



Ancient mining from southwest Bulgaria (based on data from Archaeological information system “Archaeological Map of Bulgaria”)

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ABSTRACT

The subject of this paper is a review of the archaeological sites associated with ancient ore mining and metallurgy, located in Southwest Bulgaria. The information for this type of sites is drawn mainly from the data recorded in the Archaeological information system “Archaeological Map of Bulgaria” (AIS AKB), as well as from academic publications on the topic. The region under study includes archaeological sites located on the territory of three administrative districts in Bulgaria – Pernik, Kyustendil and Blagoevgrad.

The vast majority of sites associated with ore mining are found in the Kraishite region, situated in today’s Pernik and Kyustendil districts and partly in Republic of Serbia and Republic of North Macedonia. The presence of gold, lead, copper, silver and iron deposits was appreciated already in ancient times, and their exploitation became a major livelihood for the local population. Most numerous are the sites dated to Antiquity, followed by sites from the Middle Ages, but the extraction of precious metals along some rivers may be dated to the Bronze Age as well. There are only a few sites where traces of both mining and metallurgical production are found. The places where slag is registered comprise mainly settlements and the materials discovered are rather from the manufacture of metal items than metal extraction.

KEYWORDS

Ancient mining, Ancient metallurgy, Southwest Bulgaria, Archaeological information system “Archaeological Map of Bulgaria” (AIS AKB)

Introduction

The subject of this paper is a review of the archaeological sites associated with ancient ore mining and metallurgy, located in Southwest Bulgaria. The information for this type of sites is drawn mainly from the data recorded in the Archaeological information system “Archaeological Map of Bulgaria” (AIS AKB), as well as from academic publications on the topic. So far, there is no such summary work presenting all of the known sites connected to ore mining and processing in this part of the country.

The region under study includes archaeological sites located on the territory of three administrative districts in Bulgaria – Pernik, Kyustendil and Blagoevgrad (fig. 1). This southwestern part of the country borders to the west with Serbia and North Macedonia, and to the south with Greece. The terrain is predominantly mountainous covering over 70 % of the area. The mountains Pirin, Maleshenska, Ograzhden, Belasitsa, Slavyanka, Osogovo, Vlahina, parts of Rila, Vitosha and Western

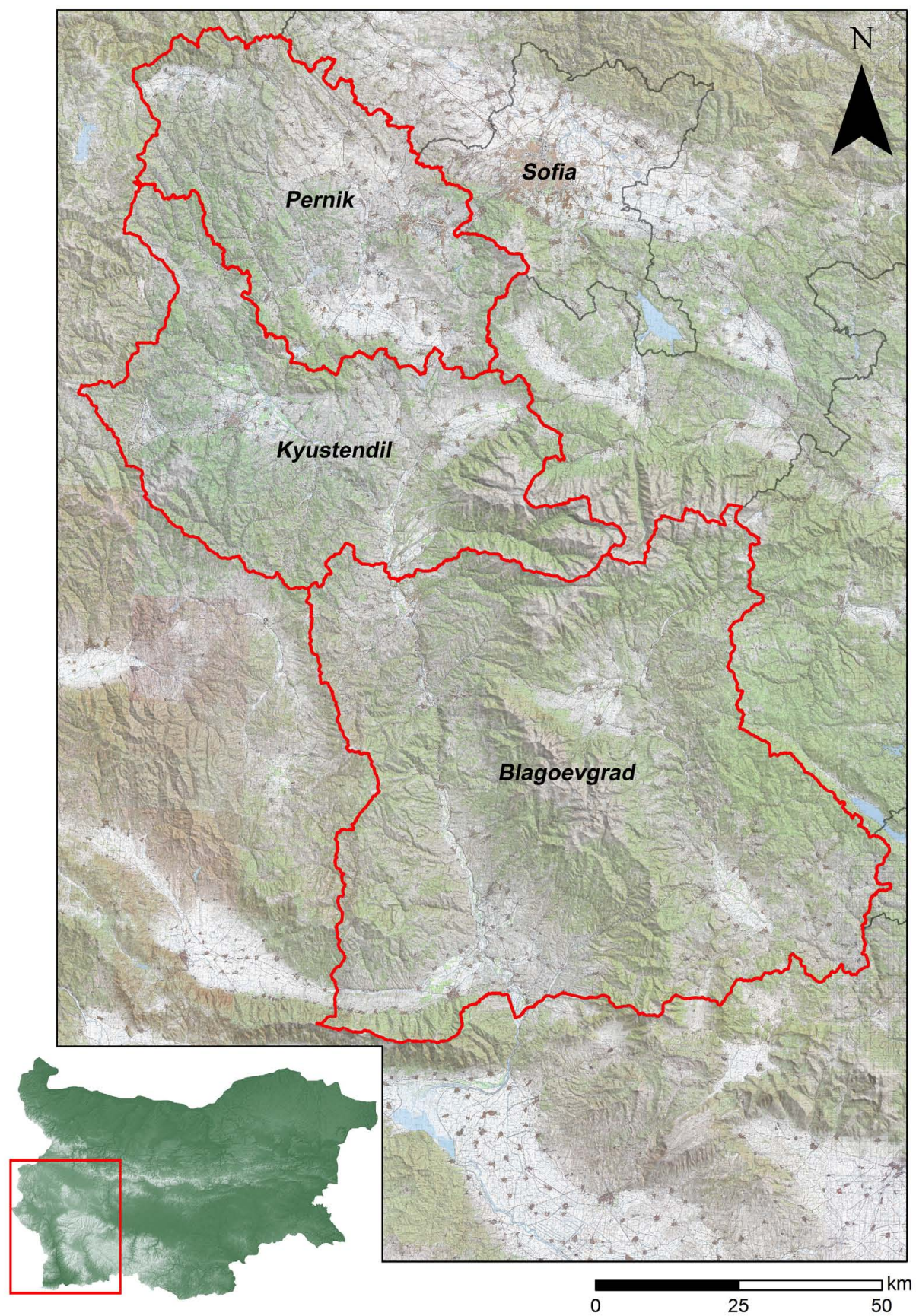


Fig. 1. Map of the studied regions – the administrative districts of Pernik, Kyustendil and Blagoevgrad (figure by I. Cholakov)

Rhodope are situated here, as well as the Kraishte area which includes the Ruysko–Verilska and Milevsko–Konyavska mountain ranges. The water resources are diverse with the rivers Struma, Mesta, Dragovishtitsa, Dzherman, Erma and their numerous tributaries being the most important. The climate is humid continental, with a strong Mediterranean influence in the southern parts of the region. Although much of the area is hilly, there were suitable conditions for habitation since antiquity.

The development of settlements, especially along the upper course of the Struma River, is to a large extent related to the exploitation of ore deposits. The area is rich in gold-bearing sands, deposits of lead, gold, zinc, copper, silver and iron ores. This largely determines part of the local livelihood. As early as the Chalcolithic, mining and ore processing has started, as well as the production of various types of metal and its end products. Initially, the ancient miners exploited only the secondary, placed deposits such as the sedimentary rocks deposited by running waters. That is realised mainly by panning off the gold-bearing sands along the river valleys. With the advance of technology and knowledge and the increasing need for metals, the exploitation of root ore deposits took place, initially only as open-air and later as underground workings. The most common traces of ancient mining discovered during field surveys represent piles of waste material. These are the so-called dumps, which formed during the ore deposits mining. Remains of ancient open-air ore mining are recorded more rarely. These represent negative forms on the rock surface, typically with a linear structure. They usually follow the ore seam on the land surface. The ancient miners processed and crushed the rock material into fractions suitable for the subsequent stages of mining. The ancient underground workings, such as shafts and galleries, also follow the ore body, but at greater depth they follow the base rock. Today, in most cases these galleries are inaccessible or destroyed by modern mining. Determining the chronology of this type of sites is difficult because of the frequent lack of dating artefacts. Their association with a certain period of exploitation is based mainly on the discovered pottery vessels, coins and, rarely, mining equipment and tools.

The term metallurgy often refers to ore mining. However, the actual process represents the extraction of metal from the ore through heat treatment (Stoychev 2012, 168). The immediate vicinity of the ore mines usually contains furnaces, in which this process was carried out. Most often, the traces of mining and metal production recorded on the surface are in the shape of slags. They are found not only in places situated close to the ore deposits but also in settlements where the end products were manufactured, as is evident by various metal items.

Sources of data and state of research

The topic of ancient mining and metallurgy is widely examined in Bulgarian academic literature. Many scholars have studied the mining and metallurgy in Bulgaria through the ages. This is also the main topic of three symposiums on mining and metallurgy in Southeastern Europe, held in the country in different years¹.

In addition to the academic literature, there is information about sites associated with ancient mining and metallurgy in the AKB information system. The archaeological map has existed since 1992 as a system for the collection and storing of data about archaeological sites. So far, it contains information for over 25 800 sites and represents the most complete data register of Bulgaria's archaeological heritage. The main part of the data is acquired by field surveys. In recent years, the principle of full-coverage survey in a given area was established in targeted expeditions for registration

1 "First symposium on the History of Mining and Metallurgy in Southeast Europe", Varna, November 3–6, 1975; "Second Symposium on the History of Mining and Metallurgy in Southeastern Europe", Chiprovtsi, November 10–12, 1988; International Symposium "Metallurgy in Southeast Europe from Antiquity to the end of the 19th century", Sozopol, September 26–30, 2005.

of archaeological sites. With that end in view, a uniform methodology of field survey and recording of the investigated area is applied, using Geographic Information Systems (GIS) (Nekhrizov 2018, 197–198).

The archaeological field surveys, carried out in the three administrative districts under review, are with different intensity, and this has been reflected in the data collected in the AKB information system. By the end of 2024, there are 3403 registration cards entered for the districts of Pernik, Kyustendil, and Blagoevgrad (fig. 2). Thirty-eight of these sites are associated with ancient ore mining and metallurgy, while slag is recorded in 105 of them. In recent years, several expeditions related to large scale infrastructure projects were carried out in the three districts such as the construction of “Lyulin” and “Struma” highways or observations along the routes of the national electricity and gas network. In addition, archaeological field surveys were carried out in the region in the second half of the 20th c. as part of different academic projects. These include the investigations of the Bulgarian–Polish expedition “Struma” in the late 1970s lead by M. Domaradski. The area surveyed includes the Strumeshnitsa River valley, the southern slopes of Ograzhden Mountain and the lower part of the northern slopes of Belasitsa Mountain. These surveys are the first attempt at a full-coverage of the surveyed area. The results are published as a catalogue of sites located in the lands of the modern settlements, together with information about excavations if such took place (Domaradski et al. 2001). In the 1970s, several expeditions were carried out in the middle Struma valley led by Ts. Dremsizova-Nelchinova, aimed at creating a State Register of the Archaeological Monuments in Bulgaria. The discovered archaeological sites are published as part of a catalogue (Dremsizova-Nelchinova 1987). The continuation of the “Struma” expedition, now only with Bulgarian participation, was carried out between 2009 and 2012 under the supervision of B. Atanasov and I. Kulov (Atanasov et al. 2010; 2011; Kulov et al. 2013). The emphasis was on the northern parts of the middle Struma valley between the towns of Sandanski and Kresna, including also the Kresna gorge. Field surveys were carried out again in the region between Belasitsa and Ograzhden in 2016–2018 together with data verification by Lidar recording as part of the Archaeological Map of Bulgaria project led by L. Vagalinski, N. Kecheva and I. Cholakov (Vagalinski et al. 2017; Vagalinski, Kecheva 2018; Kecheva 2019). The field surveys in Simitli municipality took place within the same project (Zlatkov et al. 2018). In the 1960s and early 1970s, L. Slokoska and Ts. Dremsizova-Nelchinova conducted field investigations and registration of archaeological sites in Kyustendil district, the results of which were published (Dremsizova-Nelchinova, Slokoska 1978). In the last decade of the 20th c., field surveys covering the entire district were carried out. These were realised by V. Genadieva and S. Chohadzhiev, and as a result, approximately 800 archaeological sites were recorded (Genadieva, Chohadzhiev 2002; 2003). A considerable part of the sites is associated with ore mining and metallurgy. Like Blagoevgrad and Kyustendil districts, activities for the localisation and registration of archaeological sites took place in the Pernik district in the 1970s under the supervision of D. Mitova-Dzhonova. As a result, a catalogue of these monuments was published (Mitova-Dzhonova 1983). Other field surveys were carried out by I. Velkov, V. Lyubenova and V. Paunova. Contrary to the other two districts, the field surveys here are just a few and covering only limited areas. Developer-led field surveys were conducted in the last few years. Most often these are concession areas intended for modern ore mining (Kecheva, Tsvetkova 2015; Mihaylov 2017a; 2017b; Paunova 2017). Surveys connected particularly to ancient ore mining in Pernik district were carried out in 2006 and 2007 led by A. Cholakova. They include parts of the Erma River valley and the slopes of Ruy Mountain (Cholakova 2007; 2008a). A review of local copper ore deposits and their earliest exploitation was made by F. Mihaylov. He mapped these deposits, together with copper tools finds from the Upper Struma valley, and suggested that during the Chalcolithic small communities were engaged in the extraction and processing of copper (Mihaylov 2008, 38–39, fig. 1).

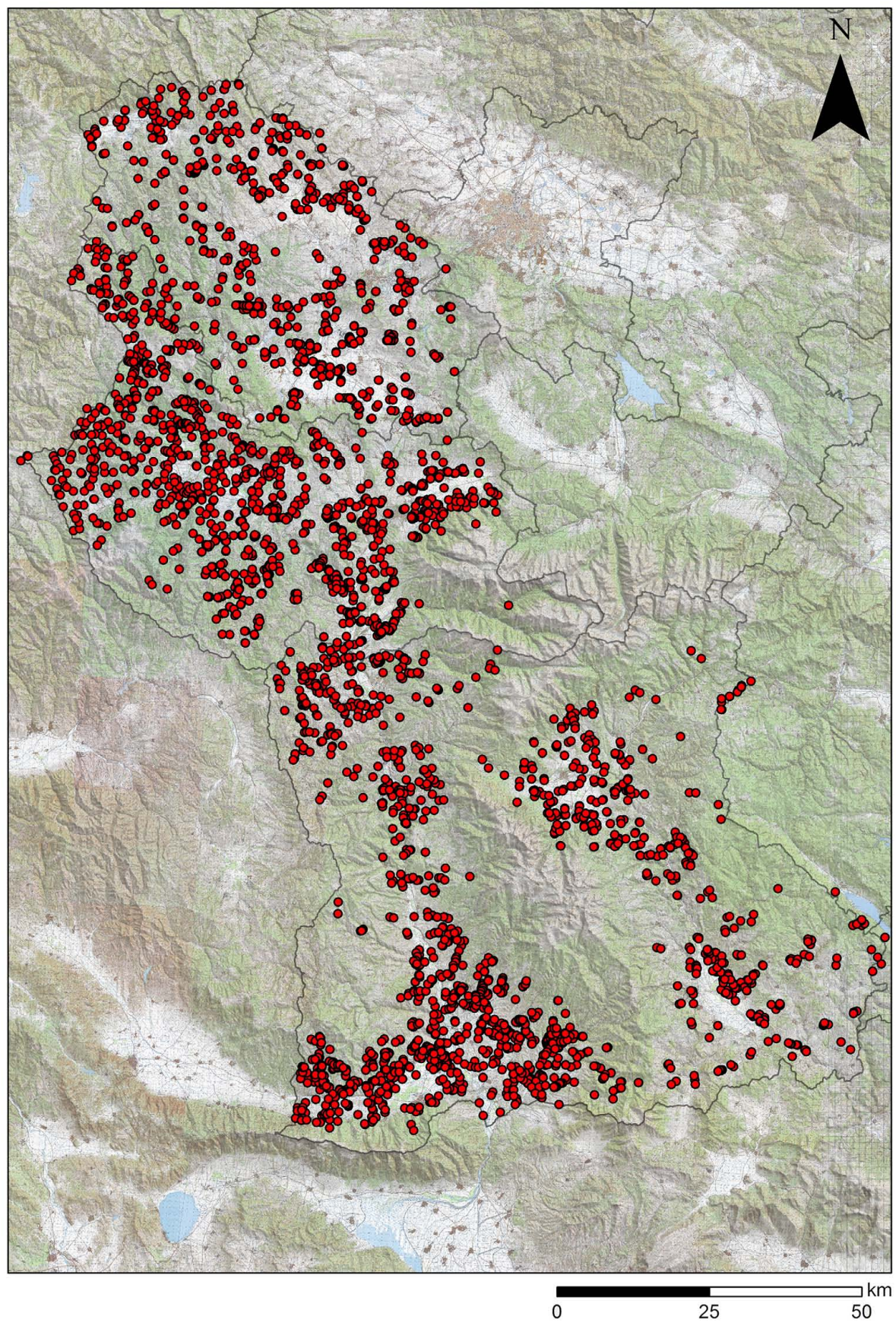


Fig. 2. All archaeological sites in the AKB database, registered in the districts of Pernik, Kyustendil and Blagoevgrad (figure by I. Cholakov)

Review of archaeological sites

1. The northern and eastern part of the Kraishte area, southern part of Ruy Mountain and western part of Lyulin and Vitosha Mountains. Upper course of the Struma River. Pernik district.

The sites related to ancient mining and metallurgy will be examined from north to south. In the AKB information system, nine such sites are registered in Pernik district (fig. 3). This area includes the northern and eastern part of the Kraishte area, the southern part of Ruy Mountain, the western part of Lyulin and Vitosha Mountains, as well as the areas along the upper Struma River. The ore deposits in the Tran region are known in the academic literature. They are situated in the northernmost part of the Kraishte area and have been exploited in Antiquity and the Middle Ages. They are located near the modern villages of Mramor, Busintsi, Glogovitsa, Vukan, Zabel, Turokovtsi, Milkyovitsa, Mislovshitsa, Kozhintsi, Gorochevtsi and Erul (Gaul 1942, 401; Gerov 1961, 253, 329; Nenov 1994, 120; Avdev 2005, 195). Mainly silver, lead and gold were mined, and the exploitation in Roman times was particularly extensive. During this period, the region fell within the urban territory of *Pautalia* (today's town of Kyustendil), and probably many of the inhabitants of the ancient settlements and villas were engaged in this kind of activity (Katsarova 2005, 150, obr. 65, 273).

There are five archaeological sites with traces of ancient ore mining in the areas around the village of Zabel, Tran municipality. Three of them are stone piles and embankments of open mine workings, one is a hole and the last one is a ruined entrance to a mine gallery (Mitova-Dzhonova 1983, 83; Cholakova 2007, 628; 2008a, 767; Paunova 2017, 665). They all are associated with the ancient ore mining in Ruy Mountain. In the AKB information system, there is only one registration card referring to all sites around the same village. A Roman villa-residence near the village of Zabel has been partially studied, whose occupation has a direct connection to ore and metal mining. An epigraphic monument discovered in its vicinity – a dedicatory inscription associated with the *Aufidii* – reveals a family of large mining concessioners from the third quarter of the 2nd c. AD. The connection of this family to the residence has been discussed by various scholars, some of whom argue that the villa belonged to the other notorious family of mining concessioners – the *Antonii* from the end of the 2nd c. AD (Mitova-Dzhonova 1983, 187; Gerov 1961, 370, nos 227–230; 1965, 72).

There are two registered sites in the AKB information system in Tran municipality, referring to the villages of Erul and Turokovtsi. According to their author V. Lyubenova, these are traces of ore mining from Antiquity and the Middle Ages. D. Mitova-Dzhonova mentions gold mines in the vicinity of Erul, however, they are not described in the district catalogue (Mitova-Dzhonova 1983, 80). In the same publication, there are references to an antique gallery in the Slavi dol locality, near the village of Turokovtsi. It is located close to an antique settlement and a villa estate prompting the author to assume that they are interrelated. The villa probably belonged to one of the mining concessioners (Mitova-Dzhonova 1983, 169).

The last site registered in the AKB information system from the Tran municipality is near the villages of Kashle and Dolna Melna. It is described as traces of ore mining and presence of negative forms on the surface and is not mentioned in the academic literature. A fortified site from the Iron Age and Late Antiquity is registered around the village of Divotino, Pernik municipality. It is located in the Chuchuly locality, on the western slopes of Lyulin Mountain. The description in the AIS AKB registration card includes the presence of iron ore. Ore processing at this place during Late Antiquity is also mentioned in the academic literature (Mitova-Dzhonova 1983, 63). There is data for ancient ore mining in present-day Breznik municipality, but sites have not been recorded (Gerov 1961, 253).

The remaining sites associated with ore mining from Pernik district are located on the western and southwestern slopes of Vitosha Mountain. Late antique and medieval fortress is registered in the

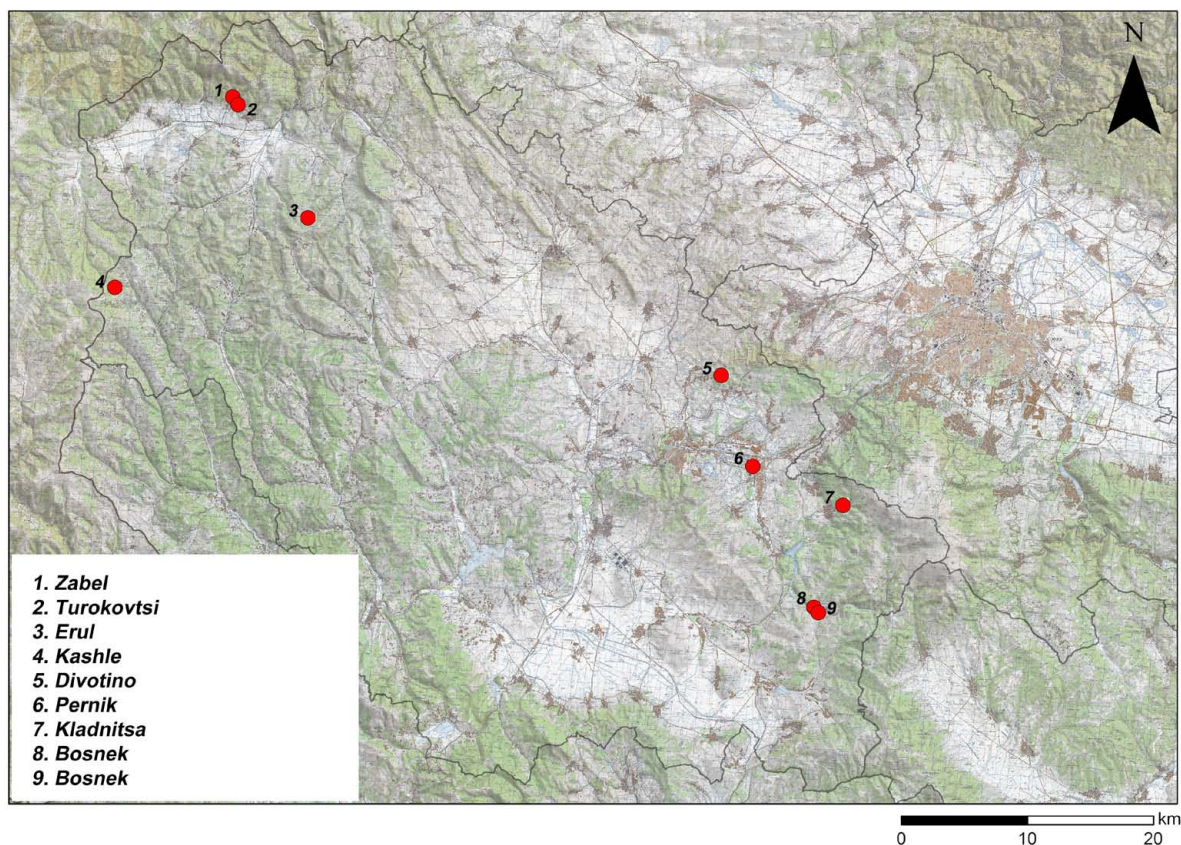


Fig. 3. Archaeological sites associated with ancient ore mining and metallurgy in the AKB database, registered in the district of Pernik (figure by I. Cholakov)

AKB information system, near the village of Kladnitsa. It has been discovered during a field survey by P. Deliradev in 1926 (Deliradev 1926, 99). Materials associated with metal production have been found and the site is situated near the ore mining regions of the Vitosha mountain (Velkov 1955, 89; Mitova-Dzhonova 1983, 95). Around 3 km to the southeast, in the Golemo Gradishte locality, there is a fortress mainly occupied during the Late Antiquity. It is also likely that it was connected to the mining and metallurgy practiced in the area (Pencheva 2018, 485–487). There is evidence of ancient mining and metallurgy, especially of iron ore, in the vicinity of the villages of Bosnek and Chuypetlovo (Velkov 1955, 88–89; Georgiev 1978, 117; Mitova-Djonova 1983, 27–28, 178; Pencheva 2018, 487). Two of the sites near the village of Bosnek have registration cards in the AKB information system. Both are located in the Gramagye locality and are linked to ore mining and panning of precious metals. B. Gerov also mentions the exploitation of ore deposits on the western slopes of the Vitosha mountain and along the upper reaches of the Struma river. He notes this activity near the villages of Studena, Kladnitsa, Krapets, Popovo, Chuypetlovo and Bosnek, as the extraction of iron and gold was carried out in Antiquity and the Middle Ages (Gerov 1961, 254). S. Avdev has authored a description of the ancient gold mining near Sofia, paying attention to the mining and gold panning at the foot of Vitosha mountain (Avdev 1988, 120–121; 2005, 117–123). T. Nenov also mentions the extraction of placer gold from the Vitosha rivers near Sofia (Nenov 1994, 120). For the large amount of slag left from the ancient metallurgy we can judge by the fact that, according to the AIS AKB registration card, in the second half of the 20th c., part of it was transported for processing in the “Stomana Industry” steelworks in Pernik.

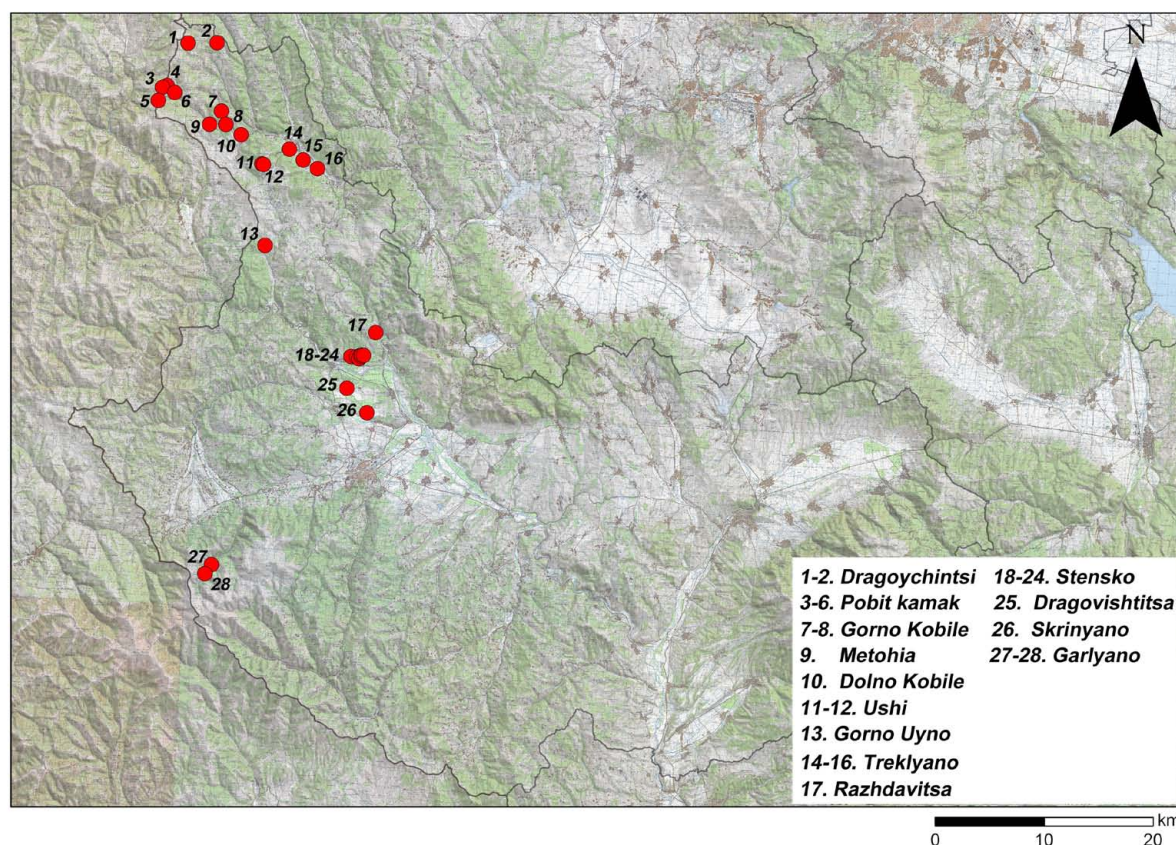


Fig. 4. Archaeological sites associated with ancient ore mining and metallurgy in the AKB database registered in the district of Kyustendil (figure by I. Cholakov)

2. Kraishte area. Osogovo Mountain. Upper course of the Struma River. Kyustendil district.

The present-day territory of Kyustendil district covers a large part of the geographical area of Kraishte. This territory also includes the Osogovo and Vlahina mountains, the northwestern part of the Rila mountain, as well as the valleys along the upper reaches of the Struma River and its tributaries. In Kyustendil district there are twenty-eight registration cards in the Archaeological Map of Bulgaria of sites associated with ancient ore mining (fig. 4). Most of these are located in the geographical area of Kraishte which is rich in gold, lead, zinc, copper, silver and iron ores. At the end of the 19th c. K. Irechek became the first author to mention the ancient mines in Kraishte. He describes the lead and silver extraction in the village of Gorna Lyubata and of gold and iron in the village of Bozhitsa (Irechek 1974, 641–662). Both villages are currently situated in the Pčinja district in the Republic of Serbia. J. H. Gaul also mentions these and other deposits, together with the gold panning along the Struma River valley (Gaul 1942, 400–401). The most comprehensive study of the Kraishte area is the geographic and ethnographic works by Y. Zahariev. He describes every settlement in detail and people's livelihood including also the ore mining in the past (Zahariev 1918). According to B. Gerov, the growth of settlements in the upper Struma valley is connected with the ore exploitation in the area. Besides the already mentioned deposits, he describes the extraction of gold, silver and copper in Osogovo Mountain, and the gold panning in the area of Radomir and Dupnitsa. The author refers to ancient galleries and workshops for gold processing, situated near the village of Gorno Uyno, Kyustendil district (Gerov 1961, 251–252). E. Maksimov also mentions a large amount of processed material from the gold mining in the areas of the villages of Gorno Uyno and Dolno Uyno (Maksimov 1972, 121). An indication for the exploitation of the old galleries in the region during the 3rd c.

AD is a coin of Julia Domna discovered in the mine workings (Zahariev 1918, 276; Gerov 1961, 252; Kolev 1975, 77). There are coins of *Pautalia* from the time of *Marcus Aurelius Severus Antoninus Augustus* (211–217), on which the local livelihood is depicted, including ore mining and gold panning off (Ruzicka 1933, Taf. VI, 19; Gerov 1961, 265; Kolev 1975, 76). On a coin from *Pautalia* of *Lucius Septimius Severus* (193–211), a river god representing *Strymon* (today's Struma River), accompanied by a genius, who is panning the gold from the river (Velkov 1972, 31). The presence of military fortresses during the Roman and Late Antique periods in the lands of the urban territory of *Pautalia* may be associated not only with the roads' protection but also to the strategically important ore mines in Kraishte, Osogovo and Ruy Mountains (Katsarova 2005, 274).

The oldest copper ore extraction in the Struma river basin is reported by S. Chokhadzhiev. The deposit is located near the town of Boboshevo and was used during the Chalcolithic. The pure copper at the top of the deposit was exploited in the Early Chalcolithic followed by the extraction of the copper in depth (Chohadzhiev 1998, 14).

The level of technical skills of the ancient miners can be assessed by the remains of ancient gold mining along the Struma, Dragovishtitsa and Uyneshtitsa rivers. The beginning of panning and mining of precious metals here may be dated to the Bronze Age. The analysis of waste materials from the mining facilities of the ancient miners demonstrates a relatively high level of gold in them. From a contemporary point of view, the results indicate not very high efficiency of the gold mining. This is probably due to the low technical and technological level of the ancient facilities, the high levels of groundwater in the workings, and the extraction of only large and relatively easily enriched gold fractions (Tsintsov 2018, 61–65).

An attempt for the periodization of the gold mining in Kyustendil district was made. The earliest prehistoric workings are situated in the region of the village of Garbino. There, the processed rock material is returned to the trenches. In pre-Roman times the extraction was mainly from placer gold along the rivers. There are also workings where the processed material was thrown out of the holes. Traces of such activities are observed in the region of the village of Treklyano. In Roman times the scale of extraction was greater, shafts and galleries were used, mainly in the region of the villages of Kopilovtsi, Shishkovtsi, Razhdavitsa, Perivol and Sovolyano. In the Middle Ages along with panning, mining by underground workings played a major part. At that time the deposits in the region of the village of Dolno Uyno were actively exploited (Vitov 2007, 439–442).

Half of the registration cards in the AKB information system associated with ore mining in Kyustendil district are located in the territory of the Treklyano municipality. The municipality falls within the Kraishte area, the terrain is mountainous with the Bazovichka, Metohiyska, Kosovska, Cheshlyanska and Treklyanska rivers passing through it. The field surveys in the municipality demonstrate a big concentration of traces of ancient ore mining. Such are discovered in the Kamaka locality, northwest of the village of Dragoychintsi. They represent stone piles and burnt strata found in trenches made by treasure hunters. Traces of waste materials are recorded also in the Klyuch locality, neighbourhood of Zlon dol, with some of the piles being approximately 20 m long. There is information for the presence of two furnaces for smelting of iron ore (Genadieva, Chohadzhiev 2002, 29). In the vicinity of the village of Pobit kamak there are several sites associated with ancient ore mining. In the neighbourhood of Shatkovitsa, there are shallow galleries, stone piles of waste material and one mining ditch 10 m wide and up to 3 m deep (Genadieva, Chohadzhiev 2002, 33–34). These sites are situated immediately next to the border with the Republic of Serbia and continue on the other side of the frontier. In the Kaludzherov dol locality, to the southeast of the Metohia village, two mining ditches are registered and there is information for the existence of a furnace for iron there (Genadieva, Chohadzhiev 2002, 33). In the lands of the village of Gorno Kobile, there are preserved traces of mining. According to Y. Zahariev, during the Late Medieval period iron ore was mined and processed

in the Manastir locality. Mining ditches are preserved which, according to the author, supplied water from the region of the village of Metohia. The name of the eastern part of the same hill – Zlatarevi rupi, also implies the extraction or tossing of precious metals. In the Rupye locality, village of Gorno Kobile, there are preserved traces of ore mining on a large scale – deep trenches and large stone piles (Zahariev 1918, 475; Genadieva, Chohadzhiev 2002, 20). In the Stroilitza locality, village of Dolno Kobile, waste materials of ancient ore mining are recorded, some of which are up to 25 m long and 5 m high. There are also large pits on the site, which probably resulted from the exploitation of open mine workings (Zahariev 1918, 477; Konyarov 1953, 118; Genadieva, Chohadzhiev 2002, 26). Traces of open mine workings are recorded near the village of Ushi in the shape of trenches in the rocks and large stone piles. Some of the trenches are approximately 100 m long and up to 15 m wide (Genadieva, Chohadzhiev 2002, 43). In the Zlatarevi rupi and Sveta voda localities, to the southeast of the village of Treklyano, there is evidence of ancient ore mining covering an area of over 10 ha. There are two other sites with the same characteristics in the lands of this village. These are ancient dumps in the Todorova and Vrashintsi neighbourhoods, and according to the excavators, some reach up to 7 m in height (Dremsizova-Nelchinova, Slokoska 1978, 30; Genadieva, Chohadzhiev 2002, 42). Y. Zahariev mentions traces of ancient ore mining – in the Mlektse locality, to the southwest of the village of Treklyano, there are numerous pits, stone piles and traces of large mining ditches. The author refers to the presence of “samokov” for the production of iron raw material which functioned until the last quarter of the 19th c. AD in the vicinity of the village of Gabreshevtsi (Zahariev 1918, 499).

All of the remaining sites from the district associated with ore mining are located on the territory of Kyustendil municipality. Known from the literature and field surveys are the ancient ore workings near Gorno Uyno village. In the Kretsul locality, to the north of the village of Gorno Uyno, there are large stone dumps – the result of ancient gold mining. Gold panning continued in the region until the end of the 19th c. AD. Preserved antique mine galleries are registered also during field survey in the Kakarazin dol locality, and in one of these the already mentioned coin of Julia Domna was found (Zahariev 1918, 275–276; Genadieva, Chohadzhiev 2002, 21). Several Antique and Late Antique settlements and cemeteries are known in the region of the village, probably related to the ancient ore mining (Dremsizova-Nelchinova, Slokoska 1978, 15–16). In the area of the Razhdavitsa village, mining workings are registered during field survey, possibly associated with gold extraction. In the Dvete Chukleta, Kasapski dol and Bulino loze localities, near the village of Stensko, several dumps were recorded during field surveys, probably from ancient ore mining. Their height varies from 2.5 to 9 m and their length is between 15 and 50 m (Georgieva et al. 1981, 23–24). Some of them have a mound shape, others are elongated. They are situated on low terraces north from the village along small tributaries of the Dragovishtitsa River. In the Belata cheshma locality, near the village of Dragovishtitsa, there are traces of ore mining over an area of circa 20 ha (Peev 1980, 52). The stone piles are probably connected to ancient gold mining as well. Similar is also the site located to the northwest of the Skriniano village. Stone piles from ancient dumps covering approximately 15 ha were registered during a field survey, probably deriving from gold extraction. The last two sites from Kyustendil district associated with ore mining are located in the Srebarno kolo locality near the village of Garlyano. They represent ancient galleries situated along the Bistritsa River and at the foot of Tash Tepe Peak in Osogovo Mountain. There are many examples for Antique and Medieval ore mining in the western part of the mountain, in the regions of Kratovo and Zletovo in the Republic of North Macedonia (Keramitchiev 1977, 108; Donevski 2017, 65–68). Silver, lead and copper were extracted in the mines at Srebarno kolo locality. Besides the galleries, numerous stone piles, building foundations, as well as the remains of a furnace for iron ore smelting have been registered. The ore deposit was probably used in pre-Roman times, as evident by the coin of Philip II of Macedon

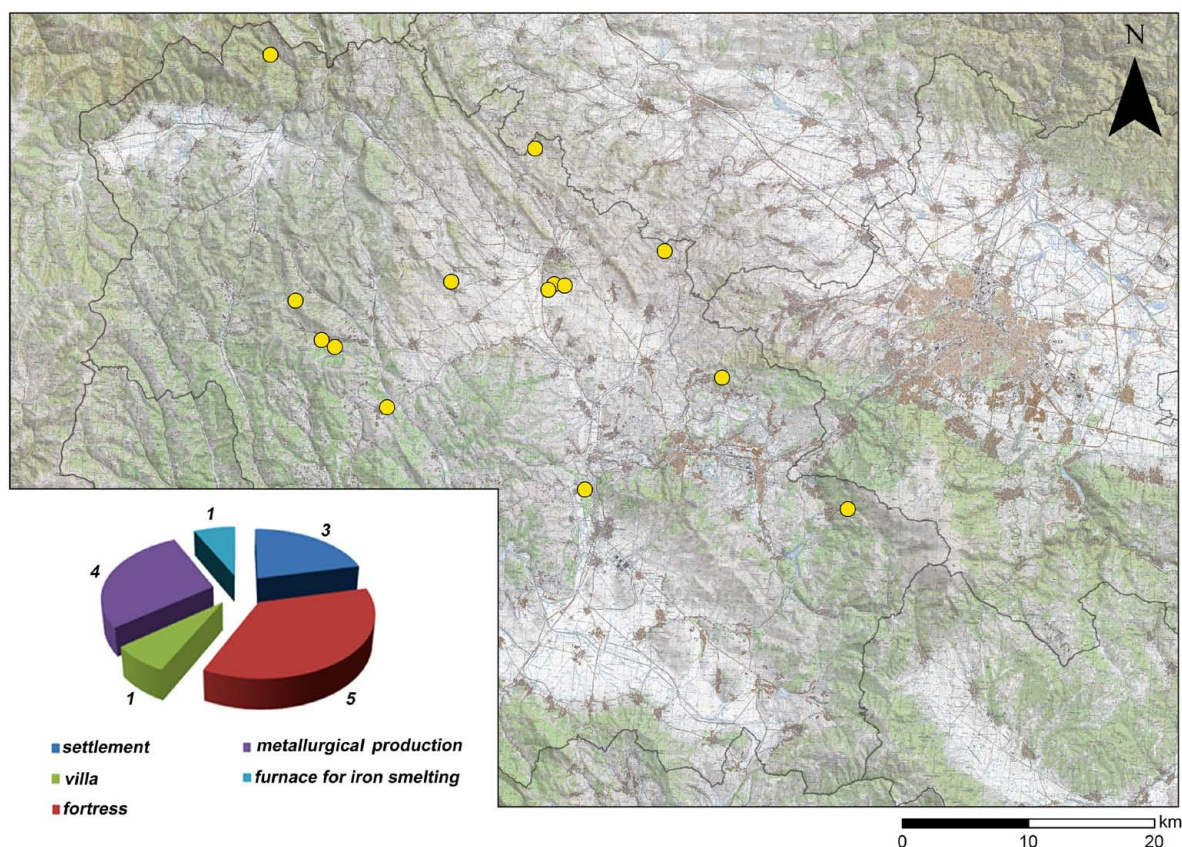


Fig. 5. Archaeological sites with discovered slag in Pernik district, sorted by type (according to the AKB database) (figure by I. Cholakov)

discovered here (Genadieva, Chohadzhiev 2003, 14). There was an active extraction of lead-zinc ore in the vicinity of these two sites from the 1950s until the 1980s.

3. Middle Struma and Middle Mesta rivers, Pirin Mountain, southern parts of Rila Mountain, northern slopes of Slavyanka and Belasitsa Mountains, eastern parts of Maleshevska and Ograzhden Mountains and western parts of Rhodope Mountain. Blagoevgrad district.

The territory of Blagoevgrad district covers parts of the Rila, Pirin, Rhodope, Belasitsa, Maleshevska, Ograzhden and Slavyanka mountains. It also includes the valleys of the Middle Struma and Middle Mesta rivers. The number of field surveys with full-coverage is the greatest in Blagoevgrad district. However, there are no sites associated with ore mining. The only such site, registered in the AKB information system, is located near Dolna Ribnitsa village, Petrich municipality. Despite the presence of copper ore in the region, the site type remains uncertain. It is possible that ore mining took place along the valley of the Middle Mesta river as a source of raw materials for the metallurgical activities carried out in the settlement near Koprivlen (Popov 2004, 35–36). The almost complete lack of sites related to ancient ore mining in Blagoevgrad district is surprising, since geological surveys show that the region is not poor in metal ores, especially in the valley of the Mesta River, the northern slopes of Slavyanka Mountain, the eastern, southern and western slopes of Pirin Mountain, the southern parts of Rila Mountain and Western Rhodope Mountain (Popov, Popov 2019, fig. 2; Petrunov 2002, fig. 282).

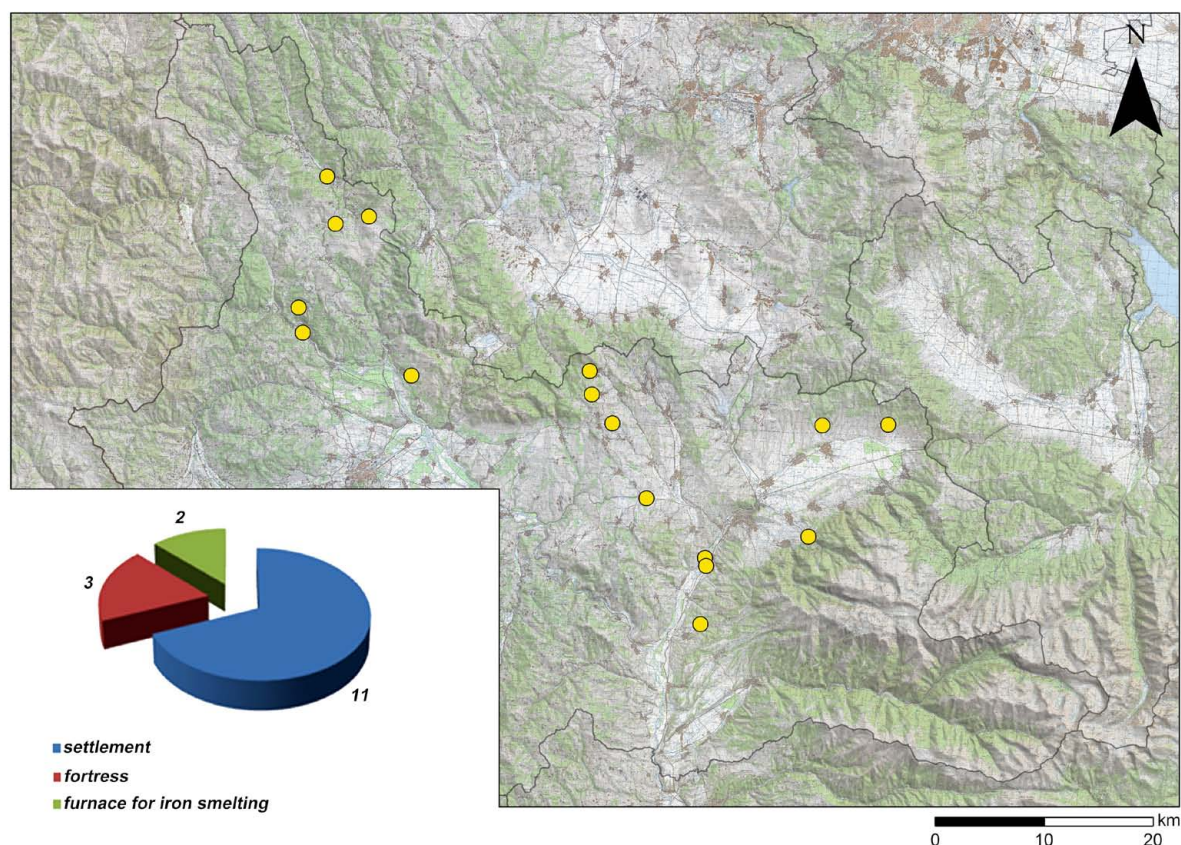


Fig. 6. Archaeological sites with discovered slag in Kyustendil district, sorted by type (according to the AKB database) (figure by I. Cholakov)

Data on ancient metallurgical production

In an archaeological context, the reconstruction of the ancient processes of metallurgical production, can be only based on the available evidence of heat treatment for metal extraction and processing. The most informative and frequent finds are the slags, which are specific wastes and by-products, and are usually obtained during the primary and secondary forging of iron (Cholakova 2008b, 117–118). Information about archaeological sites where slag has been found in the study region is available in the AKB information system. In most cases, the sites descriptions do not distinguish whether the slag is from metal mining or from its processing.

Fourteen such sites are registered in Pernik district. Of these, three represent settlements; five are fortresses; one is a farm estate or a villa; four are defined as associated with metallurgical production, and one is a furnace for iron smelting (fig. 5). The dates vary from the Iron Age to the Late Middle Ages.

In Kyustendil district there are 16 sites. Eleven of them are settlements, three are fortresses and two are defined as furnaces for iron smelting (fig. 6). Their dates vary from the Early Iron Age to the Late Middle Ages.

One of the oldest workshops related to metallurgical production in the Balkans has been discovered in the Blagoevgrad district. It is located in the Late Neolithic settlement of Topolnitsa-Pro-mahon, and native copper was used as the raw material (Todorova, Dimitrov 2005, 8). Blagoevgrad district also has the largest number of sites with registered slag – 75. Fifty-six of them represent settlements, 11 are fortresses; two are associated with metallurgical production; three are cult structures

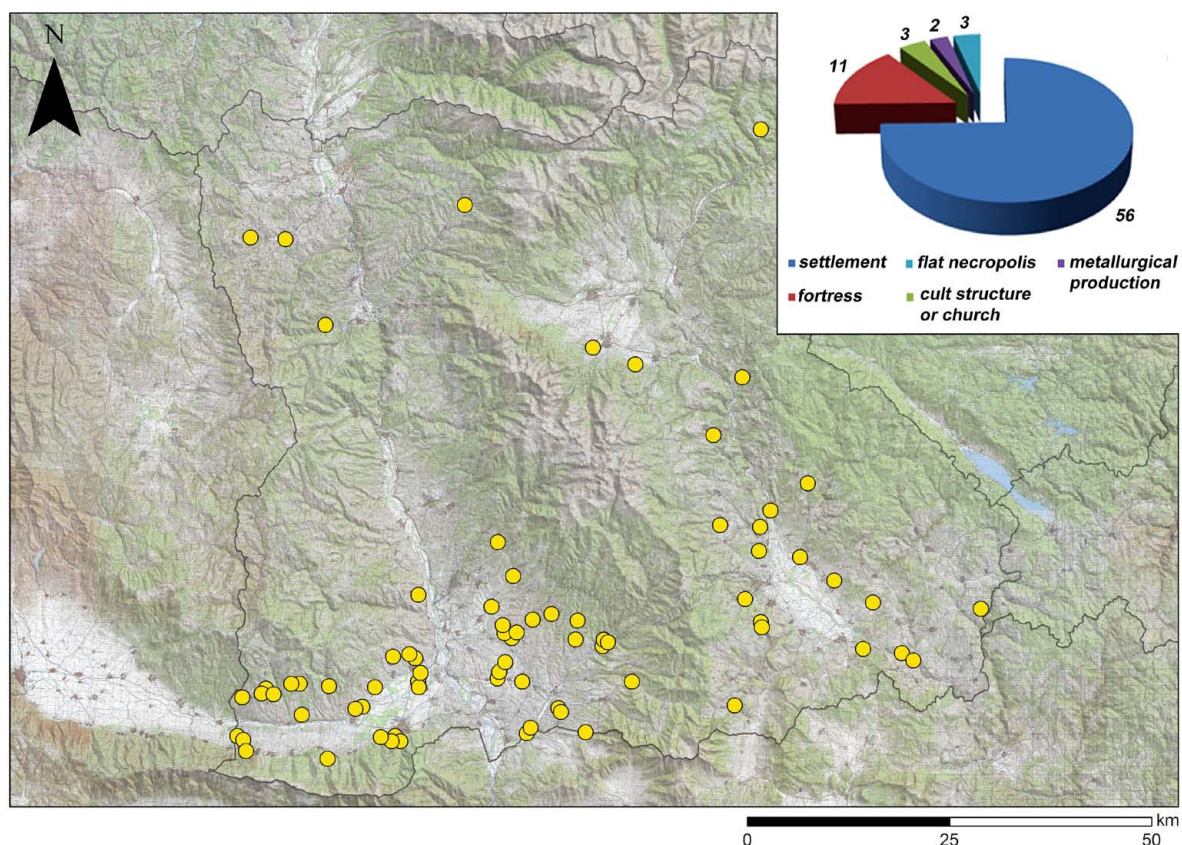


Fig. 7. Archaeological sites with discovered slag in Blagoevgrad district, sorted by type (according to the AKB database) (figure by I. Cholakov)

or churches and three are flat cemeteries (fig. 7). The dates vary from the Bronze Age to the Late Middle Ages, with the sites from Antiquity being predominant. A large part of the sites is located in Marvashko – an area covering the Middle and South Pirin, Slavyanka and Stargach mountains, where from the 17th until the beginning of the 19th c. AD there is a well-developed iron production (Georgiev 1953).

Conclusions

After the review of the data for ancient ore mining and metallurgy in Southwest Bulgaria, the following conclusions can be drawn:

The vast majority of sites associated with ore mining is found mainly in the Kraishte area, situated in today's Pernik and Kyustendil districts. The presence of gold, lead, copper, silver and iron deposits was appreciated already in ancient times, and their exploitation became a major livelihood for the local population.

Most numerous are the sites dated to Antiquity, followed by sites from the Middle Ages, but the extraction of precious metals along some rivers may be dated to the Chalcolithic and Bronze Age as well. The great number of sites from the Roman period is not surprising. A purposeful central policy for the use of these resources was implemented at that time, and most of the data, including epigraphic and numismatic, derive from this period.

The almost complete lack of sites associated with ancient ore mining in Blagoevgrad district is surprising, as modern geological studies show that there are deposits of polymetallic ores in the

region, especially in the area of Slavyanka, Pirin, Rila and Western Rhodope Mountains. It is possible that the ancient miners were unaware of some of these deposits or did not have the opportunity to develop them.

There are only a few sites where traces of both mining and metallurgical production are found. The places where slag is registered are mainly settlements and the materials discovered are rather from the manufacture of metal items than metal extraction.

Despite the large number of sites recorded in the three regions, there are still blank spots where a full-coverage field survey is required. This will allow the assembling of as complete data as possible about the archaeological sites located in Southwest Bulgaria.

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