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The Asian ancestry of the first hominins in Europe: the state of the art

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FIRST PARAGRAPH: In recent years, new Eurasian hominin fossils [1-4] and new molecular data have compelled us to reconsider long-standing assumptions about the first human settlement of this continent. The paleontological, archaeological and biogeographical evidence suggest repeated speciation and migration events within Eurasia [3-8]. The 1.3 Ma human mandible from Sima del Elefante (Atapuerca, Spain), provisionally assigned to *H. antecessor* species, is currently the oldest hominin specimen from Western Europe [4]. Its detailed morphological assessment suggests that the first settlement of Europe occurred as part of an early, Late Pliocene or early Early Pleistocene, demographic expansion out of either Africa or Southwest Asia, rather than a later one in the late Early Pleistocene [4,6]. In addition, previous dental studies have demonstrated the existence of a distinctive “Eurasian dental pattern” in Early and Middle Pleistocene hominins that differed from their African counterparts and that may suggest relatively independent evolutionary courses for the African and the Eurasian continents during the Pleistocene [6].

欧洲最早的古人类源于亚洲：最新进展

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首节: 近年来, 新发现的化石 [1-4]和新的分子生物学数据使我们不得不重新审视长期以来对欧洲最早人类起源的假设。古生物学、考古学和生物地理学的证据提示了欧亚大陆存在多次人种形成和迁徙事件[3-8]。在埃勒芬特裂谷遗址(西班牙阿塔普埃卡)发现的130万年前的下颌骨, 被暂时归属于先驱人, 是西欧迄今发现的最古老的古人类物种[4]。对它形态学方面的细节考量显示, 欧洲最早的人类定居发生于上新世晚期或者更新世早期, 是来自非洲或者西亚的较早的一次人口扩张, 而非来源于较晚的更新世晚期的一次扩张[4,6]。此外, 早先的牙齿学的研究已经证实了在更新世早中期的古人类中独特的“欧亚牙齿模式”的存在, 这种模式不同于非洲的古人类的牙齿模式, 这表明在更新世非洲和欧亚大陆经历了独立的进化路线[6]。

An updated debate about the origin of the first Europeans obliges to the incorporation of new revealing notions based on the latest paleontological and molecular studies. The evolutionary scenario of the first Eurasian settlement envisages multiple hominin dispersals and complex population interactions such as extinctions, re-colonisation and hybridization between “paleontological species”, particularly at the root of their lineages [8-12]. The persistence in time of ancient hominin lineages such as the Denisovan mt-DNA [13] or the earlier chronology proposed for the Ceprano fossil [14] (tentatively assigned to *H. antecessor* [15]) suggest, are key pieces for this debate. *H. antecessor* was initially proposed as the best candidate to represent the last common ancestor of *H. sapiens* and *H. neanderthalensis*

[16], The identification of two dental synapomorphies exclusively shared with the *H. neanderthalensis* lineage [17-18] as well its Eurasian dental signature [6] suggest that *H. antecessor* had both a Eurasian origin and (likely) Eurasian destiny. We propose that the last common ancestor of the modern human and Neanderthal lineage become fragmented into an Eurasian and an African deme when the Saharan-Arabian desert barrier closed the contacts between continents around 800 ka [7,8,19]. The African populations (possibly represented by fossils such as the Daka calvarium) evolved into the *H. sapiens* lineage, while the European populations (represented by the Gran Dolina-TD6 fossils) started their specialization towards the *H. neanderthalensis* lineage. The 825 ka gene divergence time

provided by Green et al. [12] would be consistent with this scenario.

关于最早欧洲人起源的最新争论促使了古生物学和分子生物学基础上的多种观点的结合。关于第一批欧洲人的进化假说包含了人群的多次扩散和复杂的人群交流，包括“古生物学上的物种”特别是位于系统发育树根部的群体之间的诸如灭绝、重新迁入和混血[8-12]。关于古人类在时间上延续，比如丹尼索瓦人的线粒体DNA[13]或者早期的切普拉诺化石[14](暂时归类为先驱人[15])，是这个争论的关键。先驱人最初被认为是智人和尼安德特人的最有可能的共同祖先[16]，独有的与尼人共享的两个牙齿性状[17-18]以及他的欧亚牙齿特征[6]揭示了先驱人的欧亚起源和特征。我们推测，在80万年前当撒哈拉-阿拉伯沙漠阻断了两个大洲之间的联系的时候[7,8,19]，现代人和尼人的最近共同祖先分化成欧亚类群和非洲类群。非洲类群进化成了智人，而欧洲类群开始了他们向尼人进化的历程。格林[12]等算出的基因分离时间为82.5万年，符合这个假说。

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