

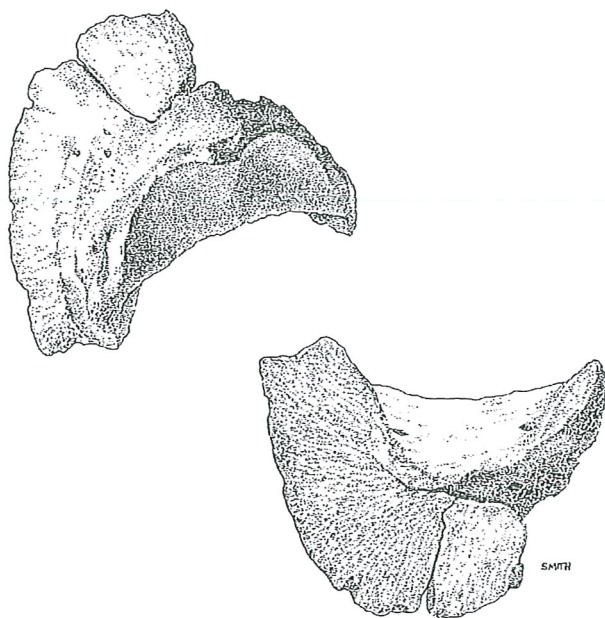


ARCHAEOZOOLOGY OF THE NEAR EAST III

Proceedings of the third international symposium on the
archaeozoology of southwestern Asia and adjacent areas

edited by

H. Buitenhuis, L. Bartosiewicz and A.M. Choyke



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Cover illustration: Dorsal and palmar aspects of a
Bronze Age horse phalanx from Arslantepe, Turkey,
identified by Sándor Bökönyi.
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Preface

This publication is the result of the third international symposium on archaeozoology of southwestern Asia and adjacent areas, held in Budapest, Hungary from 2 - 5 September 1996. The editors would like to thank all colleagues of the Working Group who helped with the translation of abstracts. Financial support for the publication was given by the Acker Stratingh Stichting, Groningen, The Netherlands.



Participants of the 3rd ASWA Conference, Budapest 1996
(Photo: Péter Komjáthy, Aquincum Museum)

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THE ANTIQUE SITE OF SAGALASSOS (TURKEY): FAUNAL RESULTS FROM THE 1990-1994 EXCAVATION SEASONS

Bea De Cupere¹ and Marc Waelkens²

Resumé

Des fouilles grande chelle sont menés depuis 1990 sur le site antique Sagalassos (prov. Burdur, Turquie) et ont livré un grand nombre de reste faunique. Les données archéozoologiques ont permis de rassembler des informations sur la paléoeconomie et la paléoeologie du site. Les résultats présents ici prennent en compte le matériel des campagnes de fouille de 1990 à 1994.

Introduction

Since 1990, large-scale excavations have been carried out at the antique site of Sagalassos (Burdur province, Turkey; Fig. 1) under the directorship of the second author (Waelkens, 1993a; Waelkens and Poblome, 1993, 1995, in press). These produced a large amount of faunal remains, which are being studied on the spot during the excavation campaigns (Van Neer and De Cupere, 1993a, b; De Cupere *et al.*, 1993, 1995; Degeest *et al.*, 1993; De Cupere, 1995; Van Neer *et al.*, in press). This article presents results from the archaeozoological analysis based on the material from the 1990-1994 excavation

seasons. The detailed analysis will be presented in a doctoral thesis (De Cupere, in preparation). The examined material comprised about 160,000 specimens and was collected in several areas of the site, namely the Doric Temple, the area of the late Hellenistic Fountain House and the Roman Library, the Lower and Upper Agora, the constructions north of the Upper Agora, and a small trench in the southwestern domestic area (site W). Contextual artefacts were dated from the 1st to the 6th century AD. The site itself is situated on a southern slope of the western Taurus mountains at an elevation between 1490 and 1600 m above sea level. Several fertile valleys are present to the south and the west of the site.

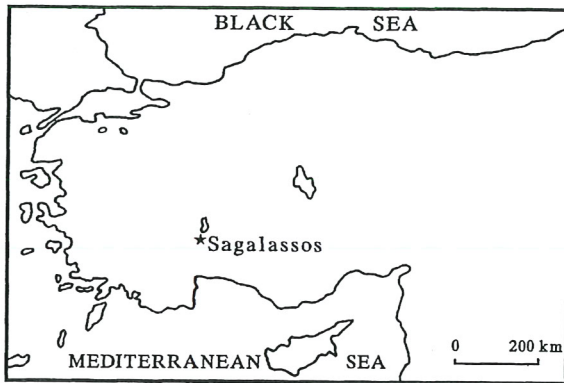


Figure 1. Geographical position of Sagalassos.

Species composition and taphonomic groups

In general, the preservation of the faunal remains is very good. Although most of the bones show a certain degree of fragmentation, postdepositional breakage is minimal and the fragmentation observed should be regarded as the result of butchering and marrow extraction. This is also indicated by the presence of many cut and chop marks. Saw-edged fragments, sometimes in combination with cut marks, are the result of bone-, horn- and antler-working. Gnawing marks of dogs are visible on several occasions and attested the presence of these domestic animals in the ancient town even before their remains

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were found among the material. Other traces made by plant roots, small rodents and herbivores were observed as well.

An exhaustive list of all the animal species and the number of their remains will not be given here. The remains were divided in several taphonomic groups based on their predepositional history (Gautier, 1987) and the animal species represented at the site will be given in view of this classification:

Intrusives

This first group comprises the remains of animals which have entered the assemblage during (=contemporaneous intrusives) or long after (=late intrusives) the deposition of the layers without human interaction. The shells of the terrestrial gastropods, of which group the *Helix* species is the largest member, and the remains of the toad (*Bufo* sp.), the reptiles (*Testudo graeca*, *Lacerta* sp.), some bird species (Passeriformes) and some smaller mammals (Microchiroptera, Rodentia spp., *Mustela nivalis*), were classified within this taphonomic group. The lesser mole rat (*Spalax* sp.) is the best represented animal among the rodents. Its frequent appearance in the excavated sediment should not be neglected by the archaeologist: these animals are able to disturb the stratigraphical layers and move artefacts from their original context into others.

Carcasses

This category includes the remains of all the animals brought to the site by the inhabitants but not used for human consumption. They are recognised as such by the absence of cut or chop marks and the completeness of the bones. In some cases several elements from one individual were found together. Within this group two subdivisions can be made. The first comprises domestic mammals; they were kept for services such as companion and transport (dog, cat, equids, dromedary). Certain wild birds (*Corvus corax*, Accipitridae sp.) and mammals (*Vulpes vulpes*, *Ursus arctos*, *Martes* spp.) fall within the second subdivision: they were hunted for their fur or killed since they were a nuisance to domestic fowl. It can not be excluded, however, that red fox and marten partly represent intrusive animals.

Consumption refuse

Most of the animal species represented at Sagalassos were meant for human consumption. They include molluscs (freshwater bivalves, marine bivalves and gastropods), freshwater fish (Cyprinidae spp., *Silurus glanis*, *Esox lucius*, *Clarias* sp., Tilapiini), anadromous fish (*Acipenser* sp.), marine fish (Scombridae spp., *Epinephelus* sp., *Sardina pilchardus*), wild birds (*Podiceps* spp., Anseriformes spp., *Alectoris chukar*, *Perdix perdix*, *Fulica atra*, *Scolopax rusticola*, *Columba* spp.), wild mammals (Cervidae spp., *Lepus capensis*) and the classical domestic group (chicken, sheep, goat, pig and cattle). The consumption refuse constitutes the bulk of the faunal remains at Sagalassos.

Refuse of artisanal activities

Bone, horn, antler and shells were used at Sagalassos as raw materials for the production of ornamental objects and utensils. The bone waste was studied in detail and will be discussed below.

Subsistence

Table 1 summarizes the number of bones from the consumed species for the different chronological contexts. The supply of animal proteins was assured by domestic as well as wild animals. However, the latter did not play a significant role in the diet of the inhabitants. About 0.8% of the faunal remains belonged to wild birds and mammals. The fish remains represented 13 species; half of the identifiable bones were recovered by hand, the others were retrieved during sieving (De Cupere *et al.* 1995, Van Neer

	1°A	1°B	2°A	2°B	1°-3°	4°A	4°B-5°A	5°E-6°A	undated	Total
freshwater molluscs	.	.	.	.	.	1	1	4	4	10
marine molluscs	.	.	2	.	2	3	4	22	4	37
freshwater fish	2	43	10	1	2	18	13	139	67	295
anadromous fish	.	.	.	.	.	.	.	1	.	1
marine fish	.	.	7	1	.	.	1	6	2	17
exotic freshwater fish	1	1	.	.	3	.	.	5	10	20
wild birds	2	10	14	13	19	43	14	40	84	239
domestic birds	33	26	30	47	5	128	71	593	702	1635
wild mammals	10	.	13	11	18	35	38	97	61	283
domestic mammals	489	1548	2138	2028	5934	13215	5069	15589	14163	60173

Table 1. Consumption refuse in the different chronological units at Sagalassos. (1°A: first half 1st century AD; 1°B: second half 1st century AD;; 5°E-6°A: end of 5th - first half 6th century AD). Figures indicate numbers of fragments.

et al. in press). Since screening could only be practised on a small fraction of the excavated sediment it is obvious that a substantial part of the fish bones must have been lost. Consequently, fish must have played a more important role in the diet of the inhabitants of Sagalassos than could be recognised from the studied material. Nevertheless, the supply of animal proteins was mainly provided by the typical domestic animals, namely cattle, ovicaprines, pig and chicken.

Animal husbandry

Diachronic changes in the composition of the livestock are shown as the relative abundance of the bones of cattle, ovicaprines and pig through time (Fig. 2). Whereas at the beginning of the considered periods sheep and goats were far more often slaughtered than cattle and pig, their relative numbers decline in the following centuries, mostly in favour of cattle. The first half of the 4th century AD is a turning point. Thereafter ovicaprines again became more important. The share of pig bones remains more or less constant through time.

The increasing proportion of cattle bones and their sharp decline afterwards, which continues until the abandonment of the site, is believed to reflect the growth and the decline of the town and probably

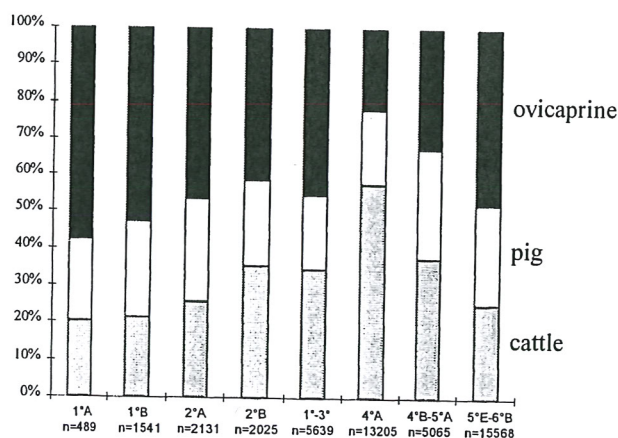


Figure 2. Composition of the livestock (cattle, pig and ovicaprines) through time based on the relative number of identified bones. Abbreviations of the time periods same as in Table 1.

must be related to political and economic events. During the Hellenistic period the local economy may have suffered from a continuous series of wars in the area. With the establishment of the *Pax Romana* in 25 BC, a period of stability followed and lasted for three centuries. A good network of roads was developed, probably resulting in economic activities that shifted from a more subsistence oriented economy towards a more trade-oriented economy (Waelkens, in press). The growing potter's industry, located in the town of Sagalassos, required more raw materials. Mineralogical analysis of the ceramics produced, indicate that the clays were most probably derived from the quarterna-

ry sediments in the valley of Çanakli at 10 km to the south of Sagalassos (Ottenburgs *et al.*, 1995; Viaene *et al.*, 1995). Transport of the clay and the distribution of end-products had to be secured which may have favoured the keeping of cattle as a dual-purpose animal (food and draught-power). After the beginning of the 5th century AD the town underwent successive Isaurian raids (around AD 401), earthquakes (AD 518 and 528), the plague (AD 541-542), Arab invasions (starting in AD 644) and another earthquake in the middle of the 7th century AD, after which the city eventually was abandoned (Waelkens, in press). All this resulted in a ruined economy, creating a situation wherein the inhabitants of the town and the territory may have turned towards a more subsistence economy, which favours the herding of ovicaprines.

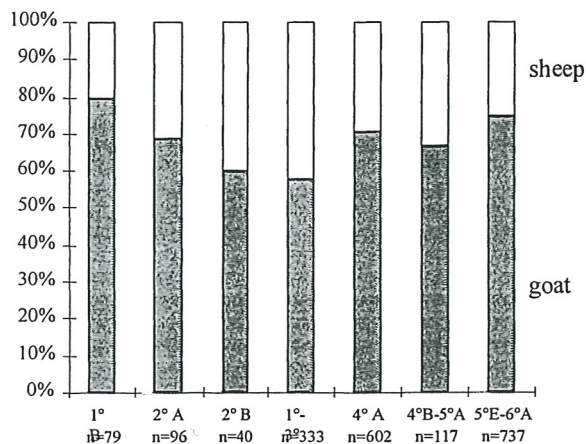


Figure 3. Ratio between sheep and goat based on the number of identified bones. Abbreviations as in Table 1.

Slaughtering ages of cattle, pig and ovicaprines were reconstructed according to the method of Grant (1982) which evaluates the condition of the molar dentition known as the mandibular wear stage (M.W.S.) and gives relative age classes. The frequency distribution of the M.W.S. for each species is presented in a histogram (Figs. 4 and 5).

In the case of pig, a distinction was made between the assemblages dated respectively to the first half of the 4th century AD and the period of end of the 5th - first half of the 6th century AD (Fig. 4). Pigs all seem to have been slaughtered at a relatively young age: almost no values higher than 30 are observed. Although the mandibular wear stages only represent relative age classes, an attempt was made to correlate these peaks with the exact age of the animals. From the data it is known that the eruption of the first molar corresponds to wear stage 3, the eruption of the second molar to wear stages 9 to 12, and that of the third molar to wear stages 18 to 23. The eruption ages for the three molars are respectively 6, 13 and 22 months (Silver, 1963). The ne-

The sheep:goat ratio demonstrates that goat herding was much more common than sheep keeping, which can be explained by the rough environment of Sagalassos where goats thrive better than sheep. Small diachronic changes were observed (Fig. 3) and it is worth mentioning that the highest proportion of sheep bones is noted for the second half of the 2nd century AD and that exactly for that period a local inscription tells of the activity of a guild of textile dyers in town (Waelkens, in press). Some imported amphorae, found at Sagalassos in the excavation area of the Doric temple, may have contained alum and thus be related to wool-dressing and wool-dyeing (R. Degeest, personal communication).

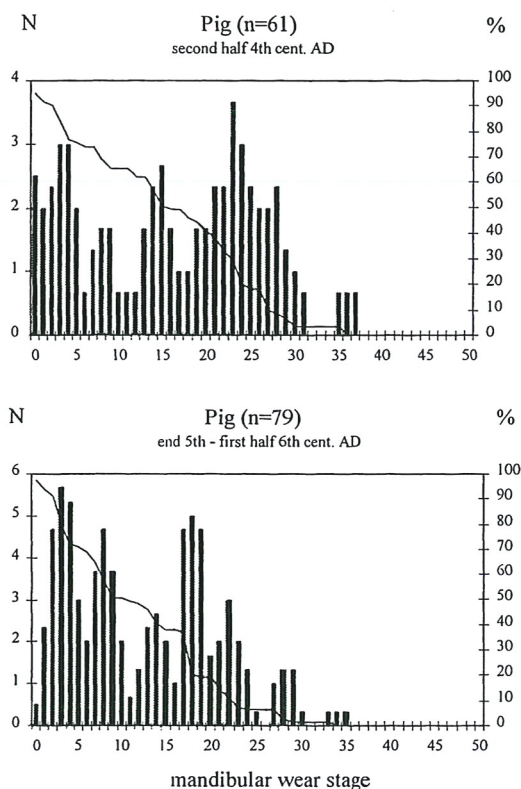


Figure 4. Slaughtering ages of the pigs consumed at Sagalassos based on the method of Grant (1982). N: running mean of the number of specimens.

gative cumulative curves indicate that during the first half of the 4th century AD about 80% of the animals consumed at Sagalassos did not exceed the age of about 22 months, even less than 10% of the pigs consumed was older than this age during the second period under discussion. Pigs are mainly meat providers and, therefore, with the exception of individuals which were necessary for breeding, they were not kept alive after they had reached a certain age or weight. The frequency distributions of the stages in both diagrams show several peaks. Whereas the first peak is indicative of the consumption of suckling-pigs and piglets (until the age of about 6 months) at Sagalassos, it is believed that the following peaks correspond to winter-slaughtering (during the first two or three years of life), so that not too many animals had to be kept during the winter when fodder was scarce in the surrounding woods or fields. The differences observed between both assemblages are possibly related to either changes in pig husbandry or dietary preferences.

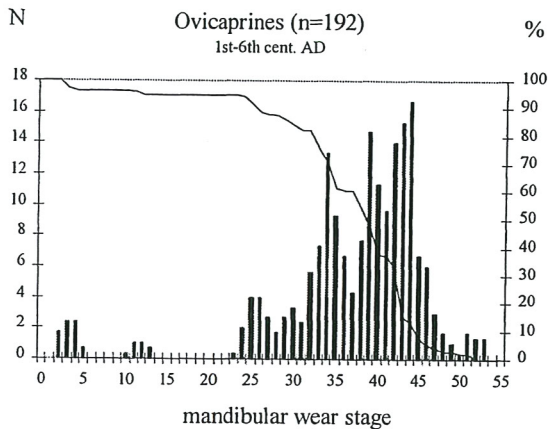


Figure 5. Slaughtering ages of the consumed ovicaprids based on the method of Grant (1982). N= running mean number of specimens.

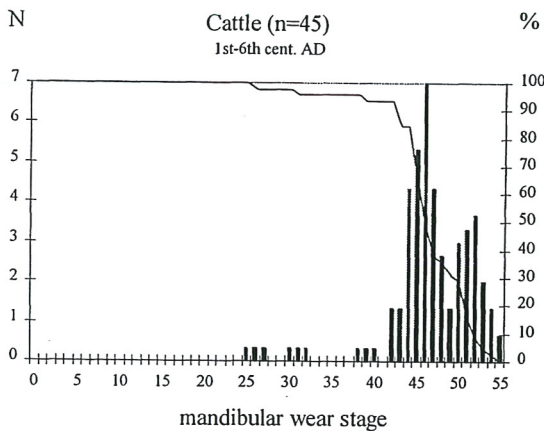


Figure 6. Slaughtering ages of the consumed cattle based on the method of Grant (1982). N= running mean number of specimens.

The M.W.S. distribution of ovicaprids (Fig. 5) and cattle (Fig. 6) are completely different from those observed in pig. In the case of the ovicaprids the molars erupt at wear stages of respectively 3, 12 and 24 to 29. The corresponding age for the third molar is about 3 to 4 years (Silver, 1963). Since most of the wear stages have values above 29, ovicaprids apparently were mainly slaughtered when adult. The older slaughtering age of the ovicaprids may be explained by the fact that these animals were not only kept for their meat. They were also important for their dairy products. Furthermore sheep produce wool, and from ancient literature it is known that the hair of goats was cut to weave rough cloths and blankets (White, 1970). Nowadays, goat hair is still cut yearly in this region and sold for the manufacture of textiles (De Cupere *et al.*, this volume).

A similar slaughtering pattern is observed in cattle (Fig. 6). Cattle provided milk and were used for hard labour in tillage and transport. The ceramic industry at Sagalassos must have played an important role in this respect (see above). The use of cattle as traction animals is also indicated by pathological deformations, such as broadening of the articular surface and new bone formation on the distal ends of metapodials and phalanges. In some cases grooving and eburnation were present on the articular surface. In the past, these kinds of pathologies have been used to indicate the use of cattle as draught animals (Baker and Brothwell, 1980; Higham *et al.*, 1981; Armour-Chelu and Clutton-Brock, 1985), although other factors such as age, weight, sex, substrate and the circumstances

under which the animals are kept, should also be taken into consideration. A recent study on the presence of pathologies on the bones of modern Rumanian draught oxen (Bartosiewicz *et al.*, 1993; Bartosiewicz *et al.*, in press) involved the establishment of a scoring-system to quantify the considered pathologies (Bartosiewicz *et al.*, in prep.). This scoring-system has been applied to the material of Sagalassos and revealed that the majority of the foot bones showed at least one of the pathologies. However, the severity of the pathologies was, in general, less than in the 20th century Rumanian oxen.

Bone-working

Even after slaughtering and consumption, cattle may still have remained an economic commodity. In the eastern part of the town, excavations first concentrated on the area of a late Hellenistic fountain house and a Roman Imperial Library. Being constructed in the twenties of the second century AD, the Library was destroyed by fire during the third quarter of the 4th century. Its ruins were partially filled and later covered with erosion layers washed in from the north (Waelkens *et al.*, 1992; Waelkens, 1993a,b). A large proportion of the animal remains recovered in the fill of the Library are the refuse of bone-working, which have been found only rarely in other study-areas of the town (De Cupere *et al.*, 1993). The material comprises more than 1700 saw-edged fragments and half-finished products. The worked bones were grouped according to skeletal element and animal species. The majority of the material belonged to cattle, which was the most frequently slaughtered domestic animal during this period (see Fig. 2). Bones could easily be obtained after slaughtering and butchering, and the size of these bones must have been an important criterion in their selection for working. The rarity of equid bones contrasts with the situation at for example Roman Pergamon, where equid remains were more commonly used for manufacturing objects (von den Driesch and Boessneck, 1982). As far as the preferred skeletal element for bone-working is concerned, it was noted that flat bones were very rare while the long bones, with the exception of the humerus, were abundantly used. Among the long bones, metapodials were most frequently observed as was to be expected on the basis of the low nutritional value of this part of the body. Radius, tibia and femur probably were often broken during butchery practices. The excavations at Sagalassos yielded numerous products from the initial and intermediate stages of the production process. The majority of the half-finished objects seem to be related to the production of hairpins; other objects were needles and spoons. The study of all the discarded fragments allowed a provisional reconstruction of the production process of these objects during Roman times at Sagalassos.

Import

Although their relative number in respect to the mammals and birds was rather low, the fish remains contribute to the understanding of the economy and trade at Sagalassos. The list of fish species can be divided into three groups, namely Turkish freshwater fishes, marine fishes and exotic freshwater fishes (Van Neer *et al.*, in press). The latter group is comprised of the bones of two fish taxa, namely a tilapia and a catfish from the genus *Clarias*. Both are indicators for long-distance trade with either Egypt or the Levant. *Tilapia* are typical African fish but the distribution of some species extends into the Syro-Palestinian area. The identification of the *Clarias* could not be carried out beyond genus level. Two species of *Clarias* live in the Nile today, namely *Clarias anguillaris* and the more common *Clarias gariepinus*. The distribution of *C. anguillaris* is limited to Africa but *C. gariepinus* is also found in the Near East. Beside these fish remains, coins from the imperial mints of Alexandria and Antiochia (Scheers, 1993a,b, 1995) may also point to import from these regions towards Sagalassos. Goods were also exported from Sagalassos, as is shown by locally produced red slip ware lamps and 'pilgrim flasks' discovered at Pharas in Sudan, Alexandria and some sites in the Fayum of Egypt, and Kapharnaon in Galilea (Poblome, 1996a,b; Poblome and Waelkens, in press). Finally, epigraphic data show that the Sagalassian aristocracy almost exclusively served in the Roman army and provincial administration of Syria, Palestina and Egypt during the Imperial period (Devijver, 1993). An inscription found during the 1996 excavation season even revealed that a citizen from Sagalassos became director of the famous Mouseion of Alexandria during the reign of Caracalla in the early 3rd century AD.

Palaeoecology

Environmental reconstructions are mainly based on the presence of birds and larger mammals due to the lack of microfauna with special habitat preferences. The presence of some wild mammals such as

cervids and brown bear indicate that the area was more wooded in the past than it is today. Nowadays, woods are almost completely lacking in the immediate vicinity of the site or have been recently planted. This is also one of the reasons why these animals no longer occur in this part of the country. The constant proportion of the pig remains among the consumption refuse (Fig. 2) supports the idea that, if pigs in Roman times were herded in the woods as is suggested by Varro (ten Cate, 1972:39) and Vergilius (ten Cate, *ibid.*: 40), forests must have been maintained by the Romans in the surroundings of Sagalassos. Therefore, the drastic deforestation of the region that resulted in the present-day situation must have occurred after the abandonment of Sagalassos. This was confirmed by palynological research (Bottema and Woldring, 1995). On the other hand, the presence of cattle points to good pasture grounds in the vicinity of Sagalassos. These open areas probably were located in the more fertile valleys in association with arable lands or along the foothills.

Some bird species represented at Sagalassos such as the stork, coot, wood-cock, ducks and grebes live or seek their food in the surroundings of bodies of water (pools, lakes), marshes and swamps. In former times the valley of Çanakli was partially covered by a shallow lake that has been drained only recently on its southern side (Bottema and Woldring, 1995). Therefore, this place may have been an excellent breeding and feeding ground for these birds. Other lakes in the vicinity of Sagalassos are Lake Burdur and Gölçük, a small crater-lake by the northern side of the mountain range. Species such as the chukar and the accipitridae are characteristic for rough mountains. Most probably they were found in the higher parts of the mountain range.

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