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Oksýgala in Dietetics, Medical Procedures, and Culinary Art: Galen and his Followers

In *De alimentorum facultatibus*, Galen interlaces the characteristics of *oksýgala* with a description of properties typical of fresh milk[1]. This type

[1] G a l e n, *De alimentorum facultatibus*, 689, 8 – 696, 6, vol. VI. Soured (or fermented) milk in Greek and Roman antiquity – J. A n d r é, *L'alimentation et la cuisine à Rome*, Paris 1961, p. 159–160; A. D a l b y, *Siren Feasts. A History of Food and Gastronomy in Greece*, London–New York 1996, p. 66, 200; S. H i l l, A. B r y e r, *Byzantine Porridge Tracta, Trachanás and Trahana*, [in:] *Food in Antiquity*, eds. J. W i l k i n s, D. H a r v e y, M. D o b s o n, Exeter 1999, p. 45. J.P. A l c o c k, *Milk and its Products in Ancient Rome*, [in:] *Milk. Beyond the Dairy. Proceedings of the Oxford Symposium on Food and Cookery 1999*, ed. H. W a l k e r, Totnes 2000, p. 32; C.A. D é r y, *Milk and Dairy Products in the Roman Period*, [in:] *Milk...*, p. 120–121; A. D a l b y, *Food in the Ancient World from A to Z*, London–New York 2003, p. 218; P. F a a s, *Around the Roman Table. Food and Feasting in Ancient Rome*, transl. S. W h i t e s i d e, Chicago 2005, p. 124; J.P. A l c o c k, *Food in the Ancient World*, Westport–London 2006, p. 83, 159; D.L. T h u r m o n d, *A Handbook of Food Processing in Classical Rome. For her Bounty no Winter*, Leiden–Boston 2006, p. 192–193; A. D a l b y, *Cheese. A Global History*, London 2009, p. 75; H. V e l t e n, *Milk. A Global History*, London 2010, p. 31; D. B r a u n d, *Food among Greeks of the Black Sea: the Challenging Diet of Olbia*, [in:] *A Companion to Food in the Ancient World*, eds. J. W i l k i n s, R. N a d e a u, Malden, Mass.–Oxford–Chichester 2015, p. 300; A. B a s c h a l i, A.-L. M a t a l a s, *Indigenous Fermented Milks in the Mediterranean.*

of account may hinder reading, since it makes the passage quite puzzling, and yet we have no other way but to use this fragment to determine the basic properties of the foodstuff[2].

Though it is not said by the author *expressis verbis*, from the analysed passage we should understand that the noun *oksýgala* was used to refer to milk which has undergone a process of natural fermentation, and thereby became sour[3]. The conclusion is supported by the fact that the word itself is a compound and consists of the noun *gála* preceded by the adjective *oksýs*, meaning acidic or sharp. Thus, the term itself differentiates the product from other sorts of set milk, like, for instance, from *schíston*, which was produced not due to fermentation but thanks to the addition of rennet and/or by means of heat processing.

As for its qualities, at the beginning of his disquisition Galen states that this product has a harmful effect on teeth in people with a cold or a balanced constitution of the body (*krásis*). We may conclude from the text that this action is related to the cooling properties of soured milk (which result from its acidification, and which were absent from fresh milk), since, having consumed the foodstuff, people with the former constitution were exposed to a further reduction in body temperature, whereas the latter could suffer from the disturbance of temperature balance. In both cases, it led to painful oversensitivity of the teeth (*haimodía*). One, however, was able to adapt to the influence of the foodstuff. The physician believes that the time required for the body to become accustomed to soured milk depends on the person's *krásis*. Thus, Galen explains that it is better digested by people with warm stomachs, and that

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A Heritage of Health and Civilisation, [in:] *Latte e latticini. Aspetti della produzione e del consume nella società miditerranee dell'Antichità e del Medioevo. Atti del Convegno Internazionale di Studio promosso dall'IBAM – CNR e dall'IRS – FNER nell'ambito del Progetto MenSALe Atene, 2–3 Ottobre 2015*, eds. I. A n a g n o s t a k i s, A. P e l l e t t i e r i, Lagonegro 2016, p. 190.

[2] The product is absent from other Galen's works.

[3] This conclusion is supported by information from Galen on the taste of soured milk, which is described as bearing a resemblance to unripe mulberries, which were classified among foodstuffs that are styptic and sharp in taste. Thus, the sourness of this type of milk must have been the effect of a natural process (G a l e n, *De alimentorum facultatibus*, 689, 14–15, vol. VI).

this process does not happen in those with a cold disposition. By the same token, in people with a moderate humoral constitution, it may be accompanied by a number of complications[4]. As far as other dangers of consuming *oksýgala* are concerned, the consumption of soured milk leads to the generation of so-called raw juices within the body[5]. Furthermore, Galen writes that soured milk is a naturally obtained milk curd[6] (and that is why *oksýgala* shares the qualities ascribed to it), a statement which explains why soured milk stimulates the body to produce thick humours[7]. Consequently, he warns the reader against consuming it too often, indicating that it might lead to the formation of kidney stones[8]. Difficult to notice though it is, one can claim that the passage also addresses the physical qualities of the product, alluding to the fact that the soured milk Galen knew was very thick (appearing almost solid), and, in this respect, more similar to curd than to milk itself. Accordingly, we can infer that the *oksýgala* the physician wrote about resembled more of a typical Greek set yogurt than of a liquid.

This disquisition, in a significantly simplified form, is repeated in almost all the other Byzantine medical treatises already quoted herein. For instance, an analogical version of Galen's theory can be found in *Collectiones medicae* by Oribasius[9], who also emphasised the most crucial

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[4] G a l e n, *De alimentorum facultatibus*, 689, 9 – 690, 7, vol. VI.

[5] G a l e n, *De alimentorum facultatibus*, 692, 10–16, vol. VI.

[6] G a l e n, *De alimentorum facultatibus*, 692, 5–6, vol. VI.

[7] G a l e n, *De alimentorum facultatibus*, 692, 10, vol. VI.

[8] G a l e n, *De alimentorum facultatibus*, 693, 1–7, vol. VI.

[9] O r i b a s i u s, *Collectiones medicae*, II, 60, 1, 1 – 3, 2. On soured (or fermented) milk in the late antiquity and Byzantine period – E. K i s l i n g e r, *Les chrétiens d'Orient: règles et réalités alimentaires dans le monde byzantin*, [in:] *Histoire de l'alimentation*, eds. J.L. F l a n d r i n, M. M o n t a n a r i, Paris 1996, p. 342; i d e m, *Trōgontas kai pinontas ektos spitiou*, [in:] *Byzantinōn diatrofē kai mageireiai. Praktika ēmeridas "Peri tes diatrofēs sto Byzantio". Thessalonikē Mouseio Byzantinou Politismou 4 Noembriou 2001. Food and Cooking in Byzantium. Proceedings of the Symposium "On Food in Byzantium". Thessaloniki Museum of Byzantine Culture 4 November 2001*, ed. D. P a p a n i k o l a-B a k i r t z i, Athena 2005, p. 55; Ch. B o u r b o u, M.P. R i c h a r d s, *The Middle Byzantine Menu: Palaeodietary Information from Isotopic Analysis of Humans and Fauna from Kastella, Crete*, IJOa 17, 2007, p. 65; A. D a l b y, *Tastes of Byzantium. The Cuisine of a Legendary Empire*, London–New York 2010, p. 65–66, 220; M. K o k o s z k o, *Rola nabiału*

properties of the foodstuff in his dietetic catalogues. Namely, he listed *oksýgala* among the products generating raw humours[10]. In addition, the physician also classified it as one of the stodgy foodstuffs[11] as well as one generating thick[12] and cold[13] juices. An identical arrangement of data can be traced in *Iatricorum libri* by Aëtius of Amida[14]. In turn, an

w diecie późnego antyku i wczesnego Bizancjum (IV–VII w.), ZW 16, 2011, p. 17–19; I. A n a g n o s t a k i s, *Dining with Foreigners*, [in:] *Flavours and Delights. Tastes and Pleasures of Ancient and Byzantine Cuisine*, ed. I. A n a g n o s t a k i s, Athens 2013, p. 162; Ch. B o u r b o u, *All in the Cooking Pot. Advances in the Study of Byzantine Diet*, [in:] *Flavours and Delights...*, p. 67; J. K o d e r, *Everyday Food in the Middle Byzantine Period*, [in:] *Flavours and Delights...*, p. 145; i d e m, *Natural Environment and Climate, Diet, Food, and Drink*, [in:] *Heaven & Earth. Art of Byzantium from Greek Collections*, eds. A. D r a n d a k i, D. P a p a n i k o l a-B a k i r t z i, A. T o u r t a, Athens 2013, p. 215; i d e m, *Cuisine and Dining in Byzantium*, [in:] *Byzantine Culture. Papers from the Conference "Byzantine Days of Istanbul" Held on the Occasion of Istanbul Being European Cultural Capital 2010. Istanbul, May 21–23 2010*, ed. D. S a k e l, Ankara 2014, p. 428, 433; Ch. B o u r b o u, S. G a r v i e-L o k, *Bread, Oil, Wine and Milk: Feeding Infants and Adults in Byzantine Greece*, [in:] *Archaeodiet in the Greek World. Dietary Reconstruction from Stable Isotope Analysis*, eds. A. P a p a t h a n a s i o u, M.P. R i c h a r d s, S.C. F o x, Princeton 2015, p. 174; Z. R z e ź n i c k a, *Milk and Dairy Products in Ancient Dietetics and Cuisine According to Galen's De alimentorum facultatibus and Selected Early Byzantine Medical Treatises*, [in:] *Latte e latticini...*, p. 55–56, 60–61, 63, 68–69.

[10] O r i b a s i u s, *Collectiones medicae*, III, 6, 1, 1 – 2, 7 (soured milk – III, 6, 2, 6); O r i b a s i u s, *Synopsis*, IV, 5, 1, 1 – 2, 7 (soured milk – IV, 5, 2, 6); O r i b a s i u s, *Libri ad Eunapium*, I, 22, 1, 1 – 2, 8 (soured milk – I, 22, 2, 7).

[11] This property was particularly noticeable for people with a cool constitution of the stomach – O r i b a s i u s, *Collectiones medicae*, III, 18, 1, 1 – 13, 1 (soured milk – III, 18, 7, 1–2); O r i b a s i u s, *Synopsis*, IV, 17, 1, 1 – 12, 1 (soured milk – IV, 17, 5, 1–2); O r i b a s i u s, *Libri ad Eunapium*, I, 35, 1, 1 – 8, 2 (soured milk – I, 35, 5, 1).

[12] O r i b a s i u s, *Collectiones medicae*, III, 3, 1, 1 – 7, 3 (soured milk – III, 3, 6, 5); O r i b a s i u s, *Synopsis*, IV, 2, 1, 1 – 5, 3 (soured milk – IV, 2, 4, 6); O r i b a s i u s, *Libri ad Eunapium*, I, 19, 1, 1 – 5, 4 (soured milk – I, 19, 4, 6).

[13] O r i b a s i u s, *Collectiones medicae*, III, 7, 1, 1 – 2, 2 (soured milk – III, 7, 2, 1–2); O r i b a s i u s, *Synopsis*, IV, 6, 1, 1 – 2, 2 (soured milk – IV, 6, 2, 2); O r i b a s i u s, *Libri ad Eunapium*, I, 23, 1, 1–3 (soured milk – I, 23, 1, 3).

[14] The dietetic characteristics of soured milk, cf. A ë t i u s o f A m i d a, II, 98, 1–15. Dietetic catalogues mentioning soured milk, cf. A ë t i u s o f A m i d a, II, 241, 1–21 (soured milk – II, 241, 14) – soured milk as a foodstuff generating thick juices; II, 244, 1–7 (soured milk – II, 244, 7) – soured milk as a foodstuff generating raw humours; II, 245, 1–4 (soured milk – II, 245, 3) – soured milk as a foodstuff generating cold juices; II, 255, 1–25 (soured milk – II, 255, 12) – soured milk as a stodgy foodstuff.

approach that differs to a certain extent when compared to the aforementioned views, is the opinion expressed by Anthimus, who claims that soured milk does not have a harmful effect on healthy individuals since it does not coagulate within the stomach. At the same time, however, the physician suggests that it should be consumed with honey and oil made from unripe olives[15], which might be interpreted as revealing that both additives positively contributed to the transformation of *oksýgala* in the stomach (possibly, due to their thinning properties). The anonymous compiler of the short work entitled *De cibis*, in turn, confines himself to classifying soured milk as a foodstuff which leads to the generation of viscous[16] and acid[17] humours, which does not deviate from the line of reasoning we find in *De alimentorum facultatibus*. We can also reasonably assume that Paul of Aegina followed Galen's teachings, as he recommended it to patients suffering from anorexia caused by excessive calefaction of the body (accordingly, in cases of hot *dyskrasía*)[18].

Ancient and Byzantine texts show that *oksýgala* was not an unequivocal term. For instance, according to Pliny, the foodstuff named *oxygala* was a by-product obtained when butter was made. The encyclopaedist suggests that the foodstuff was solid and adds that it was seasoned with salt[19]. The definition does not mean, however, that the Romans treated the product exclusively as a second-class food obtained whenever another comestible was made. The information above is simply confirmation that no edible substances were wasted. Latin sources also speak

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[15] Anthimus, 78. The statement on the lack of harmfulness of the analysed foodstuff is difficult to understand. Perhaps, for the author, the consumption of the product which has already been coagulated excluded the possibility of its re-coagulation within the stomach. Moreover, he might have wanted to imply that the curd contained in soured milk was not as hard to digest as the one transformed into cheese.

[16] *De cibis*, XVIII, 1–16 (soured milk – XVIII, 11).

[17] *De cibis*, XX, 1–14 (soured milk – XX, 9).

[18] Paul of Aegina, III, 37, 4, 1 – 6, 19 (analysed extract – III, 37, 4, 16–21; soured milk – III, 37, 4, 18). Other (though rather few) examples of the use of soured milk in Byzantine therapeutics – M. Chronē, *Ē panida stēn diatrofē kai stēn iatrikē sto Byzantio*, Athenai 2012, p. 208–209.

[19] Pliny, XXVIII, 133, 1 – 134, 2. Cf. the part of the present book devoted to butter.

of the intentional production of *oxygala*. The most detailed description which allows us to reconstruct this type of technology is preserved in *De re rustica* by Columella (1st c. AD)[20], who starts his disquisition by familiarising the reader with the method of preparing an appropriate vessel in which the process is to take place[21]. The author recommends drilling a hole in the bottom of a brand-new pot and plugging it with a wooden stopper. Next, the freshest available sheep milk, seasoned with freshly collected herbs (wild marjoram, mint and coriander) and onion, should be poured into the pot and left for five days. Later, the stopper is removed to drain the precipitated whey. This operation is repeated over three days, at which time the herbs are also disposed of and substituted with crumbled dried thyme and oregano (or leek leaves), while the contents of the vessel are stirred. After two more days, the excess whey is drained again, the remaining milk curd is seasoned with salt, and the pot covered with a lid and sealed[22]. The recipe calls for

[20] On the author, cf. E.S. F o r s t e r, *Columella and his Latin Treatise On Agriculture*, GR 19.57, 1950, p. 123–128; I. M i k o ł a j c z y k, *Rzymska literatura agronomiczna*, Toruń 2004, p. 231–256; R.H. R o d g e r s, *L. Iunius Moderatus Columella of Gadēs (ca 40 – ca 70 CE)*, [in:] *The Encyclopedia of Ancient Natural Scientists. The Greek Tradition and its Many Heirs*, eds. P.T. K e y s e r, G. I r b y-M a s s i e, London–New York 2008, p. 456–457; Ch. R e i t z, *Columella, De re rustica*, [in:] *A Companion to the Neronian Age*, eds. E. B u c k l e y, M.T. D i n t e r, Chichester 2013, p. 275–287. On Columella's interest in health and wellbeing, cf. J. D r a y c o t t, *Roman Domestic Medical Practice in Central Italy*: *From the Middle Republic to the Early Empire*, London–New York 2019, p. 140–141.

[21] C o l u m e l l a, XII, 8, 1–3. The process described by Columella must have led to the production of a solid foodstuff, more analogical to quark than soured milk. As a result, this may be a Western variant of the recipe for cheese which in the East was called *oksygaláktinos*. On the same product cf. the section of this book devoted to cheese.

[22] C o l u m e l l a, XII, 8, 1–2. Later in the text (XII, 8, 3), the author also mentions two other recipes for *oxygala*. The first advises seasoning fresh milk with dried leaves of peppercress, previously soaked in brine for 24 hours, and the optional possibility to salt the obtained mixture. Once curd was formed, it was processed in the above presented fashion. The second recipe, in turn, involves pouring fresh milk into a vessel with the aforementioned (but fresh) leaves. After three days, the whey was removed and the foodstuff remaining within the pot seasoned with fresh summer savoury, dried and ground coriander, dill, thyme and celery seeds, and dry sieved salt. The product was also sealed to last.

a comment. The product obtained must have been far different from the *oksýgala* mentioned by Galen because it was entirely devoid of whey, and in this respect was similar to the foodstuff mentioned by Pliny. In other words, the work by Columella proves that the term *oksýgala/oxygala* was used not only to denote a drink but also a sort of cottage cheese spiced with herbs and salted. This can be confirmed by the use of the same term in the Byzantine treatise *Geoponica* (compiled between the 6th and the 10th c. AD)[23], whose author speaks about submerging *oksýgala* into olive oil or wrapping it up with terebinth leaves[24] – such a piece of advice could not concern liquids. On the other hand, *Geoponica* also uses a noun which might have been employed as an alternative term to denote genuine soured milk. It was *mélke* in Greek and *melca* in Latin. The author writes that it was obtained by pouring fresh milk into the pots in which vinegar was previously boiled. The traces of vinegar made it ready for consumption the next day[25]. The two terms are also mentioned as equivalent by Anthimus, but it is impossible to infer from his words whether the author meant cheese of soured milk[26]. Whatever the case, the first option must have been quite widespread since the culinary *opusculum* attributed to Apicius advises the reader to serve *melca* with pepper, fish sauce (or salt), and coriander[27], which appears to refer more to a solid than a drink.

[23] On the treatise, cf. R.H. R o d g e r s, *The Apuleius of the "Geoponica"*, CSCA 11, 1978, p. 197–207; A.A. C a r r a r a, *Geoponica and Nabatean Agriculture: A New Approach into their Sources and Authorship*, ASP 16, 2006, p. 105–123; R.H. R o d g e r s, *Geōponika (ca 950 CE)*, [in:] *The Encyclopedia of Ancient Natural Scientists...*, p. 346; A. D a l b y, *Introduction*, [in:] *Geoponika. Farm Work. A Modern Translation of the Roman and Byzantine Farming Book*, transl. A. D a l b y, Blackawton–Totnes 2011, p. 9–18; I. M i k o ł a j c z y k, *Wstęp*, [in:] *Kassianus Basssus, Geoponika, bizantyńska encyklopedia rolnicza*, transl. I. M i k o ł a j c z y k, Toruń 2012, p. 7–45.

[24] *Geoponica*, XVIII, 12, 3.

[25] *Geoponica*, XVIII, 21. Just like Columella, the author of the recipe stresses that new vessels should be used to prepare this type of foodstuff, which probably stems from the fact that it was extremely difficult to clean them from milk residue.

[26] A n t h i m u s, 78.

[27] A p i c i u s, VII, 11, 9.