# Arboriculture and Beekeeping in ancient North Africa in literary, epigraphic and visual sources

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## Abstract

This study examines the longstanding traditions of arboriculture (olive and winegrowing) and beekeeping in Algeria, highlighting their positive impact on population longevity through the antioxidant polyphenols found in virgin olive oil, red wine, spelt, honey and garlic. The analysis draws on the works of the Punic agronomist Mago (3rd century BCE), as well as numerous Roman authors who followed him, and is supported by evidence from realistic iconography and Libyan and Latin epigraphy.

**Keywords**: Numidians, lifestyle, olive and vine growing, beekeeping, longevity

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## 1. Introduction

Many wealthy North African landlords, eager to flaunt their prosperity, depicted the numerous activities carried out in their productive estates in mosaics that reflect everyday realities in remarkable detail, with a high degree of realism (Dunbabin 1978 : 109-123). This form of self-representation was intended to command respect from visitors, *clientes* and personnel.

Numerous agronomic texts help us interpret these images of agricultural activities. These include works by the Carthaginian Mago (III c. BC), an inexorable source for later authors such as Cato (II c. BCE), Varro (I c. BCE), Pliny the Elder (I c. CE) and Columella. The latter, originally from Gades (modern Cádiz), and active at Rome in the I c. CE, occasionally refers to agricultural practices overseas. Finally, Palladius writing in the IV c. CE, owned estates in Italy and Sardinia - an island with notable similarities to North Africa. A Byzantine compilation *Geoponica* of earlier texts about agriculture and farming was created in Constantinople between the VI and IX centuries.

After Rome conquered Carthage in 146 BCE at the end of the Third Punic War, the Senate ordered that Mago's agronomic treatise be saved from the city's total destruction and brought to Rome ( Pliny *NH* 18.22-23). The work documented Carthaginian practices and likely incorporated indigenous Berber agricultural traditions. Although Mago's treatise has not survived, it is partially preserved through 66 quotations in Roman agronomists and through condensed Greek translations by Cassius Dionysius and Diophanes (Speranza 1974). These were

later used by Cassianus Bassus Scholasticus in compiling the *Geoponica*.

Algeria preserves some of the most realistic visual evidence of agricultural activity from approximately seventeen centuries ago.



Figure 1. Caesarea in Mauretania, modern Cherchell, Maison des Travaux Champêtres, mosaic discovered 1925. Musée National Public de Cherchell. It depicts scenes of ploughing and sowing in an olive yard, and of shoring and weeding in a vineyard. Photo D-DAI-ROM-2016.1379

The fame of wine nursey of Mauretania Caesariensis (present-day northwestern Algeria) is mentioned only by Strabo 17.3.4, and is highlighted in a series of floor mosaics. The most outstanding example, discovered in 1925 (Bérard 1935, Ferdi 2005 : 113-117), is arranged in four registers (each approximately 3 m wide and 1.05-1.35 m) wide (Fig. 1). It was found in a reception room of a wealthy house at Caesarea in Mauretania (modern Cherchell), and dates to between the mid and final 3rd c. CE. It depicts the ploughing of an olive grove and two methods of vine cultivation: high-trained vines, considered more expensive, and low-trained vines, which are more economical. The labourers on the mosaic are likely slaves rather than *coloni*, as they are shown working under the supervision of an overseer (*vilicus*) represented in the fourth register. The material evidence

of slaves in North Africa is scarce, the literary evidence of Apuleius, the Life of Melania the Younger and Augustinus is discussed by Lenski 2017.

Register 1: In October, within an olive grove where the olives have turned purple and are fully ripe yet still on the trees, an *arator* leans his full weight on the handle of his plough drown by two oxen, being driven forward with a whip by a slave at the left. He faces left, while his counterpart in the next register faces right, illustrating the boustrophedon pattern - alternating directions from left to right and then right to left, like an ox ploughing a field.

Register 2: "It is also a certain art to sow evenly: the movement of the hand must match the step, always beginning with the right foot" : *Artis quoque cuiusdam est aequaliter spargere. Manus utique congruere debet cum gradu semperque cum dextro pede.* (Pliny *NH* 18.197). The mosaic strikingly illustrates Pliny's prescription for optimal sowing. The *sator* scatters seeds evenly from his raised right hand, while his left-hand rests on the *corbula* [...] *satoria* (Columella 12.52.8: here is suppressed the too voluminous *trimodia*: 3 modii = 26.25 l.) suspended from his neck. He precedes the labourer who is ploughing the field for a second time. As Cato *Agr.* 61.1 famously states: "What follows good ploughing? Ploughing again : *Bene arare, quid secundum? Arare"* : considered "Cato's oracle" : *oraculum Catonis* by Pliny *NH* 18.174, in the chapter on the proper upkeep of an olive yard, and in Varro's words: "after the seed has been sown, the oxen cover the grain in an olive yard" :

*iacto semine, boves... satum frumentum operiunt*: Varro *R.* 1.29.2. The setting is once again an olive grove, illustrating the characteristic North African practice of integrated farming, in which cereals or vines were cultivated beneath olive trees. In such systems, the agronomists recommended a wider spacing between the trees: 60 x 40 feet, instead of 25 feet : *Spatium intermedium esse debet pingui et frumentario solo sexagenum pedum in alteram partem, atque in alteram quadragenum* (Columella 5.9.7; Palladius 18). This arrangement allowed crops and vines to benefit from the shade of the trees, which also helped to reduce soil evaporation. Mixed farming of vines and olive trees is depicted one two mosaics of Thabraca (Fig. 2-3).

Register 3: The scene unfolds among vines trained on a trellis (*pergula*), a system typically used for table grapes: *In pergulis vero seruntur escariae appellatae* : "the so-called table-grapes are grown on trellis" (Pliny *NH* 14.4.42), as the *uvae Libycae* mentioned by Columella 3.2. *Uvae Libycae* owe their name to the region (Isid. *Orig*. 17.15 and 17), in the broader sense of Northern Africa. Cf. Pausanias 1.33.5 : "the Libyans, who do not till at all the soil, live on wild vines" : ἀπὸ δὲ ἀμπέλων ζῶντες ἀγρίων. The problem of the excessive costs of a vineyard compared to the income that can be generated from it, is discussed between Scrofa and Varro and later more thoroughly by Columella, because of the *instrumentum* of the wooden support of stakes (*pali*) or trees (*arbusta*), to which the vines were "married". The problem is resolved in North Africa, where the support consists of reeds (*harundines*). They abound along the

many wadi (de Vos 2019 : 41-42, Fig. 1.34, 1.35 : *phragmites*) in the hilly and mountainous landscape and on the mosaic, they are carefully tied together in a horizontal framework (*transversae perticae* : Columella 4.12.1). Bundles of three vertical reeds sustain the horizontal trellis, they serve as support for the vine trunks circling them. Already some four centuries earlier, to the North of the central Mediterranean, the context of reeds along the rivers, their cutting and use for fettering the vines are highlighted by Virgil *G* 2.414-415 *ripis fluvialis harundo / caeditur*, and 2.416 *Iam vinctae vites*. Virgil considers work on the vines never enough (G 2.397-398) : *labor curandis vitibus..., / numquam exhausti satis est.*

Three slaves are shown digging a shallow depression (*lacus* or lake, hence the technical term *ablaqueatio*) around the base of the leafless vines using a two-pronged pick (*bidens*). Varro *R* 1.29 indicates the period for this activity and verbalizes it the most precisely: *inter favonium et aequinoctium vernum... circum, uites ablacuari, radices, quae in sit umma terra sunt praecidi :* "from the time the west wind begins to blow (early spring) to the vernal equinox (March 21), the vines are trenched and outcropping roots removed". This process aerates the soil and allows moisture and fertilizer to the roots (Columella 2.14.3; Pliny NH 17.140; Palladius 2.1). The application of fertilizer is called *stercoratio*. This involves adding pigeon dung, human urine or other types of dung, burying it near the vine and spreading goat dung around each mature olive tree (Columella 4.8.3; 11.2.86). Human urine was collected in numerous coarse

ware chamber pots discovered in many rural sites in the Thugga survey. A kiln for their production has recently been excavated in Utica (Ben Jerbania *et al.* 2015 : 25, 32), while their contents have been analysed in a jar found at Gerace, in Sicily (Rabinow *et al.* 2022). Latrines are in fact rare in North Africa. The twelve *latrinae* in Tunisia published by Guizani 2018 are all in residential city houses. Chamber pots were used in conjunction with special seats, such as the *sella pertusa* mentioned by Cato (*Agr.* 157.11) and the two λασανῖται δίφροι (chamber-pot seats) recorded in an Egyptian house lease agreement of 13 BCE at Abusir el-Meleq near Medinet el-Fayum (BGU 4.1116.25). Cato *Agr.* 10.2, 11.3 recommended including a chamber pot (*matella*) among the essential containers of both olive groves and vineyards. Human and bovine urine was collected and aged for antiseptic use in veterinary medicine, even by beekeepers (Varro R 3.16.22, Columella 9.13.6).

Register 4: presents the alternative and more economic method of low, spiralling vines "without support, on its own strength" : *sine adminiculo suis viribus* (Columella 5.1-15). The branches of three vines, covered with large buds swollen with sap, indicate an early spring setting. Two slaves are hoeing the ground beneath the vines, "urged on by the exhortations of the bearded overseer" with a furrowed brow: *variisque exhortationibus in opere ipso exhilaret laborantes* (Columella 11.17). This figure represents probably the *vilicus* (estate manager), a slave between 35 and 65 years of age, *media aetas huic officio est aptissima* (Columella 11.3, cf. 8.1.3) who had the trust of the owner and

who therefore was responsible for supervising the *villa rustica*. The *vilicus* did his best with the prospect of liberation as a slave as a reward for his commitment. It could also be the *monitor*, the foreman of a gang of not more than ten labourers (Columella 1.9.4). In the period the mosaic was created the *vilicus* was also referred to as *actor* (de Vos, Porena 2020). In two long chapters Columella (1.8 and 11.1) sketched the characteristics and commands of the *vilicus*. He was expected to possess thorough knowledge of agricultural practices (*disciplina ruris*) and of commanding others, such as digging. ploughing (*ut fodiendi arandique*) and choosing the right people for certain types of work (*scire et existimare, quale officium et qualis labor sit cuique iniungendus*). The two ploughmen, bent over their plough in the two upper registers, recall Virgil's *curvus arator* (*Ecl.* 3.42) and Pliny's *vi omni arato* (*NH* 18.49.176). The other workers are also in stooped postures, expending their full strength on their tools. Only the older, bearded overseer stands upright, shown frontally and leaning on a staff. The slaves, rendered in three-quarter view, wear short, wrinkled, long-sleeved tunics; with unkempt hair and legs spread, their bodies are bent forward at roughly a 45-degree angle. Indeed, Sallust's characterizations of Africans as *patiens laborum* 'enduring hard work' (*Jug.*17), in particular *volgus*, [...] *et maxime Numidarum*, [...] *quieti et otio adversum*, "Numidian people was against rest and leisure" come to mind (*Jug.* 66.2, Dauge 1981 : 628). These observations are based on Sallust's personal experience made during his proconsulship of Africa Nova from 46 to early 45 BCE. For Oniga 1995 : 38-41, they

arise from an ethnographic *topos* in the Hippocratic tradition, started in the 4th c. BCE, but for Dauge 1981 : 111, Sallust added truth with rare fairness to the "barbarologie historique".

The plough appears to be drawn by uncastrated oxen, as was customary in Algeria until relatively recent times, where similar plough types remained in use (Bérard 1935 : 135). Evidently, the landowner sought to enhance his prestige by staging a detailed and idealized spectacle of his well-managed estate, attended by well-dressed -indeed, perhaps deliberately overdressed - slaves. They are wearing short tunics -provided with two vertical stripes (*clavi*) and small medallions (*orbiculi*) on the long sleeves-, white felt socks (*udones*) and rustic shoes made of a single piece of untanned bovine hide (*carbatinae*, Bérard 1935 : 111-112) fastened with laces crossed around the legs up to the knees. In reality, however, such garments were likely worn and soiled, if perhaps not to the extreme as those of the mill slaves described by Apuleius of Madauros (near modern M'Daourouch) *cuncti tamen sic tunicati ut essent per pannulos manifesti, frontes litterati et capillum semirasi et pedes anulati* : "they wore such worn tunics that their bodies were visible through the rags, their foreheads were branded, their hair half shaved, and their feet in chains". (Apuleius *Met.* 9.12). This is the only written source on the living conditions of slaves in ancient North Africa. Normally slaves were dressed in *centones*, patchwork garments made from the least worn parts of men's clothing (Cato *Agr.* 10.6, and 59, Columella 1.8.9), by *centonarii*, organized in *collegia* all over the Empire, also at Zaghouan, near

Carthage (*CIL* 8.10523 and 12424). However, Cato *Agr.* 59 prescribes also a new tunic for slaves *tunicam p(edes) IIIs* : of 3½ feet, every two years, first taking the old one back to make *centoni*. The owner could concede a special dress to the slave who accompanied him on journeys or served at table: *cum sequeretur eum sive cenanti ministravit* (*Dig.* 15.1.25), and this may be well reflected in Cherchell's mosaics.





Figures 2-3. Thabraca, modern Tabarka, Henchir Godmet, Musée du Bardo, Tunis. Two mosaics depicting mixed cultivation of *vites characatae* alternating with olive trees. Fig. 3 Bottom right: skep. Photo de Vos

Spiralling vines, described by Columella as *vites characatae*, that is, vines supported by canes from the Greek χά□□ξ, "stake ledge planted in the ground" appear in mosaics from coastal Africa Proconsularis, at Thabraca (Fig. 2-3) and Utica. Columella 5.4.1 notes that he had personally observed this method: *quas ipse incognivi*; *ligatis in orbiculos gyrosque*. Cf. Palladius 3.11 : "several canes placed around the vine and the branches are tied to the canes, so it is trained in a series of circles."

The Maison de la Mosaïque Bachique. excavated in 1920, shows three figures dressed in panther skins (*pardalides*) treading

grapes beneath a pergola (*uvae calcantur* : Varro *R.* 1.54) within the *cella vinaria* (Palladius 1.18), with red wine flowing down from two lion spouts into two large storage jars (*dolia*) (Fig. 4).

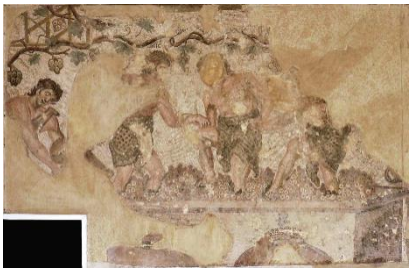


Figure 4. Caesarea, modern Cherchell, Maison de la Mosaïque Bachique, mosaic with grape treading scene. Musée National Public de Cherchell. Photo D-DAI-ROM-2016.1368

Around the middle of the I c. CE, Pomponius Mela of Baetica observes (*Chor.* 1.41-42) that the common indigenous people who lives in *mapalia* in the countryside "is clad in skins of wild beasts and of cattle" : *vulgus bestiarum et pecudum vellibus.*

A mosaic discovered in 1958 at the so-called 'Tennis Club' site at Cherchell, dating back to the 4th or early 5th century CE, shows a striking design that mirrors the *compluvium* of a pergola of carefully pairwise tied reeds: horizontal yokes (*iuga*) supported by four vertical stakes (*pedamenta*) at the corners, represented *sotto in su* (from a perspective looking upward) (Fig. 5). This constitutes a very original adaptation of a well-established principle in Roman floor mosaics, whereby the pavement reflects the articulation of the ceiling, as in coffered designs, so-called *lacunari* (Morricone Matini 1965). On three sides, the *compluvium* is encircled by grape harvesters with a vineyard scythe (*vinitoria falx*: Columella 4.25.1) in their hand. They are dressed in tunics adorned with stripes (*clavi*) and roundels

(*orbiculi*). This *vitis compluviata* system was known to yield a greater quantity of wine than the other cultivation methods (Varro 1.8.2, Pliny *HN* 14.13 and 17.164-6). It derives its name from the *compluvium* roof in the *atrium* houses. On the fourth side, red wine flows down from the treading basin through a hollowed-out lion's mouth (Fig. 8). The inscription to the left of the lion's head PVP likely refers to the beginning of the landowner's name, for example Pupius, Pupinus, attested at Carthage, Sicca Veneria and Lambaesis, or Pupianus, members of the Pullaieni family, attested near Thugga and in Thugga city (Pupi: CIL 8.24623 and CIL 8.12806, Carthago, CIL 8.16168 Sicca Veneria; Pupinus, CIL 8.3871 Lambaesis; Pupianus CIL 8.26414: de Vos, Attoui 2013, 79; Khanoussi, Maurin 2002, 695, n. 643.).



Figure 5. Caesarea, modern Cherchell, 'Tennis Club' site, mosaic depicting grape harvesting under a pergola. Musée National Public de Cherchell. Photo D-DAI-ROM-2016.1145

With a long handle a slave is stirring the must in a large globular earthenware vessel (*dolium*) (Fig. 7). A less convincing interpretation sustains that he is lining and waterproofing the interior with pitch; in that case the vessel had to lay on its flank (*in latus depositum*) as Columella 12.18 prescribes and as depicted in the calendar mosaic of Saint-Romain-en-Gal (Lafaye 1892, 343. Balmelle, Brun 2005 : 902-903). The pitched vessels,

*dolia picata*, had to storage wine, oil and other food (Cato *Agr*. 25, Columella 12.18; Bonifay 2021). Conifers, which secrete pitch, are widespread across the high mountain range of North Africa: Rif, Atlas, and Aurès. A lizard climbs a vine trunk (Fig. 8) while numerous birds perch on the pergola, pecking at the ripened grapes and enhancing the vivid reality of the vintage scene. Birds begin to arrive even before the fruit have fully matured, consistently damaging the crop.





a



Fig. 6-8. Details of the previous image: 6. red wine flowing down from a treading basin; 7. slave stirring of the must; 8. a lizard climbing up a vine trunk. Photo D-DAI-ROM-2016.1152_A

Atop a tree, a raven (*corvus corax*) feeds on a cracked ripe red fig. Figs typically ripen between late summer and early autumn. Nearby, a thrush (*turdus*) perched on a vine leaf and a quail standing on the yoke peck at a grape berry. A pigeon at the edge of the pergola looks back towards a cluster of grapes. The hand grasping the yoke at the opposite edge, near the pigeon approaching the grapes (Fig. 5), belongs to a partially lost figure

seeking support while treading the grapes (Fig. 8). The largest bunch of grapes hanging from the centre of the pergola centre is approached by another pigeon. These pigeons evidently are not fattened in a dovecote, as recommends Columella (8.8.1-7) and as depicted in the mosaic of Thabraca (Fig. 2).

The exceptional craftmanship of these and other North African mosaics explains why African mosaicists were in demand throughout the Mediterranean world (Dunbabin 1978: 115, fig. 105; 196-233). Furthermore, the lavishly decorated wineries recently uncovered in two imperial villas near Rome illustrate how the start of annual vintage and grape-treading season could be experienced as a form of elite spectacle (Fentress, Maiuro 2011, Dodd *et al.* 2023). At Caesarea (Cherchell). Emperors would visit their estates to observe these activities from their dining rooms and to celebrate the *Vinalia rustica*, the rural wine festival, on 19 August, as attested in three letters written by the young prince Marcus Aurelius, then aged twenty-one, to his tutor Fronto (*ep.* 4.6.2): *rusticos cavillantes audivimus libenter* : "we enjoyed hearing the rustic workers (*i.e.* the vine-treaders) teasing each other", the elite staged the spectacle of the *Vinalia* through mosaics in their dining rooms, contextualizing scenes of grape harvesting and wine production alongside images of ploughing and agricultural labour.

The geologist Joleaud 1936 : 156 offers an illuminating comparison between modern and ancient land use in Algeria: *Oliveraies des basses pentes des monts de La Cheffia à sous-sol argilo-siliceux. — Des olivettes ont été installées sur les basses*

*pentes des reliefs qui encadrent la vallée de la Seybouse entre Saint-Joseph et Barrai, et sur les coteaux qui dominent au Sud-Est la plaine de Zerizer. Il en existe de plus importantes, surtout dans la dépression de La Cheffia, mais aussi sur les basses pentes des alentours de Toustain et dans la vallée de l'oued Zitoun; sans doute avaient-elles, à l'époque romaine une extension plus notable qu'aujourd'hui dans toute la contrée*. This observation suggests a broader extent of olive cultivation in Roman times across the region. In fact, archaeological survey of some 1400 km$^2$ in north-eastern Algeria has mapped some 400 presses in farms and 50 rock-cut wine presses, in a density of 2 per km$^2$. A similar situation exists around Thugga in Tunisia: https://rusafricum.org/en/thuggasurvey/ . Archaeobotanical evidence and research are available so far only of Carthage, Segermes and Althiburos (Van Zeist, Bottema, Van der Veen 2001; Kolstrup 1995; López, Cantero 2016).

Beekeeping

A lengthy passage in the inscription of the *lex Manciana* from the Trajan period - discovered on the estate known as Villa Magna Variana or Mappalia Siga (modern henchir Mettich) - addresses the obligations of *coloni* engaged in beekeeping. Those who maintain more than five hives were required to deliver to the landowner or *conductor* one *sextarius* (0.55 litres) of honey from each additional hive at the time of the honey-harvest (*vindemia mellaria*). The exemption granted to the first five hives aimed clearly to encourage apiculture, thereby promoting the pollination of the nearby orchards (*pomaria*) and cereal fields (CIL 8.25902; Kehoe 1988: 29-41). Recent studies show how

bee-pollination boosts also crop yields (Wallace-Hare 2021, 121-126), very important in ancient North Africa, the corn shed of Rome. Henchir Mettich lies in a mountainous landscape (245 m above sea level, 24 km north of Thugga). The removal of hives, swarms, bees, containers or honey from the estate was strictly prohibited under penalty of confiscation. The significance of beekeeping in antiquity is further underscored by the extensive and detailed discussions devoted to it by agronomists, beginning with the Carthaginian Mago, cited by Varro, Columella (entire book 9), Palladius during the Roman period and by the Byzantine *Geoponica,* entire book 15, based on Mago's abridgers and translators (see above)( Columella 1.1.13; 9.14.6 and 9.15.3, Varro *R.* 3.2.13, Palladius 1.37; 4.15; 7.7; 11.18; 12.8. Crane 1999: 37, rock art in Algeria and Morocco, 180, 203-211.). This compilation even cites Iuba, king of the Libyans, who recommended that bees be bred in a wooden box (*larnax*), confirming the longstanding North African tradition of apiculture. One of the lost chapters of Mago's manual was entitled "Getting bees from the carcass of a bullock or ox" (Columella 9.14.6; *Geoponica* 15.2; Harissis 2009). This widespread mythical origin of the ox born bees, the *bougonia*, is eventually visualised in the third register of one of the dedications to Saturn, found at Mascula / modern Khenchela, Algeria (Fig. 9).





Figure 9. Mascula, modern Khenchela, dedication to Saturn. A round honeycomb is depicted over a rhombic honey cookie, so called makrout, still today very popular. Leglay 1961.2 Pl. XXIX.4
Fig. 10 Beni Fouda, Sillègue / Novaricia (Sétif-Djemila), Mauretania Caesariensis. Dedication to Saturn depicted with sickle and honeycomb. Algiers, Musée des Antiquités. Photo de Vos

Beekeeping in Byzantine times in the region is witnessed by the Berber poet Corippus *Ioh.* 1.430-437 and 7.336-339, who describes bees emerging from their hives and drinking from garden ditches, drawing parallels between bees and soldiers. Already Herodotus (4.194.1) remarked on the abundant honey production of the Gyzantes, a tribe in Byzacena/central-southern Tunisia. Iconographic evidence further highlights the importance of honey: fifteen Roman-period stelae dedicated to Saturn commissioned by rural, local sub-elites depict either the god or the dedicant holding a circular honeycomb or a honey cake in his left hand (Fig. 9-10)( 17 *stelae* in Africa Proconsularis, Numidia and Mauretania Caesariensis, Leglay 1961 : 291, 308-309; 1966 : 291, 308-9; 1966 : 97-98, 166-167, 171, 172-173, 219, 222, 226, 243-244, 248, 250, 251, 256, 285; Ben Baazis 2000.). In Cyrene, Saturn was regarded as the "discoverer of honey extraction techniques and, more broadly, of fruit cultivation" : *mellis et fructuum repertorem Saturnum* according to Macrobius *Sat.* 1.7, who lived around 400 CE at Sicca Veneria (modern El Kef, Tunisia). Honey brought in large profits from a small space (Varro R. 3.16.10-11). served as the only sweetener known in Antiquity, was employed as both preservative and a medical substance. Punic wax (Pliny *HN* 21.49 and Vitr. 7.9.3), renowned for its quality, was employed in medicines and in

encaustic painting. In the 1st c. CE Africa ranked among the major producers of honey (*copia mellis*), alongside Crete and Cyprus (Pliny *HN* 11.14). Indeed, the word for honey in the genitive *mellis* is written on an amphora found in the harbour city Thabraca (*ILTun* 1710.55), where a mosaic in a villa depicts the oldest known figure of a skep or curved shaped hive (Fig. 3), eventually coinciding with Columella's *corbes ex vimine* and Cato's *corbula* (Colum. 11.2.90; Cato, *Agr*. 11.5).

Documents in the Geniza Archive at Cairo dating back to the 11th-13th c. CE show that Tunisia continued to export its surplus of honey and wax (Goitein 1967 : 125-129); so still or again in the late 18th c. CE (Valensi 1969 : 74, 80). In 1912 J. Georges published his beekeeping survey in Tunisia, observing that the area around in Teboursouk is the most profitable for the production of honey and wax. When flowering in the valleys ended, the indigenous beekeepers moved the hives to the Djebel Gorraa (960 m above sea level). Today beekeeping is practiced intensively in entire Northern Africa, in Northern Tunisia the traditional horizontal hive is still used, the *djeba*, a cylinder of reeds woven with wickers of lentisk (Fig. 11).



They are attested also in other Mediterranean regions, in Egypt even already during the Fifth Dynasty in a relief of the Solar Temple of king Nyuserra (2445-2421 BCE) at Abu Ghorab, to the north of Abusir (Hammad 2018). The oldest material items of this type of hive, dated to 900 BCE, have been found at Tel Reḥov in Israel (Mazar 2017). Until fifty years ago, it was still in use in Northern Spain (Chevet 2022). Varro and Columella recommend to use local natural resources such as flexible twigs for making circular beehives: *ex viminibus rutundas*. Columella 9.6.1 gives us the technical term, *opus vitorium* for this kind of manufacture, a *hapax*, which derives from *vitor*, basket weaver (Gullin-Mingaud 2015 : 77-78; Crane 1999 : 203 Table 24.1A). In Rome it is represented on the proto-Augustan funerary relief of T. Paconius Caledus found near Porta Capena (Schäfer 1990, Pl. 26.4). Some North African toponyms contain the root meli-, melli-, such as Melissa, Ain Melliti, Melilla. Mellarius ("beekeeper" : CIL 8.5970 and 16133) and Mellitus appear in onomastics (Ain Melliti: de Vos, Attoui 2013: 158-60; http://rusafricum.org/it/thuggasurvey/DU565/. *Mellitus/a* is attested 48 times in the entire Empire,18 times of which in N. Africa, with a preference for female names: 14 out of 18.)[1]. Rusaddir, on the coast of Mauretania Tingitana, now Melissa, had two pre-Roman coins (118-33 BCE), with a bee between two ears or between an ear and a bunch of grapes (Uriel 2004).

The longevity of the inhabitants of North Africa is higher than that of people who lived in Europe. The North African funerary inscriptions always mention the age of the deceased, which is often elevated. Over the age of 60, 33% of the rural population died in northeastern Algeria, 37% in northwestern Tunisia, and 45% in the city of Thugga.

Naturally, these lifespan figures must be treated with caution, as ages were often rounded to numbers ending in 5 or 0. Walter Scheidel 2007 and many others have expressed strong scepticism about the reliability of ages indicated in epitaphs. Sallust (*Jug.* 17.6: *plerosque senectus dissolvit*) already noticed the longevity of North Africans, which he personally observed, in line with a *topos* of ancient ethnography and literary models. Two centuries later, the Alexandrian historian Appian (*Pun.* 71.323) confirmed another observation by Sallust, recalling the bravery of Massinissa, who, at the age of 88, participated in a battle on horseback: "among the Africans the Numidians are the most rugged and long-lived people. The reason maybe that their winters are not very frosty—and frost kills everything—while their summers do not burn everything up as in Ethiopia and India. This is also the reason why Africa produces the most powerful animals, and why the men are always outside at work. Numidians do not drink much wine, and they all eat simply and frugally" (transl. McGing).

| on Age epitaphs | NE rural Algeria 59 epitaphs | Rural Tunisia Thugga 333 epitaphs | Thugga city 2000 epitaphs |
|---|---|---|---|
| 100-120 | 1 | 9 | 19 |
| 91-99 | 5 | 17 | 31+1 |
| 80-89 | 3 | 36 | 82+2 |
| 70-79 | 8 | 52 | 78+1 |
| 60-69 | 2 | 20 | 74 |
| | 33% | 30% | 45% |

Table 1. Ages mentioned on the epitaphs in the surveyed rural zones (de Vos, Attoui 2013), and in the city of Thugga (Dougga, Khanoussi, Maurin 2002).

The climate, the lifestyle, the multilingualism (Libyan, Punic, Latin, and sometimes Greek), and the consumption of extra virgin olive oil, red wine (Buljeta *et al.* 2023), honey, garlic and raw, unground, and uncooked spelt (Procopius *Vand.* 4.6.13, VI c. CE) - all five rich in polyphenols with antioxidant benefits (Finicelli *et al.* 2018) - certainly played an important role in contributing significantly to the longevity of the inhabitants of ancient North Africa.

Columella 11.3.20 states: some call the great-headed African garlic Punic. The Greek, however, have the homeland incorporated in the name. *Ulpicum, quod quidam alium Punicum vocant, Graeci autem ἀφρόσκορδον appellant, longe maioris est incrementi quam alium.* The name of the African variety of garlic, *ulpicum*, probably derives from *punicum*. The Greek name, mentioned by Columella, incorporates the reference to Africa: ἀφρόσκορδον or *afroskorodon.* It held a high rank in the dishes of the rural African population: Pliny *NH* 19.34, *praecipue Africae celebratum inter pulmentaria ruris.* According to Theophrastus it was not cooked, only pounded up in salads (Theophrastus, Enquiry 7.4.10-12), so suffering minimal loss of polyphenols. It was used in medical remedies (Pliny *NH* 20.50-7, *Geoponica* 12.30), as is still used today in the North African countryside. A rest of garlic was excavated at

Althiburos (López, Cantero 2016, 460). The plant is known to modern botanists as *Ampeloprasum L.* (Mezzabotta 2000).

Finally, the epitaph in two languages, Libyco-Berber and Latin, of the 115 aged Berber named Mersen, found at Dar Abed in the National Park of El Kala (Fig. 12a-b) is representative of the widespread North African longevity.



Fig. 12 Dar Abed, funerary stele of Mersen, transliteration of the Latin and the Libyan text to be read from bottom to top. Photo de Vos

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| MERSEN | | | | c | | | | | K |
| FUSCI | | k | u | t | | | H | G | N |
| VIXIT | u | g | b | s | | G | T | R | M |
| ANRV | e | l | m | n | | S | Y | Ẓ | W |
| CENTV | b | ⊐ | s | e | | R | D | M | S |
| ET QVIN | s | s | n | s | | M | M | W | M |
| DEC | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 |

Mersen / Fusci / vixit / anru (!) / centu / et quin/dec//
MRSG / MDYTH / WMẒRG / MSW RNK

## Conclusion

The realistic North African mosaics provide insights into aspects that cannot be understood elsewhere. When combined with a surprisingly large number of written sources—most from outside Africa, and some dating back to the pre-Common Era—they allow us to better understand certain typical characteristics of the indigenous population: hardworking, with healthy diets, and long-lived.

## Bibliography


| | |
|---|---|
| BGU | https://papyri.info/ddbdp/bgu;4;1116 |
| CIL | *Corpus Inscriptionum Latinarum* |
| Dig. | *Digesta Iustiniani Augusti*. Th. Mommsen (1963). Berlin : Weidmann. |
| ILTun | *Inscriptions Latines de la Tunisie*, A. Merlin (1944), Paris : Presses Universitaires de France. |

Ancient sources, translations in volumes of the LCL = Loeb Classical Library, Cambridge MA : Harvard University Press

| | |
|---|---|
| Appianus *Pun.* | Roman History II, book VIII.1 Λιβυκή, African Book; edited and translated by B. McGing (2019). LCL 3: London. |
| Apuleius *Met.* | *Metamorphoses*. The golden ass, translated by S. Ruden (2011). New Haven: Yale University Press. |
| Apuleius ap | *Apologia Florida; De Deo Socratis*; edited and translated by C.P. Jones (2017). LCL 534. Cambridge, MA. |

| | |
|---|---|
| Augustinus | *De civitate Dei*. Réimpression de l'édition de 1959 avec un Suppl. de C. Revel-Barreteau (2014). Paris: Études Augustiniennes. Bibliothèque Augustinienne. Œuvres de Saint Augustin, 0996-4657 |
| Cato *Agr.* | *De l'agriculture*. Texte établi, traduit et commenté par R. Goujard (1975). Paris: Belles Lettres. |
| | *On agriculture*; transl. W.D. Hooper; revised by H.B. Ash. LCL 283. Repr. (1979). London: Heinemann. |
| Columella | *On Agriculture* I-III: books 1-12, transl. Harrison Boyd Ash, E.S. Forster (1941-1954). LCL 361, 407, 408. |
| Fronto | *Correspondence* I-II, transl. C.R. Haines, LCL 112. Cambridge, MA (1928-1929). |
| *Geoponica* | *L'agricoltura antica: i Geoponica di Cassiano Basso*. Text, Italian transl., comm. E. Lelli (Ed.) (2010). Soveria Mannelli CZ: Rubbettino. |
| *Geoponika*, farm work. | Geoponika, farm work. A modern translation of the Roman and Byzantine farming handbook A. Dalby. (2011) Totnes: Prospect books. |
| Isidorus | *Etymologiae, sive, Origines,* transl. S.A. Barney (2006). Cambridge, New York, N.Y. |

| | |
|---|---|
| Macrobius | *Saturnalia*; books 1-7 ed. and transl. R.A. Kaster (2011). Cambridge MA. LCL 510-512. |
| Mago | Speranza T. (1974). *Scriptorum Romanorum de re rustica reliquiae* 1, Università degli Studi di Messina: 76-119. |
| Martial | *Épigrammes*; texte établi et traduit par H.J. Izaac. Paris, Belles Lettres, (1973). 2.1 Livres VIII-XII, 2.2 Livres XIII-XIV. |
| Palladius | The work of farming (*Opus Agriculturae*) and Poem on grafting, a new translation by J.G. Fitch (2013). Totnes : Prospect books. |
| Pausanias | *Description of Greece,* transl. and comm. J.G. Frazer. 1965. Vol 1. Translation, Vol. 2 Commentary on book 1. New York : Biblio and Tannen. |
| Pomponius Mela | *Geography of the world,* translated with introduction and commentary by G.L. Irby (2025). Liverpool : Liverpool University Press. |
| Pliny *HN* | Pliny, Natural History, Vol. III: books 8-11; 1983. Vol. IV: books 12-16, 1968, Vol. V: books 17-19, 1950, transl. H. Rackham; Vol. VI, books 20-23, 1969, transl. W.H.S. Jones, LCL 353, 370, 371, 392. |
| Sallust *Jug.* | *The War with Catiline. The War with Jugurtha*, 2013, transl. J.T. Ramsey, LCL 116 |

| | |
|---|---|
| Strabo | *Geography*, transl. D.W. Roller. Cambridge: Cambridge University Press, 2014. |
| Theophrastus | *Enquiry into Plants*. Volume II: Books 6-9. On Odours. Weather Signs. Transl. A.F. Hort (1916). LCL 79. Cambridge MA. |
| Varro *R* | *On Agriculture*, transl. W.D. Hooper, H.B. Ash (1934, repr. 1960), LCL 283, Cambridge MA. |
| Virgil *Ecl.* and *G* | *Eclogues, Georgics, Aeneid*, books 1-6. Transl. H. Rushton Fairclough (1916). Rev. G.P. Goold (1999). LCL 63. Cambridge MA. |
| *Vita Melaniae Latina* | Gerontius, Vita latina di santa Melania; introduzione, traduzione e note L. Coco (2013). Roma, Città Nuova. Collana di testi patristici 22. |
| Vitruvius | *De l'architecture*: livre 7. Texte établi et traduit par B. Liou et M. Zuinghedau; commenté par M.-T. Cam (1995). Paris : Belles lettres. Collection des Universités de France. Série latine 327 |

Balmelle C., Brun J.P. (2005). La vigne et le vin dans la mosaïque romaine et byzantine. Dans La mosaïque gréco-romaine IX. Colloque international pour l'étude de la mosaïque antique, 2001, Rome. Publications de l'École française de Rome 352-2 : 899-921. https://www.persee.fr/doc/efr_0223-5099_2005_act_352_2_8426

Ben Baazis S. (2000). *Rohia et le Sraa Ouertane dans l'Antiquité*. Tunis : Institut National du Patrimoine.

Ben Jerbania I., Fentress E., Ghozzi F., Wilson A., Carpentiero G., Dhibi C., Dufton J.A., Hay S., Jendoubi K., Mariotti E., Morley G., Oueslati T., Sheldrick N., Zocchi A. (2014). Excavations at Utica by the Tunisian-British Utica Project. https://www.researchgate.net/publication/277649792_Excavations_at_Utica_by_the_Tunisian-British_Utica_Project_2014

Bérard J. (1935). Mosaïques inédites de Cherchel. *Mélanges de l'École Française de Rome* 52 : 113-142.

Bonifay M. (2021). African amphora contents: an update. In Reflecting on the Maritime Trade of Foodstuffs in Antiquity, eds Casasola D., Bonifay M., Pecci A., Leitch V. : 281–297. Roman and Late Antique Mediterranean Pottery 17, Oxford, Archaeopress.

Buljeta I., Pichler A., Šimunović J., Kopjar M. (2023). Beneficial Effects of Red Wine Polyphenols on Human Health: Comprehensive Review. *Molecular Biology* 45.2: 782–798. doi: 10.3390/cimb45020052

Chevet R. (2022). Approches de l'Archéologie: L'apiculture insolite du nord de l'Espagne. Dans D. Wallace-Hare (Ed.), New Approaches to the Archaeology of Beekeeping : 233-252. Oxford : Archaeopress.

Crane E. (1999). *The World History of Beekeeping and Honey Hunting*. New York, London : Routledge.

Dauge Y.A. (1981). *Le barbare: recherches sur la conception romaine de la barbarie et de la civilisation*. Bruxelles : Collection Latomus 176.

de Vos M., Attoui R. (2013). Rus Africum 1. *Le paysage rural antique autour de Dougga et Téboursouk: cartographie, relevés et chronologie des établissements*. Bari : Edipuglia.

de Vos M., Porena P. (2020). Flavius Caecilius Primus, administrator of the fundus Glebonianus (near Thabbora – Africa Proconsularis): agricultural investments and social rise in the Fourth century AD. *Mediterraneo Antico. Economie Società Culture* 23 : 487-531.

Dodd E., Galli, G., Frontoni. R. (2023). The Spectacle of Production: a Roman imperial winery at the Villa of the Quintilii, Rome. *Antiquity* 97 (392) : 436-453.

Dunbabin K.M.D. (1978). *The mosaics of Roman North Africa: studies in iconography and patronage*. Oxford: Clarendon, Oxford Monographs on Classical Archaeology.

Fentress E., Maiuro M. (2011). Villa Magna near Anagni: the emperor, his winery and the wine of Signia. *Journal of Roman Archaeology* 24 : 333-369.

Ferdi S. (2005). *Corpus des mosaïques de Cherchel*. Études d'Antiquités Africaines, CNRS Editions, Paris.

Finicelli M., Squillaro T., Di Cristo F., Di Salle A., Melone M.A.B., Galderisi U., Peluso G. (2019). Metabolic syndrome, Mediterranean diet, and polyphenols: Evidence and perspectives. *Cellular Physiology* 234.5 : 5807-5826.

Georges J. (1912). *La Tunisie apicole*. Tunis : Imprimerie Centrale.

Goitein S.D. (1967). Shelomo Dov Goitein. A Mediterranean Society. The Jewish Communities of the Arab World as Portrayed in the Documents of the Cairo Geniza. Vol. I: Economic Foundations. University of California Press, Berkeley and Los Angeles.

Guizani S. (2018). Les espaces d'hygiène et de confort en Tunisie à l'époque romaine: les latrines privées. Dans S. Marcos (Ed.), Entre espace public et espace privé: les élites en représentation. Presses universitaires de Perpignan : 87-111. https://books.openedition.org/pupvd/38257

Gullin-Mingaud M. (2015). *La vannerie dans l'Antiquité romaine*. Naples, Publications du Centre Jean Bérard 35.

Hammad M.B. (2018). Bees and beekeeping in ancient Egypt. *Journal of Association of Arab Universities for Tourism and Hospitality*. June 2018 : 1-16. DOI: 10.21608/jaauth.2018.47990

Harissis H.V. (2009). Aristaeus, Eurydice and the ox-born bee. An ancient educational beekeeping myth. Dans H.V. Harissis and A.V. Harissis (Ed.),

Apiculture in the Prehistoric Minoan and Mycenean Symbols Revisited, Oxford Archaeopress, BAR Internationale Series 1958. https://www.academia.edu/1259037/Apiculture_in_the_Prehistoric_Aegean_Minoan_and_Mycenaean_Symbols_Revisited

Joleaud L. (1936). Étude géologique de la région de Bône et de La Calle. Bulletin du Service de la Carte Géologique de l'Algérie, 2e série, Stratigraphie - Descriptions régionales n° 12. Alger.

Kehoe D.P. (1988). *The Economics of Agriculture on Roman Imperial Estates in North Africa*. Hypomnemata 89. Göttingen : Vandenhoeck & Ruprecht.

Khanoussi M., Maurin L. (2002). *Mourir à Dougga, recueil des inscriptions funéraires*, Bordeaux.

Kolstrup, E. (1995). Holocene vegetational records from the Segermes Valley, NE Tunisia with special reference to the Roman Period. Dans Dietz S., Ladjimi Sebaï L., Ben Hassen H. (Ed.), Africa Proconsularis. Regional Studies in the Segermes Valley of Northern Tunisia I. Copenhagen : 85-109.

Lafaye G. (1892). Mosaïque de Saint-Romain-en-Gal (Rhône). *Revue Archéologique* 19 : 322-347.

Leglay M. (1961a, 1961b). *Saturne africain: monuments* I-II. Paris: Arts et métiers graphiques.

Lenski N. (2017). Paesant and Slave in Late Antique North Africa, c. 100-600 CE. Dans R. Lizzi Testa (Ed.), Late Antiquity in Contemporary Debate : 113-155. Cambridge: Scholars Publishing.

Mazar A. (2017). The iron age apiary at Tel Reḥov, Israel. Dans F. Hatjina, G. Mavrofridis, R. Jones (Ed.), Beekeeping in the Mediterranean from Antiquity to the present, International Symposium of beekeeping in the Mediterranean, Syros, 9-11.10.2014 : 40-49. Nea Moudania.

Mezzabotta M.R. (2000). What Was "Ulpicum"? *The Classical Quarterly* 50.1 : 230-237.

Morricone Matini M-L. (1965). Mosaici romani a cassettoni del I secolo a.C. *Archeologia Classica* 17: 79-91, Pl. XXIII-XXX.
Oniga R. (1995). *Sallustio e l'etnografia*. Pisa, Giardini. Biblioteca di Materiali e discussioni per l'analisi dei testi classici 12.
Rabinow S., Wang, T., Wilson R.J.A., Mitchell P.D. (2022). Using parasite analysis to identify ancient chamber pots: an example of the fifth century CE from Gerace, Sicily, Italy. *Journal of Archaeological Science Reports* 42.3. doi: 10.1016/j.jasrep.2022.103349
Schäfer T. 1990. *Imperii insignia: Sella curulis und Fasces: zur Repräsentation römischer Magistrate*. Römische Mitteilungen, Suppl. 29. Mainz : Zaberndruck.
Scheidel W. (2007). Demography. Dans W. Scheidel, I. Morris, R. Saller, (Ed.), The Cambridge Economic History of the Greco-Roman World. Cambridge: Cambridge University Press : 38–86.
Uriel P.F. (2004). La moneda de Rusaddir. Una hipótesis de trabajo. *Gerión* 2004, 22.1 : 147-167.
Valensi L. (1969). *Le Maghreb avant la prise d'Alger*. Paris : Flammarion.
Van Zeist W., Bottema S., Van Der Veen M. (2001): Diet and vegetation at ancient Carthage: The archaeobotanical evidence. Groningen : Groningen Institute of Archaeology.
Wallace-Hare D. (2022). Beekeeping and Problematic Landscapes: Beekeeping and Mining in Roman Spain and North Africa. Dans D. Wallace-Hare (Ed.), New Approaches to the Archaeology of Beekeeping : 112-129. Oxford : Archaeopress

## Captions

Figure 1. Caesarea in Mauretania, modern Cherchell, Maison des Travaux Champêtres, mosaic discovered 1925. Musée National Public de Cherchell. It depicts scenes of ploughing and sowing in an olive yard, and of shoring and weeding in a vineyard. Photo D-DAI-ROM-2016.1379

Figures 2-3. Thabraca, modern Tabarka, Henchir Godmet, Musée du Bardo, Tunis. Two mosaics depicting mixed cultivation of *vites characatae*

alternating with olive trees. Fig. 3. Top: quails on emerging rocks. Right margin: 'barbe' horse, river slope with skep. Photo de Vos

Figure 4. Caesarea, modern Cherchell, Maison de la Mosaïque Bachique', mosaic with grape treading scene. Musée National Public de Cherchell. Photo D-DAI-ROM-2016.1368

Figure 5. Caesarea, modern Cherchell, 'Tennis Club' site, mosaic depicting grape harvesting under a pergola. Musée National Public de Cherchell. Photo D-DAI-ROM-2016.1145

Fig. 6-8. Details of the previous image: 6. red wine flowing down from a treading basin; 7. a slave stirring of the must; 8. a lizard climbing up a vine trunk. Photo D-DAI-ROM-2016.1152

Figure 9. Mascula, modern Khenchela, dedication to Saturn. A round honeycomb is depicted over a rhombic honey cookie, so called makrout, still today very popular. Leglay 1961.2 Pl. XXIX.4

Fig. 10 Beni Fouda, Sillègue / Novaricia (Sétif-Djemila), Mauretania Caesariensis. Dedication to Saturn depicted with sickle and honeycomb. Algiers, Musée des Antiquités. Photo de Vos

Fig. 11 Machtat el Aldjia, site 585. In Tunisia the horizontal hive is still used : the djeba, a cylinder of reeds woven with wickers of lentisk. Photo de Vos (2008).

Fig. 12a Dar Abed, funerary stele of Mersen, Fig. 12b transliteration of the Latin and the Libyan text to be read from bottom to top. Photo de Vos