Arabic Prescriptions from the Cairo Genizah

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Abstract
Hitherto, research on Arabic pharmacy and pharmacology has largely been based on the study of pharmacopoeias. While practical in nature, it is not clear to what extent the recipes in the pharmacopoeias were in fact used. The Cairo Genizah, the most famous and best preserved of the many depositories of documents written by medieval Jewish communities, provides us with a unique glimpse of practical medicine, by virtue of the prescriptions found there. These prescriptions reflect the medical reality that actually existed in the eastern Mediterranean basin in the 10th–13th centuries, and will be compared especially to pharmacopoeias known to have been used, or even deriving from, members of the Genizah community, such as Minhāj al-dukkān, al-Dustūr al-bīmāristānī and the works of Maimonides. We will examine three prescriptions in depth, attempting to answer the following questions: Who wrote these prescriptions? Who made them up, i.e. prepared the medical recipes? What can be learnt from the prescriptions about medicine, public/community health, the use of materia medica? To what extent are these prescriptions original, i.e. how do they reflect the relationship between medieval medical theory and practice?

Keywords
prescriptions, Islamic medicine, medieval pharmacology, Cairo Genizah

Pharmacology in medieval Arabic medicine
Pharmacology is considered, along with ophthalmology, to be one of the medical fields in which the Arabs excelled; these are the two areas that developed their own specialist monographic literature, in addition to chapters in medical compendia.1 From quite an early stage, pharmacy and medicine were separate professions.2 Books on medicine were among the first scientific works to be translated into Arabic during the translation movement of the eighth to tenth centuries CE,3 while the range of materia medica known to the Arabs greatly surpassed that of the classical world, due to the extent of the Islamic empires and their trade contacts with the Indian and Chinese medical

1 Savage-Smith 2000.
traditions (see below); however, pharmacological theory seems to have remained strictly within the confines of Galenic humouralism.

Hitherto, research on Arabic pharmacy and pharmacology has largely been based on the study of pharmacopoeias. While practical in nature, it is not clear to what extent the recipes in the pharmacopoeias were in fact used. The Cairo Genizah provides us with a unique glimpse of practical medicine, by virtue of the prescriptions found there.

The Cairo Genizah is the most famous and best preserved of the many depositories of documents written by Jewish communities. These depositories originated as storehouses for worn-out and disused sacred writings in Hebrew, which according to Jewish tradition, may not be destroyed. As time passed, all writings in the Hebrew alphabet were placed in such depositories, and, at least in the case of the Cairo Genizah, a chamber in the women’s gallery of the Ben Ezra synagogue in old Cairo (Fuṣṭāt), almost everything written or owned by members of the Jewish community for the best part of three hundred years.

The major collection of documentary material from the Genizah is the Taylor-Schechter Genizah Collection, held in the Cambridge University Library, England. Some sixteen hundred fragments dealing with medical matters, ranging from complete or almost complete codices (including autograph copies) to documents dealing with medical practice and doctor-patient relationships, have been catalogued. About two hundred more have been identified in the past decade. This study is based on prescriptions found in the Taylor-Schechter Collection.

Arabic prescriptions in the Genizah

As Tony Hunt pointed out in a very different context,

The medical receipt has a long and unusually stable history . . . . Equally striking is the receipt’s continuity of form. Its characteristic structure is already discernable in Babylonian medicine where the scheme indication—preparation—application was early established, and a comparable stability in its linguistic features gave rise to set formulae . . . The use of linguistic formulae remained a characteristic feature of the receipt, the nature of the formulae naturally varying according to the language employed.

5 For a general study of this issue, see Lev and Amar 2008a.
6 For the history of the Genizah and Genizah research, see Reif 2000.
7 For a catalogue, see Isaacs 1994. For surveys of the material, see Fenton 1980; Baker 1996.
8 Niessen and Lev 2006.
This feature enabled us to identify Genizah fragments as prescriptions by checking for the following characteristics:

1. It names medicinal substances and quantities, and gives instructions on preparation.
2. A prescription is usually written on one page.
3. It is usually written on one side of a sheet of paper (very rarely vellum).
4. It is often written on reused paper (at times in the margin or in between the lines of other documents or even books).

The following elements are found rarely, but they are very helpful in identifying a fragment as a prescription:

1. Benedictions at the beginning or end of the recipe,\(^{10}\) or both.\(^{11}\)
2. Symptoms/diseases.\(^ {12}\)
3. The name of the inventor of the recipe.
4. The name of the medicine.\(^ {13}\)
5. Instructions for use (how many times a day, special diet, and quantities).\(^ {14}\)
6. The patient’s name.\(^ {15}\)

Of the 141 prescriptions identified so far,\(^ {16}\) eighty-three were written in Arabic, fifty-six in Judaeo-Arabic,\(^ {17}\) one in Judaeo-Persian,\(^ {18}\) and one in Hebrew.\(^ {19}\) This article will be devoted to the majority Arabic-script prescriptions. We consider these prescriptions to be an important element of medical knowledge in its practical form. These prescriptions reflect the medical reality that actually existed, and will be compared especially to pharmacopoeias known to have been used, or even deriving from, members of the Genizah

\(^{10}\) For example, T-S Or. 1081.J.39.
\(^{11}\) T-S Ar.30.305.
\(^{13}\) T-S AS 150.59.
\(^{14}\) T-S Ar.30.305, T-S AS 142.22.
\(^{15}\) T-S Or. 1081.J.39.
\(^{16}\) Research in all fields is a dynamic process, and in no field more so than in Genizah studies. In the last three years, several additional fragments in Arabic script have been identified as prescriptions, while several Judaeo-Arabic documents formerly considered to be prescriptions have been reclassified as notebooks.
\(^{17}\) For a full discussion of these, see Lev 2008.
\(^{18}\) T-S NS 281.158.
\(^ {19}\) T-S NS 90.65.
community, such as Minhāj al-dukkān,\textsuperscript{20} al-Dustūr al-bīmāristanī\textsuperscript{21} and the works of Maimonides. We will examine three prescriptions in depth, attempting to answer the following questions:

(a) Who wrote these prescriptions?
(b) Who made them up, i.e. prepared the medical recipes?
(c) What can be learnt from the prescriptions about medicine, public/community health, the use of \textit{materia medica}?
(d) To what extent are these prescriptions original, i.e. how do they reflect the relationship between medieval medical theory and practice?

It is important to note that the existence of prescriptions in Arabic script alongside those in Hebrew script (Judaeo-Arabic) is another piece of evidence for the multi-cultural and multi-faith character of medicine in the medieval Islamic world. A prescription in Hebrew letters presupposes that all three parties—prescribing physician, patient and pharmacist—were Jews, able to read Hebrew. In contrast, an Arabic prescription means that at least one party may have been a non-Jew (in the Egyptian context, either Muslim or Copt). Members of different religious communities trusted each other enough to allow medicines to be prescribed or made up by ‘outsiders’.

\textit{Examples of prescriptions: transcription, translation, comments}

\textbf{a. T-S Ar.42.189 Prescription (recto)}

This fragment is described thus in the forthcoming revised Isaacs-Baker Catalogue:

\textit{Arabic; Naskhi script; paper; 1 leaf; stained; 27.1 \times 19.1; 15 lines; verso is blank.}

Two recipes and advice on the special diet to be taken by an invalid; the first recipe begins with a \textit{basmalah} followed by the phrase \textit{yu’khadh’ alā barakat Allāh wa-’awnihī} (‘to be taken with God’s blessing and His help’); both recipes conclude with the phrase \textit{al-khayr yakūn min Allāh} (‘benevolence is from God’).\textsuperscript{22}

\hspace{1cm} \textsuperscript{20} Chipman and Lev 2006.
\textsuperscript{21} Lev et al. 2008.
T-S Ar.42.189–42.189; Prescription (recto), Cambridge University Library.
Transcription

1. بسم الله الرحمن الرحيم

2. يأخذ على بركة وعونه

3. ينجز من أثنا وإثنا ومضى ومضى من كل واحد نصف درهم

4. ويبعد في نصف ثقف في السحر على حمية مستمرة ينسب عند الصبح عقد

5. على ... هليلج كالي مزروع وهليلج اصغر مزروع من كل واحد أربعة دراهم لسان

6. حور شامي وعرق سوس وقشر هندبا من كل واحد ثلاثة دراهم بزر رازياج درهم

7. [two words illegible]

8. ويجمع منه على شراب ورد ويسير ريحان

9. للبدا استنفاج جهم خروف أو دجاجة

10. ويسقئ في نصف فانه الشربة عبىته

11. وبعدل في جميع رياح النشا وحر صيفية يؤخذ بارج ثلاثة دراهم إسطخودس

12. وعبري وحيلج كالي واصغر مزروع من كل واحد درهم ويشرب وكثيرا

13. بيض من كل واحد نصف درهم وسحق ويعجن وبحب ويبعد في ثلاثة ليالي متوالية في

14. كل شهر

الخليج يكون من الله

Translation\textsuperscript{23}

1. In the name of God, the Merciful, the Compassionate. To be taken with His blessing and help.

2. Hiera picra, one \textit{mithqāl};\textsuperscript{24} Iraqi agaric and Chinese rhubarb, of each one-half \textit{dirham};\textsuperscript{25}

3. Aniseed and white tragacanth and blue bdellium and scammony, of each one \textit{dānīq};\textsuperscript{26} grind, knead and form into pills;

\textsuperscript{23} The \textit{materia medica} throughout is translated on the basis of the identifications in Kahl 1996 and 2007.

\textsuperscript{24} The authority on Islamic weights remains Hinz 1970. A \textit{mithqāl} is approximately 4.25g.

\textsuperscript{25} A \textit{dirham} is approximately 3.125g.

\textsuperscript{26} A \textit{dānīq} is approximately 0.5g.
4. Swallow in half a draught [of water?] at daybreak with advanced diet appropriate for the morning, . . .
5. . . . cleaned\textsuperscript{27} chebulic myrobalan and cleaned yellow myrobalan, of each four dirhams;
6. Syrian borage and licorice and endive peel, of each three dirhams; fennel seed, one dirham;
7. strained over one \textit{ūqiyya}\textsuperscript{28} of white sugar . . .
8. and mix some of it with rose syrup and basil seed.
9. For lunch: spinach one part, lamb or chicken
10. and use in half, and that is the potion itself
11. and balance in all the winter winds. And in summer heat:\textsuperscript{29} take hiera, three dirhams, lavender
12. and agaric and chebulic and yellow myrobalans, both cleaned, of each one dirham and it should be drunk and white
13. tragacanth, of each half a dirham. It should be ground and kneaded and formed into pills and swallowed on three consecutive nights in each month.
14. Benevolence is from God.

\textbf{Comments}

This prescription presents a holistic treatment of the patient, adapted for different times of year. In fact, we have before us not a single prescription, but three recipes, for two kinds of pills and a potion, as well as dietary advice. The first pill and the potion are meant for use in winter (as are the spinach and meat), while a different pill is to be used in summer. In winter, the pill is taken in the morning, while in summer it is taken on three consecutive nights each month.

The purpose of this prescription is not mentioned explicitly; however, the \textit{materia medica} used seem to indicate a purgative or a stomachic. The first pill contains the compound \textit{hiera picra}, Iraqi agaric,\textsuperscript{30} Chinese rhubarb,\textsuperscript{31} aniseed,\textsuperscript{32}

\textsuperscript{27} That is, stripped of its stalks.
\textsuperscript{28} An \textit{ūqiyya} is approximately 33.85g.
\textsuperscript{29} The wording of this line is not very clear. We take it to refer to the seasons, with different treatments considered appropriate for winter and for summer.
\textsuperscript{30} On the medical use of agaric in Genizah material generally, see Lev and Amar 2008a, pp. 89–91.
\textsuperscript{31} See Lev and Amar 2008a, pp. 259–61.
\textsuperscript{32} See Lev and Amar 2008a, pp. 102–104.
white tragacanth, blue bdellium and scammony. All these are purgative or cleansing drugs. The dry ingredients are pounded and kneaded, with the liquid hiera picra serving as a binding agent. Each pill weighs approximately 14g, i.e. forming a single dose. It is to be swallowed in a small amount of liquid, presumably water. Similar recipes can be found in Sābūr’s Aqrābādhin (a stomachic), in Minhāj al-dukkān (a pill for pains in the head and stomach) and in al-Samarqandī’s Aqrābādhin.

The potion contains chebulic myrobalan, yellow myrobalan, borage, licorice, endive peel and fennel seed, sifted over white sugar. The mixture is then added to rose syrup and basil seed. Unusually, there is no mention of any cooking, and the mixture seems rather dry and stiff. A recipe for ‘spiced syrup,’ good for liver diseases, that appears in Minhāj al-dukkān is quite similar to this potion, but does not include myrobalans. The total ingredients come to about 90g, thus half being used for each dose seems reasonable.

The second, summertime pill is described most clearly: hiera, lavender, agaric, chebulic myrobalan, yellow myrobalan and white tragacanth are kneaded together to form pills. Similar recipes are found in Minhāj al-dukkān (a hiera picra pill good for purging and cleansing, a decoction of dodder good for expelling black bile, to be taken at night), and al-Samarqandī’s Aqrābādhin. As the total ingredients come to about 23g, presumably a fresh batch was made every month. The summer pills contain mainly materia

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33 See Lev and Amar 2008a, pp. 302–305.
34 See Lev and Amar 2008a, pp. 111–12.
35 See Lev and Amar 2008a, pp. 280–82.
36 Kahl 2004, p. 87.
37 Al-Kūhīn al-ʿAṭṭār 1992, p. 120.
38 Levey and Khaley 1967, pp. 82, 84.
39 On all kinds of myrobalan and their medical uses according to Genizah material, see Lev and Amar 2008a, pp. 218–21.
40 See Lev and Amar 2008a, pp. 116–18.
41 See Lev and Amar 2008a, pp. 205–207.
42 See Lev and Amar 2008a, pp. 164–66 on endive in general; many parts of the plant are used medically.
43 See Lev and Amar 2008a, pp. 166–68 on fennel in general; fennel seeds are used as a digestive and vermifuge.
44 See Lev and Amar 2008a, pp. 261–66 on the rose in general.
45 See Lev and Amar 2008a, pp. 108–110.
46 Al-Kūhīn al-ʿAṭṭār 1992, p. 24. This recipe is noted as being ‘from the writing of Ibn Bayān,’ but does not appear in Sbath 1932–33.
47 See Lev and Amar 2008a, pp. 196–98.
48 Al-Kūhīn al-ʿAṭṭār 1992, p. 113. A version of this can be found in Kahl 2007, no. 63.
50 Levey and Khaley 1967, p. 82.
medica used in the winter medicines (hiera, agaric and tragacanth like the winter pills, chebulic and yellow myrobalans like the potion). While both summer and winter pills are largely composed of hot substances like agaric and scammony, the summer pill does contain a cooling substance (lavender), and the winter pill contains additional hot substances such as aniseed.

The dietary advice mentions spinach and lamb or chicken. The medical qualities of spinach are varied and change according to the way it prepared. In general, it has balanced properties that make it suitable for cold and hot people alike. It is laxative and used to treat sicknsses caused by yellow bile. Lamb meat is hot and moist in nature, mainly moist. According to Ibn Khalsūn, it is not suitable for people that have bile in the stomach, and it is less harmful during the summer time. Chicken meat was considered nourishing. It had medical qualities as a dry and dense meat.

Finally, despite the fact that this prescription is in Arabic letters, it seems possible that the physician-author was Jewish. Evidence for this is the blessing in the first line—yu’khadh’alā barakat Allāh wa-`awnihī—being found in two additional prescriptions, both in Judaeo-Arabic, and therefore certainly of Jewish origin.

b. T-S Ar.41.81—triphala for hemorrhoids
This fragment is described thus in the forthcoming revised Isaacs-Baker Catalogue:

Arabic; Naskhī script; light brown cloth; frayed at the edges; 19.6 × 20.5; 15 lines.
Two prescriptions . . .

Only the first, better preserved prescription will be dealt with here.

Transcription

1. اتطيفل الاصغرلبواس[يرك]؟

2. اهليلج اسود واصفر وكابلي من كل واحد

3. خمسة تربد و [one word missing] عشرين درهم؟ مقل؟

51 Nasrallah 2007, pp. 785–86.
52 Ibn Khalsūn 1996, p. 84.
53 Nasrallah 2007, p. 723.
٤. خمسة عشر دراهم وتوضع في ما حار
٥. وابن في هاون فائدة عشرين درهم
٦. خناف الأدوية بالملق ويعجن كله
٧. بعد الشربة ثلاثة دراهم نافع ان شا الله
٨. ويجوز كذلك يوخذ مقل وواصل
٩. الكبر وزير الكراث وبراء الحمل
١٠. وزراوند طويل وبرز الحمر
١١. يذق ويعجن...
١٢. وينحر به

Translation

1. Lesser triphala\textsuperscript{55} for hemorrhoids?
2. Black, yellow and chebulic myrobalan, of each
3. five dirhams; turpeth and . . . , twenty dirhams; bdellium,
4. fifteen dirhams. Crush and macerate in hot water
5. and soften in a mortar sugar candy, twenty dirhams.
6. Combine the bdellium with the drugs and knead all of it
7. in honey. The dose is three dirhams. Beneficial, if God wills.
8. And next to this: take bdellium and caper-
9. root and leek seed and camel dung
10. and long aristolochia and harmala seed
12. and snuff it.

Comments

Once again, the prescription comprises two prescriptions, separated by a blessing. The first is complete, while the second lacks certain details: the precise indication, full instructions and the measurements of both ingredients and

\textsuperscript{55} This is a new translation according to the new reading of the phrase \textit{itrīfal al-aghbar} that was previously read \textit{itrīfal al-āsfar} by Isaacs, and translated by him as “lesser yellow trefoil.” (cf. Isaacs-Baker 1994, no. 381.)
The verb *yajūz* (root j-w-z) in l. 8 means ‘to pass,’ or ‘to be permitted,’ while the reading *yujzā* (root j-z-w) means ‘to take the place of;’ thus the second recipe may be a substitute for the first one. Alternatively, if we read *yujzaʾ* (root j-z-', passive voice), ‘to be divided,’ it can be understood that the same proportions should be used in both recipes.56

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56 In this connection, it may be relevant that a late term for pharmacist, in both Arabic and Turkish, is *ajzāʾi*, literally one who deals in divisions or proportions. On the use of the passive voice in prescriptions, see Geva-Kleinberger and Lev 2009.
The term *iṣṭiṣāf* is believed to derive from the Sanskrit *triphala*, recipes using the three myrobalans, as this one does.\(^{57}\) Recipes for bdellium pills that are useful for hemorrhoids can be found in Kindī’s *Aqrābādhīn*,\(^{58}\) Sābūr’s *Aqrābādhīn*\(^{59}\) and *Minbaj al-dukkān*.\(^{60}\) These recipes are very similar to the first recipe here, but are not called *triphala*. Recipes bearing that name in *Minbaj al-dukkān* and *al-Dustūr al-bīmāristānī*\(^{61}\) are panaceas, mainly for the digestive system, but do not treat hemorrhoids specifically. In the general medical literature, simple drugs used to treat hemorrhoids include all myrobalans, aniseed, borage, raw silk, cassia fistula and iron scoria. Maimonides, from whose *Treatise on Hemorrhoids* this list is taken,\(^ {62}\) also recommends the lesser triphala: It heads his list of compound medicines for hemorrhoids, but he does not provide a recipe, saying that any version will do.\(^ {63}\) Ibn al-Tilmīdh’s version\(^ {64}\) has five kinds of myrobalan, adding beleric and emblic, in comparison with the first recipe here, while anise and fresh dodder replace the bdellium. Turpeth, a purgative, and sugar, a sweetener, remain important ingredients. Again, hemorrhoids are not indicated for treatment. As triphala is of Indian origin, we also consulted ‘Alī b. Rabban al-Tabarī’s *Firdaws al-Hikma*, where a recipe for the greater triphala (*al-iṣṭiṣāf al-kabīr*), a very different recipe, is recommended for hemorrhoids.\(^ {65}\)

Additional *materia medica* in these recipes are turpeth,\(^ {66}\) bdellium, sugar candy\(^ {67}\) and honey\(^ {68}\) in the first recipe, and bdellium (again), caper-root,\(^ {69}\) leek seed,\(^ {70}\) camel dung, long aristolochia\(^ {71}\) and harmala seed\(^ {72}\) in the second one. The *materia medica* used in the second recipe seem to be less common than that used in the first one.

\(^{57}\) Levey-Khaledy 1967, pp. 69–70.
\(^{58}\) Levey 1966, nos. 39, 207.
\(^{59}\) Kahl 2004, p. 85.
\(^{60}\) Al-Kūhīn al-‘Aṭṭār 1992, p. 117.
\(^{61}\) Ibid., pp. 70–71, 76–77; Sbath 1932–33, pp. 19–20. Sābūr does not have a recipe for triphala.
\(^{63}\) Ibid., p. 20.
\(^{64}\) Kahl 2007, no. 122.
\(^{65}\) Siddiqi 1928, pp. 480–81.
\(^{66}\) See Lev and Amar 2008a, pp. 307–308.
\(^{67}\) See Lev and Amar 2008a, pp. 294–97, on sugar generally in the Genizah.
\(^{68}\) See Lev and Amar 2008a, pp. 185–87.
\(^{69}\) See Lev and Amar 2008a, pp. 387–88.
\(^{70}\) See Lev and Amar 2008a, pp. 433–34.
\(^{71}\) See Lev and Amar 2008a, pp. 359–60.
\(^{72}\) See Lev and Amar 2008a, p. 505.
The first recipe produces seventy dirhams of medicine, enough for twenty-three days at the suggested dose of three dirhams a day. After three weeks of treatment, the hemorrhoids should be cured. A similar timespan is recommended for judging the efficacy of treatment today, also.

c. T-S Ar. 42.60 recto—probably eye medicine
This fragment is described thus in the forthcoming revised Isaacs-Baker Catalogue:

Arabic; Ruqʾab script; paper; 1 leaf; slightly mutilated; 15.4 × 9.8; 9 lines; verso is blank.73

Transcription

1. اشْتوَانَ؟ تسّعاً درّاهِمٍ اّشْتَانٍ
2. وَثَلَاثَةُ درّاهِمٍ رِجَاحٍ/رِجَاحٍ عَراّقٍ
3. وَدَرْهُمْ نَشَا
4. وَدَرْهُمْ مَلْحِيّ
5. وَنَصْفُ دِرْهُمُ اّقْلِيمِيّاً ذَهْبٍ
6. وَنَصْفُ دِرْهُمُ اّقْلِيمِيّاً فَضْنَةٍ
7. وَزْنُ ثَلَاثَةٍ درّاهِمٍ فَانِيّاً دَعْبٍ؟
8. بِاّلْسَدَابِ وَالْإِسْهَانِيّ وَزْنُ [الْجَمِيعُ]?
9. نَافِعُ أَنْ شَا اللّٰهُ

Translation

1. Black spleenwort nine dirhams, lichen ten dirhams . . .
2. three dirhams of Iraqi basil and three dirhams of white tragacanth
3. and three dirhams of gum arabic and two dirhams of starch
4. and one dirham of lead ceruse and one dirham of Indian salt
5. and half a dirham of mineral sal-ammoniac and half a dirham of gold scoria

T-S Ar.42.60,r—T-S Ar.42.60; Prescription (recto), Cambridge University Library.
6. and half a dirham of silver scoria. Knead all of it in rue-water
7. and three dirhams’ weight of sugar-candy; also melt
8. in the rue water Isfahan [kohl?] to the weight [of all?]

Comments

This prescription does not state what it is for, but the high level of mineral materia medica (ceruse, Indian salt, sal-ammoniac, gold scoria, silver scoria) and the reference to ‘Isfahan’ (possibly short for Isfahan kohl, a known ingredient of eye medicines?) make it seem likely that this is an eye salve. The plants mentioned here (black spleenwort, lichen, basil, rue-water) are also used for various eye ailments (although this is not their primary use—all are also good for the digestive tract), while gum arabic, tragacanth and starch may be carrier materials for the other ingredients. If this is a preparation for external use, the function of the sugar candy is unclear; perhaps it is a preservative?

Eye medicines normally come in the form of powders or salves; the fact that this prescription contains gums and starch that are kneaded in rue-water indicated that it is a salve. The final weight of the recipe comes to 90g, possibly indicating long-term use. There is no mention of dosage or application—perhaps these instructions were given orally by the physician or the pharmacist.

The chapters on eye medicines in Minhāj al-dukkān, al-Dustūr al-bīmāristānī and Ibn al-Tilmīdh’s Aqrābādhīn include many recipes containing some combination of the materia medica appearing in this prescription, but so far an exact equivalent has not been found in any pharmacopoeia. This
indicates the practicality and originality of these prescriptions, and thus their value in reflecting reality on the ground (or rather, in the market), in contrast to books, in which recipes were copied regardless of their actual usefulness.88

Discussion

Although relatively few Indian medical works were translated during the translation project of the eighth-tenth centuries,89 the influence of Indian medicine can be seen in the writings of many prominent authors and practitioners, such as ʿAlī b. Rabban al-Ṭabarī, al-Bīrūnī, Abū Bakr al-Rāzī and Sābūr b. Sahl. This influence was largely in the field of materia medica, encouraged not only by the Muslim conquest that reached Sind, but also by the extensive trade with India.90 How deeply and extensively did eastern medicinal substances from China,91 Tibet,92 and India (including Indian Ocean islands such as Zanzibar),93 penetrate the classical Galenic inventory, based largely on Mediterranean flora and fauna?

Studies carried out by Amar, Lev and Serry94 indicate that about one hundred ‘new’ medical substances, not mentioned by Dioscorides or Galen, were found in Arabic sources. The vast majority of these are of plant origin, the minority are of animal origin, and a few precious stones and compound drugs are mentioned. The geographical origin of at least half of these substances is South-East Asia. The pace of the distribution of the substances was undoubtedly inconsistent chronologically and regionally. Some of the ‘Indian’ plants were known in the Middle East from earlier times. For example, cinnamon, nard and sesame were known there during the Biblical period;95 pepper, cardamom and the Indian aloe tree were known from Classical times.96 Some of the Indian substances mentioned in the Arab sources were probably known to a limited degree in earlier periods: From Byzantine commercial sources we learn that various substances that came from the

88 Riddle 1974, p. 175.
90 See now Goitein and Friedman 2008.
93 Goitein and Friedman 2008, index.
95 For cinnamon, see Feliks 1976, pp. 263–64; for nard, see Song of Songs, 1:12 and 4:14; for sesame, see Levey 1959, s.v.
96 For pepper, see Dioscorides 1959, II.159; for cardamom, see ibid., I.5; for Indian aloe tree, see ibid., I.21.
East were taxed including: cinnamon, cassia, long pepper, white pepper, cotus, spikenard, myrrh, ginger, malabthron, galbanum, cardamom, myrobalanum, oil of roses and iris, mastic, saffron. Many of these later spread again in a second and more substantial wave, in the early Middle Ages. A further wave of eastern materia medica arrived following the Mongol conquests in the thirteenth century.

A full discussion of Indian materia medica and its uses within medieval Islamic pharmacology is beyond the scope of this article. However, to give an idea of the extent of this material, a partial list of Indian medicinal substances (some of which are regarded in the Arab literature as Chinese) that have been identified with certainty and predominate in the inventory of the drugs to whose distribution the Arabs contributed follows: various species of myrobalan, puging cassia, tamarind, galingale, cubeb pepper, grains of Paradise, nutmeg, bamboo, betel palm, camphor, turmeric, sandalwood. As mentioned, the Arab sources took some of the above substances to be Chinese, and to these we should add plants such as Chinese rhubarb and Chinese rose.

As noted above, the medical material of the Genizah may be divided into practical and theoretical sources. Study of the practical materia medica shows that in the eleventh-thirteenth centuries, only two thirds of the substances (278) out of a fuller list, based on theoretical sources as well (414), were actually used in practical medicine. Understandably, some medicines and medicinal substances were used more often than others, depending on price, availability, practitioners’ choices, and even local medical trends. Analysis of the inventory of practical medicinal substances shows that it contains the vast majority of the ‘Indian’ substances, which were described as ‘new’.

Conclusions

The Arabic prescriptions found in the Genizah form a unique window onto the practice of medicine in medieval Cairo. While the survival of many pharmacological treatises indicates the importance of pharmacy, it is not always possible to know whether a given recipe was in fact in use or a ‘fossil’, to use

100 We refer the interested reader to Amar and Lev (forthcoming a) for such a study.
101 For the trade in drugs, see Amar and Lev 2007, pp. 74–86. This list refers only to drugs found in prescriptions. A complete study of all materia medica spread by the Islamic conquests will appear in Amar and Lev (forthcoming b).
103 Lev and Amar 2008a, pp. 71–74.
Riddle’s term. The Genizah prescriptions allow us to compare the recipes in books with those that were indeed in use, and our conclusions are unequivocal: While the ingredients are similar, in no case are the recipes identical. As noted above in the three examples, this shows the flexibility of the medical treatment offered to patients in medieval Cairo, which may have been tailored to individual patients on the basis of known recipes, rather than the physician choosing from among pre-existing drugs (as a modern practitioner of biomedicine must do). The prescriptions discussed in this article treat cough, the digestive system and the eyes. While it is not always possible to know the indication of Genizah prescriptions, our general impression is that these were the areas of greatest concern to patients. This impression is borne out by literary sources, which also devote a great deal of space to these issues.

Many heritages—Greek, Persian and Indian—combined to form the Arabic medical tradition. The practical medicine preserved in the Genizah reinforces the dominance of Greek medical theory, but equally shows the importance of materia medica originating further east, principally India and China.

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104 On this term see also Lev and Amar 2008b.

105 The issue of the common ailments suffered by the Genizah people will be dealt with in our book-length study of all known prescriptions from the Genizah, currently in preparation. See on this also Goitein 1971, p. 255.
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