

PLOUGHING IN MEDIEVAL TIMES ON THE TERRITORY OF PRESENT-DAY SERBIA

SZÁNTÁS A KÖZÉPKORBAN A MAI SZERBIA TERÜLETÉN

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Abstract

During medieval times the majority of the population in the territory of present-day Serbia dealt with agriculture, as evidenced by a number of farming tools found at archaeological sites. In this paper, ethnological, iconographic, textual, archaeological and archaeozoological evidence for the method of medieval tillage and the typological evolution of the plough are presented. Specific pathological changes in the distal parts of the limbs potentially caused by the intensive use of animals in draught work are also discussed. Two different types of ploughing devices – usually pulled by a pair of oxen were used – ralo (ard) and plug (mouldboard plough), in Serbia during the Middle Ages. Work-related pathologies were observed in faunal assemblages from two medieval sites dated to the second half of the 14th century.

Kivonat

Amint arról a régészeti lelőhelyeken talált földművelő eszközök számából következtethetünk a mai Szerbia területén a középkori lakosság zöme mezőgazdasággal foglalkozott. Cikkünkben néprajzi, képi és írott források, valamint régészeti és régészeti állattani leletek alapján tekintjük át a középkori talajművelés módszereit és az eke típusainak fejlődését. Megvitatjuk azokat a sajátos kóros elváltozásokat, amelyeket az ígásállatok végtagjainak disztális részein az intenzív munka okozhat. Szerbiában a középkor folyamán a szántásban két különböző típusú eszköz, a túróeke (ralo) és az ágyeke (plug) volt használatban. Ezeket általában egy pár ökör húzta. A munkavégzéssel kapcsolatos kóros elváltozások voltak megfigyelhetők két a XIV. század második felére keltezett középkori lelőhely régészeti állattani leletegyüttesében.

KEYWORDS: PLOUGH, PLOUGHSHARE, CATTLE, PALEOPATHOLOGICAL CHANGES, MEDIEVAL SERBIA

KULCSSZAVAK: SZÁNTÁS, EKEVAS, SZARVASMARHA, PALEOPATOLÓGIAI ELVÁLTOZÁSOK, KÖZÉPKOR, SZERBIA

Introduction

Agriculture was one of the most significant, if not the most important economic activity in medieval Serbia. The majority of the population was engaged in the production and processing of agricultural goods. Medieval farmers had used numerous and diverse tools which allowed them to perform different cultivation activities efficiently. Soil preparation for planting is one of the most important procedures, both in the cultivation of cereal grains and the production of other agricultural goods. In order to become suitable for planting any crops, soil had to be tilled first. Besides various hand tools (e.g. hoes, shovels, spades, pickaxes etc.), farmers also used animal-drawn ploughing devices. Previous studies dealing with agriculture and farming tools in medieval Serbia were based on ethnographic, historical, iconographic and archaeological records (Bratanić 1939, 1952, 1953, 1954; Благојевић 1973; Манојловић-Николић 2004, 2009, 2010, 2011). In this paper the afore-mentioned forms of evidence are summarized, while for the first time

paleopathological changes in cattle caused by draught exploitation are taken into the consideration as well.

Ethnographic and archaeological evidence

During medieval times two different types of plough were used in Serbia: one of them had a symmetrical ploughshare (**Fig. 1.a**) and was called *ralo* (ard), while the other had an asymmetrical ploughshare (**Fig. 1.b**) and was called *plug* (mouldboard plough). There were various kinds of the *ralo* depending on shape of its lower and middle part (Bratanić 1939). The components of the simplest, two-sided *ralo* (**Fig. 1.c**) were a draft-pole or beam, pierced by a thinner vertical stick called the head or body with one end being the handle, and the other a ploughshare that was dragged though the topsoil to cut a shallow furrow. The three-sided *ralo* (**Fig. 1.d**) had also a shorter beam pierced through the draft-pole and fixed in the head, which helped to control the depth of ploughing. The four-sided *ralo* (**Fig. 1.e**) also had this shorter beam, but the draft-pole was fixed directly to the handle.

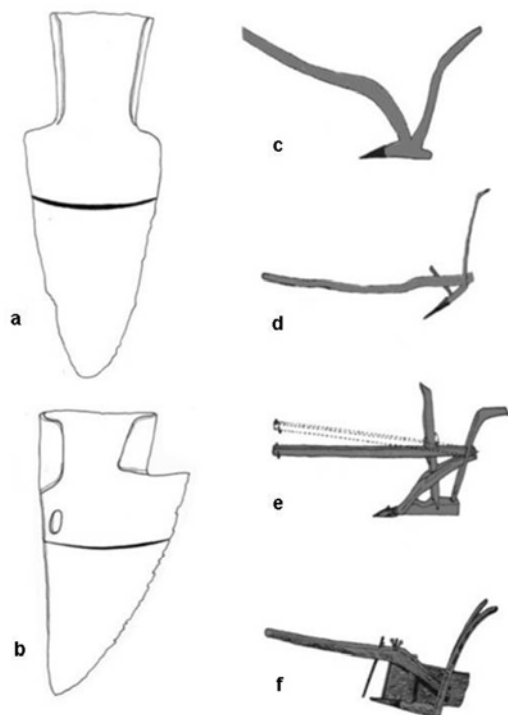


Fig. 1.: a) symmetrical ploughshare; b) asymmetrical ploughshare; different kind of the *ralo* – c) two-sided type, d) three-sided type, e) four-sided type; the *plug* – f) (from Bratanić 1939, fig. 39, 44, 10a, 28; Манојловић-Николић 2010, fig. 24/232, 28/269).

1. ábra: A *ralo* különböző típusai – a) kétoldalú típus, b) három oldalú típus, c) négy oldalú típus; a *plug* típusai – d); szimmetrikus ekevas – e); aszimmetrikus ekevas – f) (Bratanić 1939, fig. 39, 44, 10a, 28; és Манојловић-Николић 2010, fig. 24/232, 28/269 nyomán)

The plug (**Fig. 1.f**) had the same parts as the *ralo*, but there are some fundamental differences between them, although both were made of wood, except for the ploughshare which was made of iron. The plug had another iron part, the coulter or front blade, which was added to cut vertically into the soil just ahead of the ploughshare. Unlike the *ralo* and besides coulter, the plug also had two handles and a board which helped not only to cut furrows but also to turn the soil.

Although agriculture was the main economic activity in medieval Serbia, a relatively small number of shares and coulters are known from archaeological contexts. The reason for this is certainly to be found in the relative rarity of excavations at medieval sites, and in the fact that the hoe as a cheaper and easier tool for manufacturing was more accessible to poor rural households (Манојловић-Николић 2011). Up to date, 49 ploughshares were found at archeological

sites in Serbia, dated to the 9th–16th century, of which 43 were symmetrical, while only 6 asymmetrical. Similarly to asymmetric ploughshares, coulters are rarely found. Certainly their appearance is related to the later use of the plug in the region. To date only four coulters, dated to the 15th–16th century have been found (Манојловић-Николић 2010, 2011).

Textual and iconographic evidence

The earliest mention of the plug is in the muniment of the monastery devoted to Sveti Stefan of Banjska, dated to the late second half of the 14th century (Благојевић 1973; Манојловић-Николић 2009, 2010). Here, like in other monastic muniments from this period, the word *plug* marks oxen and ox-drawn devices used for ploughing in general, not the plug with asymmetrical ploughshare (Благојевић 1973). Information about the plug with asymmetrical ploughshare and coulter are given in texts from the Archives of Dubrovnik, from the late 14th and the 15th century. It would also be the earliest mention of the use of the plug in the region. The appearance of the plug at the end of 14th and the beginning of 15th century in Serbia was connected to the cultural influence of the Western Europe, and not of Byzantium in which the *ralo* has been the main ploughing implement through many centuries (Благојевић 1973). The plug did not suddenly replace the *ralo* which remained in use until quite recent times in some parts in Serbia (Благојевић 1973).

The oldest mention of the *ralo* is in the muniment of King Milutin from 1300, at the monastery of Sveti Đorđe, near Skopje, where the word "ralo" represents an areal measure of agricultural land (Благојевић 1973). The Dečani muniment of King Dušan mentioned the word "ralije" which means ploughing but only done by the *ralo*. Historical data indicate the use of *ralo* for ploughing in medieval Serbia during the 13th and 14th century (Благојевић 1973). The oldest written source in Serbian about the *ralo* as a tillage device is preserved in the Serbian translation of the Byzantine agrarian law from the 15th century (Благојевић 1973).

Iconographic evidence for the *ralo* is to be found in frescoes and miniatures. The *ralo* used during the 14th century was presented on three frescoes from the monastery of Dečani and one miniature from Munich or Serbian Psalter. The double-sided *ralo* is shown on all three Dečani frescoes. The most famous fresco presents how Cain and Abel offer a sacrifice to God (**Fig. 2**). In the lower part of the fresco Abel is shown among the flocks of sheep, while on the right side there is Cain ploughing using a one-handle plough with a symmetrical iron ploughshare pulled by a pair of oxen.



Fig. 2.: Sacrifice of Cain and Abel, Dečani monastery (Тадић & Чанак-Медић 2005, fig. 267)

2. ábra: Káin és Ábel áldozata, Dečani kolostor, (Тадић & Чанак-Медић 2005, fig. 267 nyomán)

Another presentation of the *ralo* is shown in the fresco depicting a scene from hell. A completely naked thief is shown in this picture; his hands are tied behind his back, while a millstone is hung of his neck and the *ralo* of both his legs. There is an inscription concerning the sinner "Who steals someone else's field" (Благојевић 1973; Манојловић-Николић 2011). The third fresco shows how St. George (Sveti Đorđe) resurrects Glikeriје's ox. Glikeriје was an inexperienced tiller and one of his oxen died, so on this fresco a pair of oxen, of which one lies and the other stands, are shown (Благојевић 1973). The frescoes of the Dečani monastery also provide chronological data for the *ralo* use in medieval Serbia which are in accordance with the historical and archaeological records. The Dečani frescoes date mostly to the period 1338/9-1343, and their painting was fully completed in 1347/8 (Манојловић-Николић 2011).

A different type of the *ralo* (three-sided type), more massive and similar in construction to the plug, is presented on the Munich miniature (Fig. 3). The tiller is walking with one of his hands on the handle of the *ralo* pulled by a pair of oxen. The difference in the times of creation of the Dečani frescoes and this miniature was 50 years, and in that time the plug appeared in medieval Serbia, although there is no iconographic evidence for it. The Byzantine miniatures from the 11th–12th century also show different types of the *ralo*, some of them similar in shape to the Dečani examples, indicating cultural influences from and connections with Byzantium (Благојевић 1973).

Based on textual and iconographic evidence the pair of animals which drew the *ralo* or the plug consisted exclusively of oxen of a local type, the so called Illyrian cattle (Буша), whose weight rarely exceeded 250 kg. The tractive power of these oxen was very modest.

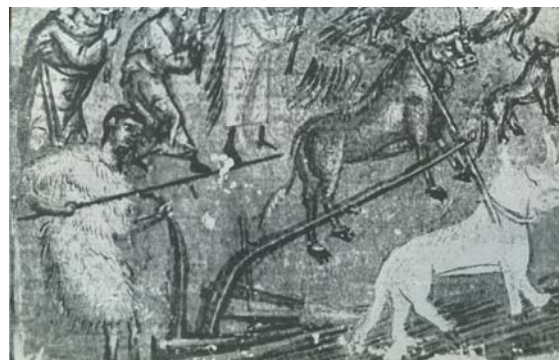


Fig. 3.: Agricultural works, miniature, Munich psalter (Острогорски 1969, fig. 4)

3. ábra: Mezőgazdasági munkálatok egy müncheni zsolttároskönyvből (Острогорски 1969, fig. 4 nyomán)

It should be emphasized that horses were never used for drawing the *ralo* or the plug in medieval Serbia in the iconographic sources available to date (Благојевић 1973).

Archaeozoological and paleopathological evidence

Domestic animals played a prominent economic role in the territory of present-day Serbia during medieval times. Sheep and goat husbandry had a greater significance in the hilly areas of Central Serbia (Блажић 1999; Blažić 1999; Булатовић & Марковић 2013). On the other hand, cattle was the most commonly identified species, followed in abundance by sheep, goat and pig at the archaeological sites from the northern part of country (Блажић 1995; Blažić 2005). The withers height of cattle from Serbia, dating from the 12th to the 15th century, ranged between 111 to 119 cm (Блажић 1995, 1999; Blažić 1999, 2005), which is in accordance with historical data concerning the small, local form of cattle.

Before mechanization the draught exploitation of cattle has been of great economic significance in the development of both tillage and transport. Cattle usage for pulling carts and ploughs resulted in alterations in their skeletons caused by mechanical stresses which they had been exposed to. Work-related pathological changes in cattle are usually found in lower part of limb bones (metapodial bones and phalanges). The ability to recognize the bones of working animals in archaeozoological materials is of great significance in reconstruction of economic activities (Bartosiewicz et al. 1997).

Research on paleopathological changes in animal skeletons from archaeological sites in Serbia are at the beginning, and so far there are only a few studies dealing with this topic (Марковић 2013; Marković et al. 2014/in press).

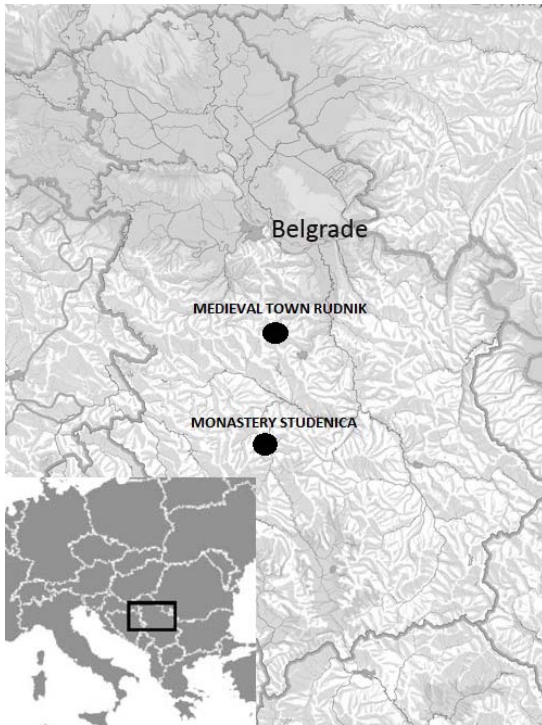


Fig. 4.: Location of the medieval sites - Rudnik town and Studenica monastery

4. ábra: A vizsgált középkori lelőhelyek – Rudnik és Studenica



Fig. 5.: Proximal phalanx of cattle with pathological changes, Studenica monastery, second half of the 14th century

5. ábra: Szarvasmarha proximális ujjperc kóros elváltozásokkal, Studenica kolostor, (XIV. század második fele)



Fig. 6.: Middle phalanx of cattle with pathological changes, Rudnik town, second half of the 14th century

6. ábra: Szarvasmarha középső ujjperc kóros elváltozásokkal Rudnik városából (XIV. század második fele)

This is not surprising, given that there are only a few archaeozoological reports based on materials from medieval sites in Serbia (Bartosiewicz 1996; Vlažić 1999, 2005; Блажић 1995, 1999; Булатовић & Марковић 2013). Up to date pathological changes related to traction are found in cattle bones from two medieval sites in Serbia, dated to the second half of 14th century – Rudnik town and Studenica monastery (**Fig. 4, Table 1**). The animal economy at the Studenica monastery was dominated by caprines (58.1% NISP, NISP= 1401). Based on the number of identified specimens domestic pig was the second most frequent species (20.9%) followed in abundance by domestic cattle (11% NISP). The prevalence of adult individuals (67% were older than four years) in the survivorship curve for domestic cattle together with pathological alterations in some bones (3% of 159 cattle bones) indicate the use of animals for traction. Marković et al. (2014/in press) noticed five proximal phalanges with pathological alterations (**Fig. 5**) in the faunal assemblage from Studenica monastery. Two different types of deformation were defined: exostoses near the proximal or distal articular surface, as on lateral side, and depression on proximal articular surface of phalanges. Depressions in the articular surfaces of bovine phalanges are relatively common in archaeological material (Baker & Brothwell 1980). Articular depression noticed in cattle metapodials and phalanges from medieval and early modern domestic cattle from England and Neolithic domestic cattle from Denmark are interpreted as a result of osteochondrosis, heredity and/or environmental factors (Thomas & Johanssen 2011). The authors of this article found distal exostoses in one cattle middle phalanx from the medieval town of Rudnik in central Serbia (**Fig. 6**).

Table 1.: Cattle phalanges with pathological changes, stage according to Bartosiewicz et al. 1997**1. táblázat:** Szarvasmarha ujjpercek kóros elváltozásokkal. Fokozatok Bartosiewicz et al. 1997 nyomán

Site	Species	Element	Pathological findings	Stage
Monastery Studenica	<i>Bos taurus</i>	proximal phalanx	proximal and lateral exostosis	3
		proximal phalanx	proximal, lateral exostosis and articular depressions	3
		proximal phalanx	proximal and distal exostosis	2
		proximal phalanx	articular depressions	-
		proximal phalanx	articular depressions	-
Rudnik	<i>Bos taurus</i>	middle phalanx	distal exostosis	3

Results of the analysis of the Rudnik town assemblage has shown that sheep and goats are the most frequent taxa (47.7% NISP, NISP= 216), followed in abundance by domestic cattle (24.5% NISP) and domestic pig (14.4% NISP). Survivorship for domestic cattle indicates that the majority of bones (91%) were of the individuals older than two years, but given that it was based on the epiphyseal fusion of only 26 bones, mortality data should be taken with caution. Also, given the small size of sample the relative frequency of cattle older than four years which might be indicative for draught use remains unknown.

Conclusion

During medieval time the majority of the population on the territory of present-day Serbia dealt with agriculture. Present data based on different kind of evidences (textual, iconographic, archeological, and ethnological) allowed the reconstruction of one specific agricultural activity – tillage. These data enabled obtaining the vivid picture about ploughing devices, their form and animals involved in this process. The team of animals which drew the ralo or the plug consisted exclusively of oxen of local race (Buša). Archaeozoological researches, especially paleopathological in this case, are also of great importance for gaining better information about draught animals. Work-related pathologies caused by intensive use of animals for traction of cart or plough, were found in cattle bones from two medieval sites in Serbia – the Studenica monastery and Rudnik town.

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