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Scientific methods for identification of plants mentioned in ancient texts (as exemplified by biblical phytonymics)

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Аннотация: Статья основана на результатах этноботанических исследований текстов библейского корпуса. Ранее нами были детально изучены «модельные» древнееврейские наименования растений, упоминаемые в текстах Библии (ʔēzôḇ «иссоп» и boṭnîm «фисташка») (Сорокин, 2012, 2017б, 2018, 2019). Ключевая проблема этноботанических исследований древних текстов, написанных на «мертвых» языках, – ботаническая идентификация древних наименований растений (фитонимов), под которой мы понимаем установление соответствия древнего фитонима какому-либо биологическому таксону или группе таксонов в их современном понимании. Нашей задачей являлась разработка методологических принципов подобных исследований. В статье критически рассмотрены методы ботанической идентификации библейских фитонимов, проведена сравнительная оценка значения каждого метода, предложены оригинальные методологические рекомендации в данной области исследований, изложенные в виде алгоритма.

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Introduction

One of the most important areas of ethnobotany can be considered the study of plants mentioned in ancient literary monuments. Formed at the dawn of human history, in the heart of ancient civilizations, these texts contain invaluable information on the dynamics of changes in the flora and vegetation of individual regions, on the history of domestication and the distribution paths of many economically important plant species and varieties. In addition, in ancient (even mythological) texts, one can find a reflection of the ideas of people of past eras about the plant world. The study of the archaic botanical worldviews and ancient folk classifications of plants is not only of cultural and historical significance, but it is of undoubted interest for understanding the development of natural history in general and plant taxonomy in particular.

Among the ancient texts that study ethnobotany, an important place is occupied by the texts of the biblical corpus. And this is not surprising, because the Bible has remained the most published and most read book in the world for centuries, which has had a strong influence on the development of world culture, philosophy, science. The Bible is a unique collection of monuments of Hebrew and Ancient Greek literature, a source of the most important information on the history, culture, religion and everyday life of the peoples of the Ancient Near East.

Typically, the corpus of biblical texts is usually divided into two large parts: Old and New Testaments. This article is based on materials from the study of plant names from the books of the Old Testament. Most of these texts were written in Ancient Palestine in the second half of the first millennium BC in Hebrew. However, the earliest layer of Old Testament texts dates back to more ancient times, namely, to the period of the Babylonian captivity of the Jews (VI century BC), as well as to the late era. Undoubtedly, certain biblical fragments convey to us plots and traditions that appeared even earlier and were transmitted orally before their written fixation (Tsenger, 2008).

The names of plants or phytonyms are found on the pages of Bible books many times. Researchers agree that at least 100 plant species are mentioned in the Bible, but the exact number of species, according to various authors, varies greatly. So in the work of H. and A. Moldenke “Plants of the Bible” (1952) the list of “biblical” plants is very extensive – 230 species. The authors of the last quarter of the 20th century in their works compiled noticeably narrower lists of Bible plants. For example, in the work of M. Zohary “Plants of the Bible” (1982), the list of “biblical” plants consists of 128 names. Slightly more extensive lists are in the work of F. Nigel Hepper (1992), which lists approximately 180 species, and in the book of J. and S. Maillat (1999) with a list of 174 “biblical” species. Such a serious scatter of opinions clearly demonstrates that biblical phytonyms continue to be a poorly studied area of ethnobotany.

In the ethnobotanical study of ancient texts written in extinct languages, the problem of botanical identification of ancient phytonyms comes to the fore. We call the botanical identification of the phytonym the search for the correspondence of the ancient phytonym to any biological taxon or group of taxa in their modern sense.

Numerous studies in the field of archeology, paleofloristics, ethnobotany, on the one hand, and comparative semitology, philology, linguistics, on the other hand, make it possible to more accurately identify plants mentioned in the Old Testament (H. & A. Moldenke, 1952; Fauna and Flora ..., 1980; Hareuveni, 1980; Nigel Hepper, 1992; Musselman, 2011). However, the degree of certainty of such identifications remains very heterogeneous. When identifying a number of biblical Hebrew phytonyms, there is currently no consensus of data obtained using methods of different disciplines. Many existing hypotheses regarding the identification of biblical plants are not sufficiently reasoned or are voiced by researchers completely beyond any argument.

Thus, the development of methodological principles of ethnobotanical studies of ancient texts and, in particular, the identification of ancient phytonyms seems to us an urgent task.

Results and discussion

A review of the scientific methods of Bible plants identification

As noted, when working with the names of plants mentioned in ancient literary monuments, the identification of these plants becomes the most important step. For each ancient phytonym, it is necessary to make the most complete and comprehensive analysis of taxonomic affiliation. In other words, it is necessary to try to determine reasonably and methodologically correctly which biological taxon (taxonomic group) each plant belongs to. In order to solve the problem, it is necessary to consider the whole range of methods used to determine the meaning of ancient biblical phytonyms.

It should be noted, however, that when working with Hebrew botanical vocabulary, the fact of the absence of any unified system of plant names in the era of the creation of the Old Testament texts should be taken into account. The names of some of the most economically significant species (olive, grape, date palm) could be distributed throughout the Syro-Palestinian region, especially since many languages of this region were closely related. However, most plants could have numerous local folk names that were understandable only to residents of a certain territory insignificant in area. Obviously, not in all cases, every ancient phytonym corresponds to a

botanical taxon in the modern scientific sense.

A study of the scientific literature on the Bible plants showed (Sorokin, 2017a, b) that the vast majority of researchers pay insufficient attention to the description of the methods by which biblical plants were identified. Most often, the authors of the reviewed publications do not describe the sequence of steps and the logic of their research to determine the botanical affiliation of the biblical phytonym, but express only the final result or the opinion of another specialist accepted by them. It can often be seen that in the specialized literature, as well as in the corresponding dictionary entries, each Hebrew phytonym corresponds to a single modern botanical name. Moreover, this correspondence is indicated without any arguments.

Below we will try to list and discuss the main methods of botanical identification of biblical phytonyms.

1. Analysis of the context, parallels, meaning of quotations

Of course, one of the most important methods for revealing the meaning of ancient phytonyms is the analysis of the context of quotations in which this name occurs. Probably there is no such researcher of biblical flora who would completely ignore this method. Most of the biblical texts in which plants are mentioned contain certain information about the appearance, habitat, and human use of these plants, although the information is often extremely fragmented and, at first glance, not at all obvious. Of great importance for the application of this method is the number of occurrences of the phytonym in the entire corpus of biblical texts. The more often a certain phytonym is found and the more diverse are the contexts, the more information can be obtained by a researcher about the plant that was meant by ancient authors. That is why identification of phytonyms that occur only once in the corpus of the books of the Bible is very difficult. Often such botanical names are of greatest difficulty for Bible scholars and translators.

2. Analysis of Jewish tradition, targumim, commentaries

The most important source of information for revealing the botanical affiliation of Hebrew phytonyms can be post-biblical Jewish religious literature, in which attempts are often made to explain and interpret the difficult passages of the Bible. Such sources include: targumim, midrashim, Mishnah, Talmud, medieval commentaries on the books of the Old Testament (Maimonides, Rashi, Nachmanides). Sometimes in them a particular ancient name of a plant is discussed in sufficient detail, and different opinions about its botanical affiliation are also given. Of course, these opinions do not always reflect the true ancient meaning. The fact is that already at the turn of the era, the Hebrew language of the Bible completely ceased to be a colloquial language in Jewish communities, not only in the diaspora, but also in Palestine, and therefore the idea of the exact meaning of a number of biblical phytonyms was lost over time. Nevertheless, for the purposes of our work, this literature is of exceptional importance, as it brings to us a living tradition of reading and understanding biblical texts. It is important to note that Jewish religious communities sought to maximize the preservation of these traditions, which allows us to consider post-biblical literature as the most important source of information for determining the botanical affiliation of biblical phytonyms.

3. Analysis of ancient translations – Septuagint, Vulgata, etc.

As mentioned above, Jewish post-biblical literature, in particular Aramaic Targumim, although written in a significantly different Aramaic language from Hebrew, is essentially aimed at an audience of readers and listeners belonging to the same Middle Eastern culture in which the Bible texts were formed. However, in order to create the ancient Greek (Septuagint) and Latin (Vulgate) translations of the Bible, their authors needed not only to translate the Hebrew botanical vocabulary into another language, but also to make it understandable to the reader, belonging to a completely different ethnic group, different culture, different civilization. Both Greek and Latin

botanical vocabulary were formed in completely different conditions: geographical, environmental, agricultural, cultural, and therefore they could not contain the names of plants that accurately and adequately reflect the content of all the Hebrew phytonyms of the Bible. In addition, the Middle Eastern botanical realities hiding behind the Hebrew phytonyms could simply not be known to the authors of Greek and Latin translations. That is why the value of the Septuagint and Vulgate for revealing the botanical affiliation of Bible plants seems to us not so high in comparison with Jewish literature. However, the importance of these translations for the purposes of our work is due to the proximity of the time of the creation of the Septuagint and the Vulgate to the time of the formation of the biblical texts themselves. In addition, in the Greek and Latin world of that era, the emergence and formation of botany as a scientific discipline took place. Thanks to the latter fact, using ancient Greek and Latin natural science literature, we can in a number of cases with a high degree of certainty understand how translators understood the meaning of some Hebrew phytonyms.

As we have shown (Sorokin, 2015), many translations of the Bible into European languages, carried out from the Renaissance to the present, often follow the Septuagint and Vulgate regarding the translation of botanical lexicon. In those cases, where this connection is not obvious and the translation of the phytonym is completely original, as a rule, the basis for the translation is either the most authoritative dictionaries of its time, or the latest results of studies of the biblical flora, or even some stylistic preferences of translators. In any case, considering the biblical translations of the Modern period into European languages as an independent source of information about the botanical affiliation of ancient phytonyms, in our opinion, is methodologically incorrect.

4. Analysis of linguistic data (including etymology data)

Of course, in the work to identify the botanical affiliation of the Hebrew phytonyms, one of the key roles was played by the studies of linguists specializing in Semitic languages. This kind of research is aimed, first of all, at clarifying the etymology of the ancient phytonym, reconstructing the linguistic processes and transformations due to which this name arose. In some cases, the very meaning of the ancient Semitic root of the biblical name can give the researcher some diagnostic features of this plant.

Numerous ancient inscriptions and texts, surviving to this day in other Semitic languages (Akkadian, Aramaic) are the most important source of information for reconstructing the meaning of biblical botanical vocabulary. The presence of parallels of Hebrew phytonyms in other ancient languages of the Semitic group, as well as a large number of trade and agricultural texts in these languages, allowed researchers to put forward a number of very convincing hypotheses regarding the plants of the Bible. This source of information is especially relevant in the case of the botanical names, the initial meaning of which, apparently, was not preserved in translations of the Bible and exegetical literature.

5. Archeology (sensu lato)

It is impossible to imagine a work on determining the meanings of biblical phytonyms without taking into account the results of a study of the material culture of the Ancient Near East. This can be attributed directly to artifacts of plant origin (wood products, food leftovers, grain, fabrics, etc.), and agricultural implements, dishes, specially organized plots for farming (terraces) and much more. In addition, works of fine art can play a certain role: bas-reliefs, jewelry, elements of architectural decoration.

6. Data of botanical disciplines

A significant set of methods for studying biblical flora can be taken from botanical science. The study of the modern flora of the Middle East can play a major role in this matter. And although it is obvious that the modern flora of the Middle East, due to the many plant species introduced over

the past centuries, is significantly different from the flora of the era of the formation of biblical texts, studying its current state can give many answers to the questions posed in our article. Speaking about the modern Middle Eastern flora, it is impossible to overlook the question of the history of domestication and cultivation of plants in this region. For a number of cultivated plants, the geographical centers of their domestication and the main ways of promoting these crops to other regions have not been finally established. The question of the time of the appearance of certain invasive weed species in Palestine remains a controversial issue.

In addition to the floristic method itself, spore-pollen analysis, as well as molecular genetic methods, can play a significant role in establishing the botanical affiliation of biblical phytonyms. Using the analysis of spores and pollen from various geological layers, it is possible to quite accurately note the appearance or disappearance of the main landscape-forming plant groups in the region's flora at a given time. For example, using this method, specialists studied the dynamics of cereal communities in the Negev desert, reflecting the dynamics of changes in humidity in the region. In addition, the periods of occurrence of representatives of the genus Plantago in the vegetation of this region recorded by pollen analysis indicate periods of intensive grazing (Babenko et al., 2007; Babenko, 2012).

It is difficult to imagine modern research in the field of botany without molecular genetic methods that allow us to trace the relationships of different populations, varieties and species of plants, and therefore, to establish the history of migration and domestication of various species.

All the methods discussed above cannot be applied to absolutely any phytonym of the Bible. In addition, each of these methods can result in very different hypotheses regarding the same plant, which are hardly reducible to any “common denominator”. What are the limits of application of each method? Which method should be preferred in which case? How to combine seemingly incompatible hypotheses? All these questions are the most important methodological problems that must be solved before making a final decision, to which taxon the ancient phytonym belongs.

Evaluation of methods for Bible plant identification

Our original studies of two selected “model” biblical phytonyms (ʾēzôḇ “hyssop” and boṭnîm “pistachio”) served as the basis for our further considerations. A detailed analysis of each phytonym, a review of the scientific literature, as well as the results of original studies are given in our other works (Sorokin, 2012, 2017b, 2018, 2019). In this paper, we summarize in tabular form the results of applying the methods we have listed in our work on elucidating the botanical affiliation of phytonyms ʾēzôḇ and boṭnîm (Table 1).

The plus sign means that the method turned out to be applicable and played a decisive role in the formulation of the main hypothesis about the botanical affiliation of the phytonym. The plus-minus sign indicates that the method turned out to be applicable, but played only an auxiliary role in the formulation of the hypothesis of the phytonym's botanical affiliation. A minus sign means that the method did not work in this situation, i.e. does not give us any additional reasons when analyzing the botanical affiliation of the phytonym.

Table 1. The importance of various methods in the analysis of the botanical affiliation of phytonyms ʾēzôḇ “hyssop” and boṭnîm “pistachio”.

	ʾēzôḇ	**boṭnîm**

Context assessment	+ –	+ –
	10 entries	1 entry
	features of the plant: small size, growing on the walls, "tree".	product of export from Palestine to Egypt.
Jewish tradition	+	+ –
	mention in the Mishnah, the opinion of medieval Jewish scholars (Maimonides, Saadia Gaon).	Ibn Ezra's opinion is "nuts," Rashi's opinion is "peaches," and Rabbi Mahirah's opinion is "pistachios."
Ancient translations	+ –	+ –
	LXX σσωπος – from the V century BC in Greek cooking and rituals VUL hysopus – calque from the LXX	LXX τερέμινθος terebinth VUL terebinthus terebinth
Etymology, linguistics	+ –	+
	possible etymologies - "hairy", "dwarf", etc.	Akkadian, Ugaritic, Arabian parallels
Archeology, ethnography	+	+
	the use by modern communities of Samaritans, the similarity of the system of modern Arabic names for herbs	archaeological finds of wild pistachio and domesticated pistachio shells
Botany	+	+
	the presence / absence in the flora of Palestine, studies of the chemical composition of aromatic substances.	the question of natural pistachio populations in Central Asia, molecular genetic studies of the appearance of real pistachios in the culture

In the case of the study of the ʾēzôḇ phytonym, all six of the listed research methods turned out to be applicable to varying degrees. The priority modern hypothesis about the botanical affiliation ʾēzôḇ (ʾēzôḇ = *Origanum syriacum*) is based on a complex of three groups of arguments: Jewish tradition, ethnography, biochemical research, which in sum looks very convincing, despite the low convincingness of the facts taken separately. The "linguistic method" and the analysis of the ancient Greek translation in the case of ʾēzôḇ play only a supporting role. Their results do not allow us to propose independent hypotheses about the ʾēzôḇ botanical affiliation, but only indirectly confirm the existing priority hypothesis. The presence of several contexts makes it possible to draw certain conclusions about the characteristics of the ʾēzôḇ plant. However, the most convincing hypothesis (ʾēzôḇ = *Origanum syriacum*) is not fully supported by the context, which requires either reinterpretation of the texts (especially 1 Kings 4:33) or rejection of the hypothesis.

As can be seen from the Table 1, in the case of the phytonym boṭnîm, all six methods can also be applied to determine its botanical affiliation. However, in this case, in contrast to ʾēzôḇ, the "linguistic method" plays a key role in the formation of priority hypotheses (boṭnîm = *Pistacia vera* or boṭnîm = *Pistacia* spp. - terevinth - natural Palestinian species). In addition to it, data from archaeological and botanical-geographical studies make a significant contribution to understanding

the meaning of boṭnîm. The Jewish tradition, as well as the analysis of translations, in this case can only be considered as additional arguments. The same can be said here about the analysis of contexts, since unlike ʔēzôḇ, the phytonym boṭnîm is found only once in the entire corpus of the Bible texts, and the context itself does not allow drawing almost any conclusions about the plant boṭnîm.

Thus, when comparing the two situations, it becomes clear that in the formation of hypotheses regarding the botanical affiliation of an ancient phytonym, each of the methods considered can play a different role.

The role of context analysis depends, first of all, on the number of occurrences of this phytonym in the corpus of biblical texts, as well as on the variety of contexts, their genre and degree of realism. The greater the number of occurrences of this phytonym, the more diverse the contexts, the closer they are to the historical narrative or utilitarian and practical texts, the more information about the botanical reality that is "hidden" behind the phytonym can be obtained by the researcher. Therefore, the role of context analysis is minimal in the case of hapax legomenon and maximal in the case of frequently occurring phytonyms.

In the two situations considered, the study of Jewish tradition played a different role in determining the meaning of the ancient phytonym. In the case of ʔēzôḇ, this role is one of the key, while in the case of boṭnîm, it is rather an auxiliary one. This difference is determined, first of all, by the fact that in post-biblical Jewish texts the connection ʔēzôḇ with the Arabic name zaʿtar, which is used to this day, is traced. And besides, we have a whole complex of texts from different eras (from the Mishnah to Maimonides), where this phytonym is mentioned, which allows us to trace a living tradition from an era close to the time of the formation of the biblical corps. It is important to note that this tradition was preserved, including due to the fact that ʔēzôḇ is an important part of a number of Jewish religious rituals. In the case of boṭnîm, we have only a number of heterogeneous assumptions made by Jewish commentators on Genesis in the Middle Ages. Moreover, these assumptions were expressed with a certain doubt, as a kind of hypothesis. Thus, to assess the role of the post-biblical texts of the Jewish tradition in identifying the meaning of ancient phytonyms, it is necessary to take into account both the diversity of these texts and the time of their writing. The more texts the phytonym is mentioned and the chronologically closer these texts are to the biblical era, the more convincing is the argument in favor of this hypothesis.

Translation analysis to solve the problems of ancient phytonyms is, rather, of auxiliary value. For example, in the case of ʔēzôḇ, only an analysis of the ancient Greek translation provides additional indirect arguments in favor of the main hypothesis, while a later translation into Latin copies the Greek version of the translation of the word ʔēzôḇ. In the case of boṭnîm, the considered translations are essentially interpretations. The two most important ancient translations of the Bible (the Septuagint and the Vulgate) convey the Hebrew boṭnîm, like terevinth, i.e. wild pistachio. Later European translations understand boṭnîm as "nuts", "dates", "pistachios". Note that the comparative value of different translations for the purposes of our work is not the same. It is determined, first of all, by the chronological proximity of the translation to the time of the formation of the original Hebrew texts themselves. Thus, the Septuagint and the Vulgate convey to us an understanding of the biblical phytonym in the last centuries BC and at the turn of the 4th-5th centuries AD, respectively. And, therefore, these translations to a greater extent preserve the understanding of phytonyms of the era of the writing of the Old Testament. On the other hand, translations of the Renaissance, as well as versions of the Bible of the 19th-20th centuries, cannot be considered as independent sources of information about the meaning of phytonyms.

The role of the "linguistic method" in the work of the researcher of the biblical flora is difficult to overestimate. However, as can be seen from our two examples (ʔēzôḇ and boṭnîm), the role of this method can vary greatly in the case of different phytonyms. For example, at the moment there is no generally accepted idea of the etymology of the word ʔēzôḇ. In this regard, the "linguistic method" in the work to identify the botanical affiliation of the ʔēzôḇ phytonym currently plays only

an auxiliary role, whereas in the case of boṭnîm its role is more significant. Obviously, the presence of parallels in other Semitic languages, as well as the number of references and the genre of texts in which these parallel phytonyms occur, determine the degree of applicability and the role of this method in determining the botanical affiliation of the Hebrew names of plants.

The results of archaeological and ethnographic studies, united by us into one complex, of course, cannot be ignored by researchers of the biblical flora. In both examples considered, this complex plays an important role, however, in the case of ʾēzôḇ it is exclusively ethnographic data, and in the case of boṭnîm it is archeology. Despite this, their role in determining the botanical affiliation ʾēzôḇ and boṭnîm, in our opinion, is quite comparable. In both cases, archaeological and ethnographic facts are a kind of material, and therefore a very convincing confirmation of the priority hypothesis.

Of course, attempts to determine the botanical affiliation of ancient phytonyms are impossible without the botanical research itself. Moreover, in this case, “botanical” is the widest range of natural sciences that study the plant world: from floristry to genosystematics, from spore-pollen analysis to phytochemistry. For example, in the ʾēzôḇ case, for its botanical identification, floristic and phytochemistry data were relevant, and in the case of boṭnîm, the systematics of the pistachio genus plays a key role. The results of natural science research for the purposes of this work are especially important, since they are a set of data independent of linguistic and archaeological.

Thus, the main methods for identifying biblical phytonyms should be recognized: linguistic, archaeological and botanical. The data obtained using these methods, in our opinion, are of the greatest value for the purposes of such work. Of the methods we examined, the opposite place in terms of the reliability and value of the results can be given to the analysis of translations. At the same time, if the result of studying ancient translations (Septuagint, Vulgate, Peshitta) may have some independent significance for understanding the Hebrew phytonym, then translations of the Reformation era and modern times in relation to botanical vocabulary either copy ancient translations or give a very free author’s interpretation of the ancient phytonym, or are based on data obtained by scientists of their time using other methods.

As for the separately examined method of studying Jewish tradition, which played a significant role in both examples, it is not an independent method. In our opinion, it combines both the linguistic method and the analysis of translations and ethnography, for which, in this case, the material for research is the whole complex of post-biblical texts of the Jewish tradition. Therefore, one should not speak of a method, but of a special material of research, which, of course, is of great importance for understanding biblical phytonyms. The contribution of context analysis to the identification of ancient phytonyms in each case is individual and, as we have already noted, directly depends on the number of occurrences of the studied phytonym in the biblical corpus, as well as on the variety of contexts.

Conclusions

General methodological guidelines for identifying Bible plants

We examined the basic methods of botanical identification of biblical phytonyms and tried to evaluate the relative contribution of these methods to identify the meaning of the Hebrew names of the plants of the Old Testament. Based on this, we offer our methodological recommendations in this field of research. The most difficult question for the biblical flora researcher is the problem of the reasonable choice of the hypothesis about the meaning of the ancient phytonym in the case when there are several such hypotheses and when each of them is methodologically correct and well-reasoned.

As the first stage of work with each biblical phytononym, the researcher needs to assess the potential for application, and then apply each of the methods described above. The information

obtained as a result of this will serve as the main material for the development and selection of working hypotheses. Note that each method should be applied to the maximum extent in order to obtain the most complete and reliable facts. The second stage should be to create a list of working hypotheses about the botanical affiliation of the phytonym obtained as a result of applying the described methods. It is important to note that the presence of a certain established tradition of understanding and translating the phytonym (as in the case of ʔēzôḇ hyssop) can also be considered as one of the working hypotheses.

At the third stage, each hypothesis in this list should be critically evaluated for confirmation / refutation of the facts. At this stage, it is important to take into account the comparative value of the research methods that we identified, and, accordingly, the facts obtained with their application. So, in our opinion, linguistic, archaeological and botanical methods are the most significant for the purposes of such work and form a kind of a basic triad. Since the information obtained using each of these three methods is independent of each other, their consensus can be considered as an indicator of a high degree of reliability of the hypothesis. All other methods, in our opinion, are additional and can serve to verify the hypotheses obtained using the three main methods.

As noted above, the relative weight of the analysis of Jewish tradition and / or ancient translations is higher than the opinions of modern-day translators. Context analysis is also considered by us as an additional method, the relative weight of which directly depends on the number and variety of contexts. In other words, in the case of a large number of diverse contexts, their role in the verification of working hypotheses increases. Thus, at the end of the third stage, the researcher must produce a certain gradation and partial screening of working hypotheses according to the degree of their argumentation. As a result, a list of the most fully and comprehensively developed and reasoned hypotheses with an assessment of the comparative degree of their reliability should be obtained.

In our opinion, such a list of the main, most reasoned, methodologically correct and critically evaluated hypotheses about the botanical identification of the ancient phytonym should be the result of the scientist's work. To make a final conclusion about the correspondence of the ancient phytonym to any botanical taxon or group of taxa will be methodologically not quite correct, in our opinion. The fact is that a final solution to this problem is theoretically not achievable. Even a purely hypothetically impossible experiment or method that could absolutely accurately establish the meaning of the ancient phytonym. Therefore, the researcher should avoid subjectivity in the choice of a hypothesis as the main one. Only in a situation where one of the hypotheses is so far from the others in terms of its reliability that it is essentially out of competition can a researcher stop at the end of his work on one single hypothesis.

In general, in most cases, a scientist cannot finally dwell on a single meaning of the ancient phytonym. More often, a scientist operates with a set of hypotheses. Since the translator cannot always cite the whole spectrum of these hypotheses in his translation, he is compelled, based on the available material, to take the final choice of the translation equivalent on himself. In addition, such a choice can be convenient when creating popular publications for a wide range of readers, as well as in the development of visual materials (stands, tablets) for biblical gardens.

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Scientific methods for identification of plants mentioned in ancient texts (as exemplified by biblical phytonymics)

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Summary: The article is based on the results of ethnobotanical studies of the texts of the biblical corpus. Earlier, we studied in detail the “model” Hebrew names of plants mentioned in the texts of the Bible (ʔēzôḇ “hyssop” and boṭnîm “pistachio”) (Sorokin, 2012, 2017b, 2018, 2019). The most important problem of ethnobotanical studies of ancient texts written in extinct languages is the botanical identification of ancient plant names (phytonyms), by which we mean revealing the correspondence of an ancient phytonym to any biological taxon or group of taxa in their modern sense. Our task was to develop methodological principles for such studies. The article critically examines the methods of botanical identification of biblical phytonyms, makes a comparative assessment of the value of each method, offers original methodological recommendations in this field of research, presented in the form of an algorithm.

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