


RESEARCH

Open Access



In search of traces of the mandrake myth: the historical, and ethnobotanical roots of its vernacular names

Amots Dafni^{1*} , Cesar Blanché², Salekh Aqil Khatib³, Theodora Petanidou⁴, Bedrettin Aytaç⁵, Ettore Pacini⁶, Ekaterina Kohazurova⁷, Aharon Geva-Kleinberger⁸, Soli Shahvar⁹, Zora Dajic¹⁰, Helmut W. Klug¹¹ and Guillermo Benítez¹²

Abstract

Background: Mandrake (*Mandragora* spp.) is one of the most famous medicinal plant in western cultures since Biblical times and throughout written history. In many cultures, mandrake is related to magic and witchcraft, which is said to have a psychosomatic effect (especially when mandrake contains narcotic compounds) in addition to the pharmacological influence, as occurs with other narcotic magical plants. Due to its unique properties and related myths, it is not surprising that this plant has many names in many languages.

Methods: This paper presents an attempt to reconstruct the historical, ethnobotanical, and folkloristic roots of 292 vernacular names of *Mandragora* spp. in forty-one languages. We used the plant's morphological data, philology, myths and legends, medicinal properties and uses, as well as historical evidence and folkloric data, to explain meaning, origin, migration, and history of the plant's names.

Results: The names were classified into the following main categories: Derivatives of *mandragora* (19 languages), *alraun* (7) and of *yabroukh* (5). The salient groups of the plant's vernacular names are related to: Anthropomorphism (33 names in 13 languages); Similarity to other plants (28/9); Supernatural agents (28/9); Narcotic effects (21/8); Leaves, fruits, and seeds (21/8); Aphrodisiac properties (17/10); Use of a dog (15/9); Gallows (14/5); Black magic, sorcery, witchcraft (13/8), and Medicinal use (11/7).

Conclusions: This frequency distribution of the mandrake's vernacular names reflects its widespread reputation as related to the doctrine of signatures, beliefs in its supernatural, natural, and mythic powers, and to a lesser extent, its uses in magic and medicine. A spatiotemporal analysis of the mandrake's names supports the old idea that the pulling ceremonies for this plant originated in the Near East and that various other myths related to this plant may have originated in different places and periods.

Keywords: *Mandragora* spp., Plant names, Etymology, Phytonymy

Introduction

Gledhill [1:1–2] noted that “Common plant names present language at its richest and most imaginative... Local variations in common names are numerous and this is perhaps a reflection of the importance of the plant in general conversation in the kitchen and in herbalism throughout the country in bygone days.”

*Correspondence: amots.dafni@gmail.com; adafni@research.haifa.ac.il

¹ Department of Evolutionary and Environmental Biology and Institute

of Evolution, University of Haifa, Haifa, Israel

Full list of author information is available at the end of the article



© The Author(s) 2021, corrected publication 2022. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Some names refer unequivocally to a specific plant species (monosemic name), while other names can be used for different plants (polysemic names). The proliferation of names for individual botanical species is related to a variety of factors: the geographical range of the plant and languages spoken in its area, the ethnobotanical value as a ritual and/or medicinal plant, its strange appearance or resemblance to familiar objects, etc.). For example, *Pistacia terebinthus* L. has a variety of names throughout Greece, which probably reflects the importance of the plant for local societies [2, 3]. Functionality, however, is no guarantee of name diversity. Consider the olive tree, which in the Mediterranean is both omnipresent and widely used yet is known simply as the “olive tree.” On the other hand, some plants’ names are quite similar in the different languages of the places where they grow, for example, *Potentilla reptans* L. is called “five fingers herb” (or names containing the words “five,” “fingers,” “hand” or “foot”) in English, French, Spanish, Portuguese, German, Russian, Greek, Romanian, Polish, Lithuanian, Catalan, Basque, and Chinese, due to the leaf morphology [4]. In Serbo-Croatian, “petoprsnica,” literally meaning “of five fingers.”

A few studies have conducted a multilingual comparison of the same plant species to understand its performance, perception, and use across its area of distribution. Flattery and Swartz [5:141–152] study the identity of the mythical “Haoma” plant, which plays an important role in Zoroastrian worship. In addition to historical–geographic analyses, they employ a multilingual comparison of the common names of *Peganum harmala* L. (and other plant species suspected of being “Haoma”). Linguistic analysis is used by these authors as another tool to establish the plant’s identification. A similar approach is adopted by Šeškauskaitė and Gliwa [6] when studying the etymology of *Datura stramonium* L. and related narcotic species in Lithuania. Austin and Felger [7] study the etymology of the genus *Fagara* (Rutaceae), from its first written record in the eleventh century through to the present day. They employ historical, economic, geographic, linguistic (in several languages) and ethnobotanical approaches to understand the origin of the plant and its economic trade route. Austin [8] studies the history and etymology of *Sambucus* to reveal the history of the intercultural exchange of this plant and the evolution of its name. Dafni et al. [9] reconstruct the etymological, ethnobotanical, and folkloristic roots of 290 vernacular names of *Ecballium elaterium* (L.) A.Rich. in 38 languages. They use the plant’s morphological data, ecological characteristics, medicinal properties and uses, as well as historical evidence and ethnobotanical data, to explain the meaning, origin, spread, and history of the plant names.

Mandrake is perhaps the most famous medicinal plant in western culture since biblical times and throughout written history. This view has been clearly expressed by several authors, with statements such as: “Of all the medicinal herbs used in the ancient and medieval world, none was regarded with as much fear or wonder as the mandrake”; Silberman [10:89] noted that “Of all the plant illustrations (in medieval herbals) representing mythological beliefs, superstition, or witchcraft, the one that comes uppermost to mind is the mandragora or mandrake.”

Moreover, several well-known writers have devoted passages to the plant and its properties, from William Shakespeare’s many plays (see [11]), including *Othello*, *Macbeth*, and *Romeo and Juliet* (e.g., “And shrieks like mandrakes torn out of the earth” Act IV, Sc. 3), to Niccolò Machiavelli’s *La Mandragola*, the Nobel Prize-winner C. J. Cela’s *Diccionario del Erotismo*, and the recent and popular J. K. Rowling’s *Harry Potter and the Chamber of Secrets*.

Aim of the study and hypotheses

Waniakowa’s [12] survey of the mandrake names is limited to linguistic aspects mostly of northern and central European languages and deals especially with the comparison of the common names with those of *Atropa belladonna* L. She relies extensively on ethnobotanical information to elucidate the meanings of these plant names in Europe. Most of this geographic area is beyond the mandrake’s natural distribution, i.e., mainly the Mediterranean area spreading eastward to Iran and the Caucasus.

In the present study, we cover a larger geographic area and more languages in search for mandrake names. We use the plant’s morphological data, ecological characteristics, medicinal properties and uses, as well as historical evidence and ethnobotanical data, to explain the meaning, origin, spread, and history of the plant’s names. The study was done to pinpoint the putative geographic origin and cultural distribution of the myths related to the mandrake based on the distribution and the origin of names throughout history. Our working assumption is that a proliferation of mandrake names in any specific language or category (see below) may reflect its ritual and/or practical importance and/or intimate knowledge related to this plant (see above; [1:1–2]). Based on our analysis, we examine four hypotheses:

Hypothesis 1 Due to the longer history and broader distribution around the Mediterranean (including the Middle and the Near East), one expects to find more cultural migrations of names (and myths and customs reflected in these names) from east to west (Middle East to Europe) and from south to north (southern Europe to eastern,

central, and northern Europe) than migrations in the opposite directions.

Hypothesis 2 One expects to find more plentiful names (and in more categories, see below) in countries in which the mandrake is native (especially around the Mediterranean) and has more ancient history than in other parts in Europe in which the mandrake (and its legends) arrived later. This would particularly relate to the appearance of the plant (e.g., morphology of aerial parts, root, fruits) and their similarity to other plants and animals including humans, and to its uses and effects.

Hypothesis 3 Since the mandrake has a long history as an aphrodisiac and as an omnipotent medicinal plant over generations (see [13]), one expects to find relatively many names which are related to these categories.

Hypothesis 4 Witchcraft and black magic were highly developed in Europe [14, 15], and involved hallucinogenic and narcotic plants [16:passim], while in the Muslim world, they are strictly condemned [17:1356, 18:passim, 19:passim]. Thus, one expects to find more names related to this category in Europe than in the Muslim world.

Materials and methods

Data gathering and possible pitfalls

Popular names for *Mandragora* spp. were collected in as many languages as possible through: literary reviews, dictionaries, the authors' personal knowledge, and rarely in internet sources (where the plant's identity was not doubtful). All the names were checked by us as well as by local botanists to ascertain their validity as well as their meaning in each language. Dubious or wrong names not clearly related to *Mandragora* were discarded.

We have focused on the names of the two species generally recognized as growing wild in the Mediterranean area: *M. officinarum* L. and *M. autumnalis* Bertol. (see [20–22] for nomenclature and taxonomy), excluding the Asian species usually considered as different ones *M. caulescens* C.B. Clarke and *M. turcomanica* Mizg. and their related synonyms. This approach was taken for several reasons: 1. The taxonomical distinction between *M. officinarum* L. and *M. autumnalis* Bertol. is debateable even among specialists [20–23]. We have not found any traces of distinction between the vernacular names of these two species. 2. A significant amount of European mandrake descriptions and iconography since antiquity but also in late medieval times and the Renaissance, refer to a distinction between male and female plants, known as *mas* (male) or *foemina* (female). While in antiquity, the distinction was made according to the root shape (thin for female and thick for male ones; e.g., Dioscorides, Pliny), some authors suggest that plants with ovoid fruits (more abundant

in Central and Eastern Mediterranean, attributed to *M. officinarum*) were considered male mandrake, whereas plants with spherical fruits (more abundant in W & S Mediterranean and attributed to *M. autumnalis*) were considered female (e.g., [24, 25]). Therefore, this distinction seems to be more or less arbitrary through time. 3. The Iranian-Caucasian species (*M. turcomanica* Mizg.) shares, largely, the same medicinal uses as the former two species, which indicates a large-scale cultural migration between the Mediterranean and the Irano-Turanian species [13] as well as many rituals (see below). Secondary sources (e.g., [26–31]) were scrutinized as carefully as possible for the validity of the mandrake names by comparison to the original texts in each language and personal knowledge of the authors.

Considering the validity and reliability of the names used for mandrake in the various languages, we tried to look out for, and avoid, the following possible pitfalls:

In several countries in which the mandrake is not native (e.g., Northern, Central, and Eastern Europe), there is a tendency in the literature to adopt, transliterate and translate the mandrake's names from other languages (especially from Ancient Greek and Latin as well as from the Arabic). Authors just translate/transliterate old literary names into their own languages, while these names were practically not used in the vernacular. This discrepancy is obvious when botanical texts are compared to folkloric/literary ones.

It is worth paying attention to distinguish between names that were given to the mandrake in its natural distribution in comparison to countries into which it was introduced (as a garden plant and as medicine, for ritual, and/or witchcraft purposes). It is assumed that as the folk tradition of the plant in these countries is historically shorter, some names in these languages may reflect locally evolved beliefs and traditions from the periods after the plant introduction.

Some of the reviewed literature used the name “mandrake” when the botanical identity is that of species of other genera such as: *Atropa* (rev. [12]), *Bryonia* (see [32:111, 33:193, 11:144], and *Podophyllum* [34, 35: 495]. Also, less frequently other species such as: *Datura stramonium* L., *Valeriana officinalis* L., *Aconitum tauricum* Wulfen, *Gratiola officinalis* L., *Hyoscyamus niger* L., *Leonurus cardiaca* L., *Cicuta virosa* L. and *Peganum harmala* L. [36: 3–4], *Chelidonium majus* L. [37: 273], *Allium victorialis* L. [38: 120–121] and *Tamus communis* L. [39: 204] were named “mandrake.” Thus, it is not surprising that Eliade [40] in his famous article “The Cult of *Mandragora* in Romania” referred to *Atropa belladonna* as “mandrake” and not *Mandragora officinarum* (that was previously in the genus *Atropa*, which is not indigenous to Romania). As a result, since several authors

cited Eliade's work (e.g., [41–44]), *Atropa belladonna* was related to *Mandragora*.

In the literature, several times a name is given from a certain language as a proper name from a different language. For example, the mandrake names *anthropophora* and *xērà ánthē* are regarded as “Latin” names as in the consulted works (Dioscorides' *Materia Medica* [45: IV,75]) are considered so, but these have been directly transcribed to Latin from Greek, and these names are probably better considered as just Greek names and were omitted from our analysis.

In the same sense, in some territories, a certain name for the plant may have arrived with migrants, sellers, or any citizen, or even from the medical literature together with medical texts. In these cases, names could be better interpreted as a cultural migration and not as a vernacular name originated in this specific territory. An example is the name *mandragora* in Catalan. Once it is explained that the origin of this name is more probably Greek than Latin, and since Catalan is a Romance language, it seems that the very first references recorded in Catalan in the thirteenth-to-fourteenth centuries (firstly: *mandràgola*; secondly: *madragora*; see [46]) come from a Catalan context but were originally published in an Arabic text, afterward translated to Catalan and later inserted in medical (official medieval medicine) texts. This first mention in Catalan is a translation of a previous work written in Arabic by the same author (Ramon Llull [46]), and translated by himself into Catalan (Llull used Latin, Arabic and Catalan alternately in his writings on the thirteenth century in an attempt to spread his “scientific” ideas through Mediterranean cultures). The reference to *mandràgola* is even earlier than *mandràgola* and comes from the first scientific texts written in Catalan.

Data presentation

Spelling variants of the same name were pooled into the same cell in the tables and counted only once. To avoid repetition, we cited each author only once in the relevant cell even if he presents several spelling variants. This method had no influence on our conclusions. Sometimes, especially with respect to *alraune* in German, distinguishing between a “derivative” (i.e., derivatives from a generic name, as *mandragora* or *alraune*) and a “spelling variant” (e.g., *mandracola* instead of *mandragora* in Spanish; about sixty variations are scattered in the literature; see Table 1) is quite arbitrary. The same is the case with regard to transcriptional corruptions of Farsi and Arabic names in European languages (e.g., *abrusanam* and *yabroukh*). For language names and categorization, we followed the website ethnologue (<https://www.ethnologue.com/>).

The names were grouped, in the light of linguistic and ethnobotanical aspects, into the following categories: **A.** Derivatives of “generic” names (with their variants in transcription): 1. *Mandragora*; 2. *Alraune*; 3. *Yabroukh*. **B.** Morphological characteristics: 1. Root (Anthropomorphism); 2. Leaves, Fruits, and Seeds; 3. Similarity to other plants. **C.** Pharmacological characteristics and medicinal uses: 1. Medicinal properties; 2. Narcotic; Hallucinations; Poisonous; 3. Aphrodisiac. **D.** Magic and witchcraft: 1. Black magic—sorcery, witchcraft, and magic, Bad luck, Evil eye; 2. Evil supernatural agents, Satan, the devil, genie, monster, dragon. 3 White magic—Good luck, talisman, dolls. **E.** Pulling-out ceremonies: 1. Screaming, groaning and voices; 2. Use of a dog; 3. Shining and lights; **F.** Plant conception: Gallows and hanging: 1. Plant originated from human semen, urine; 2. Creation of Adam. **G:** Relationship to historical and mythological characters: 1 King Solomon, Circe, and Prometheus; 2 Elephant. **NC:** Not classified. There are other names whose meaning/origin is not clear, or are not related to any of the above-defined categories. A very few names (e.g., *Mandragora mannetje* [“Mandrake man”] and *pisduiveltje* [“Little piss devil”] in Dutch) may be classified into two categories. In these cases, we decided on the category according to relevance in the original text.

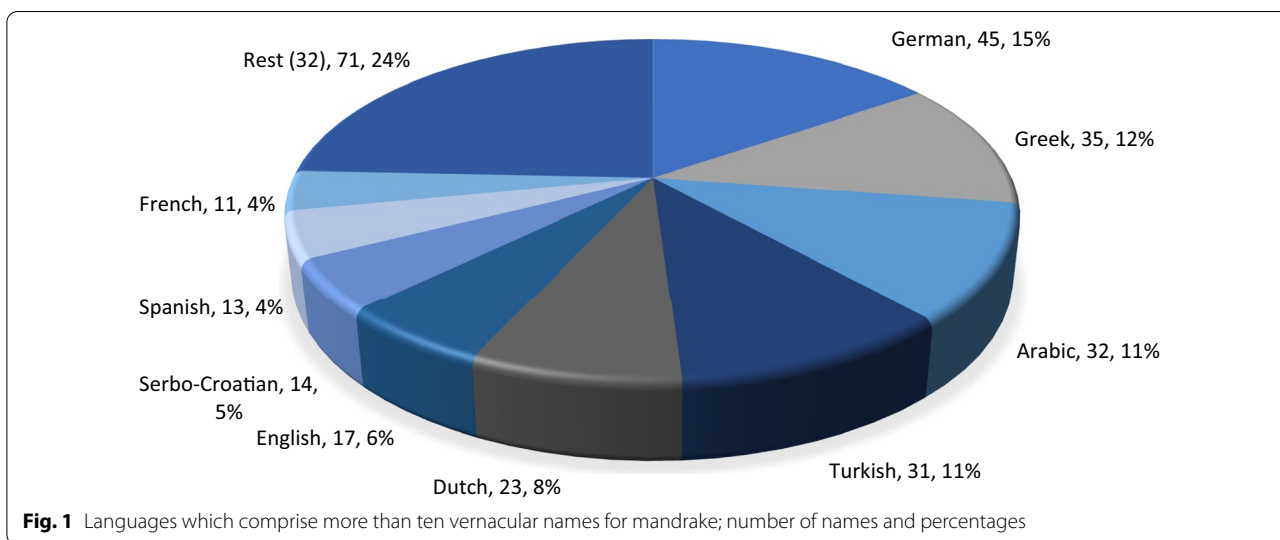
Results and discussion

Our database with 292 names for the plant covered, as mentioned, a total of forty-one languages spoken from antiquity to the present day in the area where *Mandragora officinarum* (including *M. autumnalis*) is widely distributed and/or used. This includes two dead languages (Latin and Old German). There are nine languages for which more than ten vernacular names for mandrake were recorded (see Table 8; Fig. 1). It is somehow surprising that four of these nine languages are not from the territory in which the plant is native (German, Dutch, English, French), and that at least in one more (Serbo-Croatian) the plant has been considered extinct [47], while in Greece, Arabic countries of North Africa, Spain, and Turkey, it is currently wild [22]. These nine languages cover 74% of all names, while the remaining thirty-three languages represent 26% of names.

Derivatives of “generic” names

The origin of “mandragora”: The origin of the Greek $\mu\alpha\upsilon\delta\rho\alpha\gamma\omicron\rho\alpha\varsigma$ is obscure [41: 115, 91: 256, 149: 316]. The main suggestions to explain the origin of this name are as follows:

1. Persian origin from *mardum-giyah* (plant–man) [41: 115, 207: 237]. This idea is rejected by Asatrian [100] based on the arguments that this plant has no name



in old Persian texts and because in the historical period it was already an extinct (or sporadic) species within the floristic nomenclature of Iran.

2. Greek origin: *‘mándra’* = “stable” and *‘agora’* = “gathering place” thus referring to the places where it was commonly found [208: 302, 120: 1835]; although this explanation was refuted by Genaust [208: 237].
3. Greek origin: *‘mandragoros’* is derived from *‘mándra’* = “an oxtail,” sometimes relating to cattle, and *‘aguros’*, cruel, on account of its poisonous effect on cattle [209, II:132, 210: 355].
4. Greek origin: may be a variation of the Greek *‘mandragoritis’*, an alternate name for Venus [79: 20, 211: 3, 122: 260, 176: 241]. This idea was refuted by Genaust [208: 237].
5. Sanskrit origin: a. *‘mand’* = “joy,” “intoxication” [91: 256].
6. Sanskrit origin: b. *‘mantasana’* = “sleep,” “life,” or *‘mandra’* = “pleasure” [91: 256].
7. Sanskrit origin: c. *‘mantara’* = “paradise tree” and *‘aryu’* = “unmarried, violently passionate” [91: 256].
8. Sanskrit origin: d. *‘mandros’* = “sleep” and *‘agora’* = “substance” [176: 241; 149: 316] (see also [212: 22–23]).

We found 24 names in 19 languages in which the plant is called mandragora and/or its derivatives.

Most of the variants were in Greek (8) and in Italian (6), and most of the derivatives are from European languages (except one in Turkish and one in Georgian). We consider this as indirect evidence for the European (Greek) origin of the derivatives of this name (Table 1), as some dictionaries reflect (e.g., [213]). Asatrian [100] also analyzed the Farsi names and concluded that

the origin of the name *mandragora* is Greek and not Iranian.

The origin of “alraun”: Mandrake in modern German is known as *‘der Alraun’* or *‘die Alraune’*, which indicates the idea of a male and a female of the plant by referring to the shape of the root (two roots: female; more than two roots: male [214: 34]). The first occurrence of the plant name occurs in a 10th c. gloss of the biblical *dudaim* or else mandragora [30: 21, 142: 327]. The name in Old High German is *‘al-rūna’*, which transformed to Middle High German *‘al-rūne’*, which then became the Early and Modern High German *Alraun(e)* [215]. The German name is composed of the prefix *‘al-’* and the stem *‘rune’*. All etymological explanations of the name are highly speculative [214: 34]. There are several theories concerning its origin:

1. The name might be associated with the seeress Albrūna (Lat. *Aurinia*), who lived during the first century and is documented in Tacitus’s *Germania* [30: 22]; the theory is labeled highly unlikely [214: 34]. This theory can be found in Grimm [216, I:404–5], who relates that the names *alrūne/alrūn* (and the Nordic Aelfrūn, [214: 34]), to be identified with a wise-woman of the (Teutonic) antiquity from its old sense of a prophetic and diabolic spirit, has at length passed into that of the root (mandragora).
2. Etymologically, the word-stem *‘-rune’* can denote “to murmur, to whisper magic words,” or “whisper secrets, talk, spell” [30: 21, 214: 34].
3. The prefix *‘al-’* can either be related to the historic forms of *‘Alb’* (‘incubus’) or *‘all, groß’* (‘all, mighty’).

Combinations of these word parts suggest that the name means either “whispers/secrets of incubi,” or

Table 1 A. Derivatives of “generic” names: A1. *Mandragora*; A2. *Altaune*; A3. *Yabroukh*

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
A1				
Albanian	<i>mandragora</i> , <i>madëronë</i> , <i>matëronë</i>			Albanian Bible [12:163]
Armenian	[<i>mandragora</i>]	մանդրագորա		[48: 1268]
Bulgarian	[<i>mandragora</i>]	мандратора		[49: 36]; [50]; [51: 394]
Catalan	<i>mandràgola</i> , <i>mandràgora</i>			[46: 190] (13th c.)
Corsican	<i>tramangula</i>			[52: 471]
Dutch	<i>mandragers kruit</i>		["mandrake herb"]	[53: 11]; [31: 45]
Dutch	<i>mandragore</i>			[31: 45]
English	<i>mandrake</i> Spelling variations: <i>mandrage</i> , <i>mandrag</i> , <i>mandragge</i> , <i>mendrage</i>			[54: 51]; [55: 322]; [56:66]; [28: 71]; [31 : 43]; [30: 333]
French	<i>mandrigoula</i>			[28: 71]; [31: 44]
Georgian	[<i>mandragora</i>]	მანდრაგორს		Rainer Bussmann (Pers. Comm 25.1.20)
Greek	[<i>mandragora</i>] Spelling variations: [<i>mandragúda</i> , <i>mandragúdas</i> , <i>matragúra</i> , <i>man- tragúras</i> , <i>mandragúri</i> , <i>mandraúla</i> , <i>mandraúna</i> , <i>mentragúra</i>]	μαντραγόρα μαντραγούδα, μανδραγούδας, ματραγούρα, μαντραγούρας, μαντραγούρι, μανδραούλα, μανδραούνα, μεντραγούρα		[57: 173]; [58: 2509]; [59: 433,437]; [60: 408]
Greek	[<i>mandragóras</i>] (<i>m</i>)	μανδραγόρας		[45: IV, 75]; [58: 2509]; [59: 440]; [61: 9,8,8]; [62: 600]
Hungarian	<i>nadragyula</i>			[63: I, 537]; [64: 55]

Table 1 (continued)

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
Italian	<i>mandragora</i> Spelling variations: <i>mandraeola, mandràhura, mandràgura, mandràura, mandulàgrona, mandràgura</i>			[65]; [28: 71]
Polish	<i>matryguna, matrygan, medregula</i>			[12: 170]
Portuguese	<i>mandragora, mandragola</i>			[66]
Russian	[<i>mandragora</i>]	Мандрагора		[67: 75–76]; [68: 411]; [69: 187]
Serbo-Croatian	[<i>mandragora</i>]	Мандрагора		[70: 291]; [71: 20]
Serbo-Croatian	[<i>mandragula</i>]	Мандрагула		[70: 291]
Serbo-Croatian	[<i>narangulina</i>]	Нарангулина	In Serbo-Croatian it is easier to pronounce " <i>mandragula</i> " than " <i>mandragora</i> "	[71: 20]
Spanish	<i>mandràgura</i> Spelling variations: <i>mandràgura, mandracola, mandràcola</i>		Probably a variation of " <i>mandragula</i> "	[66]; [72: 585]
Spanish	<i>mandràgula, mandragula, mandràcula</i>		Frequently adjectivized as " <i>mandragora macho/hembra</i> " (male or female) or " <i>mandragora de flor azul/blanca</i> " (regarding flower's color)	[66]; [72: 585]
Turkish	<i>mandràğa</i>		["Landlord Mandir"] (folk etymology of mandrake)	[73: 107]
Ukrainian	[<i>mandrygula</i>]	андригула		[12: 163]
A2	<i>alrune</i>			[74: 160]
Danish	<i>alruneken, alrunik</i>			[75: 229]; [76: 195]
Dutch	<i>alruyne, alruin</i>			[77: 333]; [74: 160]; [28: 71]; [31: 45]
Finnish	<i>alruna</i>			[78: 64]
German	<i>alraun</i> (+ ca 60 spelling variations; see text)			[79: 5]; [75: 229]; [28: 71]; [31: 41]; [30: 329]; [29: 11: 336]; [27: 344]; [80: 19]; [81: 23] [82];
Norwegian	<i>alrune</i>			[74: 169]
Serbo-Croatian	[<i>alrauna, alrun</i>]	алрауна, алрун		[71: 20]
Swedish	<i>alruna</i>			[83: 258]; [74: 160]
Swedish	<i>alrunsröt</i>		[" <i>alrune</i> (mandrake) root"]	[63: 123]
A3				
Arabic	[<i>ež-zarbhāh</i>]	الزبروح		AGK Pers. obs. (Palestine)
Arabic	[<i>yabrāh, yabrāhāh</i>]	يزبروح		[84: 351] (Andalusia, 6–7th c.); [85: 11: 773] (Andalusia, 11th c.)

Table 1 (continued)

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
Arabic	[yabrūh, yabrūx]	بَرُوح ، بَرُوح		[86: 207] (Arabia, 9th c.); [87: 54] (Arabia, 10–11th c.); [88: 592]; [89: 299] (Jordan); [90: 115] (Palestine); [91: 203] (Syria); [84: 351] (Andalusia, 6–7th c.); [85: II: 773] (Andalusia, 11th c.); [92: 26] (Morocco)
Aramaic	[yabroukh, yabroukha, yabroukhin]	ܝܒܪܘܚ , ܝܒܪܘܚܐ , ܝܒܪܘܚܝܢ	See text concerning the etymology of yabroukh	Onkelos (Rome, 1st c., Aramaic translation, Genesis 30:14 [93: 14]); Babylonian Talmud [94]
Bengali	[yebruj]		Derivative of yabroukh in Aramaic (see text)	[28: 71]
Farsi	[sāyeh-barūj]	سایه بروج	See text concerning the etymology of yabroukh	[95: 645]
Turkish	Yebrūh		See text concerning the etymology of yabroukh	[73: 107]; [41: 124]; [96: 232–234]
Turkish	yebṛūhūs-sanem		Idol's yabroukh	[97: 1391]; [73: 107]; [41: 124]; [96: 232–234]

Table 2 B. Morphological characteristics: B1. Root (anthropomorphism); B2. Leaves, fruits, and seeds; B3. Similarity to other plants

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
B1				
Arabic	[šəğarat aš-šanam]	شجرة الصنم	Lit. ["The image's (idol) tree," "a human (shaped) tree"]	[88:14]; [98, IV: 443]; [99]
Armenian	[marada-khot]	Մարդախոտ	Literarily ["Human (-like) plant"]	[100: 106]; [101: 152]; [102: 251]
Czech	mužjik, mužček		["little man"]	[103: 43]; [104: 289]; [12: 166]
Czech	stryček		["uncle"]	[104: 289]
Danish	dukkeurt		["doll's herb"]	[27: 344]
Dutch	aardmanneje		["little earth man"]	[76, 195]; [31: 45]; [105: 35]
Dutch	alruinmannje		["mandrake's little man"]	[106:29]
Dutch	mandragora manneje		["mandrake's man"]	[28: 71]; [31: 45]
Dutch	wortelmannetje		["little root man"]	[107: 63]; [31: 45]
Dutch	wortelmannsch		["root man"]	[108: 541]; [31: 45]
English	ladylin		["little lady"]	[29, II: 336]; [109: 70]
English	root of life		Due to the hallucinogenic effects?	[30: 334]
English	womandrake			[110: 343]; [56:66]; [109:70]; [29, II: 336]
Farsi	[mardom-giyāh]	مردم گیاه	["plant of the people"]	[100: 106]; [111: 2]; [101: 152]
French	hommeplante		["planted man"]	[28: 71]; [31: 43]; [29: 336]
French	plante humaine		["human Plant"]	[112: 225]; [28: 71]; [31: 44]; [113: 8]
German	alraunmännchen, alruyn manneken		["alruun man"]	[31: 41]; [114: 15]
German	atzelmännchen		["doll"]	[115:164]; [30:330]
German	atzmann		["doll," "puppet"]	[31]; [30]; [114: 15] [81: 23]
German	erdmännchen, erdmännlein		["little earth man"/"earth mannekin"]	[116: 25]; [30: 331]; [31: 41]; [114: 15]; [81: 23]
German	erdweibchen		["little earth woman"]	[117: 185]; [116: 25]
German	mandlwurz, mandelwurz		["little root-man"]	[118: 355]; [119: 137]; [120: 113]; [2: 1138]
German	menschenwurzel		["human's root"]	[114: 15]; [81: 23]
Greek	[anthropomorphos]	ἀνθρωπόμορφος	["human-shaped"] (due to its anthropomorphic roots)	[45: IV,75]
Greek	[paidi]	παιδί	["child"] (may be because of its small, child-shaped root; less probable is because it may induce fertility)	[59: 442]
Greek	[arkánthropos]	ἀρκάνθρωπος	["bear-man shaped"] (due to its fat/hairy roots)	[62: 600]; [58: 2509]; [121: 357]
Latin	antropophora		["human-bearer"] (from Greek)	[45: IV,75]
Latin	semihomo		["half human"]	[45: IV, 75]
Polish	męzyk		["male"]	[12: 164]
Turkish	adamkökü		["man root"]	[122: 268]; [73: 107]; [90: 232–234]; [41: 124]
Turkish	adamotu		["man plant"]	[123: 21]; [124: 2]

Table 2 (continued)

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
Turkish	<i>insan kökü</i>		[“person root”]	[73: 107]; [28: 71]; [93: 232–234]; [41: 124]
Turkish	<i>insan otu</i>		[“person plant”]	[73: 107]; [123: 21]; [124: 2]
B2				
Arabic	[<i>fākihāt al—gūrāb</i>]	فاكية العرب	[“raven’s fruit” (the birds like this fruit)]	[125: 624–625] (Andalusia, 13th c.)
Arabic	[<i>sābizāj, šābizāj</i>]	صابيزاج, شابيزاج	[“a plant with black (dark) seeds” from Farsi: “ <i>sā(h)</i> ” which means black (cf. <i>šāh-tūt</i>) and “ <i>bizak</i> ” means seed, grain]	[84: 351] (Andalusia 6–7th c.); [126: 219]; [100: 106] (Syria)
Arabic	[<i>tuffāh</i>]	تفاح	[“The burning (or emitting a good odor) fruit” (name related only to the fruit of the plant)]	[86: 107] (Arabia, 9th c.); [85: 774] (Andalusia, 11th c.); [88: 592]; [41: 121]; [127: 285]; [128: 242] (Arabia, 9th c.); [129: 250] (North Africa); [130: 36] (Turkey); AGK Pers. obs.(Palestine)
Armenian	[<i>loštak, loštak</i>]	Լոշտակ	<i>Loštak</i> means literally “ear” (due to the fact that “the leaf is large and with many ridges like an ear” (Garnik A satirian, Pers. com. 30.10.19))	[63: i: 537]; [101: 154]
Farsi	[<i>šā(h)bizak</i> Spelling variants: <i>sābisaj / šbizak / sbyaq, šbysk</i>]	شابيزك	[“plant with black seeds”] (see above, also A. <i>bella donna</i>)	[130: 36]; [95: 688]; [100: 106]
Greek	[<i>avgoulátsa / avgoudátsa</i>]	αυγουλάτσα, αυγουδάτσα	[“bearing little egg-shaped fruits”]	[59: 430]
Greek	[<i>chondrovotáni</i>]	χοντροβοτάνι	[“fat herb”] (probably due to its large leaves or its fat taproot)	[59: 439] (Lakonia)
Greek	[<i>kourouniá</i>]	κουρουνιά	[“crow nest-shaped”] (leaves)	[59: 433–434] (Nisyros and Leros islands)
Greek	[<i>megalovotáni</i>]	μεγαλοβοτάνι	[“large herb”] (due to its large leaves or fat taproot)	[59: 439] (Lakonia)
Greek	[<i>prapútsa</i>]	πραπούτσα	[“shoe-shaped”] (leaves)	[59: 440] (Cyprus)
Serbo-Croatian	[<i>nadliška</i>]	Надлишка	“ <i>Nad</i> ” means over, above; “ <i>liška</i> ” means leaf. Probably the word means something stronger or more important than leaf (which is close to the root in the mandrake) or could also emphasize the fruit (“above the leaf”)	[71: 20]
Serbo-Croatian	[<i>veliko zelje</i>]	велико зелье	“ <i>Veliko</i> ” means great, large, big; “ <i>zelje</i> ” means greens or herb. The word could implicate “a great herb” because of its relatively large (long) leaves	[71: 20]
Serbo-Croatian	[<i>vodopić</i>]	водопић	“ <i>voda</i> ” means water, “ <i>pit</i> ” means to drink; literally “ <i>vodopić</i> ” is one who drinks water; could be linked to shiny intense green leaves (?)	[71: 20]

Table 2 (continued)

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
Serbo-Croatian	[veliko zejle / velje zejle]	велико зелье	"Veliko" means great, large, big; "zejle" means greens or herb. The word could implicate "a great herb" because of relatively large (long) leaves	[71: 20]
Spanish	<i>lirios</i>		["lily flower"] (resemblance to lily flower)	[131: 175]
Turkish	<i>beş damar otu</i>		["five-veined plant"]	[41: 124] (North Cyprus)
Turkish	<i>lüffâh</i>		<i>Luffah</i> ; mandrake's fruit in Arabic	[41:124]; [87: 293,340]
Turkish	<i>lüffâh-ı berry</i>		["wild luffah"] (see <i>Luffah</i>)	[41: 124]
B3				
Arabic	[<i>tuffâh al-barî</i>]	تفاح البر	["wild apple"]	[132]
Arabic	[<i>tuffâh bitanzân</i>]	تفاح بطنجان	["eggplant's apple"]	A local name in the Galilee. Israel (SAH Pers. Obs)
French	<i>belladone sans tige</i>		["belladonna without a stem"]	[31: 43]; [28: 71]; [29: 336]
French	<i>pomme terrestre</i>		["earth's apple"]	[112: 225]; [133: 184]; [113: 8]
German	<i>borchart</i>		<i>Burcher</i> : a popular name for <i>Atropa belladonna</i> (Hambel 2002:330)	[75: 229]; [134, III: 53]; [31: 41]; [30: 330]
German	<i>erdapfel, ertapfel</i>		["Earth's apple"]	[83: 258]; [118: 355]; [119: 137]; [75: 22]; [134, III: 53]; [31: 41]; [30: 331]
German	<i>malzapfel, maltzapfel, melzih apfel</i>		Seems to be a corruption/translation of " <i>pomum macianum</i> "	[136: I:2021]; [135: 23]; [137: 84]; [134, III:53]; [81: 23]
Greek	[<i>mala silvestria</i>]	μάλα σιλβέστρια	["wild apples"]	[45: IV:75] (Romans in Greece)
Greek	[<i>mala terrestria</i>]	μάλα τερρέστρια	["Earth's apples"]	[45: IV:75]
Greek	[<i>milopeponia</i>]	μηλοπηπονιά	["apple-melon tasting"]	[62: 600]; [121: 357] (Cyprus); [59: 440]; [60: 408]
Greek	[<i>milidkos</i>]	μηλιάκος	["apple-like"]	[60: 408] [58];
Greek	<i>θηριακία (f) / θηριακίας (m)</i>	θηριακία (f)/θηριακίας (m)	["lettuce-looking plant"]	[45: IV:75]; [61: 9,8,8]
Latin	<i>malum terrae, mala terrestria</i>		["Earth's apple"/ "Earth's apples"]	[84: 351] (Andalusia, 6-7 th c.); [79: 6] (Spain). [45: IV:75]
Latin	<i>thridakia, thridaks</i>		["lettuce-looking plant"]	[45: IV:75]; [138: 419]
Serbo-Croatian	[<i>divlja jabučica</i>]	Дивља Јабучица	["wild small apples"] " <i>divlja</i> " means wild and " <i>jabučica</i> " means small apple	[71: 20]
Slovak	<i>Pěkná jablečka</i>		["beautiful apple"]	[139: 359]
Spanish	<i>manzana de tierra</i>		["Earth's apple"]	[131: 192]
Spanish	<i>acelgón, acelgones</i>		["chard"] (due to the leaves resembling this plant)	[66]

Table 2 (continued)

Language/sub-category	Name	Ethnic transcription	Meaning	Selected references
Spanish	<i>berengenilla, berenjenilla</i>		["little eggplant"]	: [66] [72: 585]
Spanish	<i>berenjena mora</i>		["Moorish eggplant"]	[66]
Spanish	<i>lechuguilla</i>		["small lettuce"]	[66]
Spanish	<i>tomatico</i>		["small tomato"]	[66]
Spanish	<i>uva de moro</i>		["Moorish grape"]	: [66] [72: 585]
Turkish	<i>luffah-ı berri</i>		["Earth loofah"]	[41: 124]
Turkish	<i>toskafa kavunu</i>		["butting head melon"] (because it looks like a head that butts)	[73: 107]; [123]
Turkish	<i>yer elması</i>		["Earth apple"]	[73: 73]; [123: 21]
Turkish	<i>yer yenedünyası</i>		["Earth's loquat"]	[41: 124]; [123: 21]

“knowing all magic,” or “mighty secret” [208: 237, 214: 34]. Referring to the highly uncertain etymology of the name, Kluge [214: 34]) also but hesitantly suggests the meanings “highly cleft” or “covered with wrinkles” as possible etymological interpretations.

We found nine names in seven languages in which the plant is called *alraune* and/or its derivatives. Most of these occur in different German variants (32); two variants are in Serbo-Croatian and the rest are Scandinavian languages.

The origin of “yabrouh”: The biblical (Genesis 30:14–16; Songs of Songs 7:14) “דודאים” [*duda'eem*) was translated into Aramaic by Onkelos (35–120 BCE [93]) as “יברוה” ([*yabrouh*]) and this name also appears in the Midrash, Bereshit Rabbah 72.5 (217) [בראשית רבה], a religious text from Judaism’s classical period, 3–5th c.) and the Talmud (4–5th c. BCE, Sanhedrin 99b; Erubin 10:26a [93]), as one of the names of the mandrake. This interpretation is accepted by the common Aramaic dictionaries (e.g., [218: 562, 219: 234, 220: 329, 221:197]) as well by the most important Jewish Bible commentaries (e.g., Avraham Ben Meir Ezra (Ibn Ezra), 12th c. [222] and Mōšeh ben-Nāḥmān = Ramban (Nachmanides), 13rd c. [223]). Although some other identifications for *duda'eem* have been suggested, e.g., by Rashi (Shlomo Yitzchaki 1040–1105) in his authoritative interpretation of Genesis, they are not accepted by later authors (e.g., [224: 323–325, 186, III: 363–368]).

While there is general acceptance concerning the botanical identity of the “*yabrouh*” as mandrake, there are several debatable interpretations concerning the etymology of this name, as follows:

1. *Yavruha* (יברוהא), “the chaser” (the root b-r-ḥ means to chase); a plant which chases the demon away [225: 298 Note 189].
2. According to Wetzstein [226: 441] [*jebrūah*] means “it (only) needs life.” This is equivalent to saying that the root is so like a human body that it only needs to have a soul breathed into it to become a small human being. The author relates this name to the Farsi [*medumgiā*] = “the plant man.”
3. Ascherson [191: 890] mentions that today’s name for mandrake in Syria is [*ḡerābūh*], which is likely an intentional corruption of the literary Arabic name [*jabrūh*], which would not provide the Syrians with a suitable meaning, whereas *būh*, the final syllable of [*ḡerābūh*], denotes sex drive, and thus the word can be given the meaning of “aphrodisiac,” as indeed the mandrake fruits were considered to be (in Genesis 30, 14) and still are today.
4. “Soul-giver,” “spirit-giver” *yavee* [יביא = “will bring,” *ruh* = [רוח] = “soul” [191: 890]. This author thinks

that *yabrouh* is Syro-Arabic. According to Elliot [227: 203], Aramaic *yahb-rouh* = giver of life.

5. Nathan Ben Yeshaya (Yemen 14thc.) explains: “*yabroukh*, since its nature is that the one who pulls it out will lose his spirit” [228:151].
6. According to Ibn Sina, “*jabrol*” (a derivative of *yabroukh*) is the root of the mandrake and could be a name for any natural object, for instance a growing plant, in human shape (Ibn Sina, Canon of Medicine, Lib. II, Trsacii, Cap 365; cited by [229: 70].
7. Fleisher and Fleisher [230: 245] suggest that [*yabruḥ*] comes from Arabic [yā-abu-er-ruḥ], which means “O master of breath,” (but in Aramaic it is the opposite meaning; see [231: 169].

We found eight names in five languages in which the plant is called [*yabroukh*] and/or its derivatives. Its derivatives appear only in Arabic (6), Aramaic (3), and Bengali (1). The Farsi name [*sāyeh-borūj*] may also be related to this group.

Names related to the plant’s morphological characteristics

Names related to morphological characteristics are the most frequent ones in all languages (up to 79 names within this category, 27% of total names, see Fig. 2), especially those connected with the root form and the similarity with other plants.

Root

Mandrake is a classic exemplar of the doctrine of signatures: this could be stated as form recapitulating function—physical characteristics of plants reveal their therapeutic value [232: 256]. The root resembles the human form (anthropomorphic)—symbolically, it is equivalent to the “root” of the human being, sexuality, and further, to fertility [11: 144] and love philtres [231, II:715]. Schultes and Hoffmann [117: 185] suggest that the European fear of the mandrake during the Middle Ages was due to doctrine of signatures. It was Pythagoras (in Dioscorides *Materia Medica* I.570 [45, I.570]) who gave the name *anthropomorphos* (ανθρωπομορφος, which means “shaped like a man”) to the mandrake. It is not surprising that 33 names in 13 languages are connected to the similarity of the mandrake’s root to the human body, of which seven are in German, six in Dutch, and four in French. Thus, the anthropomorphic view of the mandrake, as reflected in its names, appears especially in western European languages.

Leaves, fruits, and seeds

Few names are related to the shape of the leaves of the mandrake such as: *loshtak* [“ear”] in Armenian, [“five-veined plant”] in Turkish, and *papútsa* [“shoe-shaped

leaves”] in Greek. These names are also related to other plant species. The Arabic name [š'bysk] originated from Farsi *šā(h)*- “black” (cf. *šāh-tūt*) and *bīzak* “seed, grain,” meaning “(a plant with) black (dark) seeds.” Isidore of Seville (Archbishop of Seville, c. 560–636 CE) wrote [84: 351]: “Mandrake is so called because it has a sweet-smelling fruit the size of a Matian apple; hence Latin speakers call it “apple of the earth.” Eighteen names in seven languages denote the resemblance of the mandrake to the apple. Many other names, such as [“dog’s apple”] and [“devil’s apple”] are assigned to other categories.

Similarity to other plants

Although the mandrake is a well-known and very distinctive plant, sometimes its name refers to another plant. This could be because the other plant is better known locally, usually because it offers big, edible fruits (such as names related to apples, tomatoes, or even loquat). Such names are, e.g., [“wild tomato”] in Italian, [“eggplant”] in Spanish and Arabic, and [“earth loquat”] in Turkish. Conversely, we should mention here that the name “mandrake” has been also used for other plant species (see “Introduction” section).

Gender distinction

Our results also show that after taking into consideration the opinions explained in the introduction, the distinction between the male and female mandrake, made in ancient times, seems to have been a mental, intellectual, or scholarly construction. No true vernacular names allude to the gender of mandrake plants.

Names related to the plant’s uses

Medicinal properties

Mandrake (*Mandragora* spp.) is perhaps the most famous medicinal plant in western culture since biblical times and throughout written history. This view has been clearly expressed by several authors, with statements such as: “Of all the medicinal herbs used in the ancient and medieval world, none was regarded with as much fear or wonder as the mandrake” [234: 189]). Harrison [171; 91] mentions that the plant’s medicinal virtues appear to have been discovered at a remote point in the development of ancient cultures, and although magical and superstitious beliefs tended to accompany its use, it seems clear that the narcotic qualities of the mandrake were appreciated through the entire period of its usage. Therefore, it is not surprising that “there is no medicinal plant known around which cluster more mysterious and quaint associations than around mandragora” [235: 6]. Mandrake was considered a panacea, especially in the Middle Ages [236]. In Wright’s [237: 182] words, “Mandrake is a cure for all except death.”

Thus, it is not at all surprising to find eleven names in seven languages that reflect the importance of the mandrake as a panacea down the generations. It is noteworthy to mention the names [“father of health”] in Arabic and Turkish, and [“doctor’s plant”] in German. The Armenian name [“king of all grasses”] deserves special attention. Arakelova [101: 153] mentions that in the Armenian folk tradition, the mandrake is “the king of all plants.” Its obvious sacred meaning among Armenians and its high estimation as a real panacea is proved by the existence of a special prayer-praise called *Ayot ‘k ‘ vasn loštakin* [“the Prayer to the mandrake”] [238: 285–286]; “You are the king of all the plants!/Almighty God created you and endowed you/With talent the of healing of people and nations/From all known illnesses in the name of the invisible and eternal God...”

Three names of the mandrake indicate specific medicinal uses of this plant. The Greek names *fistuloriza* and *fistulochorito* mean [“fistula-healing root”] a use already mentioned by Hippocrates, *Fistulae*.11 [239: 822]; 4th–3rd BCE. The Turkish name *kankurutan* [“blood dryer”] reflects this use as indicated from Syria–Iraq in the 12th c. [144, II: 334] to “flow of the blood” and from Turkey [240: 2011] to “stops fever of the bile and blood.”

Narcotic, hallucinogenic, poisonous

Hyoscyamine and scopolamine (or hyoscyne) stand out among the major tropane alkaloids in mandrake [241], although several other alkaloids are present [231, 242–246]. These tropane alkaloids are antagonists of muscarinic receptors (thus, with parasympatholytic effect), and have been described as having psychedelic and hallucinogenic properties. In higher doses, they may cause chronic spasms, a strong heartbeat, tachycardia, dilation of the pupil, inhibition of salivation, respiratory arrest, and coma. Therefore, mandrake was regarded as extremely hazardous to the level of being a mind-altering substance [241].

These widely known effects (narcotic, hallucinogenic, and poisonous) are reflected in 21 names in eight languages. Out of these, six names are related to the somniferous effect of the plant and eight to madness. The rest are related to poisoning, intoxication, and the causing of death.

Aphrodisiac

The reputation of mandrake as an aphrodisiac first appeared in biblical times (Genesis 30: 4–16). It was noted by Theophrastus in the 4th–3rd c. BCE [61, IX, 8. 8] and was widely expanded and iconographically depicted and transmitted in the medieval period, with reference mainly to the fruits [24]. Benítez et al. [13] found that this use was popularized in the last century

and remained in the tradition with limited citations throughout history. A possible explanation has already been pointed out: “the fruit of the mandragora became a symbol of love” [247: 90], but not for actual use. Hanuš et al. [243] found no fewer than 136 chemical compounds in the mandrake fruit, but none of them is known to have an effect on human sexual behavior. They conclude: “The main compounds found in the ripe fruit and undetected in the unripe fruit are likely to be responsible for the fruit’s special taste and odor and its so-called aphrodisiac qualities.” Therefore, although mandrake’s aphrodisiac properties have never been pharmacologically proven, still today the fruit is eagerly sought for this purpose throughout its distribution range (especially in the south-east Mediterranean and the Balkans; [13]). Nevertheless, the profound of the Bible as well as local traditions are so deep rooted in many cultures that no less than 17 names in ten languages are related to love (especially “love apple or berry” (3) and “love plant or herb” (5), or other love-related attributes (e.g., [“the fruit that gets the lovers close”] and [“the dependent bride”] in Arabic). The relatively low number of names relating the mandrake to love and as an aphrodisiac (category C3; only 5.7% of total) reflects its rather rare use for this purpose down the generations. We note that many of the names related to the use of the plant come from ethnobotanical sources with field data from interviews with local people, or compendiums of these sources. Mentions of the plant, its names, and the different popular uses of it are not scarce in ethnobotanical works focusing on areas where it is native (e.g., [72, 129, 131, 167, 173] and references therein).

Names related to the plant’s mythology

Black magic—sorcery, witchcraft, and magic, bad luck, and evil eye

Mandrake is probably the most celebrated of all “magical” plants in history and has thus given rise to a mammoth literature [12: 161, 248: 110, 249: 94]. The magical powers ascribed to the mandrake, both benign and evil qualities, made it an object of awesome veneration. In the folk imagination, the mandrake was conceived as a being with obvious ties to underworld forces [100: 105, 101: 153]. In many cultures, the mandrake has a notorious reputation as a plant used in black magic and witchcraft [250: 532]. In the Middle Ages, the mandrake was an indispensable element in the witch’s cauldron [44: 112, 109: 71]. Because the root has an uncanny resemblance to human limbs, the mandrake was considered half demon [251: 3], with great magical properties [252: 71].

The mandrake contains narcotic and hallucinogenic compounds which have the ability to heal, to injure, to cause madness, to induce a shamanistic trance, or to kill [117, 171, 179, 253], as is the case with other narcotic

magical plants [27, 254, 255]. The ultimate result is that mandrake has a role in magic [142, 200, 235] and witchcraft [179, 256:166], especially during the Middle Ages [77]. Most famous was its use in witches’ flying ointment during the Middle Ages [29, II:342, 182, 257:166, 257:passim]. Witches’ activities are inseparable from demonic/devilish/Satanic worship; thus, the distinction between names related to witchcraft and those related to the devil/Satan is made from a purely technical viewpoint.

In our analysis, we recognize three subcategories related to this wide issue. Thirteen names in eight languages were found related to black magic and witches and witchcraft such as [“sorcerer’s root”] in English and Russian and [“magic root”] in Estonian, Dutch, and German. Four names are related to witches: [“witches’ herb”] in Dutch, English, and German, and [“witches’ love root”] in Dutch. All these names related to witches are from European countries which are beyond the natural distribution of the mandrake.

Evil supernatural elements—satan, devil, genie, monster, and dragon

Hildegard von Bingen (1098–1179 CE) stated: “The mandrake takes on and holds the influence of the devil more than other herbs because of its similarity to a human” [258: 33]. According to Thompson [251: 66–67], the narcotic effect of the mandrake, which may also cause death, is the reason for the plant’s association with the devil or an indwelling demon. In some places (such as England), it was still believed in the nineteenth century that the devil/Satan was perpetually looking on [180: 60].

Many authors discuss the relation between the mandrake and the devil/Satan [29, II:346, 33, 259]. The mandrake legend was at its height during the fifteenth, sixteenth, and seventeenth centuries, a period during which belief in the devil acquired an intensity and an immensity of scope unknown before or since [122: 268].

Twenty-eight names in nine languages were connected to various supernatural agents due to the narcotic and hallucinogenic effects. Nine names include the devil (e.g., [“devil’s plant”] in Dutch, [“devil’s apple”] in English, German, and Hungarian; [“devil’s food”] in English and Dutch); eight are related to various demonic Muslim figures (mainly *goula*, *jinn*), to Satan (e.g., [“Satan’s testicle”] in English, [“Satan’s apple”] in German, [“Satan’s turnip”] in Turkish), and three names include the word dragon: [“dragon’s apple”] in Dutch, [“dragon’s puppet”] in German, and [“dragon’s doll”] in English. Six names refer to various other evil agents, (e.g., [“little imp-man”], [“demon’s root”], and [“demon’s herb”] in German, [“goblin”] in Greek, and [“ghost’s apple”] in Turkish). It is noteworthy that while black magic and witchcraft names are restricted to Europe, the various other demonic figures

appear in almost all the distribution range of the mandrake, probably as a result of its narcotic effect that was considered to be caused by supernatural evil, in addition to the “demonic” human-like root shape.

White magic—good luck, talisman, and dolls

The mandrake root was carved into human-like puppets or dolls which were highly regarded as omnipotent talismans [29, II:343–344, 56: 54–64, 122:26, 200:406, 201: 126–127]. The virtues ascribed to these dolls are not always the same: some act as love charms, others make the wearer invulnerable. But they all have two properties in common. They reveal treasure hidden underground and relieve their owner of chronic disease [122: 267]. These dolls were carefully treated, dressed in expensive clothes, fed (with food and wine), and were kept in special boxes with great tenderness [29, II:343–345, 215, 4:1674, 260, II:726, 261, III:487]. Germans formed little idols from mandrake roots and consulted them as oracles [180: 293]. In German folklore, mandrake came to be identified with the *alrune*, a devilish spirit and a magic root in human form who, when questioned, reveals all secret things touching welfare and increases possessions, enriches, removes all enemies, brings blessing on wedding, and doubles every piece of coin laid under her [122: 262].

Few names are related to the positive fabulous powers of the mandrake doll/root which were used in white magic. According to De Cleene and Lejeune [29, II: 343], the German names *geldmännchen* (“money manikin”) and *glücksmännchen* (“good luck manikin”) reflect its ability to double money [29, 215, I:94, 262: 282]. Two other German names, *hausväterchen* [“little house father”] and *hinzelmännchen* [“gnome”] refer to a legendary creature resembling a tiny old man who lives in the depths of the earth and guards buried treasure; a gnome, while [“house’s father”] in German denotes the mandrake as a keeper of good luck. The French name *plante qui chante* [“singing plant”] even while not explicitly mentioning a doll is also related to the miraculous positive powers of the mandrake. In France (19th c.), the mandrake was thought to have the ability to sing, and its song had the magical potential to endow the alchemist with powers of transformation...just like the philosopher’s stone [263: 240–241].

Pulling-out ceremonies and supernatural phenomena

The andromorphic shape of the mandrake’s root caused it to be considered a semi-demon; thus, it screams while being pulled out and may cause death. This is the reason why a dog was used and why there was the need to close the ears [251: 3]. The pulling out of the mandrake, which is related to its supernatural evil powers, is threatened by

revenge from these powerful agents [180, 201: 124–125, 210: 17–18, 251: 153]. This is the very reason why special ceremonies needed to be performed before and during the digging out of the mandrake to pacify these elements. Otherwise, they might immediately kill the herb collectors (“rhizotomies”) if they did not take the proper precautions to avoid the expected dangers as stated above. The main elements of the ceremony are special incantations, prayers, and dances, and the use of a dog.

The first to mention the use of a dog while pulling mandrake is Flavius Josephus (first c. CE), provided that the plant name he mentions, “*ba’aras*,” really is the mandrake, as it is agreed to be by most authorities (e.g., [186, III: 368]). According to Josephus, *Jewish War* VIII:6.3 [264], the dog dies immediately. The dog is mentioned again in relation to mandrake pulling-out ceremonies in Iran in the sixth c. [111: 2], Syria, twelfth c. [144, II: 708–710], Uzbekistan (today’s borders), thirteenth c. [41: 116], Andalusia, thirteenth c. (under the name [“dog killer”] [125]), Hindustan, fourteenth-fifteenth c. [154, 6, footnote 4], Dagestan, sixteenth c. (possibly associated to *M. turcomanica*) [198: 409], Armenia, eighteen c. [265: 99] and again in Iran [266: 13] (period not given). The dog was used as a scapegoat to avoid the danger of immediate death caused by the voices that the plant produces. The Avars of Dagestan (northern Caucasus, Dagestan) call this herb *xIapuleb xer* [lit. “barking grass,” “grass (causing) barking”] [184: 1486], and call their witches simply *xIapulel ruččabi* [“barking women”], since the witches bark during the digging ceremony [102: 251–2]. In the Yezidi folk tradition, to avoid death, the soil must first be dug around the root, after which a hungry dog or a goat is tied to it [101]. The first pictorial reference linking the plant to the dog appears to be in the 6th c. in Europe: the illustration of Dioscorides with the nymph Heuresis in the so-called Vienna Dioscorides or Juliana Anicia Codex [142: 69] and later only from the 12th c. onward [142: 69, 201: 380]. Our survey includes 15 names in nine languages which relate mandrake with a dog. Two names ([“dog’s apple”] in Dutch, French, German, Greek, Italian, and Turkish and [“dog’s testicle”] in Turkish) include the word “dog,” while four ([“dog killer”] in Arabic, [“dog uprooter” = dog killer], [“dog killer”], and [“dog breaker”] in Farsi) explicitly express the fate of the dog in the ceremony. While the general names are mainly from Europe, the four specific names are in Arabic and in Farsi. This list, combined with the literature on the role of the dog in the ceremony from Iran and adjacent countries, strongly sustains the view that the use of a dog in this ceremony originated in this region.

It is commonly stated in the literature that when being pulled out, the mandrake will let out a scream and the dog will die [54: 46, 251: 168–170]. An erudite analysis by

Van Arsdall et al. [142: 317] shows that the screaming element only reached Europe from the twelfth c. In the first record of a mandrake pulling-out ceremony in the Middle East from Flavius Josephus [264: VIII:6. 3] (1st c. CE, Judea), there is no mention of a scream. A Syrian-Jewish story composed in Damascus in the twelfth–thirteenth centuries [215: 14] mentions the scream. The belief in the screaming mandrake still exists in and around Iran. For example, in northwest Iran there is a belief even today that the mandrake “groans” [267: 54–65]. In Armenia, in the eighteenth century, it is mentioned that the mandrake “moans with a human voice” [265: 99]. In the Yezidi folk tradition, the mandrake supposedly shouts so shrilly that one who digs it up dies at once [101:153].

We found seven names related to the scream (Tables 5 E1, 9), all of which are from Europe, particularly Poland (3 names), where mandrake was widely used in witchcraft to prepare flying ointment, mainly during the sixteenth–seventeenth c. [182: 180]. Mandrake does not grow in Poland, and both the term and the folklore attached to *M. officinarum* have been applied to local herbs, usually *Atropa belladonna*, deadly nightshade [12: passim, 182: 194–195]. However, it is not at all clear why mandrake was so tightly related to the element of the scream in Poland. The first records about the screaming mandrake appear simultaneously in Europe and the Middle East in the twelfth c. The prevalence of this belief in northwest Iran and Armenia nowadays may serve as indirect evidence for its origin in this part of the world. Rahner [199: 214] assumes that the scream was imported from Arabic or eastern sources without giving any references.

Mandrake may shine and produce lights: the first to mention the burning mandrake was again Josephus Flavius [265, VIII:6.3] (we accept the general agreement that his plant named “*ba'aras*” is the mandrake; see [186, III:365]). In the Herbarium Apuleii Platonici, the author (4th c. CE; see [268: 39]) states: “it [the mandrake] shineth at night altogether like a lamp.” The Arabic name *sirag al kutrub* is usually translated as [“the devil’s candle”] [189, I:49, 190: 250]. Al Baithar [88: 14] wrote, “this medicine (the mandrake) is called *sirag al kutrub* and is like a torch at night ... the cortex of the root (is like) fireflies which glow at night...it looks like a fire.” Richardson [189, I:49] explains: “The devil’s candle, on account of its shining appearance in the night, from the number of glow-worms which cover the leaves.” Another Arabic name, [“the burning mandrake”] corroborates this tradition. Roger [269: 47] visited the Holy Land in the 17th c. and reported that the mandrake emits sulphurous vapors and glows at night. Stories of the shining mandrake are frequently repeated by European sources (e.g., [142, 190, 250, 270:144, 271: 330]). Arakelova [101: 153] mentions that the Yezidis believe that at night mandrakes glitter

and their leaves look like silver. So, this ancient belief still survives to this day in Iran and Armenia.

Thief, gallows, semen, and the mandrake

The belief that the mandrake grew under the gallows from the semen of hanged victims [142, 195:59–60] was first recorded in 1532 by the physician and botanist Otto Brunfels (1488–1534) and later became widespread in European medical literature during the seventeenth century [142, 201:121–122]. However, the gallows mandrake tradition was strongest in German lands [195: 60]. Talley [74: 166–168] relates the legend that mandrakes come from the urine or semen of a thief hanged on the gallows to sacrificial rites and myths of pre-Christian Germanic people. He finds parallels between Odin’s human sacrifice (in Nordic mythology) and the growth of the mandrake from urine or semen under the gallows, while Randolph [200: 495] connects it to the myth of Prometheus (see below). Starck [56: 79] already concluded that the belief in the mandrake as a magical plant with human form which grew from the semen of a sleeping or dead man had its origins in Mesopotamia or Persia (see [41: 115] for the same view), while according to van Arsdall et al. [142: 330]: “Its origin is not known at the present time.”

Another aspect of the mandrake-gallows connection is “the hand of glory.” The dried hand of a hanged man was believed to have magical properties and was used by thieves and burglars [272: 99–100]. The notorious hand of glory is known in French as the *main de gloire*, which is thought to be a corruption of the French for mandrake: *mandragore*. There is an obvious shared association with the gallows corpse [195: 62]. The myth arose among thieves and illiterate persons during the Middle Ages in France through a misunderstanding of words, *mandragore*, the French term for the mandragora or mandrake, being mistaken for *main de gloire*. The term *mandegloire* is given as a popular synonym for *mandragore* [273: 59].

All the names (14) related to gallows are from Europe, especially from Germany (7) and the Netherlands (4): it is logical to think that Europe must be the cradle of this myth. Examples are: [“gallows’ youngling”] and [“gallows’ man”] in Dutch; [“torturer’s root”], [“little gallows’ man”], [“executioner’s root”] and [“piss thief”] in German.

Names related to religion and historical characteristics

Adam’s creation

Hildegard Von Bingen (twelfth c.) posits that the mandrake came forth from the same seed from which Adam was created, and to some extent its shape resembles that of man [258: 1151A–1152A]. According to a Persian myth, man was created from a plant that resembled a human shape; this plant is a rhubarb (*Rheum*

Table 3 C. Pharmacological characteristics and medicinal uses: C1. Medicinal properties; C2. Narcotic, hallucinogenic, poisonous; C3. Aphrodisiac

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
<i>C1</i>				
Arabic	[<i>abu salām</i>]	أبو سلام	["father of health"]	[145: 709]
Arabic	[<i>abd es-salām</i>]	عبد السلام	["the servant of health"]	[122: 268]
Armenian	[<i>t 'agawor amen Xotic</i>]	Թագաւոր սւնն խոտից	["king of all (every) grasses (and forbs)"]; see text	[141: 389]; [101: 153]
German, Old	<i>ârzat uvûrze, arzanwurt, arzatzwurz</i>		["doctor's root"]	[75: 229]; [137: 93]; [134, III:53]; [31: 41]; [114: 330]; [30: 330]; [142: 38]
German	<i>heilmännchen, heilmännlein</i>		["healing male"/healing man-nikin	[120: 113]; [31: 41]; [81: 23]
Greek	[<i>fistulôrizā</i>]	φιστουλόριζα	["fistula-healing root"]	[143: 331]; [59: 427,435]
Greek	[<i>fistulôchorto</i>]	φιστουλόχορτο	["fistula-healing herb"]	[59: 445]
Serbo-Croatian	<i>bunovina</i>	Буновина	" <i>bunilo</i> " (root of the word) means delirium, madness	[71: 20]; [70: 291]
Turkish	<i>ebîselâm</i>		["father of health"]	[41: 124]; [124: 2]
Turkish	<i>hastalık otu</i>		["sickness plant"]	[41: 124] (North Cyprus)
Turkish	<i>Kankurutan</i>		["blood dryer"] (because it is believed that it stops bleeding; see text)	[144: 334]; [73: 107]; [28: 71]; [41: 124]; [123: 21]
<i>C2</i>				
Dutch	<i>doodkruid</i>		["death's herb"]	[83: 258]; [28: 71]
Dutch	<i>slaapappel</i>		["sleep's apple"]	[145: 263]; [146: 940]
Dutch	<i>slaapkruid</i>		["sleep's herb"]	[146: 940]
English	<i>brain thief</i>			[109: 70]; [147: 169]; [148: 3]
English	<i>divine root</i>		May be due to its hallucinogenic effect	[30: 331]
English	<i>fool's apple</i>		May be due to its hallucinogenic effect	[149: 316]
Gaelic	<i>codalian</i>		["sleep apple"]	[83: 258]; [150: 139]
German	<i>doilwurz</i> Spelling variations: <i>doilwurz, dolwurtz, dollwurz, tollwurtz, dilwurz</i>		["mad root"]	[75: 229]; [134, III:53]; [120: 113]; [31: 41]; [30: 331]; [114: 15]
German	<i>dollblume</i>		["mad flower"]	[81: 23]
German	<i>schlafbeere, schlafbeer</i>		["sleep berry"]	[30: 334]; [81: 23]; [31: 42]
German	<i>tollkraut südliches</i>		["southern mad herb"]	[119: 137]; [31: 42]
German	<i>schlafapfel, schlaf-aepffel</i>		["sleep apple"]	[150: 693]; [119: 137]; [135: 23]; [134, III:53]; [31: 42]; [30: 334]; [81: 23]
German, Old	<i>twalm, tuualm</i>		["sleep"]	[134, III:53]; [31: 42]
Greek	[<i>alitis</i>]	ἀλιτίς	["deceiving, alluring, seductive"]	[45: IV,75]
Greek	[<i>ippóflomos</i>]	ἵπποφλωμος	["driving horses dizzy"]	[59: 446]
Greek	[<i>mórión</i>]	μώριον	["stupefying plant"]	[45: IV,75]; [61: 9,8,8]
Greek	[<i>trellôchortaro</i>]	τρελλοχόρταρο	["madness herb"]	[59: 439]
Greek	[<i>vomvôchylos</i>]	βομβόχυλος	["humming-inducing juice"; "intoxication-inducing juice"]	[45: IV,75]
Greek	[<i>rigaléos</i>]	ρίγαλέος	["shiver-inducing, thrilling"]	[45: IV,75]
Hungarian	<i>bolondfű</i>		["fool's grass"]	[152: 41]
Spanish	<i>cerezas de sapo</i>		["toad cherries"], maybe due to the poisonous effect of toads	[66]
<i>C3</i>				
Arabic	[<i>'arūsa</i>]]a]	عروسانة	Diminutive of ["a bride"]	[125: 624–625] (Andalusia, 13th c.)

Table 3 (continued)

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
Arabic	[ħabb at-taʕlīf]	حب التاليف	["the fruit that gets the lovers close"]	[125: 624–625] (Andalusia, 13th c.)
Arabic	[luʕba muṭallaqa]	لعبة مطلقه	["the expelled bride"]	[99]
Arabic	[luʕba muʕallaqa]	لعبة معلقه	["the dependent bride"] (lit. "The married bride")	[99]
Danish	<i>kærlighedsæble</i>		["love apple"]	[153: 81]
Farsi	[meh̄r gīyah, mīhrgīāh]	مهر گیاه	["plant of love"]; "meher" means affection, "gīah" means grass	[154: 6 note 4]; [95: 152]
Finnish	<i>lemmenmarja</i>		["love berry"]	[155: 261]
German (old)	<i>chindelina wurz</i>		["little child's root"] (see text)	[156: 118]; [31: 41]
German	<i>kindleinkraut</i>		["child herb"]	[120: 113]; [114: 15]; [81: 23]
German	<i>liebesapfel</i>		["love apple"]	[114: 15]; [81: 23]
German	<i>liebeswurz, liebeswurzel</i>		["love herb"]	[114: 15]; [81: 23]
Greek	[semnikobótano]	σερνικοβότανο	["male-birth-inducing herb"]	[59: 441]
Hebrew	[dudaʕem]	דודאים	Probably related to "דוד" meaning love	Genesis 30:14–16; Song of Songs 7:13
Turkish	<i>ayikotu</i>		"vivacity grass"	[157]: 128
Turkish	<i>muhabbet otu</i>		["love plant"]	[73: 107]; [124: 2]; [41: 124]; [90: 232–234]
Turkish	<i>sevgi otu</i>		["love plant"]	[41: 124]; [90: 232–234]
Ukrainian	[lubovyča]	любовица	["love plant"]	[12: 162]

spp., originally named "ribas"). The tradition says that Gayōmart, the first man, was created by Ahuramazda. When he died, there came a seed from his loins ... (it was kept inside the soil. After forty years, it changed into ribas (or a mandrake) [266: 12]). Eliade [274] has already pointed out the striking similarity between the myth of *Gayōmart* and the traditions about mandrake; the union of anthropomorphic plant and shining power which fertilizes the earth. *Gayōmart's* seed creates a hybrid creature, partway between a human being, an animal, and a plant [275: 186]. Zarcone [41: 120] concludes: "mandrake follows in the tradition of all the myths that mention the birth of humans from the earth at the beginning of time."

Despite these ancient Iranian myths concerning the creation of the first man and mandrake, which may have migrated very late to the West, there is no name in this language related to this issue. The Russian ["Adam's head"] and the Turkish ["Adam's plant"] may hint at a relic of the ancient Iranian myth. One might consider that the German legend has a negative connotation (spawn of evil), and all the eastern myths (as well as Hildegard von Bingen's text [258]) have a positive one (creation of peoples).

King Solomon

The name ["King Solomon tree"] in Arabic and in Armenian is a relic of an old legend that there was a

piece of a mandrake in the ring of King Solomon, who used it against demons. This story follows an old tradition handed down under the name of Hermes Trismegistos via Ibn al-Bayṭār [276, III: 14] (13th c.). According to Amasiaci [198: 96], in fifteenth-century Armenia, mandrake was called ["the tree of Solomon"]; it was thought to bring its owner happiness and power over people.

Circe

Dioscorides [45: 4.75] cites a specific plant called by the ancients "Circe's root" (*kirkala rīza/κίρκαια ρίζα*) and, according to Pliny in *Natural History* [277: 25.147], as *Ciecaeon*, referring to the passage in the *Odyssey* (10.210–43) in which Homer describes Circe, the mythical sorceress who turned men into sexually supercharged swine. Several authors have suggested that this enchanted plant was the mandrake [199: 228–229, 200: 501–505, 201: 114, 278: 204]. So, it is not surprising that this name persisted in English as "herb of Circe," *Circée* in French, and *zauberpflanze der circe* ["Circe's magic plant"] in German.

Prometheus

Apollonius of Rhodes (third century BCE [279:3,843–868ff]) reports: "Prometheus was condemned to his punishment for theft...the flower sprang from his gore

Table 4 D. Magic and witchcraft: D1. Black magic, sorcery, witchcraft; D2. Evil supernatural agents—Satan, devil, genie, monster, dragon; D3. White magic, good luck, talisman, dolls

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
D1				
Dutch	<i>tooverworte</i> , <i>tooverworte</i>		["magic root"]	[146: 940]; [158: 255]; [159: 333]; [28: 71]; [105: 35]
Dutch	<i>heksenkruid</i>		["witches' herb"]	[146: 940]; [105: 35]
Dutch	<i>heksenloverworte</i>		["witches' love root"]	[28: 71]; [31: 45]
English	sorcerer's root			[12: 166]; [109: 70]
English	enchanter's nightshade			[54: 354]
English	witches' herb			[149: 316]
Estonian	<i>nõiajuua</i>		["magic root"]	Dainius Ražasuskas (Pers. Com. 12.3.19)
French	<i>herbe aux magiciens</i> , <i>herbe des magiciens</i>		["magician's plant"]	[160: 91]; [28: 71]; [31: 43]; [29: 336]
German	<i>hexenkraut</i>		["witches' herb"]	[83: 258]; [119: 137]; [28: 71]
German	<i>zauberwurzel</i> , <i>zauberwurz</i>		["magic root"]	[75: 229]; [134, ill: 53]; [31: 42]; [30: 335]; [114: 15]; [28: 71]; [80: 19]
Hungarian	<i>varázsgyökér</i>		["magic/miracle root"]	[161: 151]
Serbo-Croatian	[<i>skocel</i>] / <i>skočac</i>	Скоцель / Скоцац	The word " <i>skokat</i> " means jump, leap. Probably related to beliefs in a very "alive," restless, and troublous root, especially when pulled out from the soil / of " <i>skocelj</i> "; " <i>skočac</i> " means one who jumps	[71: 20]
Russian	[<i>koldunova trava</i>]	колдуньова трава	["sorcerer's herb"]	[83: 259]; [162: 1129]
D2				
Arabic	[<i>beḍ el-ḡūl</i>]	بيض الغول	["monster's eggs"]	[163: 34] (North Africa); [129: 167]; [92: 26]; AGK pers. obs. (Palestine)
Arabic	[<i>beḍ el-ḡinn</i>]	بيض الجنّ	["genie's eggs"]	[164: 114]; [165, ll: 261] (Palestine)
Arabic	[<i>bayḍ al-ḡūl</i> , <i>bayḍ el-ḡūl</i>]	بيض الغول	["Goula's (witches') eggs"]	[166: 47] (Morocco)
Arabic	[<i>xawx el-ḡinn</i>]	خوخ الجنّ	["the Jin's Peach"]	[167] (Lebanon)
Arabic	[<i>luffāḥ el-ḡinn</i>]	لقاح الجنّ	["the burning (or emitting a good odor) fruit of the Genie"]	[129: 167]; [92: 26] (North Africa)
Arabic	[<i>tuffāḥ il-maḡāl</i>]	تفّاح المجلّ	Probably derivative of <i>Tuffāḥ il-Maḡān</i> area	[168, l: 250] (Palestine, Gaza area)

Table 4 (continued)

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
Arabic	[<i>tuffāḥ il-ǧūla</i>]	تفاح العرلة	["Goula's apple"]	[163: 34] (Morocco)
Arabic	[<i>tuffāḥ al-ǧinn</i> , Spelling variants: <i>tuffāḥ al-maǧānīn</i> , <i>tuffāḥ al-maǧān</i> , <i>tuffāḥat al-ǧinn</i>]	تفاح الجن تفاح المجانين تفاح الجن / تفاحة الجن	["apple of the Genie/ apple of the genies"]	[84: 351] (Andalusia, 6–7th c.); [87: 54] (Arabia, 10–11th c.); [169, Ill: 21]; [170: 577] (Palestine); [164: 114]; [171: 87]; [172: 248] (Moorish Spain); [41: 121]; [89: 299] (Palestine); [90: 115]; [173: 73] (Palestine)
Arabic	[<i>tuffāḥ eš-šayṭān</i>]	تفاح الشيطان	["apple of Satan"]	[174: 587] (Palestine); AGK Pers. Obs. (Palestine)
Czech	<i>diavelsappl</i>		["devil's apple"]	[29: 346]
Dutch	<i>duivelsplant</i>		["devil's plant"]	[29: 346]
Dutch	<i>appeldragend</i>		["dragon's apple"]	[83: 258]; [28: 71]
Dutch	<i>duivelsete</i>		["devil's food"]	[29: 3346]
English	devil's apple			[175: 209]; [159: 332]; [176: 24]; [179: 64]
English	devil's food			[180: 60]; [181: 85]
English	dragon's doll			[149: 316]; [109: 70]
English	Satan's testicle			[149: 316]
German	<i>drachenspuppe</i>		["dragon's puppet"]	[30: 331]; [114: 15]; [80: 19]; [81: 23]
German	<i>satansapfel</i>		["satan's apple"]	[151: 693]; [81: 23]
German	<i>teufelsapfel</i>		["devil's apple"]	[134, Ill: 53]; [28]; [31: 42]; [30: 335]
German	<i>unholdwurz</i>		["demon's root"]	[134, Ill: 53]; [28: 71]; [31: 42]; [30: 335]
German	<i>unholdkraut</i>		["demon's herb"]	[75: 229]; [28: 71]
German	<i>wichtelmännchen</i>		["Imp"]	[120: 113]; [31: 42]; [30: 337]
Greek	[<i>kaldánthros</i>]	καλάνθρος	["Goblin"] because their root looks like <i>Kalikánt-zaros</i> , the goblin in Greek folklore	[177]
Hungarian	<i>ördögalma</i>		["devil's apple"]	[178]
Polish	<i>czartawa</i>		["the demon flower"]	[12: 164]
Turkish	<i>cinelması</i>		["ghost's apple"]	[73: 107]; [41: 124]
Turkish	<i>şeytan şalgamı</i>		["Satan's turnip"]	[41: 12]

Table 4 (continued)

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
D3				
French	<i>plante qui chante</i>		["singing plant"] (see text)	[28: 71]
German	<i>geldmännlein,</i> <i>geldmännchen</i>		["little money-man"]/ ["money manikin"]	[83: 258]; [114: 15]; [29, II: 343]
German	<i>glücksmännlein,</i> <i>glücksmännchen</i>		["little fortune-man"]/ ["good luck manikin"]	[182: 88]; [120: 113]; [29, II: 343]
German	<i>hausväterchen</i>		["little house father"]	[114]; [27: 344]; [81: 23]
German	<i>hinzelmännchen</i>		["gnome"]	[118: 355]; [119: 137]

Table 5 E. Pulling-out ceremonies: E1. Screaming, groaning, and voices; E2. Use of a dog; E3. Shining and lights

Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
E1				
French	plante qui crie		["the screaming plant"]	[28: 71]
Polish	krzykaiec, krykwa		["screamer"/["female screamer"]	[12: 164]
Polish	pokrzyk, pokrzyk biały, pokrzyk samiec		["the screamer"/ ["the female's scream" or "the screaming female"/ ["the male's scream" or "the screaming male"]	[12: 166]; [182: 180]
Polish	pokrzyk ziele, pokrzykowe ziele		["the screamer herb"]	[83: 259]; [162: 1129]; [12: 164]
Russian	[pevenka trava]	певенька трава	["the screaming herb"]	[63, l: 23]; [27: 19]
Serbo-Croatian	[pokrik]	Покрик	The root of the word is "krik," meaning scream or cry (see text)	[70: 291]
Turkish	hüngürük kökü		["Sobbing root"]; it is believed that it sobs when pulled out from the earth	[73: 107]; [28: 71]; [41: 122,124]; [124: 2]
E2				
Arabic	[qātil al-kalb]	قاتل الكلب	["dog's killer"]	[125: 624–625] (Andalusia, 13th c.)
Dagestani (Avar)	xlapuleb xer		["barking grass" or "grass (causing) barking"]	[184: 1486] cited by [102: 250]
Dutch	hondsappel, hundappel, hunderapfel		["dog's apple"]	[151: 42]; [28: 71]; [31: 45]; [102: 35]
Farsi	[sag-kanak]	سگ کنک	["dog uprooter"] (= dog killer)	[95: 691]; [185: 200]; [186, III: 366]
Farsi	[sag-kuš]	سگ کش	["dog killer"] (= dog slayer)	[100: 106]; [101: 152]
Farsi	[sag-šikan, sag-shekan]	سگ شکن	["dog breaker"]	[100: 106]; [101: 152]
French	pomme de chien		["dog's apple"]	[112: 225]; [28: 71]; [3: 44]; [29: 346]; [113: 8]
German	hunds apfel, hunds apfelwurzel		["dog's apple"]	[83: 258]; [118: 335]; [135: 23]; [119: 137]; [134: 53]; [28: 71]; [114: 15]; [81: 23]
Greek	[mala canina]	μάλα κανίνα	["dog's apple"]	[45: IV,75]
Italian	mela canina		["dog's apple"]	[65] (Tuscany); [28: 71]
Italian	poma di cane		["dog's apple"]	[133: 184]; [77: 333]
Italian	mala canina		["dog's apple"]	[133: 184]
Turkish	köpek elması		["dog's apple"]	[73: 107]; [187: 15]; [188: 23]
Turkish	köpek otu		["dog's plant"]	[73: 107]; [187: 15–17]; [188: 23]
Turkish	köpeктаşağı		["dog's testicle"]	[41: 124]; [123: 21]
E3				
Arabic	[al -yabrūḥ al-waqqād]	اليبروح الوقاد	["the burning mandrake"]	[132: 14]
Arabic	[sirāḡ al-qutrub]	سراج القطرب	["devil's candle" or "firefly candle"] (see text)	[87: 54] (Arabia, 10-11th c.); [122: 3]; [138: 246] (Andalusia, 13th c.); [88: 14]; [187, l: 49]; [190: 250]; [191, 891; No.246]; [28: 71]; [41: 121]
Russian	chortovaja svecha	чёртова свеча	["devil's candle"]; the Avarians believe that the mandragora emits light at night	[192: 143]

Table 6 F. Gallows and hanging: F1. Plant originated from human semen, urine under gallows; F2. Creation of Adam

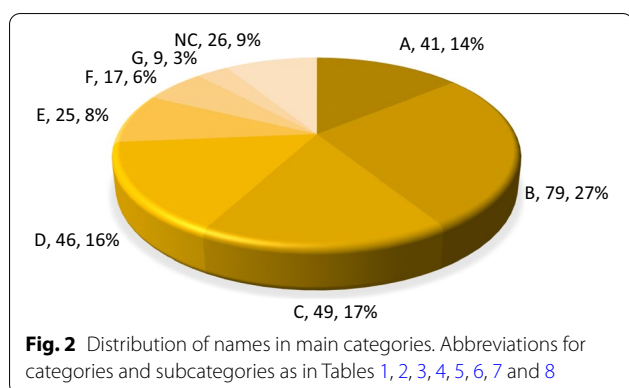
Language/subcategory	Name	Ethnic transcription	Meaning	Selected references
F1				
Dutch	<i>galgejong, galgenjong</i>		["gallows' youngling"]	[31: 45]; [28: 71]; [102: 35]
Dutch	<i>galgenmann, galgenmannkens, galgenmannntje</i>		["gallows' man"]	[107: 63]; [102: 35]
Dutch	<i>pisdiefe</i>		["piss thief"]	[159: 333]; [31: 45]
Dutch	<i>pisduiveljtje</i>		["little piss devil"]	[159: 333]; [31: 45]
French	<i>madaglorie</i> Spelling variations: <i>magloire, madagloire, main-de-gloire, main degloire, maindegloire, mandagloire, mandegloire, main de gore</i>		["hand of glory"] (see text)	[56: 66]; [28: 71]; [31: 43]; [30: 332]; [29: 346]
German	<i>armesünderblume</i>		["poor sinner's flower"]	[30: 330]; [80: 19]; [81: 23]
German	<i>folterknechtswurzel</i>		["torturer's root"]	[30: 331]; [114: 15]; [80: 19]; [81: 23]
German	<i>foltenwurzel</i>		["torturer's herb"]	[27: 344]
German	<i>galgenwurz</i>		["gallows' root"]	[81: 23]
German	<i>galgenmännlein, galgenmännchen</i>		["little gallows man"] / ["gallows' mannikin"]	[83: 258]; [119: 137]; [193: passim]; [134: 53]; [114: 15]
German	<i>henkerswurz, henkerswurzel</i>		["executioner's Root"]	[114]; [27]; [81]
German	<i>pisssdiebchen, pissdieb</i>		["piss thief"]	[119: 137]; [75: 229]; [134, ill: 53]; [28: 71]; [31: 42]; [30: 334]; [81: 32]
Icelandic	<i>thjófarót</i>		["thief's root"]	[194: 44]; [195: 60]
Italian	<i>mano di gloria</i>		["hand of glory"]	[65] (Sicily)
F2				
Russian	[<i>adamova golovā</i>]	адамова голова	["Adam's head"]	[63: l: 1458]; [162: 1129]; [196: 335]; [197: 203]
Serbo-Croatian	[<i>Adamova glava</i>]	адамова глава	["Adam's head"]; " <i>glava</i> " means head	[70: 291]
Turkish	<i>âdemotu</i>		["Adam's plant"]	[73: 107]; [123: 21]

Table 7 G: G1. Relation to historical and mythological characters: King Solomon, Circe, and Prometheus; G2. Elephant

Language	Name	Ethnic transcription	Meaning	Selected references
G1				
Arabic	[<i>šajarat Suleimān</i>]	شجرة سليمان	["(King) Solomon's tree"]	[99]
Armenian	[<i>Solomon-imastunicat</i>]	Սոլոմոնի ծառ	["Solomon's tree"] literally	[198: 97] (15th c.); [100: 106]; [101: 152]
English	Herb of Circe			[199: 224]; [29, li: 336]; [109: 70]
English	Herb of Prometheus			[200: 496]; [201: 121]
French	<i>circée</i>		["Circe"]	[29: 336]
German	prometheuskraut		["Prometheus herb"]	[31: 42]
German	<i>zauberpflanze der circe</i>		["Circe's magic plant"]	[28: 71]; [31: 42]
Greek	<i>kirkéa</i> Spelling variants: <i>kirkéon</i> , <i>dirkéa</i>	Κίρκαιον / Κίρκαια / Δίρκαια	["Circe"]	[45: IV/75]
G2				
English	Elephant ear		See text	[202: 249]

Table 8 Non-classified names

Language	Name	Ethnic transcription	Meaning	Selected references
Arabic	[<i>labbāh</i>]	لَبَّاح (a variant of <i>Luffāh</i>)	["makes a man brave"] (A hint for a potent man?)	[86: 107] (Arabia, 9th c.); [85, II: 449,774] (Andalusia, 11th c.)
Arabic	[<i>magd</i>]			[86: 107] (Arabia, 9th c.); [85, II: 774] (Andalusia, 11th c.); [140: 1219]
Arabic	[<i>šugǧā</i>]	شَجَاع	["brave"] (A hint for a potent man?)	[168, I: 250]; [164: 114] (Palestine)
Basque	<i>urrillo, urriilo, urriolo, urriola</i>			[66]
Berber	[<i>tāryāl, taralya</i>]			[85, II: 774] (Andalusia, 9-11th c.); [203: 213]; [204: 257] (Morocco)
Berber	[<i>habb alʔilb, habb attaʔlif</i>]		"wild" seeds	[85, II: 774] (Andalusia, 9-11th c.)
Catalan	<i>albalarsa</i>			[84: 351]
Chinese	[<i>茄参属</i>]	qie shen shu	<i>Qie</i> 茄 in Chinese is Solanaceae (refers to plants in this family), 参 is suggesting a fat root or stem underground, like that of Ginseng	[205]
Greek	[<i>diámorfos</i>]	διάμορφος	["double-formed; ended with various forms"]	[45: IV,75]
Greek	[<i>emionás</i>]	ήμιονάς	["mule's plant"] (may be due to the use of mules to eradicate the plant?)	[45: IV,75]
Greek	[<i>kalánthropos</i>]/ [<i>kalanthropáki</i>]	καλάνθρωπος/ Καλανθρωπάκι	["good man"] (euphemistic name) / [diminutive for " <i>kalánthropos</i> "]	[121: 357] (Cyprus); [62: 600]; [58]; [206: 78–79]; [59: 429]
Greek	[<i>kalanthropári</i>]/ [<i>kalanthropárin</i>]	καλανθρωπάρι / Καλανθρωπάριν	["good-man shaped"] (euphemistic name); [diminutive for " <i>kalánthropos</i> "] / ["good -man (shaped)"] (euphemistic name); [diminutive for " <i>kalánthropos</i> "]	[121: 357] (Cyprus); [206: 78–79] (Cyprus); [62: 600]; [58: 509] (Greece)
Greek	[<i>kaláthreptos</i>]	καλάθρεπτος	["well-fed"] name probably based on the plant's fat roots (see also the name <i>arkánthropos</i> above)	[206: 78–79]
Greek	[<i>kaláthrepos</i>]	καλάθρεπος	Corrupted from " <i>kalánthropos</i> " or " <i>kaláthreptos</i> "	[59: 436]
Greek	[<i>skalánthropos</i>]	σκαλάνθρωπος	["good man"; "wooden man"]	[59: 431]
Greek	[<i>tátoulas</i>]	τάτουλας	Besides mandrake, also <i>Datura stramonium</i> , <i>Solanum nigrum</i> and <i>Atropa belladonna</i> . Seems to be a corrupted form of "Datura."	[59: 431]
Latin	<i>aperium</i>			[45: IV,75]
Polish	<i>nasik</i>		May be related to the seeds?	[12: 164]
Serbo-Croatian	[<i>dliskva</i>]	Длисква	Word without meaning; " <i>liska</i> " means leaf; probably " <i>d</i> " as " <i>do</i> " meaning near; thus the word could refer to the importance of the part near to the leaf, i.e., the root, since mandrake is stemless, or the importance of a fruit	[71: 20]
Spanish	<i>vilanera, vinanera</i>		["vinegar-taste plant"]	[66]; [72: 585]
Spanish	<i>vinagrera</i>		["vinegar-taste plant"]	[66]
Syriac (Eastern Aramaic)	<i>bnat ganē</i>		name for the mandrake's fruit	[186, III: 193]
Turkish	<i>at elması</i>		["horse's apple"]	[73: 107]; [123: 21]
Turkish	<i>bendavleo</i>			[41: 124] (North Cyprus)
Turkish	<i>hacılar otu</i>		["pilgrim's plant"]	[123: 21]; [28: 71]
Turkish	<i>hacı otu</i>		["pilgrim's plant"]	[73: 107]



as it dripped to the ground.” According to Randolph [200: 495–496], “since gore does not drip from the bodies of hang-thieves, a change had to be made here...in adapting the story to the mandrake, and so the plant is said to spring from the thief’s urine” (see also [29, II:338, 201: 121, 280:passim]). Van Arsdall et al. [142: 293] reject this view. It still might be the origin of the thief/gallows/semen/urine myth. The question is, what happened with the story from the third c. BCE to the fifteenth c. AD? The semen and urine of a hanged thief in connection with the mandrake legend is relatively late, entering written sources only about 1500 [195: 59–60]; one name in German (“Prometheus plant”) and the English name “herb of Prometheus” retain this old myth.

Paradise, mandrake, and the elephant

The mandrake’s rare name “elephant ear” [202: 249] is related to a medieval legend of the elephant and the mandrake. A Latin bestiary of the eighth or ninth century tells the tale of an elephant great in intellect but feeble in the desire to reproduce. The cure was for him and his mate to travel eastward until, near paradise, they found the mandrake plant [281: 248]. A male and female elephant (Adam and Eve) require the fruit of the mandrake (here, the “Tree of Knowledge”) to arouse their sexual desire [282: 153]. The German name [“little child’s root”] indicates that this is the plant that the elephants ate in paradise [31: 41].

Non-classified names

Non-classified names constitute the fifth widest category (26 names; Fig. 2), indicating that a lot of names are of unknown origin despite all the above-mentioned connections between names and the plant’s properties, shape, or features. Languages such as Basque, Berber, Chinese, and Slovak all have names for the plant in this category, but ten more also have names in this group (Arabic, Catalan, Greek, Italian, Latin, Polish, Serbo-Croatian, Spanish,

and Turkish). Some Greek names included under this section could represent euphemistic names. Euphemism has been in use since Greek antiquity as a kind of innocuous expression to describe or name something that is considered dangerous or unpleasant. By using bland, inoffensive terms, the speaker appears to treat the subject in a positive rather than pejorative way and avoids invoking its malign characteristics. In a way, euphemisms are used to politely refer to negative life issues such as disability, disaster, death.

Analysis of hypotheses

Our hypothesis 1 suggests that due to the longer history and larger distribution area around the Mediterranean (especially in the Middle and Near East), it is expected to find migration of names (and myths and customs reflected in these names) from east to the west (Middle East to Europe) and from the south to the north (southern Europe to western and central and northern Europe) than migrations in the opposite directions.

Several authors [32: 261, 41: 115, 185: 200, 191: 89, 200: 499, 226: 442, note 1] consider Persia to be the original home of mandrake superstitions based mainly on the role of the dog (see below), with a linguistic background (the origin of the word “mandragora”; see above) that was disputed by Asatrian [100: 106].

Our data show that three Farsi mandrake names are related to the role of a dog in the pulling-out ceremony: *sag-kuš* [lit. “dog slayer”], *sag-šikan* [lit. “dog breaker”], *sag-kan* [lit. “dog-dug”]). Two more names related to this issue occur in Arabic and Dagestani (also named Avar). The other mandrake names related to a dog (in five languages) could be translated as “the dog apple.” We assume that the mention of a dog in relation to the mandrake in western languages is a kind of echo of its role in the pulling-out ceremony in the Middle East (and Iran), since the use of a dog has deep roots in this region (see above).

As expected, we were unable to pinpoint the migration of any name from northern Europe to the south or from Europe to the Middle East.

It was expected (hypothesis 2) that we would find more names (and in more categories) in countries in which the mandrake is native (especially around the Mediterranean) and has a longer history than in other parts of Europe in which mandrake (and its legends) arrived later. The order of the languages according to number of mandrake names (Table 8) (not counting spelling variants) is as follows: German 45 (including 3 Old German ones); Greek 35; Arabic 32; Turkish 31; Dutch 23; English 17; Serbo-Croatian 15; Spanish 13; French 11, Latin 8, Polish 7, and Farsi 7. Since mandrake (*M. officinarum/autumnalis*) is a Mediterranean/Middle-Eastern plant, our hypothesis

Table 9 Mandrake name distribution according to languages and categories: 292 vernacular names for the plant in 41 languages

Category	A			B			C			D			E			F		G NC			Total
	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	F1	F2	G1	G2	NC	
Language																					
Albanian	1																				1
Arabic			3	1	3	3	2		4		9			1	2			1		3	32
Aramaic			1	1																	2
Armenian	1				1		1											1			4
Basque																					1
Bengali			1																		1
Berber																					2
Bulgarian	1																				1
Catalan	1																				1
Chinese																					1
Corsican	1																				1
Czech				2							1										3
Dagestani															1						1
Danish		1		1					1												3
Dutch	2	2		5				3		3	3			1		4					23
English	1			3				3		3	4									2	1
Estonian										1											1
Farsi			1	1	1				1						3						7
Finnish		1							1												2
French	1			2		2				1		1	1	1		1		1			11
Gaelic								1													1
Georgian	1																				1
German		1		7		3	1	5	3	2	6	4		1		7		2			42
German,Old								1	1	1											3
Greek	2			3	5	5	2	6	1		1			1					1		8
Hebrew									1												1
Hungarian	1							1		1	1										4
Icelandic																	1				1
Italian	1														3	1					5
Latin				2		2															1
Norwegian		1																			1
Polish	1			1							1			3							1
Portuguese	1																				1
Russian	1									1				1		1					5
Serbo-Croatian	3	1			4	1	1			1				1		1					14
Slovak						1															1
Spanish	2				1	7		1													2
Syriac																					1
Swedish		2																			2
Turkish	1		2	4	3	4	3		3		2			1	3			1			4
Ukrainian	1								1												2
Total	24	9	8	33	18	28	11	21	17	13	28	5	7	15	3	14	3	8	1	26	292

Abbreviations for categories and subcategories as in Tables 1, 2, 3, 4, 5, 6, 7 and 8

NC non-classified names

must be rejected. According to the distribution map presented by Volis et al. [23], only Arabic, Aramaic, Berber, Corsican, Greek, Hebrew, Italian, Latin, Portuguese, Spanish, Syriac, and Turkish are currently spoken in the areas where the plant naturally grows. Therefore, while 129 names in these 12 languages are used to mention the plants in the areas where they naturally occurs nowadays, 163 names are or have been used in other territories, and our hypothesis must be rejected. Concerning the proliferation of the mandrake's German names, it seems that this reflects the importance of the mandrake in the local witchcraft and folklore in this country [251: 12, 283: 144]. Nevertheless, another cause of the highest records in languages as German can be a higher availability of written sources in these languages.

Since the mandrake has a long history as an aphrodisiac and as an omnipotent medicinal plant down the generations [13], it was expected (hypothesis 3) to find relatively many names related to these categories. In fact, we found (Table 3) relatively few names which express hallucinogenic or narcotic aspects (21 names, C2) or are related to "love issues" (17 names, C3), and even fewer related to its general medicinal properties (11 names, C1). Thus, just 17% of total names are related to this category (Fig. 2), and our third hypothesis must be rejected.

It was expected (hypothesis 4) that we would find more names related to witchcraft and black magic in Europe than in the Muslim world. Thompson [251: 131] has already mentioned that "In Germany in medieval times belief in the powers of the mandrake became a universal cult, and through the country the plant was regarded with veneration for its magical properties." Names related to this category comprise nearly 16% of the totals (Table 8, Fig. 2). Of the 46 names (Table 4 D1–D3), except for nine in Arabic, and two in Turkish, the rest occur in European languages. Thus, this hypothesis was confirmed.

Conclusions

Mandrake has been named in diverse ways since antiquity, summing up to 292 vernacular names in 41 languages. Vernacular names reflect local manners, beliefs and uses, many of which wandered during history. The distribution of mandrake's vernacular names according to the designated categories reflects its widespread historical reputation as related to the doctrine of signatures, beliefs in its supernatural powers, mystic beliefs, and to a lesser extent its uses in magic and medicine. Most of the vernacular names are related to the plant's morphology (79 names, B1–B3), rather than its pharmacological (49, C1–C3) or mystical (46, D1–D3) properties, the pulling out ceremony (25, E1–E3) or other aspects.

Van Arsdall et al. [142] have already noted that different myths related to the mandrake have different origins and ages. Some are ancient while others are later, according to the written evidence. This observation could be exemplified in several cases as inferred from spatiotemporal analysis of the mandrake names. The pulling-out ceremonies for the mandrake (especially with the use of a dog) originated in the Middle East. In this category we have 25 names, 28% of them from the Near East. The scream heard during the pulling out is a later phenomenon [142: 317] and is reflected in four European languages and in Turkish.

The relation of the mandrake's names to magic and witchcraft appears only in European countries in which the mandrake is non-native (Table 4 D1). This is also indirect evidence for a later expansion of these beliefs after the introduction (or import of the roots) of the mandrake to these countries. Names which are related to demonic agents (as a result of the similarity to the human shape) appear mainly in Arabic but also in seven European languages, most of them from countries in which the mandrake is not indigenous. This finding may provide indirect support for Middle-Eastern origin of this aspect. Thus, it seems that witchcraft and magical traditions originated mainly in central Europe (see above), while the fear of the plant due to its shape may have an eastern origin.

The origin of the mandrake under the gallows has late, western roots. All the names related to gallows are from Europe (14), especially from Germany (7) and the Netherlands (4) and for sure reflect a late-Medieval European origin.

Acknowledgements

We are grateful to Ela Harrison (German), Shula Vardi (French), Yonathan Bar-On (Dutch and German), Dr. Sonia Klinger (Polish), Hava Lahav (Czech), Sorin Solomon (Romanian), Prof. Michael Lukas Petersen (Danish), Dr Gitte Peterson (Danish), Prof. George Fayvush (Armenian), Dr. Margareta Walczak (Polish), Prof. Petr Pyšek (Czech), Prof. Zoltán Barina (Hungarian), and Dainius Razauskas (Estonian) for checking the validity and accuracy of the mandrake's names and for text translations.

Authors' contributions

AD and GB designed and conceived the study. All of the authors collected names in their own languages, checked their validity and meaning, and participated in the data analysis and discussion. AD and GB prepared, revised, and finalized the manuscript. All authors read and approved the final manuscript.

Funding

This work was financially supported by the Henk and Dorothy Schussheim Fund for Ecological Studies in Mt. Carmel.

Availability of data and materials

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Department of Evolutionary and Environmental Biology and Institute of Evolution, University of Haifa, Haifa, Israel. ²GREB-BioC, Botany Laboratory, Faculty of Pharmacy and Food Sciences, University of Barcelona, Av. Joan XXIII S/N, 08028 Barcelona, Catalonia, Spain. ³20128 Mghar, Israel. ⁴Laboratory of Biogeography and Ecology, Department of Geography, University of the Aegean, 81100 Mytilene, Greece. ⁵Department of Arabic Language and Literature, Faculty of Languages, History and Geography, Ankara University, Ankara, Turkey. ⁶Department of Life Sciences, Università degli Studi di Siena, Siena, Italy. ⁷Faculty of Pharmacy, Department of Pharmacognosy, Medical University of Sofia, Dunav 2 sr., 1000 Sofia, Bulgaria. ⁸Department of Arabic Language and Literature, University of Haifa, Haifa, Israel. ⁹Department of Middle Eastern and Islamic Studies, The Ezri Center for Iran and Persian Gulf Studies, The University of Haifa, Haifa, Israel. ¹⁰Faculty of Agriculture, Department of Applied Botany, University of Belgrade, Nemanjina 6, 11080 Belgrade, Republic of Serbia. ¹¹Centre for Information Modelling, University of Graz, Graz, Austria. ¹²Department of Botany, University of Granada, Campus Universitario de Cartuja, 18071 Granada, Spain.

Received: 30 May 2021 Accepted: 16 November 2021

Published online: 04 December 2021

References

- Gledhill D. The names of plants. Cambridge: Cambridge University Press; 1989.
- Petanidou T. Terraces of the Aegean—the example of the Dodecanese. Athens: Parisianou Scientific Publications; 2015.
- Petanidou T. Terminology on terraces. *Nissos Andros*. 2018;12:168–78 (In Greek).
- Vallès J. Los nombres populares de las plantas: método y objetivo en etnobotánica. In: Hernández EB (ed.) *Monografías del Real Jardín Botánico de Córdoba* 3:7–14; 1996.
- Flattery DS, Swartz M. Haoma and harmaline: the botanical identity of the indo-iranian sacred hallucinogen “soma” and its legacy in religion, language and Middle Eastern folklore. Berkeley: The University of California Press; 1989.
- Šeškauskaitė D, Gliwa B. Some Lithuanian ethnobotanical taxa: a linguistic view on Thorn Apple and related plants. *J Ethnobiol Ethnomed*. 2006;2:13. <https://doi.org/10.1186/1746-4269-2-13>.
- Austin DF, Felger RS. Sichuan peppers and the etymology of Fagara (Rutaceae). *Econ Bot*. 2008;62(4):567–73.
- Austin DF. *Sambucus* intercultural exchange and evolution. *Ethnobot Res Appl*. 2012;10:213–34.
- Dafni A, Benítez G, Blanché C, Ramón-Laca L, Petanidou T, Aytaç B, Horvat M, Lucchese F, Geva-Kleinbergeri A. The etymological, ecological, historical and ethnobotanical roots of the vernacular names of *Ecballium elaterium* (L.) Rich. (Squirting cucumber). *J Ethnobiol Tradit Med Photon*. 2013;119:515–37.
- Silberman HC. Superstition and medical knowledge in an Italian Herbal. *Pharm Hist*. 1996;38(2):87–94.
- Carter AJ. Myths and mandrakes. *J R Soc Med*. 2003;96:144–7.
- Waniakowa J. Mandragora and belladonna—the names of two magic plants. *Studia Linguistica Univ Iagellonicae Cracoviensis*. 2007;124:161–73.
- Benítez G, Böck B, Vulfsons S, Leonti M, Dafni A. The rise and fall of the mandrake as a medicinal plant. *J Ethnopharmacol*. 2021. (in press).
- Kors A, Peters AC, editors. *Witchcraft in Europe, 400–1700: a documentary History*. Philadelphia: University of Pennsylvania Press; 2001.
- Maxwell-Stuart PG. *Witchcraft in Europe*. London: Macmillan International Higher Education; 2001.
- Harner MJ. The role of hallucinogenic plants in European Witchcraft. In: Harner MJ, editor. *Hallucinogens and shamanism*. Oxford: Oxford University Press; 1973. p. 125–50.
- Sultana A. Belief and practice of “Black magic” and its implications for Pakistani muslim society. In: *Supporting cultural differences through research*. 2011 monograph series 19th annual conference. February 14–19. Louisiana: Baton Rouge, p. 1349–2364; 2011.
- Kamali MH. Islam’s views on sorcery and black magic. *ICR J*. 2011;2(3):564–5.
- Perlmutter D. The politics of Muslim magic. *MEQ*. Spring 2013, p. 73–80.
- Ungricht S, Knapp S, Press JR. A revision of the genus *Mandragora* (Solanaceae). *Bull Nat Hist Mus Bot Ser*. 1998;28:17–40.
- Hawkes JG. *Mandragora*. In: Tutin TG, Hywood VH, Burges NA, Moore DM, Valentine DH, Walters SM, Webb DA, editors. *Flora Europaea*, vol. 3. Cambridge: Cambridge University Press; 1972. p. 193–201.
- Volis S, Fogel K, Tu T, Sun H, Zaretsky M. Evolutionary history and biogeography of *Mandragora* L. (Solanaceae). *Mol Phylogenet Evol*. 2018;129:85–95.
- Volis S, Tu T, Deng T, Zaretsky M, Fogel K, Sun H. Phylogeographic study of *Mandragora* L. reveals a case of ancient human assisted migration. *Isr J Bot Plant Sci*. 2015;62(3):176–86.
- González HI. El fruto del deseo: connotaciones sexuales de la mandrágora desde Egipto hasta la Edad Media. *Revista Digital de Iconografía Medieval*. 2017;9(17):61–79.
- Gallego MJ, et al. *Mandragora* L. In: Castroviejo S, et al., editors. *Flora iberica*, vol. 11. Madrid: Consejo Superior de Investigaciones Científicas; 2012. p. 211–4 (In Spanish).
- Duke JA. *Handbook of medicinal herbs*. Boca Raton: CRC Press; 2002.
- Rätsch C. *The encyclopedia of psychoactive plants: ethnopharmacology and its applications*. New York: Simon and Schuster; 2005.
- Stephenson J. *Hahnemannian provings*. New Delhi: B. Jain Publishers; 1998.
- De Cleene M, Lejeune MC. *Compendium of symbolic and ritual plants in Europe (Herbs)*. Ghent: Mens & Cultuur Uitgevers; 2003.
- Hambel V. Die alte Heydnische Abgöttische Fabel von der Alraun: Verwendung und Bedeutung der Alraune in Geschichte und Gegenwart. Universität Passau. Diplomarbeit im Studiengang Sprachen-, Wirtschafts- und Kulturraumstudien. 2002. <http://docplayer.org/69590247-Die-alte-heydnische-abgoettische-fabel-von-der-alraun.html>.
- Wittlin D. *Mandragora eine Arzneipflanze in Antike, Mittelalter und Neuzeit*. Basler Dissertationen zur Geschichte der Pharmazie und Naturwissenschaften. Band 14. Basel: Dietikon: Juris Druck und Verlag; 1999.
- Starr F. Notes upon the mandrake. *Am Antiq Orient J*. 1901;23:258–68.
- Cule J. The devil’s apples. *Vesalius*. 1997;3:95–105.
- Chaurasia OP, Ballabh B, Tayade A, Kumar R, Kumar GP, Singh SB. *Podophyllum* L.: an endangered and anticancerous medicinal plant—an overview. *Ind J Trad Know*. 2012;11:234–41.
- Corns CM. Herbal remedies and clinical biochemistry. *Ann Clin Biochem*. 2003;40:489–507.
- Gorun G, Curcă GC, Hostiuc S, Buda O. Legal highs” in Romania: historical and present facts. *Rom J Leg Med*. 2011;19:73–6. <https://doi.org/10.4323/rjlm.2011.73>.
- Mitrović A. Mein Besuch bei einer Zauberfrau in Norddalmatien. *Anthropophyteia*. 1907;4:227–36.
- Reč K. 2014. *Rečnik svetih i magijskih biljaka*. (Dictionary of saint and magic plants). Belgrade: Babun; 2014. (In Serbo-Croatian).
- Rudkin EH. *Lincolnshire folklore*. *Folklore*. 1933;44(2):189–214.
- Eliade M. *Zalmoxis, the vanishing god*. Chicago and London: University of Chicago Press; 1972.
- Zarcos T. The myth of the mandrake, the ‘plant-human.’ *Diogenes*. 2005;52:115–29.
- Schmidbauer W. Die magische Mandragora. *Antaios*. 1969;10:271–83 (In German).
- Lowinsky NR. What the centaur said: of sacred springs, neolithic caves, and the mysteries of thrace. *Psychol Perspect*. 2003;45:90–115.
- Taussig M. The language of flowers. *Crit Inquiry*. 2003;30:98–131.
- Dioscorides. *Materia Medica*. In *Thesaurus Linguae Graeca—A digital Library of Greek Literature*. University of California, Irvine. <http://stephanus.tlg.uci.edu/Iris/inst/csearch.jsp?doc=tlg&aid=0656&wid=>

- 001&q=De%20materia%20medica&dt=list&st=work_title&per=50. Accessed 23 Feb 2019.
46. Alcover A, Moll E (eds) *Diccionari català-valencià-balear: inventari lexicogràfic i etimològic de la llengua catalana en totes les seves formes literàries i dialectals*. vol. 7. (LI-OM). Palma de Mallorca: Mn Alcover; 1956. (In Catalan).
 47. Bilz M, Kell SP, Maxted N, Lansdown RV. European red list of vascular plants. Luxembourg: Publications Office of the European Union; 2011.
 48. Avanesyan GA. Armenian medicine of the Middle Ages. *Bull Med Int Conf Saratov Russia Ltd Liabil Co Sci Innov*. 2013;3(11):1268–9.
 49. Simeon E. Bogomily and bogomils. *Cereal Grain*. 2000;3–4:9–12 **(in Bulgarian)**.
 50. Sedir P. Botanical dictionary to the magical plants; 2017. <http://friendsoftherainbow.net/node/1770>.
 51. Georgieva A. Light on magic and sacral medicine. In: Póch É, editor. *The magical and sacred medical world*. Tyne: Cambridge Scholars Publishing; 2019.
 52. Falucci FD. *Vocabolario dei dialetti della Corsica*. Firenze: Licosa Reprints; 1972. (in Italian).
 53. Van Lis W. *Gualtheri van Lis Pharmacopoea*. Amsterdam: Jan Morterre; 1764. (in Dutch).
 54. Britten J. *A dictionary of english plant names*. Part I. London: Trübner and Co.; 1886.
 55. Turner W. *The first and seconds partes of the herbal of William Turner*. Collen. London: Arnold Birckman; 1568.
 56. Starck AT. *Der Alraun. Ein Beitrag zur Pflanzensagenkunde*. Ottendorfer Memorial Series of Germanic Monographs 14. Baltimore: J.H. Furst Company; 1917. **(in German)**.
 57. Politis NG. *Laografika symmeikta*, vol. III. Athens: Akadimia Athinon—Dimosievmeta Laografikou Archeiou No 6; 1931. **(in Greek)**.
 58. Kavvadas DS. *Eikonografimenon BotanikonPhytologikon Lexicon*. (Illustrated Botanical Dictionary) volumes 1–9, Athen: Pigassos; 1956. **(in Greek)**.
 59. Kritikos PG. *O mandragoras. Laografia - Deltion thw Ellinikis Laografikis Etaireias*, vol 19, p. 399–452. Athens: 1960–1961. **(in Greek)**.
 60. Vlastos P. *Synonyma kai syggenika—Nea ekdosi sympliromeni apo ta katalogia tou syggrafa*. Athens: Etaireia Ellinikou Logotechnikou & Istorikou Archeiou (ELIA); 1989. **(in Greek)**.
 61. Theophrastus E. *Enquiry into plants*. Hort A. (transl.). London: William Heinemann; 1916.
 62. Papakonstantinou Th. *Mandragora*. In: Megali Elliniki Egkyklopaedia, vol 16. Athens: Foenix Publishing Organization; 1956. **(in Greek)**.
 63. Nernich PA. *Neues Waaren-Lexicon in zwölf Sprachen, Deutsch, Holländisch, Danisch, Schwedisch, Englisch, Französisch, Italienisch, Spanisch, Portugiesisch, Russisch, Neugriechisch und Lateinisch*. Band I Hamburg: Nernichschn Buchhaldung; 1820. **(in German)**.
 64. Géczy J. *Egy szempont a biológia-tankönyvek szövegének és illusztrálásának vizsgálatához*. Iskolakultúra. 1999;9(5):55–69 **(in Hungarian)**.
 65. Penzig O. *Flora Popolare Italiana*. Bologna Orto Botanico, Genoa, Reprint Edizioni Edagricole; 1924. **(in Italian)**.
 66. Anthos 2019. *Sistema de información sobre las plantas de España*. <http://www.anthos.es/>. Accessed 12 Mar 2019.
 67. Tumanova OT. "Rasteniia v tekstakh Biblii" [Plants in the texts of the Bible]. *Russkaia rec'*. 2001;2:75–8 **(in Russian)**.
 68. Ushakov D. *The great interpretive dictionary of the Russian language*. Moscow: The modern edition of the Slavic Book House; 2014.
 69. Nurmukhamedova RA, Karomatov ID, Baymuradov RR. *Mandrake and medicine*. *Biol Integ Med*. 2017;4:17–195.
 70. Simonović D. *Botanički rečnik, Srpska Akademija Nauka i Umetnosti, Posebna izdanja, knjiga 3, Naučno delo*, Beograd. Belgrad: Serbian Academy of Sciences and Arts, Special issue, Book 3, Naučno delo; 1959. p. 291. **(in Serbo-Croatian)**.
 71. Stojanović D, Jančić I, Jančić R. *Dar neba ili cveće zla – psihoaktivne i druge opasne biljke Balkanskog poluostrva*, Autorsko izdanje, Beograd, (Gift of heaven or evil flowers – psychoactive and other dangerous plants of Balkan peninsula). Belgrade: Author's publishing; 2017. **(in Serbo-Croatian)**.
 72. Ceballos A. *Diccionario ilustrado de los nombres vernáculos de las plantas en España*. Madrid: ICONA; 1986. **(in Spanish)**.
 73. Hauenschild I. *Türksprachige Volksnamen für Kräuter und Stauden mit deutschen, englischen und Russischen Bezeichnungen*. Wiesbaden: Otto Harrassowitz; 1989. **(in German)**.
 74. Talley E. *Runes, Mandrakes, And Gallows*. In: Larson GJ, Littleton CS, Puhvel J, editors. *Myth in indo-European antiquity*. Berkeley: University of California Press; 1974. p. 157–68.
 75. Pritzel GA, Jessen KFW. *Die deutschen Volksnamen der Pflanzen: neuer Beitrag zum deutschen Sprachschätze*. Berlin: Philip Cohen; 1882. **(in German)**.
 76. Grellman HMG. *Geschiedkundige verhandeling over de heidens, betreffende hunne herkomst, leevenswijze, gesteldheid, zeden en lotgevalen, sedert hunne verschijning in Europa*, vol. 1. Dordrecht: bij A. Blussé & Zoon; 1791.
 77. Hocking GM. *Radix mandragorae*. *Q J Crude Drug Res*. 1963;3:332–5.
 78. Hallfast, E. "Onko tuo anka jonka näen edessäni?": Terry Pratchettin Wyrdr Sisters-teoksen parodisten Shakespeare-viittausten suomen-taminen teoksessa Noitaisiskokset (Master's thesis); 2019. <https://trepo.tuni.fi/bitstream/handle/10024/115998/HallfastEmily.pdf?sequence=2>.
 79. Thomasius J. *Disputatio Philologica, De Mandragora*. In *Academia Lipsiensis D. XIX. Calend. Ianuar. A. MDCLV. Litteris Hendelianis*. 1739 **(in Latin)**.
 80. Rättsch C, Müller-Ebeling C. *The encyclopedia of aphrodisiacs: psychoactive substances for use in sexual practices*. New York: Simon and Schuster; 2013.
 81. Fetzner A. *Die alraune Pflanze-Pflanze der Liebe, Pflanze des Tods*. BoD Books on Demand. Norderstedt. Münster: Druck der Theiddingschen Buchhaldung; 2019.
 82. Schweizerishev Idiotikon. <https://digital.idiotikon.ch/idtkn/id1.htm#page/10173/mode/1up>. Accessed 24 Dec 2019.
 83. Langstedt FL. *Allgemeines botanisches Repertorium*. Band 1:A-F. Nürnberg: Raspeschen; 1801. (in German).
 84. Barney SA, Lewis WJ, Beach JA, Berghof O. *The etymologies of isidore de seville*. Cambridge: Cambridge University Press; 2006.
 85. Al-Isbilli, Abu I-Hayr. *Kitabu 'Umdatit Ttabit Fi Ma'rifati Nnabat Likulli Labib (Libro base del médico para el conocimiento de la Botánica por todo experto)*. vol. II (Fuentes Árabe-Hispanas) de Abu I-hayr al-Isbilli; Córdoba FC, Tilmatine C, Costa JB.
 86. Levey M. *Early arabic pharmacology: an introduction based on ancient and medieval sources*. Leiden: Brill; 1973.
 87. Said HM, Hamarneh SK. *Al-Biruni book on pharmacy and materia medica*. Karachi: Hamdard National Foundation; 1973.
 88. Sontheimer von J. *Aus dem Arabischen uebersetzt*. Hallberger'sche Verlagshandlung, Stuttgart. Grosse Zusammenstellung über die Kräfte der bekannten einfachen Heil-und Nahrungsmittel, von abu Moham-med Abdallah ben Ahmed aus Malaga bekant under der namen Eben Baithar. (Tansl.) vol 2. Stuttgart: Hallberger'sche Verlagshandlung; 1842.
 89. Aburjai T, Hudaib M, Tayyem R, Yousef M, Qishawi M. *Ethnopharmacological survey of medicinal herbs in Jordan, the Ajloun Heights region*. *J Ethnopharmacol*. 2007;110:294–304.
 90. Abu-Rabia A. *Indigenous medicine among the Bedouin in the Middle East*. New York: Berghahn Books; 2015.
 91. Smith G. *The evolution of the dragon*. Manchester and London: Elliot; 1919.
 92. Bnouham M, Merhfour FZ, Elachoui M, Legssyer A, Mekhfi H, Lam-naouer D, Ziyat A. *Toxic effects of some medicinal plants used in Moroccan traditional medicine*. *Moroc J Biol*. 2006;2:21–30.
 93. Aberbach M, Grossfeld B. *Targum onkelos to genesis: a critical analysis together with an English translation of the text*. New York: Ktav Publ. House; 1982.
 94. Steinsaltz A. *Talmud Bavli (Hebrew translation)*. Jerusalem; Hamachon Halsraeli Lepirsumim Talmudim; 1967–2010.
 95. Steingass FJ. *A Comprehensive Persian-English Dictionary: Including the Arabic Words and Phrases to be Met with in Persian Literature, Being, Johnson and Richardson's Persian, Arabic, and English Dictionary, Revised, Enlarged, and Entirely Reconstructed*. New Delhi: Asian Educational Services; 1992.
 96. Ibn Sina I. *Kitāb al-Qānūn fī al-Tibb*. (Canon of Medicine). Book 2: *Materia medica*. New Delhi: Jamia Hamdard; 1998. **(in Arabic)**.
 97. Devellioglu F. *Osmanlıca-Türkçe Ansiklopedik Lügat*. Ankara: Doğuş Ltd., Şti. Matbaası; 1962. **(in Turkish)**.

98. Houtsma MT, Walker A, Basset R, Hartmann R, editors. The encyclopedia of Islam: a dictionary of the geography, ethnography, and biography of the muhammedan peoples, vol. 4. Leiden: EJ Brill Limited; 1934.
99. Dehkhoda, Ali Akbar. Loghatnameh-ye Dehkhoda. Tehran: Mu'assasah-ye Entesharat va- Chap-i Daneshgah-e/ Tehrn; 2003. <http://www.vajehyab.com/dehkhoda/%D8%A7%D8%A8%D8%B1%D9%88%D8%B5%D9%86%D9%85/>. Accessed 18 May 2020.
100. Asatrian G. Marginal remarks on the history of some Persian words. *Iran and the Caucasus*. 2012;16(1):105–16.
101. Arakelova V. The onion and the mandrake: plants in yezidi folk beliefs. *J Persianate Stud*. 2014;7:149–56.
102. Khapizov S. The mandrake in east Caucasian folk beliefs. *Iran Caucasus*. 2019;23(3):248–55.
103. Šumavský J, Rank, J. Taschenwörterbuch der böhmischen und deutschen Sprache. Böhmischeschdeutscher. Prag: Theil; 1859.
104. Zibrť Č. Mandragory. *Rudolfa II Český*. 1903;12:288–97 (in Czech).
105. De Cleene M. Giftige bloemen on planten. Antwerpen: Garant Uitmling; 2016. (in Dutch).
106. Timmer M. Van anima tot Zeus: Encyclopedie van begrippen uit mythologie, religie, alchemie, cultuurgeschiedenis en analytische psychologie. Rotterdam: Lemniscaat; 2001. (in Dutch).
107. Beets N. Nieuwe verscheidenheden: meest op letterkundig gebied. Bohn: De Erven; 1890. (in Dutch).
108. Huygens C. Koren-Bloemen: Nederlandsche Gedichten. vol 2. Amsterdam: Van Ravesteyn; 1672. (in Dutch).
109. Andrews S. Herbs of the northern shaman. Blue Ridge Summit: John Hunt Publishing; 2010.
110. Parkinson J. *Paradise in Sole, paradisu terrestris*. London: Methuen and Co.; 1629 (1904).
111. Matin P. Mandrake a plant totem; 2013. <https://yerevan.academia.edu/pmatin>.
112. Cotgrave R. A French-English dictionary. London: Luke Faune; 1650.
113. Daunay MC, Laterrot H, Janick J. Iconography and history of Solanaceae: antiquity to the 17th century. *Hort Rev*. 2007;34:1–111.
114. Friedrich T. Hexenkräuter wissenschaft und mythos. Diplomarbeit zur Erlangung des akademischen Grades Magistra der Naturwissenschaften an der Fakultät für Naturwissenschaften und Mathematik der Universität Wien ausgeführt am Institut für Pharmakognosie Vorstand. Wien. 2002 (in German). <https://www.scribd.com/doc/215353942/Hexenkrauter-Wissenschaft-und-Mythos-126-S-pdf>.
115. De Genlis SF. Die Botanik der Geschichte und Literatur oder die Pflanzen in ihren mythologischen, religiösen, bürgerlichen, sinnbildlichen, abergläubischen, sprüchwörtlichen, literarischen, ästhetischen, und geschichtlichen Beziehungen, Band 2. Bamberg and Würzburg: Goebhardt; 1813. (in German).
116. Siegel RK, West LJ. Hallucinations: behavior and theory. New Jersey: Wiley; 1997.
117. Schultes RE, Hofmann A. The botany and chemistry of hallucinogens. Springfield: Charles C. Thomas; 1973.
118. Anthon EF. Manuel de synonymie chimico-pharmaceutique on nomenclature de toutes les dénominations latines, allemandes et françaises des produits chimiques et matières premières médicinales. Paris: J. Rothschild; 1862. (in French).
119. Ulrich W. Internationales Wörterbuch der Pflanzennamen: in Lateinischer, Deutscher, Englischer und Französischer Sprache: zum Gebrauche für Botaniker, Lehrer, Pharmaceuten, Mediciner, Drogisten Handelsgärtner, Landwirthe und Forstmänner. Leipzig: H. Schmidt & C. Günther; 1872. (in German).
120. Madaus G. Lehrbuch der biologischen Heilmittel. Band 8. (Reprint of the Leipzig edition by Georg Thieme from 1938). Ravensburg: Mediamed Verlag; 1987. (in German).
121. Anastassiades J. Mandragora officinarum; its toxicity. *Cyprus Med J*. 1950;3:357–60.
122. Clark HF. The Mandrake Fiend. *Folklore*. 1962;73:257–69.
123. Baytop T. Türkçe Bitki Adları Sözlüğü. (3th edition). Ankara: Atatürk Kültür, Dil ve Tarih Yüksek Kurumu, Türk Dil Kurumu; 2007. (in Turkish).
124. Tarhan N, Arslan M, Sevgi ŞA. Bazı tıbbi bitkiler ve onlara ait mitoslar. *Mersin Üniversitesi Tıp Fakültesi Lokman Hekim Tıp Tarihi ve Folklorik Tıp Dergisi*. 2016;6(1):1–9.
125. ʾİsbiliyyi, Abū al-Khayr. Kitāb ʾUmdat al-Ṭabīb fi Maʾrifat al-Nabāt [The Pillar of the Doctor on the Knowledge of the Plants]. Bayrūt: Dār al-Ḡarb al-Islāmiyyi; 1995. (in Arabic).
126. Ciancaglini CA. Iranian loanwords in Syriac: Beiträge zur Iranistik. Wiesbaden: Reichert; 2008.
127. Amar Z. Arabian drugs in medieval mediterranean medicine. Edinburgh: Edinburgh University Press; 2016.
128. Kahl J. Sābūr ibn Sahl's Dispensatory in the Recension of the ʾAḡḡudī Hospital. Leiden: Brill; 2008.
129. Boulos L, Gohary M. Medicinal plants of North Africa. Algonac: Reference Publications, Inc.; 1983.
130. Harvey JH. The book of Abūl-Khayr. *Gard Hist*. 1993;21:118–20.
131. Medina-Gavilán JL. Flora de Burguillos (Sevilla): bases para su conservación. Diputación de Sevilla-Ayuntamiento de Burguillos. Sevilla; 2011. (in Spanish).
132. Bak A. ʾİsā, Muʾ ʾġam ʾAsmāʾ il-Nabātāt [=The Lexicon of the Names of the Plants]. Al-Qāhira: al-Maṭbaʾa al-Amiriyya; 1930 (in Arabic).
133. Howell J. Lexicon tetraglotton, an English-French-Italian-Spanish dictionary. London: Samuel Thomson; 1660.
134. Marzell H, Wissmann W. Wörterbuch der deutschen Pflanzennamen. Band III. Leipzig: Hirzel; 1937. (in German).
135. Regel C. Das mittelniederdeutsche Gothaer Arzneibuch und seine Pflanzennamen. Ernestin zu Gotha: Osterprogr. des Gymnas; 1873. (in German).
136. Lexer M. Mittelhochdeutsche Wörterbücher. Leipzig: Hirzel; 1872. (in German).
137. Diefenbach L, Wülcker E. Hoch- und nieder-deutsches Wörterbuch der mittleren und neueren Zeit. Basel: B. Schwabe; 1885. (in German).
138. Leclerc LM. Traité des simples par Ibn el- Beithar. Tome troisième. Notices et extraits des manuscrits de la bibliothèque nationale. Paris: Imprimerie Nationale; 1881. (in French).
139. Altbauer M. Studies in the vocabulary of the Byelorussian translations of the Bible. *J Belarus Stud*. 1972;2(4):359–68.
140. Johnson F. A dictionary, Persian, Arabic, and English by Francis Johnson. London: Wm H. Allen and Company; 1852.
141. Russell JR. Zoroastrianism in Armenia. Harvard: Harvard University, Department of Near Eastern Languages and Civilizations and National Association for Armenian Studies and Research; 1987.
142. Van Arsdall A, Klug HW, Blanz P. The mandrake plant and its legend: a new perspective. In: Bierbaumer P, Klug HW (eds) Old names—new growth. Proceedings of the 2nd ASPNS conference, University of Graz, Austria, 6–10 June 2007, Peter Lang; 2009, p. 285–346.
143. Tatarakis AM. Ae di'epodon therapeiae. In: Neoeilnika Analekta, Vol. A. Athinae: Filologikos Syllogos Parnassos-Vivliopoleion Noti Karavia; 1872, p. 337. (in Greek).
144. Budge EAW, editor. Syrian anatomy, pathology and therapeutics: or the book of medicines, vol. 2. Oxford: Oxford University Press; 1913.
145. Weitland P. Kunstwoordenboek. Gravenhage: Wediwe J. Allart; 1824. (in German).
146. Van der Velde J. Volledig Nederduisch-Fransch woordenboek. Bruxelles: Greeuse; 1848 (in Dutch).
147. Conway DJ. Norse magic. Woodbury: Llewellyn Worldwide; 1991.
148. De JJ. alruin in het volksgelooft. *Van Mensen en Dingen*. 2017;15:2–6 (in Dutch).
149. Blom JD. A dictionary of hallucinations. New York: Springer; 2010.
150. O'Reilly E. Sans Gaoidhlighe-Sagsbhearla. An Irish-English dictionary. Dublin: Barlow; 1817. <https://pharmacy.erciyes.edu.tr/ckfinder/userfiles/files/Bitirme%20Projeleri/2019/Bu%20C4%9Fra%20ZORO%20C4%9ELU%20Tez.pdf>. Accessed 20 Jan 2020.
151. Riedel JC. Kurzabgefastes Garten-Lexicon: in welchem nicht allein die in und ausländischen Blumen, Gewächse, Stauden, Bäume und Kräuter, nach ihrer Gestalt, Natur, Erziehung, Vermehrung, Wartung und Erhaltung, gründlich beschrieben werden; sondern auch von andern zur Gärtnerie dienlichen Wissenschaften und Verriichtungen hinlänglicher Unterricht zu finden; mit einem nützlichen Garten Kalender. Nordhausen: J.H. Groß; 1751. (in German).
152. Bugát P. Természettudományi szöhalalmaz. Budán: Magyar Királyi Egyetem; 1843. (in Hungarian).
153. Olesen A. Hekseurter og folketro. København: Hovedland; 2019. (in Danish).

154. Baber, ZD. Memoirs of Zehir-Ed-Din Muhammed Baber: Emperor of Hindustan. In: Leyden J, Erskine W (transl.), Waddington C (ed). London: Longman, Rees, Orme, Brown, and Green; 1826.
155. Särkkä H. Englantilais-suomalais-englantilainen yleiskielen käyttösanakirja. Helsinki: Otava; 1992. **(in Finnish)**.
156. Lauchert F. Geschichte des Physiologus. Strasburg. Trübner; 1889. **(in German)**.
157. Beveridge AS. The babar-nama description of farghana. *J R Asiat Soc.* 1910;42:111–28.
158. Delathauwer LA. Het Belgischkruitboek. Gent: H. Hoste; 1848. **(in Dutch)**.
159. Von Mosig A. Radix mandragorae. *Int J Crude Drug Res.* 1963;3(1):332–5.
160. Duchesne EA. Repertoire des plantes utiles et des plantes vénéneuses du globe. Paris: J. Renouard; 1836. **(in French)**.
161. Vahot I. Matyas Diak Naptara. Bodaapesti: Müller; 1857. **(in Hungarian)**.
162. Loudon JC. An encyclopaedia of gardening. London: Longman, Rees, Orme, Brown, Green, and Longman; 1829.
163. La BJ. Mandragore en Afrique du Nord. *Bull Soc Sc Nat Tunisie.* 1952;5:29–44 **(in French)**.
164. Crowfoot GMH, Baldensperger L. From cedar to hyssop. London: The Sheldon Press; 1932.
165. Post GE. Flora of Syria, Palestine and Sinai, vol. 2. Beirut: American Press; 1933.
166. Venzlaff H. Der marokkanische Drogenhändler und seine Ware: e. Beitr. zu Terminologie u. volkstüml. Gebrauch traditioneller arab. materia medica (vol. 31). Franz Steiner Verlag: Wiesbaden; 1977. **(in German)**.
167. Noun, J. Neglected and underutilized plant species in the shouf-aley area of lebanon: an ethnobotanical study. In: Region. Workshop Biodiver. Food. 2006. http://www.underutilized-species.org/Documents/PUBLICATIONS/moa_aub_feb_06.pdf. Accessed 8 Jan 2020.
168. Dalman G. Arbeit und Sitte in Palästina. Band I: Von der Ernte zum Mehl. Bertelsmann: Nachdruckaufl. der Ausgabe Gütersloh; 1928. **(in German)**.
169. Wahrmund A. Handwörterbuch der neu-arabischen und deutschen Sprache (vol. 2). J. Ricker. Wiesbaden: Otto Harrassowitz; 1870. **(in German)**.
170. Thomson WM. The land and the book, or biblical illustrations drawn from the manners and customs, the scenes and scenery of the holy land. London: T. Nelson and Sons; 1872.
171. Harrison RK. The mandrake and the ancient world. *Evang Q.* 1956;28:87–92.
172. Dickie J. The Hispano-Arab garden its philosophy and function. *Bull Sch Orient Afr Stud.* 1968;31(2):237–48.
173. Jaradat NA, Al-Ramahi R, Zaid AN, Ayesb OI, Eid AM. Ethnopharmacological survey of herbal remedies used for treatment of various types of cancer and their methods of preparations in the West Bank-Palestine. *BMC Complement Altern Med.* 2016;16(1):93. <https://doi.org/10.1186/s12906-016-1070-8>.
174. Kitto OJ. A cyclopaedia of biblical literature. New York: Newman; 1846.
175. Rossiter W. An illustrated dictionary of scientific terms. London: William Collins, Sons, and Company; 1870.
176. Holzman RS. The legacy of Atropos, the fate who cut the thread of life. *Anesthesiology.* 1998;89:241–9.
177. Vaios Ntavos. Ten myths about goblins from all over Greece. *LIFO* 28.12.2019.
178. Mátyás B. Balogh Mátyás: a mongóliai burját sámánok viselete és eszközei; 2016. <https://seven-cornered21.rssing.com/chan-11700108/latest.php>. Accessed 12 Feb 2020.
179. Riddle JM. Goddesses, elixirs, and witches. New York: Palgrave Macmillan; 2010.
180. Friend H. Flowers and flower lore, vol. 2. London: W Swan Sonnenschein; 1884.
181. Taylor B. Storyology: essays in folk-lore, sea-lore, and plant-lore. London: E. Stock; 1900.
182. Nathanius J. Die Blumenwelt ihre deutschen Namen Sinn und Deutung, vol. 12. Leipzig: Arnoldifache, Oage & Glucksmann; 1868. **(in German)**.
183. Ostling M. Witches' herbs on trial. *Folklore.* 2014;125:179–201.
184. Runovskij A. Dnevnik polkovnika Runovskogo, sostoyavšego pristavom pri Šamile vo vremya prebyvaniya ego v gorode Kaluge, s 1859 po 1862 god (1904), Akty Kavkazskoy arheografičeskoj komissii XII, Tiflis: 1904: 1468–1506 (cited by [201:250]).
185. Vöth PJ. De Alruin en de Heggerank. *Arch Int Ethnog.* 1894;7(81–8):199–205 **(in German)**.
186. Löw I. Die Flora der Juden. Band III, Wien – Leipzig. Löwit. 1924. **(in German)**.
187. Gezgin, D. Bitki Mitosları (Üçüncü Baskı), İstanbul: Sel Yayıncılık; 2015. **(in Turkish)**.
188. Zorğlou B. Mandragora officinarum Hakkında Farmakognozok ve Tarihsel Araştırmalar. Kaiserli. Erciyes Üniversitesi Eczacılık Fakültesi. 2019. **(in Turkish)**.
189. Richardson J. A Persian, Arabic, English Dictionary. London: Cox; 1806.
190. Moore T. Lalla Rookh: Veiled Prophet of Khorassan. London: Thomas Y. Crowell & Company; 1817.
191. Ascherson P. Nachträgliche Mittheilungen über Mandragoras. Berlin: Berliner anthropologischen Gesellschaft; 1891. P. 890–892. **(in German)**.
192. Hoshimkhudzhaeva MM. Study of polysemantic phytonyms of the English, Russian and Uzbek languages in the linguoculturological aspect. *Bull Chelyabinsk State Univ Philol Art Crit.* 2012;67:143–6.
193. Schlosser A. Die Sage Von Galgenmännlein Im Volksglauben Der Literatur. Münster: Druck der Theissingschen buchhandlung; 1912 **(in German)**.
194. Waggoner B. Norse magical and herbal healing. New Haven: Troth Publications; 2011.
195. Davies O, Matteoni F. Executing magic in the modern era: criminal bodies and the gallows in popular medicine. London: Palgrave Macmillan; 2017.
196. Jaworski J. Die Mandragora im südrussischen Volksglauben. *Zschr f österr Volkskunde.* 1896;2:353–61 **(in German)**.
197. Vardanian A. The Assyro-Babylonian Xumbaba and the Armenian Plant name X'Mbaba. *Iran Caucasus.* 2001;5:207–8.
198. Amasiaci A. Nenužnoe dlja neučej. Transl. Vardanian. Moscow: S.A. Nauka; 1990. (In Russian). (In [102:253]).
199. Rahner H. Greek myths and Christian mystery. New York: Biblo and Tannen Publishers; 1963.
200. Randolph CB. The Mandragora of the ancients in folk lore and medicine. *Proc Am Acad Arts Sci.* 1905;40:487–532.
201. Simoons FJ. Plants of life, plants of death. Madison: Univ. of Wisconsin Press; 1998.
202. Wagstaff DJ. International poisonous plants checklist: an evidence-based reference. Boca Raton: CRC Press; 2008.
203. Topper U. Wortsammlung der Tier- und Pflanzennamen im Taschelhiyt-Berberischen von Marokko. *Almogaren.* 1998;29:199–214 **(in German)**.
204. Harrak H, Lebrun M, Alaoui MMI, Senhaji AF, Hamouda A. Vers une valorisation du savoir-faire local des oasis: cas du jus de dattes Tassabount au Maroc. *Fruits.* 2009;64(4):253–60 **(in French)**.
205. Léveillé, MH. Mandragora. *Flora of China.* St Louis: Missouri Botanical Garden Press; 1994;17:329.
206. Politis NG. Laografika symmeikta, Vol. II.—Dimosievmata tou Kentrou erevnis tis Ellinikis Laografias No 13, Second edition. Athens: Akademia Athinon; 1975. **(in Greek)**.
207. Genaust H. Etymologisches Wörterbuch der botanischen Pflanzennamen. Basel and Stuttgart: Birkhäuser; 1979. **(in German)**.
208. Gassen HG, Minol S. Die Alraune oder die Sage vom Galgenmännlein: science and fiction. *Biol in uns.* 2006;36(5):302–7 **(in German)**.
209. Paxton J. Paxton's botanical dictionary: comprising the names, history, and culture of all plants known in BRITAIN; with a full explanation of technical terms. New ed. including all the new plants up to the present year. London: Bradbury, Evans, & Company; 1868.
210. Craig J. A new universal, technological, etymological and pronouncing dictionary of the english language, embracing all the terms used in art, science and literature (Vol. 2). London: Routledge and co.; 1852.
211. Frazer JG. Jacob and the mandrake. *Proc Br Acad.* 1917;8:59–79.
212. Laufer B. La mandragore. *T'oung Pao/1917;* 18(1/2):1–30. **(in French)**.
213. Royal Academy of Language–Spanish-, Web <https://dle.rae.es/mandragora>. Accessed 22 Mar 2019. **(in Spanish)**.
214. Kluge H. Etymologisches Wörterbuch der deutschen Sprache. Ed. by Elmar Seebold. 24th revised and enlarged edition. Berlin, New York: de Gruyter; 2002. **(in German)**.

215. Anderson RR, Goebel U, Reichmann O. Frühneuhochdeutsch arbeit und einige zugehörige Wortbildungen. Ebenbauer, A. (Hg.): *Philologische Untersuchungen*, Elfriede Stutz zum, 65:1–29; 1984. **(in German)**.
216. Grimm J, Stallybrass JS. *Teutonic mythology*, vol. 4. New York: Dover Publ; 1966.
217. Albeck C, Theodor J, editors. *Midrash bereshit rabbah*, vol. 3. Jerusalem: Wahrman; 1965.
218. Jastrow M. *A dictionary of the Targumim, the Talmud Babli, and Yerushalmi, and the Midrashic literature*, vol. 2. London: Luzac; 1903.
219. Sokoloff M. *A dictionary of Jewish Palestinian Aramaic of the Byzantine Period (DJPA)= Dictionaries of Talmud*. Ramat-Gan: Midrash and Targum II; 1992.
220. Tal A. *A dictionary of Samaritan Aramaic*, vol. 2. Leiden: Brill; 2000.
221. Melamed EZ. *Aramaic-Hebrew-English Dictionary of the Babylonian Talmud*. New York: Feldheim Publishers; 2005.
222. Ibn-'Ezra ABM, Shachter JF. *The Commentary of Abraham Ibn Ezra on the Pentateuch*. A. Ibn Ezra, Jay F. Shachter, Trans., Leviticus, The Commentary of Abraham ibn Ezra on the Pentateuch: vol. 3. New York: Ktav Publishing House; 1986.
223. Nachmanides M, Chavel CB. *Commentary on the Torah: Be-reshit-Genesis*. Jerusalem: Shilo Publishing House; 1999.
224. Kohut A. *Kritische Beleuchtung der persischen Pentateuch-Uebersetzung des Jacob Ben Joseph Tavus unter stetiger Rücksichtnahme auf die aeltesten Bibelversionen Ein Beitrag zur geschichte der Bibel-Exegese von dr. Alexander Kohut*. Leipzig und Heidelberg: CF Winter'sche Verlagshandlung; 1871. **(in German)**.
225. Ginzberg L. *The Legends of the Jews: From the creation to Exodus*. Notes for Volumes 1 and 2. Philadelphia: Jewish Publication Society of America; 1925.
226. Wetzstein DJG. *Excursus zum Hohenlied und zu Koheleth*. In: *Biblischer Commentar*, Bd. Hoheslied und Koheleth. Vol. 4. Delitzsch F. (ed.). Leipzig: Dörffling und Franke; 1875. p. 437–455. **(in German)**.
227. Elliot S. *Evolution of the Dragon*. New York: Library of Alexandria; 1919.
228. Yehsha'aya N. *Sefer Maor Ha'afela*. Y. Kappakh (transl.). Jerusalem: Ha'aguda Lehatsalat Ginzey Teiman; 1957. **(in Hebrew)**.
229. Clendening L. *Source book of medical history*, vol. 621. New York: Courier Corporation; 1960.
230. Fleisher A, Fleisher Z. *The fragrance of biblical mandrake*. *Econ Bot*. 1994;48:243–51.
231. Bos G, Hussein M, Mensching G, Savelsberg F. *Medical Synonym Lists from Medieval Provence: Shem Tov ben Isaac of Tortosa: Sefer ha-Shimmush*. Leiden: Brill; 2011.
232. Bennett BC. *Doctrine of signatures: an explanation of medicinal plant discovery or dissemination of knowledge*. *Econ Bot*. 2007;61:246–55.
233. Lindley J, Moore T. *The treasury of botany: a popular dictionary of the vegetable kingdom*, vol. 2. London: Longmans; 1876.
234. Keezer WS. *Botanical sources of early medicines*. *Bios*. 1963;34:185–91.
235. Dumas A. *The history of anaesthesia*. *J Natl Med Assoc*. 1932;24:6–9.
236. Gottlieb LS. *In search of Nepenthe*. *J Health Hum Behav*. 1962;3:288–93.
237. Wright T. *The archaeological album; or museum of national antiquities*. In: Wright T. (ed.). London: Chapman & Hall; 1845.
238. *Sruanjteanc' G. Erker (Songs)*, vol. 1, Yerevan: 1978. (In: 101:153).
239. Adams F. *The genuine works of Hippocrates*. 2 vols. London: Printed for the Sydenham Society; 1849.
240. Başer KHC, Honda G, Miki, W. *Herb drugs and herbalists in Turkey*. Tokyo: Stud. Cult. Islam. No. 37. Institute for the Study of Languages and Cultures of Asia and Africa; 1986.
241. Wink M. *A short history of alkaloids*. In: Roberts MF, editor. *Alkaloids: biochemistry, ecology and medicinal applications*. Berlin: Springer; 2013. p. 11–45.
242. Hanuš LO, Řezanka T, Spižek J, Dembitsky VM. *Substances isolated from Mandragora species*. *Phytochemistry*. 2005;66:2408–17.
243. Hanuš LO, Dembitsky VM, Moussaieff A. *Comparative study of volatile compounds in the fresh fruits of Mandragora autumnalis*. *Acta Chromatog*. 2006;17:151–60.
244. Jackson BP, Berry MI. *Mandragora taxonomy and chemistry of the European species*. In: Hawkes JG, Lester RN, Skelding AD, editors. *The biology and taxonomy of the Solanaceae*, Linnean Society symposium series. London: Academic Press; 1979. p. 505–12.
245. Al-Khalil S, Al Kofahi A. *The chemical constituents of Mandragora autumnalis*. *Alexand J Pharm Sci*. 1996;10:135–8.
246. Schlesinger D, Rikanati RD, Volis S, Faigenboim A, Vendramin V, Cattonaro F, Hooper M, Oren E, Taylor M, Sitrit Y, Inbar M. *Alkaloid chemodiversity in Mandragora spp. is associated with loss-of-functionality of MoH6H, a hyoscyamine 6β-hydroxylase gene*. *Plant Sci*. 2019;283:301–10.
247. Bosse-Griffith K (2001) *Amarna studies and other selected papers*. Fri-bourg, Switzerland/Göttingen, Germany: University Press. Vandenhoeck Ruprecht.
248. Folkard R. *Plant lore, legends, and lyrics: embracing the myths, traditions, superstitions, and folk-lore of the Plant Kingdom*. London: Sampson Low, Marston, Searle, and Rivington; 1892.
249. Weil MS. *Magiferous plants in medieval English herbalism*. Doctoral dissertation. Department of History and the Faculty of the Graduate School of the University of Kansas. 2009. http://humboldt-dspace.calst.edu/bitstream/handle/2148/500/magi_plants_h.pdf?sequence=1. Accessed 20 Mar 2019.
250. Trevelyan M. *Folk-lore and folk stories of wales*. London: Elliot Stock; 1909.
251. Thompson CJS. *The mystic mandrake*. London: Rider; 1934.
252. Buckland R. *Signs, symbols and omens: an illustrated guide to magical and spiritual symbolism*. St. Paul: Worldwide; 2003.
253. Jurj G. *Mandragora*. *Bull Soc Rom Homeopat*. 1998;2:22–7.
254. Emboden W. *Narcotic plants, hallucinogens, stimulants, inebriants and hypnotics-their origins and uses*. London: Littlehampton Book Services Ltd.; 1972.
255. Abraham HD, Aldridge AM, Gogia P. *The psychopharmacology of hallucinogens*. *Neuropsychopharmacology*. 1996;14(4):285–98.
256. Laza Palacios M. *El ungüento de las brujas*. *Gibralfaro. Revista de estudios malagueños*. Año III, num. 3; 1953. p. 163–170. **(in Spanish)**.
257. Ostling M. *Babyfat and BellCEonna: witches' ointment and the contestation of reality*. *Magic Ritual Witchcr*. 2016;11:30–72.
258. Hildegard Von Bingen. *Physica the complete English translation of her classic work on health and healing*. Throop P. (transl.). Trochester: Art Healing Press; 1998.
259. Lee MR. *The Solanaceae II: the mandrake (Mandragora officinarum); in league with the Devil*. *J R Coll Phys Edin*. 2006;36:278–85.
260. Chéruel A. *Dictionnaire historique des institutions moerues et coutumes de la France*, 7th edn, vol. 2. Paris: Librairie Hachette; 1899.
261. Le SP. *Folk-lore de France*, vol. 3. Paris: Éditions G.P. Maisonneuve et Larose; 1969. **(in French)**.
262. Frazer JG. *Folk-lore in the old testament*, vol. 2. London: Macmillan; 1918.
263. Crichfield G. *The alchemical magnum opus In Nodier's "La Fee Aux Miet-tes"*. *Nineteenth Century French Stud*. 1983;11(3–4):231–45 **(in French)**.
264. Flavius J. *The war of the Jews*. Transl. W. Whiston. New York: Simon and Schuster; 2014.
265. Artemi. *Momoirs of the Life of Artemi of Wagarschapet*. London: Treuttel and Würtz, Treuttel Jun. and Richter; 1822.
266. Bajela-Farroki MH (1980) *Creation of mankind in Asaia myths*. In: Yadava JS, Gautam V (eds) *The communication of ideas*. International congress of anthropological and ethnological sciences, vol 3. New Delhi: Concept Publishing Company. p. 11–16.
267. Cowan JM. *A botanical expedition to Persia*. *Bull Misc Inform Kew*. 1930;2:49–68.
268. Arber A. *Herbals: their origin and evolution*. Cambridge: Cambridge University Press; 1938.
269. Roger E. *La Terre Sainte, ou, Description topographique tres-particuliere des Saints Lieux & de la Terre de Promission*. Paris: Chez A. Bertier; 1764. **(in French)**.
270. Hardwick C. *Traditions, Superstitions, and Folklore, (chiefly Lancashire and the North of England) Their Affinity to Others in Widely distributed Localities; Their Eastern Origin and Mythical Significance*. Manchester: A. Ireland; 1872.
271. Bosner W. *The medical background of Anglo-Saxon England*. London: The Wellcome; 1963.
272. Rowe K. *Dead hands: fictions of agency, renaissance to modern*. Stanford: Stanford University Press; 1999.
273. Baker F. *Anthropological notes on the human hand*. *Am Anthropol*. 1888;1(1):51–76.

274. Eliade M. Gayōmart et la Mandragore. In: Altera P (ed) *Ex orbe religionum*. Leiden: Brill; 1972. p. 65–74.
275. Albrile E. *Hypnotica Iranica, Zoroastrianism ecstasy in the West*. In *Zoroastrianism in the Levant and the Amorities*. In: Abouzayd S (ed) *Proceedings of conferences held in 2010 & 2012*. Oxfors: ARAM; 2014. p. 181–187. <https://docplayer.net/119328891-Hypnotica-iranica-zoroastrian-ecstasy-in-the-west.html>. Accessed 18 Feb 2020.
276. Ibn al-Bayṭār. *Kitāb al-Ġāmi' li-Mufradāt al-'Adwiya wa-l'ʿAġḍiya*. Bayrūt: Dār al-Ġarb al-Islāmiyy; 1992. (in Arabic).
277. Pliny. *Natural History*. Rackham H. (transl.). Loeb Classical Library. London: William Heinemann. p. 1938–1962.
278. Dierbach JH. *Flora mythologica oder Pflanzenkunde in Bezug auf Mythologie und Symbolik der Griechen und Römer: ein Beitrag zur ältesten Geschichte der Botanik, Agricultur und Medicin*. Frankfurt am Main: Johann David Sauerländer; 1833. (in German).
279. Apollonius Rhodius. *The Argonautica* (trans. Seaton RC). London: Loeb Classical Library. William Heinemann: G.P. Putnam's Sons; 1930.
280. Clark RJ. A note on Medea's plant and the mandrake. *Folklore*. 1968;79(3):227–31.
281. Forbes TR. Medical lore in the bestiaries. *Med Hist*. 1968;12(3):245–53.
282. Diekstra FN. The physiologus, the bestiaries and medieval animal lore. *Neophilologus*. 1985;69(1):142–55.
283. Lang A. *Customs and myths*. In: Price D (ed). London: Longmans, Green and Co.; 1884.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions



Terms and Conditions

Springer Nature journal content, brought to you courtesy of Springer Nature Customer Service Center GmbH (“Springer Nature”).

Springer Nature supports a reasonable amount of sharing of research papers by authors, subscribers and authorised users (“Users”), for small-scale personal, non-commercial use provided that all copyright, trade and service marks and other proprietary notices are maintained. By accessing, sharing, receiving or otherwise using the Springer Nature journal content you agree to these terms of use (“Terms”). For these purposes, Springer Nature considers academic use (by researchers and students) to be non-commercial.

These Terms are supplementary and will apply in addition to any applicable website terms and conditions, a relevant site licence or a personal subscription. These Terms will prevail over any conflict or ambiguity with regards to the relevant terms, a site licence or a personal subscription (to the extent of the conflict or ambiguity only). For Creative Commons-licensed articles, the terms of the Creative Commons license used will apply.

We collect and use personal data to provide access to the Springer Nature journal content. We may also use these personal data internally within ResearchGate and Springer Nature and as agreed share it, in an anonymised way, for purposes of tracking, analysis and reporting. We will not otherwise disclose your personal data outside the ResearchGate or the Springer Nature group of companies unless we have your permission as detailed in the Privacy Policy.

While Users may use the Springer Nature journal content for small scale, personal non-commercial use, it is important to note that Users may not:

1. use such content for the purpose of providing other users with access on a regular or large scale basis or as a means to circumvent access control;
2. use such content where to do so would be considered a criminal or statutory offence in any jurisdiction, or gives rise to civil liability, or is otherwise unlawful;
3. falsely or misleadingly imply or suggest endorsement, approval, sponsorship, or association unless explicitly agreed to by Springer Nature in writing;
4. use bots or other automated methods to access the content or redirect messages
5. override any security feature or exclusionary protocol; or
6. share the content in order to create substitute for Springer Nature products or services or a systematic database of Springer Nature journal content.

In line with the restriction against commercial use, Springer Nature does not permit the creation of a product or service that creates revenue, royalties, rent or income from our content or its inclusion as part of a paid for service or for other commercial gain. Springer Nature journal content cannot be used for inter-library loans and librarians may not upload Springer Nature journal content on a large scale into their, or any other, institutional repository.

These terms of use are reviewed regularly and may be amended at any time. Springer Nature is not obligated to publish any information or content on this website and may remove it or features or functionality at our sole discretion, at any time with or without notice. Springer Nature may revoke this licence to you at any time and remove access to any copies of the Springer Nature journal content which have been saved.

To the fullest extent permitted by law, Springer Nature makes no warranties, representations or guarantees to Users, either express or implied with respect to the Springer nature journal content and all parties disclaim and waive any implied warranties or warranties imposed by law, including merchantability or fitness for any particular purpose.

Please note that these rights do not automatically extend to content, data or other material published by Springer Nature that may be licensed from third parties.

If you would like to use or distribute our Springer Nature journal content to a wider audience or on a regular basis or in any other manner not expressly permitted by these Terms, please contact Springer Nature at

onlineservice@springernature.com