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## **Common and Foxtail Millet in Dietetics, Culinary Art and Therapeutic Procedures of the Antiquity and Early Byzantium**

**Abstract:** Common millet (*Panicum miliaceum* L.) and foxtail millet, also known as Italian millet (*Setaria italica* P. Beauv.), are among crop grasses that in the Antiquity and the early Byzantine period were grown on a relatively large scale. Yet although the sources indicate that they were among popular crops, they were neither as widespread nor as highly regarded by consumers as wheat and barley. Views pertinent to the dietetic doctrine with regard to those plants evolved before Galen's lifetime and were very consistent, considering that they did not change over the period from the 2<sup>nd</sup> to the 7<sup>th</sup> century. This doctrine pointed to the less beneficial qualities of both these crop plants in comparison to the most highly valued grains used in bread-making, especially to wheat. Also, common and foxtail millet were constantly present in the cuisine of the period in question, both being used as food in the rural areas rather than in cities. They were usually put in boiled dishes, because millet bread was unpopular owing to its brittleness and disagreeable taste.

Both common and foxtail millet were included among the *fármaka* used in the period between the 2<sup>nd</sup> and 7<sup>th</sup> century, although they certainly were not as favoured in medicine as wheat and barley. Common millet was more often mentioned in the healing role. Both grains were used in medical procedures as components of healing diets, especially foods helpful in alleviating gastric disorders. Flour ground from common millet was applied as powder, whereas the grain itself found use as a component of warming cataplasms and poultices which usually had a drying quality. In addition, millet was considered to be an efficacious antidote against poisons.

**Key words:** ancient Byzantium, nutrition, culinary habits, medicine, millet.

## Common millet (*kenchros*) and foxtail millet (*elymos/meline*). A brief history

The subfamily of *Panicoideae* includes many species of plants belonging to the family *Poaceae* (Barnh.) also called true grasses (*Gramineae* Juss.). Apart from many wild-growing grasses, the family includes a number of domesticated grains which have played a significant role as staple foods in the history of mankind. The most important of these is common millet (*Panicum miliaceum* L.) and, beside it, foxtail millet also known as Italian millet (*Setaria italica* P. Beauv.) and its subspecies: moharium (*Setaria italica* ssp. *moharium* Alef.), Japanese and Indian barnyard millet (*Panicum frumentaceum* Rott. or *Paspalum frumentaceum* Rott.), large crabgrass, also known as hairy crabgrass (*Digitaria sanguinalis* L.), pearl millet (*Pennisetum glaucum* L., sometimes referred to as *Panicum spicatum* L.) and finally the numerous species of sorghum (e.g. *Sorghum halepense* Pers.). This diversity was not unknown to the ancient Greek and Byzantine authors writing in Greek, who often described many *Panicoideae* grasses together, but nevertheless identified the differences between them. They used a variety of terms; common millet was most commonly described as *kenchros*, *kerchnos*, *kenchrion* or *kenchris*, while foxtail millet was referred to as *elymos*, *elyme*, *elymion*, *meline*, or *melinos* [see Witczak 2003: 77, 85; *A Greek-English Lexicon* 1996: 538, 933, 1097; *Lexicon zur byzantinische...* 2001: 486, 817; *Słownik grecko-polski* 1960: 106].

Bearing in mind the variety and the sheer number of species belonging to the *Panicoideae* subfamily, as well as the large area of their cultivation, the authors of the present article wish to focus solely on the types grown in the Mediterranean in the relevant period of time (2<sup>nd</sup>–7<sup>th</sup> century A.D.) and the species that, although cultivated in other regions, still elicited the interest of the Greek-speaking writers in this period.

The *Panicoideae* plants were among the earliest crop grasses domesticated by man. To our knowledge, *kenchros* began to be purposefully grown presumably around 7000 or 6000 B.C. in northern China or in the Caucasus, from where it spread in all directions, reaching the Iranian Plateau, India and Europe. Only in the 1<sup>st</sup> millennium B.C. did it appear and achieve the status of a cultivated crop in the Middle East [see Watson

1969: 398–399; Zohary, Hopf 2000: 80; Dalby 2003: 218; Strzelczyk 2003: 9]. The other important ancient Mediterranean variety, the *elymos/meline*, became the subject of interest later in the Neolithic period, namely around the 6<sup>th</sup> or 5<sup>th</sup> millennium B.C., and was domesticated in late 5<sup>th</sup> or early 4<sup>th</sup> millennium B.C. in the region that today is northern China. In Europe the species has been grown at least since around 2000 B.C.; in the Middle East it most probably appeared in the 1<sup>st</sup> millennium B.C., a little later than common millet [Zohary, Hopf 2000: 219]. The origins of cultivation and the channels of dissemination of other species of millet throughout the so-called Old World (i.e. Africa, Asia and Europe) were different, but since these grains did not play a role in the agriculture of the Greco-Roman lands of the Mediterranean and beyond, the present study shall not dwell on the issue of their provenance, domestication or scope of expansion.

As regards the relevant area, millet was well-known not only in ancient Greece and Rome, but also in other regions later encompassed within the borders of the Imperium Romanum. The Hellenes certainly grew it in the northern parts of their homeland, in the areas neighbouring Macedonia and in Thessalia. Millet was also a popular crop in Laconia, where it was considered a traditional staple. It was used to prepare various types of food, mainly gruel, pottage or mush, and also to produce leaven that was consumed throughout the year. It could also serve as the grain from which to bake bread, especially if there was a shortage of wheat, although its low content of gluten made making bread from it difficult [Hesychios 2005: 2229, 1; Dalby 1996: 46, 90; Forbes 1964: 97]. Although millet was unable to compete with wheat and barley preferred by most Greeks, it was recognised as a crop with many advantageous qualities: high tolerance to drought and a relatively short growing season [Isager, Skydsgaard 1992: 42].

Millet was sown in the fields of Italy, and it appears that harvest was particularly abundant in Campania and Cisalpine Gaul (in the latter mainly in the Po Valley) [André 1961: 55; White 1970: 67; Braun 1999: 37]. In many other places it presumably was a valuable supplement to the dominant crops and provided a security measure against famine, if the harvest of wheat or barley (the crops most valued in the ancient Mediterranean world) failed catastrophically. When the population was not threatened by such

dire prospect, foodstuffs made of millet joined oats and other less valued grains as the usual fare of the less affluent and the people living far from the administrative centres who could not afford to consume wheat [Erdkamp 2005: 148, 157–158]. The inhabitants of Italy ate millet in the form of bread (usually with some legumes added to facilitate baking) or gruel; millet bread was considered more tasty than barley bread, and bread made of foxtail millet was valued even higher [Galen 1823a: 524, 9–10; Pliny 1938–1963: XVIII, 10, 54; André 1961: 66]. The grain was also used as fodder for farm animals; it is, however, hard to ascertain the extent to which it was utilised to feed the livestock and not people [Katon 1895: 54, 4; cf. White 1970: 324].

As noted above, the peoples known to Greeks and Romans, which came into contact with them and ultimately were incorporated into the population of the Imperium Romanum, also grew various types of millet, and in these regions this crop often had far more importance. The inhabitants of Pannonia, for instance, were wont to imbibe a drink made of barley and millet, as did the Paenionians [Dzino 2005: 59]. Millet also held some significance in the diet of the inhabitants of the western part of Roman Europe; it is known to have been successfully cultivated by the Gauls from beyond the Alps, especially in Aquitaine, and by the Gaulish inhabitants of the Po Basin [see Polybius 1998: II, 15, 1; Pliny 1938–1963: XVIII, 25, 101]. In Asia Minor, millet was particularly cherished by the inhabitants of Caria, even though this crop did not grow very well in the local conditions [Galen 1823a: 524, 8–9; Suda 1928–1935: 300, 1–2]. Common millet was also known to the barbarians from the lands outside the Roman rule, e.g. the Sarmatians. According to Pliny, they were prone to mix unprocessed (i.e. wholemeal) millet flour with mares' milk or blood let from a horse's leg [Pliny 1938–1963: XVIII, 24, 100] to prepare a nutritious gruel. Foxtail millet was grown and consumed mainly by peoples living by the shores of the Black Sea [Pliny 1938–1963: XVIII, 24, 101].

In the Byzantine period, the role of millet remained mostly the same. As it has already been mentioned, in the areas which in addition to Greece proper constituted the heartland of the Eastern Empire, i.e. in Asia Minor, plants from the *Panicoideae* subfamily had already been grown for a long

time and the local population was fully aware of their properties [Baltensperger 1996: 182–190]. The crops were also cultivated far in the hinterland of Constantinople, i.e. in Thrace (Bulgaria). They were most probably not held in high esteem, however. The common opinion, indubitably influenced by the views of their Greek ancestors repeated from generation to generation, was that these plants were less valuable than wheat and barley. Here, too, a portion of arable land was apportioned to millet out of common sense and as a precaution against the failure of other crops [Lefort 2002: 250–251]. The situation remained basically unchanged until the ultimate fall of the Byzantine Empire, though it may be surmised that an increasingly large proportion of the harvest was used as animal fodder, while on most people's tables millet was gradually replaced by other grains [Laiou 2002: 326].

It must also be noted that the appearance of Turkish peoples closer to, and later also within the borders of Byzantium coincided with an increase in the popularity of a light alcoholic beverage (known and produced independently in Anatolia, most probably since ancient times) the contents of which included millet. The drink, called *boza* by the newcomers, was well-liked not only in Asia Minor, which was penetrated by Turks, but also in Bulgaria. It did not, however, win the approval of Byzantines and did not reverse the tendencies specified in the previous paragraph. Still, it seems certain that the subjects of the Eastern Roman emperors were familiar with *boza*.

Another notable factor that helped to popularise millet (and presumably foxtail millet) in the Roman and Byzantine world is the fact that during the entire history of the Imperium Romanum a thick soup of boiled millet was used to feed the legions: it was the staple food of the army [Winniczuk 1950: 232–233]. This continued in the times of the Byzantine Empire, when the soldiers' fare included a dish called *puls* in Latin and *poltos* in Greek, a type of porridge made of millet groats called *piston* [Dalby 1996: 197]. The popularity of this dish as the means to feed an army on the move may be explained by the fact that, according to Pliny, one sixteenth of a *modius* of millet flour/groats soaked in water was enough to make a *modius* of *puls* [Pliny 1938–1963: XVIII, 10, 54]. Millet was obviously a very cost-effective staple.

The ancient categorisation of millet (and foxtail millet) is as follows. The works of Galen, which for centuries served as a canon of Hellenic medical knowledge, so to speak, and profoundly influenced the art of medicine in Byzantium, the Latin-speaking West and the Arab world, contain a double classification of both these grains. Galen includes both common millet and foxtail millet in the group of *sitera geumata*, i.e. foods produced from cereals, or *sitoi*. He also claims that the term *sitoi* is most often applied to wheat, barley and emmer, and explains that this name is sometimes expanded to include all of the “gifts of Demeter”, i.e. lentils, lupine, broad beans, green peas, foxtail millet, common millet and also other crops [Galen 1914: 454, 10–16]. Apart from the above classification (presented, *nota bene*, in *In Hippocratis de victu in acutorum commentaria*), Galen’s works include a different manner of categorisation. In *De simplicium medicamentorum temperamentis ac facultatibus* foxtail millet was classified among the *ospria* [Galen 1923a: 875, 6], i.e. legumes (in the narrow understanding of the term) or plants whose grains are not fit for making bread (in a broader definition). Such double classification is not uncommon in Galen’s works; oats and rice, for instance, were also treated in this manner.

### The evaluation of nutritional properties

Information on the dietary characteristics of millet is difficult to find in *Corpus Hippocraticum*, yet this does not mean that the work does not mention any. One particular fact worth mentioning in this context is that Hippocrates described it as a very cooling foodstuff [*De morbis popularibus vel epidemiae* 1840, 1841, 1846: VI, 5, 15, 9–10]. This is the only remark that can be interpreted as a clear reference to the nutritional properties of this type of grain. *De diaeta in morbis acutis*, in turn, mentions *pyriai*, warming poultices of millet, and describes this cereal as light and having a delicate influence [*De diaeta in morbis acutis* 1840: 7, 15–18]. Most probably, however, Hippocrates was not referring here to the general dietary characteristics of the cereal, but rather to its effectiveness as an ingredient of the *pyriai*. Finally, *De diaeta* discusses the properties of cooked millet referred to as *kenchroi hephthoi* [*De diaeta* 2003: 45, 10], and declares

that the dish is not easily processed by the digestive system [*De diaeta* 2003: 45, 10–11]. This opinion was reflected in later descriptions of the properties of millet as such, e.g. in the works of Galen.

Dioscorides described these products in more detail. He declared common millet to be less nutritious than other cereals [Dioscorides 1906–1914: II, 98, 1, 1]. He did not state, however, that millet was unfit to be consumed; on the contrary, he mentioned millet bread and a type of boiled pottage or soup called *poltos* [Dioscorides 1906–1914: II, 98, 1, 1-2]. He also claimed that both the bread and the pottage stop the process of digestion [Dioscorides 1906–1914: II, 98, 1, 2] and increase the production of urine [Dioscorides 1906–1914: II, 98, 1, 2–3]. Dioscorides counted foxtail millet among staple foods [Dioscorides 1906–1914: II, 98, 1, 1–2]. In his opinion, this cereal was similar in its properties to *kenchros*, i.e. common millet, but even less nutritious [Dioscorides 1906–1914: II, 98, 1, 3] and less compressing [Dioscorides 1906–1914: II, 98, 1, 4] than *kenchros*.

More thorough than his predecessors in enumerating the properties of common and foxtail millet, Galen compiled a number of descriptions. Some of these referred to both types, while others discussed the properties of each of the grains separately. These descriptions may be found in several of Galen's treatises. A rather exhaustive specification is included in *De victu attenuante* [Galen 1923b: 52, 1–3]. The overall summary states that foxtail millet and common millet do not contain beneficial juices, and thus cannot be included in the category of *euchyma*. Moreover, they were deemed to cause wind and to be hard to digest [Galen 1923b: 52, 2–3]. On the other hand, they dried the excess of juices in the digestive system and could also cause this effect to occur in other parts of the body [Galen 1923b: 52, 2]. It must be added that their ability to dehydrate was important and used in medicine, and as such it was mentioned once again by Galen in *De sanitate tuenda* [Galen 1823b: 351, 2–11]. Despite the fact that in the latter treatise only the properties of common millet are mentioned in this context [Galen 1823b: 351, 5], it may be supposed that the conclusion is also applicable to foxtail millet, as it too was classified as desiccating in *De simplicium medicamentorum temperamentis ac facultatibus* [Galen 1923a: 732, 5–6].

What is more, a thorough description of the properties of foxtail millet may be found in *De simplicium medicamentorum temperamentis ac facultatibus* [Galen 1923a: 875, 5–9]. The famous physician asserted there that this type of grain was similar to common millet both in its outer appearance and in its qualities. As such, he considered it not very nutritious, and also dehydrating [Galen 1923a: 875, 7]; he recognised its ability to remove excess juices from the digestive system [Galen 1923a: 875, 7–8]. Used as a cataplasm, foxtail millet was thought to have cooling and astringent properties [Galen 1923a: 875, 8–9]. Galen's analysis suggests that in his dietary doctrine he recognised some differences between the two types of millet. In his opinion, foxtail millet was decidedly less beneficial; in *De rebus boni malique suci* he explicitly warned his readers against consuming the grain [Galen 1823a: 791, 7–8].

An overall description of common millet was also included in Galen's *De simplicium medicamentorum temperamentis ac facultatibus* [Galen 1923a: 16, 3–13]. According to the information included in the treatise, common millet had cooling and dehydrating properties [Galen 1923a: 16, 3–5]. Its pulp was composed of small grainy particles [Galen 1923a: 16, 5–6] which suggested that the cereal was not very nutritious [Galen 1923a: 16, 6–8]. Consuming millet could lead to an excessive dehydration of the digestive system. Used externally, millet was suitable as the main ingredient of warming poultices called *pyriai*, which dry the skin surface without damaging tissues [Galen 1923a: 162, 9–11]. The cereal could also be used to make moisture-absorbing cataplasms but, since its structure was not internally cohesive, such poultices were difficult to apply [Galen 1923a: 16, 11–13]. In *De rebus boni malique suci* Galen categorised common millet as less harmful than foxtail millet [Galen 1823a: 791, 9–10]. When used by this particular physician, the statement means that this product is simply better than the other. It transpires from *On the Properties of Foodstuffs* that common millet has a more pleasant taste and is easier to digest, being less constipating and more nutritious. It must also be noted that Galen mentioned another author, Herodotus of Attalia, who regarded common millet as a foodstuff with contracting properties [Galen 1923a: 441, 18–442, 1].

Processed grains retain their initial characteristics. Galen reported that common and foxtail millet was sometimes used to bake bread, but in his opinion this occurred only in times when other cereals were not readily available. Such bread was not very nutritious, had cooling properties, was brittle and not cohesive, as it did not contain any adhesive or cementing substances (in *De rebus boni malique suci* Galen graphically compared its structure to that of sand or ash [Galen 1823a: 782, 4–6]). Such bread could be used to dehydrate a digestive system containing an excess of humours [Galen 1823a: 523, 10–14].

Millet could also be ground to produce a type of flour called *aleurion*. As has already been mentioned above, it was sometimes used to bake bread. Galen also attests that poor farmers [Galen 1823a: 782, 9] cooked it to prepare a type of pottage with some added fat (olive oil, lard etc.) [Galen 1823a: 782, 6–9] or milk [Galen 1823a: 524, 2–3]. Fat improved the inner cohesion of the dish, while milk was added to augment its humoral balance, which was relatively poor to start with. It also improved its digestive qualities and aided bowel movement, as well as added to the taste of the food, making it more pleasant to consume.

Texts by Oribasius also provide some information about the two types of millet under analysis. The overall description of common and foxtail millet [Oribasius 1928–1933: I, 15, 1, 1–4, 4] included in his *Collectiones medicae* was borrowed from Galen or, more specifically, from *De alimentorum facultatibus* [Galen 1823c: 523, 9–524, 10]. The only element that is absent is information regarding the areas of the ancient world in which these cereals were cultivated; in Galen's treatise these data appeared at the end of the relevant paragraph [Galen 1823c: 524, 8–10]. It is difficult to ascertain why Oribasius decided not to include these facts in his *Collectiones medicae*; it may be supposed that, being the personal physician to Emperor Julian, he aimed at presenting generalised data for the entire Mediterranean region, whereas Galen's *De alimentorum facultatibus* only pertained to Asia Minor and Italy. Yet even despite the lack of information on territorial distribution of these crops, the reverence with which Oribasius treated the opinions of his predecessor confirms the claim that Galen's conclusions were treated as medical dogma in the latter half of

the 6<sup>th</sup> century, and that his doctrines were consistent with the conditions of some 200 years later.

Oribasius' text contains not only a general characteristics of the grains (with emphasis on the properties of common millet), but also a separate description of foxtail millet, repeating the already mentioned set of assumptions [Oribasius 1928–1933: XI, 10, 1–3]. In accordance with his writing practice, both types of millet are also mentioned in book III of the *Collectiones medicae*, where all the important foodstuffs are grouped according to their alleged properties. These characteristics were also included in his later treatises, namely *Synopsis ad Eustathium filium* and *Libri ad Eunapium*. The *Collectiones medicae* contain the information that common millet belongs to the category of products that do not provide wholesome nourishment to the body, and foxtail millet is even less nutritious [Oribasius 1928–1933: III, 14, 7, 3]. Similar statements may also be found in the work Oribasius wrote for his son [Oribasius 1964b: IV, 13, 6, 3] and in the treatise dedicated to Eunapius [Oribasius 1964a: I, 30, 6, 3]. In Oribasius' *opus magnum* both common and foxtail millet are counted among the group of foods labelled as the *kakochyma* [Oribasius 1928–1933: III, 16, 9, 1; III, 16, 8, 3]; this categorisation is maintained in *Synopsis ad Eustathium filium* [Oribasius 1964b: IV, 15, 9, 1] and in *Libri ad Eunapium* [Oribasius 1964: I, 33, 6, 2]. The entire body of Oribasius' work contains numerous mentions of the fact that these types of grains are difficult to digest [Oribasius 1928–1933: III, 18, 11, 3; Oribasius 1964: IV, 17, 9, 3] and carminative [Oribasius 1928–1933: III, 23, 1, 1; Oribasius 1964: IV, 22, 2, 1] and that their consumption slows the process of digestion [Oribasius 1928–1933: III, 30, 9, 1–2; Oribasius 1964: IV, 30, 13, 1–2]. Moreover, both these cereals are described in *Collectiones medicae* as having cooling properties [Oribasius 1928–1933: III, 32, 1, 1]; the author noted that common millet has a first-degree cooling effect [Oribasius 1928–1933: XIV, 20, 1, 1]. The same description (i.e. common and foxtail millet being counted among cooling foodstuffs [Oribasius 1964: IV, 32, 1, 1] with common millet mentioned as cooling in the first degree [Oribasius 1964: II, 8, 1, 1–2]) appears in the text Oribasius compiled for his son [Oribasius 1964: I, 48, 1, 1] and later in the treatise for Eunapius. The latter

work also states that common and foxtail millet have a drying and cooling effect if applied externally (as a cataplasm) [Oribasius 1964: II, 13, 1–14, 1]. The extracts forming Oribasius' *opus magnum* also contain the information that common millet belongs to the products that soak up water without damaging tissue [Oribasius 1928–1933: XIV, 24, 3, 1], yet it is stated there that it possesses this quality in the second degree [Oribasius 1928–1933: XIV, 26, 1, 4]. A similar body of information can be found in other works by Oribasius; in the treatise for his son he counted millet among the substances that desiccated tissues without damaging them [Oribasius 1964: II, 12, 1, 8], while in *Libri ad Eunapium* he stated that both common millet and foxtail millet absorbed moisture when applied internally or externally [Oribasius 1964: II, 1, 12, 1–13, 1], and described them as desiccating without damaging tissues [Oribasius 1964: II, 6, 1, 11]. Lastly, it must be noted that the *Collectiones medicae* contain the information that millet is composed of very small particles [Oribasius 1928–1933: XIV, 33, 9, 19].

Some two centuries later the properties of common and foxtail millet came to the attention of Aetius of Amida. In describing the latter of the grains, he followed in the footsteps of Galen and Oribasius, not altering the image of it built by his predecessors [Aetius of Amida 1935–1950: I, 142, 1–4]. The same tendency is observable in his description of common millet [Aetius of Amida 1935–1950: I, 188, 1–6]. Particular characteristics were later repeated in Book II, which (similarly to the third part of Oribasius' *Collectiones medicae*) presents a list of foodstuffs grouped according to their significant properties. Aetius [1935–1950: II, 204, 2] lists common millet among the products with a first-degree cooling effect [Aetius of Amida 1935–1950: II, 204, 1–2] (he also states that both types of millet under analysis [Aetius of Amida 1935–1950: II, 268, 1–2] belong to products with a cooling effect [Aetius of Amida 1935–1950: II, 268, 1–13]). He included *kenchros* [Aetius of Amida 1935–1950: II, 208, 8] in the list of products that dry the tissue without damaging it [Aetius of Amida 1935–1950: II, 208, 1–15] (this particular property was emphasised in the excerpt from Archigenes [Aetius of Amida 1935–1950: IX, 42, 33], in which the author of *Iatricorum libri* quoted information about the millet *poltoi* as a very effective exsiccator [Aetius of Amida 1935–1950: IX, 42,

65–67]). What is more, common millet was described as composed of small particles [Aetius of Amida 1935–1950: II, 218, 7]. Aetius classified both common and foxtail millet [Aetius of Amida 1935–1950: II, 251, 8] as members of the *oligotropha* group [Aetius of Amida 1935–1950: II, 251, 1–20], yet foxtail millet was described as even less nutritious than common millet. Both grains [Aetius of Amida 1935–1950: II, 253, 14] were also classified as members of the *kakochyma* group [Aetius of Amida 1935–1950: II, 253, 1–37]. Furthermore, Aetius categorised common and foxtail millet as indigestible foodstuffs [Aetius of Amida 1935–1950: II, 255, 19] (this characteristic was also mentioned in Book IX, in the passage describing the *poltoi* [Aetius of Amida 1935–1950: IX, 35, 180–181]). He included common millet and foxtail millet in the category of carminative products [Aetius of Amida 1935–1950: II, 259, 1]. Finally, both these types of cereal were classified as slowing the process of digestion [Aetius of Amida 1935–1950: II, 266, 20]. All in all, the views presented by Aetius did not differ from the canon established by Galen and continued by Oribasius.

A Latin work by Anthimus *De observatione ciborum* written in approximately the same period of time as the treatise by Aetius of Amida contains little information on common or foxtail millet. According to Anthimus, both the former (*miliun*) and the latter (*panicum*) have properties very similar to those of rice, especially with regard to the effect they have on patients with dysentery [Anthimus 2007: 71]. This conclusion, though seemingly limited in its significance, suggests that the author of this concise work shared the views of his predecessors in terms of the basic properties of the two types of millet, particularly their exsiccating and constricting effect.

*The Medical Compendium in Seven Books* compiled in the 7<sup>th</sup> century by Paul of Aegina contains all the basic information on both common and foxtail millet known from the works of Galen and Oribasius. The data is presented in the form of three descriptions – a general characteristic [Paul of Aegina 1921–1924: I, 78, 1, 18–19], a description of common millet [Paul of Aegina 1921–1924: VII, 3, 10, 107–109], and, lastly, a specification of foxtail millet [Paul of Aegina 1921–1924: VII, 3, 5, 73–75]. Since the work does not add any new information to the characteristics enumerated in the previously mentioned sources, it needs not be discussed in detail.

The last treatise to be analysed in the present article, namely *De cibis*, presents mainly information that accords with the views expressed in the works of earlier dieticians. The short list of the properties of *kenchros* included in this book states that this type of grain is exsiccating [*De cibis* 1963: 2, 22] and nourishing for the body [*De cibis* 1963: 2, 22–23]; it also decelerates the processes of digestion [*De cibis* 1963: 2, 23]. This description is included in the section pertaining to foodstuffs produced of seeds or fruits [*De cibis* 1963: 2, 22–31] and is in agreement with the doctrine presented e.g. by Galen. The part of the treatise listing various groups of edible products according to their most important properties, the foodstuff called *kenchros* [*De cibis* 1963: 13, 14] was, once more, counted among the foods that slow digestion. Both common and foxtail millet [*De cibis* 1963: 14, 20] were mentioned in the category of foods whose juices were not very beneficial to the body. The treatise also contains a warning that common millet [*De cibis* 1963: 19, 2] may have a harmful influence caused by the emergence of raw, undigested juices within the body [*De cibis* 1963: 19, 1–7]. In a different chapter of the same work common and foxtail millet [*De cibis* 1963: 22, 8] are included among foodstuffs with little nutritional value; common millet alone was listed as a cooling product [*De cibis* 1963: 26, 2].

### **The evaluation of culinary properties**

Medical works that constitute the *Corpus Hippocraticum* do not contain much information on the preparation of dishes from common or foxtail millet. The two cereals are mentioned as the basic ingredient of medicinal soups or gruels of varying consistency, boiled with added water and with very little spicing or with no spices at all. Such dishes were recommended as suitable for people suffering and recovering from various ailments. A detailed description of these gruels will be given in the section pertaining to the relevant afflictions. It ought to be noted, however, that *De diaeta* mentions boiled millet, referred to simply as *kenchroi hephthoi* [*De diaeta* 2003: 45, 10], perhaps meaning a dish similar to the *pyroi hephthoi*, but made of boiled millet groats. It is described as food that is not easily processed by the digestive system [*De diaeta* 2003: 45, 10–11]. Remarks in Galen and Oribasius, specified below, may refer to this culinary practice.

The meagre information on culinary uses of these two cereals included in the works by Dioscorides suggests only that common and foxtail millet were prepared in a very similar manner [Dioscorides 1906–1914: II, 97, 1, 2–3]. The grain was ground and the flour [Dioscorides 1906–1914: V, 3, 3, 4] was used to bake bread [Dioscorides 1906–1914: II, 97, 1, 1–2] or make *poltos* [Dioscorides 1906–1914: II, 97, 1, 2]. Another dish that included millet flour were fried pancakes with raisins, eggs and honey [Dioscorides 1906–1914: V, 3, 3, 4–6].

Relatively numerous clues as to the culinary uses of common and foxtail millet may be found in Galen's writings. He stated [Galen 1823c: 510, 8] that common millet was ground into flour (presumably coarse one) and kneaded (but not baked or boiled) with liquids: water, but also wine or grape must [Galen 1823c: 510, 2–3], most probably to produce a dish similar to the barley *madza* [Galen 1823c: 510, 6–11]. The dish was commonly known long before Galen, i.e. in the times of Philotimus and his teacher Praxagoras, to whose conclusions Galen was referring in his *De alimentorum facultatibus* [Galen 1823c: 509, 14–16]. In this treatise, flour made of common or foxtail millet is called *aleuron*. Galen also states that peasants working in the fields used these types of flour to prepare a dish similar to the one made of ordinary (i.e. wheat) *aleuron*, to which they added some pork fat or olive oil [Galen 1823c: 523, 14–15]. In a different treatise, *De rebus boni malique suci*, he returns to the subject and informs his readers that both common and foxtail millet were used to cook soups, or rather dense gruels, such as *lekithos* and *etnos*. To prepare them properly, fatty products and enough adhesives had to be added to make the dish stick together. The most commonly used fat was pork lard, goat tallow or olive oil. Sheep or cow milk was also added. The author states that such gruels were usually eaten in the field during breaks from work [Galen 1823a: 782, 6–9], which means that they belonged, *ex definitione*, to the category of simple and cheap dishes that were easy to make. Galen also mentioned *aleuron* made of common millet in his *De rebus boni malique suci*, in the section enumerating the methods of improving nutritional properties of milk [Galen 1823a: 767, 11–16]. He claimed that such flour was added to milk during the process of boiling [Galen 1823a:

767, 14–16]. Milk must have been a typical addition to such dishes, as it is mentioned in the context of preparing millet [Galen 1914: 897, 9–10] in *In Hippocratis de victu in acutorum commentaria* [Galen 1914: 897, 5–11].

Sometimes common and foxtail millet were used to bake bread. Galen suggests that both these cereals were processed in this way only in times of a shortage of other grains from which bread was normally made. This was because bread of millet flour was very brittle, which Galen attributes to the absence of viscous substances [Galen 1823a: 523, 10–11]. The physician also stated that such dishes were consumed mostly by country folk [Galen 1914: 876, 1–2]. This suggests that the bread could be made in relatively crude conditions and that the price of the finished products and the ingredients were low – provided that such bread ever made it to city markets. The recipe is unknown, yet it may be surmised that the general process was the same as in the case of the already mentioned wheat bread.

Some indication on the methods of preparing common and foxtail millet for consumption may also be found in the works of Oribasius. The recipes combine culinary information and strictly medical knowledge. His writings clearly suggest that both grains were used primarily to prepare liquid foods, which fall into the general category of soups, as well as certain types of groats. As regards the first group of dishes, parts of the *Collectiones medicae* (which, incidentally, consist of excerpts from the works of Dieuches) contain the following prescription: in cases of serious illness, millet should be cooked to a thin soup or a mush, based, as Oribasius adds, on mutton broth or other types of stock [Oribasius 1928–1933: IV, 7, 10, 1–5]. The same passages of treatises by Dieuche also contain a recipe for an apparently uncooked, but nutritious beverage made of the types of cereal under analysis here, recommended for patients suffering from problems with digestion [Oribasius 1928–1933: IV, 7, 15, 1–18, 1]. Dieuches writes that if the husks are removed, common and foxtail millet grain is suitable for patients whose digestive system contains an excess of bile, making their stool watery. To prepare a remedy for this affliction, it is necessary to grind the grain finely in water (taking at least one *oxibaphon* of water per person) and strain the mass through a cloth, mix the liquid with a *cotyla*

of water and add some dry wine before giving it to the patient to drink on an empty stomach. The same author states that before grinding foxtail millet and common millet, one may also add some Euboean nuts (i.e. chestnuts) without removing their inner husks, crush and strain them, and use the liquid as a remedy for fever. The *Synopsis ad Eustathium filium* also contains excerpts from Dieuches' work [Oribasius 1964: IV, 35, 16, 1–19, 1], yet with some important changes. The latter text advises to boil [Oribasius 1964: IV, 35, 18, 1] the liquid resulting from the processing of millet; thus, in the light of this new information, the finished product should rather be considered as a broth or soup. It ought to be mentioned that the latter variant is included in a section of *Synopsis ad Eustathium filium* entitled "On the preparation of broths", which logically corresponds to the information on the boiling of the liquid produced by straining millet, thus confirming the correctness of the reading of the passage from Dieuches' work incorporated into this treatise by Oribasius. Another reference to methods of millet processing included in *Collectiones medicae* [Oribasius 1928–1933: IV, 8, 6, 2], also borrowed from Dieuches, appears in the chapter devoted to the *amylon*, or starch. It contains the information that dried *amylon* may be mixed with broths given as medication to patients suffering from gastric problems. Thus, it was added to boiled millet, bread boiled to a pulp, *ptisane* and *hepsemata* of legumes [Oribasius 1928–1933: IV, 8, 6, 1–7, 2]. No details are given, yet the context suggests that the mentioned dish of *kenchros* was liquid and could be compared to a soup or gruel.

When discussing the recipes for preparing millet, it must be remembered that the physician to whose work Oribasius referred mentioned cooking millet in the form of groats. In his opinion, it was not suitable as food for people burning with fever or suffering from digestive problems. According to Dieuches' recipe, an *oxibaphon* of millet (previously soaked in water, strained and crushed in a mortar) was to be cooked in ten *oxibapha* of water spiced with dill and salt. Soft, strained millet could be added not only to lentil soup (called *fake*) or barley soup (*ptisane*), but also to other liquid dishes. The treatise states that such an addition served as a substitute for olive oil. Dieuches also writes that *fake* could be enriched with raw cucumber seeds, while *ptisane* sometimes included pine nuts (soaked in

water, mashed, cooked and strained), referred to as *strobiloi*, or “nuts from Pontus” (hazelnuts) or “nuts from Thasos” (almonds) [Oribasius 1928–1933: IV, 7, 25, 1–27, 1].

Lastly, it should be noted that Oribasius’ work also includes excerpts from another celebrated dietician, namely Philotimus. It mentions two recipes for preparing millet. The first method is to boil fine-grained groats [Oribasius 1928–1933: IV, 10, 1, 1–2, 1], the second, described in much less detail, also involves cooking groats, but much more coarsely ground [Oribasius 1928–1933: IV, 10, 2, 1–5]. As noted by Philotimus himself, the latter recipe was much more popular, probably due to its simplicity. The first recipe advised that raw millet should be preliminarily crushed, then ground and pulverised after adding some water. Then it was time to strain the groats and cook it until it became sticky like cooked flour. At this stage, according to Philotimus, the groats would start to taste a little acrid. The physician attested that this dish was a preventive measure against a blockage of the digestive system. Cooked wholegrain millet, a more popular foodstuff, was deemed to be harder to digest, but to remove concretions from the digestive duct and cause minor changes in the appearance of the stool. It also produces a sweet juice with contracting properties.

Another treatise under analysis here, the *Iatricorum libri* by Aetius of Amida, does not contain much information about the methods of preparing common or foxtail millet. It may nonetheless be concluded that this work does not contradict the general tendencies outlined by the previously mentioned physicians. Aetius confirmed that in his time the *aleuron*-type millet flour was still being made [Aetius of Amida 1935–1950: VI, 47, 13–16]. Millet was also ground to produce groats with larger grains. Aetius testifies to the fact that such ground and purified grains of *kenchros* were used to prepare medicinal soups referred to as *rophemata* [Aetius of Amida 1935–1950: VIII, 31, 18]. These were not recommended for the *koliakoi* [Aetius of Amida 1935–1950: IX, 35, 1–203], i.e. patients suffering from digestive ailments called colic, since millet processed in this way was considered to be too hard to digest and to cause harmful juices to be produced in the body [Aetius of Amida 1935–1950: IX, 35, 180–181]. Aetius’ treatise also states that millet was used to cook thick soups or

gruels called the *poltoi*, which removed excess moisture [Aetius of Amida 1935–1950: IX, 42, 34] from the abdominal cavity more effectively than *poltoi* made of rice [Aetius of Amida 1935–1950: IX, 42, 65–67]. It contains the information that common millet was cooked together with the famous medicinal soup called *ptisane* [Aetius of Amida 1935–1950: VIII, 69, 86] as a remedy against stomach hemorrhage [Aetius of Amida 1935–1950: VIII, 69, 67–70].

*Therapeutica* by Alexander of Tralles tells us very little about the culinary practices related to the cereals under analysis. The physician mentioned a thick soup called *poltos* made of millet that was cooked for a long time (i.e. softened) [Alexander of Tralles 1963: II, 407, 23–24]. He also stated that this grain was still traditionally mixed with milk [Alexander of Tralles 1963: II, 209, 27]. Foxtail millet [Alexander of Tralles 1963: II, 219, 20] was mentioned as an additive to poultry broth [Alexander of Tralles 1963: II, 219, 7–10], which most probably gave the liquid the thick consistency of modern barley soup.

Additional information on millet processing can be found in the works of Anthimus [2007: 71]. He mentions a type of a soup made of wholegrain millet; the recipe is detailed enough to have inspired Mark Grant to attempt to recreate the actual dish [Grant 2002: 40–41]. First, the cereal was to be boiled in fresh hot water, and when the grains started to break open, they were heat-processed (in water) with some goat's milk. This had to be performed slowly and carefully, just like with rice [Anthimus 2007: 70]. The passage describing the latter grain contains a warning that rice that is too hard or was prepared without due care becomes harmful for the body.

The treatise by Paul of Aegina does not constitute a good source of information about the processing of common millet and foxtail millet as a foodstuff; his compendium is practically devoid of such details. On the other hand, general information about the features and medical applications of both grains indicates that the theory and practice professed by this celebrated physician differed in this respect from that of his predecessors and successors. It might, however, be added that some data about the types of food produced of the two cereals can be found in non-medical sources from Byzantium or ancient Greece and Rome. The information

they contain constitutes an interesting supplement to the data included in the medical treatises mentioned above. For instance, in his *Deipnosophistae*, Athenaeus of Naucratis mentions the content of the works of the logographer Hecataeus of Miletus. Among other things, he described an alcoholic beverage called *parabie* [Athenaeus of Naucratis 1887–1890: X, 447d] produced in Paeonia. The drink resembled beer, but was made of millet and knotgrass.

The lexicon written by Hesychius of Alexandria contains some useful information on the culinary uses of common millet. Data suggests that it was cooked to prepare a type of gruel or a thick soup, sometimes referred to as *kenchrine* [Hesychius 2005: κεγχρίνη, κ, 1969, 1]. Millet was also an ingredient of a dish especially popular in ancient Laconia [Hesychius 2005: ἔλυμος, ε, 2229, 1], which has already been mentioned in the introductory section of the present article. Moreover, the cereal was used to produce a type of groats called *alphita*. Hesychius confirms that it was white in colour. [Hesychios 2005: λευκὰ ἄλφιτα, λ, 721, 1]. Millet could also be made into *aleuron*. When ground into a very fine flour, it was called *paipale* [Hesychios 2005: παιπάλη, π, 94, 1].

The *Suda* describes one more type of groats made of the cereals under analysis. Called *chidron*, it was produced of foxtail millet or unripe barley [Suda 1928–1935: Χίδρον, χ, 300, 1–2]. It was relatively fine-grained, which may be surmised from the fact that the author of the lexicon compares it to the *semidalis* flour [Suda 1928–1935: Χίδρον, χ, 300, 1]. The encyclopaedic work also suggests that such groats was popular in Caria in Asia Minor [Suda 1928–1935: Χίδρον, χ, 300, 1–2]. It should be added that the same lexicon repeats the information that a finely-ground flour of the *paipale* type is a kind of *aleuron* made of millet or barley [Suda 1928–1935: Παιπάλη, π, 886, 1–3].

Finally, the *Geoponica* provides an insight into another group of culinary procedures intended not to satisfy sophisticated tastes, but rather to protect against the adverse effects of eating some foodstuffs. Book XIV of this 10<sup>th</sup>-century collection of agricultural lore includes a passage stating that millet, or most probably millet groats, was cooked together with quails. This was done not so much to influence the flavour, but to avoid unpleas-

ant medical conditions that could occur if these wild-living fowls had fed on black false hellebore or white false hellebore (*Veratrum nigrum* L. and *Veratrum album* L.). If prepared otherwise, the fowl dish could induce food poisoning with symptoms such as headache and swooning [*Geoponica*... 1985: XIV, 24, 2]. Millet was also made into a decoction, presumably thin and resembling the cereal gruel that is given to patients with stomach diseases even today. It was recommended if there was a suspicion of food poisoning, especially caused by eating the meat of wild fowl that had fed on false hellebore [*Geoponica*... 1985: XIV, 24, 2]. Similar references may be found in *De observatione ciborum*, where Anthimus mentions wild pigeons [Anthimus 2007: 25], as it was believed that these birds could also dine on false hellebore. The plant was one of the stronger *farmaka* known in the Antiquity and in the Byzantine world, used for a number of purposes, e.g. to treat psychological disorders [Dioscorides 1906–1914: IV, 148, 162; cf. Dalby 1996: 174–175; Kokoszko 2006: 96]. Both Anthimus and Didymos (the latter was quoted in the *Geoponica*) claimed that if a turtledove had fed on this dangerous plant, its meat became poisonous. According to the author of *De observatione ciborum*, eating it would lead to symptoms such as vomiting, internal haemorrhage and diarrhoea. He also stated that he personally encountered a case of severe food poisoning caused by turtledove meat. The treatment of the two patients, both of them peasants, involved giving them mature wine and warm olive oil to drink slowly. These antidotes were said to alleviate the effects of the poison; Anthimus says nothing about the possibility of using millet to this effect. It should also be noted that he recounts a similar tale about the dangers of eating starlings [Anthimus 2007: 26] that used to feed on hemlock and caused food poisoning in people who consumed their meat. What remains to be said about the *Geoponica* is that according to this compendium of knowledge, *aleuron*-type millet flour was still commonly produced in the 10<sup>th</sup> century. It was used not only as foodstuff, but also to sprinkle inside boxes that held bunches of grapes [*Geoponica*... 1985: IV, 15, 9]. Millet was ground to make edible flour, used primarily to bake bread, which was recommended as a very effective protective measure against poisoning [*Geoponica*... 1985: XIV, 24, 4].

## The role of common and foxtail millet in medical procedures

The final subject that shall be analysed in the present article is the use of common and foxtail millet in medical procedures described by the authors of medical works mentioned in the preceding paragraphs. First, it must be emphasised that although *kenchros* and *elymos/meline* were mentioned in medical treatises included in the *Corpus Hippocraticum* mostly as a food-stuff, the existing data also indicates that these grains could be used – as a part of a patient's diet – as a type of a *farmakon* or a medicine, *boethema*, employed by the ancient physicians for a number of purposes. The sources also suggest that common millet was much more popular as an element of medical procedures, as most of the remarks (save one included in *De mulierum affectibus* [1853: 110, 28]) refer to the beneficial effects of this type of grain. As regards the presence of common and foxtail millet in the diet recommended for patients, it should be emphasised that all the millet dishes enumerated in the *Corpus Hippocraticum* as elements of medicinal diet are somewhat similar in form. The more seriously ill were mostly fed with various types of soups, usually rather thin, presumably based only on water and with other ingredients limited to the necessary minimum. Such practice reflected a tendency present in the medicine of the time, which is now identifiable since *De affectionibus* strictly advises that the gravely ill be nourished and medicated mostly with soups or cereal decoctions, including millet pottage. As fever is a symptom of many ailments, it does not come as a surprise that the author of this treatise prescribes the same measure for patients suffering from fever only [*De affectionibus* 1849: 40, 1–2]. He explains that such dishes are suitable for the ill, as they belong to the category of light foods, i.e. ones that do not overburden the system of digestion and food absorption [*De affectionibus* 1849: 41, 2–3].

The list of maladies treated with a diet that included millet begins with illnesses that, in the words of the author of *De morbis*, spread from the head [*De morbis I–III* 1849: II, 12, 1–45; II, 19, 1–19; II, 22, 1–18]. A patient suffering from one of the first type of medical conditions in this group was to be fed millet that was ground so finely that it could be consumed by licking the spoon [*De morbis I–III* 1849: II, 12, 31]. For other illnesses of this type, physicians strongly recommended millet in liquid form. The

context suggests that in terms of consistence and properties the dish was similar to *chylos ptisanes* [*De morbis I–III* 1849: II, 22, 17], i.e. a watered-down gruel. In the final stages of an affliction called *pleuritis* (pleurisy) [*De morbis I–III* 1849: II, 44, 1–21] the patient was given, initially with every meal, a beverage consisting of one-fourth *kotyle* of a thin and cold millet broth, to which the author refers as *kenchrou chylos*, lightly sweetened with honey [*De morbis I–III* 1849: II, 44, 13–14]. After the fever had gone down, the patient was given a presumably more nutritious millet soup and beetroot twice a day [*De morbis I–III* 1849: II, 44, 16–17]. Finally, in the latter stages of recovery, it was recommended that millet should remain the main foodstuff eaten as the first meal [*De morbis I–III* 1849: II, 44, 19–21] and that the amount of cereal products included in the ordinary diet should be reduced. It might be added that patients suffering from another type of pleurisy [*De morbis I–III* 1849: II, 45, 1–9], were given *chylos kenchrou* twice a day [*De morbis I–III* 1849: II, 45, 6–7]; in yet another type of the same illness [*De morbis I–III* 1849: II, 46, 1–15], after fourteen days physicians recommended a diet in which morning meals consisted only of millet, while the evening ones included poultry in broth and only small quantities of commonly eaten cereal products [*De morbis I–III* 1849: II, 46, 12–15].

As noted above, millet dishes were prescribed for patients with high temperature. It is perhaps advisable to list some examples of the uses of such dishes found in the *Corpus Hippocraticum*. In a section of *De morbis* concerning fevers induced by an excess of bile [*De morbis I–III* 1849: II, 40, 1–25], the author mentions feeding patients with a thin soup of *kenchros* [*De morbis I–III* 1849: II, 40, 16–18]. A similar diet [*De morbis I–III* 1849: II, 42, 7–8] was recommended for three-day fever [*De morbis I–III* 1849: II, 42, 1–9]. In *De affectionibus*, in turn, a watered-down millet decoction or gruel [*De affectionibus* 1849: 14, 10–11] was recommended as basic sustenance in the period of high fevers (this meant the three- and four-day fever), which usually came around harvest-time [*De affectionibus* 1849: 14, 1–21]. Similar prescriptions were given for other ailments in the same group. In cases of illnesses accompanied by hiccough, referred to as *pyretos lyngodes* [*De morbis I–III* 1849: II, 64, 1–21], the author of *De morbis* suggested that in the period of recovery, i.e. from the tenth day

after contracting the disease onwards, the diet of the patient should be based on *ptisane* or on a similar dish made of *kenchros* [*De morbis I–III* 1849: II, 64, 7–10]. Further on, the author stated that people suffering from the so-called lethal fever, *pyretos phonodes* [*De morbis I–III* 1849: II, 67, 1–22], from the seventh day onwards should be fed some millet in a form that may easily be licked off the spoon [*De morbis I–III* 1849: II, 67, 13–14]. Again, it may be supposed that this dish had to be liquid, since in this form it would be easiest to consume for a person weakened by the affliction. Most probably the author is referring here to a soup with the consistency of a syrup, which may be eaten without exertion. After the critical period had passed, the patient was still advised to eat millet as the first meal of the day [*De morbis I–III* 1849: II, 67, 16–17]. Sadly, there is no information about the consistency of the dish, yet it might have been slightly thicker and thus more nutritious. It must be remembered that *kenchros*, in the form of *boethema*, was also used to warm up the body parts affected by illness. Warming poultices of millet, usually called *pyriai*, were recommended already in *De diaeta in morbis acutis*. The treatise deems their effects to be mild: they softened swollen tissue and alleviated the pain [*De diaeta in morbis acutis* 1840: 7, 15–18].

According to Dioscurides, the main remedial use of products made of common and foxtail millet lay in their ability to combat afflictions of the digestive tract, especially those accompanied by stomach-ache and diarrhoea. The grains could be used as a remedy due to their contracting properties and the ability to slow down digestion. Dioscurides prescribed *kenchros* [Dioscurides 1914: II, 51, 2, 5] as an element of the diet of people suffering from gastric problems and dysentery [Dioscurides 1914: II, 51, 1, 1–2]. The patients were given a medicinal *poltos* made of common millet (but also of *elymos/metine*) [Dioscurides 1914: II, 51, 3, 4]. The same author stated that a certain type of pancakes of millet flour [Dioscurides 1906–1914: V, 3, 3, 4] with raisins [Dioscurides 1906–1914: V, 3, 3, 1], eggs and honey could be used to remove excess phlegm from the body [Dioscurides 1906–1914: V, 3, 3, 5–6]. The treatise entitled *De materia medica* contains the information that common millet, roasted, reheated and placed on a sore spot as a *pyria* was an effective measure for treating

bowel obstruction or other painful afflictions [Dioscurides 1906–1914: II, 97, 1, 3–4]. A similar remark may be found in *Euporista vel de simplicibus medicines*: that *kenchros* [Dioscurides 1914: I, 234, 1, 4] and *elymos/meline* [Dioscurides 1914: I, 234, 1, 5], or salt mixed with the grains, is a remedy against sciatica and other types of pain [Dioscurides 1914: I, 234, 1, 1–2].

Galen was also one of the physicians recommending millet as an ingredient of *pyriai*, the warming poultices. Such *boethemata* including *kenchros* were said to have a mild effect. Another type of *pyriai* to be used was composed of a mixture of common millet and salt [Galen 1914: 525, 6–9]. Galen prescribed warm poultices of the grain in question [Galen 1825: 867, 13–14] to treat painful ear and eye infections [Galen 1825: 867, 11]. This use had been known for a long time, since excerpts from Archigenes' works pertaining to the treatment of *otalgiai* which appear in Galen's treatise [Galen 1826–1827: 620, 5–624, 14] mention the very same remedy [Galen 1826–1827: 621, 4–7]. It must be added that other prescriptions mentioned by Archigenes and included in Galen's works also mention warming poultices of *kenchros* [Galen 1826–1827: 862, 14–864, 11] as a remedy for toothache [Galen 1826–1827: 862, 14–863, 1]. Furthermore, in the descriptions of *kenchros* and *elymos/meline* quoted in the previous sections of the present article, Galen mentioned their use in cataplasms with a drying and cooling effect, although he did not specify which afflictions were to be treated with such measures. Such lack of information may suggest that the use of these remedies was relatively common. What is more, in other passages derived from Archigenes' work, this time pertaining to treating surgery wounds and head injuries [Galen 1826–1827: 576, 6–579, 3] which were incorporated into *De compositione medicamentorum secundum locos* together with the other excerpts, Galen recommended *aleuron kenchrinon* to be used as powder to cover open wounds of the skull that exposed the injured dura mater [Galen 1826–1827: 577, 8–10]. Finally, *kenchros* was mentioned as a recommended foodstuff [Galen 1914: 897, 9–10] in Galen's commentary entitled *In Hippocratis de victu in acutorum commentaria* [Galen 1914: 897, 5–11], with the suggestion that in this case millet was to be cooked with some milk [Galen 1914: 897, 10].

The data included in the works of Oribasius suggest that in the period when, as the personal physician to Emperor Julian, he was compiling his treatises, millet was still being used as an ingredient of warm poultices. In *Eclogae medicamentorum*, *pyriai* made of *kenchros* [Oribasius 1933: 74, 4, 28] are prescribed for example as a remedy against sciatica. The same treatise mentions warm poultices of *kenchros* [Oribasius 1964: IX, 13, 6, 1–3] as a medicament to treat *teinesmos* [Oribasius 1964: IX, 13, 1, 1–6, 3], i.e. prolonged constipation. Finally, the treatise dedicated to Eunapius contains the information that *pyriai* were prescribed by physicians to alleviate toothache [Oribasius 1964: IV, 59, 3, 1–2].

Moreover, Oribasius' works indicate that both foxtail and common millet were ingredients of various cataplasms. *Libri ad Eunapium* inform us that both grains have a drying effect [Oribasius 1964: II, 1, 12, 1–13, 1], and thus, when applied to the body, they remove excess liquid and cool the surface [Oribasius 1964: II, 1, 13, 1–14, 1]. In accordance with this general principle, sections of the *Collectiones medicae*, which are, incidentally, taken from Book I of Antyllus' *Peri boethematon*, mention millet cataplasms applied to the body to rid the intestines of excess and harmful juices [Oribasius 1933: IX, 24, 14, 2–3]. General recommendations given by Antyllus were supplemented by a recipe for a poultice devised by Lycus. The physician quoted by Oribasius called the millet-made remedy *epiplasma* [Oribasius 1933: IX, 33, 1, 1]; the treatise describes it as an effective for gastric problems, including the resulting swelling [Oribasius 1933: IX, 33, 2, 1–3, 1]. Adding pitch to this poultice made it a remedy for sciatica [Oribasius 1933: IX, 33, 3, 1–4, 1]; water, vinegar or a mixture of the two cold also be added to transform the poultice into an effective treatment for centipede bites [Oribasius 1933: IX, 33, 4, 1–2]. According to Lycus, the medicine was prepared in the same way as poultices of flax seed [Oribasius 1933: IX, 33, 1, 1–2, 1]: ground millet seeds (of a similar consistency as *aleuron*) were tossed into boiling honey [Oribasius 1933: IX, 29, 2, 2–3].

Common and foxtail millet were also recommended by Oribasius as remedies for specific afflictions, mostly gastric in nature. As has been mentioned above in the section describing cataplasms, foxtail millet was

considered fit not only for external use (as a means of drying the surface of the body), but also as a foodstuff that removes excess liquid from the gastric tract [Oribasius 1964: II, 1, 12, 1–13, 1]. The same properties were ascribed to common millet [Oribasius 1964: II, 1, 13, 1]. Physicians adhered to the already mentioned principle that the seriously ill and feverish patients should be given millet or foxtail millet in the form of a liquid, while groats can be included in their diet during the period of recovery. Prescriptions pertaining to this rule may be found for instance in the works of Dieuches, whose teachings were recounted by Oribasius in Book IV of the *Collectiones medicae*. Oribasius' famous predecessor claimed that people whose health had been weakened by a grave illness were unable to consume ordinary products, and should therefore not be given any solid foods [Oribasius 1933: IV, 7, 1, 1–3]; they ought to be fed foodstuffs that had been boiled soft into an emulsion or a soup suitable for drinking [Oribasius 1933: IV, 10, 1–5]. The already mentioned problems with digestion were usually explained in terms of imbalance of the humours; information on the use of millet as a remedy for afflictions resulting from the accumulation of excess juices [Oribasius 1964: V, 6, 3, 3–4] may be found in a passage of the *Synopsis ad Eustathium filium* discussing the treatment of the youngest patients. When it comes to determining the humour responsible for these problems, it should be noted that Dieuches recommended eating common and foxtail millet in cases of afflictions caused by an excess of bile [Oribasius 1933: IV, 7, 15, 1–18, 1]. When the health of the patient began to improve, it was time to introduce some groats to their diet. The recipe for the medicinal dish appearing in Oribasius' work is also borrowed from Dieuches [Oribasius 1933: IV, 7, 25, 1–27, 1]. Groats was also mentioned by Philotimus [Oribasius 1933: IV, 10, 1, 1–2, 5], who claimed that well-cooked groats prevents blockages from forming in the patient's digestive tract.

The encyclopaedia compiled by Aetius of Amida also provides some information about the use of foxtail and common millet in treating afflictions occurring in 6<sup>th</sup>-century society. The grain known as *kenchros* [Aetius of Amida 1935–1950: XI, 35, 40] was mentioned as an ingredient of a very effective (as the author of the recipe affirms) medicine ensuring potency

[Aetius of Amida 1935–1950: XI, 35, 38–47]. Aetius borrowed the formula for this medication from Philagrius [Aetius of Amida 1935–1950: XI, 34, 1]. In Book VI of *Iatricorum libri* Aetius quotes Galen (who in turn took his information from Archigenes) on the issue of treating ailments related to mechanical injuries of the head [Aetius of Amida 1935–1950: VI, 47, 1–16]. The section mentions sprinkling open-tissue injuries with fine-grained flour of the *aleurion* type made of common millet [Aetius of Amida 1935–1950: VI, 47, 13–16]. Supplementary measures included a decoction of catmint, as well as butter, rose oil and pork lard. In several passages of his treatise Aetius talks of millet *pyriai* as a product with a warming effect, which could alleviate pain resulting from various afflictions. He mentions poultices of *kenchros* [Aetius of Amida 1935–1950: VI, 39, 29] in Book VI of *Iatricorum libri*, where he quotes Archigenes' prescriptions regarding cases of tetanus. The same warming poultices of millet [Aetius of Amida 1935–1950: IX, 30, 40–41] were recommended as a remedy for stomach pains resulting from the excess of cold juices amassing in its cavity [Aetius of Amida 1935–1950: IX, 30, 28–29]. In Book VIII of his compendium, he also prescribed using warming millet poultices as an anaesthetic for toothaches resulting from a cold [Aetius of Amida 1935–1950: VIII, 30, 39–41]. Finally, it must be remembered that Archigenes, whose advice is also quoted in Book XII of *Iatricorum libri* [Aetius of Amida 1935–1950: VIII, 30, 39–41], mentioned *pyriai* made of *kenchros* [Aetius of Amida 1935–1950: VIII, 30, 39–41] as an effective measure against the pain caused by sciatica.

When it comes to medicinal diet, the works by Aetius of Amida contain the information that millet was used for more than just an external anaesthetic in cases of periodontosis and dental caries. Patients suffering from such afflictions were also advised to eat various types of soups (of bread, rice etc.), which included a *rophema* made of *kenchros* [Aetius of Amida 1935–1950: VIII, 31, 17–18]. Common millet cooked together with *ptisane* [Aetius of Amida 1935–1950: VIII, 69, 86] was deemed a suitable dish for people who occasionally experienced stomach haemorrhage [Aetius of Amida 1935–1950: VIII, 69, 67–70]; this information may be found in Book VIII of *Iatricorum libri*, which discusses the methods of treating patients after the bleeding was stopped [Aetius of Amida 1935–1950: VIII,

69, 1–89]. Moreover, it was thought that in some cases millet should be eliminated from daily diet. The prescriptions written down by Aetius suggest that the already-mentioned Archigenes was not an advocate of including *kenchros*-based soups into the diet of patients who had a tendency towards digestive problems, i.e. belonged to the group of *koliakoi* [Aetius of Amida 1935–1950: IX, 35, 1–203]. This view was justified by the fact that millet is hard to digest and causes harmful juices to form within the body. However, in another excerpt from Archigenes, this time discussing foodstuffs suitable for patients with problems of the abdominal cavity resulting from an excess of juices in the digestive tract [Aetius of Amida 1935–1950: IX, 42, 34], Aetius mentioned millet *poltoi* as a very effective means of drying up the humours [Aetius of Amida 1935–1950: IX, 42, 65–67]. Lastly, in Book III of *Iatricorum libri* the author states that *aleura* of common millet are among foodstuffs that facilitate the production of women's milk [Aetius of Amida 1935–1950: III, 142, 1–9].

The works of Alexander of Tralles provide very limited information regarding the use of common and foxtail millet in medicine, which in addition is relatively similar to the data presented above. For patients suffering from the so-called dysentery of the liver caused by a cold *dyskrasia* [Alexander of Tralles 1963: II, 407, 5–409, 16], he recommended including *poltos* of long-cooked millet into the diet [Alexander of Tralles 1963: II, 407, 23–24]. This choice was most certainly dictated by the intent to dry up the unwanted juices that induced the affliction. When patients coughing up blood started to excrete a juice referred to as a humour with acute characteristics [Alexander of Tralles 1963: II, 201, 28–209, 30], he prescribed drinking milk [Alexander of Tralles 1963: II, 209, 22–27] cooked together with foxtail millet. It might be added that *elymos/meline* [Alexander of Tralles 1963: II, 219, 20] was also mentioned as an additional ingredient of poultry broths [Alexander of Tralles 1963: II, 219, 7–10]. Such food was also recommended for people suffering from internal bleeding manifesting itself by the presence of blood in the saliva [Alexander of Tralles 1963: II, 219, 14–20]. Alexander recommended *kenchros*-based poultices for different types of medical conditions. He prescribed millet *pyriai* for patients whose health was jeopardised by some juice that has lingered

in one part of the body for too long. If the humour in question had the features of blood, the physician had to apply diaphoretic measures that dried the body but did not heat it up too much. According to Alexander, millet poultices possessed such properties [Alexander of Tralles 1963: II, 233, 9–12]. The recommendation is found in the passage discussing the treatment of pleurisy (*pleuritis*) [Alexander of Tralles 1963: II, 229, 1–235, 15]. What is more, the physician recommended applying *pyria*-type poultices of *kenchros* [Alexander of Tralles 1963: II, 343, 10–11] after a visit to the baths [Alexander of Tralles 1963: II, 341, 19–345, 28] and as a treatment for pain caused by an excess of gas in the abdominal cavity [Alexander of Tralles 1963: II, 361, 18–27].

Another 6<sup>th</sup>-century physician, Anthimus, did not contradict the instructions of earlier dieticians and claimed that millet and rice, when properly prepared (i.e. cooked in water with an addition of goat milk), were suitable foods for people suffering from dysentery [Anthimus 2007: 71]. This is the only mention of the use of *kenchros* in the medical procedures described in Anthimus' work.

The legacy of Paul of Aegina is equally uninformative with regard to the use of common and foxtail millet in medicine. He considered both grains to be *hapla farmaka*, since this is the category in which they appear in the relevant list in Book VII of his work. On the other hand, only common millet was included in the diet, i.e. the feeding pattern, suitable for children suffering from various afflictions. *Pyriai* with millet were mentioned in several sections of the *Epitome*. Paul prescribed giving *kenchros* [Paul of Aegina 1921–1924: I, 6, 1, 10] to children that had developed skin eruptions [Paul of Aegina 1921–1924: I, 6, 1, 1–11] and presented with excess juices in the digestive tract [Paul of Aegina 1921–1924: I, 6, 1, 10–11]. He did not, however, specify the form in which the grain was to be served. Logic dictates that his prescription most likely refers to liquid foods, i.e. soups or gruels based on millet. As regards warming poultices of millet, Paul of Aegina [1921–1924: III, 9, 3, 19–21] considered them useful in treating lethargy [Paul of Aegina 1921–1924: III, 9, 3, 1–38]. He also knew of using *pyriai* made of the grain in question [Paul of Aegina 1921–1924: III, 33, 2, 11] as a remedy for pain [Paul of Aegina 1921–1924: III, 33, 2, 9–10] applied

after bloodletting, which was sometimes considered a necessary medical procedure in cases of pleurisy [Paul of Aegina 1921–1924: III, 33, 2, 1–32]. Lastly, he recommended hot poultices [Paul of Aegina 1921–1924: III, 38, 1, 13] to alleviate pain of medium intensity that was sometimes associated with afflictions caused by residual gas in the digestive tract [Paul of Aegina 1921–1924: III, 38, 1, 1–25].

What remains to be mentioned are the non-medical sources referred to in the section pertaining to the culinary uses of millet. The *Geoponica* contains the information that the grain in question was considered an antidote for at least some poisons, notably hellebore. A decoction of millet was similarly effective, and could also be used in treating mushroom poisoning. The author of the work also claimed that millet bread could make a person immune to all kinds of poison if consumed right before coming in contact with the harmful substance [*Geoponica*... 1895: XIV, 24, 2–4].

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