STUDIA TROICA

Band 18 · 2009

VERLAG PHILIPP VON ZABERN · MAINZ AM RHEIN

Eberhard Karls
Universität
Tübingen

STUDIA TROICA

Gedruckt mit Unterstützung von-/-printed with the support of
INSTAP The Institute for Aegean Prehistory, Philadelphia PA
James H. Ottaway, Jr., New York
Taft Semple Fund, Cincinnati

283 Seiten mit 69 Schwarzweißabbildungen, 85 Farbabbildungen und 29 Tafeln

Herausgeber/Editors: Dr. Peter Jablonka, Prof. Dr Ernst Pernicka, Prof. Dr. Charles Brian Rose
Sigel der Studia Troica: *StTroica*
Redaktionelle Betreuung/Editorial staff und Layout: Erdmute und Prof. Dr. Dietrich Koppenhöfer
Alle Photos, sofern nicht anders vermerkt: Troia-Projekt

Adressen für Autoren-/Addresses for authors:
Dr. Peter Jablonka, Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters
der Universität Tübingen, Schloss Hohentübingen, D-72070 Tübingen (deutschsprachige Artikel)
Prof. Dr. Joachim Latacz, Hauptstr. 58c, CH 4313 Möhlin
(Artikel mit altphilologischem Hintergrund)
Prof. Dr. Charles Brian Rose, Dept. Classical Studies, University of Pennsylvania,
Room 351B, 3260 South Str., Philadelphia PA 19104, USA (Articles in English)

Einsendeschluss von Manuskripten für *Studia Troica 19, 2010* ist der 15. Dezember 2009.
Studia Troica ist eine Jahresschrift, in der die Leitung und die Mitarbeiter des Troia-Projektes über ihre Arbeit vor Ort in Troia und der Troas und die daraus resultierenden Forschungsergebnisse berichten. Manuskripte, die nicht unmittelbar mit diesen Arbeiten verbunden sind, werden von international renommierten Fachleuten auf ihre Druckwürdigkeit hin beurteilt. Deren Empfehlungen fühlt sich der Herausgeber verpflichtet.

The deadline of manuscripts for *Studia Troica 19, 2010* is December 15, 2009.
Studia Troica is a periodical published annually in which the director and staff of the Troia project report on their fieldwork in Troia and the Troad and present the results of their research. Manuscripts submitted for publication which are not directly related to these studies are read by internationally renowned specialists in the relevant fields prior to publication. The editor will follow their recommendations.

ISBN: 978-3-8053-4115-8

Bilddaten: Troia-Projekt

Printed in Germany by Philipp von Zabern
Printed on fade resistant and archival quality paper (PH 7 neutral) · tcf

INHALT – CONTENTS

Teil A: Troia − Aktuelle Ausgrabungen und Umfeld

Teil B: Weitere Forschungen

4. Anhang

Small Mammals from Troia VIII
Environment and Taphonomy

Maria Ronniger

Abstract

The following article deals with a sample of small mammals recovered from a levelling fill situated to the southwest of the Lower Sanctuary, and dated to about 550 B.C. The position of the bones within the pit and the condition of their surfaces indicate that they were probably piled up by an owl. The identified species perfectly fit into the environment, which has been reconstructed based on archaeozoological and -botanical investigations, they must have led a contented life in the man-made landscape and the grassland of Troia and its surroundings. An interesting aspect to be mentioned is the general absence of the black rat *(Rattus rattus)* within the sample as well as in the cultural layers of Troia up to at least the archaic period. It is likely that these animals had not yet reached the Mediterranean by that time.

Zusammenfassung

Der vorliegende Beitrag beschäftigt sich mit einem in die archaische Phase von Troia datierten Kleinsäugerfundkomplex. Die Probe stammt aus dem Verfüllmaterial, das im Zuge von Planierungsarbeiten zwischen 550 und 500 v. Chr. südwestlich des Unteren Heiligtums eingebracht wurde. Zustand und Lage der Knochen deuten darauf hin, dass die Akkumulation von einer Eule zusammengetragen wurde. Die festgestellten Arten fügen sich gut in die bereits mit Hilfe vorangegangener archäozoologischer und -botanischer Untersuchungen rekonstruierte Umwelt, sie dürften sich auf dem Kultur- und Grasland in und rund um Troia sehr wohl gefühlt haben. Bemerkenswert ist die Abwesenheit der Hausratte *(Rattus rattus)* sowohl in der Probe als auch allgemein in den Kulturschichten von Troia, was darauf hinweisen könnte, dass diese Art die Mittelmeerküste zumindest bis zur archaischen Phase noch nicht erreicht hatte.

Introduction

Since the excavations in Troia began, archaeozoological remains have been analysed. Up to now data on various animal groups have been published – wild and domestic animals, birds, molluscs, and fishes.[1] One group to which no attention has been paid to yet is the group of small mammals – rodents and insectivores.

Thus, to start the investigation of these fellow occupants of the Troians a sample of bones from the archaic period was chosen. I worked on it within the scope of my master theses. The sample was supposed to be ana-lysed for species composition in order to verify or modify the already existing image of the paleoenvironment. Another subject of interest was the modus of accumulation. In addition, the material was used as a pretext for studying postcranial elements in order to find characteristic morphological features that would allow every piece to be identified. The results will briefly be presented in the following.

Material and method

The small mammal sample comes from a levelling fill situated to the southwest of the Lower Sanctuary (feature no. 132, a pit in the prolonged course of the building's southern wall). This fill also contained a large number of other animal bones, some of which showed cut marks,[2] and a lot of archaic fine ware. First the sample was divided into three groups containing animals of different classes – amphibians, birds, and small mammals. The amphibians were put aside for later examination, the bird bones were given to Petra Krönneck who identified them for me,[3] and the small mammal bones I analysed myself.

To identify the species tooth patterns – the classical method – was used. In addition, postcranial bones were examined. To be able to do that I analysed several skeletons, especially limb bones, of the expected species using the comparative collections of the Archaeozoological Laboratory in Tübingen, the Forschungsinstitut Senckenberg in Frankfurt/Main,[4] and the Museum für Naturkunde in Stuttgart.[5] This way I found some characteristic morphological features that helped me to tell the different rodents and insectivores apart.[6] After identification each bone was aged by means of epiphyses' fusion and measured. For the measurements I used a binocular microscope with build-in micrometer. Data gained in this way was very helpful for differentiation within one genus. Thus, for example, the variability of limb length in Crocidurinae suggests that there are three sorts of white-toothed shrews present, which I could not have told apart only by their tooth-morphology and -measurements.

An overview of the identified species together with the associated MNI, based on the most frequently found element, and the percentage composition of the sample is given in Table 1.

Taphonomy

One question I wanted the material to answer concerned the way the deposition was formed. Who is "to blame" for the small mammal accumulation?

It was unlikely people had anything to do with it. They would have thrown away kitchen scraps like bones of larger animals but surely no mouse or hamster bones, especially not neatly arranged in one spot. Exactly this was the case – the bones formed a concentration among the other thrown-in rubbish and, according to a note in the diary, were discernible as such. So there must have been other agents at work. Small mammals could have fallen into the pit by themselves, without any help, but, again, they wouldn't have done it at the very same place.

Alternatively one could think of mammalian predators, such as foxes, martens, and cats, or birds of prey like kestrels, buzzards, and owls. To check these possibilities I examined the outward appearance of bones and teeth.[7] First I tried to judge the breakage keeping in mind that I dealt with archaeological material, which could have been affected by different taphonomical agents after deposition and been broken by them as well. But the fragmentation was even low enough to definitely exclude mammalian predators: With their teeth they would have caused much more destruction than was present.

Thus, our predator must have been a bird that swallows its prey as a whole, without chewing. To examine whether it was a diurnal or nocturnal bird of prey I analysed the skeletal element proportions. Finding them to be very near to the proportions expected for a common four-footed animal I began strongly to consider an owl because diurnal avian raptors usually produce greater loss of distal elements represented by radius, tibia, and foot bones. To verify my suspicion, I analysed the limb bones and teeth for signs of digestion. As a rule in diurnal birds' prey the frequency and intensity of digestion marks are considerably higher than in owls' quarry. In fact, I observed some limb bones with affected articular surfaces, but there were just few of them. I found nearly the same results in the teeth. Some incisors showed intrusive digestion, while molars were not affected at all. These findings finally convinced me to concentrate on owl species that don't digest their prey's bones very intensively. Such species are barn owls, long-eared owls, and short-eared owls. All three are living in the Troad today.[8] Eared owls also occur in archaeozoological remains of Troia VIII.[9] A short glimpse at the prey species shows that the bird we are looking for must have been an opportunist hunting any animal it could seize (including amphibians and small songbirds). Short- and long-eared owls are more specialised, preferring voles. According to that, it is most likely that we owe our sample to a barn owl.

At the time the deposition was formed (between 550 and 500 B. C.), the Lower Sanctuary was a kind of "reduced-traffic" area without permanent human activity and, therefore, a wonderful place for an owl to rest. The nearby temple of Athena on the other hand was still in operation. Maybe that's exactly why owls were tolerated there.

Paleoenvironment of Troia VIII as reconstructed by means of archaeozoological and archaeobotanical remains

During the archaic period the Troian economy was mostly based on domestic animals like cattle, sheep, goats, and pigs. These are not as informative as wild animals because they are looked after by men and so do not absolutely depend on environmental conditions. However, even in Troia VIII we have some bones which belong to wild animals. Among them fallow deer *(Dama dama)* and hare *(Lepus europaeus)* are the most common species. Much more rare are wild boar *(Sus scrofa)*, red deer *(Cervus elaphus)*, roe deer *(Capreolus capreolus)*, and bison *(Bos primigenius)*. Bones of fox *(Vulpes vulpes)*, beaver *(Castor fiber)*, and badger *(Meles meles)* have also been found.[10] The dominance of species preferring more open landscapes as well as those which are content with small (gallery-) woods shows that there was not much left of the former woodland by that time. Another subject of hunting were birds, especially water fowl like goose, duck, and swan that must have inhabited the delta region of the Karamenderes. Other species refer to open steppe-like landscapes, especially the great bustard *(Otis tarda)* that does not tolerate higher vegetation or marshy underground, and the Chukar partridge *(Alectoris chukar)* that also likes areas with sparse vegetation.[11] The results of archaeobotanical analysis show a similar trend. There is strong evidence of agricultural use in the form of crops, and also a large number of different pollen referring to grassland. Tree-pollen is very rare.[12]

Thus, from the dominance of mammals living in more open landscapes, the presence of birds preferring steppe-like conditions, and the predominance of non-tree pollen we can draw the following conclusion: By the archaic period, the surroundings of Troia, the expected natural vegetation of which is deciduous Mediterranean forest, must have been almost completely cleared because of the need for building material and fuel. Instead farmland, pastures, and meadows came into being. Sheep and goats kept the remaining vegetation short causing erosion and reducing the fertility of the soil.

Small mammal fauna of Troia VIII

Does the found small mammal fauna fit into this picture? The sample contained different kinds of mice, voles, shrews, a jird, a hamster, and a mole rat species (see Table 1).

Species/Genus	**MNI**	**%**	**Most frequently found skeletal element**
House mouse *(Mus* sp.)	46	37,1	Right mandible
Wood mouse *(Apodemus* sp.)	15	12,1	Left maxilla plus superfluous lose M^1
House/Wood mouse *(Apodemus/Mus)*	36	29,0	Left femur
Vole *(Microtus* sp.)	8	6,5	Left M_1
Grey hamster *(Cricetulus migratorius)*	8	6,5	Right maxilla
Tristram's jird *(Meriones tristrami)*	4	3,2	Left ulna
Mole rat *(Microspalax nehringi)*	1	0,8	Left mandible
White-toothed shrew *(Crocidura* sp.)	4	3,2	Complete maxilla
Dwarf shrew *(Suncus etruscus)*	2	1,6	Left mandible
Total	124	100	

Tab. 1 List of small mammal species found in the Troia VIII sample.

Let's begin with the most abundant group – the house and wood mice. Together they constitute the absolute majority of 78,2%, house mice *(Mus sp.)* being predominant. The latter are typical concomitants associated with civilization and occur everywhere human settlements are present. They live in storehouses and residential buildings where food supply and a nice warm place for nesting are guarantied. Wood mice *(Apodemus sp.)* are also not very particular regarding their requirements of environmental conditions and are living in agricultural landscapes as well as in luxuriant macchia and woodland. The two vole species *(Microtus arvalis* and *M. guentheri)* prefer not too moist grassland with narrow vegetation and, correspondingly, must have been very pleased about the forest clearing and were presumably living on the crops growing on the fields. The grey hamster *(Cricetulus migratorius)* is an animal that was formerly restricted to dry treeless habitats like half-deserts, steppes, and rocky landscapes. However, in the course of time it became adapted to agricultural landscapes and, therefore, is no longer an "indicator" for special conditions. Jirds *(Meriones tristrami)*, likewise, love dry environments with sparse vegetation but also feel well in brush-wood and grassland. Mole rats *(Microspalax nehringi)* are spending a large part of their time underground digging branched off galleries and feeding on underground parts of plants, like roots and nodules, but also on stems, leaves, and seeds. They require open preferably dry grassland and avoid wooded and swampy areas. Thus, agricultural landscapes are also acceptable for them. Shrews, white-toothed *(Crocidura lasia, C. leucodon,* and *C. suaveolens)* as well as dwarf shrews *(Suncus etruscus),* are almost generalists and occur in steppe-like landscapes as well as in areas with rich vegetation, except large forests, preferring the proximity of watercourses. For them, as well as for all the other small mammal species contained in the sample, the surroundings reconstructed for Troia VIII offer optimal living conditions.

Black rats in archaic Troia?

Obviously, no remains of the black rat *(Rattus rattus)* have been recognised in the depositions of the archaic and older periods of Troia. It is the more surprising because Troia with its harbour and far-reaching trade connections would have been a typical "country of choice" for rats.

The black rat originally comes from Eastern Asia from where it colonised nearly every spot of the world travelling with (trades)men. When it reached Western Asia and Europe is not definitely settled. The oldest certain find of a rat outside of its native area had been the last meal of a cat mummified and buried in Quseir, Egypt, on the coast of the Red Sea and dates about 1st or 2nd century A.D.[13] Approximately at the same time another rat fell or was thrown into a roman well in Ladenburg near Mannheim, Germany,[14] and, thus, is the oldest proof for the presence of this species in Central Europe.

Frankly speaking, it is hard to believe that these animals reached the mentioned regions that late. But, indeed, there have been just few rat-suspicious bones reported from other sites in the Near East, including one femur from Korucutepe dated 1400–1200 B. C., which could not be identified with absolute certainty as a black rat,[15] and one tibia from Tell Išān Bahrīyāt in Southern Mesopotamia, whose association with the archaeological layer it was taken from is very much in doubt.[16] Tchernov found remains of what he called black rats in Mousterian depositions in Israel,[17] but, again, he could by mistake have taken the species *Rattus rattoides*, which does not differ from the black rat morphologically, for *Rattus rattus.*[18]

Thus, it seems the black rat took its time over conquering the world and then spread very quickly. But still, it could be exciting to have a closer look at pre-roman samples from different Anatolian Tells.

Notes

[1] For example Uerpmann – Köhler – Stephan 1992; Krönneck 1996; 2003; Fabiš 1995; 1996; 1999; Uerpmann – van Neer 2000; Uerpmann – Uerpmann 2001.
[2] Fabiš 1996; Rose 1996, 85.
[3] Petra Krönneck M. A. identified different songbirds and remains of some crow species *(Corvus sp.).* In this place I would like to thank her for her professional support.
[4] I am obliged to Dr. Gerhard Storch for making it possible to use his comparative collection and for giving very helpful taxonomical advices.
[5] In this place I would like to express my great gratitude to Dr. Reinhard Ziegler who supported my work with methodical advices, technical equipment, and inspiring conversations.
[6] This work was part of the (unpublished) master thesis I wrote in 2002 at the Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters in Tübingen conducted by Prof. Dr. Dr. Hans-Peter Uerpmann, to whom I am deeply indebted. Among other things it contains some morphological descriptions and drawings.
[7] All conclusions were drawn with the great help of Peter Andrews' observations concerning the influence of different agents, among them various predators, on bones, published in 1990.
[8] Kasparek 1992.
[9] Krönneck 1996, Tab. 1.
[10] Fabiš 1995; 1996; 1999.
[11] Krönneck 2003.
[12] Riehl 1999a, b.
[13] Boessneck 1988, 62, 63.
[14] Lüttschwager 1968.
[15] Boessneck – von den Driesch 1975, 147.
[16] Boessneck 1977, 126.
[17] Tchernov 1970, 4*.
[18] Niethammer 1975, 406.

Bibliography

Andrews, Peter. 1990. *Owls, Caves and Fossils. Predation, preservation and accumulation of small mammal bones in caves, with an analysis of the Pleistocene cave faunas from Westbury-sub-Mendip, Somerset, UK.* London.
Boessneck, Joachim. 1977. Tierknochenfunde aus Išān Bahrīyāt (Isin), in: *Isin – Išān Bahrīyāt I. Die Ergebnisse der Ausgrabungen 1973–1974.* Bayrische Akademie der Wissenschaften. Phil. Hist. Klasse, Abhandlungen, N. F. 79. München. 111–133.
Boessneck, Joachim. 1988. *Die Tierwelt des Alten Ägypten*. München.
Boessneck, Joachim – Angela von den Driesch. 1975. Tierknochenfunde vom Korucutepe bei Elaziğ in Ostanatolien. (Fundmaterial der Grabungen 1968 und 1969), in: Loon, M. N. V. *Studies in Ancient Civilization, Korucutepe I.* Amsterdam. 1–201.
Fabiš, Marian. 1995. Animal bones from the classical city of Ilion (Troy), Turkey, in: Biutenhuis, H. – Hans-Peter Uerpmann (Eds.). *Archaeozoology of the Near East II. Proceedings of the second international symposium on the archaeozoology of southwestern Asia and adjacent areas.* Leiden. 105–108.

Fabiš, Marian. 1996. Archaeofaunal remains from the lower sanctuary. A preliminary report on the 1994 excavation, *Studia Troica* 6: 217–227.

Fabiš, Marian. 1999. Studies in hellenistic Ilion: The archaeofaunal remains of C29, w28 and y28/29, Lower City, *Studia Troica* 9: 237 – 252.

Kasparek, M. 1992. *Die Vögel der Türkei.* Eine Übersicht. Heidelberg.

Krönneck, Petra. 1996. Vogelknochen aus Troia. Ein Beitrag zur Umweltrekonstruktion, *Studia Troica* 6: 229–236.

Krönneck, Petra. 2003. Troian bird remains – Environment and Hunting, in: Wagner, Günther A. – Ernst Pernicka – Hans-Peter Uerpmann (Eds.). *Troia and the Troad: Scientific Approaches.* Berlin/Heidelberg/New York. 277–283.

Lüttschwager, J. 1968. Hamster- und Hausrattenfunde eines römischen Brunnens in Ladenburg, Landkreis Mannheim, *Säugetierkundl. Mitt.* 16: 37–38.

Niethammer, J. 1975. Zur Taxonomie und Ausbreitungsgeschichte der Hausratte *(Rattus rattus), Zool. Anz.* 194: 405–415.

Riehl, Simone. 1999a. Archäobotanik in der Troas, *Studia Troica* 9: 367–409.

Riehl, Simone. 1999b. *Bronze age Environment and economy in the Troad. The archaeobotany of Kumtepe and Troy.* BioArchaeologica 2.

Tchernov, E. 1970. Rodent Faunas and Changing Environments in the Upper Pleistocene of Israel, *Mi'tekufat Ha'even* 10: 1*–14*.

Uerpmann, Hans-Peter – Kirsten Köhler – Elisabeth Stephan. 1992. Tierreste aus den neuen Grabungen in Troia, *Studia Troica* 2: 105–121.

Uerpmann, Hans-Peter – Margarete Uerpmann. 2001. Leben in Troia. Die Pflanzen- und Tierwelt, in: *Troia. Traum und Wirklichkeit*. Ausstellungskatalog Stuttgart. 315–318.

Uerpmann, Margarete – Wim van Neer. 2000. Fischreste aus den neuen Grabungen in Troia, *Studia Troica* 10: 145–179.

Maria Ronniger M. A.
Institut für Ur- und Frühgeschichte
und Archäologie des Mittelalters
Arbeitsgruppe Archäozoologie
Rümelinstraße 23
72070 Tübingen
E-Mail: mronniger@web.de