

## Decoctions in the treatise of Nikolaos Myrepsos' *Dynameron*

Elias Valiakos<sup>1</sup>

<sup>1</sup> History of Health Sciences, Faculty of Nursing, School of Health Sciences, University of Thessaly, Larissa, Greece

### Abstract:

**Background:** The decoctions were widely used during the Byzantine era. Several of them are recorded in the *Dynameron* of Nikolaos Myrepsos, which has recently been published in a critical edition. This edition describes an extensive book of prescriptions, the richest in its time; it contains 2667 prescriptions, all referring to the Medical Science. It is considered that Nikolaos Myrepsos is the author of the monumental work entitled *Dynameron* of the late Byzantine period (13th century). It is one of the last medical texts of this era, which records all the previous experience of all the medical specialties in relation to various and different illnesses and diseases, how they can be treated with specific herbal ingredients of liquid preparations, such as the decoctions examined here. Related medicines can be found in the chapter *περὶ Προπομάτων* (About “propomata” = drinks taken before meals or medicines), but there is also a plethora of medical recipes in all the chapters of the book.

**Materials and Methods:** The primary source material was Nikolaos Myrepsos' *Dynameron* that has been published in open access on the internet under the name of Ilias Valiakos. For the first time in 800 years, the book is published in a Greek critical edition. The original text was written in the second half of the 13th century and it had not been studied since.

**Results:** *Dynameron*'s comprehensive study led us to examine the therapeutical use of decoctions as recorded in the book of Nikolaos Myrepsos, how to cure diseases and illnesses and which plants and herbs were used in the late Byzantine era with decoctions. According to these, it can be concluded that many diseases were effectively treated with herbs. The most frequently mentioned plants in the *Dynameron* are the following: quince (*Cydonia oblonga* L.), rose (*Rosa centifolia* L.), wormwood (*Artemisia absinthium* L.), common myrtle (*Myrtus communis* L.), pear (*Pyrus communis* L.), fenugreek (*Trigonella foenum-graecum* L.), hazelwort (*Asarum europaeum* L.), opium poppy (*Papaver somniferum* L.), and honey.

**Conclusions:** This research leads to the conclusion that the content of the *Dynameron* is a valuable resource for the study of the decoctions, not to mention their contribution in the treatment of some illnesses and diseases. The decoctions include 88 *afepsema*, 125 *apozema* as well as 26 *propoma* and 20 herbal recipes with the suffix – *aton* (-ἄτον). The plants or fruits stand out with their frequent reference: quince, myrtle, chamomile, wormwood, hypocistis, broadleaf plantain, licorice, fenugreek and lupine. Their composition is mainly based on medicinal plants, most of them inherited from the classical ancient Greek and Hellenistic period and used until the late Byzantine era.

**Key Word:** Nikolaos Myrepsos, *Dynameron*, Decoction, Byzantine pharmacy, Herbal medicine

Date of Submission: 14-06-2021

Date of acceptance: 28-06-2021

### I. Introduction

This study examines the information conveyed to us by the *Dynameron* of Nikolaos Myrepsos regarding the herbal ingredients of liquid preparations, and especially the decoctions, extracts and refreshing drinks during the late Byzantine era. Myrepsos' work was published in a critical edition only recently, in 2019 (Valiakos, 2019). Until that moment, scholars either knew the specific work from its Latin translation of the 16th century (Fuchs, 1549), from the recipes mentioned in the *Pharmacopoeia* textbooks (Cordus, 1546; Occo, 1564; Holtzem, 1565; Occo, 1573) or from the manuscripts themselves. The *Dynameron* as a text acquired its current form shortly after the middle of the 13th c. It is the most extensive recipe book of the late Byzantine era. The recipes it contains, the number of which reaches 3000, show, among other things, wide use of decoctions for therapeutic purposes during the late Byzantine era. At the same time, each drink was a daily habit, while it was in itself medical advice or a recommendation for taking the drink-medicine. The decoctions are the liquor resulting from concentrating the essence of a substance by heating or boiling, especially a medicinal preparation made from a plant. Herbs are known to have many medicinal properties (Valiakos, et al., 2015; Valiakos, et al., 2017). These properties have contributed to the treatment of many diseases and ailments. Writers prior to Myrepsos, mainly in the Hellenistic and late Roman era, record in their texts infusions, refreshing preparations, extracts, or preparations (Totelin, 2009; Scarborough, 1984). For several of these preparations in *Dynameron*, their ingredients or their method of preparation are noted. We will focus on Myrepsos' reports, in each of which

he names and mentions their ingredients in detail and how they should be prepared.

## II. Material And Methods

The primary and main source of research and extraction of data is the *Dynameron* of Nikolaos Myrepsos. At the same time, parallel information was sought and examined by previous medical writers from antiquity to the late Byzantine era. The writing of the *Dynameron* is registered shortly after the middle of the 13th c. with the most accepted date of writing, that of 1260. Myrepsos informs us through a number of recipes, for the treatment of many diseases using organic ingredients, such as plants, animals, and fungi, but also inorganic, such as earth and metals. The recent publication of the work, in 2019, allows us to draw valid, safe and certain conclusions without having to look back at the manuscripts.

The *Dynameron* is structured in 24 sections; one for each letter of the Greek alphabet. These sections include chapters, which are included in each of them based on their letter. So, the chapters in each section vary between one and nine. Many of them also include subchapters, as a result of the merging and the shortening of the chapters (Valiakos, I., 2019). For the present work, the following subchapter, *Propomata* (=Pre-drinks, *περι Προπομάτων*), as well as the scattered recipes throughout the *Dynameron*, which contained decoctions. Other drinks, such as melikraton, or oxykraton, or even oxymelikraton, were not examined in the present study as they are in themselves another category, that of beverages, and do not come from plants, despite the fact that they are widely used in the medical literature of all authors and not only in the *Dynameron*.

## III. Results

Presenting the results, it is important to clarify the words that we find in the *Dynameron* of Nikolaos Myrepsos, and that attribute the meaning of decoction.

Decoctions, in the Greek language, are recorded with two different words that have similar meaning: the *afepsema* (*ἀφέψημα*), the treatment of parts of the plant by boiling in water, such as bark, root, flowers and the *arozema* (*ἀπόζεμα*), drink with a high content of the active ingredients of a medicinal herb. (Trapp, 2001; Demetrakos, 1966; Liddel, et al., 1996). These words are found in all medical writers. Most of them, such as Galen, Oreibasios, Aetius of Amida, and Paul of Aegina mostly use the word *afepsema*, while Myrepsos and Dioscorides share the use between the two words in their books.

1. *Afepsema* is what comes out when the plant is being boiled in the water (*ἡ ἐν τῷ ὕδατι ἀφέψησις*). In the *Dynameron* we find 88 references, from 51 different plants, of which the most common are the *common myrtle* (*μυρτιά*) in seven different recipes, the *fenugreek* (*τῆλις*) and the *lupine* (*θέρμων*) each of five.

The common myrtle (*μύρτος*), *Myrtus communis* L., belongs to the family Myrtaceae. Used in perfumery, cosmetics and pharmaceuticals. Produces essential oil, myrtle oil (Messoud C., et al., 2012). The plant has been known since ancient times with the first written reference of Archilochus in the 7th century B.C. (West, 1971) and our most detailed description is provided by Dioscorides (Sprague, 1936). The *afepsema* of myrtle is mentioned in the *Dynameron*, in the chapter of *Antidotes* in two recipes, while in *Trochisks* (*περι Τροχίσκων*) is mentioned in five. In all recipes used it treats dysentery, lientery, colic and stomach pains (Valiakos, 2019). Scientific research has shown that the myrtle decoction actually treats these pains and helps the proper functioning of the intestine (Aleksic and Knezevic, 2014).

The fenugreek (*τῆλις*), *Trigonella foenum-graecum* L., belongs to the Fabaceae family. Parts of the plant and mainly its seeds are used in addition to cooking, veterinary medicine, and folk medicine (Kakani and Anwer, 2012). Nikolaos Myrepsos mentions the *afepsema* of fenugreek, in the chapter of *Antidotes*, in two recipes, where the treatment of weakness and hysteria is noticed, while in the chapter of *Coughs* (*Βηχικῶν*), as well as in the chapter of *Eligmata* (=medicines that melts in the mouth, *περι Ἐλιγμάτων*), the decoction of fenugreek contributes to the reduction of coughs, runny noses, and orthopnea. Finally, in the *Pessary* (*περι Πεσσῶν*) chapter, fenugreek decoction is mentioned in recipe 92 and is used as an ointment against the hematoma (*ιχθῶρας*) of the head and its hypocrisy. According to studies, fenugreek, effectively contributes to the treatment of atherosclerosis (Basu and Srichamroen 2010; Gunn, et al. 2013).

The *lupine* (*θέρμος*), according to Langkavel (1866), is the white lupine (*Lupinus albus* L.), while Berendes (1902) identifies it with the species *Lupinus hirsutus* L. It belongs to the Fabaceae family. In *Dynameron*, the decoction of lupine is found in the chapter of *Satyriasis stimulating* (*περι Σατυριακῶν ἐντατικῶν*). Here, we can read a sub-chapter about Soaps, where it mentioned the making of soaps for medicinal use. Together with other herbal ingredients, lupine is used as a scalp dryer. In the chapter on *Lice* (*περι Φθειρῶν*), it is recommended to wash the head with the decoction of the heat, and as in the chapter *Scabies spreads* (*περι Ψώρας ἀλειμμάτων*), it is used against scabies and itching. This is probably due to the fact that lupine, containing legumin, is a protein that has been used in the past as a diluent, emollient and sedative in a topical compress, while its decoction has been used in washes, infusions (thermal pads), against chronic skin diseases such as eczema, lichens, etc. Lupins contain bitter oil, calcium phosphate, magnesium, traces of potassium and iron phosphate, starch and no sugar (Knecht, et al., 2006; Takamatsu, et al. 1990). All species of

lupins contain a toxic substance, lupinidine, which if taken in large quantities, causes the deadly disease lupinosis (Gardiner, 1967).

2. In the *Dynameron* we find 125 reports of *apozema* (ἀπόζεμα), 83 different plants are found. In various recipes, we find eight times the extract of the chamomile, five times the celery, and four times the rue. Note here that another 79 plants are listed one to three times as *apozema*, as shown in Table 1.

Chamomile (χαμαίμηλον), *Matricaria chamomilla* L., of the Asteraceae family, is synonymous with *Chamomilla recutita* (L.) Rausch. About 120 components have been identified in chamomile as secondary metabolites (Singh O, et al., 2011). It is used as a decoction and often in aromatherapy and cosmetology. It is utilized in medicine because it has anti-inflammatory, antispasmodic, antibacterial, sedative, anti-allergic, antioxidant, antipyretic and antimicrobial action (Cemek M, et al., 2008). The *apozema* of the chamomile is mentioned in the *Dynameron*, in many chapters: *Antidotes*, *Refreshments*, *Trochisks*, *Granules* (περὶ Κοκκίων), *Theriaks* (περὶ Θηριακῶν), *Pessary* and *Waters* (περὶ Ὑδάτων). In all of them, it treats the nervous mood and the pains in the stomach and abdomen, the kidney conditions such as strangury, dysuria and lithiasis (Valiakos, 2019).

Celery (σέλινον), *Apium graveolens* L., is a biennial plant of the genus *Apium* of the family Apiaceae (syn. Umbelliferae), known since ancient times when used in cooking, and in medicine as remedy. It is a highly aromatic plant. The seeds are aromatic, with the same aroma as the plant but with a bitter and more caustic taste. The seeds are used as a spice. The strong aroma of celery is due to the essential oil, which gives the plant appetizing, digestive, and tonic properties (Al-Howiriny T., et al., 2010). Contains iron, calcium, phosphorus and vitamins C, B1, B2, and K. It is considered to have anti-ulcer, antibacterial (Baananou S., et al., 2012) and antioxidant activities (Kooti, W. and Darai, N., 2017) and can be used in diseases of the kidneys, bladder and arthritic diseases (Powanda MC. and Rainsford KD., 2011). In the *Dynameron* the *apozema* of celery is used in the chapter of *Antidotes*, where it cleanses the conditions of the penis, while in the chapter of *Refreshments*, in a recipe it contributes together with other plants to the treatment of liver obstruction, while in another it treats dropsy, lithotripsy and the diseases of the spleen. In the chapter of *Oxymels* (περὶ Ὄζυμελίτων) we find the *apozema* of celery in two recipes, where it is a laxative of bile and stomach.

Rue (πήγανον), *Ruta graveolens* L., is a fragrant, evergreen, perennial plant of the Rutaceae family. It contains mainly volatile oils, flavonoids, alkaloids and routine (Movafeghi A., et al., 2009; Lamchouri F., et al., 2002). In ancient Greece, it was used as an emmenagogue, an abortion as an antidote to poisons, for better eyesight and the epidemic diseases (Totelin, 2009). Rue has been used in folk medicine to treat many other ailments. Its antimicrobial (Shahverdi AR., Et al., 2005) and its therapeutic properties have been confirmed by laboratories (Hamden, et al., 2008). In the *Dynameron* the *apozema* of rue is used to treat various diseases: in *Antidotes*, other times for kidney diseases and lithotripsy, and sometimes for the fight against periodic fevers; in *Clysters* (περὶ Ἐνεμάτων), it fights colic while; in *Waters* (περὶ Ὑδάτων) it treats hysterical algae (Valiakos, 2019).

3. Finally, in the category of decoctions, there is another group of recipes entitled *Propomata* (περὶ Προπομάτων). As the word *propoma* says, these are decoctions that are taken before eating or before taking a prescription (Liddell, et al., 1996). Perhaps the word *pre-drink* could be used here. Concerning food, we have breakfast, lunch and dessert; in a similar way it seems that we have the correspondence in the drinks: pre-drink/propoma, drink, and after-drink/metapoteon (Dalby, 2003). All the *propomata* are preparations containing honey and wine, while all the previous herbal decoctions contain water. The first information and earlier reference to *propoma* are made by the *Athenaeus* (early 3rd c. AD) in his book *Deipnosophistae*, who in fact gives the meaning of the word: ...prepare what was served before dinner, when it first arrives... (Jacoby, 1965; Kaibel, 1965).

Indeed, as recorded by the medical authors in the next centuries, these decoctions were given before dinner or the recipe offered to the attendees or guests. However, their reference is not extensive.

The *propomata* have the largest and most extensive reference to Nikolaos Myrepsos, in relation to all previous authors. In the *Dynameron*, the *Propomata* is a sub-chapter of *Pessary* (περὶ Πεσσῶν). Here we read 26 recipes. Each of them is a preparation that bears the name of a plant. This plant is the basis of the recipe. The other ingredients of the recipe are plants that complement or enhance the taste or medicinal action. The *propomata* are the following: wormwood (*Artemisia absinthium* L.), anise (*Pimpinella anisum* L.), pennyroyal (*Mentha pulegium* L.), official storax (*Styrax officinalis* L.), rose (*Rosa x centifolia* L.), common pear (*Pyrus communis* L.), hazelwort (*Asarum europaeum* L.), almond (*Prunus dulcis* (Mill.) D. A. Webb), citrus (*Citrus medica* L.), polypody (*Polypodium vulgare* L.), carpesium (*Carpesium* sp.), aloe (*Aloe vera* L.), cumin (*Cuminum cyminum* L.) and conditum. The last is a spiced *propoma*.

The specific formulations of the plant-based preparations have the suffix *-aton* (-ἄτον) at the end of the word and they refer to the way they are prepared, without noting the diseases to which they were applied. Then follow six more prepositions, aimed at either patients with quartan fever, now known as malaria (*Plasmodium malariae*), or in *phlegmagogoi*, carrying off phlegm, or hydrops, suffering from dropsy. It is important to

mention here that these recipes are also based on a plant, such as hazelwort (*Asarum europaeum* L.), dodder (*Cuscuta epithymum* (L.) L.), senna (*Senna alexandrina* Mill.) or chamelaia (*Daphne oloides* Schreb), but without the characteristic suffix in *-ἄτον* in the title of the recipe. In fact, a recipe is titled as an aromatic *propoma* (*ἀρωματικὸν πρόπομα*), which suggests that it stood out for its aroma. This fragrance was exuded by the ingredients of the recipe.

In addition, scattered decoctions, with the suffix *-ἄτον*, can be found in several recipes in *Dynameron*, such as *ἀλισφακᾶτον*, *ἀλοᾶτον*, *ἀψινθᾶτον*, *ἀνισᾶτον*, *ἀπιδᾶτον*, *ἀμυγδαλᾶτον*, *γληχωνᾶτον*, *ἰᾶτον*, *καρπησιᾶτον* and *κυδωνᾶτον*, *κυτρᾶτον*. These in *Dynameron* scattered decoctions do not exceed twenty in number. And it is important to mention that these decoctions with the suffix *-ἄτον* are not *propomata*. That is why they are based on water and not on honey or wine. For this reason, they are not called *propomata*.

From the completely specific category of the *Propoma* and herbal preparations with words ending in *-ᾶτον*, the plant that has the most reference is the quince. It is found in a total of 19 recipes. The wormwood with seven recordings follows in reference frequency. All other plants have a minimal reference, from two to one time, as shown in Table 1. It is worth noting here that two animal products are mentioned, the frog and the turtle. These are included as ingredients to make a decoction. It is noted that the use of animal products has a broader reference in *Dynameron* (Valiakos et al. 2021).

The quince (*κυδόνια*) *Cydonia oblonga* Mill., or quince apple as they are occasionally called in the *Dynameron*, are the fruit of the quince tree of the Rosaceae family. An *afepsema* is prepared from the leaves of the tree, and mainly from the quince itself, which has emollient, expectorant, antimicrobial and antioxidant properties (Fattouch, et al., 2007; Silva, et al., 2004). In the *Dynameron* we find it in 19 recipes as quince-ᾶτον (*κυδωνᾶτον*). It is referred in the chapters of *Antidotes*, *Refreshments*, *Laxatives* (*περὶ Καθαριστικῶν*), *Granules*, where the vast majority it is used as a laxative and as a sedative of abdominal diseases, combat dysentery, lenter, dyspepsia, anorexia and stomach atony. In a recipe in the chapter of *Oxymels*, it is noted that the quince must be prepared in the fall (Valiakos, 2019). However, no reference is made about a *propoma* quince-ᾶτον. Until today, only the antioxidant and antiproliferative activities have been proven in the laboratory. (Sajid et al., 2011).

The wormwood (*ἀψίνθιον*) *Artemisia absinthium* L., belongs to the family Asteraceae and it is used, among others, in the distillery. Wormwood facilitates digestion and contributes to weight loss and digests fats, and stimulates the digestive system (Baumann, IC, 1975). It is also suitable for diabetics and helps treat rheumatism. Likewise, it helps with anemia, diuresis, fever, dropsy, and cleanses the blood (Lachenmeier, DW, 2011). In the *Dynameron* the wormwood-ᾶτον (*ἀψινθᾶτον*) is noted in the chapters of the *Antidotes* and the *Refreshments*. Wormwood massages the stomach, treats colic pains, helps with diuresis and strengthens the stomach, while two *Propomata* are also mentioned as wormwood-ᾶτον (*ἀψινθᾶτον*) (Valiakos, 2019).

Table 1. List of plants mentioned in Nikolaos Myrepsos' *Dynameron* as decoctions

	Plant name	Scientific name**	Scientific family	Decoctions*			
				<i>afépsem</i> a	<i>apózema</i>	<i>própoma</i>	suffix -ᾶτον
1.	ἄβρότονον	[ <i>abrotonon</i> ]	<i>Artemisia abrotanum</i> L. <sup>a,b,e</sup>	Asteraceae		1	
2.	ἄγρωστις	[ <i>agrostis</i> ]	<i>Cynodon dactylon</i> (L.) Pers. <sup>a,b,d,e,j</sup>	Poaceae		1	
3.	ἄδιαντος, κάπιλον βένερισ <sup>f</sup>	[ <i>adianton</i> , <i>capilon</i> <i>veneris</i> ]	<i>Adiantum capillus-veneris</i> L. <sup>a,b,e,d,j</sup>	Pteridaceae		1	
4.	ἄλθαια ἰβίσκος	[ <i>althaia</i> , <i>iviscos</i> ]	<i>Althaea officinalis</i> L. <sup>a,b,e,d,j</sup>	Malvaceae		1	
5.	ἄλόη	[ <i>aloi</i> ]	<i>Aloe ferox</i> Mill. <i>Aloe vera</i> (L.) Burm. f. d,e,j <i>Aloe perfoliata</i> L.a,b	Xanthorrhoeacea e			1
6.	ἄμυγδαλον	[ <i>amygdalon</i> ]	<i>Prunus dulcis</i> (Mill.) D.A. Webb <sup>a,b,d,e</sup>	Rosaceae			1
7.	ἄνδράχνη	[ <i>andrahni</i> ]	<i>Portulaca oleracea</i> L. <sup>a,b,e,d,j</sup>	Portulacaceae		1	
8.	ἄνηθος	[ <i>anithos</i> ]	<i>Anethum graveolens</i> L. <sup>b,e,d,j</sup> <i>Pimpinella anisum</i> L. <sup>a</sup>	Apiaceae		1	
9.	ἄνισον, γλυκάνισον	[ <i>anisson</i> , <i>glykanisson</i> ]	<i>Pimpinella anisum</i> L. <sup>b,e,d,j</sup> <i>P. saxifraga</i> L. <sup>d</sup> <i>Tordylium officinale</i> L. <sup>a</sup>	Apiaceae	1	2	1
10.	ἄντιδιον	[ <i>antidion</i> ]	<i>Cichorium endivia</i> L. <sup>b</sup>	Asteraceae		1	
11.	ἄπιον, ἄπιδι, ἄχλάδι	[ <i>apion</i> , <i>apidi</i> , <i>achladi</i> ]	<i>Pyrus communis</i> L. <sup>b</sup>	Rosaceae			1
12.	ἄρνόγλωσσον, πεντάνευρον	[ <i>arnoglosson</i> , <i>pentanevron</i> ]	<i>Plantago major</i> L. <sup>b,e,d,j</sup> <i>P. lagopus</i> L. <sup>a,e,d,j</sup>	Plantaginaceae		2	
13.	ἄρτεμισσία	[ <i>artemissia</i> ,	<i>Artemisia</i> sp. <sup>b</sup>	Asteraceae	-	5	

	άβάσκαντον	[avaskanton]	<i>A. arborescens</i> (Vaill.) L. <sup>a,b,d,j,b,e</sup>					
14.	ἄσαρον	[assaron]	<i>Asarum europaeum</i> L. <sup>a,b,e,j</sup>	Aristolochiaceae	2	3	1	
15.	ἀσπάραγος	[asparagos]	<i>Asparagus</i> sp. <sup>b</sup> <i>Asparagus acutifolius</i> L. <sup>a,d</sup> <i>Asparagus officinalis</i> L. <sup>a,e</sup>	Asparagaceae		2		
16.	ἀψίνθιον	[apsinthion]	<i>Artemisia absinthium</i> L. <sup>a,d,e,j</sup>	Asteraceae	3	2	2	7
17.	βαλαύστιον, σίδιον ρόας ροίδιον	[valafstion, sidion, rhoas, rhoidion]	<i>Punica granatum</i> L. <sup>a,b,e</sup>	Lythraceae	1	2		
18.	βάτος	[vatos]	<i>Rubus vulgaris</i> Weihe & Nees <sup>a,d</sup>	<u>Rosaceae</u>	2	2		
19.	βερβελίκη	[verveliki]	<i>Cephalaria transylvanica</i> (L.) Schrad. ex Roem. & Schult. <sup>b,d</sup> <i>Tussilago farfara</i> L. <sup>b,f</sup>	Caprifoliaceae Asteraceae		1		
20.	γεντιανή	[gentiani]	<i>Gentiana lutea</i> L. <sup>a,b,d</sup> <i>G. purpurea</i> L. <sup>e</sup>	Gentianaceae	1			
21.	γλήχων, βλήχων	[glíhon, vlichon]	<i>Mentha pulegium</i> L. <sup>a,b,e,j</sup>	Lamiaceae	1		1	
22.	γλυκώριζα	[glykorhiza]	<i>Glycyrrhiza glabra</i> L. <sup>a,b,e,d,j</sup>	Fabaceae	2	2		
23.	γρανασόλε <sup>f</sup>	[granasole]	<i>Lithospermum officinale</i> L. <sup>e,d,j</sup> <i>Buglossoides tenuiflora</i> (L.) I. M. Johnst. <sup>a</sup>	Boraginaceae		2		
24.	δαμάσκηνον	[damaskinon ]	<i>Prunus domestica</i> L. <sup>a,b,e</sup>	Rosaceae		1		
25.	δαΰκος	[dafkos]	<i>Daucus carota</i> L. <sup>a,b,e,d,j</sup>	Apiaceae	1			
26.	δρακόντιον	[drakontion]	<i>Dracaena cinnabari</i> Balf. <sup>f,a</sup>	Asparagaceae		1		
27.	ἐλελίσφακον ἄλισφάκιον ἀλίφακα	[elelispako n, alisphekion, aliphaka]	<i>Salvia</i> sp. <sup>e</sup> <i>S. officinalis</i> L. <sup>d</sup> <i>S. pomifera</i> L. <sup>b</sup>	Lamiaceae		1		1
28.	ἐρέβινθος	[erevinthos]	<i>Cicer arietinum</i> L.	Leguminosae	1			
29.	ἐρυθρόδανον, ρίζαρι τῶν βαφαίων λάκα τῶν βαφαίων	[erythrodan on, rhizari vafeon, laka vafeon]	<i>Rubia tinctorum</i> L. <sup>b,d,j</sup> <i>R. peregrina</i> L. <sup>a,e,b,d</sup>	Rubiaceae	1	1		
30.	ἐῦπατόριον ἀγριμόνιον	[efpatorion] [agrimonion ]	<i>Agrimonia eupatoria</i> L. <sup>b,e,d,j</sup>	Rosaceae	1			
31.	ἡδύοσμος, ἡδύοσμος ἄγριος μέντα	[hedyosmos, hedyosmos agrios, menta]	<i>Mentha</i> sp. <sup>e,d,j</sup> <i>M. x piperita</i> L. <sup>a,b</sup>	Lamiaceae	1			
32.	ἡρύγγιον	[eryngion]	<i>Eryngium campestre</i> L. <sup>b,e,d</sup> <i>E. maritimum</i> L. <sup>a</sup>	Apiaceae	1			
33.	θέρμον	[thermon]	<i>Lupinus micranthus</i> Guess. L. pilosus L.	Fabaceae	5	1		
34.	θύμος	[thymos]	<i>Thymbra capitata</i> (L.) Cav. (= syn. <i>Thymus capitatus</i> (L.) Hoffm. & Link) <sup>e,d</sup> <i>T. vulgaris</i> L. <sup>a</sup>	Lamiaceae	2			
35.	Ἴον ιέλαιο <sup>f</sup>	[ion, ieleos]	<i>Viola odorata</i> L. <sup>a,b</sup>	Violaceae		2		1
36.	ισχάς (=σύκο <sup>f</sup> )	[ischas]	<i>Ficus carica</i> L. <sup>d,b</sup>	Moraceae	2	3		
37.	καλαμίνθη	[calaminthe]	<i>Clinopodium nepeta</i> (L.) Kuntze <sup>e,b,d</sup> <i>C. nepeta</i> subsp. <i>glandulos</i> <i>um</i> (Req.) Govaerts <sup>a,e</sup> <i>Acinos alpinus</i> Moench <sup>e,d</sup> <i>Mentha pulegium</i> L. <sup>a,b</sup> <i>M. arvensis</i> L. <sup>a</sup>	Lamiaceae	1			
38.	κάππαρις	[capparis]	<i>Capparis spinosa</i> L. <sup>e,b,d,j</sup>	Capparidaceae		3		
39.	καρπησία	[carpesia]	<i>Carpesium</i> sp. <sup>b</sup>	Asteraceae			1	
40.	κασία, (γλυκο)κάλαμον	[cassia, glykokalamon]	<i>Cinnamomum</i> sp. <sup>a</sup> <i>C. cassia</i> (L.) J. Presl. <sup>e,j</sup>	Lauraceae	1	1		

	κάλαμος άρωματικός	<i>kalamos aromaticos</i>						
41.	κέδρος	[cedros]	<i>Juniperus sp.</i> <sup>e,d,j</sup> <i>Juniperus drupacea</i> Labill. <sup>b,j</sup> <i>J. oxycedrus L.</i> <sup>b,j</sup> <i>J. phoenicea L.</i> <sup>b,j</sup>	Cupressaceae		1		
42.	κιννάμωμον, κινναμώμηγ, κανέλα ξύλοκασσία	[ <i>cinnamomon, cinnamomin, kanaela, xylokassia</i> ]	<i>Cinnamomum verum J.</i> Presl. <sup>e,d</sup> <i>Cinnamomum tamala</i> (Buc h.-Ham.) T. Nees & Eberm. <sup>e,d</sup> <i>Cinnamomum sp.</i> <sup>a</sup>	Lauraceae		2		
43.	κισσός	[ <i>cissos</i> ]	<i>Hedera helix L.</i> <sup>a,e,d,j</sup>	Araliaceae		1		
44.	κίτρον	[ <i>citron</i> ]	<i>Citrus medica L.</i> <sup>e,d,j</sup> <i>Arbutus andrachne L.</i> <sup>a</sup>	Rutaceae <u>Ericaceae</u>			1	2
45.	κόνυζα	[ <i>conyza</i> ]	<i>Inula britannica L.</i> <sup>e,d,j</sup> <i>Dittrichia viscosa (L.)</i> Greutera, <sup>e,j</sup> <i>Dittrichia graveolens (L.)</i> Greutera, <sup>e,d,j</sup>	Asteraceae		1		
46.	κολοκύνθη	[ <i>colocynthe</i> ]	<i>Cucurbita pepo L.</i> <sup>a</sup> <i>Lagenaria siceraria</i> (Molina) Standl. <sup>e,d</sup> <i>Costus arabicus</i> <sup>a,d</sup>	Cucurbitaceae		1		
47.	κόστος	[ <i>costos</i> ]	<i>Cheilocostus speciosus (J.</i> Koenig) C.D. Specht <sup>a,d</sup> <i>Aucklandia lappa DC.</i> <sup>e</sup>	Costaceae Asteraceae		1		
48.	κριθή	[ <i>krithe</i> ]	<i>Hordeum vulgare L.</i> <sup>a,e,j</sup>	Poaceae		1		
49.	κρίνος	[ <i>krinos</i> ]	<i>Lilium candidum L.</i> <sup>d,j</sup>	Liliaceae				1
50.	κυδώνι	[ <i>kydoni</i> ]	<i>Cydonia oblonga Mill.</i> <sup>e,d,j</sup>	Rosaceae				19
51.	κυκλάμινος	[ <i>cyclaminos</i> ]	<i>Cyclamen graecum Link.</i> <sup>e,d,j</sup>	Primulaceae		2		
52.	κύμινον, καρναβάδιον <sup>f</sup>	[ <i>cymimon, carnavadin</i> ]	<i>Cuminum cyminum L.</i> <sup>e,d,j</sup>	Apiaceae			1	1
53.	κύπερον <sup>f</sup>	[ <i>cyperon</i> ]	<i>Cyperus longus L.</i> <sup>a</sup> <i>C. rotundus L.</i> <sup>d</sup>	Cyperaceae		1		
54.	λάπαθον	[ <i>lapathon</i> ]	<i>Rumex conglomeratus</i> Murraye, <sup>d</sup> <i>Rumex crispus L.</i> <sup>d</sup> <i>Rumex patientia L.</i> <sup>b,d</sup>	Polygonaceae		1		
55.	λιβάνι, μάννα	[ <i>livani, manna</i> ]	<i>Boswellia serrata Roxb. ex</i> Colebr. <sup>b,d</sup>	Burseraceae		1		1
56.	λινόσπερμον λινόσπορον	[ <i>linosperma, linosporon</i> ]	<i>Linum usitatissimum L.</i> <sup>e</sup> , <i>Linum bienne Mill.</i> <sup>d</sup>	Linaceae		1		
57.	λωτός	[ <i>lotos</i> ]	<i>Celtis australis L.</i> <sup>b</sup> <i>Melilotus sp.</i> <sup>e</sup>	Cannabaceae Fabaceae		2		
58.	μακεδονήσι	[ <i>makedonissi</i> ]	<i>Athamanta macedonica</i> (L.) Spreng. <sup>b</sup>	Apiaceae		1		
59.	μάραθρον	[ <i>marathron</i> ]	<i>Foeniculum vulgare</i> Mill. <sup>d,e,j</sup>	Apiaceae		2	4	1
60.	μελάνθη	[ <i>melanthe</i> ]	<i>Nigella sativa L.</i> <sup>d,j</sup>	Ranunculaceae		1		
61.	μαλάχη, μολόχη, μελόχη άγρια	[ <i>maloche, moloche, meloche agria</i> ]	<i>Malva pusilla Sm.</i> (= syn. <i>M. rotundifolia L.</i> ) <sup>b</sup>	Malvaceae		1		
62.	μέσπιλα σούλβα	[ <i>mespila, soulva</i> ]	<i>Mespilus germanica L.</i> <sup>b</sup>	Rosaceae		1		
63.	μούσκούλα δαμάσκηνα	[ <i>mouscoula, damascina</i> ]	<i>Prunus domestica L.</i> <sup>a,b,e</sup>	Rosaceae		1		
64.	μυρίκη, μύριγγ <sup>ε,ζ</sup>	[ <i>myriki, myrinx</i> ]	<i>Tamarix tetrandra Pall. ex</i> M. Bieb. <sup>e,j</sup> <i>T. africana Poir.</i> <sup>a,b</sup>	Tamaricaceae		1		
65.	μυριόφυλλον	[ <i>myriophyllon</i> ]	<i>Myriophyllum spicatum</i> L. <sup>d,j</sup>	Haloragaceae		1		
66.	μυρσίνη, μύρτος, μυρτόκοκκα, μυρσινόκοκκα	[ <i>myrsini, myrtos, myrtokokka, myrsinokokka</i> ]	<i>Myrtus communis L.</i> <sup>d,j</sup>	Myrtaceae		8	4	
67.	νάρδος κελτική	[ <i>nardos celtice</i> ]	<i>Valeriana celtica L.</i> <sup>e,d,j</sup>	Caprifoliaceae		2		
68.	όρίγανη	[ <i>origane</i> ]	<i>Origanum vulgare L.</i> <sup>d,j</sup>	Lamiaceae		1		

69.	κωδεία	[codeia]	<i>Papaver somniferum</i> L. <sup>d,e,j</sup>	Papaveraceae	3			
70.	πέπερι [κοινό], πέπερι μελανό, πέπερι λευκόν πέπερι μακρύ	[peperi koino, peperi melano, peperi lefkon, peperi makri]	<i>Piper nigrum</i> L. <sup>e,d,a,j</sup> , <i>P. album</i> Vahl <sup>a,d</sup> , <i>P. longum</i> L. <sup>a,d</sup>	Piperaceae		1		
71.	πεπόνι <sup>f,k</sup> , πέπων πέπων χειμωνικός	[peponi, pepon, pepon chimonikos]	<i>Cucumis melo</i> L. <sup>a,d</sup>	Cucurbitaceae				1
72.	περιστέριον	peristerion	<i>Verbena officinalis</i> L. <sup>e,a,d,j</sup>	Verbenaceae	1			
73.	πετροσέλινον, ζήνων <sup>f</sup> (=σίνων)	[petroselinon, zinon]	<i>Petroselinum crispum</i> (Mill.)Fuss <sup>e,a,d,j</sup>	Apiaceae	3			
74.	πήγανον	[peganon]	<i>Ruta graveolens</i> L. <sup>e,j</sup>	Rutaceae	3	4		
75.	πικροδάφνη	[pikrodafne]	<i>Nerium oleander</i> L.	Apocynaceae		1		
76.	πόλιον	[polion]	<i>Teucrium polium</i> L. <sup>a,e,j</sup>	Lamiaceae	2			
77.	πολύγονον κορίτζολε <sup>f</sup>	[polygonon, coritzole]	<i>Polygonum aviculare</i> L. <sup>a,e,j,d</sup> <i>P. maritimum</i> L. <sup>d</sup>	Polygonaceae	1	1		
78.	πολυπόδιον	[polypodion]	<i>Polypodium vulgare</i> L. <sup>e,d,j</sup>	Polypodiaceae			1	
79.	πράσιον μαυρόμαρσον μαρούμπια	[prasion, mavromarson, maroumbia]	<i>Marrubium vulgare</i> L. <sup>d,j</sup>	Lamiaceae		1		
80.	πτέρι	[pteri]	<i>Pteridium aquilinum</i> (L.) Kuhn <sup>b</sup>	Dennstaedtiaceae	1			
81.	ρόδον	[rhodon]	<i>Rosa centifolia</i> L. <sup>d,j</sup>	Rosaceae	2	3	1	2
82.	ρόυ έρυθρόν ρόυ μαγαρικόν, ρόυς βυρσοδεψικός σουμάκι ρόυ συριακόν	[rhou erythron, rhou magaricon, rhous byrsodepsikos, soumaki, rhou syriakon]	<i>Rhus coriaria</i> L. <sup>a,d,e,j</sup>	Anacardiaceae		5		
83.	σάμψυχον	[sampsyhyon]	<i>Origanum majorana</i> L.	Lamiaceae		1		
84.	σαξιφράγον, σασίφρυγα	[saxiphrago n, sasifryga]	<i>Pimpinella saxifraga</i> L. <sup>b,d,e</sup>	Apiaceae		2		
85.	σέλινο νεροσέλινο	[selinon, neroselinon]	<i>Apium graveolens</i> L. <sup>a,d,e,j</sup>	Apiaceae	3	5		
86.	σέννα	[senna]	<i>Senna alexandrina</i> Mill. <sup>d</sup> (=syn. <i>Cassia senna</i> L.) (= syn. <i>Cassia angustifolia</i> Vahl.)	Fabaceae	1	2		
87.	σίον	[sion]	<i>Sium latifolium</i> L. <sup>a</sup> <i>Berula erecta</i> (Huds.) Coville <sup>d,e,j</sup>	Apiaceae		1		
88.	σίσαρον	[sissaron]	<i>Sium sisarum</i> L.	Apiaceae	1			
89.	σκολοπένδριον, ἄσπληνον σπληνοδάπανον λιθοπτέριον	[skolopendri on, aspnenon, splenodapan on, lithopterion]	<i>Ceterach officinarum</i> Willd. <sup>a,e,b,f</sup>	Aspleniaceae		1		
90.	σκορπίουρον	[skorpiouoron]	<i>Scorpiurus muricatus</i> L.	Leguminosae	1			
91.	στρούθιον	[strouthion]	<i>Saponaria officinalis</i> L. <sup>a,d,e,j</sup>	Caryophyllaceae		1		
92.	στρύχνος, άγριομελιτζάνα	[stryhnos, agriome- litzana]	<i>Solanum americanum</i> Mill. (= syn. <i>S. nigrum</i> L.) <sup>d,e</sup>	Solanaceae				
93.	στύραξ	[styrax]	<i>Styrax</i> sp. L.	<a href="#">Styracaceae</a>			1	1
94.	σχοίνος, σχοιάνθη <sup>f,b</sup>	[schoinos, schoinathe]	<i>Cymbopogon schoenanthus</i> (L.) Spreng. <sup>a,d,e,j</sup>	Poaceae		1		
95.	σύμφυτον	[symphyton]	<i>Symphytum officinale</i> L. <sup>a,d,e,j</sup> <i>Coris monspeliensis</i> L. <sup>d,j</sup>	Boraginaceae Primulaceae	1	1		
96.	τεϋτλον, σεϋτλον	[teftlon, seftlon]	<i>Beta vulgaris</i> L. <sup>a,d,e,j</sup>	Amaranthaceae	1	1		
97.	τήλις μουσχοσίταρον <sup>b</sup>	[telis, moshositaron,	<i>Trigonella foenum- graecum</i> L. <sup>a,d,e,j</sup>	Fabaceae	5	1		

	βούκεριν	[voukerin]						
98.	τριβολον τριόβολον	[trivolon, triovolon]	<i>Tribulus terrestris</i> L. <sup>a,d,e</sup> <i>Trapa natans</i> L. <sup>b</sup>	Zygophyllaceae Lythraceae		1		
99.	ὑσσώπος	[hyssopos]	<i>Hyssopus officinalis</i> L. <sup>d</sup> <i>Micromeria graeca</i> (L.) Benth. ex Rchb. <sup>e</sup>	Lamiaceae	1	2		
100.	φακή	[phake]	<i>Lens culinaris</i> Medik. <sup>a,d,e,j</sup>	Fabaceae	4			
101.	φοίνις <sup>f</sup>	[phoinix]	<i>Phoenix dactylifera</i> L. <sup>a,e,j</sup>	Palmae		2		
102.	φόλιον	[folion]	***	***				4
103.	φοῦ	[phou]	<i>Valeriana officinalis</i> L. <sup>a</sup> <i>V. dioscoridis</i> Sm. <sup>e,d,a</sup> <i>V. italica</i> Lam. <sup>b</sup>	Valerianaceae		2		
104.	χαμαίδρυς	[chamaedrys]	<i>Teucrium flavum</i> L. <sup>a,d,e,j</sup> <i>T. chamaedrys</i> L. <sup>a,d,e</sup>	Lamiaceae	1	1		
105.	χαμαελύκη οὔγκλα καβαλίνα σκαμπιοῦζα βηχανία	[chamaelefke, ougl kavalina, skabiouza, vechania]	<i>Tussilago farfara</i> L. <sup>d,j</sup> <i>Ptilostemon chamaepeuce</i> (L.) Less. (= syn. <i>Serratula</i> <i>chamaepeuce</i> L.) <sup>a</sup> <i>Cyclamen graecum</i> Link <sup>e</sup>	Asteraceae Primulaceae		1		
106.	χαμαίμηλα, ἀνθεμίς <sup>g,f</sup>	[chamaimela, anthesis]	<i>Matricaria chamomilla</i> L. (= syn. <i>M. recutita</i> L.) <sup>a,e</sup>	Asteraceae	1	1		
107.	ῶκιμον	[okimon]	<i>Ocimum basilicum</i> L. <sup>a,d,e,j</sup>	Lamiaceae		1		

Table 2. List of animals mentioned in Nikolaos Myrepsos' *Dynameron* for decoctions

	Animal name	Scientific name**	Scientific family	Decoctions*			
				afépsēma	apózēma	própōma	suffix - ἄτον
1	βάτραχος ποτάμιος [vtrachos potamios]	<i>Rana graeca</i>	Ranidae		1		
2	χελώνη ὀρεινή, χερσαία [helone oreini hersea]	<i>Testudo graeca</i>	Testudinidae		1		

\* Number of times mentioned in recipes;

\*\* The Latin names of the plants are recorded according to the *Plant list* (www.plantlist.org);

\*\*\* No identification available

a: Berendes, 1902;

b: Langkavel, 1866;

c: Kühn, 1829;

d: Gennadios, 1914;

e: Salamanca, dioscorides.usal.es;

f: Fuchs (identification of the vernacular name by Fuchs in the Latin version of 1549);

g: Demetarakos, 1966;

j: Liddell, et al., 1996

#### IV. Conclusion

The *Dynameron* of Nikolaos Myrepsos is a book of the late Byzantine era with about 2667 recipes. His recipes include decoctions. In the sub-chapter of *Propomata*, we find the majority of them, while scattered throughout the work we find innumerable other recipes with just as many references to these types of drinks. The decoctions include 88 *afepsema*, 125 *apozema* as well as 26 *propoma* and 20 herbal recipes with the suffix –aton (-ἄτον). The plants or fruits stand out with their frequent reference: quince, myrtle, chamomile, wormwood, hypocistis, broadleaf plantain, licorice, fenugreek and lupine. Most of the decoctions treat respiratory and abdominal diseases. Given all the aforementioned, it is concluded that these drinks occupy an important place and reference in the *Dynameron*. This particular category group of drinks demonstrates their continuous use from the Hellenistic and Roman eras until the late Byzantine era of the 13th century and it is shown that their use was not only refreshing but also medicinal, accompanying recipes or meals and providing daily relief to respiratory or abdominal ailments.

#### References

- [1]. Aleksic V., Knezevic P., Review Antimicrobial and antioxidative activity of extracts and essential oils of *Myrtus communis* L. *Microbiological Research*, 2014; 169, (4), 240-254. doi: 10.1016/j.micres.2013.10.003
- [2]. Al-Howiriny T, Alsheikh A, Alqasoumi S, Al-Yahya M, ElTahir K, Rafatullah S., Gastric antiulcer, antisecretory and cytoprotective properties of celery (*Apium graveolens*) in rats, *Pharm Biol.*, 2010; 48(7), 786-93. doi: 10.3109/13880200903280026
- [3]. Baananou S, Bouftira I, Mahmoud A, Boukef K, Marongiu B, Boughattas NA., Antiulcerogenic and antibacterial activities of *Apium graveolens* essential oil and extract, *Nat Prod Res.*, 2012; doi: 10.1080/14786419.2012.717284.
- [4]. Basu T. K., Srichamroen, A., "Health Benefits of Fenugreek (*Trigonella foenum-graecum* leguminosae)", In: *Bioactive Foods in Promoting Health*, eds. Watson, R.R., and Preedy V.R., San Diego: Academic Press, 2010; pp. 425-435



- [5]. Baumann IC, Glatzel H, Muth HW., Studies on the effects of wormwood (*Artemisia absinthium* L.) on bile and pancreatic juice secretion in man, *Z Allgemeinmed.*, 1975; 20:51(17), 784-91
- [6]. Berendes J., *Des Pedanios Dioskurides aus Anazarbos Arzneimittellehre*, Stuttgart: Enke, 1902
- [7]. Cemek M, Kağa S, Simşek N, Büyükkokuroğlu ME, Konuk M., Antihyperglycemic and antioxidative potential of *Matricaria chamomilla* L. in streptozotocin-induced diabetic rats, *J Nat Med.*, (2008), 62(3), 284-93. doi: 10.1007/s11418-008-0228-1
- [8]. Cordus V., *Pharmacorum Omnium, Norimbergae* 1546
- [9]. Dalby A., *Food in the Ancient World from A to Z*. London: Taylor & Francis, 2003
- [10]. Dimitrakos D., *Mega lexikon of the Greek language*. (in Greek). Domi, Athens 1966
- [11]. Fattouch S, Caboni P, Coroneo V, Tuberoso CI, Angioni A, Dessi S, Marzouki N, Cabras P., Antimicrobial activity of Tunisian quince (*Cydonia oblonga* Miller) pulp and peel polyphenolic extracts., *J Agric Food Chem.* (2007), 7:55(3), 963-9. doi: 10.1021/jf062614e
- [12]. Fuchs L., *Nicolai Myrepsi Alexandrini De Compositione Medicamentorum*, Basiliae: Oporin, 1549
- [13]. Gardiner M.R., *Lupinosis*, *Adv Vet Sci.*, (1967), 11:85-138
- [14]. Gennadios P., *Botanical Dictionary*, (in Greek), Athens: Giourdas Publications, 1914
- [15]. Gunn J., Che C.-T., Farnsworth N., "Diabetes and Natural Products", in *Bioactive Food as Dietary Interventions for Diabetes*, eds. Watson R and Preedy B., San Diego: Elsevier, 2013; pp. 386-394
- [16]. Hamden K, Masmoudi H, Ellouz F, ElFeki A, Carreau S., Protective effects of *Peganum harmala* extracts on thiourea-induced diseases in adult male rat, *J Environ Biol.*, 2008; 29(1), 73-7.
- [17]. Holtz P., *Pharmacopoea sive dispensatorium Coloniense*, Coloniae: Birkmannica, 1565
- [18]. Jacoby F., *Die Fragmente der griechischen Historiker (FGH)*, 81, fragm. 50. Leiden: Brill, 1965
- [19]. Kaibel G., *Athenaei Naucratis deipnosophistarum libri xv*, 2, p. 51, Leipzig: Teubner, 1965
- [20]. Kakani, R.K., Anwer M.M., "Fenugreek", in: *Handbook of Herbs and Spices*, ed. Peter K.V., Boca Raton, FL: Woodhead Publishing Limited and CRC Press, 1, 2012; pp. 286-298
- [21]. Knecht KT, Nguyen H, Auker AD, Kinder DH., Effects of extracts of lupine seed on blood glucose levels in glucose resistant mice: antihyperglycemic effects of *Lupinus albus* (white lupine, Egypt) and *Lupinus caudatus* (tailcup lupine, Mesa Verde National Park), *J Herb Pharmacother.*, 2006; 6(3-4), 89-104. doi: 10.1080/j157v06n03\_04
- [22]. Kooti, W., Daraei, N., A Review of the Antioxidant Activity of Celery (*Apium graveolens* L), *J Evid Based Complementary Altern Med.*, 2017; 22(4), 1029-1034, doi: 10.1177/2156587217717415
- [23]. Kühn D.C.G., *Pedanii Dioscoridis, De Materia Medica*. Lipsiae: Cnobloch, 1821-1833
- [24]. Lachenmeier DW, Walch SG., The choice of thujone as drug for diabetes, *Nat Prod Res.* 2011; 25(20), 1890-2. doi: 10.1080/14786419.2011.622279
- [25]. Lamchouri F, Settaf A, Cherrah Y, El Hamidi M, Tligui N, Lyoussi B, Hassar M., Experimental toxicity of *Peganum harmala* seeds, *Ann Pharm Fr.*, 2002; 60(2), 123-9
- [26]. Langkavel B., *Botanik der späteren Griechen*, Berlin: Berggold, 1866
- [27]. Liddell H. G., Scott R., Jones H. S. (eds.), *A Greek-English Lexicon*, Oxford: Clarendon Press, 1996.
- [28]. Messaoud C, Laabidi A, Boussaid M., *Myrtus communis* L. Infusions: The Effect of Infusion Time on Phytochemical Composition, Antioxidant, and Antimicrobial Activities, *J Food Sci.*, 2012; 77(9), C941-7. doi:10.1111/j.1750-3841.2012.02849.x
- [29]. Movafeghi A, Abedini M, Fathiazad F, Aliasgharpour M, Omid Y., Floral nectar composition of *Peganum harmala* L., *Nat Prod Res.* 2009; 23(3), 301-8. doi: 10.1080/14786410802076291.
- [30]. Occo A., *Enchiridion, sive ut vulgo vocant dispensatorium, compositorum medicamentorum, pro Reipub. Augusturgensis Pharmacopeis, Augusta Vindelicorum*, 1564
- [31]. Occo A., *Pharmacopoeia seu Medicamentarium pro Rep. Augustana, Augusta Vindelicorum*, 1573
- [32]. Plant List Database. <http://www.theplantlist.org> [accessed June 14, 2021].
- [33]. Powanda MC, Rainsford KD., A toxicological investigation of a celery seed extract having anti-inflammatory activity, *Inflammopharmacology*, 2011; 19(4), 227-33. doi: 10.1007/s10787-010-0049-1
- [34]. Sajid S. M., Zubair, M., Waqas, M., Nawaz M., and Ahmad, Z., A Review on Quince (*Cydonia oblonga*): A Useful Medicinal Plant, *Global Veterinaria*, 2015; 14 (4), 517-524. doi: 10.5829/idosi.gv.2015.14.04.93154
- [35]. Samuelsen AB., The traditional uses, chemical constituents and biological activities of *Plantago major* L. A review., *J Ethnopharmacol.*, 2000; 71(1-2), 1-21. doi: 10.1016/s0378-8741(00)00212-9
- [36]. Scarborough J., *Early byzantine pharmacology*. *Dumbarton Oaks Papers*, 1984; 38, 213-232.
- [37]. Shahverdi AR, Monsef-Esfahani HR, Nickavar B, Bitarafan L, Khodae S, Khoshakhlagh N., Antimicrobial activity and main chemical composition of two smoke condensates from *Peganum harmala* seeds, *Z Naturforsch C.*, 2005; 60(9-10): 707-10. doi: 10.1515/znc-2005-9-1008.
- [38]. Silva BM, Andrade PB, Valentão P, Ferreres F, Seabra RM, Ferreira MA., Quince (*Cydonia oblonga* Miller) fruit (pulp, peel, and seed) and Jam: antioxidant activity, *J Agric Food Chem.*, 2004; 28:52(15):4705-12. doi: 10.1021/jf040057v.
- [39]. Singh O, Khanam Z, Misra N, Srivastava MK., *Chamomile (Matricaria chamomilla L.): An overview*, *Pharmacogn Rev.*, 2011; 5(9):82-95. doi: 10.4103/0973-7847.79103.
- [40]. Sprague T. A., *Technical Terms in Ruellius' Dioscorides*, *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*, 1936; 2, 145-185. [accessed June 14, 2021]
- [41]. Takamatsu S., Saito K., Sekine T., Ohmiya S., Kubo H., Otomasu H. and Murakoshi I., Glycosidic alkaloids from *Lupinus hirsutus*, *Phytochemistry*, 1990; 29(12):3923-3926 doi.org/10.1016/0031-9422(90)85361-I
- [42]. Totelin L., "Hippocratic recipes. Oral and written transmission of pharmacological knowledge in fifth- and fourth-century Greece", [in:] *Studies in Ancient Medicine*, 34, eds. Scarborough, J., VanderEijk, P., Hanson, A., Siraisi, N., Leiden/Boston, 2009; pp. 353-366.
- [43]. Trapp E., *Lexikon zur byzantinischen Gräzität besonders des 9.-12. Jahrhunderts*, Wien: VÖAW 2001
- [44]. *Universidad Salamanca, Spain, Dioscorides interactivo*, 2006; <http://dioscorides.usal.es> [accessed June 14, 2021]
- [45]. Valiakos E., Marselos M., Sakellaridis N., Constantinidis Th., Skaltsa H., Ethnopharmacological approach to the herbal medicines of the "Antidotes" in Nikolaos Myrepsos' *Dynameron*. *J. Ethnopharmacol.*, 2015; 163, 68-82. <https://doi.org/10.1016/j.jep.2015.01.005>
- [46]. Valiakos E., Marselos M., Sakellaridis N., Constantinidis Th., Skaltsa H., Ethnopharmacological approach to the herbal medicines of the "Elements Alpha to Delta" in Nikolaos Myrepsos' *Dynameron*. Part II. *J. Ethnopharmacol.*, 2017; 205, 246-260. <https://doi.org/10.1016/j.jep.2017.04.021>
- [47]. Valiakos E., Marselos M., Grafakou ME., Skaltsa H., Sakellaridis N., Remedies of animal origin and their indications in Nikolaos Myrepsos' *Dynameron*. *J. Ethnopharmacol.*, 2021; 276, 114191, <https://doi.org/10.1016/j.jep.2021.114191>

- [48]. Valiakos I., *Das Dynameron des Nikolaos Myrepsos*, Heidelberg: Propylaeum, 2019; <https://books.ub.uni-heidelberg.de/propylaeum/catalog/book/455> [accessed June 14, 2021]
- [49]. West M. L., *Iambi et elegi Graeci ante Alexandrum cantati*, 1: Archilochus. Hipponax. Theognidea, Oxford: Clarendon Press, 1971

Elias Valiakos, et. al. "Decoctions in the treatise of Nikolaos Myrepsos' Dynameron." *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 10(3), 2021, pp. 09-18.