

Nigella in the Mirror of Time

A Brief Attempt to Draw a Genus' Ethnohistorical Portrait

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INTRODUCTION¹

Nigella (fennel flower) is one of the smaller genera in the Ranunculaceae (buttercup) family: it comprises only about 15 species if considered in the wider sense, thus including the sister taxa *Garidella* and *Komaroffia* (ZOHARY 1983; DÖNMEZ/MUTLU 2004). In this study, we also treat the various (sub)species within the *Nigella arvensis* complex as one single species – a rather strong simplification when considering the results obtained by STRID (1970) or BITTKAU/COMES (2005; 2008), but sufficient for our purpose in this paper.

All members of the genus *Nigella* are therophytes (annuals that overwinter as seeds) with a short life cycle, requiring open habitats to flourish. This makes several of them occur frequently in anthropogenic ecosystems. As an example, the well-known ornamental species *Nigella damascena* (love-in-a-mist) can nowadays be observed as a rapid colonizer of fallow land around the Mediterranean. Taxa from the *Nigella arvensis* complex have played a role in the vegetal vegetation of Europe's agriculture since at least the Late Iron Age (CANEPPELE et al. 2010; KOHLER-SCHNEIDER et al. forthcoming), but are nowadays endangered or even extinct in wide areas due to intensification of agricultural technology, and excessive use of fertilizers and herbicides (in central Europe, cf. LUDWIG/SCHNITTNER 1996; NIKLFELD/SCHRATT-EHRENDORFER 1999). *Nigella sativa* (black cumin), to mention a third example, is probably the best-known species of the genus. Lore has it – and we are going to test this against the available evidence – that this condiment has been propagated and culti-

vated for thousands of years. At least today it is indeed a frequently consumed condiment in North Africa, the Arabian Peninsula, and the Indian subcontinent while also being the object of intensive pharmacological research and more or less reliable phytomedicine vendors (see below).

The evolutionary origins of the genus are most probably to be found in its centre of species diversity, which occurs in the Aegean (BITTKAU/COMES 2008) and the adjacent Western-Irano-Turanian region (STRID 1970; ZOHARY 1983), as illustrated in Figure 1. *N. sativa* may thus have come into existence somewhere in this area, although its alleged long-term cultivation would raise significant obstacles to easily proving this hypothesis: When a crop has been propagated by humans and traded across long distances for long periods, knowledge of (and data on) its origins tends to be obliterated, and only long-term multidisciplinary studies may bring these roots back into daylight. However, it is precisely this presumably long history of use, cultivation and/or unintentional spread which makes *Nigella* a promising challenge, and an object of considerable interest both for archaeobotany/palaeoethnobotany and botanical chorology. Also the great popularity which *Nigella* (and, again, especially *N. sativa*) has gained in pharmaceutical literature, particularly well-illustrated in M. A. ANWAR's (2005) bibliometric study, makes this kind of research necessary: The amount of published literature on black cumin or "black seed" is immense, generating the impression that the plant must be a true panacea. Most of these scientif-

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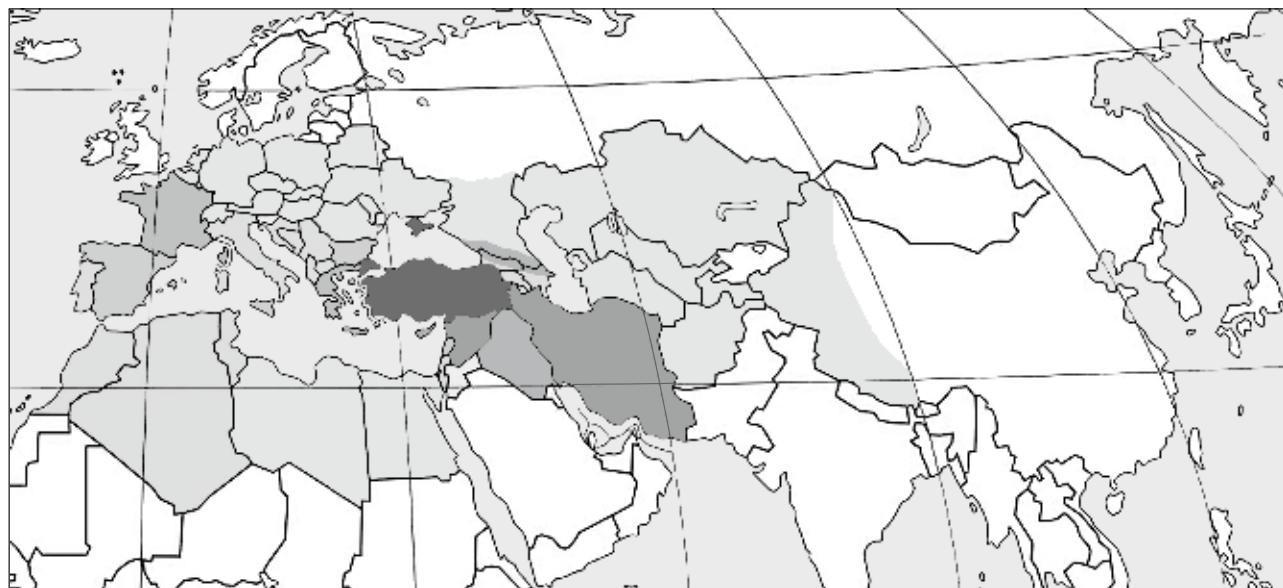


Fig. 1. Modern natural distribution of *Nigella* species in the Old World: 100 % white: 0 species, 100% dark grey: 9 species. Map source: SPIESS 2002; distribution data and species delimitations according to ZOHARY 1983.

ic publications, and even more so the popular “alternative” medical literature and “black seed oil” advertisements, frequently refer to historical accounts or “traditional uses” stressing the alleged high medical potential of the plant – and usually without disclosing any sources.

The current study now aims to compile literature on *Nigella*’s possible past uses, by analysing extant data on the genus provided by archaeology and archaeobotany, with historical written records from

pre-Linnean times (see pp. 158 ff. Table 1–3). Our goal is not only to present an “elaborate florilegium”, but to draw a picture of the cultural perceptions of a group of plants as complete as possible in these few pages. In addition, the sources we have cited here may prove useful for further research in archaeobotany or historical botany, ethnobotany and ethnomedicine, not only of *Nigella* but also of other plant taxa.

SOURCES OF INFORMATION

Archaeobotany

For the current work, an archaeobotanical bibliography of the genus was built, starting with the comprehensive indices by SCHULTZE-MOTEL (1992; 1993; 1994) and KROLL (1995; 1996; 1997; 1998 a;

1999; 2000; 2001; 2004), successively adding more recent publications on archaeological finds. Information on unpublished data was collected via personal communication (see Tab. 1).

Written Sources

The second group of sources used in this work were numerous written documents from all periods available to us, with a strong focus on the eastern Mediterranean – the probable centre of origin of the genus – and on Europe. Although we tried to limit ourselves to primary literature from the respective periods, these were not always available. So, in some cases, later editions had to be used (as in the case of the book by GASPARD BAUHIN 1671 which

was published posthumously), as well as secondary literature.

The temporal range covered extends from Mesopotamian cuneiform tablets of the mid-3rd millennium BC to the 17th century AD (Table 2–3). We decided to omit later periods as the development of botany as a science on its own was already very advanced in the late 17th century, the literature leaving only a few questions on the proper identification

of cultivated plants (see e.g. PAVORD 2005). For the most recent periods included (Early Modern Times), not all available books or documented plant names of the (putative) *Nigella* species were considered in the evaluation due to the great number and the space restrictions of a brief article. Hence, we limited them to those which seemed most important to us, and only discussed some characteristic examples in the text.

In order to facilitate discrimination between historical plant names and modern botanical names

in the sense of the ICBN (the International Code of Botanical Nomenclature, see McNEILL et al. 2006), only the latter are printed in italics. In contrast, all historical plant names are put in quotation marks, even if this does not concur with common practice. Quotation marks are not used in Tables 2–3, column 4, where all plant names are written regularly without quotes, in order to maintain legibility. Original spellings and transcriptions, if missing in the literature consulted, were taken from KATZER (2006 onwards).

Plant Identification and Interpretation

As this work is mainly intended as a compendium and bibliographical work, proper identification (or its refusal) was one of our main goals.

Archaeological plant remains can exactly indicate the presence of a certain plant taxon in a certain place and period, provided that their identification is still possible. They thus serve as a valuable source of information on a plant's distribution, be it natural or anthropogenic. But in order to find out about past ways of plant utilisation, their reception by past societies, or their relation to symbolic or transcen-

dental thought, interpretation by the researcher is always necessary. This interpretation must be based on the plant's properties, the archaeological context, and all available information on the contemporary society. Analogies found in written sources and in ethnographic research often assist in better understanding a plant's role and perception (HANSSON/HEISS forthcoming). In the case of *Nigella* species, the oil-rich seeds (e.g. HEISS et al. 2011) often bearing a conspicuous aroma such as in *N. sativa* and in the *N. arvensis* complex suggest a primary use as condiments. However, all other possible aspects of *Nigella* utilisation need to be inferred from other sources.

While the identification of archaeological remains mainly depends on their preservation, written sources often pose several problems to identification of the plants mentioned, mainly due to vastly differing concepts of what a plant (and a species) is: In a nutshell, in modern botany a species is referred to by similarities of individuals to a certain specimen in a herbarium (the holotype). These similarities usually involve a broad range of characters, such as morphology, anatomy, karyology (chromosome counts), embryology, cross-breeding, chemical con-

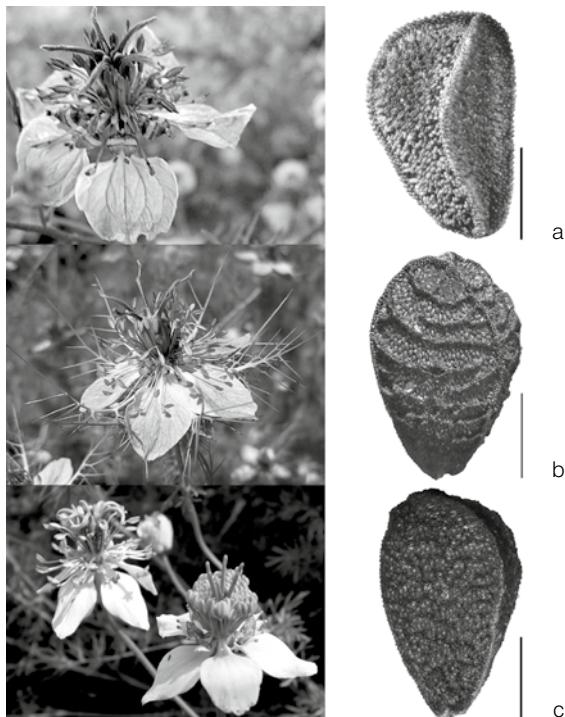


Fig. 2. The three *Nigella* species which currently are documented in the archaeological record by their seeds. a *N. arvensis* (field nigella). b *N. damascena* (love-in-a-mist). c *N. sativa* (black cumin). Scale bar length (seed): 1 mm. For a detailed seed identification key of the whole genus, please refer to HEISS et al. 2011.



Fig. 3. *Agrostemma githago* (corn-cockle) flower and seed. Scale bar length (seed): 1 mm.

stituents, or DNA/RNA sequences – and the range is constantly widening. Although in Linnaeus' time, far fewer characters were available, the idea behind the system was basically the same.

In pre-Linnean times, however, all kinds of properties were used for classifying the living (plant) world, and some of these characters were not even remotely useful for a taxonomical classification: Seed colour, flower colour, scent, taste, usefulness of its fruits for human nutrition, “tree-like” versus herbaceous habit, or even their most common place of growth, to mention a few. Furthermore, these characters were not generally used in combination, but in a quite isolated way. The main consequences for *Nigella* can be described as follows: Greek sources mention a plant possibly corresponding to *Nigella sativa* under the names of “git(h)” and “melanthion” (e.g. in FUCHS 1895–1900; BERENDES 1902; also see here Table 2). As will be demonstrated later, the common feature of dark-coloured – “black”, so to speak – seeds was obviously sufficient for some au-

thors to treat *Nigella* (mainly *N. sativa*) and the toxic *Agrostemma githago* (corn cockle) as more or less the same plant – or at least this character has led to constant confusion of the two, despite all their conspicuous differences in vegetative, flower, and seed morphology (see Fig. 2 versus Fig. 3). Occurrence of *Nigella arvensis* and *Agrostemma githago* in basically the same ecosystems (in crop fields) makes differentiation in literature even more difficult.

Thus, identification of the species mentioned in written sources had to remain uncertain in many cases. Major exceptions were, on the one hand, illustrated herbals allowing identification of the taxa mentioned. On the other hand, several written sources gave hints on the nature of the plants by describing their attributes: A “nigella” plant growing in the field and with pungent black seeds was most probably identified correctly by the ancient author. But if any warning of possible toxic properties was found, or even a description of red flowers, we could be sure of confusion with *Agrostemma*.

RESULTS

Oldest Archaeological Finds

In the eastern Mediterranean, the presence and use of *Nigella sativa* (black cumin) is more than well-documented: In Egypt alone, archaeological finds from eleven sites help trace the plant from the 28th/27th century BC up to Roman times, showing a significant increase of information since RENATE GERMER's (1989) comment on the “rare evidence” of *Nigella* (likewise, see ZOHARY/HOPF 2000). Scattered evidence also exists from the Antiquity of present-day Syria, Jordan, and Turkey. However, in spite of the vast written evidence on the knowledge of *Nigella (sativa)* from the Ancient Near East, such as in Babylonian and Assyrian cuneiform tablets (see below), we still do not know about the plant's role in Ancient Egyptian culture: Textual sources are still missing, although frequently – and perhaps contrary to more reliable knowledge? – stated otherwise by companies eager to sell *Nigella sativa* oil (e.g. AGENTUR 2012). What is certain is that the plant has

been known and used in the Near East and in Ancient Egypt since at least 2700 BC, the oldest archaeological evidence of *Nigella sativa* originating from Saqqara (RZEUSKA 2006).

Interestingly enough, even older finds of *Nigella* seeds have been discovered in an Eneolithic (Copper Age) site in the Spanish province of Murcia (PRECIOSO ARÉVALO 2004). Unfortunately they could not be identified to species level. There is also quite early archaeological evidence for *Nigella* from Central Europe: Pollen grains in miners' faeces from the Late Iron Age Dürrenberg indicate the consumption of some unidentified *Nigella* species (ASPÖCK et al. 2007). Even older is the Late Bronze Age find of a partly charred *N. damascena* seed in an Alpine ore-processing site (HEISS/OEGGL 2005). Both find contexts may suggest import and consumption of *Nigella* species by metallurgy specialists from the eastern Mediterranean area.

Oldest Written Sources: the Ancient Near East

This region is basically the richest in very early historical sources for *Nigella*, and for *N. sativa* in particular. We may begin tracing this evidence with two sources from Biblical texts, which are commonly cited as “clear” evidence of *Nigella* use: The “qesah” from the Book of Isaiah, and the “kyminon” from the Book of Matthew. The latter at least is not all that

clear, as “kyminon” directly corresponds to Greek, Akkadian and Arabic names for cumin (*Cuminum cyminum*; see ZOHARY 1995). The Hebrew “qesah” may be somewhat closer (TREVER 1959; ZOHARY 1995), as the word is used in parallel with “kammōn” (cumin) in Isaiah and is understood to refer to black cumin, i. e. *Nigella sativa*, by ancient translations and

Medieval and later commentators alike; also the survival of the word in the form “*kizḥa*” in Palestinian vernacular Arabic points in the same direction (Löw 1924, 120–123; see also below). However, it is only in the cuneiform sources from Mesopotamia that one finds good contextual evidence for the cultivation of *Nigella* and for its use for culinary and, to a lesser degree, medical purposes from the late 3rd millennium BC until the late 1st millennium BC. In fact, the Ancient Near East has produced the richest body of ancient textual evidence that can be brought to bear on the present topic, and an unusually strong case for a positive identification of the Ancient (Sumerian and Akkadian, i.e. Babylonian and Assyrian) plant name(s) with the genus *Nigella* and even specifically *N. sativa* can be made – a case that is based not only on etymology, as is commonly the case with Ancient Near Eastern (and generally ancient Semitic) plant names, but also based on context.

Starting points are the Akkadian plant names “*kamūnu*” and “*zibibiānu*”, the latter with its variants “*zibū*”, “*sabibiānu*”, “*šibibānu*” etc. (in the following, we will always use the variant that is attested in the source in question). These words do not have Semitic etymologies in the sense that they are not of Semitic origin, rather, they are ancient *Wander- or Kulturwörter*. The first corresponds to Arabic “*kammūn*”, Hebrew “*kammōn*”, Syriac “*kammūnā*” (cumin, *Cuminum cyminum*), this word itself being of course a loan of the same origin in all modern European languages (via Greek). “*Zibibiānu*” etc. etymologically corresponds to Syriac “*sbūbānā*” (and variants), which is equated in various traditions with Hebrew “*qeṣah*” and Arabic “*šūnīz*”, the latter of which is a synonym of “*kammūn aswad*” (black *kammūn*). Medieval Hebrew and Western early modern as well as modern commentators take all these words to designate *Nigella (locus classicus: Löw 1924, 120–123)*. The etymologies of the Akkadian words were recognized early on, and they have thus generally been translated as “cumin” and “black cumin” (*N. sativa*) respectively (e.g. VON SODEN 1965–1981, 434; 1524; LANDSBERGER/GURNEY 1957/58, 336; THOMPSON 1949, 69–72).

The context of the attestations of “*zibibiānu*” etc. bears out the etymological argument. The earliest evidence comes from the second half of the 3rd millennium BC and is in Sumerian. In administrative texts of the period one encounters the condiment “*gamun*” (e.g. STEINKELLER/POSTGATE 1992, 77). This word is of the same origin as the slightly younger “*kamūnu*”. “*Gamun*” comes in two variants: “white” (babbar), and “black” (gi₆) (e.g. SCHNEIDER 1931, no. 64: 7–8). The cuneiform signs used to write the loan word “*gamun*”, viz. (Ú-ŠE+NUN.NUN-SAR or Ú-DIN-ŠE+NUN.NUN-SAR) indicate that garden plants (Ú ... SAR) characterized by their grainy seeds (ŠE) are meant, or rather, the seeds of these plants. In

some scribal traditions of late 3rd millennium BC Sumerian, e.g. in the city of Girsu, the pair “white/black *gamun*” is given as (unqualified) “*gamun*” and “*zibum*” or “*zibibianum*” – the latter corresponding of course to the Akkadian words “*zibū*”/“*zibibiānu*” (e.g. MAEKAWA 1993, 123 no. 94 ii: 11–12; iii: 4–5; vi: 5–6). The interpretation of “*zibibiānu*” as “black *gamun/kamūnu*” also re-occurs in the native Babylonian lexical tradition of the 2nd and 1st millennium BC (e.g. THOMPSON 1949, 70–71; LANDSBERGER/REINER 1970, 94: 300–303). The fact that the black seeds were the principal product of the plant follows also from medical recipes which indicate that “*zibū*” had to be ground with a pestle or a handmill (e.g. VON SODEN 1965–1981, 1525; SALONEN 1965, 53).

In the late 3rd millennium BC, the black and white “*gamun*” were cultivated in southern Mesopotamia in special spice gardens (MAEKAWA 1985, 99; 112) together with coriander and legumes. From later periods there is only some scattered evidence for the cultivation of “*kamūnu*” in the south (e.g. STOL 1986, 61; 98), and we do not hear of the cultivation of “*zibū*”, even though the use of the seeds continues in this region. After the 3rd millennium, explicit attestations for the cultivation of “*zibibiānu*” (“*sabibiānu*”) are only available for northern Mesopotamia. Evidence comes from the Khabur region (RÖLLIG/TUKIMOTO 1999, 436: note the absence of “*kamūnu*” in this context) and from the region around modern Kirkuk (ZACCAGNINI 1979, 128). Since the bulk of the evidence for the use of “*zibibiānu*” is also from northern Mesopotamia, it is probable that the plant was cultivated and used predominately in this region, while the seeds used for culinary and medical purposes in the south were possibly imported (cf. REYNOLDS 2007, 178).

Medical use of “*zibū*” involves usually braying the seeds in a mortar and mixing them with a fatty substance, or with barley beer. It is used for mouth or tooth disorders, but also for other internal problems (THOMPSON 1949, 70–71). Culinary use is much better documented. In the late 3rd millennium BC, the “*gamun*” varieties are well attested as culinary ingredients (e.g. BRUNKE 2011, 198; 219). From later periods, rich bodies of evidence come again from northern Mesopotamia. In the city of Mari on the middle Euphrates, “*zibū*” was an important spice that was used side by side with “*kamūnu*”. The two were important ingredients of the sumptuous *mersu* cake, in addition to flour, fat, dates and other fruit, as well as garlic and coriander (BOTTÉRO 1995, 23–24), but they were also used for other meat and vegetable dishes (SASSON 2004). Also in the city of Alalakh, further to the west, “*zibū*” was much in demand (ZEEB 2001, 193–194), and it is also attested in the 13th century BC in the city of Ugarit on the northern Mediterranean coast in the local alpha-

betic cuneiform script in the form “ssbyn” (*ibid.*). Around the same time, Hittite sources from Anatolia make their contribution: There the word “*kappani-*“ (a loanword, with m > p) renders the Sumero-gram “*gamun*”, and again we find a black and a white variety (e.g. SÜEL/SOYSAL 2003, 354 §9: 18–21’). The black variety is used, *inter alia*, in a ritual where it is sprinkled on dough – a reflex of its being used as an ingredient of bread (HOFFNER 1974, 103–104). The richness of the data from northern Mesopotamia summarized here makes the dearth of information from the south stand out: In the detailed

culinary recipes from southern Mesopotamia from the first half of the 2nd millennium BC, “*zibû*” is not employed, while “*kamûnu*” is (BOTTÉRO 1995).

Summing up the Mesopotamian evidence, we conclude that the contextual data support the etymology-based identification of “*zibû*” etc. with *Nigella sativa*. Certainly, nothing in the sources contradicts the identification. We note that the “*zibû*” seeds were in particularly intensive use in, and therefore perhaps originating from, the hilly regions of today’s Eastern Turkey, Northern Syria and (especially) Northern Iraq.

Greek and Roman Antiquity

Written sources from Greek Antiquity are – contrary to what would be expected – much more ambiguous in their contents than the much older sources mentioned above: The works by Hippocrates contain hints on the utilisation of a plant “*melanthion*” (black flower), a name which seems to be in contrast to *Nigella*’s blue or white flowers. As no morphology is described and one of the Hippocratic recommendations is that of an abortifacient (cf. FUCHS 1895–1900), the identity as *Nigella* seems at least questionable. VON GROT (1887) suggested the Hippocratic “*melanthion*” might even be the highly toxic ergot (*Claviceps purpurea*), its black sclerotia (the dense mass in which the fungus’ fruiting bodies are produced) protruding seed-like from cereal ears. The advice to “sort it out” (εκλέξας; *ibid.* 81) is thus interpreted as to avoid ergot intoxication. Also the use as an abortifacient (among other gynecological indications, see Table 2) speaks, in von Grot’s opinion, in favour of ergot. But rye, which is most susceptible to ergot infection, has never been cultivated as a main cereal in the Mediterranean (cf. BEHRE 1992), rendering wide-spread ergotism as well as common knowledge about it rather improbable phenomena. And, as mentioned above, *Nigella* (see Fig. 2) was frequently confused with the toxic – and black-seeded – corn cockle (*Agrostemma githago*; see Fig. 3) during most periods since Antiquity. It may well be that proper identification of the “*melanthion*” from the Hippocratic texts is not possible at all, and it is very likely that this oldest mention of black cumin – the basis for centuries of medical literature dealing with this plant – in fact may have described the corn cockle.

Only much later, in the Natural History of Pliny the Elder from the 1st century AD, does the situation improve: Apart from attributing numerous medicinal effects to the plant (the name “*melanospermon*” = “black seed” corresponds a lot better to the morphology of *Nigella* than “*melanthion*” = “black flower”), Pliny describes the extraordinary smell of its black seeds, as well as their use as a bread condiment (BOSTOCK/RILEY 1855, lib. 20, 71). Columella’s recommendation of “*git*” as an appetizing drug for horses (FORSTER/HEFFNER 1954) might also be a plausible use for an aromatic plant like *N. sativa*. Pliny’s contemporary author, Pedanios Dioscorides, recommends the plant “*melanthion*” for roughly the same purposes – with one important difference, as he warns against the possible lethal effects of the plant’s seeds consumed in excess (BERENDES 1902). Considering the very low toxicity in all *Nigella* species (ROTH et al. 1994), this “mistake” may be due to some random misconception, or to the amalgamation of the plant’s properties with those of a toxic plant. Whether this species was the corn cockle or not, the “toxicity myth” found in Dioscorides, as we will see later, was carried forward up to Modern times.

Archaeological evidence of *Nigella sativa* during Roman times comes mainly from Egyptian excavations (VAN DER VEEN 2007; J. Walter/U. Thanheiser pers. comm.), while only one site in France and one in Great Britain document long-distance transport of the plant across Europe in this period. Also, Roman finds of *N. arvensis* exist from several sites in central Europe (see Table 1), but currently it is impossible to tell whether at the time this plant was used at all by the local population.

The rich archaeobotanical evidence published on *Nigella* finds during Antiquity vastly decreases during the Middle Ages: Only two sites with *Nigella sativa* are reported from Late Medieval Germany (WOLF 1991; LANGE 1993), and one site with *N. arvensis* in Austria (unpubl., S. Wiesinger/U. Thanheiser pers. comm.).

In the south-eastern Mediterranean, archaeological and textual evidence has already well documented a long tradition in the utilisation of *Nigella sativa* since prehistory (see Table 1). Thus, in spite of the scarcity of archaeological finds from the Medieval Arabic world, we judged most Arabic texts as rather certain documents for *Nigella sativa* use. Perhaps the most influential mention of *Nigella sativa* is found in the beginnings of Islamic culture, where Sahih al-Bukhari's *hadith* mentions the plant as a panacea (STILLMAN 1983; MUHSIN KHAN 1996). This source may even represent the main driving force for the extraordinarily high amount of scientific and popular publications from Islamic countries (see for example ANWAR 2005; ANONYMOUS 1993).

From Al-Andalus on the Iberian Peninsula, from the 9th century AD, comes the Book of Agriculture by Ibn al-Awwam. While mainly explaining methods of how to best cultivate the "well-known garden nigella" (CLÉMENT-MULLET 1866), the author also mentions two species growing in the wild: One similar to the first (*N. sativa*), but with "black to ashen seeds" (*N. arvensis*?), and another one with seeds that are "black, round, and rough to the touch", a character combination also found, however not exclusively, in *Agrostemma githago* (see Fig. 3; Table 2).

In western and central Europe, the often-cited 9th-century "Capitulare de Villis" gives no detailed information on the plant "gith". It is regarded as being desirable to have in a garden, so at least there is no strong argument against interpreting this as *Nigella sativa*. The contemporary "Leechbook of Bald" from present-day Great Britain is likewise poor in information on the kind of plant referred to. The author's suggestion of using "gitte" against spleen inflammations is on the one hand autonomous from the archetypes in Roman/Greek Antiquity, and on the other hand seems to have influenced some Renaissance medical literature: It is found again much later in PARKINSON (1629), but also in some of continental Europe's herbals (e.g. in BOCK 1630).

Hildegard von Bingen's 12th-century "Physica" gives more information than earlier Medieval sources, yet still remains unclear. In spite of several translators' views, the plant "Ratden" (also "Githerum rate" and "Zizania"; see DAREMBERG/VON REUSS 1855) may ambiguously be referring to *Nigella* as well as to *Agrostemma*: The author warns against its consumption for food, but recommends it against ulcers, and

as an insecticide. Due to the term "Zizania", usually used for a grass-like weed, one translator (RIETHE 1989) suggests it could even refer to poison darnel (*Lolium temulentum*). In a different chapter, Hildegard however does mention something closer to *Nigella (sativa)*, when she suggests adding "gith" as a condiment to fish (see Table 2).

Much clearer is Albertus Magnus' 13th-century work "De Vegetabilibus", although he does not mention anything corresponding to *Nigella*: Under the term "nigella" he deliberately gives a morphology of *Agrostemma githago*, with its "long, green and hairy stalk [...] red flower [...] black seeds" (transl. from MEYER/JESSEN 1867, 543). The plant's properties and suggested medicinal uses also differ in some important aspects from what we know from Hippocratic traditions for *Nigella* (or, *nota bene*, *Agrostemma*): While the author does recommend it for all kinds of skin disorders and toothache, he also indicates the use of the seed flour for washing and bleaching laundry. Due to the high saponin content of *Agrostemma* seeds (ROTH et al. 1994) this utilisation as a detergent seems plausible. Similar accounts are also given in VON MEGENBERG (1442), who also mentions a "Zizania" (see above), but explicitly synonymising it as "Lolium" (see Table 2).

Although illustrations, as indicated in the introduction, usually are a great help in identifying plants from manuscripts, in some cases the illustrators themselves are also a major source of trouble. The "Compendium Salernitanum", as an example, mentions "nigella", suggesting its use in the treatment of ulcers and skin disorders (DE RENZI 1852). But while this use conforms to the properties conveyed for *N. sativa*, its illustration from a 14th-century manuscript of the "Compendium" shows *Nigella damascena* (Brit. Mus., Eg. MS. 747; see PÄCHT 1950). The situation is even more confusing in the case of the slightly younger "Circa Instans" manuscript: It mentions a plant named "git", whose properties also basically conform to the traditional *Nigella* uses, as does the description of its seeds as triquetrous (PLATEARIUS undated; DORVEAUX 1913). But while one undated 15th-century French manuscript of the book illustrates this plant (here named "nielle") with an image of *Agrostemma githago* (Fig. 4, a), in two others (also undated) the text is accompanied by illustrations of *N. damascena* (Fig. 4, b–c). And finally, a fourth manuscript of the same book, illustrated by the famous artist Robinet Testard (Ms Fr. Fv VI #1 fol. 153v), shows a plant labelled "Cyminum sylvestre" – a name used for *Nigella* in a later work by Valerius Cordus (GESNER 1561 b) – but the plate unequivocally shows *Consolida regalis* (forking larkspur)!



Fig. 4. “Git” or “nielle” in two 15th century French manuscripts of the “Liber de simplici medicina” (or “Circa Instans”) attributed to MATTHAEUS PLATEARIUS (undated). A one manuscript (btv1b6000422n, p. 96r.) is illustrated with *Agrostemma githago*, while in (b) the same text (btv1b60004232, p. 205v.) is accompanied by an image of *Nigella damascena*, just as it is in a third manuscript (c) (btv1b9061049h, p. 232v.). Image courtesy (all pictures): Bibliothèque Nationale Française, Paris.

And, finally, JOHANNES VON CUBA (1485) tells the reader about a plant with “flowers like corn-flower” (=blue) and seeds which are “black, spicy, and with a pleasant odour” (perfectly fitting for *Nigella*!) but at the same time all editions of his book are illustrated with *Agrostemma githago* (Fig. 5) with purple flowers, its seeds being odourless.

As a conclusion for medieval literature, therefore, no clear conclusion can be made: Every herb-

al that has come down to us has its own fallacies and strengths, and many of the contradictions inside the texts, and sometimes even between the author and the illustrator, render tracing a taxon’s historical perception rather difficult. And in addition to the probable confusion/amalgamation of *Nigella* and *Agrostemma* in Greek and Roman Antiquity, *Lolium temulentum* has now been added, as well.

Early Modern Period

The Renaissance and Early Modern Period were the heyday of herbals. This is, on the one hand, due to the invention of the printing press in the mid-1450s and the new possibilities of producing a virtually unlimited number of identical copies of the same book. On the other hand, the period is characterised by the breaking up of scholastic traditions, the re-orientation towards Antiquity, and critical discussion of inherited sources and traditions. The philosophical advances in this period often show in the schoolmasterly undertone in many of the herbals, authors refuting obsolete ideas, and correcting misidentifications. Due to the vast bulk of available literature, only a few examples shall be mentioned in order to illustrate the new attitudes.

DODOENS (1557), while giving clear identification

for three *Nigella* species (see Table 3), finds that *N. damascena* has odourless seeds (which in fact release a strong strawberry-like aroma when crushed). The author treats corn cockle in a separate section and finds no sensible purpose for it, apart from “some incompetent [people] using it instead of nigella, to the great harm of the sick” (transl. from DODOENS 1557).

Likewise, Valerius Cordus describes *Nigella arvensis* (as “*Nigella cornuta*”) quite well, even pointing out an earlier confusion with (maybe) *Nigella hispanica* (“nigella Citrina”) corrected by Matthiolus (edition commented by GESNER 1561 b). And he explicitly warns against confusing *Nigella (sativa)* with a flower easily recognisable as *Agrostemma githago*, pointing out its characters as “long hairy leaves [...] purple flowers, not unlike a small rose” (transl.



Fig. 5. “Nigella” or “raten” in von CUBA (1485), Cap. 277: In contrast to the name used, the illustration shows *Agrostemma githago* (corn cockle). Image courtesy: Bayerische Staatsbibliothek, München.



Fig. 6. *Nigella* species in BESLER (1613), Plate 174: “*Melanthium Damascenum flore pleno*” as well as “*Melanthium Sativum flore simplici*”, both with the characteristic flower involucle, correspond to *Nigella damascena*, while “*Melanthium Hispanicum maius*” is what is known today as *Nigella hispanica*. Image courtesy: Taschen Verlag, Köln.

from GESNER 1561 a, Cap. 48). Konrad Gesner, in his own book “Horti Germaniae”, identifies the dissected involucre beneath the flowers of *N. damascena* as a diagnostic trait, but adds a bit of confusion in mentioning “Gith vulgaris”, identifying its seeds as fragrant, but as yellowish (the latter a typical feature for *N. hispanica*). It may be that in fact he was referring to *N. arvensis*, whose seeds are brighter in colour than those of *N. sativa* (GESNER 1561 c).

GERARD (1597) is an interesting source inasmuch as the author explicitly only attributes medical properties to the “Nigella Romana” (*N. sativa*), although also giving descriptions for other species (see Table 3). Still quite in a Dioscoridic tradition, he warns against the toxicity of excess *Nigella* use while in his chapter on corn cockle he does not mention anything of the like. He even claims that confusion of *Agrostemma githago* with darnel might have been the reason for possible intoxications. In MATTIOLI (1590), no differentiation at all is found in terms of medical properties: Three *Nigella* species and *Agrostemma* are subsumed including a plethora of indications – but also the Dioscuridic warning against toxic effects.

HIERONYMUS BOCK (1630), as another example, does not differentiate either between the effects of the three *Nigella* species he mentions, although he strictly separates *Agrostemma githago* from them, attributing no useful effects to it. But also in his book we find the warning about excessive consumption of *Nigella* seeds, carrying forward the “toxicity myth” falsely attributed to *Nigella* since Dioscorides.

Some further differentiation worth mentioning is found in PARKINSON (1629): As already anticipated in GERARD (1597), this author clearly differentiates three kinds of *Nigella* “not fit to be used” in medicine from *N. sativa* which he deems a useful remedy. Among other purposes, he recommends the plant against the “swollen spleen” as originally found in Bald’s Leechbook of the 9th century.

In the case of *Nigella*, at least the medical recommendations during early Modern times remain more or less the same as in the Middle Ages, and most of the authors do not differentiate between the qualities of the different species as remedies. At any rate, most of these works serve as examples of the emancipation of botany from medicine and pharmacology: The mention of medicinal effects of the plants gradu-

ally move into the background, while in many books large portions of the texts are devoted to plant characters. The illustrations from the “Hortvs Eystettenensis” by BASILIUS BESLER (1613), a horticultural work

and thus without any information on medicinal use, may serve as an example for the shift in the perception of plants in the period (Fig. 6).

CONCLUSIONS AND PROSPECTS

It may be obvious that textual sources on plants are to be used with caution, and proper identification of the plants treated is still the main problem. In the limited space of this article, we hope to have exemplified these difficulties for the genus *Nigella* as thoroughly as possible. Apart from this “simple” diagnosis, we have also tried to demonstrate that in written sources, properties attributed to certain plants frequently shifted around among the taxa described, and – as in the case of *Nigella* and *Agrostemma* – sometimes even seem to have existed separately from the physical plant itself, but rather as independent ideas (see also the chapter on mandrake in HEISS/KOHLER-SCHNEIDER 2011). This may be due to authors who were more focused on the tradition (and repetition) of ancient diagnoses and of a certain symbolism instead of a real striving for better knowledge about the plants.

Especially for the Eastern Mediterranean region during Antiquity, it has proved highly effective to combine historical, linguistic, and actual archaeo-

logical evidence of a plant (*Nigella sativa*, that is) in order to find out about its cultural reception, and resulting in a rather sound verification of its use as a condiment and medical plant for approximately 5,000 years in the Levant.

It has to be emphasized that assessing the actual benefits (or none) of the medical use of *Nigella* (*N. sativa*) is far from the scope of this paper and the expertise of its authors. Still, we would like to emphasize that the multitude of medical effects attributed to *N. sativa* by modern “black seed oil” vendors may not even be based on historical accounts of *Nigella* at all, but maybe refer to those of the toxic corn cockle (*Agrostemma githago*). And also the “toxicity myth” itself is still found in modern literature (e.g. DUKE et al. 2008, 302; TAHRAOUI 2007), uncritically passed down for more than two millennia.

Modern medical research has, however, started to test these old myths against reality, and has indeed revealed some promising medical effects of *Nigella* species (e.g. ANWAR 2005; LANDA et al. 2009).

SUMMARY

Nigella (Ranunculaceae) is a small genus of annuals mainly of Irano-Turanian distribution, but some species also extending across most of Europe, northern Africa, and western Asia. The genus comprises several taxa of ethnopharmacological interest, as their seeds are used in a wide range of medicinal contexts – those of *N. sativa* have even developed into a plant drug of prime commercial interest. However, the historical dimension (the “traditional uses”) of *Nigella* species, nowadays used as a marketing tool and often a justification of modern use,

has hardly ever been documented basing on the critical use of sources, and employing a multidisciplinary approach.

The current paper now attempts to combine a wide range of written sources and the full archaeological record in order to find evidence of this genus’ possible use in history and prehistory, and to serve as an example of the combination and interlinking of research tools from historical botany and archaeobotany.

ZUSAMMENFASSUNG

Nigella (Ranunculaceae) ist eine kleine Gattung annueller Pflanzen mit vor allem Irano-Turanischer Verbreitung. Einige Arten erstrecken sich auch über große Teile Europas, Nordafrikas und Westasiens. Die Gattung umfasst einige Taxa mit ethnopharmacologischer Nutzung, ihre Samen finden in einer Vielzahl volksmedizinischer Indikationen Anwendung – jene von *N. sativa* haben sich sogar zu einer pflanzlichen Droge von großem kommerziellem Interesse entwickelt. Die historische Dimension jedoch (die „traditionelle Anwendung“) von *Nigella*-Arten, die heute oft als Vermarktungsargument und Rechtfertigung für medizinischen Gebrauch heran-

gezogen wird, wurde kaum jemals anhand textkritischer Untersuchungen oder interdisziplinärer Ansätze dokumentiert.

Die vorliegende Arbeit versucht nun, ein möglichst breites Spektrum von Textquellen zusammen mit einer vollständigen Dokumentation archäologischer Funde heranzuziehen, um Hinweise auf die tatsächliche Nutzung dieser Gattung in historischer und vorgeschichtlicher Zeit zu finden und um als Beispiel für die Möglichkeiten interdisziplinärer Arbeit von historischer Botanik und Archäobotanik zu dienen.

Abbreviations in Tables 2–3

Languages: AR = Arabic; AS = Assyrian; DE = German (Deutsch); EN = English; FR = French; GR = Greek; HE = Hebrew; IT = Italian; JA = Judaeo-Arabic; LA = Latin (Latin or Latin-like names are usually not explicitly labelled); NL = Dutch (Netherlands); SR = Serbian.

Species: Ag = *Agrostemma githago* (corn cockle); An = *Anethum graveolens* (dill); Cc = *Cuminum cyminum* (cumin); Cp = *Claviceps purpurea* (ergot); Cr = *Consolida regalis* (forking larkspur); Lt = *Lolium temulentum* (darnel); cf. = “confer”, identification of a plant specimen incomplete; * = ornamental cultivars of *Nigella*.

Uses: ABO = abortifacient; ADO = antidote; ARI = antirheumatic, antiinflammatory; ATH = anthelmintic; BIT = heals bites; CAL = carminative, laxative; CON = condiment; DEN =

dental disorders; DET = detergent and bleaching agent; DIA = diabetes; DIU = diuretic; EGA = emmenagogue, galactagogue; EVE = „evil eye“ protection; FRA = heals fractures; FUM = fumigant; HEM = haemostatic; HEP = hepatic disorders, jaundice; HYC = hypercholesterolemia; HYH = hypertension, heart disorders; INS = insectifuge; MAP = male potency, prostate disorders; MEN = mental and nervous disorders, headaches; OPH = ophthalmic disorders; ORN = ornamental; OTO = otologic disorders; PAN = panacea (covers all mentioned uses except veterinary); RES = respiratory disorders; SKI = skin disorders; SNA = drives away snakes; SPL = “swollen spleen”; TOS = tonic, stimulans; TOX = toxicity warning; VET = veterinary use (diverse).

Table 1. Archaeological finds of *Nigella* species. ^a Identified as *Nigella damascena* in RUAS (1995), but revised as *Nigella sativa* by HEISS/RUAS (2007). ^b Initially identified as *Nigella sativa* (VANDORPE 2010), but according to the published images safe to be identified as *Nigella sativa*. ^c Initially identified as *Nigella arvensis* (KROLL 1998b), but revised as *Nigella sp.* by H. Kroll in 2012 (pers. comm.).

Date/Period	Archaeological site	Number and preservation of finds	Species	References
			<i>Nigella</i> sp.	
			<i>N. sativa</i>	
			<i>N. damascena</i>	
			<i>N. arvensis</i>	
Early Modern Times				
1975–1610 AD	Netherlands: Heveskesklooster terp	1 waterlogged seed	x	— CAPPERS 1995
ca. 1900–1600 AD	Libya: Wadi el-Agjal	unreported number of desiccated seeds	—	— PELLING 2003
	France: Rigny-Ussé, rectory	1 mineralised seed from a cesspit	—	x ^a — RUAS 1995
16 th cent. AD		20 mineralised seeds from a cesspit	—	x — HELLWIG 1997
1530–1580 AD	Germany: Göttingen, Johannissstraße			
Middle Ages				
14 th /13 th cent. AD	Germany: Cottbus	7 waterlogged seeds from a well mineralised seeds from a cesspit	—	x — LANGE 1993
14 th /13 th cent. AD	Germany: Höxter		—	x — WOLF 1991
12 th –8 th cent. AD	Spain: Lleida, Costa de Magdalena (Islamic)	3 mineralised seeds	—	x ALONSO I MARTÍNEZ 2005
10 th –5 th cent. AD	Austria: Leobendorf	2 waterlogged seeds	x	— S. Wiesinger/U. Thanheiser pers. comm.
8 th –7 th cent. AD	Syria: Qasr al-Hayr al-Sharqi	unreported number of mineralised seeds	—	x M. Kühn pers. comm.
Antiquity (Common Era) and Late Antiquity				
ca. 600 AD	Tunisia: Carthage (Late Antiquity)	pollen grains in the harbour sediments	—	— ? — VAN ZEIST et al. 2001
150–125 AD	Netherlands: Maastricht	1 waterlogged seed	x	— — BAKELS/DIJKMAN 2000
3 rd cent. AD	Germany: Groß-Gerau	1 seed	x	— — KREUZ/Stika 2009
3 rd cent. AD	Germany: Friesheim	unreported number of waterlogged seeds	x	— — KNÖRZER 1971
3 rd –1 st cent. AD	UK: Carlisle, Annewell Street	1 waterlogged seed	—	x — HUNTLEY 1989
3 rd –1 st cent. AD	Egypt: Dakleh oasis	unreported number of seeds	—	x — J. Walter/U. Thanheiser pers. comm.
2 nd cent. AD	Germany: Butzbach	1 waterlogged seed	x	— — KNÖRZER/BAATZ 1973
2 nd cent. AD	France: Biesheim/Kunheim	2 mineralised seeds in a pit	—	x ^b — VANDORPE 2010
2 nd /1 st cent. AD	Egypt: Mons Claudianus (Roman)	62 desiccated + 2 charred seeds	—	x — VAN DER VEEN 2007
2 nd /1 st cent. AD	Egypt: Mons Porphyrites (Roman)	31 desiccated + 12 charred seeds	—	x — VAN DER VEEN 2007
180 AD–460 BC	Germany: Hessisches Ried	pollen grains in a peat bog	?	? — SINGER 2006
1 st cent. AD	France: Biesheim/Kunheim	2 waterlogged seeds	x	— — VANDORPE 2010

Table 1, continued. Archaeological finds of *Nigella* species. ^a Identified as *Nigella damascena* in RUAS (1995), but revised as *Nigella cf. sativa* (VANDORPE 2010), but according to the published images safe to be identified as *Nigella sativa*. ^b Initially identified as *Nigella arvensis* (KROLL 1998b), but revised as *Nigella* sp. by H. Kroll in 2012 (pers. comm.).

Date/Period	Archaeological site	Number and preservation of finds	Species	References
			<i>N. sativa</i>	<i>Nigella</i> sp.
			<i>N. damascena</i>	<i>N. sativa</i>
			<i>N. arvensis</i>	<i>N. sativa</i>
Antiquity and Prehistory (1st millennium BC)				
330–578 BC	Austria: Dürnberg mine (La Tène)	pollen grains in human faeces	—	—
110–250 BC	Austria: Roseldorf (La Tène)	1 charred seed in a sanctuary	x	—
7 th –11 th cent. BC	Egypt: Gebel Rona (Intermediate Per. 3)	1 desiccated grain from a midden layer	—	x —
7 th –16 th cent. BC	Egypt: Gebel Qant el-Gir (New Kingdom/Intermediate Per. 3)	4 desiccated seeds	—	x —
7 th –16 th cent. BC	Egypt: Wadi el-Huöl (New Kingdom/Intermediate Per. 3)	1 desiccated seed	—	x —
7 th –16 th cent. BC	Egypt: Wadi el-Huöl (New Kingdom/Intermediate Per. 3)	1 desiccated seed	—	x —
810 BC	Bosnia-Herzegovina: Klisura Kadića Brdo	1 waterlogged seed	—	?
ca. 800 BC	Jordan: Tell Deir 'Allā	9 desiccated seeds	—	x —
920–1410 BC	Austria: Brixlegg, Mauken (Late Bronze Age)	1 partly charred seed	—	x —
Antiquity and Prehistory (2nd millennium BC and earlier)				
11 th –16 th cent. BC?	Egypt: Thebes (New Kingdom? Passalacqua Collect., Berlin, Inv.-No. 6997)	unreported number of desiccated seeds	—	x —
11 th –16 th cent. BC	Egypt: Gebel Rona (New Kingdom)	2 desiccated grains from a midden layer	—	x —
9250–10450 BC	Syria: Tell Qaramel	1 charred grain	—	x —
ca. 1323 BC	Egypt: Tutankhamun tomb (New Kingdom, 18 th dynasty)	unreported number of desiccated seeds in a pot	—	x —
late 14 th cent. BC	Turkey: Ulu Burun shipwreck	unreported number of waterlogged seeds	—	x —
15 th –19 th cent. BC	Serbia: Feudvar	1 charred seed	—	x ^c —
ca. 1650 BC	Turkey: Royal Höyük (Old Hittite)	ca. 180,000 charred seeds in a flask	—	x —
1771–1991 BC	Egypt: Kahun (Middle Kingdom, 12 th dynasty)	unreported number of seeds	—	x —
2216–2707 BC	Egypt: Saqqara (Old Kingdom, 4 th –6 th dynasty)	unknown number of charred seeds	—	x —
2300–2900 BC	Spain: El Prado (Jumilla, Murcia)	unreported number of seeds	—	x —
				PRECIOSO ARÉVALO 2004

Table 2. Written sources on *Nigella* species from Antiquity to the Middle Ages. Abbreviations see p. 157.

Date/Period	Work (original title and author where available)	References	Name used (original name where available)	Species	Uses
Middle Ages				<i>N. sativa</i> <i>N. hispanica</i> <i>N. damascena</i> <i>N. arvensis</i>	others
15 th cent. AD	liber de simplici medicina / circa instans (by Matthaeus Platearius?); PLATEARIUS undated; DORVEAUX 1913		- x - ? Ag, ARI, CAL, DIU Cr		
15 th –12 th cent. AD	Chilandar Medical Codex	JARIĆ et al. 2011	- x - -	-	ATH, DIU, SKI
1485 AD	Gart der gesuntheit (Johannes von Cuba); Cap. 277	VON CUBA 1485	- - - -	-	Ag ADO, ATH, CAL, DEN, DIU, FUM, INS, OPH, OTO, RES, SKI, SNA, TOX
1442 AD	buch von den natürlichen dingen (by Konrad von Megenberg)	VON MEGENBERG 1442; PFEIFFER 1861	No. 55: Nigella; röteu korn- phuum (DE)	- - - -	Ag CAL, DEN, DET, TOS
ca. 1440 AD	Kräuterbuch (by Johannes Hartlieb)	RUMPLER 1980	No. 89: Zizania; ratenkraut (DE)	- - - -	Lt TOX
14 th cent. AD	Nihayat al-Arab fi funun al-adab (by Al-Nuwayri)	LEV 2002	nigella; ratien (DE) ? (AR)	- - - x	Ag CAL, DEN, DET, SKI ADO, ARI, BIT, DEN, SKI
14 th cent. AD	Fasl fi ma'rifat al-mata'anih wa-al-asiqā (royal crop register of Rasūlid Yemen, by Al-'Afḍal)	VARISCO 1991	? (al-habba al-sawdā) (AR)	- - - x	no uses mentioned
ca. 1350 AD	compendium Salernitanum (by Bartholomeus Copho?)	PÄCHT 1950; PAVORD 2005; DE RENZI 1852	Nigella	- x - x	SKI
1309–1304 AD	De ruralia commoda (by Petrus de Crescentis)	DE CRESCENTIS 1477–1483	nigella	- - - -	Ag? ATH, CAL, DIU, OTO, SKI
13 th cent. AD	de vegetabilibus (by Albrecht von Bollstadt / Albertus Magnus); book 6, tract. 2, ch. 13	MEYER/JESSEN 1867	nigella	- - - -	Ag? ARI, DEN, DET, Lt? FUM, MEN, OPH, SKI, SNA
13 th –10 th cent. AD	medical prescriptions from the Cairo Genizah Taylor-Schechter Collection	LEV 2007; LEV/A MAR 2006; 2008	? (JA)	- - - x	ADO, ARI, OPH, SKI
12 th cent. AD	liber simplicis medicinae / "physica" (by Hildegard von Bingn)	DAREMBERG/VON REUSS 1855	book 1, cap. 12; Zizania; Rat- den (DE)	- - - -	Ag? INS, SKI, TOX Lt?
12 th cent. AD	al-Aqrābādīn (The Dispensatory by Ibn at-Tilmīd)	KAHL 2007	book 5, cap. 24; gith ?	- - - x	CON
12 th cent. AD	Kitāb al-Filāha (The Book of Agriculture, by Ibn al-'Awwam); ch. 26, art. 3	CLÉMENT-MULLER 1866	?	x - - x	ARI, CAL, MEN, SKI

Table 2, continued. Written sources on *Nigella* species from Antiquity to the Middle Ages. Abbreviations see p. 157.

12 th cent. AD	Kitābū'l-Kulliyāt fi al-Tibb (General Rules of Medicine, by Ibn Rushd / Averroës): p. 5	ZIMARA 1542 ?	-	-	x	-	FUM, OTO
11 th cent. AD	Diwan al-Filāha (Treatise on Agriculture, by Ibn Bassal)	HARVEY 1975 ?	-	-	x	-	no uses mentioned
11 th /10 th cent. AD	Mishnaic glossary Hebrew-Greek: No. 73	STARR 1934/35 תַּלְמִיד (HE)	ΜΕΑΝΘΗ (melanthie) (GR); τηλμίδ (HE)	-	-	x	no uses mentioned
10 th /9 th cent. AD	Kitāb al-Qanūn fi al-Tibb (The Canon of Medicine, by Ibn Sina / Avicenna): book 2, ch. 21	AL-SHAYKH AL-RA'IS 1593 ?	شُورَنْجَر (Habbet as-suda) (AR)	-	-	x	?
9 th cent. AD	Bald's Leechbook: f. 93r	DEEGAN 1988 wyr(t) (EN)	gitter(r) (GR/EN); sutherne	-	-	?	ARI, CON, SPL
9 th cent. AD	capitulare de villis vel curtis imperii (by Alcuin of York? Ansegius of Saint-Wandrille? Louis the Pious?)	VON FISCHER-BENZON 1894 git (GR)	wyrt (EN)	-	-	?	no uses mentioned
9 th cent. AD	Kitāb al-Sūmūm (Book on Poisons, by Ibn Wahshīya)	LEVEY 1966 ?	شُورَنْجَر (Habba sawdā') (AR)	-	-	x	ADO
9 th cent. AD	Sahih al-Bukhari (Al-Bukhari's hadith collections): vol. 7, book 71, no. 591 f.	MUHSIN KHAN 1996 ? (AR)	-	-	x	-	PAN
Antiquity							
2 nd /1 st cent. AD	"Book of Matthew" 23:23	DR. BIBELGES. 1992; ZOHARY 1995 κύμυον (kyminon) (GR)	-	-	-	Cc	no uses mentioned
1 st cent. AD	de medicina (On Medicine, by Aulus Cornelius Celsus): lib. 4	LEE 1863 gith	-	-	?	-	DIU, EGA, SKI
1 st cent. AD	de re rustica (On Agriculture, by Lucius Junius Moderatus Columella), lib. 6, 23	FORSTER/HEFFER 1954 git	-	-	?	-	VET, TOS
1 st cent. AD	de materia medica (On Medicaments, by Pedanius Dioscorides)	BERENDES 1902 μελάνθιον (melanthion) (GR)	-	-	?	-	ATH, BIT, CON, DEN, DIU, EGA, FUM, MEN, OPH, RES, SKI, SNA, TOX
1 st cent. AD	naturalis historia (Natural History, by Plinius Maior / Pliny the Elder): lib. 20, 71	BOSTOCK/RILEY 1855 git; μελάνθιον (melanthion), ? (melanospermon) (GR)	-	-	?	-	ADO, BIT, CON, DEN, EGA, FUM, INS, MEN, OPH, RES, SKI, SNA, TOX
4 th cent. BC	"corpus Hippocraticum" (by Hippokrates of Kos?)	FUCHS 1900; VON GROT 1887 μελάνθιον (melanthion) (GR)	-	-	?	Ag? Cp?	APO, CAL, EGA, MEN
7 th cent. BC (or older)	various medical prescriptions on Assyrian cuneiform tablets	THOMPSON 1923; 1925; 1930; ? (zibūm) (AS) 1937; RICHARDSON 2007	-	-	?	-	ARI, DEN, MEN, OPH, SKI
7 th /8 th cent. BC	"Book of Isaiah" 28:27	MOLDENKE 1955; TREVER 1959 נֶגֶב (quésah) (HE)	-	-	?	An?	no uses mentioned
8 th cent. BC	description of the contents of the garden of Mesopotamian king Merodach Balada	LEACH 1982 ? (AS)	-	-	?	Cc?	no uses mentioned
20 th cent. BC	Hurrian text from Nuzi (Nuzu): tab. HSS 13,353	FARBER 1977 ? (AS)	-	-	?	-	no uses mentioned

Table 3. Written sources on *Nigella* from early Modern Times (pre-Linnean). Abbreviations see p. 157.

Date/Period	Work (original title and author where available)	References	Name used (original name where available)	Species	Uses
19 th -16 th cent. AD	Iatrosophikon	LARDOS 2006	? (mavrokokkon, melanthon) (GR)	- ? -	- ARI, CAL, DEN, MEN, OPH, OTO, RES, SKI
1688 AD	The English Gardener (by Leonard Meager)	WOUDSTRA 2000	nigella; fennel flower (EN)	- x -	- ORN
17 th /16 th cent. AD	medical manuscripts (by Hayyim ben Joseph Vital)	LEV 2002	?	- -	- ADO, ARI, BIT, DEN, SKI
1683 AD	Hortus Medicus Edinburgensis (by James Sutherland)	ROBERTSON 2001	Spanish Nigella (EN)	- ?* -	- no uses mentioned
1660 AD	1660 Rate Book	WALLIS 2010	Nigella	- -	- no uses mentioned
1630 AD	Kräutterbuch (by Hieronymus Bock/Tragus); p. 92f. Bock 1630	Nigella; Schwarz Coriander (DE)	x x -	x -	collectively: ABO, ATH, CAL, CON, DEN, EGA, FUM, MEN, RES, SKI, SNA, SPL, TOX
	p. 101f.	Nigella vulgaris, Nigellastrum, Githago; Groß Raden (DE)	- -	-	- Ag no uses mentioned
1629 AD	Paradisi in paradisus terrestris (by John Parkinson); PARKINSON 1629 p. 287 f.	a) Nigella Hispanica flore simplici; great Spanish Nigella (EN)	- - x -	-	-
		b) Nigella Damascena flore multiplici; double blew Nigella (EN)	- x* -	-	a)-c): regarded as being useless
		c) Nigella Catrina flore multiplici; double white Nigella (EN)	x* -	-	-
		d) Romane Nigella (EN)	- -	- x -	ARI, SPL
1625 AD	Neuw vollkommen Kreuterbuch (by Jacob Theodor / Tabernaemontanus); lib. 1, 172-176	THEODOR 1625	a) Melanthium sativum; Zam Nardensamen (DE)	- -	collectively: ADO, ARI, BIT, CAL, CON, DIU, EGA, FUM, HYH, INS, MEN, ORN, RES... (=PAN), VET
		b) Melanthium citrinum multiflorum; Geel Nardensamen (DE)	- - x* -	-	-
		c) Melanthium Damascenum quartum; Damaszenischer Nardensamen (DE)	- x -	-	-
		d) Melanthium sylvestre; Wild Nardenkraut (DE)	x -	-	-
		e) Nigella flore pleno; Damaszenischer Nardensamen mit gefüllten Blumen (DE)	- x* -	-	-

Table 3, continued. Written sources on *Nigella* from early Modern Times (pre-Linnean). Abbreviations see p. 157.

1613 AD	Hortvs Eystettensis (by Basilius Besler); plates 174; 180	BESLER 1613	a) Melanthium Damascenum flore pleno b) Melanthium Sativum flore simplici c) Melanthium Hispanicum maius d) Nigella peregrina flore multiplici	- x* - - - -	- - - - - - - -	collectively: ORN
1597 AD	The Herball or General Historie of Plantes (by John Gerard); p. 924f.	GERARDE 1597	a) Melanthium, Nigella Romana; Garden Nigella (EN)	- - - - x -	- ARI, ATH, CAL, EGA, FUM, MEN, RES, SKI, TOX	
			b) Melanthium sylvestre; Wilde Nigella (EN)	x - - - -	- - - -	
			c) Melanthium Damasenum; Damaskē Nigella (EN)	- x - - -	- - - -	
			d) Nigella flore albo multiplici; Double flowered Nigella (EN)	- x* - - -	- - - -	
1590 AD	Kreutterbuch (by Pietro Andrea Mattioli / Matthiolus); p. 276f.	MATTIOLI 1590	Pseudomelanthium, Githago, Nigellastrum; Cockle; Bastard Nigella (EN); Niele (FR)	- - - - -	- Ag EGA, HEP	
			a) Nigella sativa; schwartzter Coriander (DE)	- - - - x	- collectively: ADO, ATH, BIT, CAL, DEN, DIU, EGA, FUM, HEM, HEP, INS, MEN, OPH, RES, SKI, SNA, SPL, TOX	
			b) Melanthium sylvestre; wilder schwartzter Coriander (DE)	x - - - -	- - - -	
			c) Melanthium sylvestre; wilder schwartzter Coriander (DE)	- x - - -	- - - -	
			d) Pseudomelanthium; Raden, Kornnäglen (DE)	- - - - -	- Ag	
1572 AD	Compendio della faculta de' semplici (...) by Philippus Florentinus); p. 38–39	FLORENTINUS 1572	a) Melantio (IT)	- - - - x	- ARI, ATH, CAL, DIU, MEN	
1570? AD	The names of all sortes of sedes (...)	HARVEY 1995	b) Nigella (IT) nigella Romana, Fennel Flower (EN)	- - - - -	- Ag no uses mentioned	
1561 AD	In Pedacii Disocoridis Anazarbei primum de medica materia librum, Annotationes (by Valerius Cordus)	GESNER 1561 a	Nigella (vera); warns of confusion with Agrostemma (but without mentioning its name)	- ? - - -	? - ORN	
		Lib. I, Cap. 48	Lolium; Raden, Trespe (DE)	- - - - -	- Ag no uses mentioned	
		Lib. II, Cap. 122	Cymimum cornutum, Nigella cornuta;	- - - - -	- Lt	
		Lib. III, Cap. 69	Hornkümmel (DE)	- - - - -	- - - -	
		Lib. III, Cap. 93	Nigella; μελανθίον (melanthion) (GR); Schwartzter Kümmel (DE); warns of confusion with Raden (Agrostemma)	- - - - x	- Ag	

Table 3, continued. Written sources on *Nigella* from early Modern Times (pre-Linnean). Abbreviations see p. 157.

1561 AD	De plantis (by Valerius Cordus), lib. II, Cap. 22	GESNER 1561b	<i>Nigella cornuta</i> , <i>Cymimum syvestre alterum</i>	x	-	-	-	-	-	-	-	-	no uses mentioned for any
		nigella Citrina		-	-	x	-	-	-	-	-	-	
	Cap. 23	Nigella		-	-	-	-	x	-	-	-	-	
	Cap. 24	nigella Damascena		-	x	-	-	-	-	-	-	-	
1561 AD	Horti Germaniae (Konrad Gesner); p. 268	GESNER 1561c	a) <i>Nigella</i> (<i>Melanthium</i> , <i>Gith</i>) <i>Damascena</i>	-	x	-	-	x	-	-	-	-	no uses mentioned for any
		b) <i>Gith vulgaris</i>		-	-	?	-	x	-	-	-	-	
		c) <i>Gith sylvestris</i>		x	-	-	-	x	-	-	-	-	
													collectively: ADO, BIT, CAL, DEN, FUM, INS, MEN, OPH, RES, SKI, SNA
1557 AD	Histoire des plantes (by Rembert Dodoens); p. 195f.	DODOENS 1557	a) <i>Melanthium sativum</i> , <i>Nigella domestica</i> ; <i>Nielle domestique</i> (FR); Schwartz kumich, Schwartz kumel (DE)	-	-	-	-	x	-	-	-	-	
		b) <i>Melanthium sylvestre</i> , <i>Nielle sauvage</i> (FR); S. Katharinensblume, waldt schwartz kumich (DE)		x	-	-	-	x	-	-	-	-	
		c) <i>Melanthium Damascenum</i> , <i>Nigella Damascena</i> ; schwartz Coriander (DE)		-	x	-	-	x	-	-	-	-	
		Lychnis sylvestris; <i>Nielle vulgaire</i> (FR)		-	-	-	-	-	Ag	TOX			
		a) Schwartz Kümlich (DE) vs. geeler Kümmich (DE)		-	-	?	-	x	-	-			collectively: ADO, ATH, BIT, CAL, DEN, DIU, EGA, FUM, INS, MEN, OPH, RES, SKI, TOX
		b) Schwartz Coriander (DE)		-	x	-	-	x	-	-	-	-	
		c) Wilder schwartz Coriander (DE)		x	-	-	-	-	-	-	-	-	Ag, ARI, FRA, HEM, MEN, SKI Lt?
		d) <i>Lolium</i> , <i>Pseudomelanthium</i> ; Radten (DE)		-	-	-	-	-	-	-	-	-	
		Cap. 44											
1541 AD	Historia plantarum (by Konrad Gesner); p. 118	GESNER 1541	<i>gith, nigella</i>	-	-	-	-	x	-	-	ATH, CAL, CON, EGA, INS, SKI		
1537 AD	Examen omnium simplicium medicamentorum (...) (by Antonio Musa Brasavola) p. 174	BRASAVOLA 1537	<i>nigella nigra</i> , <i>papaver nigrum</i> ; nelle noyre (FR)	-	-	-	-	x	-	-	CON, MEN		
		p. 175	<i>githone</i> (GR/IT); ratten (DE)	-	-	-	-	-	Ag	no uses mentioned			

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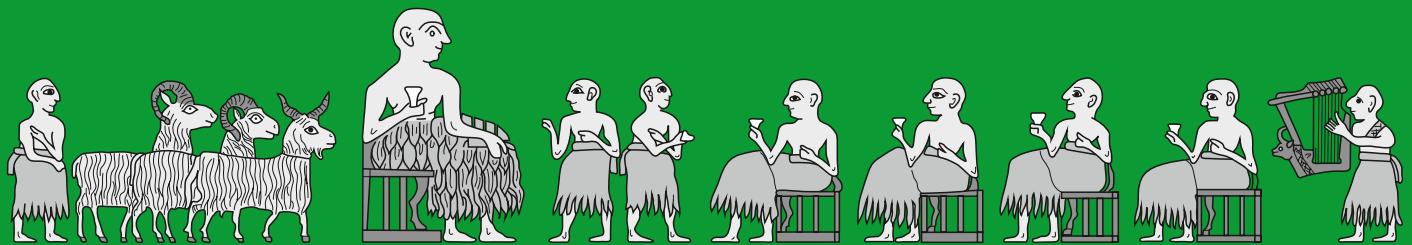
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