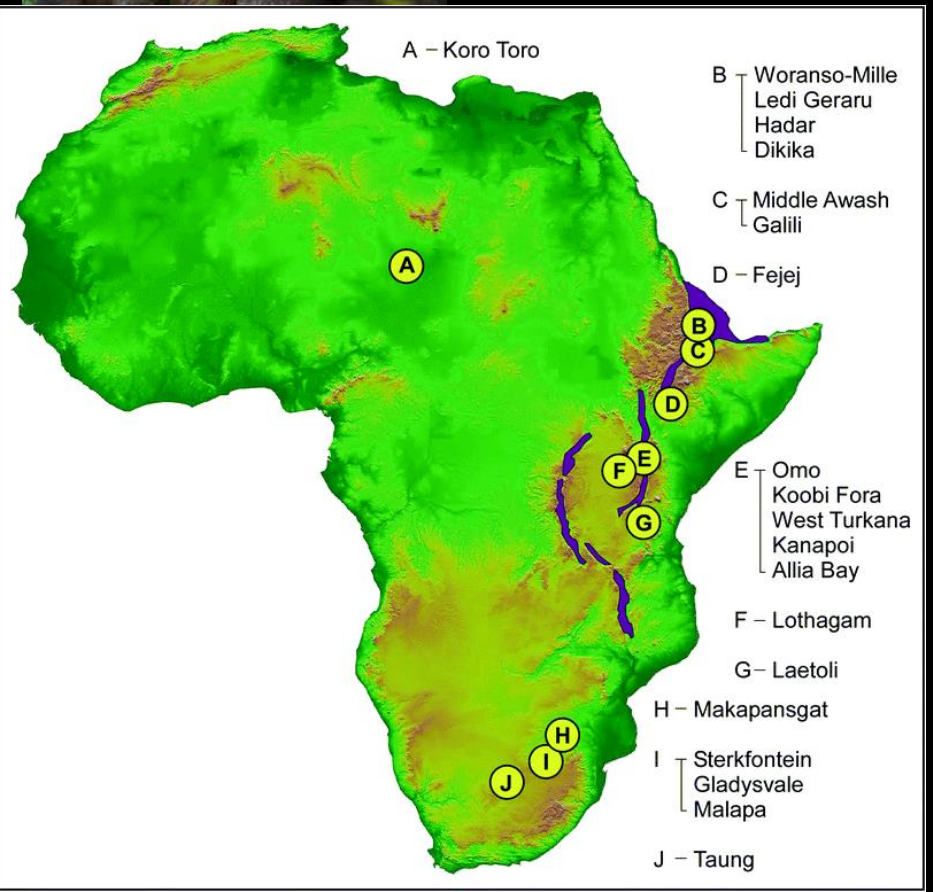
Orrorin tugenensis
(6-7 MA)

<u>Mosaico de características hominínas y no hominínas:</u>

- Capacidad craneana semejante a chimpanzé
- Dieta omnívora
- Locomoción : arbórea con indicios de bipedalismo incipiente

Australopithecus sp.

- Bipedalismo desarrollado
- Baja capacidad craneana y rasgos morfológicos arcaicos



Australopithecus sp.

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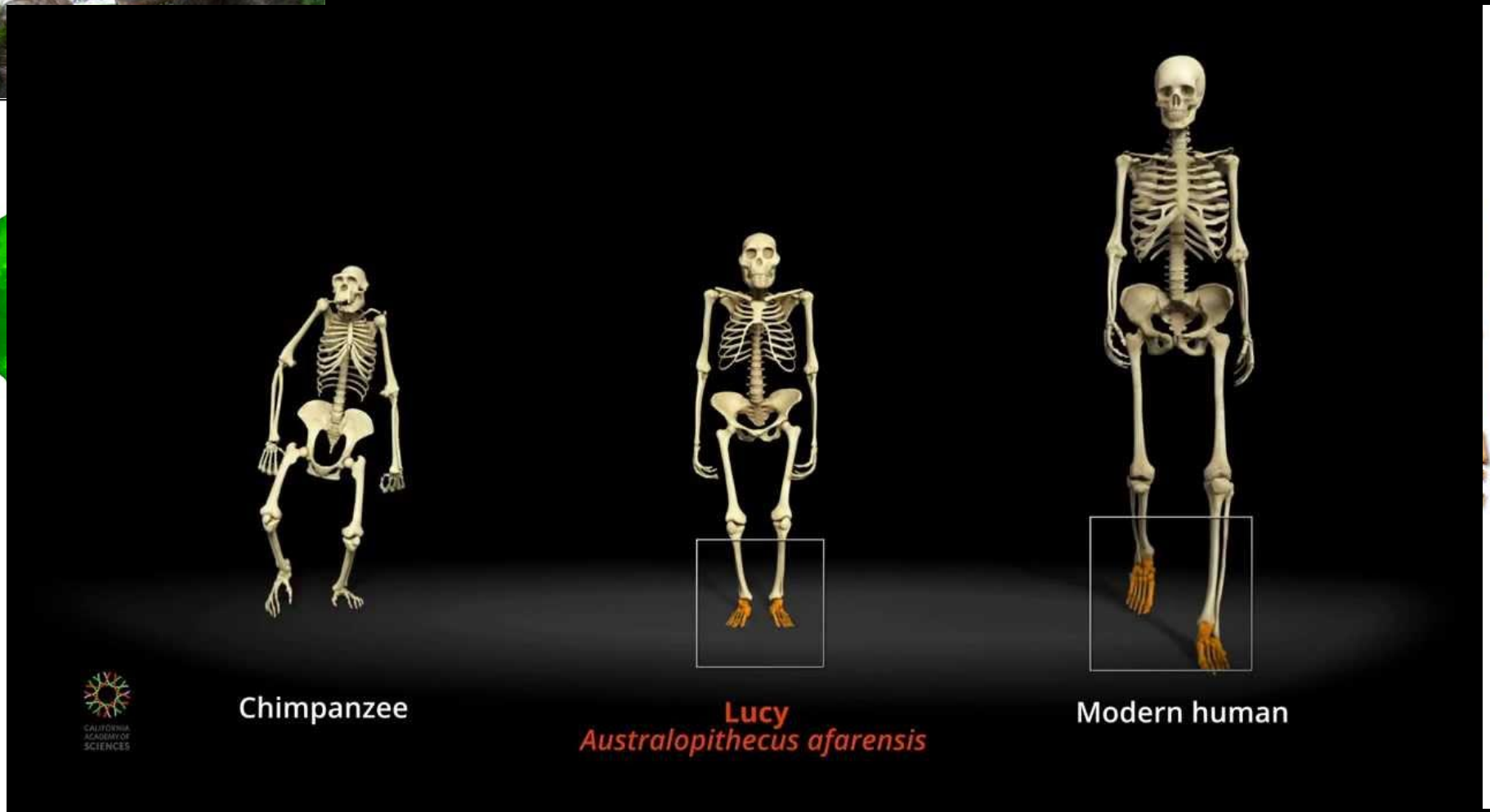


Artefactos más antiguos

Dikika (3,4 MA)

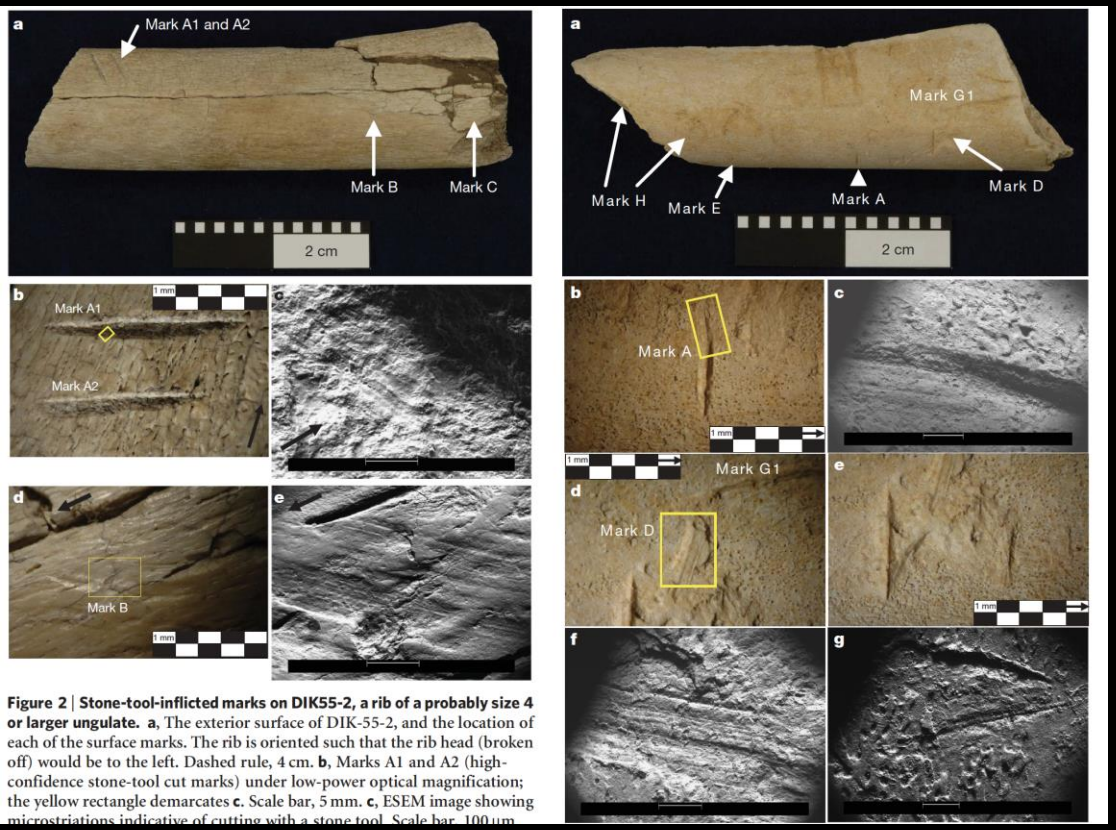
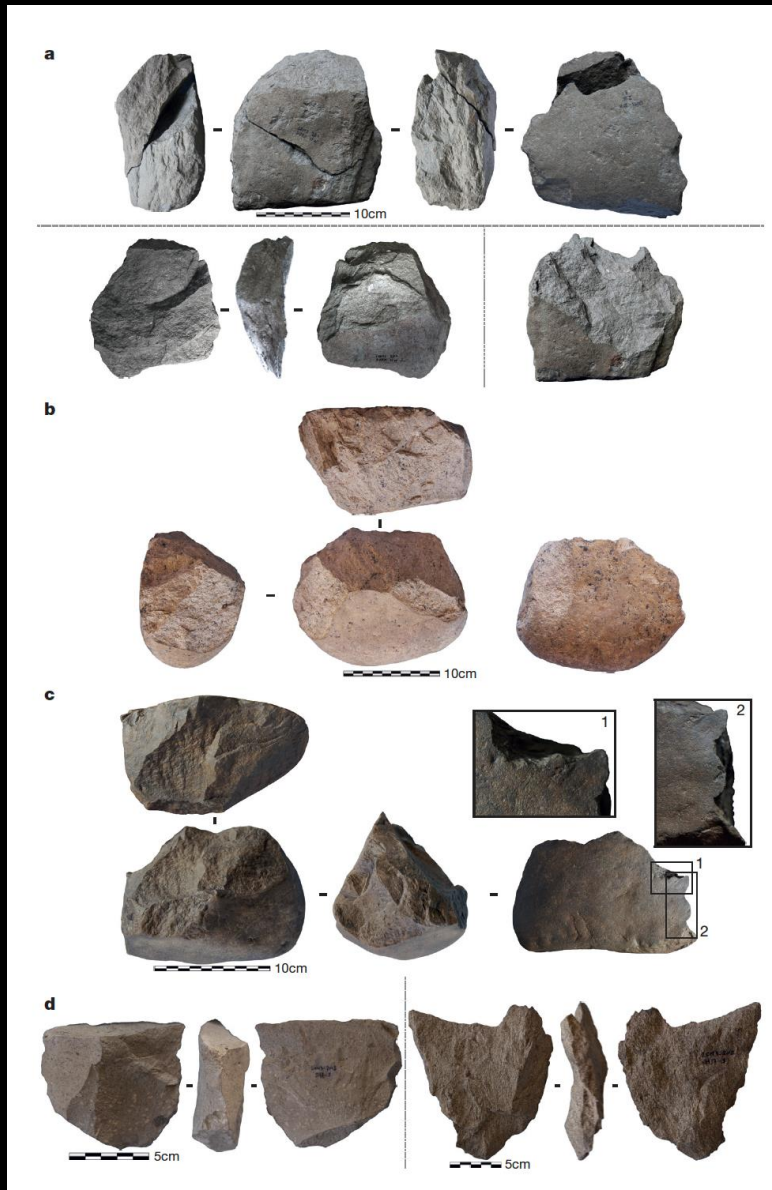


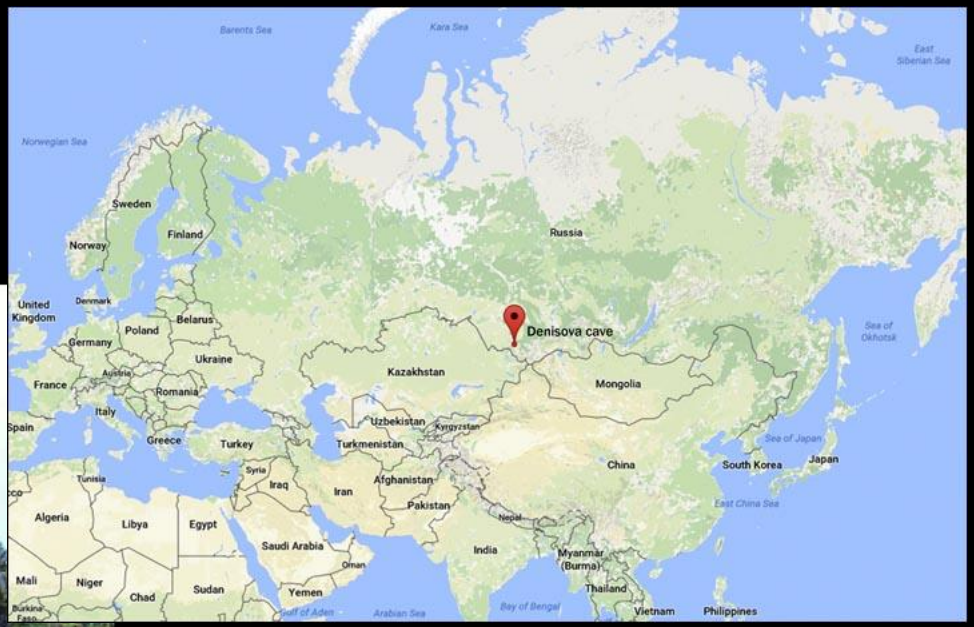
Figure 2 | Stone-tool-inflicted marks on DIK55-2, a rib of a probably size 4 or larger ungulate. a, The exterior surface of DIK-55-2, and the location of each of the surface marks. The rib is oriented such that the rib head (broken off) would be to the left. Dashed rule, 4 cm. **b**, Marks A1 and A2 (high-confidence stone-tool cut marks) under low-power optical magnification; the yellow rectangle demarcates **c**. Scale bar, 5 mm. **c**, ESEM image showing microstriations indicative of cutting with a stone tool. Scale bar, 100 μm.

Son hallazgos previos al género *Homo*

Lomkawi (3.3 MA)



Origen de nuestra especie: especies biológicas y fósiles



Denisova: Sapiens y Neandertales

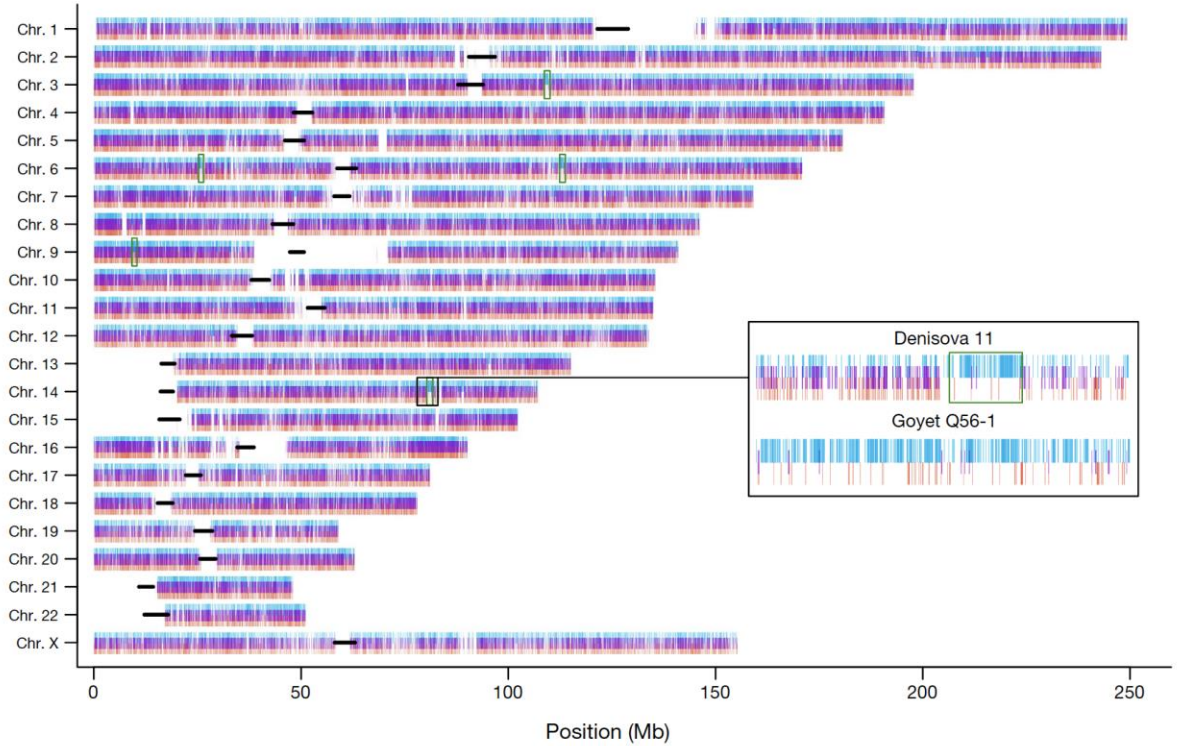


Fig. 3 | Distribution of Neanderthal-like and Denisovan-like alleles across the Denisova 11 genome. Positions for which one randomly drawn DNA fragment matches the Neanderthal genome and another matches the Denisovan genome are marked in purple. Positions are marked in blue if both DNA fragments match the Neanderthal genome and in red if both match the Denisovan genome. Black lines indicate centromeres. The inset shows one region out of five (green boxes) for which both chromosomes carry predominantly Neanderthal-like alleles. For comparison, the distribution of alleles in this region is shown for a Neanderthal genome (Goyet Q56-1).

LETTER

https://doi.org/10.1038/s41586-018-0455-x

The genome of the offspring of a Neanderthal mother and a Denisovan father

Viviane Slon[1,7]*, Fabrizio Mafessoni[1,7], Benjamin Vernot[1,7], Cesare de Filippo[1], Steffi Grote[1], Bence Viola[2,3], Mateja Hajdinjak[1], Stéphane Peyrégne[1], Sarah Nagel[1], Samantha Brown[4], Katerina Douka[4,5], Tom Higham[5], Maxim B. Kozlikin[3], Michael V. Shunkov[3,6], Anatoly P. Derevianko[3], Janet Kelso[1], Matthias Meyer[1], Kay Prüfer[1] & Svante Pääbo[1]*

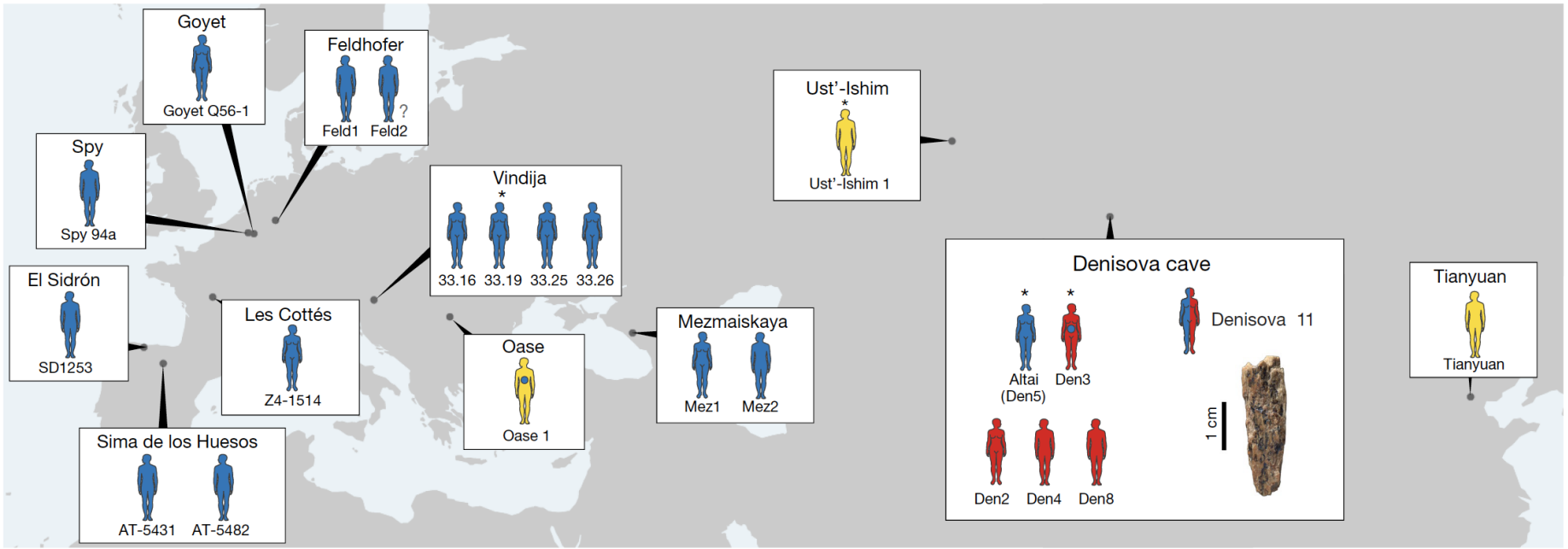
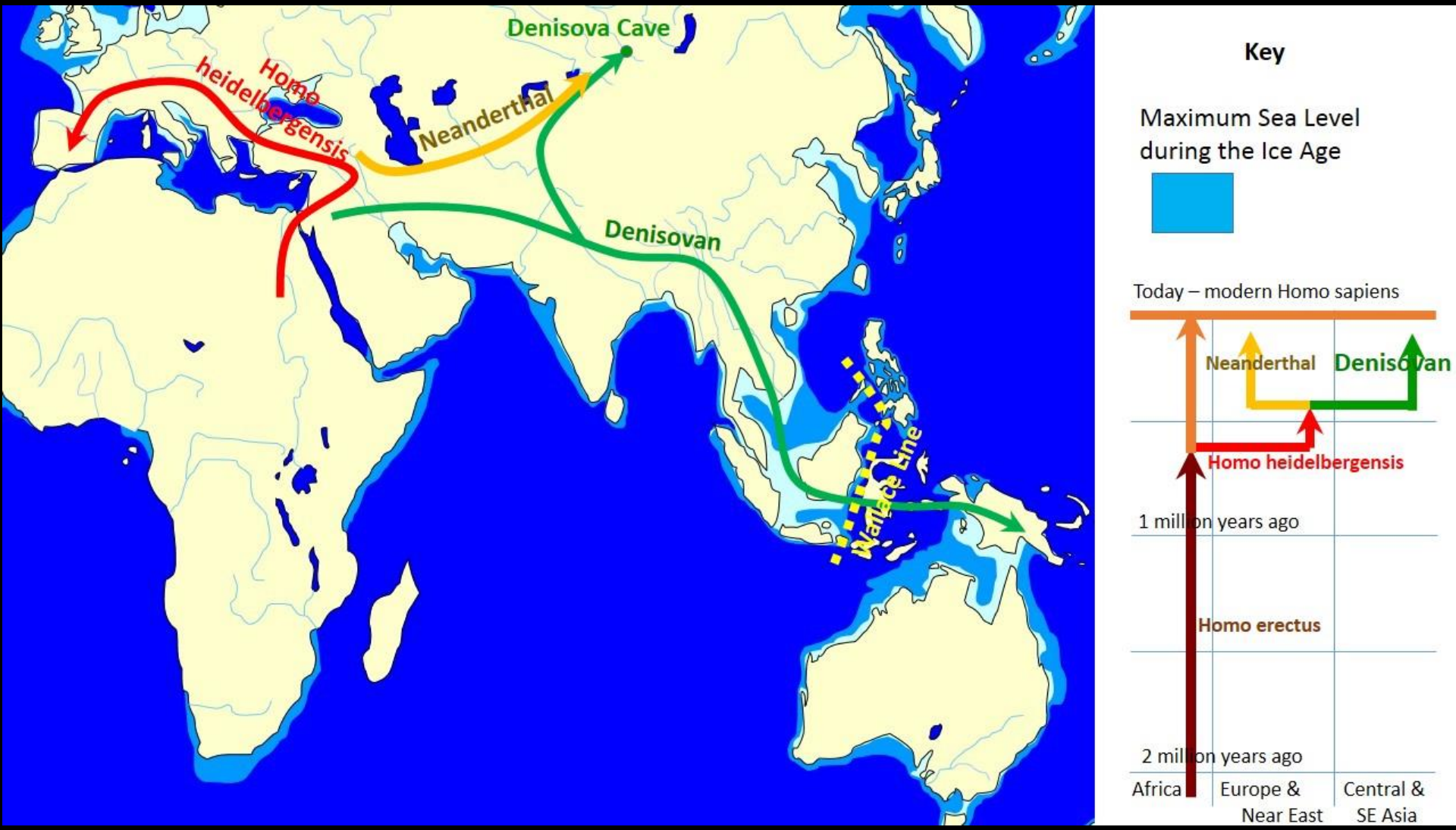
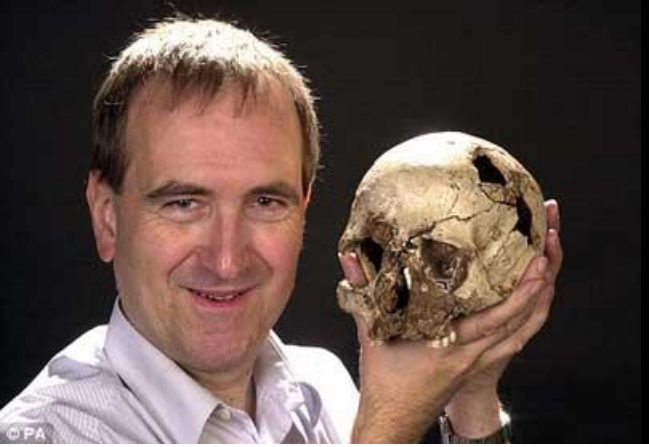


Fig. 1 | Location of Neanderthals, Denisovans and ancient modern humans dated to approximately 40 ka or earlier. Only individuals from whom sufficient nuclear DNA fragments have been recovered to enable their attribution to a hominin group are shown. Full or abbreviated names of specimens are shown near each individual. Blue, Neanderthals; red, Denisovans; yellow, ancient modern humans. Asterisks indicate that the genome was sequenced to high coverage; individuals with an unknown sex are marked with a question mark. Note that Oase 1 has recent Neanderthal ancestry (blue dot) that is higher than the amount seen in non-Africans. Denisova 3 has also been found to carry a small percentage of Neanderthal ancestry. Data were obtained from previous publications[1,2,5–8,11–13,21–24].

- Trazas genéticas en Homo sapiensa de 3 "poblaciones" modernas extintas. Cómo afecta esto la definición del Homo sapiens a nivel arqueológico?


Denisova Cave
Homo heidelbergensis
Neanderthal
Denisovan
Wallace Line
Key
Maximum Sea Level during the Ice Age
Today – modern Homo sapiens
Neanderthal
Denisovan
Homo heidelbergensis
1 million years ago
Homo erectus
2 million years ago
Africa
Europe & Near East
Central & SE Asia



Recapitulando…

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The origin and evolution of *Homo sapiens*

Chris Stringer

Department of Earth Sciences, The Natural History Museum, London SW7 5BD, UK

4. Aún evolucionamos

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

Review

The evolution of lactase persistence in Europe. A synthesis of archaeological and genetic evidence

Michela Leonardi [a], Pascale Gerbault [b], Mark G. Thomas [b,c], Joachim Burger [a,*]

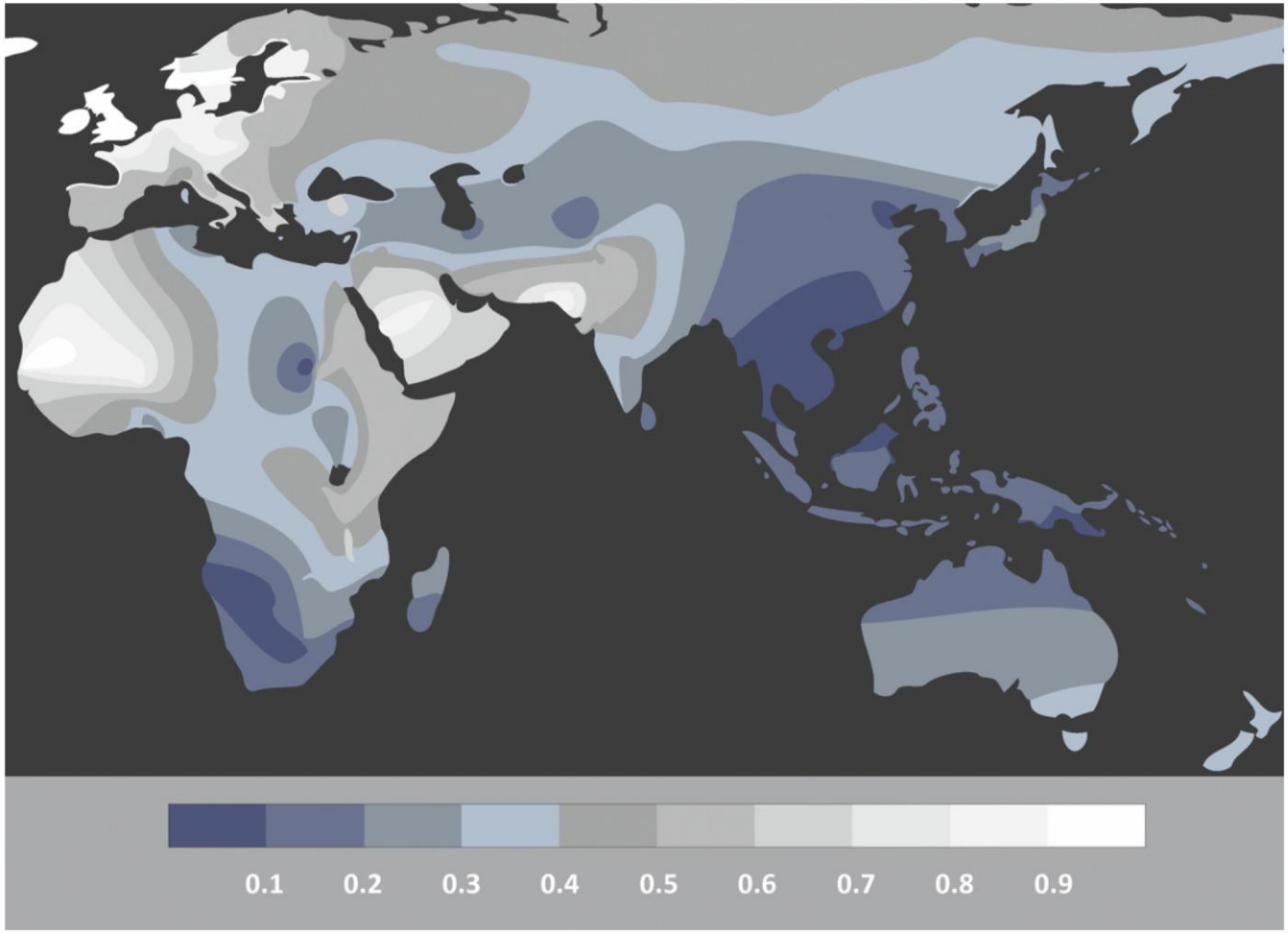

Fig. 2. Worldwide frequencies of lactase persistence phenotype (after Itan et al., 2010).

Prevalencia global de la capacidad genética de asimilación de lactasa en adultez

- **Difusión del pastoralismo y agricultura:** interacción entre genes y cultura. Se seleccionan positivamente alelos que confieren la capacidad de digerir la lactosa