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TRANSLATION AND TRANSLITERATION OF PLANT NAMES IN ḤUNAYN B. ISḤĀQ'S AND IṢṬIFĀN B. BĀSIL'S ARABIC VERSION OF DIOSCORIDES, *DE MATERIA MEDICA*

TRADUCCIÓN Y TRANSLITERACIÓN DE NOMBRES DE PLANTAS EN LA VERSIÓN ÁRABE DE ḤUNAYN B. ISḤĀQ E IṢṬIFĀN B. BĀSIL DEL TRATADO *DE MATERIA MEDICA* DE DIOSCÓRIDES

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This paper deals with the Arabic translation of *De materia medica* by the Greek author Dioscorides (1st century A.D.), particularly the rendering of plant names, which were sometimes properly translated and sometimes transliterated from the Greek. According to a traditional interpretation, the transliteration strategy was used by the translators when they did not know the exact Arabic equivalent of the plant names. I re-examine this interpretation here taking into account the role of plant names in the Greek text and the Andalusian works of botanical lexicography. As a result, I propose to interpret transliterations as a mean used by translators to keep visible the structure of the work, in which plant names played a certain role.

Key words: Arabic translation of Ancient Greek texts; Phytonym; Botany; Andalusian botanist; *De materia medica;* Dioscorides; Ḥunayn b. Isḥāq; Iṣṭifān b. Bāsil.

Este artículo se ocupa de la traducción árabe del texto griego del tratado *De materia medica* de Dioscórides (siglo I), especialmente de los fitónimos que, en unos casos, fueron traducidos al árabe y, en otros, transliterados del griego. Según la interpretación tradicional, la transliteración era una estrategia utilizada por los traductores cuando no conocían el equivalente exacto árabe de los nombres de las plantas. Se propone en este trabajo una revisión de esta interpretación, teniendo en cuenta el importante papel que los nombres de las plantas desempeñan en el texto griego, así como en las obras de los lexicógrafos y botánicos andalusíes, llegando a la conclusión de que las transliteraciones eran una técnica utilizada por los traductores para mantener visible la estructura general de la obra de Dioscórides, basada en gran parte en la nomenclatura de las plantas.

Palabras clave: traducción árabe de textos griegos; fitónimos; botánica; botánicos andalusíes; *De materia medica,* Dioscórides; Ḥunayn b. Isḥāq; Iṣṭifān b. Bāsil.

The treatise entitled *Peri ulês iatrikês* by the Greek Dioscorides (1st century A.D.), [1] which is most often identified in modern scientific literature by means of its Latin title *De materia medica,* does not need to be presented. With its 1007 chapters corresponding to as many natural substances used for therapeutic purposes, be they vegetal, animal, or mineral, it is the largest collection of data produced on this matter in classical antiquity. [2] Probably because of its encyclopedic nature, the work had an exceptional fortune: translated into Latin sometime around the 6th century in northern Africa or southern Europe, [3] it was also translated into Syriac around mid-6th century by

[1] For Dioscorides' biography, see the classical work of Wellmann, M., "Dioskurides 12", in *Realencyclopädie der classischen Altertumswissenschaft,* V, 1 (1903), cols. 1131-1142. Since then, the preface of the work has been the object of a close analysis aimed, among others, at extracting autobiographical elements; see Scarborough, J. and Nutton, V., "The *Preface* of Dioscorides' *Materia Medica:* Introduction, Translation, and Commentary", *Transactions and Studies of the College of Physicians of Philadelphia,* ser. 5, n.º 4 (1982), 187-227. An in-depth study has been published shortly after, which includes a long biographical chapter: Riddle, J.M., *Dioscorides on Pharmacy and Medicine,* Austin, 1985. For a recent synthesis taking into account the research since then, see Touwaide, A., "Pedanius [1] Pedanius Dioscorides", in *Brill's New Pauly,* 10 (2007), cols. 670-672.

[2] Edition of the Greek text: Pedanii Dioscuridis Anazarbei, *De materia medica libri quinque,* M. Wellmann (ed.), Berlin, 1906-1914 (reprint: Berlin 1958). The 17th century English translation by J. Goodyer (*The Greek Herbal of Dioscorides Illustrated by a Byzantine A.D. 512,* Englished by J. Goodyer A.D. 1655. Edited and first Printed A.D. 1933 by R.T. Gunther, New York, 1934, with several reprints the most recent of which in New York, 1968), can now be replaced with that of Beck, L.Y., *De materia medica by Pedanius Dioscorides,* Hildesheim, Zürich and New York, 2005. Spanish translation: Dioscórides, *Plantas y remedios medicinales (De materia medica),* M. García Valdés (introd., trad. y notas), Madrid, 1997, 253-254. The German translation by J. Berendes made on the 1829 edition of the Greek text by K. Sprengel (*Des Pedanios Dioskurides aus Anazarbos Arzneimittellehre in fünf Büchern.* Übersetzt und mit erklärungen versehen von Julius Berendes, Stuttgart, 1902, with several reprints, the most recent of which was published in Graz, 1988) can be replaced now with Aufmesser, M., *Pedanius Dioscurides aus Anazarba. Fünf Bücher über die Heilkunde,* Hildesheim, Zürich and New York, 2002. For an analysis, besides Riddle, *Dioscorides on pharmacy,* see also Touwaide, A., "La botanique entre science et culture au Ier siècle de notre ère", in G. Wöhrle (ed.), *Geschichte der Mathematik und der Naturwissenschaften in der Antike, I: Biologie,* Stuttgart, 1999, 219-52.

[3] For the fortuna of *De materia medica* in the West, including the 6th century Latin translation(s), see Riddle, J.M., "Dioscorides", in F.E. Cranz and P.O. Kristeller (eds.), *Catalogus Translationum et Commentariorum: Mediaeval and Renaissance Latin Translations and Commentaries. Annotated Lists and Guides,* Washington, 1980, 4, 43-143. For its history in the early Middle Ages, see Touwaide, A., "Le Traité de matière médicale de Dioscoride en Italie depuis la fin de l'Empire romain jusqu'aux débuts de l'école de Salerne", in A. Krug (ed.), *From Epidaurus to Salerno. Symposium held at the*

Sergios of Rescayna (d. 536). [4] During the 9th century, it was further translated into Arabic, [5] first from the Syriac version of Sergios and then directly from Greek, with two different versions. [6] The author of

European University Centre for Cultural Heritage, Ravello, April 1990, Strasbourg and Rixensart, 1994, 275-305. For a recent and up-to-date synthesis, see Touwaide, A., "Dioscorides", in Th. Glick, S.J. Livesey and F. Wallis (eds.), *Medieval Science, Technology, and Medicine. An Encyclopedia,* London, 2005, 152-54.

[4] On Sergios, see recently Hugonnard-Roche, H., "Note sur Sergius de Rešcainâ, traducteur du grec en syriaque et commentateur d'Aristote", in G. Endress and R. Kruk (eds.), *The Ancient Tradition in Christian and Islamic Hellenism. Studies on the Transmission of Greek Philosophy and Sciences dedicated to H.J. Drossart Lulofs on his ninetieth birthday,* Leiden, 1997, 121-43. For his translation of Greek pharmacological works (actually, Galen), see Bhayro, S., "Syriac Medical Terminology: Sergius and Galen's Pharmacopia", *Aramaic Studies,* 3 (2005), 147-65. For a short entry on the Syriacs as translators of scientific literature from Greek, see recently Brock, S., "Syriac", in J.W. Meri (ed.), *Medieval Islamic Civilization, An Encyclopedia,* New York and London, 2006, II, 789; for a wider study on the role played by the Syriacs in the transmission of ancient science and philosophy from Byzantium to the Arabic world, see Coz, R. Le, *Les médecins nestoriens au moyen âge. Les maîtres des Arabes,* Paris, 2004.

[5] The literature on the assimilation of Greek science into the Arabic world is abundant from the classical work of M. Steinschneider. It will suffice to mention here the most recent essays by Goodman, L.E., "The translation of Greek materials into Arabic", in M.J.L. Young, J.D. Latham, and R.B. Serjeant (eds.), *Religion, Learning and science in the 'Abbasid Period,* Cambridge, 1990, 477-97; Gutas, D., *Greek Thought, Arabic Culture. The Graeco-Arabic Translation Movement in Baghdad and Early 'Abbāsid Society (2nd-4th/8th-10th centuries),* London and New York, 1998; and, more recently, Saliba, G., *Islamic Science and the Making of the European Renaissance,* Cambridge and London, 2007. The theory of the gradual transfer proposed by Meyerhof, M., ''Von Alexandrien nach Bagdad. Ein Beitrag zur Geschichte des philosophischen und medizinischen Unterrichts bei den Arabern", in *Sitzungsberichte der Preussischen Akademie der Wissenschaften,* Berlin 1930, 389-429, has been critically analyzed by Lameer, J., "From Alexandria to Baghdad: Reflections on the Genesis of a Problematical Tradition", in G. Endress and R. Kruk (eds.), *The Ancient Tradition in Christian and Islamic Hellenism. Studies on the Transmission of Greek Philosophy and Sciences dedicated to H.J. Drossart Lulofs on his ninetieth birthday,* Leiden, 1997, 181-91. Similarly, the theory of the *bayt al-ḥikma* has been revised by Balty-Guesdon, M.G., "Le Bayt al-Hikma de Baghdad", *Arabica,* 39 (1992), 131-50, and more recently Glick, Th.F., "Bayt al-Hikma", in Glick, Livesey, Wallis, *Medieval Science,* 80-81. Finally, the Gondishapur theory (on which see, for example, Schöfler, H.H., *Die Akademie von Gondishapur. Aristoteles auf dem Wege in den Orient,* Stuttgart, 1979, and *idem,* "Zur Frühzeit von Gondischapur", in G. Keil, *Gêlerter der arzeniê, ouch apotëker. Beiträge zur Wissenschaftsgeschichte. Festschrift zum 70. Geburtstag von Willem F. Daems,* Pattensen-Hannover, 1982, 35-50 seems to result from an incorrect interpretation of ancient texts (in this sense, see Nutton, V., "Jundîshâbûr", in *À l'ombre d'Avicenne. La médecine au temps des califes. Exposition présentée du 18 novembre 1996 au 2 mars 1997,* Paris, 1997, 22).

[6] On the Arabic translations of Dioscorides, aside the monumental work by Dubler (see note 12), see recently Sadek, M.M., *The Arabic Materia Medica of Dioscorides,*

these Arabic versions was the physician, translator, and prolific author Ḥunayn b. Isḥāq (A.D. 808-873), [7] who made the translations from Greek with a collaborator probably of Greek origin as his name suggests: Iṣṭifān b. Bāsil. [8]

An Arabic version of Dioscorides' work was known in al-Andalus. Our main source of information on this point is the *History of medicine* by Ibn Juljul (A.D. 944-after 994), [9] according to whom the Arabic text had arrived at the court of Cordova under 'Abd al-Raḥmān III (*regn.* A.D. 912-961). [10] Although such an Andalusian agronomist as Abū 'Abd Allāh Muḥammad Ibn Mālik al-Murrī, al Hājj al-Gharnāṭī, best know as al-Ṭighnarī (*ca.* A. D. 1087), mentions Dioscorides at least in 35 passages, [11] the other Andalusian agronomists do not quote him often, if at all. This does not exclude that they knew and used it, however, all the more because the work has been abundantly used and commented on by Andalusian botanical lexicographers and botanists.

Saint-Jean Chrysostome (Quebec), 1983. For a survey of the several translations of Greek pharmacological literature (including Dioscorides), see also Touwaide, A., "L'intégration de la pharmacologie grecque dans le monde arabe", *Medicina nei secoli,* 7 (1995), 259-89.

[7] On Ḥunayn b. Isḥāq, see the biographical entries by Strohmaier, G., "Ḥunayn b. Isḥāq al-'Ibādī", in *EI*^{2}, 3, 578-81, and Anawati, G.C. and Iskandar, A.Z., "Ḥunayn Ibn Isḥāq al-'Ibādī", in *Dictionary of Scientific Biography,* 15 (Supp. 1), New York, 1978, 230-49, to be complemented with the analyses by Ullmann, M., *Die Medizin im Islam,* Leiden and Köln, 1970, 115-19, and Goodman, "The Translation", 487-91. And the more recent syntheses by Young, G. De, "Ḥunayn ibn Isḥāq", in Glick, Livesey, Wallis, *Medieval Science,* 232-34, and Morrison, R., "Ḥunayn ibn Isḥāq", in Meri, *Medieval Islamic Civilization,* 1, 336-37.

[8] On Iṣṭifān, see Arnaldez, R., "Iṣṭifan b. Basīl", in *EI*^{2}, 4, 254, and Ullmann, *Die medizin,* 259-60.

[9] On Ibn Juljul, see Dietrich, A., "Ibn Djuldjul", in *EI*^{2}, 3, cols. 755-56, and Ullmann, *Die Medizin,* 229-30. For the edition of the anonymous 12th century A.D. commentary containing material from Ibn Juljul's own work, see Dietrich, A., *Dioscurides triumphans. Ein anonymer arabischer Kommentar (Ende 12. Jahrh. n. Chr.) zur Materia medica,* Göttingen, 1988.

[10] For a translation (with a commentary of Ibn Juljul' text), see Vernet, J., *La cultura hispanoárabe en Oriente y Occidente,* Barcelona, Caracas and Mexico, 1978. (French translation used here: *Ce que la culture doit aux Arabes d'Espagne,* Paris, 1985), 81-85, and, more recently, Samsó, J., *Las ciencias de los antiguos en Al-Andalus,* Barcelona, 1992, 110-16.

[11] On him, and for a critical edition of his treatise, see Muḥammad b. Mālik al-Tighnarī (ca. 480/1087), *Kitāb Zuhrat al-bustān wa-nuzhat al-adhān (Esplendor del jardín y recreo de las mentes),* E. García Sánchez (ed.), Madrid, 2006.

In this essay, I will focus on transliterated terms, specifically the names of plants, in the Arabic translation of Dioscorides, *De materia medica,* by Ḥunayn and Iṣṭifān. I will study such transliterations from three different —but eventually complementary— standpoints: plant names in the whole work, instead of the titles only; the function of the titles in *De materia medica;* and Ibn al-Bayṭar's commentary on Dioscorides' Arabic translation. Before that, and in order to do so, I will first introduce the translations by Ḥunayn and Iṣṭifān, and a manuscript which I will use as a testimony of a form of the translation of Dioscorides' work into Arabic that is probably very similar to Ḥunayn's and Iṣṭifān's original, the codex Ayasofia 3703 currently preserved at the Süleymaniye Kütüphanesi in Istanbul.

1. Ḥunayn's and Iṣṭifān's Arabic translations

In the Arabic versions made from the Greek by Ḥunayn and Iṣṭifān, [12] plant names are often transliterated from Greek rather than properly translated into Arabic (table 1). [13]

According to an interpretation proposed by Ḥunayn himself and largely received in contemporary scholarly literature, this resulted from the fact that Ḥunayn, however knowledgeable in Arabic he was,

[12] The Arabic text of Dioscorides, *De materia medica,* has been edited by Dubler, C.E. and Terés, E. in the second volume of the monumental work by the former, *La "Materia Medica" de Dioscórides,* Barcelona and Tetuán, 1953-1957. This edition was made on the basis of three manuscripts (BN Madrid, El Escorial, and BN Paris). Several more have been brought to the attention since then, something that would require to have a new edition. In the meantime, we cite here the titles of the chapters according to the manuscript Ayasofia 3703 preserved at the Süleymaniye Kütüphanesi in Istanbul (on which see below). In its current state of preservation, the manuscript is incomplete and contains only large parts of books 4 and 5 of *De materia medica,* as well as of the two treatises on venoms and poisons ascribed to Dioscorides (on these two works, see Touwaide, A., "L'authenticité et l'origine des deux traités de toxicologie attribués à Dioscoride. I. Historique de la question. II. Apport de l'histoire du texte", *Janus,* 38 (1984), 1-53; and *idem,* "Les deux traités de toxicologie attribués à Dioscoride. Tradition manuscrite, établissement du texte et critique d'authenticité", in A. Garzya (ed.), *Tradizione e ecdotica dei testi medici tardo-antichi e bizantini (Atti del Convegno internazionale, Anacapri, 29-31 ottobre 1990),* Naples, 1992, 291-339.

[13] Column 1 gives the reference to the Ayasofia manuscript; column 2: the plant names in the titles of the chapters according to the Ayasofia codex in transliteration; column 3: the title in the Greek text, also in transliteration; and column 4: the number of the chapter in the edition by Wellmann, *The Greek herbal* (book and chapter).

Table 1

Folio	Title	Greek name	Diosc.
3r	brāṭānīqī	brettanikē	4.2
4r	lūsimākhiyūs	lusimacheios	4.3
5v	fulūghūnun	polugonon	4.4
6r	qlīmāṭīs	klēmatis	4.7
6v	fūlāmūniyūn	polemōnion	4.8
7v	sumfūṭun	sumfuton	4.9
8r	ūlusṭiyūn	olosteon	4.11
9r	qlūmānun	klumenon	4.13
10r	tūsūlūs	tribolos	4.15
11r	rijl al-arnabī	lagōpoun	4.17
12r	sawsun	xifion	4.20
12v	sfarghāniyūn	sparganion	4.21
14r		agchousa	4.23
14v	lūqābīsūs	lukapsos	4.26
15r	al-thīl	agrōstis	4.29
15v	ḍarb min al-thīl	kalamagrōstis	4.30
16r	sīdirīṭis	sidēritis	4.33
17v	al-ʻullayq	batos	4.37
18r	al-lablāb	elxinē	4.39
18v	alāṭīnī	elatinē	4.40
19r	al-ghāfit	eupatōrios	4.41
20r	banṭāfullun	pentafullon	4.42
21r	fūniqs	foinix	4.43
22r	idā'ayrizā	idaia riza	4.44
22v	rūdiyārīzā	rodia riza	4.45
23r	dhanab al-khayl	ippouris	4.46
24r	ṭrāghiyun	tragion	4.49
24v	ṭrāghus	tragos	4.51
25r	ḥazāz al-ṣakhr	leichēn	4.53
25v	khrūsūqūmī	chrusokomē	4.55
28v	iyārābūṭānī	iera botanē	4.60
29v	uwāqinthus	uakinthos	4.62
30r	nawʻ min al-khashkhāsh	mēkōn roias	4.63
31r	khashkhāsh	mēkōn	4.64
32r	nawʻ ākhar min-hu	mēkōn afrōdēs	4.66
32v	banj	uoskuamos	4.68
34r	bizrqaṭūna	psullion	4.69
34v	ʻinab al-thaʻlab	struchnon	4.70
36r	nawʻ ākhar min al-thaʻlab	struchnon	4.71
37v	al-luffāḥ	mandragoras	4.75
39r	khāniq al-namir	akoniton pardaliagches	4.76
40r	qātil al-dhi'b	lukoktonon	4.77
40v	qūniyūn	kōneion	4.78
41v	smīlaqs	smilax	4.79

Folio	Title	Greek name	Diosc.
42r	al-diflā	nērion	4.81
42v	fuṭr	mukētes	4.82
43v	ādhān al-fa'r	alsinē	4.86
44r	ḥayy al-'ālam	aeizōon to mega	4.88
45r	qūṭūlīdūn	kotulēdōn	4.91
45v	al-anjura	akalēfē	4.93
46r	ghāliyubsis	galēopsis	4.94
46v	thāliyaṭrun	thaliētron	4.97
47r	ṭuḥlub baḥrī	bruon thalassion	4.98
47v	fūqus al-baḥrī	fukos thalassios	4.99
48r	al-fārish	stratiōtēs	4.101
48v	flūmūs	flomos	4.103
49r	arqṭiyun	arktion	4.105
50r	bāṭāsīṭis	petasitis	4.107

did not necessarily know all the exact Arabic equivalents of Greek technical terms, including plant names. Such explanation requires further investigation, not only because textual evidence does not necessarily support it, as I wish to show in this essay, but also because of its theoretical background. The underpinning theory of culture is, indeed, that of gradual progress. In the specific case of transfer of knowledge studies, this means that texts received in a linguistically different group by means of a translation process were not necessarily well assimilated in a first phase because the available lexicon was not prepared for such assimilation and did not contain all the terms contained in the translated texts. Transliteration was an easy way to compensate for this, as it made it possible to create lexemes by simply reproducing the term to be translated. In such view, the absence of these terms resulted from the fact that the elements corresponding to these terms, whatever they were (concepts or realities), were absent in the group that received the translated texts. In our specific case, this means that the Arabic world did not know, and did not have, the plants designated by the terms left in transliteration in the Arabic translation of Dioscorides, *De materia medica.* Hence the absence of specific terms to designate such plants. This theory was all the more accepted because the flora of the area where Dioscorides' text was translated is defined as "Iranian" and differs from the Mediterranean one, that is, the flora of the environment where *De materia medica* was originally written. Only with the passing of time, proper lexemes

were found or created to exactly translate and further fully assimilate the elements imported by the translations and originally left in transliteration. According to Sadek, this is one of the reasons why several translations of *De materia medica* were made: capitalizing on each other, they gradually Arabized Dioscorides' Arabic translation, that is, they eliminated transliterations and replace them with authentic names of plants and other technical terms, in addition to improving the grammatical and literary quality of the translation.

The analysis of other processes of transfer of knowledge, particularly in the field of *materia medica,* from the introduction of Arabic drugs [14] and the translation and assimilation of Arabic medicine in Byzantium from the 10th to the 13th/14th centuries, [15] to 16th century translations and commentaries on Dioscorides' *De materia medica* in Italy and the West during the Renaissance, [16] shows how limited such theory is in the approach to the translation and assimilation of a scientific body of knowledge. Although there might have been indeed a gradual increase of assimilation of heterogeneous data and texts into the practice of medicine and local lexicon, respectively, this improved

[14] Touwaide, A., "Un manuscrit athonite du *Traité de matière médicale* de Dioscoride: l'Athous Magnae Laurae Ω˜ 75", *Scriptorium,* 45 (1991), 122-27, and *idem,* "Arabic Materia Medica in Byzantium during the 11th Century A.D. and the Problems of Transfer of Knowledge in Medieval Science", in S.M. Razaullah Ansari (ed.), *Science and Technology in the Islamic World. Proceedings of the XXth International Congress of History of Sciences, Liège, 20-26 July 1997,* Turnhout, 2002, 21, 223-47.

[15] Touwaide, A., *Medicinalia Arabo-Byzantina. Première partie: manuscrits et textes,* Madrid, 1997; *idem,* "Lexica medico-botanica byzantina. Prolégomènes à une étude", in *Tês fili'ês ta'de dôra. Miscelánea léxica en memoria de Conchita Serrano,* Madrid, 1999, 211-28; *idem,* "Arabic Medicine in Greek Translation. A Preliminary Report", *Journal of the International Society for the History of Islamic Medicine,* 1 (2002), 45-53; *idem,* "*Magna Graecia iterata.* Greek medicine in Southern Italy in the 11th and 12th centuries", in A. Musajo Somma (ed.), *Medicina in Magna Graecia. The Roots of our Knowledge,* Bari, 2004, 85-101; *idem,* "Arabic Urology in Byzantium", in N.G. De Santo *et al.* (eds.), *The History of Nephrology,* n.º 1, Milano, 2004, 167-73; and *idem,* "Medicina Bizantina e Araba alla Corte di Palermo", in N.G. De Santo and G. Bellinghieri (a cura di-), *Medicina, Scienza e Politica al Tempo di Federico II. Conferenza Internazionale, Castello Utveggio, Palermo, 4-5 ottobre 2007,* Napoli, 2008, 39-55.

[16] Touwaide, A., "*Loquantur ipsi ut velint... modo quis serpens sit tirus... non ignorent:* Leonicen's Contribution to Renaissance Epistemological Approach to Scientific Lexicology ", in W. Bracke and H. Deumes (eds.), *Medical Latin from the Late Middle Ages to the Eighteenth Century. Proceedings of the European Science Foundation Exploratory Workshop in the Humanities Organized under the Supervision of Albert Derolez in Brussels on 3 and 4 September 1999,* Brussels, 2000, 151-73.

assimilation did not always translate immediately in progress, as it may have also generated a loss of information. This is particularly the case of the implicit data carried by the terms themselves in the original language.

2. A manuscript of the Arabic Dioscorides

The manuscript Ayasofia 3703 is well known in the history of Islamic art. It is splendidly illustrated, indeed, not only with plant representations that cover almost all the surface of its pages and are complemented in many cases with animals, from small birds to a running deer attacked by a serpent, but also with numerous scenes including human figures pressing grapes, collecting a medical earth, filling a furnace with ores, preparing medicines, bleeding a patient, slaughtering an ox or, to mention just a few, discussing theoretical matters. Many of the pages with such illustrations were torn out of the manuscript, probably at the end of the 19th century, displayed at the Munich exhibition in 1910, and then sold on the antiquarian market from the beginning of the 20th century. Because of the changing fate of collections, they appeared repeatedly on the market until recently and are now in museums across the globe. [17]

Ayasofia 3703 is dated 1224 and is most probably a direct copy of another manuscript of Istanbul, Ayasofia 3702, which is not dated but is very close to Ayasofia 3703 in its size, its paper, its writing, and its illustrations. Ayasofia 3703 is a much higher-quality copy, however: its illustrations cover most of the surface of the pages and are much

[17] The literature on this manuscript is enormous, from the catalogues of auctions and antiquity dealers to studies of history of art. The most recent synthesis is by Touwaide, A., *Farmacopea araba medievale. Codice Ayasofia 3703,* Milano, 1992-1993. More recently, see *idem,* "La matière médicale: Dioscoride, une autorité incontestée", in *A l'ombre d'Avicenne,* 96-99; and Rogers, M., "Text and Illustrations. Dioscorides and the Illustrated Herbal in the Arab Tradition", in A. Contadini (ed.), *Arab Painting. Text and Image in Illustrated Arabic Manuscripts,* Leiden, 2007, 41-47. The book by Collins, M., *Medieval Herbals. The Illustrative Traditions,* London and Toronto, 2000, particularly chapter 2 on the Arabic illustrated herbals, should not be used as it is misleading. Strangely enough, the manuscript has not been reproduced so far in any facsimile edition, contrary to many others during the past decades. The most comprehensive collection of color reproductions of entire pages (almost in the size of the original) of the body of the manuscript (still at the Süleymaniye Kütüphanesi in Istanbul) and many of the folios torn out of it is the set of volumes by Touwaide above.

more developed than those of Ayasofia 3702, which represent just the plants, without the addition of the animals, figures and other elements mentioned above. Not to speak of the many representations of human figures. Nevertheless, the two manuscripts are so similar that they probably originated in the same workshop, and Ayasofia 3702 might be considered the model of Ayasofia 3703, which expanded the set of pictures of its model and transformed it into a work of art, probably made for a wealthy book collector in Baghdad or in an important administrative or trade centre in the provinces.

Although neither Ayasofia 3702 nor Ayasofia 3703 are the most ancient copies of the Arabic translation of Dioscorides currently known —the most ancient currently known is the Leidensis or. 289 dated A.D. 1083 [18]—, they seem to contain one of the most ancient versions of Dioscorides' text in Arabic, Ḥunayn's translation. Furthermore, a systematic comparison of their illustrations shows that they are quite close to those of a 9th century Greek manuscripts of Dioscorides, the *Parisinus graecus* 2179 of the Bibliothèque Nationale de France. [19] Though late in a certain sense, the two Ayasofia codices probably reproduced faithfully —directly or indirectly, we cannot know— an Arabic model of the 9th century that copied with great exactness the drawings of plants from a Greek manuscript. It is thus highly probable that the two Ayasofia manuscripts, though recent by comparison with other codices of Dioscorides Arabic text, contain a text that is close to Ḥunayn's and Iṣṭifān's original.

The history of the Ayasofia manuscripts is unknown. However, it might reasonably be assumed that they were preserved in a library either in Baghdad or in a wealthy city. In 1534, Soliman the Magnificent (1494/1495; sultan 1520-1566) conquered Iraq, including Baghdad, and probably moved the book collections and works of art to Istanbul. Whatever the case, it is in Istanbul, in the Sultan's library, that the manuscripts were at the end of the 19th century, before being transferred to the library of Soliman the Magnificient's mosque, the Süleymaniye Kütüphanesi, where they are currently preserved.

[18] On this manuscript see mainly Sadek, *The Arabic materia medica,* which includes black and white reproductions of several of its pages.

[19] On this manuscript, see Touwaide, "Le Traité de matière médicale", *passim.*

3. **Beyond titles**

Returning to the translation or transliteration of the titles of the chapters in the Arabic version of Dioscorides' *De materia medica,* we need to expand our analysis. In the Greek text of Dioscorides' treatise, indeed, each *materia medica* (whatever its nature, vegetal, animal, or mineral) is analyzed in a specific chapter, of a monographic nature. [20] Each such chapter bears a title built on a uniform model, starting with the preposition *peri* (*about, on*) followed by the name of the *materia medica* (in genitive). Then, the text of the chapter opens, most often by repeating the name of the *materia medica.*

In the manuscripts of Ḥunayn's and Isṭifān's translations, this initial structure of the chapters has been faithfully reproduced, with the title of the chapter (made only of the name of the substance, however, without a preposition, and often written with red ink or with the same ink as the text and underlined with a red line so as to be distinguished from the text). The text opens immediately after such title, and usually starts with the name of the substance.

From a closer examination of Ḥunayn's and Isṭifān's Arabic versions of Dioscorides' treatise, especially the chapters devoted to plants, it appears that the title and the opening words of the text are not necessarily identical. In several cases, indeed, one of them (be it the title or the beginning of the text) is the transliterated Greek name of the plant and the other (the opening word of the text if the title is a transliteration and conversely) is an authentic Arabic term. In Table 2, I reproduce the title and the opening word(s) of the text in the chapters where these two elements are not identical in book four in manuscript Ayasofia 3703. [21]

An obvious explanation of this discrepancy would be that, in Ḥunayn's and Isṭifān's original, many if not all plant names were transliterated from Greek. Later, when the text was reproduced and handed down from one copy to another and from one generation to another, such transliterations were gradually replaced with authentic

[20] Riddle, *Dioscorides on pharmacy,* entitled a chapter "One materia medica, one chapter".

[21] Table 2 is built in the same way as table 1, and contains thus the number of the folio in the manuscript (column 1), the name of the plant in the title of the chapters (column 2), the name of the plant at the beginning of the text (column 3), the Greek name of the plant (column 4), and the reference of the chapter in Dioscorides' Greek text (column 5).

Table 2

Folio	Title	Beginning of text	Greek name	Dios.
4r	lūsimākhiyūs	quthrab	lusimacheios	4.3
5v	fulūghūnun	ʿasā al-rāʿī	polugonon	4.4
11r	rijl al-arnabī	laghūbūn	lagōpoun	4.17
12r	sawsun	ksifiun wa huwa sawsun	xifion	4.20
15r	al-thīl	ʻaghrustis	agrōstis	4.29
15v	ḍarb min al-thīl	qālāmāghrūstis	kalamagrōstis	4.30
17v	al-ʻullayq	bāthus	batos	4.37
18r	al-lablāb	ālaqsīnī	elxinē	4.39
19r	al-ghāfit	ʻūbāthūriūs	eupatōrios	4.41
25r	ḥazāz al-ṣakhr	lichin	leichēn	4.53
30r	nawʻ min al-khashkhāsh	mīqūn rūwas	mēkōn roias	4.63
31r	khashkhāsh	mīqūn	mēkōn	4.64
32r	nawʻ ākhar min-hu	mīqūn afrūdīs	mēkōn afrōdēs	4.66
32v	banj	ʻiyūskuwamus	uoskuamos	4.68
34r	bizrqaṭūna	bsilliyūn	psullion	4.69
34v	ʻinab al-thaʻlab	struchnun	struchnon	4.70
37v	al-luffāḥ	mandrāghūrās	mandragoras	4.75
39r	khāniq al-namir	aqūnitun	akoniton pardaliagches	4.76
40r	qātil al-dhi'b	liqūqtūnun	lukoktonon	4.77
40v	qūniyūn	chauwkarān	kōneion	4.78
42r	al-diflā	niriyūn	nērion	4.81
42v	fuṭr	mūqītis	mukētes	4.82
43v	ādhān al-fa'r	alsīnī	alsinē	4.86
45v	al-anjura	ʻaqālīfī	akalēfē	4.93
47r	ṭuḥlub baḥrī	brūūn talāssiūs	bruon thalassion	4.98
48r	al-fārish	strātiyūtis	stratiōtēs	4.101

Arabic names. This might have started with marginal annotations that were further introduced into the body of the text and later assimilated into it (where they replaced the original readings) as is often the case in the transmission of texts, particularly scientific, which were subject to layered accretions often resulting from the practical experience of their readers and users. However plausible such explanation might be, it raises several objections. First, why should this work of Arabization of the text have been limited to one of the two elements at the beginning of the chapters (either the title or the opening word)? If the purpose was to better assimilate Dioscorides' text into the Arabic language and, on this basis, to make it more integrable into the practice of therapeutics for Arabic-speaking physicians, such revision should

have been done more systematically. Second, why would such work have been done so inconsistently from a methodological viewpoint, since it resulted in changing sometimes the title and sometimes the opening of the text? Again, if the purpose was to better assimilate the text into the Arabic language, one would assume that such revision would have been done more systematically either on the titles or on the opening words of the text, if not on both. Three —and not least—, why would such work have been done at all? The interpretation according to which such supposed work of revision aimed to better integrate Dioscorides' text into Arabic language, is contradicted by the fact that —judging from the case of manuscript Ayasofia 3703— this work (if any) has not been done systematically, but rather randomly. If we consider book 4 of *De materia medica,* indeed, only 26 out of 57 chapters have been modified, that is, a bit less than half (actually 45%). It these modifications of the text were made with the purpose of Arabizing a first state of the translation, we would expect this number to be much higher. Indeed, in the commentaries on Dioscorides, *De materia medica,* published by Albert Dietrich, [22] the work of revision was systematically done on all chapters, without exception. Finally, the theoretical model underpinning such interpretation is that of the constant progress (be it of culture or of any other domain of humans) that we have pinpointed, stressing its limitations.

4. **Function of plant names**

A further argument in that sense is provided by the function of plant names in Dioscorides, *De materia medica.* In the work, indeed, the names of the *materia medica* (whatever their nature) play an important role in the classification of the chapters and, hence, of the *materia medica* themselves.

Dioscorides' work totals indeed 1007 chapters distributed in five books. [23] One of the many problems resulting from such an amount of

[22] See below.

[23] This notion of the work being divided into 5 books (each of which is devoted to a specific topic) needs to be revised (in this sense, see Touwaide, A., "La thérapeutique médicamenteuse de Dioscoride à Galien: du pharmaco-centrisme au médico-centrisme", in A. Debru (ed.), *Galen on Pharmacology. Philosophy, History and Medicine. Proceedings of the V^th International Galen Colloquium, Lille, 16-18 March 1995,* Leiden, New

information was how to introduce some order into it. A rearrangement of Dioscorides' text, [24] as well as the work by Galen (A.D. 129-after 216) [25] on the same topic —the treatise traditionally identified under the Latin title *De simplicium medicamentorum temperamentis et facultatibus* [26]— ordered the chapters in the alphabetic order of the substance names. However efficient this classification system might seem, it does not convey any supplementary information as an organic classification system does. It is probably significant that the alphabetical version of Dioscorides' work and Galen's treatise were not

York and Köln, 1997, 255-82). Nevertheless, this point has no impact on the discussion here.

[24] This is the so-called herbal of Dioscorides, that is, a selection of some 300 chapters from *De materia medica* full text, ordered in the alphabetical order of their title (actually, the plant names). This text was supposedly produced sometimes during the 3rd and the 6th century, as it is attested, on the one hand, by Oribasius (4th century) and, on the other, by the manuscript *medicus graecus* 1 (of the early 6th century) of the Österreichische Nationalbibliothek in Vienna. In the enormous bibliography on this manuscript, see principally the catalogue by Hunger, H., *Katalog der griechischen Handschriften der österreichischen Nationalbibliothek. Teil 2 Codices juridici, Codices medici,* Wien, 1969, 2, 37-41, and, among many others, such important or recent studies as Buberl, P., *Die Byzantinischen Handschrifthen. 1. Der Wiener Dioskurides und die Wiener Genesis,* Leipzig, 1937, and Cavallo, G., "I libri di medicina: gli usi di un sapere", in E. Patlagean, *Maladie et société à Byzance,* Spoleto, 1993, 43-56. Traditionally dated to 512-513, the codex might be anterior as suggested: Gamillscheg, E., "Das Geschenk für Juliana Anicia. Überlegungen zu Struktur und Entstehung des Wiener Dioskurides", in K. Belke *et al., Byzantina mediterranea. Festschrift für Johannes Koder zum 65. Geburtstag,* Wien, Köln and Weimar, 2007, 187-95. For a different approach to its illustrations, which have been repeatedly studied through the 20th century, see Schulze, Ch., "Das Bild als Kommentar-Zur Problematik von Planzendarstellungen in spätantiken und mittelalterlichen Handschriften", in W. Geerings and Ch. Schulze (herausgegeben von-), *Der Kommentar in Antike und Mittelalter. Beiträge zu seiner Erforschung,* Leiden, Boston and Köln, 2002, 335-53. A reproduction (in sepia) with an in-depth study was published in the early 20th century (Iosephus de Karabacek (moderante), *De codicis Dioscuridei Aniciae Iulianae, nunc Vindobonensis Med. Gr. 1 historia, forma, scriptura, picturis, scripserunt Antonius de Premerstein, Carolus Wessely, Iosephus Mantuani,* Lugduni Batavorum, 1906). A color facsimile including a volume of commentary was published in 1970 (Gerstinger, H., *Dioscurides. Codex Vindobonensis Med. gr. 1 der österreichischen Nationalbibliothek* (Codices selecti phototypice impressi, XII* and XII), Graz, 1970). More recently, Otto Mazal published an introductory analysis on the manuscript volume (Mazal, O., *Pflanzen, Wurzeln, Säfte, Samen. Antike Heilkunst Miniaturen des Wiener Dioskurides,* Graz, 1981) and edited a small-size color reproduction of the codex (Mazal, O., *Der Wiener Dioskurides. Codex medicus graecus 1 der österreichischen Nationalbibliothek,* Graz, 1998).

[25] The most recent and up-to-date synthesis on Galen is by Nutton, V., "Galen of Pergam", in *Brill's New Pauly,* 5 (2004), cols. 654-61.

[26] Edition of the Greek text in Kühn, K.G., *Claudii Galeni Opera omnia,* Leipzig (1826), 11, 379 and 12 (1826), 377.

as much used as the original version of Dioscorides' text, if extant textual evidence accurately reflects the use of the text from Antiquity to the Renaissance.

Dioscorides did not explain how he proceeded to classify the several chapters of the work, apart from a very allusive phrase in the introduction. [27] However, a careful analysis of the whole work brings to light a two-level system of classification. [28] In the first one, the single *materia medica* is grouped in coherent sets on the basis of their therapeutic properties. In the second level, the several groups are ordered according to their main property, from a *warming* and *drying* action at the beginning of the work to its opposite at the end, a *cooling* and *moistening* property. Between these two groups —which would be better identified as *poles*—, all the other groups were ordered according to a system of *scala mundi,* of gradual reduction of the initial property (*warming* and *drying*) and, instead, a gradual increase of the final one (*cold* and *moist*). Therapeutic uses of the *Materia medica* were a logical consequence of these properties, given the basis of the allopathic principle underpinning ancient pharmaceutical therapy (*contraria contrariis*).

The level of classification that is relevant here is the first level of grouping of materia medica. Whereas I have said that they constitute *coherent sets of materia medica with the same property,* in some cases, however, they include one or more materia medica with properties that do not match that (or those) of the group and do not seem to be part of the series. This is the case, for instance, of the pair of plants called (in Greek) *arktion* and *arkion.* [29] They appear in a group that includes the following sequence of plants: *flomos-aithiopis-arktion-arkion-petasitis.* [30]

[27] Preface § 5 (vol. 1, p. 3, ll. 9-11 ed. Wellmann [note 2]).

[28] On this point, see Touwaide, "La botanique".

[29] Respectively 4.105 (vol. 2, 260, l. 10- 261, l. 2) and 106 (vol. 2, 261, ll. 3-9 Wellmann).

[30] In the edition of Wellmann, *De materia medica, flomos* (4.103; vol. 2, 257, l. 16-259, l. 15) – *aithiopis* (4.104; vol. 2, 259, l. 10-260, l. 9) – *arktion* (4.105; vol. 2, 260, l. 10-261, l. 2) – *arkion* (4.106; vol. 2, 261, ll. 3-10) – *petasitis* (4.107; vol. 2, 261, l. 11-262, l. 3). I use the Greek name of the plants, instead of their binomial identification, as it is significant. For the identification, one could consult the translations of Dioscorides mentioned in note 2, as well as the editions of Arabic commentaries on Dioscorides by Albert Dietrich mentioned below.

While *aithiopis* and *arktion* are compared to *flomos, arkion* is not. Furthermore, *flomos* is identified as *styptic.* Consequently, an infusion of its leaves is recommended to treat *swellings of the eyes* and *gangrenous wounds* among others. *Aithiopis,* which follows, is not said to be *styptic,* but was an ingredient of medicines used to treat *blood spitting* and *throat irritation,* as well as *sciatic,* that is, medical conditions for the treatment of which ancient therapeutic system usually recommended medicines with a styptic action. *Arktion* coming next was recommended in the case of *odontalgia* and *skin affections,* along with *sciatic* and *dysuria,* that is, medical conditions for which treatment a *styptic* action was normally used in classical antiquity. *Arkion,* instead, was prescribed against *blood spitting, purulent affections, pain in the articulations,* and *old wounds,* that is, medical conditions that are fairly different from those treated in antiquity by means of *flomos, aithiopis,* and *arktion. Petasitis* does not bear any similarity to the group made of *flomos-aithiopis-arktion* nor to *arkion,* but was an ingredient for medicines to be used to treat *gangrenous wounds* as was also *flomos.*

In the group from *flomos* to *petasitis,* thus, unity bears on the botanical characteristics of the plants as well as on the therapeutic properties of the medicines made of them. *Flomos* is followed by two plants that are similar to it, and most of the plants in the group are *styptic* or have an action that results from, or is similar to, such an action. To this, there is one exception: *arkion.* Yet its name is very similar to that of the plant coming before: *arktion.* The two names *arktion* and *arkion* differ by almost only one vertical trait in the Greek majuscule alphabet, that is, the alphabet used when Dioscorides wrote *De materia medica.* This suggests that both plants have been included in the same group in spite of their differences (botanical and therapeutic) precisely to draw attention to the fact that, although they have very similar names, they are actually different, have different therapeutic properties and, hence, were used to treat different medical conditions. Through this case, we understand that, in some cases, plant names played an important role in the classification of the chapters in *De materia medica.*

A confirmation of this comes from the group of plants whose name includes the element *chruso-*: *chrusokomē* (4.55), *chrusogonon* (4.56), and *elichruson* (also called *chrusanthemon*) (5.57). [31] Whereas

[31] For the text, see Wellmann, *De materia medica: chrusokome* (4.55; vol. 2, 209, l. 7-210, l. 5), *chrusogonon* (4.56; vol. 2, 210, ll. 6-10), and *elichruson* (also called

chrusokomē is explicitly said to be *warming* and *astringent,* and was used in medical cases requiring such action, the other two are not said to have such property, but were recommended to treat pathologies that require it. The case here is the opposite of that of *arktion-arkion,* where two plants with similar or, better, quasi-identical names were put one after the other in spite of their botanical and pharmacological differences in order to draw attention to their differences and, hence, to avoid confusion. Here, instead, the sequence of the plants is intended to make clear that plants whose name is formed with the same component (*chruso-*) have similar, if not identical properties and uses. Though *a contrario,* when compared with the group *arktion-arkion,* the *chruso-* group thus shows that names are relevant in Dioscorides' system of classification.

Knowing this, we can return to Ḥunayn's and Isṭifān's translation of Dioscorides' treatise into Arabic. Given the importance of plant names in Dioscorides' system of classification, one suspects that, if Ḥunayn and his collaborator did not translate such names into Arabic, it was because they were aware of the role that names had in the structure of the treatise.

A further hint in that sense is provided by the association of a translation and a transliteration in the rendering of a plant name. This is the case in manuscript Ayasofia 3703 of the marine alga called *fukos thalassios* in Greek. [32] In the title of the chapter in Ayasofia 3703, the term *fukos* is transliterated, while the adjective *thalassios* is translated. It is probably significant that in the chapter that comes before, on a sea moss (*bruon thalassion*), the name is fully translated in the title of the chapter and not at the beginning of the text. In this way, the titles of the chapters on *bruon* and *fukos* were partially similar in the Arabic version, exactly as they were in the Greek original text (Table 3). [33]

chrusanthemon) (5.57; vol. 2, 210, l. 11-211, l. 10).This group is followed by the chapter on *chrusanthemon* (also called *chalkas*) (5.58; vol. 2, 211, l. 1-212, l. 3), considered to be inauthentic.

[32] Dioscorides 4.99 (vol. 2, 255, ll. 6-14).

[33] The table is made on the same model as tables 1 and 2 (see above notes 10 and 18 respectively).

Table 3

Folio	Title	Beginning of text	Greek name	Dios.
47r 47v	ṭuḥlub baḥrī fūqūs al-baḥrī	brūūn ṭalāssiyūs	bruon thalassion fukos thalassios	4.98 4.99

5. **External sources**

At this point, we suspect that the original text of Ḥunayn's and Isṭifān's translations of *De materia medica* into Arabic might have maintained and transliterated the Greek names of the plants as they carried an information that was significant for the good understanding of the work, namely the classification of the plants. For some items, either the title or the opening of the text was, however, an authentically Arabic name. The external sources confirming our interpretation are commentaries on Ḥunayn's and Isṭifān's translations of Dioscorides published by Albert Dietrich: a 12th century anonymous one that contains material from the commentary by Ibn Juljul who wrote also a work complementing Dioscorides, *De materia medica,* [34] and the commentary by the Malaga-born botanist Ibn al-Bayṭār (*ca.* 1204-1248). [35]

Significantly, such material comes from al-Andalus, where Dioscorides' text was known as early as the 10th century A.D. Our main source of information on this point is the *History of medicine* by Ibn Juljul. After Ḥunayn's and Isṭifān's translation had arrived at the court of Cordova, a diplomatic mission sent from Constantinople by an emperor who cannot be identified with greater exactness because of conflicting information in Ibn Juljul's report, brought in A.D. 948 an illustrated version of Dioscorides' Greek text as a present to the Caliph. [36] As the story goes, since none of the scientists at the court

[34] Dietrich, A., *Die Ergänzungen Ibn Gulgul's zur Materia medica des Dioskurides,* Göttingen, 1993.

[35] On Ibn al-Bayṭār, see in *EI*^{2}. For the edition of his commentary on Dioscorides, see Dietrich, A., *Die Dioskurides-Erklärung des Ibn al-Baiṭār. Ein Beitrag zur arabischen Pflanzensynonymid des Mittelalters,* Göttingen, 1991.

[36] There has been much speculation in the literature on the version of Dioscorides' text in that manuscript. Because the early 6th century copy mentioned above (see note 21) was part of the imperial collection, it has been assumed that the Greek manuscript sent to

knew Greek, a request was sent to the Byzantine emperor to have a scientist come from Byzantium to help with reading the Greek text. A monk named Nikolaos was sent who worked in collaboration with local botanists and pharmacologists to help them better understand Dioscorides' text and, hence, to know the plants described in it, and to apply them in the practice of medicine. This work further contributed to the development of a local school of botany, *materia medica,* and agronomy, and to the production of new works in these disciplines.

Whatever the way we read the story (which fits the theory on cultural development and scientific progress evoked at the beginning of the essay), Ibn Juljul in the 10th century A.D. and Ibn al-Bayṭar in the 12th returned to Ḥunayn's and Isṭifān's Arabic translation of Dioscorides' text and commented on it. In their commentaries, the lemma corresponds to the transliterated names of plants in the version of Dioscorides' Arabic text contained in the Ayasofia manuscripts. Table 4 contains the results of a comparison of plant names in the Ayasofia manuscript (titles and opening of the text) and in Ibn al-Bayṭār's commentary. [37]

This correspondence is particularly revealing. It is to be expected, indeed, that the Arabic version of *De materia medica* that Ibn al-Bayṭār worked on was Ḥunayn's and Isṭifān's version, which had arrived in al-Andalus. Furthermore, it would be reasonable to assume that Ibn al-Bayṭār had a version of the text that had been revised and improved, thanks in part to the work performed in Cordova by the local scientists in collaboration with the Byzantine monk Nikolaos. Instead, the strict correspondence of the lemmas in Ibn al-Bayṭār and of the plant names in the Ayasofia manuscripts indicates that both Ibn al-Bayṭār and the Ayasofia manuscript preserved, if not the original text of Ḥunayn and Isṭifān, are at least a version of it that was close to the original.

Cordova contained the same version, that is, the alphabetical herbal (above, note 21). No element in extant sources supports such an identification. One would rather assume that, if the Cordovan scientists were able to work on Ḥunayn's and Isṭifān's Arabic version (which was made on, and contained, the five-book recension of *De materia medica*), they had at their disposal the same version of the Greek text, which is not, thus, the alphabetical herbal.

[37] The table contains the same information as the second for Dioscorides' text. For Ibn al-Bayṭār's, it includes the lemmas, the explanations provided by Ibn al-Bayṭār and the chapter number in his version of Dioscorides' text (which is slightly different from the Greek text).

Table 4

Dioscorides-Ayasofia 3703 manuscript					Ibn al-Bayṭār, *Commentary on Dioscorides*		
Folio	**Title**	**Beginning of text**	**Greek name**	**Dios.**	**IB**	**Lemma**	**Explanation**
3r	brāṭānīqī	brāṭānīqī	brettanikē	4.2	4.2	brāṭānīqī	
4r	lūsimākhiyūs	quthrab	lusimacheios	4.3	4.3	lūsimākhiyūs	
5v	fūlūghūnun	ᶜasā al-rāᶜī	polugonon	4.4	4.4	būlūghūnun	ᶜasā al-rāᶜī
6r	qlīmāṭīs		klēmatis	4.7	4.7	qlīmāṭīs	
6v	fūlāmūniyūn		polemōnion	4.8	4.8	fūlāmūniyūn	
7v	sumfūṭun		sumfuton	4.9	4.9	sumfūṭun	
8r	ūlusṭiyūn		olosteon	4.11	4.11	ūlusṭiyūn	
9r	qlūmānun		klumenon	4.13	4.13	qlūmānun	
10r	tūsūlūs		tribolos	4.15	4.15	trūbīlus	
11r	rijl al-arnabī	lāghūbun	lagōpoun	4.17	4.17	lāghūbun	
12r	sawsun	ksīfiyūn wa-huwa sawsan	xifion	4.20	4.20	kīsīfiyūn	sawsan barrī
12v	sfarghāniyūn		sparganion	4.21	4.21	sfarghāniyūn	
14r		ankhūsa	agchousa	4.23	4.23	ankhūsa	
14v	lūqābīsūs		lukapsos	4.26	4.24	lūqābsūs	
15r	al-thīl	aghrusṭis	agrōstis	4.29	4.27	aghrusṭis	al-thīl
15v	ḍarb min al-thīl	qālāmāghrūsṭis	kalamagrōstis	4.30	4.28	qālāmaghrusṭis	
16r	sīdīrīṭis		sidēritis	4.33	4.29	sīdīrīṭis	
17v	al-ʻullayq	bāṭus	batos	4.37	4.33	bāṭus	al-ʻullayq
18r	al-lablāb	ālaqsīnī	elxinē	4.39	4.35	ālaqsīnī	al-lablāb
18v	alāṭīnī		elatinē	4.40	4.36	alāṭīnī	
19r	al-ghāfit	ʻūbāthūriūs	eupatōrios	4.41	4.37	ūbāṭūriyūs	al-ghāfit
20r	banṭāfullun		pentafullon	4.42	4.38	banṭāfullun	
21r	fūniqs		foinix	4.43	4.39	fūniqs	
22r	idā'ayrizā		idaia riza	4.44	4.40	idā'ayrizā	

Dioscorides-Ayasofia 3703 manuscript					Ibn al-Bayṭār, *Commentary on Dioscorides*		
Folio	**Title**	**Beginning of text**	**Greek name**	**Dios.**	**IB**	**Lemma**	**Explanation**
22v	rūdiyārizā		rodia riza	4.45	4.41	rūdiyārizā	
23r	dhanab al-khayl		ippouris	4.46	4.42	iffūris	dhanab al-khayl
24r	ṭrāghiyun		tragion	4.49	4.44	ṭrāghiyun	
24v	ṭrāghūs		tragos	4.51	4.46	ṭrāghus	
25r	ḥazāz al-ṣakhr	lichin	leichēn	4.53	4.48	lichen	ḥazāz al-ṣakhr
25v	khrūsūqūmī		chrusokomē	4.55	4.50	khrūsūqūmī	
28v	iyārābūṭānī		iera botanē	4.60	4.55	iyārābūtānī	
29v	uwāqinthus		uakinthos	4.62	4.57	uwāqinthus	
30r	naw‘ min al-khashkhāsh	mīqūn rūwas	mēkōn roias	4.63	4.58	mīqūn rūwas	hashhāsh sā’il
31r	khashkhash	mīqūn	mēkōn	4.64	4.59	mīqūn	al-khashkhāsh
32r	naw‘ ākhar min-hu	mīqūn afrūdhīs	mēkōn afrōdēs	4.66	4.61	mīqūn afrūdhis	
32v	banj	iyusquwāmus	uoskuamos	4.68	4.63	iyusquwāmus	
34r	bizrqaṭūna	bsilliyūn	psullion	4.69	4.64	fsilliyūn	al-bizrqaṭūna
34v	‘inab al-tha‘lab	sṭrūkhnun	struchnon	4.70	4.65	sṭrūkhnus al-bustānī	‘inab al-tha‘lab
36r	naw‘ ākhar min al-tha‘lab		struchnon	4.71	4.66-67	sṭrūkhnus	
37v	al-luffāḥ	mandrāghūras	mandragoras	4.75	4.69	mandrāghūras	al-luffāḥ
39r	khāniq al-namir	aqūniṭun	akoniton parda-liagches	4.76	4.70	āqūnitun	qātil al-namir
40r	qātil al-dhi’b	liqūqtūnun	lukoktonon	4.77			
40v	qūniyūn	shawkarān	kōneion	4.78	4.71	qūniyūn	al-shawkarān
41v	smīlaqs		smilax	4.79	4.72	Smīlaqs	
42r	al-diflā	nīriyūn	nērion	4.81	4.74	nīriyūn	
42v	fuṭr	mūqīṭis	mukētes	4.82	4.75	mūqīṭis	al-futr
43v	ādhān al-fa’r	alīsīnī	alsinē	4.86	4.78	alīsīnī	Āḏān al-fa’r
44r	ḥayy al-‘ālam		aeizōon to mega	4.88	4.81	ayzūn al-kabīr	
45r	qūṭūlīdūn		kotulēdōn	4.91	4.83	qūṭūlīdūn	

Dioscorides-Ayasofia 3703 manuscript					Ibn al-Bayṭār, *Commentary on Dioscorides*		
Folio	**Title**	**Beginning of text**	**Greek name**	**Dios.**	**IB**	**Lemma**	**Explanation**
45v	al-anjura	ʿaqālīfī	akalēfē	4.93	4.84	aqālīfī	al-anjura
46r	ghāliyubsis		galēopsis	4.94	4.85	ghāliyubsis	
46v	thāliyaṭrun		thaliētron	4.97	4.87	thāliyaṭrun	
47r	ṭuḥlub baḥrī	brūūn thālāssiyūs	bruon thalassion	4.98	4.88	baryun al-baḥrī	al-tuhlub al-baḥrī
47v	fūqūs al-baḥrī		fukos thalassios	4.99	4.89	fūqūs al-baḥrī	
48r	al-fāris	sṭrāṭiyūṭis	stratiōtēs	4.101	4.91	sṭrāṭiyūṭis	fāris al-mā’

In the form of Ḥunayn's and Isṭifān's translation of Dioscorides, *De materia medica,* that is attested by these two independent sources, the names of plants were almost systematically the Greek ones, transliterated into Arabic alphabet. The fact is too systematic to result just from the translators' ignorance of the authentic Arabic names, although they were not Arabic native speakers. The adoption of plant names transliterated from Greek was not an easy solution to the problem of the Arabic language supposedly having no name for the plants described by Dioscorides when Ḥunayn and his collaborators were translating Greek science into Arabic. It seems more probable that, if Ḥunayn and Isṭifān did use transliterations of Greek names, it is because they decided to do so, rather than because they did not know the actual translation of the plant names.

By reproducing the Greek names of plants, Ḥunayn and Isṭifān demonstrated a good knowledge and understanding of Dioscorides' treatise, including the perception of the implicit information conveyed by the Greek names themselves and also by the structure of the whole work, which relies, in part at least, on the plant names. A proof *a contrario* that such strategy was necessary, not to say that it was the only one, is provided by the history of Dioscorides' text in the Renaissance, particularly the translation of, and commentary on, *De materia medica* by the Italian physician and naturalist Pietro Andrea Mattioli (1501-1578). Mattioli started his career of translator of Dioscorides in a fairly modest way, with an Italian translation first published in 1544. Shortly after, he translated that version into Latin and, after this new translation [38] had been reproduced in 1549 in an unauthorized printing that had, however, the merit of adding small representations of the plants analyzed in the text, he published in 1554 a new edition that contained small illustrations of the plants, followed, in 1562, by another edition with illustrations that covered the full width of the

[38] The bibliography on Mattioli is abundant and has been recently renewed. Among such new works, we could quote (in chronological order of publication): Pesenti, T., "Il 'Dioscoride' di Pier Andrea Mattioli e l'editoria botanica", in *Trattati di prospettiva, architettura militare, idraulica e altre discipline,* D. Gioseffi *et al.* (saggi e note di), Vicenza, 1985, 61-103; Ferri, S. and Vannozzi, F. (a cura di), *I giardini dei semplici e gli orti botanici della Toscana. In appendice saggi su Pietro Andrea Mattioli,* Perugia, 1993; Ferri, S. (a cura di), *Pietro Andrea Mattioli, Siena 1501-Trento 1578. La vita, le opere, con l'identificazione delle piante,* Perugia, 1997; Fausti, D. (a cura di), *La Complessa Scienza dei Semplici. Atti della celebrazione per il V centenario della nascita di Pietro Andrea Mattioli, Siena, 12 marzo-19 novembre 2001,* Siena, 2004.

pages. In the many editions that followed, Mattioli constantly added new material. In so doing, he gradually amalgamated into the original text a whole wealth of heterogeneous material that gradually obscured and altered the structure of the work, and made it eventually necessary to produce a new system of classification of plants.

Although it is likely that the information provided by the Greek plant names is the main reason that Ḥunayn and Iṣṭifān kept the Greek names of plants and transliterated rather than translated them, there might also have been other reasons, of a more subtle, extra-scientific nature, from the prestige of Greek as the language of culture —something that the translators might have wished to preserve, particularly Iṣṭifān— to the seduction of foreign terms among a newly acculturated society and the distinction that such terms might have conferred to the circles where they were used.

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