Journal of Ethnopharmacology 167 (2015) 11–29

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jep

Research paper

Food and medicines in the Mediterranean tradition. A systematic analysis of the earliest extant body of textual evidence

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ARTICLE INFO

Article history:
Received 4 June 2014
Received in revised form
26 September 2014
Accepted 19 October 2014
Available online 4 November 2014

Keywords:
Hippocrates
Antiquity
Hippocratic collection
Foodstuff
Materia medica
Mediterranean tradition

ABSTRACT

Ethnopharmacological relevance: The relationship between food and medicines has long been investigated and is of crucial importance for the understanding of the development of ethnopharmacological knowledge through time. Hippocrates, considered the *Father of Medicine*, is credited with an aphorism equating food and medicine. No inquiry has been performed, however, into the collection of texts attributed to Hippocrates and, going beyond, into this statement, which is generally accepted without further examination. A clarification is much needed as the question of the relationship between food and medicines as potent substances are crucial to ethnopharmacology.

Materials and methods: To verify the validity (if not the authenticity) of the theory on the identity of food and medicine attributed to Hippocrates, we digitized the whole collection of texts ascribed to Hippocrates in the original Greek language (the so-called *Hippocratic Collection*), which date back from the age of Hippocrates (late 5th century and 4th century BCE) to a more recent time (2nd century CE). On this basis, we extracted and databased all the information related to remedial therapy, that is, their materia medica (vegetable, animal and mineral) and their use(s). We identified both the plant species according to modern up-to-date taxonomy and the medical conditions as precisely as possible. We then screened these plants to discover what their uses were and, going backward in time, we examined (when possible) their native distribution, domestication, possible introduction (in the case of non-native species) and cultivation to determine whether these species had been known for a long time and might have been the object of long-term observation as both foodstuffs and medicines.

Results: Tabulated data from the *Hippocratic Collection* revealed that 40% of the remedies in the *Collection* are made out of only 44 plants. Of this group, 33 species (=75% of the group) were also used for nutritional purposes in Antiquity. Domestication history of these species indicates that humans have long been in contact with them, something that the medical uses of these species confirm, as they are multiple and finely distinguished. A pilot analysis of archeological remains of medicines confirms that textual evidence corresponds to physical evidence, that is, to the practice of medicine. As a consequence, textual information can be accepted as reflecting actual practice.

Conclusions: Although the pseudo-aphorism according to which food are medicines and medicines are food does not appear as such in the *Hippocratic Collection*, it aptly expresses a fundamental element of the Hippocratic approach to therapeutics, without being, however, a creation of neither Hippocrates nor his followers and the physicians who practiced a form of medicine in the way of Hippocrates. A vast majority of the core group of plant species used for the preparation of medicines were also consumed as foodstuff. Knowledge and use of these plants probably resulted from a long co-existence in the same environment and also from multiple experiences of trial and error over millennia, whose results accumulated over time and contributed to the formation of the Mediterranean medical tradition.

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"Let food be thy medicine and medicine be thy food." The Greek physician Hippocrates of Kos (460-between 375 and 351 BCE (Potter and Gundert, 2005)), the supposed author of the Oath that students of medicine take when they are awarded their Medical Degree and the *Father of Medicine* according to a consolidated Western tradition, has often been credited with this formula considered to be one of his *Aphorisms*. Although the formula

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http://dx.doi.org/10.1016/j.jep.2014.10.035
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might seem to aptly summarize one of the many aspects of the medical thinking fostered by Hippocrates, it does not appear in the famous *Aphorisms* that have come to us under Hippocrates' name or in any other work attributed to Hippocrates. Most recently, the exactness of the formula has even been questioned (Cardenas, 2013).

Whatever its origin, the pseudo-aphorism acutely poses the question of the relation between food and medicines, claiming that there is a total overlapping between the two types of potent substances. This question is fundamental, not only because of its relevance in present day, but also for ethnopharmacological studies as it is an investigative tool for the understanding of the many components that contribute to make up the field of pharmacological therapeutics in any society, past or present.

1. Introduction

In a study on the boundaries of food and medicines, an examination of this formula would seem to be a logical choice, particularly because of its apparent modernity and relevance to present-day health care. A closer examination of textual evidence – actually, the text of the so-called *Hippocratic Collection* (below) – quickly reveals, however, that a focus on this formula would be misleading. It would distract attention from a problem related to the place of food in medicine explicitly posed by the *Hippocratic Collection*: namely the claim made by the author of a treatise adequately identified in modern scholarship as *Regimen*, that the analysis and role in medical practice of what is now called nutraceuticals has been discovered by him, that is, in the late 5th or early 4th century BCE.

Whereas we agree with the author of Regimen on the fact that food and medicines overlap as we shall demonstrate in the present essay, we disagree on his claim to have discovered this and we hypothesize that the overlapping of food and medicines is a much more ancient phenomenon.

In this essay we will take the *Regimen* as a starting point to investigate the respective status of food and medicines in the most ancient preserved body of textual evidence which come to us from the ancient Mediterranean medical tradition, that is, the collection of treatises attributed to – but not written by – Hippocrates. To do so, we will take into consideration the whole range of food and medicinal plants in the *Hippocratic collection* – without limiting us to a theoretical analysis of food and medicines.

On the basis of a systematic analysis of the whole collection, we will first show that the claim made by the author of *Regimen* cannot be accepted at face value, but probably aimed to capture the attention of the wealthy individuals in late 5th- or early 4th-century Greek world who could devote time and afford to care for fitness. Pursuing our analysis, we will demonstrate on the basis of a quantitative analysis of textual evidence, that foodstuff and vegetable materia medica very much overlapped in Hippocratic medicine. Lastly, by analyzing the native distribution and domestication of the plant species making up the Hippocratic range of foodstuff and materia medica – will suggest that such overlapping precedes by far and larger the time of Hippocratic physicians.

2. Historical background

In the *Hippocratic Collection* (*Corpus Hippocraticum*), the treatise identified as Regimen (De regimine) is supposed to date back to the late 5th century BCE or the early 4th (Jouanna, 1992: 557–559; Jouanna 1999: 408–409). It has been linked with concepts developed in two other treatises of the *Hippocratic Collection* probably coming from the medical milieu of Hippocrates himself in the Greek island of Kos where Hippocrates was born and probably taught medicine:

- the treatise on environmental medicine *Airs, Waters, Places* (*De aëre, aquis, locis*), dating back to the 2nd half of the 5th century BCE (Jouanna, 1992: 528–529; Jouanna 1999: 374–375);
- the treatise on physical anthropology *Nature of Man* (*De natura hominis*), which is the only treatise in the *Corpus Hippocraticum* whose author is known by name (Polybus, active between 400 and 370 BCE (Nutton, 2007)) and dates to the last years of the 5th century BCE (Jouanna, 1992: 551-552; Jouanna 1999: 399-400).

Regimen is made of four books, each of which deals with a specific topic (Jones, 1931: 224–447). Of particular interest here is the 2nd book, mostly devoted to the properties of foodstuff and liquids (be these properties natural or artificial, that is, resulting from a preparation for the latter) and physical exercise (Jones, 1931: 298–365). After two introductory chapters on environmental and meteorological medicine (that is, the impact of the geographical position [chapter 38] and the winds [chapter 39] on the general state of health of populations taken as a whole, including seasonal variability), this book is mainly a catalog of foodstuff by types (15 types in total, possibly with several foodstuff in each of them):

- barley (chapter 40);
- cyceon (41);
- wheat (42);
- spelt (43);
- flour (44);
- beans (45);
- meat (46);
- poultry (47);
- seafood (fishes and shellfishes) (48);
- eggs (50);
- cheese (51);
- liquids (52);
- honey (53);
- vegetables (54);
- fruits (55).

This catalog is followed by general considerations on the properties of the substances previously listed, including their possible transformation(s) through preparations (chapter 56).

As an example of the properties the several substances listed above are credited with, one could quote a passage from the chapter on vegetables (*Regimen II*, LIV=Jones, 1931: 328–329 [Jones' translation here and in subsequent citations]):

> Garlic warms, passes well by stool and urine, and is good for the body though bad for the eyes. For making a considerable purgation of the body it dulls the sight. It promotes stools and urine because of the purgative qualities it possesses. When boiled it is weaker than when raw. It causes flatulence because it causes stoppage of wind.
>
> The onion is good for sight, but bad for the body, because it is hot and burning, and does not lead to stool; for without giving nourishment or help to the body it warms and dries on account of its juice.
>
> The leek warms less, but passes well by urine and by stool; it has also a certain purgative quality. It moistens and it stops heartburn, but you must eat it last.

As these examples show, entries are built on a template, which is not necessarily applied to all foodstuff in the same way, however, and can be reconstructed as follows (reconstruction does

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