Appendice IV

OBSERVATIONS ON THE FAUNA FROM TERRA AMATA

Jan VAN DER MADE

Chapter 13 of this monograph « *Les faunes de grands mammifères des formations du Pléistocène moyen du site acheuléen de Terra Amata* » by P. Valensi *et al.* is a very complete description and interpretation of the fauna of this important locality, treating such diverse aspects as morphology, taxonomy, biostratigraphy, taphonomy and zooarchology. The paper is very complete and where I can judge, I agree with the conclusions reached. Therefore I chose to center on a particular aspect of the material, which I believe to be of particular interest.

Figure 1 gives the temporal distribution of the species present in Terra Amata and of related species or subspecies in western Europe, and for the ungulates it is based on own observations and interpretations. The first record of *Ursus arctos* seems to be from about 400 ka or slightly earlier, eg. the *U.* cf. *arctos* from Atapuerca TD10a (formerly TD11; García et Arsuaga, 2001), whereas the earlier history of the species is less clear. For the earliest record of *Elephas (Palaeoloxodon) antiquus* there seem to be different opinions: around 900 ka (Mazo, 1989; Guérin, 1996; Sardella *et al.*, 1997) or around 500/600 ka (Lister, pers. comm.). The taxa are arranged in order of first appearance.

Some of the taxa are abundant in Terra Amata, while others are rare. The rare species tend to be more difficult to recognize, especially if the more diagnostic elements are not present. In terms of number of specimens, the rarer species of Terra Amata are *Dama clactoniana* (or *Dama dama clactoniana*), *Ursus arctos*, and *Stephanorhinus hemitoechus*. *Dama* is represented by just one upper molar, its morphology clearly indicates this genus, but the evolutionary level is more difficult to asses. (Reasoning backwards after knowing the age of the locality, an assignation to the Clacton fallow deer seems correct.) The bear is represented by more specimens, but the authors are confident that it is a brown bear. The material of the rhinoceros does not leave the slightest doubt as to its identity. In several cases, subspecific classification is discussed. The discussion on *Sus scrofa* shows that at present subspecific classifications of fossil material of that species are not sufficiently argued. The red deer is the second most abundant species in terms of number of specimens. As discussed by [illegible] authors, a great number of subspecies are recognized. [illegible] subspecies tend to be based on morphological differences [illegible] the antlers, while not always attention was paid to the [illegible] bility that is to be expected within populations. The material from Terra Amata contributes to our understanding [illegible] evolution of this species and may help to clarify subspecific classification.

It is widely accepted that the earliest *Cervus elaphus* [illegible] acoronate; it had antlers without a crown. A crown seems [illegible] have evolved in the European populations between 500 [illegible] 400 ka (while the east Asian and American populations still [illegible] not have a crown). Mosbach is the type locality of *Cervus elaphus acoronatus* and the preserved antlers do not have a crown. Mauer is the type locality of *Cervus elaphus* [illegible] and some, but not all antlers show an increased complexity in the distal part, but not a well developed crown. The ages of these two localities are discussed: the ages are generally accepted to be around 500-600 ka, but opinions differ in which Mauer is a climatic cycle older than Mosbach, or the other around. Perhaps, both localities are around 500 ka. In the M1718 on display at the university of Heidelberg, the [illegible] antler could be considered to be coronate, while the left has a tine less and could be considered as coronate. Perhaps this is the period when crowns appear and the character is very variable and *C. e. priscus* should be considered a junior synonym of *C. e. acoronatus*. Well developed crowns are known from Bilzingsleben (around 400 ka).

In addition to the acquisition of a crown, the evolution of *Cervus elaphus* in Western Europe is characterized by size changes. This is shown by the changes in the size of the [illegible] lobe of the M_3 (figure 2): from about 900 to 600 ka the species is large, from about 500 to 300 ka the species is small, from about 240 to 100 ka the species is large again, from about 100 to 30 ka it is small and during the last glacial maximum it was large and at present it is small, smaller than in the period 300 to 300 ka. Large size is not demonstrated for isotope stage [illegible] figure 2, but Lister *et al.* (2010) described a sequence of [illegible]

a. CSIC, Museo Nacional de Ciencias Naturales, C. José Gutiérrez Abascal 2, 28006 Madrid, Spain.

localities with increasing age in the order : Boxgrove, Westbury sub Mendib, West Runton and Pakefield. According to these authors, *Cervus elaphus* is small in the first and large in the other three localities. Westbury probably is to be correlated to stage 15. The combination of morphology and size gives the correct stages indicated in Figure 1. Many subspecific names are available and in some cases these names are applied in Figure 1, but this does not imply that each one of the stages is recognizable by a unique set of features.

As indicated by the first lobe of the M_3, the fallow deer from Arago is large and the red deer is small (Van der Made, 2010, figs. 1-2). A comparison of the astragalus from Terra Amata with those of the fallow deer and small red deer from Arago shows size corroborates the assignation of the specimen to *Cervus elaphus* (figure 3). In addition to M_3 size, figure 2 includes also the length of the astragalus and this allows to compare the red deer of Terra Amata to the sequence of size change as documented earlier : it is a small form. Valensi *et al.* described the crown of an antler. This combination of size and morphology occurs in a period of about 400 to 300 ka. The fauna from Terra Amata suggests interglacial conditions, pointing to isotope stages 9 and 11.

Even though a fair number of taxa existed at that time, West European large mammals faunas tend to be dominated by few species, limiting the possibilities for biochronology. From Figure 1 it appears, that it is unlikely that a more precise age estimate can be obtained from the large mammals than stage 9 or 11. This coincides exactly with the conclusions of Valensi *et al.* Dating and geological work led to the correlation of Terra Amata to stage 11, which is more precise than the biochronological interpretations, but in any case confirming these. Terra Amata is thus one of the few early localities with a complete antler, increasing thus the reliability with which the *Cervus elaphus* evolution is documented.

As mentioned above most taxa are adapted to temperate conditions, which probably implies interglacial conditions and chronology as inferred by the authors. Again most of the taxa are adapted to more or less closed or humid environment, but some are adapted to more open environment. The tahr reflects the vicinity of rocky or mountainous environments.

Terra Amata is an important locality for the study of the cultural level or abilities of early humans. Like Bilzingsleben and Schöningen it is correlated to isotope stage 11 and it is but slightly younger than the also spectacular record at Arago soil G. In addition to this it has its importance as a palaeontological locality adding to our knowledge of the evolution of the ungulates.

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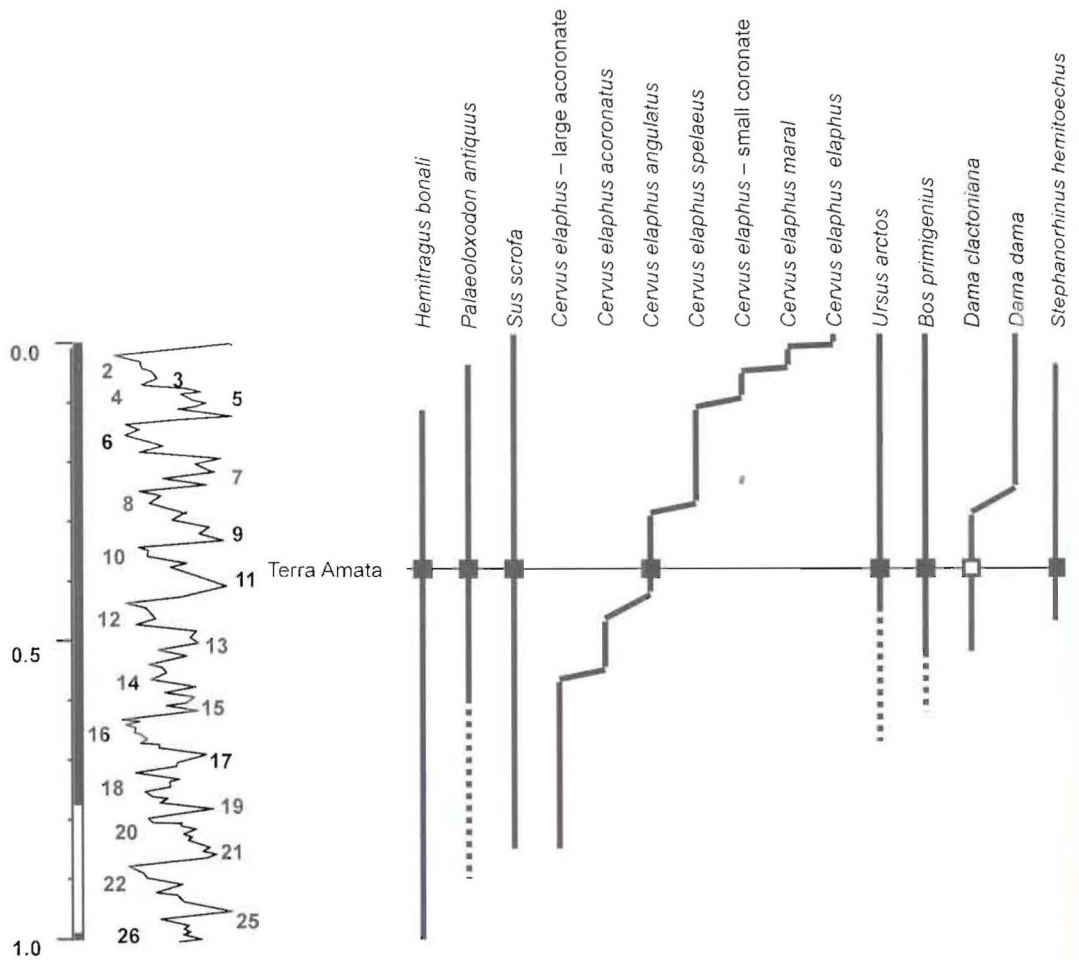

Figure 1: *The temporal ranges of the species described from Terra Amata and of related species or subspecies.*

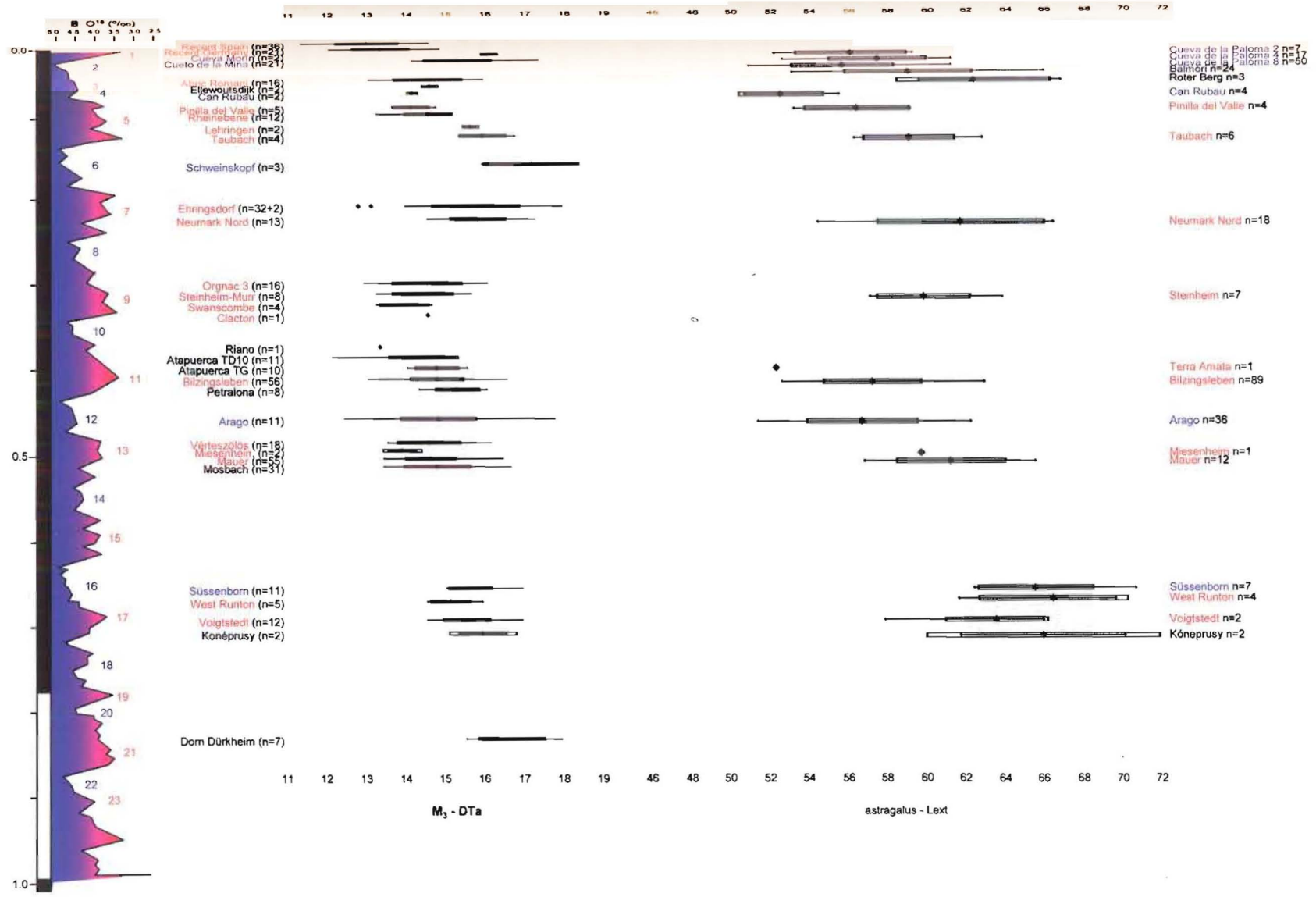

Figure 2: *Variation of size through time in* Cervus elaphus. *On the left of the figure the age in millions of years, the palaeomagnetic scale and oxygen isotope values as an indication of temperature. In the centre the samples, sample size and minimum, maximum, average and standard deviation of the width of the first lobe of the third lower molar in mm (from Van der Made, 2010). On the right, the same values for the lateral length of the astragalus. Provenance of data on the astragalus as for the M_3; in addition: Cueva de la Paloma and Balmori (Museo Nadcional de Ciencias Naturales) and Roter Berg (Museum für Naturkunde Berlin).*

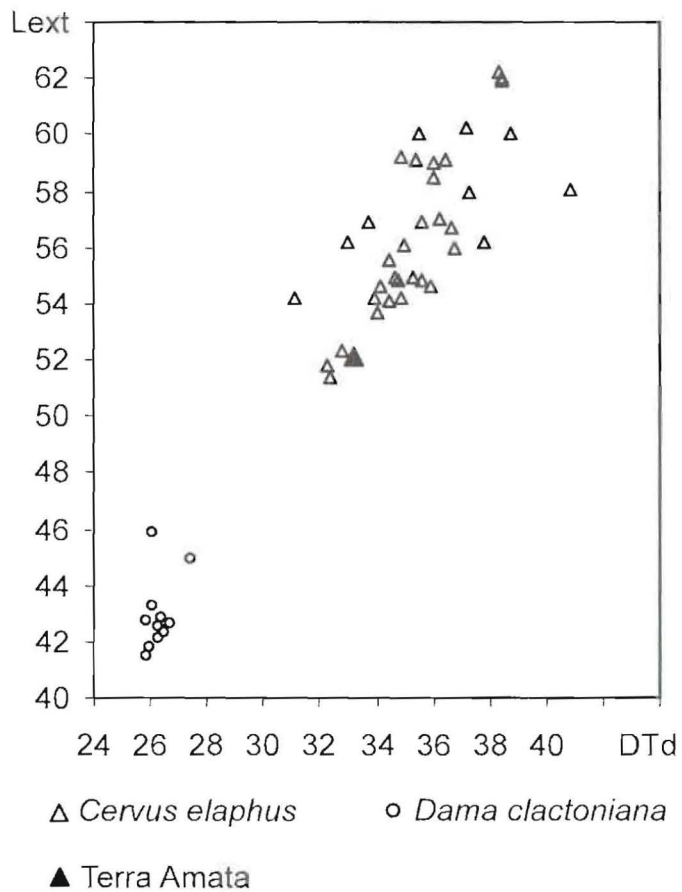

Figure 3: *The size of the astragalus of* Cervus elaphus *from Terra Amata compared with the sizes of the astragali of* Dama *and* Cervus *from Arago (specimens kept in Tautavel). Lext = lateral length, DTd = distal width.*

Terra Amata

Nice, Alpes-Maritimes, France

TOME II

Palynologie - Anthracologie - Faunes - Mollusques
Paléoenvironnements - Paléoanthropologie

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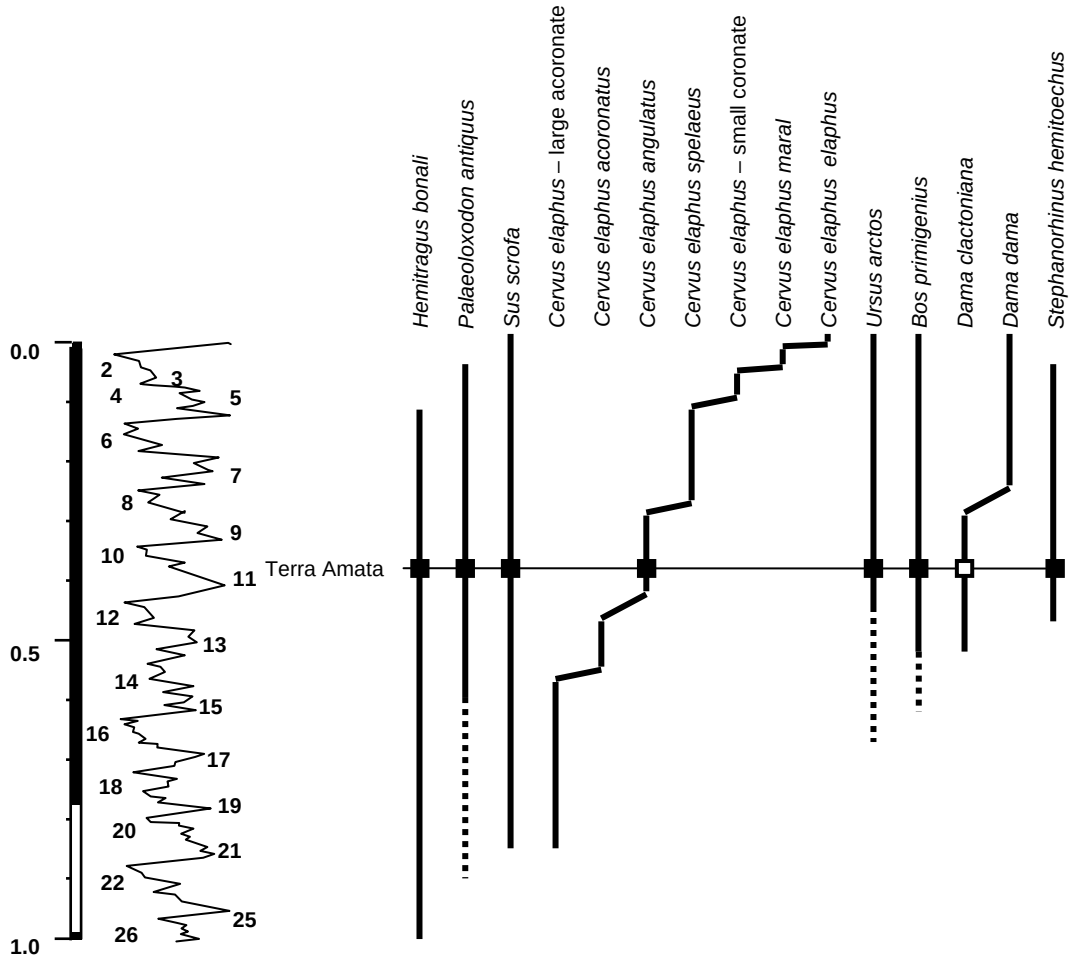

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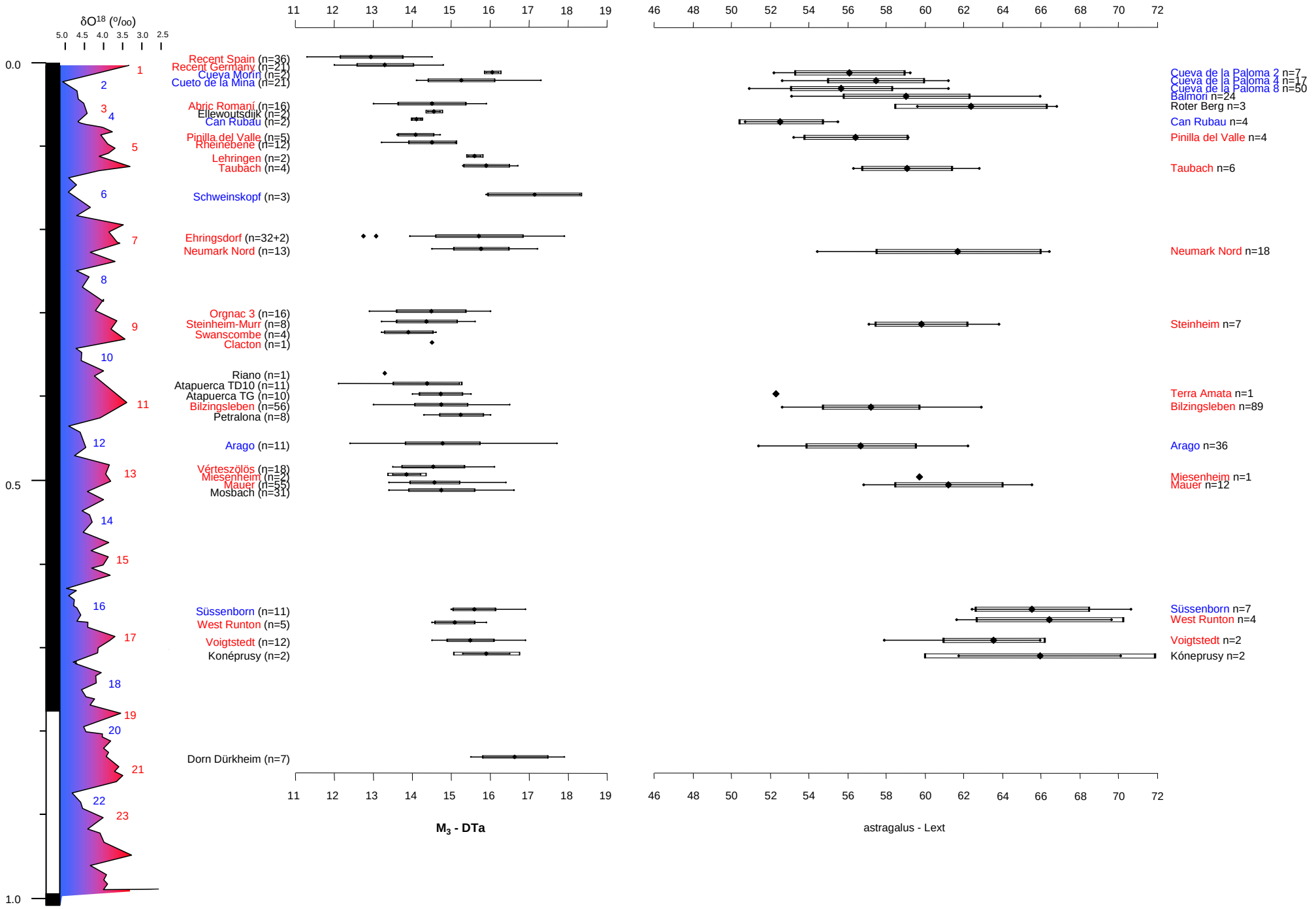
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0.0
0.5
1.0
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11 12 13 14 15 16 17 18 19
46 48 50 52 54 56 58 60 62 64 66 68 70 72
Recent Spain (n=36)
Recent Germany (n=21)
Cueva Morín (n=2)
Cueto de la Mina (n=21)
Abric Romaní (n=16)
Ellewoutsdijk (n=2)
Can Rubau (n=2)
Pinilla del Valle (n=5)
Rheinebene (n=12)
Lehringen (n=2)
Taubach (n=4)
Schweinskopf (n=3)
Ehringsdorf (n=32+2)
Neumark Nord (n=13)
Orgnac 3 (n=16)
Steinheim-Murr (n=8)
Swanscombe (n=4)
Clacton (n=1)
Riano (n=1)
Atapuerca TD10 (n=11)
Atapuerca TG (n=10)
Bilzingsleben (n=56)
Petralona (n=8)
Arago (n=11)
Vértesszölös (n=18)
Miesenheim (n=2)
Mauer (n=55)
Mosbach (n=31)
Süssenborn (n=11)
West Runton (n=5)
Voigtstedt (n=12)
Konéprusy (n=2)
Dorn Dürkheim (n=7)
Cueva de la Paloma 2 n=7
Cueva de la Paloma 4 n=17
Cueva de la Paloma 8 n=50
Balmori n=24
Roter Berg n=3
Can Rubau n=4
Pinilla del Valle n=4
Taubach n=6
Neumark Nord n=18
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Terra Amata n=1
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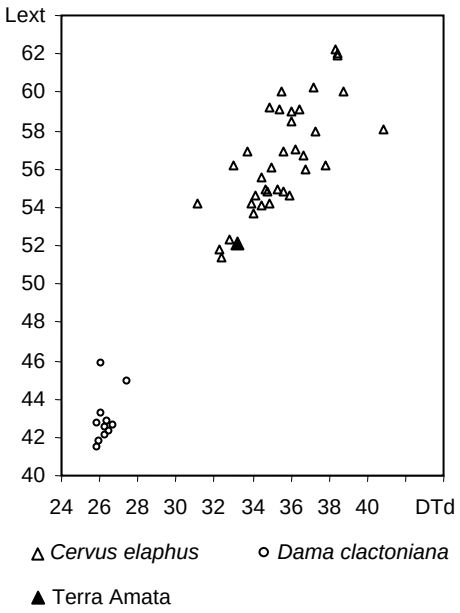

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