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A ROLE YET TO BE UNVEILED: BALKAN CRIMSON IN TRADE BETWEEN DUBROVNIK AND FLORENCE

Abstract: This paper discusses the Balkan trade in crimson pigment used for dyeing textiles—a topic that has been partially overlooked or, in some cases, only marginally addressed in previous studies. One section of the study outlines the dye's production process, identifies the geographical origin of the source insects, describes the textile dyeing technique, and analyzes the advantages of crimson pigment over more affordable alternatives. Previously proposed hypotheses suggest the existence of a specific ecological niche—or a variant of the insect—potentially endemic to the banks of the Sava River west of Belgrade, from which the pigment may also have been obtained. Building on these premises, the paper critically examines the role of Balkan trade in the distribution and commerce of this dye. By tracing procurement records in the account books of two prominent Florentine trading companies, Cambini and Salviati, the study partially reconstructs the crimson pigment trade from the Balkans, which was facilitated through Dubrovnik by both Ragusan and Italian merchants.

Keyword: 15th century, Dubrovnik, Venice, Florence, the Balkans, dyestuff, crimson, kermes, trade.

Towards the mid-13th century in old Rascia, roughly between what is now Kosovo and central Serbia, the mining industry began to flourish – an activity that spurred the rise of settlements with urban character. Little is known about this urbanisation, which was neither Byzantine nor Adriatic in nature. The most reliable studies emerged within Serbian historiography, because in Belgrade, since the 1930s, the foremost specialists in Ragusan medieval documents were trained; these documents, in the

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absence of autochthonous sources, came to be regarded as the only useful means for understanding the Bosnian and Serbian territories. Dubrovnik established strong economic ties with the vast Balkan hinterland as early as the 13th and 14th centuries, and there was scarcely a mine or marketplace without a Ragusan community or colony within it.

Serbia met the demand for metals arriving from Venice, Florence and the broader Italian area through the commercial mediation of Ragusa, and the beneficial effects of metallurgy marked an unprecedented development of urban fabrics across the Balkan region.[1] First, settlements sprang up close to the mines, and thereafter towns emerged as marketplaces. The principal studies on this phenomenon originated in the Serbian academic circle starting from the 1950s onward, building upon the work of Konstantin Jireček,[2] the father of Balkan historical studies. Of key importance are the works of Mihailo Dinić, published between 1955 and 1962, on medieval Serbian and Bosnian mining,[3] followed by numerous works of Desanka Kovačević Kojić, whom we honour in this volume, alongside notable works by Sima Ćirković and Ruža Ćuk.[4] In particular, the works of Desanka Kovačević Kojić, resulting from an intense research effort spanning several decades, asserted that the development of the mining districts had been undoubtedly instrumental in bringing about an urban transformation in regions of the western Balkans that were otherwise sparsely inhabited and little accessible. She maintained that cities serving as connecting links between mining districts and trade routes were of greater significance – for instance Priština, which occupied a central position within the triangle formed by Novo Brdo, Janjevo and Trepča. Yet even Belgrade, situated distantly along the Danube's banks, maintained strong ties with the mining district of Kopaonik.[5]

[1] Boško Bojović, „De l'économie-monde au monopole d'État. Les métaux précieux des Balkans entre Venise et l'empire Ottoman (XVe-XVIe siècles)", *Глас* САНУ CDIV. Одељење историјских наука 13 (2006) 163–195. Also see: Boško Bojović, *Raguse (Dubrovnik) et l'Empire Ottoman (1430–1520). Les actes impériaux ottomans en vieux-serbe de Murad II a Selim Ier*, Paris 1998.

[2] Constantin Jireček, *Die Handelsstrassen und Bergwerke von Serbien und Bosnien während des Mittelalters*, Prag 1879 (also *Trgovački drumovi i rudnici Srbije i Bosne u srednjem vijeku*, Sarajevo 1951).

[3] Михаило Динић, *За историју рударства у средњовековној Србији и Босни* I–II, Београд 1955–1962.

[4] Desanka Kovačević Kojić, „Dans la Serbie et le Bosnie médiévales: les mines d'or et d'argent", *Annales. Economies, sociétés, civilisation* 15/2 (1960) 248–258; Sima Ćirković, „The Production of Gold, Silver and Copper in the Central Parts of the Balkans from the 13th to the 16th Century", *Betreige zur Wissenschaftsgeschichte* 2 (1979) 41–69; Сима Ћирковић, Ружа Ћук & Десанка Ковачевић Којић, *Старо српско рударство*, Београд – Нови Сад 2002.

[5] Desanka Kovačević Kojić, *Trgovina u srednjovjekovnoj Bosni*, Sarajevo 1961; eadem, *Градска насеља средњовјековне босанске државе*, Сарајево 1978. About its great importance also see: eadem, *Трговачке књиге браће Кабужић (Савода) 1426–1433*, Споменик САНУ CXXXVII. Одељење историјских наука 11, Београд 1999; eadem, *Градски живот у Србији и Босни (XIV–XV вијек)*, Београд 2007.

Ragusan merchants appeared in nearly every Serbian centre: Novo Brdo, Rudnik, Trepča, Janjevo, Priština, Belgrade. In Priština – a town of some 2,000 inhabitants – there were 1,413 Ragusans between 1414 and 1453, with two peaks recorded: first between 1421 and 1429, with an average annual presence of about 110 merchants, and again in 1436–37, with over 200 individuals.[6] Initially, the Ragusans operated as individual merchants, then as family units, and finally as organised communities led by a consul and two judges – a body established when necessary to resolve the usual disputes arising among different colony members. The distinction between the Ragusans and Serbs remained very sharp; while rooted partly in confessional differences, it stemmed equally from cultural factors: the Ragusans spoke the languages of Serbian and Bosnian populations as well as Tuscan and Dalmatian, perceiving themselves as a distinct people and society, with their urban, maritime and mercantile Adriatic culture being aligned more closely with Italian contexts than with the Balkan interior.

At the time of Stefan Dušan, these centres prospered, and the Ragusans were granted freedom of trade by the ruler. The Roman roads of the Balkans once again saw the export of metals, but also of timber, wool, livestock, hides, wax, and lead bound for Ragusa, Venice, and, in general, the Italian regions. The return journey saw the transport of medium-quality woollen and silk textiles, wine, oil and salt, along with numerous luxury goods intended for the nobility of the interior. The scale of Ragusan commercial operations becomes evident when examining the account books of the Caboga brothers, analytically studied by Desanka Kovačević-Kojić: between 1426 and 1432, they purchased some 3.48 tons of silver, primarily from Serbia, equivalent to approximately 100,000 Venetian ducats.[7]

The role played by crimson, a red dye substance, in this commercial network has, however, been rather overlooked until now, partly because it does not appear prominently in the Ragusan sources – particularly those of a chancellery nature – which, as we have noted, have formed the basis of studies up to this point. In this paper, we seek to reassess crimson's role by introducing a fresh documentary perspective – one we have employed in prior studies and which were appreciated by Desanka Kovačević-Kojić. Over a decade ago, while preparing a volume on Ragusan textile manufacture and investigating silver-wax exchanges between Dubrovnik and Florence,[8] I exchanged numerous observations with her on these matters. In other words, we would also like to propose in this essay, not as an alternative but as a complement, the account books and commercial correspondence of Florence's foremost trading companies, which frequently engaged in business dealings with Ragusan merchants, especially from the 1420s onward.

[6] Д. Ковачевић Којић, *Градски живот*, 33–34, 62–64.

[7] Desanka Kovačević Kojić, „I libri contabili dei fratelli Caboga (Kabužić), 1426–1433, fonte importante per la storia dei rapporti economici fra la Serbia e Venezia", *Глас* САНУ CCDIV. Одељење историјских наука 13 (2006) 109–110.

[8] Paola Pinelli, *Tra argento, grano e panni. Piero Pantella, un operatore italiano nella Ragusa del primo Quattrocento*, Firenze 2013; eadem, „L'argento di Ragusa", *Storia Economica* 8 (2005) 549–574.

Crimson

Crimson differed from kermes, which also dyed in red – namely, both kermes and crimson were derived from the processing of two variants of a particular insect – the cochineal, but originated from different geographical regions. The insects yielding kermes were harvested from the western Mediterranean basin, while those producing crimson came predominantly from eastern Europe. In the western Mediterranean regions – particularly North Africa, Spain, the Balearics, southern France and Greece, rich with *Quercus coccifera* forests – *Kermes vermilio* (Fig. 1) was collected. It was also called *granum* or *coccus* (from Greek *kokkos*, meaning "berry"), as in the ancient world it was believed to be of vegetable origin owing to the round shape, size and berry-like appearance assumed by the female insect at the moment of collection, between May and June, when her body was still full of eggs. The female insects were killed with acidic vapours and sun-dried, with between 50,000 to 60,000 desiccated specimens needed to produce a single kilogram of dyestuff.

Fig. 1 – *Kermes vermilio*

The product could be traded already in powdered form, but the powdered state lent itself more readily to fraud, as it could be adulterated with various other powders that produced the same hue. The most discerning buyers, therefore, usually demanded the insects dried and whole. The colouring agent of *Kermes vermilio* was kermesic acid, present in a proportion from 75% to 100%, soluble in water, which, in combination with mordant salts, could yield a colour ranging from orange to purple-red.

In the basins of the Black Sea and the Caspian Sea, as well as in the eastern European and Caucasian regions of Persia and Armenia, *Porphyrophora* was instead collected. This insect lived in the root systems of some herbaceous plants native to these territories. Two species useful for dyeing may be distinguished: *Porphyrophora hamelii* (Fig. 2), containing 1–2% kermesic acid, whose habitat was *Aleuropus litoralis* or *Dactilis litoralis*, a wild grass often referred to as Armenian; and *Porphyrophora polonica* (Fig. 3), containing 20% kermesic acid, whose host plant was *Scleranthus perennis*, a grass found in the sandy regions of Prussia, Saxony, Poland, Lithuania and Ukraine. Dominique Cardon also hypothesizes the existence of an ecological niche—or at least a very similar variant—in a marshy region along the Sava River, west of Belgrade.[9] The dye substance obtained from the first variant was known as *cremisi grosso* (coarse crimson), while that derived from the second was referred to as *cremisi minuto* (fine crimson), as it came from a smaller yet more concentrated cochineal. The Belgrade variant of crimson *minuto*, of which the documents used in this study also bear witness, was designated as *cremisi minuto schiavo* or *raugeo*, given that the insects, of Slavic origin, were readily conveyed via the river route to Dubrovnik, whence they were chiefly traded to the Italian textile cities, Venice and Florence above all.

Fig. 2 – *Porphyrophora hamelii*

[9] Dominique Cardon, „Du “verme cremexe” au “veluto chremesino”: une filiére vénitienne du cramoisi aau XVe siècle“, in: Luca Molà, Reinhold C. Müller & Claudio Zanier (ed.), *La seta in Italia tra Medioevo e Seicento. Dal baco al drappo*, Venezia 2000, 63–74, 69.

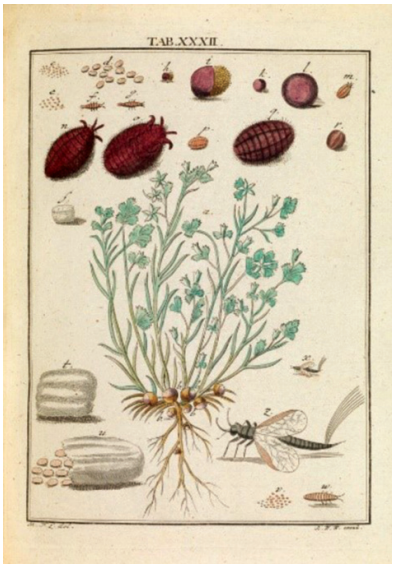

Fig. 3 – *Porphyrophora polonica*

The collection of the second insect species, *Porphyrophora polonica*, proved considerably more laborious. Not only were these insects smaller, but harvesters had to excavate down to the plant roots, afterwards replanting the vegetation to ensure future yields. A skilled collector could obtain merely 50 to 100 grams of these insects per day, in contrast to the harvesting of *Porphyrophora hamelii*, where greater quantities could be gathered, as the female insects surfaced in the early morning hours to await males, which eliminated the need to disturb the root system.[10]

Likely due to the significant difficulties concerning the collection and the consequent inability to procure substantial quantities, the use of *Porphyrophora*, particularly the *polonica* variety, remained almost exclusively limited to its production areas until the late 14th century. For red dyeing, kermes remained predominant, as evidenced by crimson's absence in Pegolotti's *Pratica della mercatura* and its rare appearance in Datini's documents.[11]

Evidence of a broader commerce in crimson dye emerges in the first half of the 15th century, for instance in the account books of the Venetian merchant Giacomo Badoer, who sailed from Venice to Constantinople in September 1436 and returned

[10] About these dyestuffs and insects also see: Luca Molà, *The Silk Industry of Renaissance Venice*, Baltimore–London 2000, 109–122.

[11] Ibidem, 110. The absence of crimson in Datini's documentation is also evident when browsing through the indexes of the volume of Federigo Melis, *Documenti per la Storia Economica dei secoli XIII–XVI*, Firenze 1972.

in 1440. When Badoer arrived, the insect harvesting season had already ended, but thanks to a draper who had the right connections with suppliers, the merchant was able to exchange the silk cloths entrusted to him for sale by two Venetian companies for a delivery of crimson the following year. In November 1437, he dispatched to Venice nearly 180 kilograms of the precious insects – 7,166,800 dried females – valued at 1,788.4 grams of gold, which was loaded onto Alvise Contarini's galley bound for Venice. This was a consignment of *rosesco* crimson, most likely identifiable as *Porphyrophora polonica*, given that when the Venetian merchant acquired the following year crimson *de Vilni* – approximately 120 kilograms totalling over 4,800,000 insects – he paid significantly less for it. The Armenian origin of the supplier further suggests this it was the *hamelii* variety.[12] As Dominique Cardon observes, the term *rosesco* is the Venetian transliteration of the Polish *czerwiec*, meaning "June" – the month when this type of the cochineal were gathered. In 1438, Badoer purchased two sacks of *savaxi* crimson – attributable to the ecological niche of Belgrade[13] – totalling almost 171 kilograms, more than 6,800,000 insects. Altogether, Badoer's purchases of crimson in Constantinople amounted to approximately one tonne and 324 kilograms – over 52,963,000 insects – for a value equivalent to 9.686 kilograms of gold. These quantities, though considerable in themselves, would not, however, have sufficed to dye more than 227 kilograms of silk if, according to the calculations of Dominique Cardon based on several medieval dyeing manuals, six pounds of Polish crimson or twelve pounds of Armenian crimson were required to dye a single pound of silk.[14]

If it is therefore true that as late as 1393, a Lucchese dyer established in Venice sent his son to Constantinople to learn the secrets of crimson dyeing,[15] this colouring substance only rose to prominence in the subsequent decades: by 1429, it ranked first among the silk-dyeing tariffs in the statutes of Florence's Arte di Por Santa Maria.[16] Only several decades later, *Trattato dell'Arte della Seta* defined it "the first and noblest colour we possess, and of the greatest worth".[17] From 1453 onwards, following the Turkish conquest of Constantinople, the production of purple dye – obtained from the murex, a marine mollusc found throughout the Mediterranean basin, particularly along the coasts of the Aegean, Phoenicia (present-day Lebanon, Syria and northern Israel), and southern Italy – ceased entirely. Until that time, it had been used primarily to dye luxurious textiles in red. Crimson consequently expanded its commercial reach, as it could produce a similar range of colours to purple and thus served as an effective substitute for dyeing the most precious fabrics, particularly silk.

[12] Umberto Dorini &Tommaso Bertelè (ed.), *Il libro dei conti di Giacomo Badoer (Costantinopoli 1436–1440)*, Roma 1956, 182, 296, 472, 602, 648.

[13] D. Cardon, „Du 'verme cremexe'", 69.

[14] D. Cardon, „Du 'verme cremexe'", 71.

[15] L. Molà, *The Silk Industry*, 159–160.

[16] Umberto Dorini (ed.), *Statuti dell'arte di Por Santa Maria di Firenze del tempo della Repubblica*, Firenze 1934, riforma del 1429, rubrica V, p. 489.

[17] Girolamo Gargiolli (ed.), *L'arte della seta in Firenze. Trattato del secolo XV pubblicato per la prima volta e Dialoghi raccolti da Girolamo Gargiolli*, Firenze 1868, 30.

Crimson's use was not, however, limited to textile dyeing alone. It became an essential element in painting as well: for example, a thin film of crimson lacquer could produce violet tones, while a glaze applied over blue transformed it into purple. Finally, we must not forget that among the most important components of cordials used in medieval pharmacopoeia – perhaps because its red hue evoked the symbolic value of blood – was *al-kermes*, whose key ingredient was none other than the insect itself. To this were added aromatic herbs, cloves, cinnamon, nutmeg and vanilla, at least according to the recipe of the nuns of Santa Maria Novella – all spices believed to possess potent curative properties. The mixture was then steeped in alcohol with sugar and jasmine flowers.

Crimson and kermes

Bearing in mind that, aside from a whole range of situations that render such figures general and variable, dyestuffs generally constituted about 45% of a textile's total production cost,[18] with crimson starting to be used principally for silk dyeing. As Hidetoshi Hoshino notes, there is no evidence of its use for woollen cloths[19] – at least until the mid-16th century – where the less expensive kermes dye remained predominant.[20] While crimson cost no less than 1 florin per pound, the finest kermes cost no more than 10 soldi. Thus in 15th-century Florence, dyeing with kermes became the hallmark of woollen cloths, while colouring with crimson became indispensable in the production of silk fabrics.

Yet crimson dyeing proved far more costly than kermes not only due to the pigment's scarcity and difficult procurement, but also because dyers first had to soften the material through days of soaking, then filter and grind it to a paste-like consistency, finally requiring two or three separate immersions to achieve the desired hue.[21] Moreover, as the dye alone could not penetrate and fix itself properly within fibres in a stable way that would guarantee optimal results, the use of additional substances called mordants was also required. Once dissolved in water, they were absorbed by the fibres, remaining permanently and deeply bound to them through very strong chemical bonds. These substances facilitated the fixation of the dye, allowing for a deeper and more durable coloration while enhancing lustre. According

[18] Federigo Melis, *Aspetti della vita economica medievale. Studi nell'Archivio Datini di Prato*, Siena 1962, 477, 568, 572, also Francesco Ammannati, *Per filo e per segno. L'arte della lana a Firenze nel Cinquecento*, Firenze 2020, 17.

[19] Hidetoshi Hoshino, „La tintura di grana a Firenze nel basso Medioevo", *Annuario dell'Istituto Giapponese di Cultura* 19 (1983–1984) 60–77, 70 note 31.
The prominent presence of crimson dye in silk fabrics is also attested by Marco Spallanzani & Francesco Guidi Bruscoli, *Tessuti di seta tra Firenze e il Levante (ca. 1350–1550)*, Firenze 2023, passim, e in L. Molà, *The Silk Industry*, 110, 359.

[20] H. Hoshino, *La tintura di grana*, 69.

[21] L. Molà, *The Silk Industry*, 111.

to the aforementioned Florentine manual, for the successful outcome of crimson dyeing, it was essential that the hanks of silk be repeatedly immersed in alum beforehand and subsequently left to soak in the mordant; additional immersions in alum were also required, even after the dyeing process, following the procedures specific to the particular shades one wished to achieve.[22] By contrast, kermes, once powdered, was immediately ready for use. After preliminary treatment with rock alum to react with the dye's acids, it fixed to fabric with a single bath, requiring significantly less dyestuff. To kermes was typically added gall, extracted from oak leaf galls formed by insect bites – rich in tannins, which served to increase the silk's weight and aid the dye's fermentation. While dyeing one pound of material with kermes required between 4 to 16 ounces of dyestuff, crimson demanded 6 to 14 ounces depending on whether it was *armeno* (Armenian) or *minuto* (fine) crimson,[23] as two pounds of coarse crimson dyed equivalent to one pound of fine crimson, because the latter "behaves opposite to the coarse variety, dyeing so delicately that when treated with alum it fades away".[24]

The two dyes further differed in chromatic properties: while kermes produced a palette of colours ranging from orange to violet, crimson tended towards purple, yielding hues of greater brilliance and durability that did not alter over time.[25]

To avoid high costs, even precious fabrics were often dyed with crimson mixed with other substances such as madder, lac, brazilwood, or verzino – all providing red tones. This process created colours like *paonazzo*, a purplish red tending towards violet achieved by first dyeing with crimson then applying a *vagello – a blue dye* bath made of indigo, madder, alum dregs[26] and bran.[27] We know that kermes dyes were sometimes corrected with crimson baths, though this practice was prohibited in both Venice and Genoa.[28]

Crimson's prominence was completely eclipsed in the 16th century by Mexican cochineal, while kermes persisted due to Europe's abundant *Quercus coccifera* forests. Today, finding even small quantities of *Porphyrophora* insects is remarkably difficult and limited to research laboratories, while *Kermes vermilio* specimens, though scarce, can still be found in Turkish and Spanish Levantine oak forests. The fact that it can be cultivated allowed Mexican cochineal to remain on the market, even though synthetic pigments are now predominantly used.

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[22] Franco Franceschi, „Il ruolo dell'allume nella manifattura tessile toscana dei secoli XIV–XV", "*Mélanges de l'École française de Rome – Moyen Âge*" 126–1 (2014) (http://journals.openedition.org/mefrm/1582), par. 25.

[23] L. Molà, *The Silk Industry*, 359.

[24] G. Gargiolli (ed.), *L'arte della seta*, 30, 32, 109.

[25] L. Molà, *The Silk Industry*, 111.

[26] These were ashes obtained from the combustion of gromma or cream of tartar (potassium hydrogen tartrate), the substance that developed in vats during wine fermentation and was easily obtainable.

[27] L. Molà, *The Silk Industry*, 112.

[28] Paolo Bensi, „Aspetti dei materiali e delle tecniche tintorie in Italia nel XV secolo e agli inizi del XVI", in: Chiara Buss (ed.), *Seta oro cremisi. Segreti e tecnologia alla corte dei Visconti e degli Sforza*, *Catalogo della Mostra*, Milano 2009, 37–41, 38.

Balkan crimson

When it comes to the crimson that arrived from the Balkan interior – the so-called *minuto raugeo* crimson – scholars have not always held convergent opinions about its nature. In Slavic literature, uncertainties on this subject trace back to Konstantin Jireček, who, while discussing the export of mineral products from Bosnia to Dubrovnik, included crimson – in Slavic *crvac* – a term encountered with multiple variants in city chancery documents: *carmosi*, *cremesi*, *cremexi*, *crimisi*, *chermesi*, *charmusi*, *grimixo*, *cremesin*, *carmisinum*. Franc Miklošić, however, explained the term with reference to an insect gathered in June near Belgrade.[29] While Ivan Božić questioned whether it referred to a mineral dye or rather a product obtained from certain insects,[30] Konstantin Jireček's opinion continued to be staunchly defended by Bogumil Hrabak[31] and Desanka Kovačević-Kojić,[32] who believed it to be cinnabar extracted from the mines of Šuplja Stena near mount Avala. Ignacij Voje initially supported this thesis as well, though he later abandoned the mineral theory[33] in favour of Sima Ćirković's assertions, which leaned instead towards an organic material – a plant parasite.[34] With reference to certain debt records preserved in the *Debita Notariae* series of the Dubrovnik Archives, Ignacij Voje highlighted that the substance was described as collected rather than extracted, and that the organic origin of *crvac* was further justified by the fact that, to be traded, it had to be ripe (*staxionatus*), dry (*siccus*), and purified (*nitidus*).[35]

Be that as it may, studies have generally undervalued the role of this dyestuff within the commercial route linking the inland regions with Dubrovnik. Even Desanka Kovačević-Kojić accorded greater importance to silver and other mineral products such as lead, as well as to wax and hides – though she did note that from the 1440s onward, crimson imports began gaining notable traction, being sold to Venetian and Tuscan, and particularly Florentine merchants, through Italian intermediaries based in Dubrovnik or through Ragusan commercial operators. Her calculations show that merchants from Trgovište and Goražde supplied approximately 2,200 pounds of

[29] Konstantin Jireček, *Važnost Dubrovnika u trgovačkoj povijesti srednjega vijeka*, Dubrovnik 1915, 68, 91; Franc Miklosich, *Die slavischen Monatsnamen*, Wien 1867, 9.

[30] Иван Божић, *Дубровник и Турска у XIV и XV веку*, Београд 1952, 306–307.

[31] Богумил Храбак, „Прошлост Пљеваља по дубровачким документима до почетка XVII столећа", *Историски записи* 8 (1955) 22–25.

[32] D. Kovačević-Kojić, *Trgovina*, 32–33, 146–147.

[33] Иганциј Воје, „Argentum de glama", *Историјски часопис* 16–17 (1966–1967) 1970, 15–43; idem, *Kreditna trgovina u srednjovjekovnom Dubrovniku*, Sarajevo 1976, 279–280; idem, „Trgovinske zveze med Dubrovnikom in Markami", *Zgodovinski časopis* 30 (1976) 279–290; idem, „Прилог трговини црвцем (chermesium) у средњовековном Дубровнику", *Историјски часопис* 56 (2008) 101–116.

[34] Сима М. Ћирковић, *Херцег Стефан Вукчић Косача и његово доба*, Београд 1964, 137–138.

[35] Državni Arhiv u Dubrovniku, *Debita Notariae*, 20, cc. 56, 57, 181; 21, c. 68v.; 27, c. 161.

crimson to Ragusa in 1440.[36] Thus, the dyestuff became an object of keen interest for certain Ragusan trading companies operating in the hinterlands, while others were established specifically to procure it. Duke Stjepan Vukčić Kosača, who ruled over the region of Saint Sava (encompassing territories of modern-day Bosnia and Herzegovina, Serbia, Croatia and Montenegro), exported around 2,000 pounds of the substance annually from 1440 onward. By 1448 at the latest, he likely also utilised it in his textile plants in Novi, which he had established by bringing in craftsmen from Rimini – much as Ragusa had done some twenty years earlier with Piero Pantella.[37]

Yet the Ragusan documents – which, as noted, compensate for the lack of autochthonous sources by recording Dubrovnik's commercial exchanges with Balkan inland cities that were rich in resources and raw materials – reveal little beyond this. Information about crimson appears with far less frequency compared to the much more numerous records concerning the trade of products that were certainly more important to the Western economy, such as mineral goods – silver above all. Consequently, the role and significance of this dyestuff would remain scarcely examined and underappreciated were it not for the account books of Tuscan merchants and trading companies. In this brief study, we present findings derived from analysing the ledgers of two of Florence's most prominent companies engaged in business with Dubrovnik during the first and second halves of the 15th century: the Cambini and Salviati companies. These companies exported primarily own textile products, woollen cloths, but also silks, to Dubrovnik, while importing Balkan raw materials – foremost silver, but also hides, wax and crimson. Our aim, though the examination promises no easy answers and will necessitate consulting numerous documents often to no avail, is to expand the analysis to other Florentine companies trading with Ragusa, in order to understand, more than is currently possible, the precise role this precious dyestuff played in commercial relations with Dubrovnik and between Dubrovnik and the Balkan interior.

Notably, the Florentine records have enabled us to identify how the company of Francesco and Carlo Cambini procured crimson from the Ragusan merchant Antonio Stai.[38] In one instance, five sacks of the dye traded by Stai were also supplied to the wool company of Piero di Cosimo de' Medici, as well as to the silk enterprises of Antonio di Giovanni della Luna, Lodovico and Leonardo Boni, Tommaso Spinelli, Giuliano di Francesco Corsellini, and Filippo and Piero del Pugliese.[39] The crimson

[36] Desanka Kovačević Kojić, „Il commercio raguseo di terraferma nel Medio Evo", in: Antonio Di Vittorio (ed.), *Ragusa e il Mediterraneo. Ruolo e funzioni di una Repubblica marinara tra Medioevo ed Età moderna*, Bari 1990, 61–78, 73. Also refer to Богумил Храбак, „Продаја производа босанског рударства у Венецији и Млечанима у Далмацији", *Годишњак Друштва историчара Босне и Херцеговине* 21–27 (1976) 59–72, 65–67, 71, И. Божић, *Дубровник и Турска*, 306–307.

[37] P. Pinelli, *Tra argento grano*.

[38] Archivio dell'Ospedale degli Innocenti di Firenze [=A.O.I.Fi.], *Estranei*, 250.

[39] A.O.I.Fi., *Estranei*, 250, c. 80.

traded by Stai was of the *raugeo minuto* variety.[40] In exchange, the Ragusan merchant requested from the Cambini primarily "fine" woollens and silk fabrics, but also lesser-quality red dyes such as Valencian kermes[41] – which the Cambini company traded and which was likely intended for Ragusan textile production. This industry, having developed around the 1420s, was characterised by middling-to-low quality goods, as its products were chiefly exported to inland regions where manufacturing was still in its infancy.[42]

In 1461, Stai sent the Cambini sixteen sacks, five bales, and six parcels of *raugeo minuto* crimson,[43] totalling approximately 4,200 net pounds, with the exception of *invoglie, sacco e scarpigliere* ("wrappings, sacks and other scraps") – each parcel averaged around 100 pounds net weight, a bale roughly 120 pounds, and a sack around 200 pounds.[44] On average, every 100 pounds of the product cost 60–70 florins,[45] while the kermes that Stai purchased from the Cambini was priced at no more than 48 florins per 100 pounds.[46] Purchase orders were concentrated between June and December, notably starting on 25 June, because 24 June, the feast of St John the Baptist, symbolically marked the start of the insect-gathering season, earning the dyestuff even the name "St John's blood". The records further reveal that the substance followed the same route we have identified in our previous studies for other inland products: it reached Pesaro by sea and then, via the Umbrian-Marchigian and Aretine passes, arrived in Florence on mules.[47]

The records of Averardo and Giovanni Salviati's company reveal that, several decades later – on the very cusp of the 16th century, between 1490 and 1493 – the trade in Balkan crimson likely gained greater significance.[48] While comprehensive quantitative data to substantiate this assertion remain unavailable, the company's account books show that most Ragusan merchants involved in this traffic represented the city's most prominent families: Giorgio Gozze, Giorgio di Marino degli Zuzzeri, Simone and Bartolomeo di Luca di Bona, and Ambrogio and Niccolò di Marino dei Diversi. Alongside them appear lesser-known traders – Lupo Turco, Giorgio di Drago (all Ragusan), and a certain Giovanni (also Ragusan) – though collectively these supplied the Salviati company with only modest quantities of the product. Between September 1490 and September 1493, these merchants sold the Salviati nearly 6,700

[40] A.O.I.Fi., *Estranei*, 250, c. 101.
[41] A.O.I.Fi., *Estranei*, 250, c. 226v.
[42] P. Pinelli, *Tra argento grano*; Desanka Kovačević Kojić, „La Serbie dans l'économie de Venise au XVeme siècle", in: Gherardo Ortalli & Oliver Jens Schmitt (ed.), *Balcani occidentali, Adriatico e Venezia fra XIII e XVIII secolo*, Wien 2009, 39–52, 51–52; eadem, *Il commercio raguseo*, 67.
[43] A.O.I.Fi., *Estranei*, 250, cc. 25v., 60, 80, 101, 108v., 112v., 121.
[44] A.O.I.Fi., *Estranei*, 250, c. 101.
[45] A.O.I.Fi., *Estranei*, 250, c. 210v.
[46] A.O.I.Fi., *Estranei*, 250, c. 226v.
[47] P. Pinelli, *Tra argento grano*, 70.
[48] Archivio della Scuola Normale Superiore di Pisa [=A.S.N.S.Pi.], *Salviati*, 403.

pounds of crimson. The Zuzzeri family dominated this trade (5,338 pounds), which suggests their near-monopoly on the dye's distribution.[49] The crimson thus acquired was almost entirely utilised by Iacopo di Giovanni Salviati's silk company, with a mere 4% sold onward to another Florentine silk company: that of Piero Corsini and Francesco del Pugliese.

The records of crimson transactions in the Salviati ledgers prove significant not only because they demonstrate the commercial dominance of Ragusa's foremost merchant companies in procuring the dyestuff, or the substantial quantities exchanged, but also because they provide details on pricing – ranging from 15 soldi to 1 florin per pound – and the nature of the traded product. The annotations specify that what was sold consisted not of whole insects or their powder, but rather their processed paste. This was likely produced by artisans of Dubrovnik, where, as previously noted, a significant textile industry had developed since the 1420s. The process involved first softening the material through days of soaking, then filtering and grinding it into a paste-like consistency.[50] This, on the one hand, signifies that by the late 15th century Ragusa no longer exported – at least not predominantly – crimson in the form of raw material, but instead subjected it to initial processing in the Ragusan dye-houses, where it was perhaps partly used and where capable artisans had been trained; on the other hand, it allows us to verify how the high price per pound was justified by a manufacturing process which, in addition to an average tare of 2% for the *invoglie* and the containers in which the substance was stowed – most notably goatskins – entailed a further diminution in weight connected with the reduction of the raw material into paste. We therefore deduce that, on average, in the operations recorded by the Tuscan register, the procedure resulted in a loss of 37–38%, reaching in some instances as much as 45–46%.

The Salviati paid for crimson either in cash or, in two instances, through six-month deferred payments. However, most transactions involved barter – exchanged for Florentine and Majorcan cloths of medium quality, textiles the Salviati frequently imported.[51]

A tentative conclusion

Between the 14th and 15th centuries, from within the Balkans, and particularly from the Serbian region, numerous and important raw materials made their way to Dubrovnik, and from there to Italy, especially to Venice and Florence. While silver undoubtedly held primacy, both due to the richness of Slavic mines and the demand of commercial Europe – not rich in the white mineral – Ragusan sources, hitherto predominantly consulted by historians, also reveal a significant role played by other resources such as hides, wax and minerals like lead. Rarely, however, does the

[49] A.S.N.S.Pi., *Salviati*, 403, cc. 30s., 36s., 75d., 81s., 88d., 100, 102d.
[50] A.S.N.S.Pi., *Salviati*, 403, cc. 81s., 88d.
[51] A.S.N.S.Pi., *Salviati*, 403, c. 81s.

Ragusan chancery's documentation record the trade in another commodity, no less essential for the textile production of the day: crimson. The quantities traded were probably not as considerable, since, as we have seen, it was neither a mineral nor an organic product but insects which, adequately treated, were employed to dye cloth red, and were both difficult and complicated to procure.

However, if we broaden our perspective and consider that the products of the Balkan interior were diverted to Ragusa to be subsequently traded on the Italian peninsula, we can supplement our account with evidence drawn from the account books of Italian merchant companies that maintained intensive trade with the Dalmatian coastal cities. In particular, the entries in the ledgers of two prominent Florentine companies – those of Averardo and Giovanni Salviati and of Francesco and Carlo Cambini – while not permitting a full reconstruction of the total quantities traded, nonetheless attest to the importance of *raugeo minuto* crimson in the exchange between the two shores, and to how highly this variant was prized – above all in the dyeing of the silk draperies produced by these companies. We have further noted that, by the close of the 15th century, the trade in this substance was likely controlled by the leading Ragusan mercantile families and that the development of Ragusan textile manufacture, through the application of Italian operators' expertise, had by then made possible the export not only of the raw material in its crude dried-insect form, but of a semi-processed product in the form of paste.

LIST OF REFERENCES

Unpublished Primary Sources

Archivio dell'Ospedale degli Innocenti di Firenze [=A.O.I.Fi.]
Estranei
Archivio della Scuola Normale Superiore di Pisa [=A.S.N.S.Pi.]
Salviati
Državni Arhiv u Dubrovniku
Debita Notariae

Published Primary Sources

Bojović, Boško, *Raguse (Dubrovnik) et l'Empire Ottoman (1430–1520). Les actes imperiaux ottomans en vieux-serbe de Murad II a Selim Ier*, Paris 1998.

Gargiolli, Girolamo (ed.), *L'arte della seta in Firenze. Trattato del secolo XV pubblicato per la prima volta e Dialoghi raccolti da Girolamo Gargiolli*, Firenze 1868.

Dorini, Umberto (ed.), *Statuti dell'arte di Por Santa Maria di Firenze del tempo della Repubblica*, Firenze 1934.

Dorini, Umberto & Tommaso Bertelè (ed.), *Il libro dei conti di Giacomo Badoer (Costantinopoli 1436–1440)*, Roma 1956.

Melis, Federigo, *Documenti per la Storia Economica dei secoli XIII–XVI*, Firenze 1972.

Ковачевић Којић, Десанка, *Трговачке књиге браће Кабужић (Caboga) 1426–1433*, Споменик САНУ CXXXVII. Одељење историјских наука 11, Београд 1999. [Kovačević Kojić, Desanka, *Trgovačke knjige braće Kabužić (Caboga) 1426–1433*, Spomenik SANU CXXXVII. Odeljenje istorijskih nauka 11, Beograd 1999]

Secondary Works

Ammannati, Francesco, *Per filo e per segno. L'arte della lana a Firenze nel Cinquecento*, Firenze 2020.

Bensi, Paolo, „Aspetti dei materiali e delle tecniche tintorie in Italia nel XV secolo e agli inizi del XVI", in: Chiara Buss (ed.), *Seta oro cremisi. Segreti e tecnologia alla corte dei Visconti e degli Sforza*, *Catalogo della Mostra*, Milano 2009, 37–41.

Bojović, Boško, „De l'économie-monde au monopole d'État. Les métaux précieux des Balkans entre Venise et l'empire Ottoman (XVe-XVIe siècles)", *Глас* САНУ CDIV. Одељење историјских наука 13 (2006) 163–195.

Cardon, Dominique, „Du 'verme cremexe' au 'veluto chremesino': une filiére vénitienne du cramoisi aau XVe siècle", in: Luca Molà, Reinhold C. Müller & Claudio Zanier (ed.), *La seta in Italia tra Medioevo e Seicento. Dal baco al drappo*, Venezia 2000, 63–74.

Ćirković, Sima, „The Production of Gold, Silver and Copper in the Central Parts of the Balkans from the 13th to the 16th Century", *Betreige zur Wissenschaftsgeschichte* 2 (1979) 41–69.

Franceschi, Franco, „Il ruolo dell'allume nella manifattura tessile toscana dei secoli XIV–XV", "*Mélanges de l'École française de Rome – Moyen Âge*" 126–1 (2014) (http://journals.openedition.org/mefrm/1582).

Hoshino, Hidetoshi, „La tintura di grana a Firenze nel basso Medioevo", *Annuario dell'Istituto Giapponese di Cultura* 19 (1983–1984) 60–77.

Jireček, Constantin, *Die Handelsstrassen und Bergwerke von Serbien und Bosnien während des Mittelalters*, Prag 1879.

Jireček, Konstantin, *Trgovački drumovi i rudnici Srbije i Bosne u srednjem vijeku*, Sarajevo 1951.

Jireček, Konstantin, *Važnost Dubrovnika u trgovačkoj povijesti srednjega vijeka*, Dubrovnik 1915.

Kovačević Kojić, Desanka, „Dans la Serbie et le Bosnie médiévales: les mines d'or et d'argent", *Annales. Economies, sociétés, civilisation* 15/2 (1960) 248–258.

Kovačević Kojić, Desanka, „I libri contabili dei fratelli Caboga (Kabužić), 1426–1433, fonte importante per la storia dei rapporti economici fra la Serbia e Venezia", *Глас* САНУ CDIV. Одељење историјских наука 13 (2006) 107–118. [*Glas* SANU CDIV. Odeljenje istorijskih nauka 13 (2006) 107–118]

Kovačević Kojić, Desanka, „La Serbie dans l'économie de Venise au XVeme siècle", in: Gherardo Ortalli & Oliver Jens Schmitt (ed.), *Balcani occidentali, Adriatico e Venezia fra XIII e XVIII secolo*, Wien 2009, 39–55.

Kovačević Kojić, Desanka, *Trgovina u srednjovjekovnoj Bosni*, Sarajevo 1961.

Kovačević Kojić, Desanka, „Il commercio raguseo di terraferma nel Medio Evo", in: Antonio Di Vittorio (ed.), *Ragusa e il Mediterraneo. Ruolo e funzioni di una Repubblica marinara tra Medioevo ed Età moderna*, Bari 1990, 61–78.

Melis, Federigo, *Aspetti della vita economica medievale. Studi nell'Archivio Datini di Prato*, Siena 1962.

Miklosich, Franc, *Die slavischen Monatsnamen*, Wien 1867.

Molà, Luca, *The Silk Industry of Renaissance Venice*, Baltimore–London 2000.

Pinelli, Paola, „L'argento di Ragusa", *Storia Economica* 8 (2005) 549–574.

Pinelli, Paola, *Tra argento, grano e panni. Piero Pantella, un operatore italiano nella Ragusa del primo Quattrocento*, Firenze 2013.

Spallanzani, Marco & Francesco Guidi Bruscoli, *Tessuti di seta tra Firenze e il Levante (ca. 1350–1550)*, Firenze 2023.

Voje, Ignacij, *Kreditna trgovina u srednjovjekovnom Dubrovniku*, Sarajevo 1976.

Voje, Ignacij, „Trgovinske zveze med Dubrovnikom in Markami", *Zgodovinski časopis* 30 (1976) 279–290.

Божић, Иван, *Дубровник и Турска у XIV и XV веку*, Београд 1952. [Božić, Ivan, *Dubrovnik i Turska u XIV i XV veku*, Beograd 1952]

Воје, Игнацај, „Argentum de glama", *Историјски часопис* 16–17 (1966–1967) 1970, 15–43. [Voje, Ignacij, „Argentum de glama", *Istorijski časopis* 16–17 (1966–1967) 1970, 15–43]

Воје, Игнацај, „Прилог трговини црвцем (chermesium) у средњовековном Дубровнику", *Историјски часопис* 56 (2008) 101–116. [Voje, Ignacij, „Prilog trgovini crvcem (chermesium) u srednjovekovnom Dubrovniku, *Istorijski časopis* 56 (2008) 101–116]

Динић, Михаило, *За историју рударства у средњовековној Србији и Босни* I–II, Београд 1955–1962. [Dinić, Mihailo, *Za istoriju rudarstva u srednjovekovnoj Srbijii Bosni* I–II, Beograd 1955–1962]

Ковачевић Којић, Десанка, *Градска насеља средњовјековне босанске државе*, Сарајево 1978. [Kovačević Kojić, Desanka, *Gradska naselja srednjovjekovne bosanske države*, Sarajevo 1978]

Ковачевић Којић, Десанка, *Градски живот у Србији и Босни (XIV–XV вијек)*, Београд 2007. [Kovačević Kojić, Desanka, *Gradski život u Srbiji i Bosni (XIV–XV vijek)*, Beograd 2007]

Ћирковић, Сима М., *Херцег Стефан Вукчић Косача и његово доба*, Београд 1964. [Ćirković, Sima M., *Herceg Stefan Vukčić Kosača i njegovo doba*, Beograd 1964]

Ћирковић, Сима, Ружа Ћук & Десанка Ковачевић Којић, *Старо српско рударство*, Београд – Нови Сад 2002. [Ćirković, Sima, Ruža Ćuk & Desanka Kovačević Kojić, *Staro srpsko rudarstvo*, Beograd – Novi Sad 2002]

Храбак, Богумил, „Продаја производа босанског рударства у Венецији и Млечанима у Далмацији“, *Годишњак Друштва историчара Босне и Херцеговине* 21–27 (1976) 59–72. [Hrabak, Bogumil, „Prodaja proizvoda bosanskog rudarstva u Veneciji i Mlečanima u Dalmaciji“, *Godišnjak Društva istoričara Bosne i Hercegovine* 21–27 (1976) 59–72]

Храбак, Богумил, „Прошлост Пљеваља по дубровачким документима до почетка XVII столећа“, *Историски записи* 8 (1955) 22–25. [Hrabak, Bogumil, „Prošlost Pljevalja po dubrovačkim dokumentima do početka XVII stoleća“, *Istoriski zapisi* 8 (1955) 1–38]

Паола Пинели

УЛОГА КОЈА ЧЕКА ДА БУДЕ ОТКРИВЕНА: ГРИМИЗНИ ПИГМЕНТ СА БАЛКАНА У ТРГОВИНИ ИЗМЕЂУ ДУБРОВНИКА И ФИРЕНЦЕ

Резиме

Дубровник је већ у 13. и 14. веку остварио јаке економске везе с простором Балкана, а као такав је био главни посредник у преносу метала из урбаних средишта Рашке, равијених захваљујући успону рударске индустрије, у Венецију, Фиренцу и друге италијанске градове. Почев од Константина Јиречека, који је поставио темеље истраживањима на ту тему, у другој половини 20. века изучавању рударства и трговине рудама посветили су се Михаило Динић, Десанка Ковачевић Којић, Сима Ћирковић и Ружа Ћук, доказујући присуство дубровачких трговаца у сваком српском рударском и трговачком центру. Анализом средњовековних дубровачких извора показано је да су дубровачки трговци извозили са Балкана и другу робу попут коже, воска, вуне, дрвета, стоке и олова. С друге стране, трговина гримизним пигментом нашла се на маргини ових студија, па је пренос те сировине балканским трговачким саобраћајницама до сада у великој мери био занемарен. Упркос вишој цени и сложенијој процедури бојења, коју је изискивао у поређењу с кермесом – тамно црвеном бојом која се добијала од другог инсекта – гримизни пигмент био је веома цењен међу италијанским бојарима и коришћен при изради најскупоценијих тканина. У продаји се могао наћи у форми праха, али је куповина већ припремљеног пигмента носила са собом ризик од фалсификовања, пошто је често био разређиван другим прашковима. Искусни трговци су, стога, куповали осушене инсекте од којих се ово бојило добијало, а који су у највећој мери долазили из источне Европе. Примећено је да је еколошка ниша или варијанта инсекта од којих се добијао гримизни пигмент постојала и на обали реке Саве, западно од Београда – такозвани *minuto raugeo*. Неки истраживачи сматрали су да се ради о минералној боји, али је Игњацај Воје, следећи теорије Симе Ћирковића, заступао мишљење да је у питању пигмент органског порекла. Иако је Десанка Ковачевић Којић придавала већи значај извозу воска, кожа, олова, сребра и других минерала, уочила је да су од 1440-их дубровачки трговци били активни у продаји гримизног пигмента венецијанским и фирентинским трговцима. Нажалост, дубровачки извори су неми по питању извоза гримизног пигмента преко Балкана, па је за изучавање те трговачке размене било потребно консултовати пословне књиге фирентинских трговаца и трговачких компанија који су сарађивали с Дубровчанима. У том смислу су важне белешке које су настале као резултат трговачког књиговодства две најистакнутије фирентинске компаније – Камбини и Салвијати – чији су представници у 15. веку увозили

гримизни пигмент са Балкана. Један од дубровачких трговаца који се у њиховим књигама истиче као набављач те сировине био је Антонио Стаи. Да је трговина гримизним пигментом на Балкану добила већи значај крајем 15. века показују подаци из регистра компаније Салвијати. Тада су у преносу гримизног пигмента учествовале неке од најугледнијих дубровачких породица: Гоци, Жужери, ди Бона и Диверси. У књигама компаније Салвијати највише се истиче породица Жужери, што указује да су готово држали монопол над дистрибуцијом тог бојила. Овакви пословни односи показују и да су италијански трговци од Дубровчана набављали већ справљену пасту, коју су дубровачке занатлије производиле за потребе градске текстилне индустрије. Иако је количина гримизног пигмента извожена преко Балкана вероватно била ограничена, активност дубровачких трговаца у трговини тим бојилом није занемарљива и као таква представља важан допринос нашем досадашњем сазнању о робној размени између Балкана и италијанских градова.