Tradiciones & transformaciones en Etnobotánica

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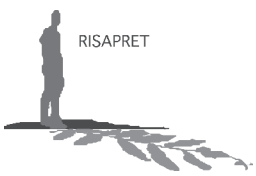

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PRÓLOGO

*La **Red Iberoamericana de Saberes y Prácticas Locales sobre el Entorno vegetal (RISAPRET)** del **Programa Iberoamericano Ciencia y Tecnología para el Desarrollo (CYTED),** fuertemente comprometida con el desarrollo de la Etnobotánica en el ámbito geográfico en el que se desempeña (Iberoamérica) pero sin descuidar la importancia de las interrelaciones con otras áreas del planeta, ofrece hoy a la comunidad este interesante libro que constituye una muestra de los avances de las investigaciones en la actualidad.*

En sus páginas, el lector encontrará valiosos aportes a este campo científico multidisciplinario, cuidadosamente compilados en Capítulos, que permiten efectuar un recorrido progresivo por una parte importante de los diferentes espacios que la Etnobotánica comprende, resultando por ello de utilidad tanto para quienes tienen interés en conocer de qué trata, para quienes ya están iniciando sus investigaciones en esta área como para quienes están en dicho camino.

Incluye los aportes de investigadores integrantes de los Grupos Participantes de RISAPRET, a los que se suman voluntariamente quienes participaron del V CONGRESO INTERNACIONAL DE ETNOBOTÁNICA (ICEB), que tuvo lugar en S. C. de Bariloche (ARGENTINA) en octubre de 2009, otorgándole ello una enriquecedora variedad de áreas geográficas diferentes de análisis, posibilitando que la Red amplíe, de esta manera, sus contactos y la posibilidad de ofrecer la presente obra.

Por un lado están representados los Grupos de las UNIVERSIDADES DE SALAMANCA y de ALICANTE (ESPAÑA), de la UNIVERSIDAD NACIONAL AUTÓNOMA (MÉXICO) y por el otro la totalidad de los Grupos de ARGENTINA, país anfitrión de este Congreso V ICEB.

Cabe expresar un particular agradecimiento a todos los autores de los trabajos que orgullosamente presenta RISAPRET en este Libro.

Dicho agradecimiento se transforma en ESPECIAL cuando va dirigido a las tres Editoras del mismo. Se trata de las Dras. María Lelia POCHETTINO - Responsable del Grupo Participante del Laboratorio de Etnobotánica y Botánica Aplicada (LEBA) de la Facultad de Ciencias Naturales y Museo de la UNIVERSIDAD NACIONAL DE LA PLATA - Patricia M. ARENAS, integrante del mismo y de Ana H. LADIO, Responsable del Grupo Participante de la UNIVERSIDAD NACIONAL DEL COMAHUE, con sede en Bariloche (ARGENTINA), quienes gracias a su extensa y destacada trayectoria y experiencia en la especialidad así como a su responsabilidad, han logrado, después de una ardua tarea que insumió extensas horas de trabajo, el producto que con honor esta Coordinación de RISAPRET ofrece a la comunidad.

Si los lectores a quienes llegue esta obra logran ampliar su visión acerca de los diferentes aspectos que conforman la Etnobotánica; si es capaz de despertar pasión por el trabajo con las comunidades; si constituye nuevas oportunidades para incrementar las comunicaciones entre investigadores, teniendo en cuenta el elevado número de autores y las diferentes procedencias y áreas de estudio; si enriquece las bibliotecas... significará que la obra ha sido útil, que el esfuerzo de autores y editores tuvo sentido y que por lo tanto, RISAPRET continúa cumpliendo su cometido.

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3.0.08

HISTORY OF BOTANY AS ETHNOBOTANY? PROPOSALS TOWARD A NEW APPROACH TO THE ANCIENT LEGACY

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ABSTRACT

Touwaide A. 2010.History of Botany as Ethnobotany? Proposals toward a new approach to the ancient legacy. Historical texts on the uses of plants as therapeutic agents are increasingly more often scrutinized in ethnobotanical and ethnopharmacological inquiries as a source of information in order to possibly detect antecedents of present traditional practice. To produce reliable results, such use requires the application of rigorous historical methods. The present essay aims to suggest some of these methods, together with the data they can generate. The approach suggested here crosses the boundaries of traditional disciplines and merges them in a synthesis superior to the sum of its elements.

Keywords: history, Hippocrates, Theophrastus, Dioscorides, cross-disciplinary inquiry.

RESUMEN

Touwaide A. 2010. Historia de la Botánica como etnobotánica? Propuestas hacia un nuevo enfoque de la herencia antigua. Los textos históricos sobre los usos de las plantas como agentes terapéuticos son cada vez más utilizados en las investigaciones etnobotánicas y etnofarmacológicas como fuente de información para detectar posibles antecedentes de la práctica tradicional actual. Para obtener resultados fiables susceptibles de ser integrados en mayores síntesis, dicho uso requiere la aplicación de rigurosos métodos históricos. El presente ensayo tiene por objetivo sugerir algunos de estos métodos, junto con los datos que pueden generar. El enfoque propuesto aquí cruza los límites de las disciplinas tradicionales que combina en una síntesis superior a la suma de sus elementos.

Palabras clave: historia, Hipócrates, Teofrasto, Dioscóride, investigación trans-disciplinar.

INTRODUCTION

In recent times, ancient written works on the therapeutic use of plants (herbals) have been increasingly introduced into the field of ethnobotany and ethnopharmacology. They are scrutinized in the hopes they contain information not available from other sources that can shortcut drug discovery.

However promising it may seem, such approach presents major challenges, starting with the method(s) to be used for the study of ancient texts. Over the past decades, several methodological essays have been proposed (most recently Buenz et al., 2004, for example). Nevertheless, they have often been limited to specific works (e.g. Buenz et al., 2005) or case studies, and have not produced a standardized protocol to be possibly applied to any kind of ancient document (in spite of Holland, 1996, for example).

In the present essay I wish to suggest how the application of rigorous methods of historical investigation may bring to light data contained in the pharmaco-therapeutic literature pre-dating modern science that are of interest to ethnobotanists and ethnopharmacologists. To this end, I will cross the traditional borders of disciplines by looking at historical texts (which are usually the province of philologists and historians) with the eyes of ethno-

botanists and ethnopharmacologists. In so doing, I will uncover information not necessarily suspected by either philologists and historians or ethnobotanists and ethnopharmacologists.

I will limit this presentation to major methodological issues and illustrate the productivity of the proposed cross-disciplinary approach by means of some key aspects of the ethnobotanical and ethnopharmacological inquiry.

For the sake of clarity and concision, I will focus on the historical documentation produced in the ancient Mediterranean world. Also, I will concentrate on the production predating printing (that is, manuscripts). Nevertheless, I will sometimes refer to printed documentation.

CONTEXTUAL INFORMATION

The written documentation on the therapeutic uses of plants in the ancient Mediterranean world currently known consists mainly of three works and/or collections of works: the *Hippocratic Collection*, *Historia plantarum* by Theophrastus, and *De materia medica* by Dioscorides.

The *Hippocratic Collection* is a series of 60+ treatises in Greek ascribed to Hippocrates (ca. 460-between 375 and 350 BC). Many of these treatises contain numerous prescriptions of remedies for the treatment of a wide range of maladies.

From the Renaissance on, Western scholars have scrutinized the several treatises in the *Collection*. They have reached the conclusion that none of the treatises is by Hippocrates himself, although some may date back to his time. The *Collection* is in fact an amalgam of works ranging from the 5th century BC to the 2nd AD, written by different authors, and coming from different medical schools (this word school being understood as meaning orientation, and not teaching structures).

The Greek text of these treatises was printed as early as 1526 and abundantly studied since. The last printed version of the whole collection dates back to the 19th century (10 vols., Littré, 1839-1861). However, editions (below) of several single treatises have been produced during the 20th century.

Theophrastus (371/0-287/6 BC) was a pupil of Aristotle (384-322 BC). Following his master's teaching, which required him first to collect all available information in a scientific field in order to build a theory, he gathered the plant knowledge of his time in his treatise known as *Historia plantarum*. The title should not be considered as referring to a historical work; in ancient Greek *historia* indicates rather a collection of data preliminary to a research. In this view, the work is an organized sum of all information on plants at Theophrastus' time and known to him.

The work was printed as early as 1498 and several times afterwards. After a new edition with English translation in the early 20th century (Hort 1916-1926, 2 vols.), it has been edited again recently (Amigues, 1988-2006, 5 vols.). In this new publication, plants are identified anew.

De materia medica by the Greek Dioscorides is similar. Its author is traditionally considered –but without conclusive evidence– a military physician who accompanied the Roman legions throughout the Mediterranean basin around the mid-1st century AD. Whatever his professional activity, in *De materia medica,* he collected much of the information available at that time on the natural substances from the three kingdoms (vegetal, animal, and mineral) used for the preparation of medicines.

The work, often dated to ca. 70 AD without supportive evidence, has been the basis of most of the literature on materia medica in the Mediterranean and Western tradition from its writing up to the rise of modern pharmacy. It was translated in many ancient languages (from Latin to Arabic) and its Greek text was printed as early as 1499 and several times during the 16th century. It was re-edited in the early 20th century in a version that has been standard since (3 vols., Wellmann, 1906-1914) and has recently been translated into English (Beck, 2005).

MATERIAL AND METHODS: A TRADITIONAL VIEW

1. Primary material

The aforementioned texts arrived to Western scholars through books written by hand (manuscripts). Such books were produced from one to another in an uninterrupted chain forming what is called a manuscript tradition. According to a generally accepted opinion, such tradition is characterized by a constantly increasing number of mistakes generated during the act of copying by hand.

For none of the works listed above do we have the copy written by the author himself (autograph).

Indeed, many of the copies have been destroyed through the centuries, leaving us with only the more recent part of their tradition.

2. Inventory

On the basis of the aforementioned notion that mistakes are introduced and accumulated in the chain of copies of a work, it is clear that the inventory of the manuscripts containing a work is of fundamental importance. It needs to be exhaustive, not to miss a single copy that may either be more ancient than all the others or offer a better version of the work a scholar is interested in (that is, a version containing fewer mistakes).

The search is more demanding than it may seem: manuscripts are not necessarily well catalogued and, consequently, cannot always be easily found. Whatever the state of cataloguing, they are in libraries all across the world. Since they are unique pieces (contrary to printed books), none of them can substitute for any other (which is the case, instead, for printed books, for which any copy in any library can be used, provided it is of the same edition).

3. Identification of texts

A key question in the study of ancient manuscript documentation is the correct identification of their texts. Manuscripts do not always contain explicit information on the author and the texts they contain, be it because the pages containing such information (usually the first ones) have disappeared at some point in time or because the manuscripts never included such data. This is a major difference between manuscripts and printed books. Unless they are incomplete, printed books always open with a frontispiece (title page) that indicates the author's name, the title of the work, and the place and date of publication of the volume.

4. Publication

The works of the ancient physicians presented above have been published in the form of scholarly editions. To produce such editions, scholars read all the extant copies of a work, identify the manuscript offering its best version (which is often, but not always and not necessarily the most ancient), reproduce such version, and correct all its mistakes so as to offer the best, that is, the most readable version of the work under consideration.

For the non-specialist audience to take advantage of such editions, scholars usually translate the edited text into a modern language. Traditionally they also include in such volumes an introduction in which they present the biography of the author and the work, and add notes of commentary in which they explain the possible obscurities of the work. In many cases, editors also add a lexicon at the end, in which they list either all or a selection of the significant terms of the work, unless they compile a full lexicon of the edited work as a separate publication.

5. History of art

The representations of plants in ancient manuscripts and early printed books are sometimes published. Such works are of two types: de-luxe replica facsimiles of illustrated manuscripts produced in a limited number of copies (usually less than 1,000) that exactly reproduce the original. Due to their process of production (by hand, one copy at a time) and their limited number of copies, such facsimiles are extremely onerous. The second type of publication is made of volumes by historians of art, and do not necessarily offer information relevant to ethnobotanists and ethnopharmacologists, let alone historians of botany.

6. Analysis

On the basis of critical editions, scholars – most often philologists, but sometimes also historians, particularly of medicine – analyze ancient works. Often they focus on a specific question and a work (or a particular segment of a work). In their analysis, they usually refer to available philological literature for technical questions such as the identification of the plants (for example, they use the classical dictionary of ancient Greek language by Liddell, Scott and Jones known as the Liddell-Scott-Jones [LSJ], first published in 1843 and several times revised since, or the English translation of Theophrastus, *Historia plantarum* by Hort [above]).

MATERIAL AND METHOD: A RENEWED APPROACH

However valuable and productive the approach described above has been and will continue to be, it is probably more appropriate for a certain type of

study, and does not make it possible to unlock all the information contained in the texts that are of interest for ethnobotanists and ethnopharmacologists. I propose here a new approach that crosses the boundaries of traditionally defined disciplines and fields of investigation (including their usual geographical and chronological delimitations). Such approach borrows its inspiration from ethnobotany and ethnopharmacology and transfers their objectives and methods to history, and also takes advantage of the many resources currently offered by information technologies.

1. Inventory: from books to relevant information

All copies of a work transmitted in manuscript form offer a different text (see above). However, not all their differences are mistakes generated by the distraction, negligence, or supposed ignorance of the copyists as the philological approach described above postulates. These differences can also be –and are in many cases– new data introduced by a user of the text into his/her copy in order to improve the scientific content of such text. In the specific case of therapeutics, such improvements often result from the personal practice of the author of the intervention, that is, a clinical experience.

Knowing this, it is even more important to locate all the copies of a work and to consider each of them as a new work. This consideration applies also to printed works. In all cases, a single copy cannot be approached independently, but needs to be referred to its models (the manuscript that it reproduces) or earlier editions (for printed works), so as to verify the possible differences from one to another.

Such way of doing exposes, however, to the risk of artificially increasing the quantity of the documentation to be analyzed. Furthermore, it generates an important quantity of duplication, induced by all the data that are repeated without variation from one copy to another. To avoid over-inflation, only the scientific differences between the several copies of a work need to be taken into consideration as they are the only significant ones.

This requirement is valid also for printed works. All their editions need to be taken into consideration and duly compared so as to identify the differences from the first edition.

2. Contextualizing data

Considering that each form of a text is itself a text, research should necessarily locate as precisely as possible this form of the text under scrutiny. Whereas for printed works such information is provided by the title page, it is usually absent in manuscripts, apart from the rare books that are signed by their copyist(s). According to our border-crossing paradigm, inquiry should use all the resources of manuscript studies to locate in space and date in time each form of the text under consideration, and such data should be attached as a tag to any information extracted from that specific manuscript/form of the text.

3. Recording and treatment of data

For this collection of micro-differences between copies of a text (as well as between similar texts) to be manageable and generate new significant information, it requires systematic computerization. Ideally this treatment should proceed in several successive steps: digitization (scanning) of the ancient documents in image mode; automatized deciphering of their text by Optical Character Recognition (OCR) so as to have the texts in a machine-readable format; automatized comparison of the resulting texts, and automatized databasing of the differences between the different versions of the same work.

Without mentioning the problem inherent to digitization of ancient documents to be made *in situ*, not all components of this series of operations are yet possible (digitization of handwritten texts by OCR, for example, is still far from practical, however useful and requested it may be; this applies also to early printing and even to much of the 19th century printed production). In these circumstances, most of these operations still need to be done manually. However time-consuming they may be (and are), manual identification and databasing of differences between copies of a text (or editions of a printed work) are indispensable.

For these databases to be reliable, they need to include in a special field the references to the source. This allows for verification, exactly as voucher numbers, for example, do for specimens collected in the field. Ideally, references should always be to accessible texts (printed editions instead of manuscripts). Since this is not always possible, references should be made to manuscripts

duly identified (city, library, collection, shelfmark). In all cases (printed edition or manuscript), references should be complete, including volume (when applicable), page, and line numbers in order to allow for easy and direct check.

For each bit of information, databases need to include also the aforementioned space/time tag. In this way, it will always be possible to locate precisely (in time and space) any information in the databases, but also to retrieve the whole information of any field in chronological order. This will make it possible to introduce a chronological and geographical sense into the differences between texts, and suggest a dynamic and a spatial distribution of the transformations.

4. Identification of plants and medical conditions

Micro-differences between copies (and printed editions) may affect plants and medical conditions. In some cases, however, these differences may not be apparent. By expanding the geographical and chronological frame of the inquiry and taking into consideration the whole tradition of a text (thus embracing areas and periods traditionally considered as separate entities in the disciplinary division of knowledge), the differences between copies may not be in the text, but in the reality the text is connected with. In the Arabic translation of Dioscorides, for example, the name of a plant may have been preserved (that is, its Greek name has not been translated, but reproduced as such, even though it is written in Arabic alphabet instead of Greek), suggesting that the plant referred to was the same as in the Greek original. However, the flora of the area where the Arabic version of *De materia medica* was used is not the same. Beyond textual identity, there thus is a difference of reality to which the text was linked. The same consideration is valid for the medical conditions for the treatment of which the plants were used.

The identification of plants and medical conditions cannot be made only on the basis of bibliography, but need to exploit all possible sources of information, possibly on a regional basis. For the plants, for example, this includes the descriptions in the texts, macro- and microscopic (pollens) archaeological remains, traces of plants in containers of any kind (from dishes in garbage pits to perfume bottles), and, to mention just some, products made of plants, from food to medicines. All available techniques of scientific inquiry should be used (from macroscopic analysis to DNA sequencing for example) and their results should be confronted and combined.

5. Interpretation

In this view, the tradition of a text – or of a larger textual collection – becomes the report of cumulative transformations arising from the knowledge and practice of the readers and users of the text. Transformations can also result from the adaptation of texts to differentiated local circumstances (through time within the same geographic area or across geographic areas), regardless if we are dealong with the flora or the epidemiology.

The task of historians of botany and pharmacology who absorb the objectives and methods of ethnobotany and ethnopharmacology into their work (let's call them ethno-historians of botany and pharmacology) changes its nature: it no longer is an archaeology of texts (as is the case with philological work), but becomes an archaeology of the knowledge transmitted through the texts. Like archaeologists, ethno-historians distinguish indeed layers of accretions, describe and identify each of them, inventory and catalogue their content, and try to understand their inter-relations, which they interpret as a dynamic process.

RESULTS

When the method briefly evoked above is applied to the works of classical antiquity listed under Contextual Information, it produces significant results on questions that are of primary importance in any ethnobotanical and/or ethnopharmacological research. Below I present results on a limited number of such topics so as to suggest the potential of the proposed approach.

1. Drug discovery

Ancient documentation contains information on how the medicinal properties of plants were discovered. Sometimes, such information is provided by the name of the plant. This is the case, for example, of *artemisia*, supposedly linked with the goddess Artemis. In other cases, it is an illustration that

suggests the origin of knowledge. In a Latin manuscript, for instance, *bettony* is represented with the god Asclepius. The figure indicates that the therapeutic properties of the plant were revealed to Humankind by the divinity. There is more historical information, however. Theophrastus, for example, refers to common knowledge (9.16.1), to a discovery by a certain Thrasyas of Mantinea (9.16.8), or by shepherds (9.17.1).

Systematic computerization of data from texts sheds a different light on this question. If morphological data as described in ancient texts are included in the databases, it appears that medicinal plants present systematically remarkable characteristics, be it their color (red, for instance), a particular morphology (poppy capsules, for example) or the general shape (*aristolochia*, among others).

Furthermore, of the many different uses of plants recommended for therapeutic purposes in the *Hippocratic Collection,* almost half appears to be made of species that were also consumed for alimentary purposes. While some of these species grew (and still grow) in the wild (capers, for instance), most of them were cultivated and were probably available in the orchard. This strongly suggests that there was a link between alimentary and medicinal use of plants, according to a theory already present in the ancient medical literature. This link does not favor the hypothesis that medicinal plants were weeds.

2. Plant representations

It is generally admitted that representations of plants in herbals were originally realistic (supposed they were present from the original of the authors, something that is still debated). Then, because of their successive copies, they became more and more schematic in a way that made them unrecognizable.

A systematic inventory, databasing, comparison, and detailed analysis of all plant illustrations in all the Greek manuscripts currently known of Dioscorides, *De materia medica* (including a close comparison with text) does not support this interpretation. Schematic illustrations correspond strictly to the text, indeed. Not only do they represent all the elements of botanical diagnosis contained in the text, but also they represent only those ones. Realistic illustrations, instead, add elements that do not appear in the text.

Since they correspond so closely to the text, schematic figures come most probably from the same scientific matrix as the text. This does not mean that they are original, that is, that they are by Dioscorides himself. They may very well have been added at some point in time. However, they are a product of the same way of analyzing the vegetal work as the textual descriptions that they visualize.

3. Range of plants

In the *Hippocratic Collection* one can locate 380 different plant names. On this basis, it has been claimed that Hippocratic physicians had an extended knowledge of the therapeutic resources offered by the natural world.

Systematic databasing of the information in the *Collection* leads to different – and probably more realistic – conclusions. Whereas there are indeed 380 different plant names, not all such plants were used with the same frequency. Of the 3,100+ mentions of plant uses, almost half (actually 1,500) is made of only 45 different plants. Of the 1,600 remaining, 1,100 are made of 80 plants, and 500 of 255 plants. This means that, even though 380 different plants names appear in the *Hippocratic Collection*, not all such plants were used in the same way. Furthermore, the 45 plants mentioned in 1,500 prescriptions are mostly common ones, from garlic to mint, including parsley, leek, oregano, pomegranate, myrtle, sage, laurel, peony, fennel, or lentil among others.

Two principles underpin the use of medicinal plants in the *Hippocratic Collection* (which, we should not forget, is an heterogeneous collection of texts): optimization (these are the 45 plants mentioned in 1,500 prescriptions, with frequencies going from 63 to 22, and an average factor of use of 33) and specialization (these are the 255 plants used in 500 prescriptions, with, thus an average factor of frequence of 2).

4. Therapeutic properties of plants

In Dioscorides, *De materia medica*, plants are credited with abstract properties with such expressions as "*it has a warming* (or *cooling*, *refreshing*, *drying*) *property*". A systematic examination of the *warming property*, for example, based on the databasing of Dioscorides' text, reveals that the plants credited with it form 5 different, but quite unitary groups: cathar-

tic plants, olive oil, exotic plants, plants used in the production of perfumes, and perfumes (which were made of oil in which the aforementioned plants were infused). In spite of their diversity, all such groups have a common denominator: they all eliminate bodily liquids, be it because they are cathartic (iris for example), heat the body (olive oil and, hence, perfumes) or are stimulant (exotic, spicy plants).

5. Physiological effects of medicines

The action attributed to the many plants in the ancient medical literature has often been dismissed as inexact in the best cases, quackery in the worst. The close examination of texts and their systematic comparison to contemporary pharmaco-chemistry literature throws a different light on this question and reveals that symptoms often considered as inexact by modern scholars and scientists may actually correspond to reality. A case in point is the description of the intoxication with a substance not necessarily well identified at the species level (although it clearly pertains to the genus of the Solanaceae) in the treatise *On the effects of poisons* attributed to Dioscorides:

> *Struchnon*: a delirium similar to drunkenness follows the intake ... (chapter 15)

However non-scientific it may seem at first glance, this diagnostic appears in the classical manual of pharmacology by Goodman and Gilman (1970: 535) about the intoxication by Belladonna alkaloids:

> The diagnosis of ... alcoholic delirium has been mistakenly made ...

Significantly, in a manuscript (Paris, Bibliothèque nationale de France, *supplementum graecum* 247, folio 30 verso), the text about another intoxication (with similar effects) is illustrated with a figure representing a man laying down on the ground!

6. Classification of plants

In its canonical form in Byzantine manuscripts, Dioscorides, *De materia medica*, is made of five *books*. According to the introductions that open each of them and summarize the content of the previous (except in the first *book*), each such *book* is devoted to one or more specific classes of materia medica defined by their nature. In this view, the first *book*, for example, contains the plants used for the production of perfumes, exotic plants, olive oil, the perfumes themselves, trees and fruit trees. Hence, we see here the traditional interpretation of this concept of *book* as a thematic coherent unit.

Whatever the actual meaning of this notion of *book* (which does not necessarily refer to a thematic unit, but may come from the history of book production and indicate rather a tome), the materia medica are listed within the *books* according to a principle that has not been identified as yet. At first sight, the collection of data may seem unorganized. At any rate, they are not listed according to the alphabetical order of their name.

A reexamination of this question based on a systematic recording of all the elements used by Dioscorides to describe the action of the materia medica through the whole work makes it possible to identify groups within the aforementioned major categories (the *books*), and also a classificatory principle within such groups of materia medica.

Starting with the groups, they contain materia medica with the same or a similar therapeutic property. This property is best represented by the first product in any such group, which is like the prototype of the property shared by all the substances in the group. Then, all the other items in the group differ from this first substance by either the degree of intensity of such property or the mechanism of its action. This made it possible for a therapist to modulate a therapeutic action according to the needs.

All the groups built in this way are ordered on a scale whose first and last points present opposed characteristics: from colored substances credited with a warming property in the first group we end with materia medica that are black (which, in the ancient Greek chromatic system meant not a color, but the absence of any color) and cold in the last group. These initial and final groups thus constitute an axis on which all groups are located according to their degree of hot or cold, in a gradually decreasing way. This reminds us of the *Great Chain of Being* illustrated by A. O. Lovejoy (1936), which was probably common knowledge to any individual in antiquity –a fortiori to a learned physician–, and made it easy for any user of *De materia medica* to locate any required substance to be used for the treatment of a patient.

7. Transmission of knowledge

The philological approach to ancient texts is primarily interested in trying to identify the most reliable version of a text in view of its edition (above). Major reorganization of texts are usually not considered as they represent deviations from the *original* (this term *original* being understood not as the autograph of the author, but the most faithful version of his work). Such variant versions of texts bear interesting information, however. This is the case, among many others, of a reduced version of Dioscorides, *De materia medica*. In such re-arrangement (usually identified as Dioscorides' *alphabetical herbal*), only selected chapters dealing with plants are present (and they are ordered according to the alphabetical order of the plant names).

The rationale for this new version of the text has been investigated without any conclusive result. A comparison with the practice of transmission of knowledge among contemporary living groups still using oral tradition (instead of the written record) helps understand the genesis of such abbreviated form. Dioscorides' complete work is made of 1,000+ chapters, indeed, that is a number much higher than any given population with an oral tradition can handle. The chapters in the alphabetical reduced version (the number of different plants) total 300, that is, a number close to the maximum number of different species usually handled by contemporary groups preserving knowledge through oral tradition. The reduction from 1,000 to 300 chapters (and plants) was not random, but aimed to bring Dioscorides' all encompassing encyclopedia closer to the transmission capacity of a traditional society.

There is more, however. The proportion of the agents used to treat the different categories of ailments of *De materia medica* is similar in both versions. For example, the troubles of the digestive system constitute 11.08 % of the total number of ailments in the full version of *De materia medica* and 11.20 in the alphabetical reduced version; those of the respiratory system constitute 6.08 and 5.91% respectively, and wounds and ulcers 4.14 and 4.03. There are some divergences, however, but they are not really significant: gynecology, for instance, accounts for 7.01% of the total number of troubles in *De materia medica* and 8.24 in the reduced version. In spite of these discrepancies, the similarities show that the reduction in the extension of *De materia medica* (by the selection of only 300 out of 1,000 chapters) was not made without principles, but took into consideration the practical application of the materia medica. In other words: it was made considering the needs of the population for the treatment of which this new version of the text was being made.

CONCLUSIONS

On the basis of a presentation of some topics taken from works on botany and pharmacology dating back to classical antiquity, the present essay suggests that the history of botany and pharmacology may contribute significant data to ethnobotany and ethnopharmacology. To this end, classical work needs to be approached by means of a trans-disciplinary set of methods borrowing its components from a wide range of traditional academic disciplines not usually brought together, but associated here.

This does not mean that the philological and historical approach to ancient medico-pharmaceutical literature should be abandoned. They are needed as indispensable, if not unique, tools able to penetrate the texts and the intricacies of their specialized language, as well as their tradition. However, they need to be integrated into a broader inquiry aimed to account for a higher number of components of the texts to which they are applied.

The comprehensive approach proposed here goes further, however. It makes it possible to bring to light mechanisms of composition, use, and transmission of data and texts typical of the practice of pharmacotherapy. Strangely enough, such mechanisms have not been identified so far.

Through this transformation of history into ethno-history, the texts submitted to this kind of analysis recover their totality and provide modern scholars and scientists with a host of information not available from any other source.

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