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CHARCOAL IN ROMANIA DURING HISTORY-AN ANCIENT MATERIAL FOR MODERN TIMES

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ABSTRACT

This paper traces the history of charcoal production and use in Romania, shedding light on the country's industrial development and forest-based economy. Research on Romanian charcoal is scarce, and available data are limited, making this study an important contribution to the European forest by-products database. Drawing on national documentary sources, the paper identifies historical regions of charcoal production, examines the evolution of production techniques, and highlights several contemporary producers. It also provides a concise overview of the current charcoal market, demonstrating the material's enduring relevance from past to present.

Keywords: charcoal, Romania, history, manufacturing, metallurgical industry

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INTRODUCTION

Romania has long been recognised for its abundant forests and wood resources. These essential resources have declined over time as human civilisation developed and the demand for wood and forest products increased. Today, approximately 27% of the country's land area is forested, with over 70% of the trees being broadleaf species (https://ro.fsc.org/ro-ro/padurile-din-romania). By contrast, during the Dacian era (c. 1st century BCE), more than 70% of the land was covered by forests, dominated by oak trees (Giurescu, 1976).

Due to this historical reduction in forested areas, many woodlands are now legally protected (https://ananp.gov.ro/ariile-naturale-protejate-ale-romaniei/).

Charcoal is the solid residue that remains when wood is „carbonised" or „pyrolysed" under controlled conditions in a closed space, such as a charcoal kiln. During pyrolysis or carbonisation, air entry is carefully controlled so that the wood does not burn completely to ash, as in a conventional fire, but instead decomposes chemically to form charcoal. The most common methods for producing charcoal can be classified into two groups:

- Traditional methods – These are generally simple. One example is the mound method, in which 1–2-meter-long pieces of wood are stacked above the ground and covered with earth. Pit kilns, used since ancient times, are another traditional method. Today, however, kilns made of reinforced concrete, bricks, or metal have replaced basic mound kilns in

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some regions, such as South America and Asia, due to the growth of the steel industry.
- Modern methods – These involve closed retorts and well-designed, safe equipment (FAO, 1983).

For mound kilns, the carbonisation process typically follows several stages:
- heating – from ambient temperature to 100°C
- dehydration – occurring between 100°C and 120°C
- exothermic stage – beginning at 270°C and reaching 500–700°C when carbonisation is complete
- cooling: the chimney is removed, and the mound is hermetically sealed (FAO, 1983).

The main raw materials for charcoal production are dense, slow-growing, and highly lignified broadleaf trees, which yield high-quality charcoal. In Europe and Romania, the most commonly used species are beech, oak, and hornbeam, although other species such as elm and ash are also utilised.

Charcoal production in Romania has a long history dating back to antiquity. The Carpathian Mountains, rich in forests, have supported charcoal production since ancient times, and the mound method remains one of the most common techniques today. This paper examines Romania's main geographical areas historically associated with charcoal production, particularly during the well-documented post-16th- and 17th-century periods. The charcoal industry was closely tied to the metallurgical sector, which expanded in western Romania during the 18th and 19th centuries, although charcoal was also produced in several northern and central regions. Today, many former production sites lie within legally protected forest areas, and the craft itself is increasingly rare.

The main objectives of this paper are:
- to compile key historical information on charcoal production in Romania, addressing the lack of previous studies on this forest by-product and the fact that existing data are limited and scattered across various sources
- to assess the current status of charcoal production as a craft and identify the locations of manufacturing centres across Romania
- to contribute to the European charcoal database, thereby enhancing knowledge of forest by-products throughout the continent.

METHOD

The study was based on a literature review and involved three main steps:
- understanding the material and the methods of its acquisition
- identifying areas of charcoal production and use, and situating this information within a geographic and chronological framework
- highlighting the significance and relevance of the material in a contemporary context.

Sources were drawn from books and journals on history, archaeology, wood civilisation, and industry, available through the national digital library. This information was compiled into a comprehensive overview of the history of charcoal, making structured knowledge more accessible to a wider audience. The geographical focus of the study was on the country's mountainous regions, where wood resources suitable for charcoal production are available.

RESULTS

A short history and geography of charcoal as an ancient material

Romania, as a forest-rich country, has a distinctive history of charcoal production. The most commonly used species are beech, oak, and hornbeam. Charcoal production has been primarily linked to the steel industry. While some producers still use traditional mound kilns today, more environmentally friendly methods involving modern retorts are increasingly employed. Recent research (Florescu et al., 2018; Mindrescu et al., 2023) revealed evidence of fire activity and charcoal presence in the Northern Romanian Carpathians – Rodna, Maramureș, and Bucovina – dating back approximately 11,000 years BP. In Tăul Mare (Maramureş), moderate fire activity was recorded between 3,000 and 2,300 years BP, with significant variation over the last 700 years. Archaeological discoveries in the Botoșani-Ghilănești-Cristești area have uncovered traces of medieval charcoal production sites (Emandi et al., 1994).

Archaeological evidence from the Dacian era (1st century BCE) indicates the use of clay kilns for iron production, which operated using charcoal as fuel

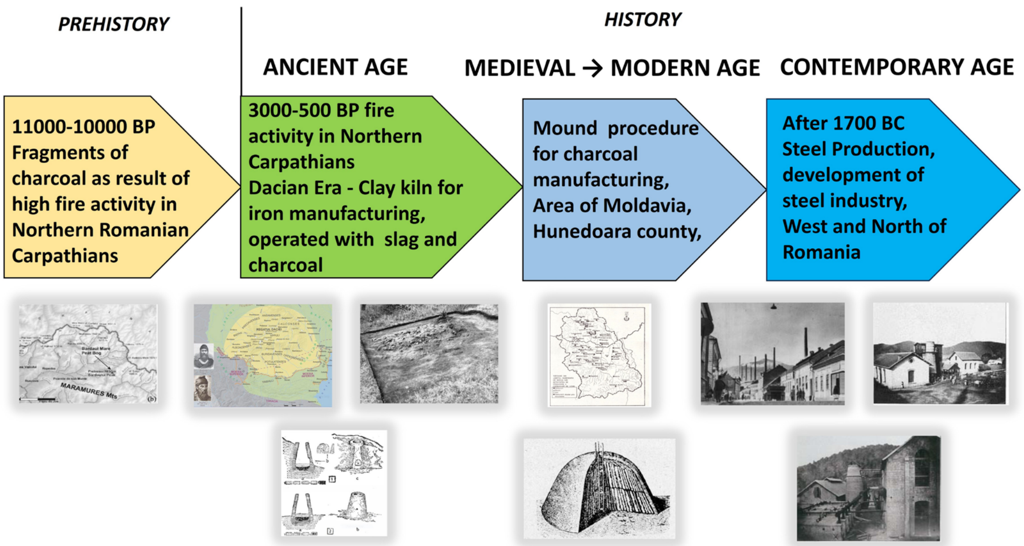
(Bujor and Rosu, 1968; Glodariu and Iaroslavschi, 1979; Ilies, 2004; Dragota, 2014).

Charcoal was closely linked to iron ore exploitation, and from the 16th century, evidence indicates its use in mineral extraction and processing in Hunedoara County. By the mid-19th century, mineral coal gradually replaced charcoal, although it continued to be employed in some regions, such as Moldova, for copper extraction using fire-assisted ore displacement (Olteanu, 1959; Lazar, 1984–1985).

In the 18th century, with the growth of ironworking, the practice of charring wood for charcoal developed near iron processing centres, particularly in Beiuş-Bihor County. In 1757, charcoal burners were recorded near Resita, laying the groundwork for Romania's future steelmaking hub. From the 19th century until 1920, the Anina iron and steel factory operated a blast furnace using two-thirds charcoal. By the end of the 19th century, forest resources in Hunedoara had diminished due to increasing demand, with 2,000 tons of charcoal produced from 300,000 hectares of forest (Lazar, 1984–1985; Graf, 1997; Zoltan, 2016; Fenesan, 2019; Riposan and Stan, 2019).

At the beginning of the 20th century (1905), approximately 23 major charcoal suppliers and 38 smaller producers supplied ironworks (Lazar, 1984–1985). Despite competition from mineral coal, the craft persisted, with two factories producing charcoal and wood distillation products noted in Reşiţa and Anina during the interwar period. Under communism and subsequent industrialisation, charcoal production continued near forest exploitation areas in Timiş, Alba, Hunedoara, Caraş-Severin, and Gorj counties. In 1980, Hunedoara alone had 26 charcoal-making sites, producing 4,000 tons annually (Lazar, 1984–1985). The industry gradually declined across the region: the last manufactory in the Căliman Mountains operated until 1970–75; in Bistra Mureşului, until the 1970s–1980s; in Bihor County, until the 1980s–1990s; and in the Groşii Ţibleşului Mountains, until the 1980s (Lengyel, 2012).

Figure 1 illustrates how charcoal has been produced and used in Romania over time. The second and third rows of the figure show the geographical distribution and main types of charcoal kilns, as well as images of the first steel manufacturing factories in the western part of the country.



Maps and illustrations from sources: Bujor and Rosu (1968); Lazar (1984–1985); Domide and Valeanu-Iaroslavschi (1997); Zoltan (2016); Riposan and Stan (2019); Florea (n.d.).

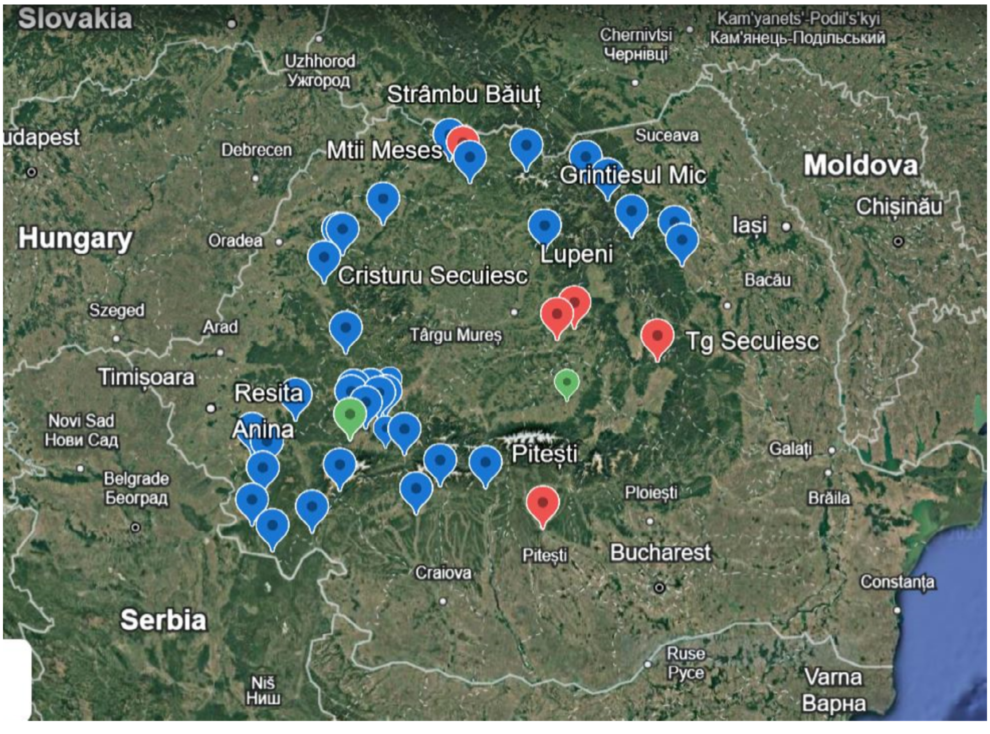
Fig. 1. Historical periods of charcoal manufacturing and its applications
Ryc. 1. Okresy historyczne wytwarzania węgla drzewnego i jego zastosowań

Today, charcoal manufacturing is very rare. Most areas that were once famous for producing charcoal are now legally protected as national parks, where this activity is prohibited. Additionally, the National Agency for Environmental Protection ensures compliance with pollution standards and works to safeguard the environment for present and future generations.

In Romania, a few charcoal producers are still active. The most well-known are located in Lupeni–Harghita and Cristuru Secuiesc, including Coal Dust SRL (since 2002; Carbun.ro CoalDust Srl, n.d.), Comlinex Nyiko SRL (since 1991; Comlinex Nyiko s.r.l., n.d.), and SC Halupex SRL (since 1992, Halupex Srl, n.d.), which export to Germany, France, Italy, England, Hungary, and Switzerland. In Strâmbu Băiuț-Maramureș, a family association produces charcoal, while in Pitesti-Arges, Letea Energo Prest SRL (since 2013; Letea Energo Prest, n.d.) operates both as a producer and importer. The common methods for producing charcoal are mound kilns and retorts.

To provide an overview of the primary historical and current charcoal manufacturing regions in the country, a map of Romania has been created, highlighting these locations (Fig. 2). The map illustrates that points of interest are predominantly concentrated in mountainous areas, particularly in the southwestern part of the country.

There are also other small producers and importers in the country. According to the Report on the Charcoal Market, Romania experienced a significant decline in its wood charcoal market in 2024, following four years of growth. In that year, Ukraine became the largest supplier of wood charcoal to Romania, accounting for 68% of total imports. Poland ranked second, with a 6.8% share of total imports, closely followed by Nigeria, also with a 6.8% share. Conversely,



Blue and green dots indicate historical production centres, while red dots represent current production areas.
Na niebiesko i zielono oznaczono historyczne centra produkcyjne, natomiast na czerwono – współczesne obszary produkcji.

Fig. 2. Map of charcoal production in Romania over time
Ryc. 2. Mapa produkcji węgla drzewnego w Rumunii w ujęciu historycznym

the United Kingdom, Hungary, and Moldova were the largest markets for Romanian wood charcoal exports, collectively representing 75% of total exports (IndexBox, 2025).

Charcoal: The Material of Modern Times

While charcoal has traditionally been used as fuel in metallurgy and food preparation, today it is increasingly viewed through the lens of sustainability and environmental responsibility.

In agriculture, biochar – a product derived from the pyrolysis of biomass – enhances soil fertility and promotes microbial activity (Biochar, n.d.).

In the pharmaceutical industry, activated charcoal was studied by Luisetto et al. (2023). In recent years, it has also become a popular ingredient in cosmetic products. Owing to its absorbing properties, it is used in various beauty products, including face masks, cleansers, and soaps (Sajjad et al., 2021). Additionally, the use of activated charcoal or biochar as a feed additive can improve animal health and feed efficiency (Ayankoso et al., 2023).

CONCLUSIONS

Romania, a country with extensive forests, has a distinctive history of charcoal production. This study is among the first comprehensive national reviews of the industry, offering new insights into European charcoal manufacturing through an analysis of national and local practices within their historical contexts.

Although some producers still rely on the traditional mound method, more environmentally friendly retorts are increasingly in use. The number of production sites has declined, largely due to environmental concerns and the establishment of protected areas.

Today, charcoal remains a relevant material, available in various forms: barbecue charcoal, briquettes, industrial-grade charcoal, bio-farm charcoal, biochar (used as an organic fertiliser), organic animal-feed additives, and natural wood paints.

Preserving and promoting the tradition of charcoal production as part of cultural heritage conservation can benefit society by strengthening historical awareness and demonstrating the value of learning from the past to improve the future.

Preserving and promoting the old tradition of charcoal production, as part of cultural heritage conservation, will impact society by deepening historical consciousness and appreciation of the importance of learning from the past to improve life in the future.

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WĘGIEL DRZEWNY W RUMUNII NA PRZESTRZENI DZIEJÓW – STAROŻYTNY MATERIAŁ WE WSPÓŁCZESNYCH CZASACH

ABSTRAKT

Celem artykułu jest przedstawienie krótkiej historii produkcji i wykorzystania węgla drzewnego w Rumunii, która ułatwia zrozumienie ewolucji i profilu przemysłowego kraju. Ponieważ w Rumunii nie prowadzono dotychchczas badań nad węglem drzewnym, a dostępne informacje są ograniczone, niniejsze opracowanie ma szczególną wartość i stanowi istotne uzupełnienie europejskiej bazy danych produktów ubocznych gospodarki leśnej. Jest to oryginalne studium oparte na krajowych źródłach dokumentacyjnych, które przedstawia ważne informacje dotyczące tradycyjnych regionów geograficznych produkcji i wykorzystania węgla drzewnego w różnych okresach historycznych. Obejmuje ono również ewolucję metod produkcji oraz wskazuje kilku współczesnych producentów. Artykuł zawiera także krótki przegląd rynku węgla drzewnego.

Słowa kluczowe: żywica, smoła drzewna, Włochy, tradycyjne leśnictwo, archeologiczne kleje, smoła brecka, terpentyna modrzewiowa