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EYE TREATMENTS IN THE TREATISE ON SMALLPOX AND MEASLES IN THE *HILANDAR MEDICAL CODEX*[*]

Abstract: This paper examines protections and treatments of the eyes described in the Treatise on Smallpox and Measles in the *Hilandar Medical Codex*, a Serbian medical collection from the mid-sixteenth century. The Treatise on Smallpox and Measles, which, together with the Treatise on the Plague constitutes a single treatise, originates from the *Canon of Medicine*, a work by the Persian physician Avicenna (980–1037). The Old Serbian translation of this treatise was based on the Latin translation of the *Canon of Medicine*, created in Toledo at the end of the twelfth century by Gerard of Cremona. In the paper, all medicinals used for treatments of the eyes of those affected by smallpox and measles, some of which have not been previously identified, are precisely identified and presented. Special attention is given to a typical Arab drug called *murri*, which was also not known in previous editions of the codex. Descriptions of individual medicines are found in the List of Simple Remedies in the *Hilandar Medical Codex*, which is a translation of the Latin work *Circa instans*, a famous pharmacopoeia from the Schola Medica Salernitana that dates to the late twelfth century, which is also highlighted.

Keywords: eye treatments, Treatise on Smallpox and Measles, *murri* (*al-murri*), *Hilandar Medical Codex*, Avicenna, *Canon of Medicine*, Old Serbian medical manuscripts, sixteenth century.

The corpus of Old Serbian medical texts, known in historiography as the *Hilandar Medical Codex*,[1] originated in the 1560s (around 1550–1560) as translations of the most significant European medical treatises based on the teachings and works of ancient Greek and Roman (Hippocrates, Aristotle, Dioscorides, Galen) and medieval Arab physicians and philosophers.[2] Although it was discovered in 1952 at the Hilandar Monastery, where it is kept under the number 517,[3] it has been established that this medical

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[1] *HMK* 1980; *HMK* 1989.

[2] Grmek 1961; Katić 1990; Bojanin 2017.

[3] Radojčić 1952.

compendium did not originate on Mount Athos.[4] The *Hilandar Medical Codex* (HMC) contains writings on phlebotomy, various types of fevers, uroscopy, infectious diseases (plague, smallpox, measles, malaria, etc.), poisons, and pediatrics, along with a treatise on simple medicines and another on compound medicines (pills [Old Serbian: **пилѳлѣ**], electuaries [**лѣтѳаріѡ**], oils [**маслѡ**], ointments [**мастъ**], balms/plasters [**єм҃бластъ**], and syrups [**ширѡпъ**, **гюлапъ**]).[5] Some texts in the *Hilandar Medical Codex* are adaptations of translations of the works from the Schola Medica Salernitana that date to the eleventh and twelfth centuries. The influence of physicians from medical schools in Salerno and Montpellier from the thirteenth and fourteenth centuries is also present in the HMC. It has thus long been held that Serbian medieval scientific medicine was based exclusively on the achievements of these significant medical schools.[6]

However, Serbian scholars have recently discovered that some of the HMC treatises originate from the *Canon of Medicine*, a work by the renowned Persian physician Abu Ali al-Husayn ibn Sina, known in the West as Avicenna (980–1037). This was first pointed out by Stanoje Bojanin, who discovered that the Treatise on Poisons in the HMC originates from Avicenna's *Canon*.[7] Unaware of Bojanin's findings, I also published a study in 2022 linking the HMC's treatise on plague, smallpox, and measles to the *Canon.*[8] I determined the origin of this Old Serbian treatise after examining a contemporary Russian translation of a twelfth-century Arab manuscript of the *Canon*.[9] Given that some of the writings in the HMC were based on medical works from Salerno, I assumed that the Treatise on Plague and the Treatise on Smallpox and Measles found their way into the Old Serbian medical collection through a Latin translation of Avicenna's treatise, which probably also originated from the medical school in Salerno.[10] However, this cannot be case, because the Latin translation of the *Canon of Medicine* (*Canon medicinae*) was created in Toledo at the end of the twelfth century by the prominent translator Gerard of Cremona.[11] Bojanin claims that the Old Serbian Treatise on Poisons from the HMC was translated on the basis of Gerard's Latin translation of the *Canon*.[12] Bojanin makes an additional and significant claim that the *Hilandar Medical Codex* does not solely contain texts from the Salerno and Montpellier medical schools, and as a result should no longer be viewed 'within the scope of influence of certain schools, but rather within the broadest context of medieval Western European science, whose knowledge was also shared by Serbian medieval medicine.'[13]

The *Canon of Medicine*, which contains five books, is also based on the theories of ancient physicians such as Hippocrates, Galen, and Dioscorides along with medical knowledge inherited from southern and southwest Asia, and Persia and India in particular.

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4 Bojanin 2017: 277–279.
5 *HMK* 1980; *HMK* 1989.
6 Grmek 1961; *HMK* 1989: XXXIII–XLVI (Katić); Bojanin 2012: 10–11; *Id*. 2017: 277–294; *Id*. 2022.
7 Bojanin 2021; *Id*. 2023.
8 Štetić 2022.
9 Abu Ali Ibn Sina IV.
10 Štetić 2022: 89, 91–92.
11 Sarton 1955: 42; Bojanin 2021: 69.
12 Bojanin 2021: 70–92; *Id*. 2023: 110–112.
13 Bojanin 2021: 93; *Id*. 2023: 112–113.

It represents one of the most important works of both Arab and European medieval medicine.[14] As previously mentioned, the *Canon* was translated from Arabic into Latin in Toledo in the late twelfth century by Gerard of Cremona and his collaborators. Between the mid-fifteenth and the late sixteenth centuries, it became the most frequently printed book in Europe after the Bible.[15] By the mid-sixteenth century, a translation into Old Serbian of certain parts of this famous work had emerged through a Latin translation of the *Canon*.

For this paper, I have consulted the Latin edition of the *Canon* printed in Venice in 1507[16] and the 1595 Venetian edition by the physician and Arabist Andrea Alpago, who had somewhat revised Gerard of Cremona's translation sometime in the early sixteenth century.[17] I also consulted two contemporary translations: a Russian translation of twelfth-century Arabic manuscript of the *Canon of Medicine*[18] and an English translation of a late-sixteenth-century Persian text produced as a translation of an Arabic manuscript of the *Canon*.[19] Bojanin was also the first Serbian scholar to point out the existence of the Latin edition of the *Canon* from 1595 and the contemporary translations of Avicenna's book, including their parallel use.[20] Here, I have for the most part accepted Bojanin's presentation and identification of medicinal drugs.[21]

Since it was believed in medieval medicine that plague, smallpox, and measles belonged to the same genus and had the same cause, the two treatises in the HMC that address them form a single treatise contained in folios 61a–73b. It contains twelve chapters, the first of which reads, '**Зде почнет(ъ) wт(ъ) огнъіце чѫмнѣ и wт(ъ) родовъ кє и wт(ъ) богин(ъ), и wт(ъ) козіачъ, и wт(ъ) дрѫгъиχ(ъ) болести кое приликвютъ къ чѫмномѫ родѫ.**' (Here begins about the plague and its kinds, and smallpox, and measles, and other diseases that belong to the plague genus).[22] In the *Canon*, Avicenna's treatise on the plague, smallpox, and measles appears in Tractate 4 (Tractatus IV) of Part 1 (Fen I) of Book 4 (Liber quartus). This treatise comprises the first twelve of twenty chapters inTractate 4, which is entitled *De febribus pestilentialibus, & que sunt (eis) homogenea, & variolis, & morbillo* (Of pestilential fevers, and [fevers] which are homogeneous [to them], and smallpox, and measles).[23] Despite the same number of chapters and nearly identical content, the chapters in the Latin editions of the *Canon of Medicine* and those in the HMC do not have consistently identical titles nor is the text organized in the same way. Plague is covered in the first four chapters of the HMC, whereas in the *Canon* it appears in the first five. Smallpox and measles are covered in eight chapters of the HMC, whereas in the *Canon* it is divided into seven (Cap. 6–12). The content of the first chapter in the Latin translations of Avicenna's treatise on smallpox and measles (Cap. 6), appears in two chapters in the

[14] Nasr 1988: 306; Bojanin 2021: 69; *Id*. 2023: 109.
[15] Sarton 1955: 42; Siraisi 1987: 19–20, 43–65, 128, 361–366; Bojanin 2021: 69–70; *Id*. 2023: 109–110.
[16] Avicenna 1507.
[17] Avicenna 1595b.
[18] Abu Ali Ibn Sina II; *Id.* IV; *Id.* V.
[19] Avicenna 2; Avicenna 4.
[20] Bojanin 2021: 69–70, n. 26–27; 73–92.
[21] *Ibid*.: 73–92.
[22] *HMK* 1980: 121–146; *HMK* 1989: 261–274. Cf. *HMK* 1989: 67–77.
[23] Avicenna 1507: 416–418' (Cap. 1–12); Avicenna 1595b: 67–76 (Cap 1–12). See also: Abu Ali Ibn Sina IV: 125–137; Avicenna 4: 258–278.

HMC, as does the content of Avicenna's chapter on healing (Cap. 10), while the final chapter of the Latin editions (Cap. 12) does not appear anywhere in the Old Serbian translation.[24]

Based on the content of Avicenna's treatise in the Latin editions from 1507 and 1595, which are almost identical, it appears that the Old Serbian treatise on plague and smallpox and measles in the HMC was also based on Gerard's translation of the *Canon*. The Latin version of Gerard's translation, which served as a template for the creation of the Old Serbian treatise, is not known. Bojanin holds that the translation of the Old Serbian treatise on poisons was based on a Latin medical book intended for practical use that contained parts of Avicenna's *Canon*. It should also be emphasized that the HMK was created in the mid-sixteenth century as a transcription of either an older medical work or individual texts from several different books.[25]

The chapters on some medicines used to treat and protect the eyes of those with smallpox and measles are found in the HMC's List of Simple Remedies: **Сказаніе кс(тъ)ствѳ wт(ъ) в′сакого биліа, или к врѳкі или к стѳдено или сѳхо, или мокрw. И вѣсако билиє за что є добро. Ѳказ ѣ wт(ъ) азѳъ** (Description of the properties of each medicine, whether it is hot, cold, dry, or moist. And for each medicine, what it is good for).[26] In the mid-twentieth century, Mirko Grmek, a historian of medicine, discovered that the Pharmacological List of Simple Remedies in the HMC is an adapted and adjusted translation of the *Liber de simplici medicina*, better known as the *Circa instans*.[27] This pharmacopoeia has been attributed to the teacher Matthaeus Platearius (died 1161) and is one of the most significant works produced by the medical school in Salerno and for European medicine in general. *Circa instans* is lagrely based on *De materia medica*[28] (first century CE), a pharmacopoeia by the Roman military physician Dioscorides, as well as on many other works, including those on medicatons from Arab and Oriental medicine. Depending on the

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[24] The part of the treatise dedicated to smallpox and measles in the HMC includes the following chapters: **Зде покинѣ wтъ богинк и wтъ козїачъ** (66б–67a) – *Here begins about smallpox and measles*; **Ѡт(ъ) козїаче или богинк** (67б–69a) – *About smallpox*; **Бѣл(ѣ)зи wт(ъ) изъшъствїа богин(ъ) или козїачъ** (69a) – *Signs of the eruption of smallpox*; **Ѡт(ъ) др8гагw рода wт(ъ) козїачъ** (69a–69б) – *About another kind of smallpox* (about differences between smallpox and measles); **Бѣлѣзъı wт(ъ) мор'билw** (69б–70a) – *Signs of measles*; **Зде почни виданіе** (70a–71б) – *Here begins the treatment*; **Ѡт(ъ) биліа, за wвѳи истѳ болѣстъ** (71б–72б) – *About medicines for this same disease*; **Ѡ знанїа, кое ѳдовѣ потрѣбѳе чѳвати wт(ъ) варившлъ или wт(ъ) мор'билw** (72б–73б) – *About the knowledge of which limbs need to be protected from smallpox or measles*. *HMK* 1980, 132–146; *HMK* 1989, 267–274.
Avicenna's treatise on smallpox and measles in the Latin editions of the *Canon of Medicine* includes chapters: *De variolis* (Cap. 6) – *About smallpox*; *De signis apparitionis variolarum* / *Signa apparitionis variolarum* (Cap. 7) – *About the signs of the appearance of smallpox / Signs of the appearance of smallpox*; *De morbillo* (Cap. 8) – *About measles*; *De signis salutis eius* / *Signa salutis eius* (Cap. 9) – *About the signs of their appearance / Signs of their appearance*; *De cura* / *Cura* (Cap. 10) – *About the treatment*; *De opservatione membrorum, & defensione eorum a nocumento variolarum, & morbillorum (morbilli)* (Cap. 11) – *About observation parts [of the face and body] and their protection against the harmful effects of smallpox and measles*; *De eradicatione vestigiorum variolarum* (Cap. 12) – *About eradication of traces of smallpox*. Avicenna 1507: 416'–418' (Cap. 1–12); Avicenna 1595b: 72–76.

[25] Bojanin 2021: 72; *Id.* 2023: 108, 110, 112.

[26] *HMK* 1989, 97–157, 293–354.

[27] Grmek 1961: 34–35.

[28] Dioscorides 2000; *Id.* 2017.

manuscript, the *Circa instans* usually contains between about 250 and 280 descriptions of medicinal drugs.[29] The List of Simple Remedies in the HMC contains 145 chapters dedicated to individual medicinal drugs of plant, mineral, or animal origin. It provides information about their basic properties according to humor theory, origin, appearance, characteristics, shelf life, how they can be used in the treatment of various diseases and ailments, and how to use them as specific treatments.[30]

Treatments for the eyes of those suffering from smallpox and measles are contained in the last chapter of HMC's treatise on the plague, smallpox, and measles, called '**ѿ знанїꙗ, коє ѕдовѣ потрѣбѣє чѕвати wт(ъ) вариwлъ или wт(ъ) мор'билw**' (On the knowledge of which limbs must be protected from smallpox or measles).[31] The content of this chapter almost entirely corresponds to the eleventh chapter in the Latin translations of Avicenna's tractate on plague, smallpox, measles, and other related diseases called *De observatione membrorum, & defensione eorum a nocumento variolarum, & morbillorum / morbilli* (On the observation of parts [of the face and body] and their protection against the harmful effects of smallpox and measles).[32] This chapter mentions the possibility of sores appearing and certain parts of the face and internal organs being affected by these diseases, along with measures for prevention and treatment. If sores appear on the eye, Avicenna warns that the afflicted may lose the eye or that it may turn white.[33] To prevent sores from forming, he says it is best to protect the eye with alcohol from *almuri* (Old Serbian: **алкоχолъ wт(ъ) алмир'ри**, Latin: almuri), coriander water (**wт(ъ) водє wт(ъ) коріанъдрw**, aqua coriandri), and rose water (*rodosta*) (**wт(ъ) родоста**, aqua ros.), in which several sumacs (**сѕмак**, sumach) and camphor (**камфор**, camphor) have previously been soaked ('fermented'). This should be applied to the afflicted as soon as the first symptoms of smallpox or measles appear. If these ingredients are not available, only *almuri* (**алмѕри**, almuri) is good for use as an eye ointment.[34]

According to research by Charles Perry, the Arabic medicine *murri* (Arabic: *murrī*) was a liquid seasoning most commonly made from *būdhaj*, which is completely rotten barley dough. Together with *kāmakh* and *bunn*, *murrī* was one of the most prized rotten seasonings in medieval Arab cuisine. The word *būdhaj*, derived from Old Persian *pudag* (rotten), most often appears in recipes in Arabized forms such as *fudhaj* or *fudhanj*.[35] Perry also refers to recipes for making *būdhaj*, which are preserved in two culinary books, the tenth-century *Kitab al-Tabikh* and the thirteenth-century *Kitab Wasf*. A recipe for *būdhaj* is

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29 Ventura 2010; *Id*. 2016; Bojanin 2017: 281; *Id.* 2022, 137–138.
Circa instans is preserved in many enlarged or revised copies, including translations into vernacular languages (Grmek 1961: 40; Ventura 2010; Bojanin 2017, 283, n. 32). The editions used here are Camus 1886; Dorveaux 1913; Ventura 2009.

30 Grmek 1961: 34–35; Katić 1977: 193–275; *Id.* 1981: 129–135; *HMK* 1989: XXXIII–XXXIV (Katić); Katić 1990: 20; Bojanin 2012: 9–15; *Id.* 2017: 279–282.

31 *HMK* 1989: 76–77.

32 Avicenna 1507: 418'; Avicenna 1595b: 76. See also: Abu Ali Ibn Sina IV: 136; Avicenna 4: 276–277.

33 *HMK* 1989: 76–77, 273. See also: Avicenna 1507: 418'; Avicenna 1595b: 76; Abu Ali Ibn Sina IV: 136; Avicenna 4: 276.

34 *HMK* 1989: 273. See also: Avicenna 1507: 418'; Avicenna 1595b: 76; Abu Ali Ibn Sina IV: 136; Avicenna 4: 276.

35 Perry 1988: 169.

also incorporated into one of the *murrī* recipes in the *Kitab Wasf*. Perry also discovered that the recipe for *murrī* from the thirteenth-century *Baghdad Cookery Book* contains incorrect instructions for making *būdhaj*.[36] All the recipes indicate that *būdhaj* was made from either barley flour or equal parts of barley and wheat, and without leaven or salt. Loaves or cakes (according to the recipe in the *Kitab Wasf*, each should weigh one Egyptian *ratl*[37]), which were well-kneaded either dry or with hot water, should be pierced in the middle, wrapped in the leaves and twigs of male figs, and then sprinkled with bran. The loaves or cakes should then be either spread somewhere, placed in a closed container, or buried under ash or straw to ferment for forty to seventy days, after which they were removed and dried. When broken, if the raw bread was seen to contain red roots, then it was fully ripe and well-dried. According to the recipe from *Kitab al-Tabikh*, pieces of hot unleavened bread could also be placed between the loaves, which would accelerate the formation of additional decay and vegetation. At the end of the drying process, decay and cobwebs were to be removed with a knife, and the loaves were crushed in a mortar or ground into flour, which was then used as a seasoning or for making *murrī*.[38]

After the preparation of *būdhaj*, one could proceed to make *murrī*. Two recipes for *murrī* have survived, both of which are found in the *Kitab Wasf*. One recipe describes the '*murrī* of the Iraqis,' and it seems to have later appeared in the *Baghdad Cookery Book*. The other is a recipe for 'infused *murrī* of the North Africans.' The first receipe calls for thirty *ratl*s of *fudhanj* (*būdhaj*) flour and thirty ratls of fine wheat flour (or five ratls each, according to the *Baghdad Cookery Book*). First, the wheat flour should be kneaded well without leaven and salt, baked, dried, and finely ground, then placed in a green washtub together with *fudhanj* flour, twenty *ratl*s of salt, two *rub*s of fennel, and one *rub* of nigella seeds). Then it is left in the sun during the summer heat for forty days and kneaded well three times a day (in the morning, at noon, and in the evening) and sprayed with water. When it turns black, it should be placed in preserving jars, covered with an equal amount of water, and left for another two weeks, during which it should be stirred in the morning and evening. After fermentation (when it swells and settles), the mixture is strained, and this yields the first infusion or *murrī*. The drained residue (sediment) is returned to the vessel (trough), covered with an equal amount of water, and left for another two weeks. When bubbles appear, the second infusion is strained and combined with the first. A third infusion of *murrī* can also be obtained from the residue, which should also be added to the first and second. If the *murrī* is too salty, jujubes are added. To achieve sweet *murrī*, honey and treacle (sweet, uncrystallized syrup) were added to the obtained infusion, which bubbles up and turns black. Saffron, cinnamon, and other good spices were also added to the *murrī*.[39]

For the 'infused *murrī* of the North Africans,' instead of wheat flour, only a certain amount of *būdhaj* was used, to which five measures of flavored salt were added, as well as five measures of dry thyme, milled dry coriander, cumin, nigella seeds, fenugreek, anise, and slightly more fennel. This mixture was then placed in a new wide-mouthed container

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36 *Ibid*.

37 For measurements appearing in prescriptions for *būdhaj* and *murrī*, see: Rebstock 2008.

38 Perry 1988: 172–173.

39 *Ibid*.: 169, 173–174.

or one greased with oil and placed on the roof to be exposed to the sun for most of the day. Water was added to the mixture to achieve a paste or syrup consistency (treacle), as well as abundant quantities of broken carob, fennel roots, lemon leaves, hearts of branches of bitter orange, and two or three pine nuts. When the seeds surfaced, the mixture was stirred with a stick made of fig wood with branches, and a sieve woven from bast and esparto was placed over it, then covered with a cloth to keep out wasps and flies from entering. Water was frequently added to the mixture, and then it was left in the sun for forty days to ferment. After that, for every ten Egyptian *ratl*s, a third of a *ratl* of baked crumbs (coarse wheat flour) kneaded with yeast was added. Then it was broken into crumbs and left in the sun for another ten days. Then the first, highest-quality extraction could be strained and placed in glass containers sealed with oil. To obtain the second infusion of *murrī*, water was again added to the sediment, which was left in the sun for forty days. It was then strained and hot bread added to it. It was then left for another ten days and finally strained again. A third or even fourth series of *murrī* could be obtained by repeating the same process. The strained mixture was dried in the shade and could be used as a seasoning for some dishes.[40]

This infusion of *murrī* obtained after the first or repeated fermentations, may be the 'alcohol from almiri/almuri' (**алкоχѳлъ шт(ъ) алмир'ри**, **алмѯри**) in the HMC's treatise on smallpox and measles. The pharmacopoeia in the *Canon of Medicine* (Book II) contains a chapter on *murrī*, which is said to be dry and hot in the second or third degree. When determining the degree of heat for this substance, a distinction is made between fish *murrī* and barley *murrī*. The *Canon*'s pharmacopoeia states that *murrī* should be applied to the eyes at the onset of smallpox to prevent the eruption of pustules. *Murrī* supposedly helped with ulcerous intestines. In addition to *murrī* prepared from salted fish, there is mention of a *murrī* made from salted meat, both of which were said to prevent the spread of malignant ulcers. This type of *murrī* is believed to have been a marinade or jelly (aspic) made from fish or meat.[41] Considering that ordinary people pronounce *al-muri* with a single *r*, Arabic lexicographers generally assumed that *murrī* was a foreign word. Therefore, the Arabic word *murri*/*almuri*/ *almira* is believed to be derived from the Greek term *halmyris* (salty thing), which further suggests a connection with the Greek sauce *garos* or the Roman *garum*, which is a brine of fermented fish. Although the *murrī* in the recipes in the *Kitab Wasf* did not contain fish, it had certain similarities with the Greek *garos*. Both substances were salty liquid seasonings produced by long fermentation. In the case of *garos*, fish were not actually fermented but instead underwent enzymatic autolysis, as the salty environment prevented microbial decay. However, it is not certain that the type of *murrī* from these Persian books originated as a variant of Greek *garos*.[42]

In the *Kitab Wasf*, a 'Byzantine *murrī*' is also described, which was not made from completely rotten bread but was instead based on toasted bread and caramelized honey. According to this recipe, three *ratl*s of toasted honey and ten loaves of finely ground toasted bread should be added to half a *ratl* of starch, two *uqiyahs* of baked anise, caraway, and nigella seeds (likely referring to the black seeds of this plant), one *uqiyah* of Byzantine

[40] *Ibid*.: 169, 174.
[41] Avicenna 1507: 136; Avicenna 1595a: 360; Abu Ali Ibn Sina II: 421. Cf. Avicenna 2: 493–494.
[42] Perry 1988: 169–170. See also: Abu Ali Ibn Sina II: 421, n. 1.

saffron and celery seeds, half a *ratl* of Syrian carob, fifty peeled walnuts (half a *ratl*), five split quinces, half a *makkuk* of salt dissolved in honey, and thrity *ratl*s of water. All the ingredients were cooked together over low heat until a third of the water evaporated, and then it was well-strained into a clean bag and placed in a greased glass or pottery container with a narrow neck. Finally, a little lemon was added. If a little water was poured onto the dough, boiled, and strained, a second infusion could be obtained.[43] This type of Byzantine unfermented *murrī* seems to have been known among ordinary people in Spain as well. The *Manuscrito Anonimo*, a work from the thirteenth century states that, regarding *al-murri*, only the infusion should be used, as well as *murrī* made from grape juice with spices and without toasted bread. *Murrī* made from toasted honey and toasted bread, made by common people, should by no means be used, as it tends to produce 'black bile' (melancholy) and has neither benefit nor a sharp taste. Here, a similarity is observed between the *murrī* to which a mixture of honey and patoka is added (*murrī of the Iraqis*) and the Byzantine and Spanish *murrī* based on honey or grape juice.[44]

As mentioned earlier, alcohol or a *murrī* infusion was recommended a treatment to protect the eyes from smallpox and measles in combination with coriander juice and rose water, in which several sumacs and camphor had been soaked. Coriander[45] (Greek: *κορίαννον*; Latin: *coriandrum*, *coliandrum*; Old Serbian: **коріан'дрѫмъ**, **кѫлиан'дрѫмъ**) is described in the List of Simple Remedies in the *Hilandar Medical Codex* (**Ѿт(ъ) коріан'дрѫмъ**), where it is said to be the seed of a herb that can often be found.[46] However, the coriander water mentioned in the treatise on smallpox and measles in the HMC was probably obtained from the plant's boiled leaves. Sumac (Arabic, Persian: *summāq*; Latin: *sumach*; Old Serbian: **сѫмак**) refers to a small, stone-like, sour fruit the size of a lentil that is green or red in color, and to the seed of a tree of the same name that is still widely used in the Middle East, primarily as a spice.[47] Rose water was widely applied in medical treatments as one of the ingredients in numerous ointments, balms, and other complex medicines. The Old Serbian term for rose water (**родостома** – 'rodostoma') is derived from **родомон**, which comes from the Greek name for rose (*ρόδον*).[48] A method for making rose water is given in the chapter on roses (**Ѿт(ъ) ръци. Ѿт(ъ) рожѣ. Съирѣч(ъ) рѫжица**) in the HMC's pharmacological list of simple remedies. Roses were to be picked while still not fully in bloom and the fresh petals placed in a covered container with an opening at the bottom under which a glass container was placed. A fire lit beneath the vessels created steam

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43 Perry 1988: 170, 174–175.

44 *Ibid*.: 170, 175.

45 The botanical name for coriander is: *Coriandrum sativum* L., *f. Umbelliferae*. Hooper, Field 1937: 106; Simonović 1959: 140; Tucakov 1971: 368–369; Katić 1982: 89; *Id.* 1987: 73; Stannard 1999: XVII 419; Paavilainen 2009: 343, 509; Jarić i dr. 2011: 607; Quattrocchi 2016: 1131–1132

46 *HMK* 1989: 131, 329. See also: Camus 1886: 55; Dorveaux 1913: XIII, 205. The *Canon*'s pharmacopoeia states that a poultice of coriander leaves prevents unhealthy matter from enthering the eye. Avicenna 1507: 104–104'; Avicenna 1595a: 294–295; Abu Ali Ibn Sina II: 352, 355–356; Avicenna 2: 315–319.

47 The scientific name of sumac is *Rhus Coriaria* L., *f. Anacardiaceae*. Hooper, Field 1937: 164; Simonović 1959: 399; Quattrocchi 2016: 3209. See also: Camus 1886: 124; Dorveaux 1913: XV, 179, 246; Ventura 2009: 751–752; Avicenna 1507: 153; Avicenna 1595a: 395; Abu Ali Ibn Sina II: 461–462; Avicenna 2: 1057–1060.

48 Katić 1982: 128; *Id.* 1987: 116. The botanical name for the genus of roses is *Rosa* L.*, f. Rosaceae*. Simonović 1959: 402–403; Paavilainen 2009: 554; Jarić i dr. 2011: 612; Quattrocchi 2016: 3237–3240.

that dripped through the opening into the bottom glass container in the form of rose water. The water was then left to stand in a well-sealed glass container in the sun for thrity days before it could be used.[49]

Camphor (Arabic, Persian: *kāfūr*; Latin: *camphor*; Old Serbian: **камфоръ**) is a white, crystalline, aromatic drug in the form of the solid part of an essential oil or resin obtained from the high tropical evergreen tree *Cinnamomum camphora* Nees et Eberm, *f. Lauraceae*, which originated in the Far East. It is one of the most valuable and luxurious resins, and it has been used since ancient times as an ingredient in many medicines and perfumes. It was ingested or used for embalming and fumigation. Europeans obtained it from the Arabs in the sixth century. Its use has also been recored in several practical recipes for eye diseases.[50] The HMC's pharmacological list of simple remedies also contains a chapter on camphor. It states that, according to Dioscorides and other scholars, camphor is obtained from the juice of a plant harvested in May. Good camphor was considered to be light, pure, and bright like glass. Camphor is also recommended here for use in treatments for various diseases and ailments and in combination with rose water for treating the eyes. Camphor mixed with rose water was strained through a clean red cloth. This medicinal liquid was then applied to the eyes with a soaked feather in cases of inflammation of the mucous membrane ('for those experiencing intense heat in the eyes').[51]

As another treatment for the eyes, the treatise on smallpox and measles recommends taking *alcohol* (**алкохѡлъ**, alcohol) and grinding it very finely. The finely ground *alcohol* should then be placed in coriander water (**въ вѡдѣ ѡт(ъ) кѳлиан'дрє**, aqua coriandri; coliandium) and sumac water, to which a little camphor should be added. This should then be frequently applied to the eye.[52] Here, *alcohol* refers to *kohl* (Persian: *kohl*, *al-kuḥl*, *kuḥūl*, *surmah*; Arabic: *ithmīd*, *kohl*), an ancient substance made mostly from lead sulfide (*galena*)[53] or from stibnite, i.e., powdered antimony, used in eye cosmetics and medicine for eye diseases. The Arabic and Persian word *kohl*, as well as the Syriac-Aramaic *kuhla*, were derived from the Akkadian term *guhlu(m)*, which specifically denotes stibnite (*stibium*) or antimony (*antimonium*). The Greek form *στίβι* and the Latin *stibium*, however, were derived from the Egyptian word *msdmt*, which was used for eye-paint in general and black in particular. Kohl is still widely used in the Middle East, South Asia, and in North, West, and Northeast Africa as an eye pencil for outlining and darkening the eyelids and eyelashes, even for children. The contents of kohl and how it is prepared vary by country and tradition. In ancient Egypt, it was used as early as the predynastic period to protect

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[49] *HMK* 1989: 149–150, 348–349. See also: Dorveaux 1913: XV, 164–167; Ventura 2009: 682–683. The properties and effects of several types of roses are described in the pharmacopoeia of the *Canon*. Avicenna 1507: 146–146'; Avicenna 1595a: 380–381; Abu Ali Ibn Sina II: 223–225, 424–425; Avicenna 2: 369–371, 938–943.

[50] Simonović 1959: 123; Tucakov 1971: 330; Paavilainen 2009: 399; Jarić i dr. 2011: 607; Quattrocchi 2016: 955; Amar, Lev 2017: 67, 134, 144–148. Cf. Katić 1982: 86; *Id.* 1987: 69.

[51] *HMK* 1989: 122, 318–319. See also: Dorveaux 1913: XIII, 36–38, 201; Ventura 2009: 314–315. Cf. Avicenna 1507: 102'–103; Avicenna 1595a: 291; Abu Ali Ibn Sina II: 322–323; Avicenna 2: 185–187.

[52] *HMK* 1989, 77, 273. See also: Avicenna 1507: 418'; Avicenna 1595b: 76. The Russian edition of the *Canon of Medicine* mentions "boiled khol" (Abu Ali Ibn Sina IV: 136). The English translation of the Persian version of the *Canon* mentions "ordinary khol" (Avicenna 4: 276).

[53] The HMC's list of simple remedies contains a chapter on lead (Serbian: *olovo*) – **Ѡт(ъ) пѳмбѳмъ. Съирѣч(ъ) ѳлѡв(ѳ)**. *HMK* 1989, 149, 348. See also: Dorveaux 1913: XV, 162–163; Ventura 2009 (*plumbum*).

against eye diseases, and it was later used as a cosmetic for the eyes made from *galena* (lead sulfide). Camphor and medicinal herbs were also added to kohl as eye medicine in Ayurvedic and Indian classical herbal medicine.[54] The *Canon*'s pharmacopoeia also states that *antimonium* ('substantia plumbi mortui') protects the eyes and removes infections.[55]

The treatise also states that, at the beginning of an infection, it is also very good to apply juice from the 'seeds of the sour pomegranate' (**сокомъ wт(ъ) зрънъ wт(ъ) кисѣлїихъ шипъкъ**)[56] to the eye, and recommends frequently applying camphor (**с кам'форwмъ**) and rose water (**с родостомъ**) immediately before the appearance of exanthemas.[57] In sixteenth-century Latin translations and the Russian translation of the Arabic version of the *Canon*, the use of pomegranate pulp juice (Latin: succus pulpae / pulpe granatorum) is also advised at the first stages of the disease, and a mixture of kohl, rose water and camphor (Latin: alcohol cum aqua ros. & camphora) immediately after the eruption of exanthema.[58] In the Latin editions, kohl mixed with white naphtha (alcohol cum naphta alba) is also recommended.[59] *Naphta alba* (Arabic, Persian: *nift*), or white bitumen, refers to white refined naphthalene (*napthalanum liquidum raffinarum*), a medicinal type of oil from the city of Naftalan in Azerbaijan, which has been used since ancient times to treat skin diseases. The chapter on naphtha in Book II of the *Canon* claims that white naphtha is rare yet helpful for pain in the legs and joints, among other things. It also claims that naphtha is useful for treating opacity of the cornea, cataracts, and eye wounds in general.[60]

Further on in the Old Serbian treatise on smallpox and measles, the use of pistachio oil (**маслo wт(ъ) фицици**, oleum de fisticis) is also recommended.[61] The Latin term *fistici* (Old Serbian: **фицици**) comes from the Persian *fistak*, *pistah* (Arabic: *fustuq*).[62] The *Circa*

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54 Sweha 1982; Tiffany-Castiglioni and others 2012: 4; Avicenna 2: 262–263. Even today, in North Africa and the Middle East, kohl is usually made from galenite powder, while in the West, amorphous carbon or organic charcoal are generally used instead of lead. Some studies suggest there is a danger in using this type of cosmetics, namely possible lead poisoning, but others refute this. Mahmood and others 2009; Tiffany-Castiglioni and others 2012.

55 Avicenna 1507: 89; Avicenna 1595a: 261–262; Avicenna 2: 262–264.

56 Pomegranate (Latin. *malum granata*; *mala granata*; *malum punicum*) is the fruit of the plant *Punica granatum* L., *f. Punicaceae*, while its common name is *pomme granate* (Serbian: *granat-jabuka*). Hooper, Field 1937: 159–160; Simonović 1959: 387; Tucakov 1971: 478–480; Paavilainen 2009: 457; Jarić i dr. 2011: 612; Quattrocchi 2016: 3142–3143. The list of simple remedies in the HMC also contains a chapter on pomegranate fruits (**Wт(ъ) малорѣм(ъ) гранаторѣмъ. Сърѣч(ъ) великъıи шипции**), otherwise called *veliki shiptsi* (**великъıи шипции**), and mentions that they can be sweet or sour (*HMK* 1989: 138, 336). See also: Camus 1886: 87; Dorveaux 1913: XIV, 54, 225; Ventura 2009: 567–569. The pharmacopoeia of the Russian translation of the *Canon* states that the juice of sour pomegranate helps with pterygoid hymen (a degenerative change in the conjunctiva and cornea). Abu Ali Ibn Sina II: 580–581. Cf. Avicenna 1507: 120'; Avicenna 1595a: 328–329; Avicenna 2: 877–882.

57 *HMK* 1989: 77, 273.

58 Avicenna 1507: 418'; Avicenna 1595b: 76; Abu Ali Ibn Sina IV: 136. Cf. Avicenna 4: 276 (the mention of khol is ommitted in this edition).

59 Avicenna 1507: 418'; Avicenna 1595b: 76.

60 Abu Ali Ibn Sina II: 434; Avicenna 2: 130–131.

61 *HMK* 1989: 273. Cf. *Ibid*.: 77, 434 (In this edition **фицици** are wrongly identified as figs).

62 Avicenna 2: 867; Paavilainen 2009: 550. Pistachios are fruits of the plant *Pistacia vera L., f. Anacardiaceae*. Simonović 1959: 360; Quattrocchi 2016: 2962–2963.

instans versions clearly state that *fistici* is another name for pistachios (*pistace*/*pistaceae*).[63] The Old Serbian treatise states that women 'in our country' often apply pistachio oil when they see smallpox or measles in their eyes. It also claims that pistachio oil is highly effective at clarifying and cleansing the eyes and removing smallpox or measles.[64] The *Canon* explains in more detail that this oil will cleanse and brighten the eyes in the event of cataracts (Latin: caliginem, cataracta; Old Serbian: **павлага** – *pavlaga*[65]). Here it is also advised to rub the eyes with a white ointment or white collyrium (Latin: *collyrium album*) after an outbreak of smallpox.[66]

As demonstrated here, the eye treatments contained in the HMC's treatise on smallpox and measles correspond almost completely to treatments from Avicenna's *Canon of Medicine*, from which this Old Serbian medical text originates. Among the medicines mentioned as eye treatments in the Old Serbian manuscript, a specific Arabic medicine—*murri*—is first mentioned, which could be of plant or animal origin depending on the type. The other medicines most frequently appear in the form of parts of plants (coriander, rose), fruits (sumac, pomegranate), oils from plant fruits (pistachio oil), and resin (camphor). There is also a medicine made of *kohl* (lead sulfide [galena] or stibnite [antimony] in powder form), which comes from a mineral. Alcohol from *al-murri* was considered the best medicine for protecting the eyes from the formation of wounds due to smallpox or measles, and it could be used alone or in combination with coriander water, rose water, sumac, and camphor. Another recipe involved using a mixture made from ground kohl, coriander juice, sumac juice, and a bit of camphor. Pomegranate juice was advised for treating the eyes at the beginning of the infection, and a combination of camphor and rose water just before the appearance of exanthema. Pistachio oil was recommended after the appearance of exanthema in the eyes, and it served to remove wounds, cleanse, and brighten the eyes. Avicenna's treatise on smallpox and measles also mentions white naphtha and white collyrium, which do not appear in the Old Serbian manuscript.

The pharmacopoeia of the *Canon of Medicine* (Book II) also mentions *murri*'s medicinal properties for protecting the eyes from smallpox and measles. There were several types of this medicine or spice, among which two were most common: one was a fermented liquid substance made from completely rotted barley dough, and the other was prepared from salted fish or salted meat, which was generally recommended in the *Canon*'s pharmacopoeia for combating malignant ulcers. It cannot be determined with certainty which type is referred to in the treatise on smallpox and measles, or how extensively this medicine was actually used in practice. Some of the other medicines mentioned here also appear in the pharmacopoeias of the *Canon* and the HMC as being effective for eye diseases. In the *Canon*, white naphtha also appears as a remedy for treating eye wounds, and pistachio

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63 Pistachios are said to be hot and moist and are the fruit of a tree that grows "across the sea," and resembles pine nuts. Camus 1886: 105; Dorveaux 1913: XV, 162, 236; Ventura 2009: 842. There is also a chapter on pistachios in the Pharmacopoeia in the *Canon of Medicine* (Book II), where they are described as bitter and pleasantly fragrant, while Syrian pistachios resemble pine nuts. Among other uses, pistachio oil is recommended for liver pain. Abu Ali Ibn Sina II: 526–527; Avicenna 2: 867–869.

64 *HMK* 1989: 273.

65 *Ibid*.: 422.

66 Avicenna 1507: 418'; Avicenna 1595b: 76. See also: Abu Ali Ibn Sina IV: 136; Avicenna 4: 276–277.

oil is recommended for cataracts. The list of simple remedies in the HMC also recommended a mixture of camphor and rose water as a treatment for diseases of the eye. Most of the Old Serbian names for these medicines were originally Arabic names—al-murri (**алмѫри**, **алмир'ри**), camphor (**камфора**), sumac (**сѫмак**), kohl (**алкохѡлъ**)—that were adopted through Latin medical texts. Pistachios, or *fìshtitsi* (**фицици**), however, appear in the typical Persian form. *Rodosta*, the Old Serbian name for rose water (**родоста**) and coriander (**корїан'дрѫмъ**) come from Greek, and the word for pomegranate is Serbian: *shipak*, *shiptsi* (**шипъкъ**, **шипции**).

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МАРИНА ШТЕТИЋ
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ОЧНИ ТРЕТМАНИ У СПИСУ О ВЕЛИКИМ И МАЛИМ БОГИЊАМА *ХИЛАНДАРСКОГ МЕДИЦИНСКОГ КОДЕКСА*

Резиме

Хиландарски медицински кодекс представља зборник старосрпских лекарских списа из средине 16. века (око 1550–1560), који се чува у Хиландару под бројем 517. Списи *ХМК* настали су у виду латинских превода најзначајнијих дела средњовековне европске медицине, засноване на теоријама и учењима најистакнутијих античких и арапских лекара. Старосрпски спис о великим и малим богињама (вариолама и морбилама), који заједно са списом о куги чини један трактат, потиче из IV књиге *Канона медицине*, дела чувеног персијског лекара и филозофа Авицене (980–1037). Спис је настао на основу неког од издања латинског превода *Канона медицине*, који је са арапског преведен крајем XII века у Толеду, од стране Герарда из Кремоне, премда латински предложак који је послужио за старосрпски превод није познат. Тртман за заштиту од избијања богиња у очима и њихово лечење налази се у последњем поглављу трактата о куги и богињама *ХМК* под насловом: **Ѡⷪ знанїꙗ, кое ѕдовѣ потрѣбѕе чѕвати шт(ъ) вариѡлъ или шт(ъ) мор'билѡ** (*О познавању (тога) које удове је потребно чувати од вариоле или морбиле*). Садржај овог поглавља скоро у потпуности одговара 11. поглављу Авиценине трактата о куги, вариолама, морбилама и болестима сличног рода, садржаном у латинским издањима *Канона* из 1507. и 1595. године (*De opservatione membrorum, & defensione eorum a nocumento variolarum, & morbillorum* / *morbilli*).

Најбољим леком за заштиту ока од стварања рана услед вариола и морбила сматрао се *алкохол од алмире* или *алмури* (стсрп. **алкоχолъ шт(ъ) алмир'ри**, **алмѕри**; лат. almuri), који се могао користити самостално или у комбинацији са водом од коријандера (**коріан'дрѕмъ**, **кѕлиан'дрѕмъ**; coriandrum, coliandrum) и ружином водицом (**родоста**, aqua ros.), сумаком (**сѕмак**, sumach) и камфором (**камфор**, camphor). *Мури* или *алмури* представља специфичну материју арапског порекла, добијену сложеним поступком, која је коришћена као лек и зачин. Постојало је више врста мурија, од којих су две најпознатије. Једна представља мури у виду ферментисане течне супстанце настале од потпуно иструлелог јечменог теста. Друга врста је мури припремљен од усољене рибе или усољеног меса. На основу списа о вариолама и морбилама не може се тврдити са сигурношћу о којој врсти је реч и колико је овај лек заиста имао примену у пракси. За превенцију од стварања рана у очима препоручује се и употреба смесе од иситњеног *алкохола* (**алкоχѡлъ**, alcohol), сока од коријандера, сока од сумака и мало камфора. *Алкохол* представља *кохл*, односно олово-сулфид (галенит) или стибнит (антимон) у праху, који су се од давнина користили за лечење очних болести, али и у козметици, за исцртавање очију црном бојом. На почетку заразе саветован је и сок од зрна киселог нара (**сокъ шт(ъ) зрънъ шт(ъ) кисѣлїихъ шипъкъ**), а непосредно пре појаве егзантема у очима камфор и ружина водица. Уље од пистаћа (**масло шт(ъ) фицици**, oleum de fisticis) употребљавано је након појаве богиња у очима, у функцији одстрањивања рана, чишћења и посветљивања ока.

За разлику од мурија, материје биљног или животињског порекла, и кохла као дроге минералног порекла, све остале лековите супстанце добијене су од делова биљака (коријандер,

латице ружа), као и њихових плодова у виду воћа (сумак, нар, пистаћи) или смоле (камфор). У Авиценином трактату јављају се и *бела нафта* (*naphta alba*), тј. бели нафталан, као и *бели колирцијум* (*collyrium album*), који нису присутни у старосрпском рукопису. Смеса од камфора и ружине водице се у терапији за очне болести препоручује и у поглављу о камфору унутар списа о једноставним лековима *ХМК*, који представља прилагођени превод чувеног дела *Circa instans* медицинске школе у Салерну из друге половине XII века. Већина старосрпских назива поменутих лекова представља оригинално арапска имена (алмури, камфор, сумак, кохл), усвојена посредством латинских медицинских текстова, док се пистаћи јављају у типично персијском облику (перс. *fistak*; арап. *fustuq*). Старосрпска имена за ружину водицу (*родоста*) и коријандер потичу из грчког језика, док зрна нара носе српски назив (шипак, шипци).

Кључне речи: очна терапија, спис о великим и малим богињама, *мури* (*алмури*), *Хиландарски медицински кодекс*, Авицена, *Канон медицине*, старосрпски медицински списи, 16. век.

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