

Practical Uses of Fruits in Ancient Medicine (based on the treatise of Quintus Gargilius Martialis *Medicinae ex oleribus et pomis*)

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ABSTRACT

Aim: The aim of the article is to study the therapeutic effect and pharmacological characteristics of using fruits, berries, and nuts in ancient medicine, expanding and deepening knowledge in the history of medicine.

Materials and Methods: The study material was *Medicinae ex oleribus et pomis*, the work of Quintus Gargilius Martialis, a third-century Roman writer, a systematizer of rules for cultivating and medical application of over 60 types of vegetables and fruits.

The methodological basis of the research is a set of general scientific and special research methods, including analysis and synthesis, induction and deduction, historical, interdisciplinary, descriptive methods, and the method of contextual analysis.

Conclusions: Gargilius' treatise *Medicinae ex oleribus et pomis* is a valuable source of knowledge about the use of vegetables, herbs, fruits, and nuts for the treatment and prevention of various diseases in antiquity. Roman physicians sought remedies in nature, considered fruit crops as a miniature pharmacy, learned to use bark, stems, flower petals, seeds, fruits, and other parts of plants to strengthen immunity, prevent and treat diseases of therapeutic and surgical profile, laying the foundations of modern phytotherapy. Ancient medicine highly valued the therapeutic and prophylactic properties of pomegranates, plums, apples, pears, quinces, figs, almonds, and other plants. Studying the experience of ancient physicians in historical retrospective, analyzing the healing properties of fruits and nuts used in their practice by ancient doctors, provides an idea of the development of the healing art, understanding the functions of the human body, means of prevention, and treatment of diseases in ancient times.

KEY WORDS: history of medicine, Quintus Gargilius Martialis, fruits, nuts, treatment, complementary alternative medicine

Wiad Lek. 2024;77(12):2510-2516. doi: 10.36740/WLek/200659 DOI

INTRODUCTION

Fruits in human diet are a source not only of vitamins, organic acids, mineral salts, but also of fiber, tannins, and pectin substances, which beneficially affect digestion and metabolism processes, play an important role in immune system formation, health preservation, reduce the risk of gastrointestinal, cardiovascular, nervous, and circulatory system diseases, and have a beneficial effect on the human body. Ancient physicians sought remedies in nature, learned to use bark, stems, flower petals, seeds, fruits, and other parts of plants for medicinal purposes, laying the foundations of modern phytotherapy. In view of this, it is important to study the experience of ancient writers and physicians in historical retrospective, analyze the healing properties of fruits and nuts used by ancient physicians in their practice, adapt their achievements to the history of the development of modern phytotherapy.

AIM

The aim of the article is to study the therapeutic effects and pharmacological characteristics of using fruits, berries, and nuts in ancient medicine, as well as to expand and deepen knowledge in the history of medicine. This research is a continuation of the series of publications by the authors' group dedicated to the issues of prevention and treatment of surgical and therapeutic profile diseases with the gifts of fields, meadows, forests, and gardens in ancient times.

MATERIALS AND METHODS

The research material was *Medicinae ex oleribus et pomis*, the work of Quintus Gargilius Martialis, a third-century Roman writer, known in the history of medicine as Book IV of the *Medicina Plinii* [1]. The manual consists of 60 chapters and contains instructions for growing fruit

trees and vegetables, as well as information about their medicinal properties and medical applications.

The methodological basis for studying the healing properties of fruits in ancient medicine includes a series of general and special scientific methods. The method of analysis and synthesis allows for the systematization of scientific developments on the mentioned issues; the inductive-deductive method enables the comprehension of theoretical and practical material; the method of contextual analysis contributes to the identification of features in the use of garden gifts in the therapeutic practices of ancient Romans; the historical method provides an opportunity for retrospective consideration; the interdisciplinary method traces the connection between the history of medicine and pharmacology, and the descriptive method is used for the description and interpretation of research material.

REVIEW AND DISCUSSION

Over the past decades, medical professionals and biologists have conducted a series of significant studies dedicated to the issues of treatment, health prevention, formation of a healthy lifestyle ideology, and proper nutrition with the gifts of fields and forests. The scientific-popular research by Artemenko M. and Latanska L. is devoted to legends about fruit trees, characteristics of the taste and healing properties of fruits and berries [2]. The scope of scientific interests of Mamchur F. is associated with studying the influence of biologically active substances of vegetables, garden greens, fruits, berries, and mushrooms on the human body, their application in disease prevention, treatment, and rational nutrition [3]. The phytotherapeutic guide edited by Orach A. and Orach O. contains information not only about the effectiveness of plant-based preparations in the treatment of pulmonological, gastroenterological, gynecological, endocrine, and surgical diseases but also about the analogs of using vegetables, greens, fruits, and berries in a particular phyto mix based on the pharmacologic properties of their bioactive components [4]. A thorough analysis of the biologically active substances of apples and their therapeutic value for human health (prevention of cardiovascular diseases, diabetes, inflammations, oncology) is presented in the article by Patocka J. et al. [5]. The subject of scientific interests of Hong S. is the research of the therapeutic properties of pears *in vitro*, *in vivo*, and in humans based on the evidence from ancient literature and modern protocols [6]. Scientific investigations by Jurenka Ju. [7], as well as Fahmy H. and Farag M. [8], are devoted to studying the antioxidant, anticarcinogenic, antimicrobial, antihypertensive, antidiabetic, hepatoprotective, neuroprotective, and immunomod-

ulatory effects of pomegranates. The dietary properties and medical application of peaches in ancient medicine based on the treatises of the 1st-7th centuries CE were studied by Jagusiak K. and Kokoszko M. [9]. The sphere of scientific interests of Barolo M., Ruiz Mostacero N., and López S. is related to the study of the biological and medicinal properties, nutritional value, and ethno-pharmacological use of figs [10]. In the context of research on the creative legacy of Gargilius in recent publications, we can highlight the investigation by Brodersen K., dedicated to illuminating the use of various herbs, vegetables, fruits, and nuts for the prevention and treatment of various diseases [11]. An overview of Gargilius' treatise as a source of knowledge in ancient pharmacology and dietetics is presented in the translation of fragments of the work into English by Riddle J. [12]. The problem of researching the origins and sources of medical knowledge of Gargilius is highlighted in the article *L'esprit ou la lettre: les sources des Medicinae de Gargilius Martialis* by Maire B. [13]. The description of the healing properties of cultivated plants based on Gargilius' work can also be found in the monograph by the researcher 'Greek' and 'Roman' in Latin Medical Texts. *Studies in Cultural Change and Exchange in Ancient Medicine* [14]. Valuable thoughts and generalizations regarding Gargilius' contribution to the development and popularization of medical knowledge in Roman society are also presented in the review of the Polish translation of the botanical-pharmacological work *Medicinae ex oleribus et pomis* by Stuligrosz M. [15]. Research on the use of citrus crops in the Western Mediterranean based on ancient Greek and Latin texts, including Gargilius' work, is encountered in the article by Pagnoux C. [16]. Mention of Gargilius' contribution to the systematization and popularization of knowledge about the use of fruits for medicinal purposes in the ancient period is found in the popular scientific exploration by Kovalenko O. [17]. The subject of interest for Kelbecheva V. is the nature, therapeutic effect, and healing properties of individual plants, including radishes, savory, and mallows, based on the material of Gargilius' medical treatise [18]. The experience of using vegetable crops in the practice of ancient Roman physicians for the prevention and treatment of diseases of therapeutic and surgical profile based on the material of the medical-pharmacological treatise *Medicinae ex oleribus et pomis* is outlined in the exploration by Petryshyn M., Zahaiska H., et al. [19]. The issue of the medical application of thyme as a repellent against snake bites based on Gargilius' treatise is addressed in the article by Rodriguez A. [20]. However, Gargilius' creative legacy has attracted the attention of scholars not only from the perspective of pharmacology and the history of medicine but also from philology. For example, the research by Maire B. [21] and Mantzilas D.

[22] is dedicated to the analysis of the lexical composition and stylistic devices and figures in *Medicinae ex oleribus et pomis*. Researcher T. Krynytska not only translated Gargilius' work into Polish, but also thoroughly analyzed the author's life and work, as well as the sources of his medical knowledge, and presented a bibliographic study of Gargilius' scientific legacy [23]. However, the question of the practical application of fruits, berries, and nuts in the medical practice of ancient Romans from the perspective of medical history requires further elucidation, as the medical knowledge of Ancient Greece and Rome laid the foundations for the further development of European medicine, and the introduction of numerous plant-based preparations into medical practice owes much to Roman scholars and physicians who, based on the works of ancient Greek physicians, created their own concept of disease prevention and treatment using gifts of nature.

In the early stages of societal development, plants were the primary source of human nutrition. By consuming the gifts of fields, orchards, and forests, people learned not only to satisfy hunger but also noticed the therapeutic effect of consuming various plants. Vegetables, fruits, and berries have become not only food products but also a means of treating many diseases, a source of health, strength, and vitality. Ancient writers and physicians synthesized accumulated experience and knowledge, devoting entire treatises to the healing properties of plant-based products. Therefore, we can objectively assert that even Roman physicians understood that nature was the source of remedies, and consuming an adequate amount of fruits and vegetables postponed the need for a visit to the doctor.

Our analysis focuses on the second part of the medical treatise by Quintus Gargilius Martialis, dedicated to describing the healing properties of fruits and nuts (chapters XL-LX). Gargilius creatively synthesized the experience and medical knowledge of his predecessors: Pliny the Elder, Dioscorides, Galen, Columella, and others.

The research indicates that Roman physicians successfully treated gastrointestinal, blood, pulmonary, and skin diseases with fruits and nuts which were accessible to all strata of the population of Rome, namely: apples, pears, plums, pomegranates, cherries, peaches, quinces, etc. Roman physicians most often prescribed the use of fruits for medicinal purposes in cases of gastrointestinal infections, which can be explained by the disruption of the digestive system due to the consumption of poor-quality food, contaminated drinking water, and poor hygiene practices. For diarrhea, it was recommended to drink a decoction of dried pears or leaves: *Aqua in qua pira sicca decocta sunt mirifice valet fluxum ventris inhibere* (XL,

10)¹, quince soaked in vinegar or wine: *Infudi quoque in aceto sive in vino solent quod stomachicis et intestinorum fluore vexatis* (XLIII, 9), resin from the peach tree: *fluenti alvo medetur* (XLIV, 11), sour cherries: *austera ... ventrem constringat, stomachum vero confirmet* (LII, 8), wine with burnt pomegranate powder: *Alvum fluentem miro modo sistit* (XLI, 12), medlar fruits: *fluctus ventris fortissime detinet* (XLVII, 5). The astringent and disinfectant effects of dried pears [3, 141; 24, 129], medlar [24, 287], and quince [3, 129; 24, 30] are still successfully used in folk medicine today. Roman physicians noticed and widely used the laxative effect of fruit pectin substances, which activate peristalsis, to treat constipation. Regular consumption of plums boiled in wine with honey: *... ventris operaci maximeque proficere* (XLVI, 5) or fresh cherries with pits intact: *... alvum copiose fluere* (LII, 4) improved intestinal motility, softened stool masses, and increased the frequency of defecation. Fresh or dried plums and cherries are also recommended by modern medicine as natural remedies for constipation and intestinal atony [24, 401]. In addition, as a prokinetic agent, walnut with fish sauce garum was recommended to be consumed: *Potest ... ventrem cum garo sumpta mollire* (LVII, 2). To stabilize the stomach mucosa and alleviate symptoms of gastric ulcer disease, as well as to stop gastric bleeding, ancient physicians prescribed a drink made from pomegranates soaked in rainwater for three days: *coeliacis sanguinemque iactantibus salutaris est* (XLI, 11), or dried ripe elderberries: *matura siccata sublevant stomachum* (L, 2). Roman physicians recommended to alleviate intestinal colic caused by a disorder of motor, secretory, and absorptive functions of the digestive system by drinking a decoction of pine bark with wine: *... contra ventris tormina subministrat* (LVIII, 8), and normalized hyperacidity by regular consumption of pine cone nuts: *ex nucleis cibus ... stomachi acrimoniam temperat* (LVIII, 1). Reduction of stomach receptor stimulation and suppression of nausea and vomiting were achieved by the intake of cherry tree resin dissolved in aged wine: *... fastidium stomachi nausiantis avertit* (LII, 12-13), cedar nuts: *stomachum a nausea vindicat* (XLV, 2), apples baked with flour: *putat stomachi nausiantis offerri* (XLII, 6). For liver pain, Romans consumed crushed pear seeds with honey: *... dolorem iecoris submovere* (XL, 16), crushed lemon with wine: *tritum et in potionem datum lienii ... querelis iecoris occurrit* (XLV, 3), or juice of jojoba roots and bark with wine: *radicis et corticis ... succus ... cum mero mixtus iecori medetur* (XLVIII, 6-7).

In Gargilius' treatise, we also find recipes for using fruits in cases of kidney dysfunction. The consumption of sour pomegranate fruits: *... urinam movent* (XLI, 4), and unripe

¹ The Roman numeral stands for the number of the chapter, the Arabic numeral – for the number of the verse line.

cherry fruits: ... *urinam movere* (LII, 4) contributed to the removal of excess fluid and the restoration of the body's water-salt balance. The high potassium and sodium content provide diuretic properties to cherries. Therefore, a decoction of cherry stems is successfully used today as an adjunctive treatment for dropsy, edema, and urinary stone disease. Ancient therapy accumulated significant experience in treating *urolithiasis* with garden gifts. A lithotriptic effect was observed with the intake of cherry tree resin with honey: *calculos vesicae in harenae pulverem solvit* (LII, 14), peach tree resin with wine: ... *mixta cum vino etiam in vesica lapillos frangit*" (XLIV, 11-12), and enemas with almond decoction with resin of the turpentine tree: *pro ecligmate data calculos frangunt* (LIII, 11).

In Gargilius' treatise, we find numerous recipes for treating diseases of the nose, throat, ear, and lungs with garden remedies. For instance, in cases of rhinitis, it was recommended to burn dry hazelnuts in clay vessels: ... *distillationibus mitigandis utilissime offeruntur* (LIV, 2). Inflammation of the tonsils was successfully treated with crushed pomegranate flowers mixed with honey: ... *itemque toxillis et uvae medetur cum melle contritus* (XLI, 20). The therapeutic properties of cherry tree resin with aged wine were highly valued in ancient times. This remedy was used to treat tracheitis: *Gummi, quod truncus inlacrimat, ... si in vino vetere detur in sorbitione resolutum* (LII, 12). Dried cherry tree sap (gum) is considered one of the effective demulcents in folk medicine for coughs [24, 86]. To alleviate symptoms of throat dryness and irritation in pharyngitis, as well as throat swellings, it was recommended to consume a decoction of peach tree resin with saffron: ... *thoracis obstrictos sinus reserat* (XLIV, 12). The symptoms of cough were treated by ancient physicians with remedies made from nuts and fruits. For instance, to soothe coughing, it was recommended to consume balls the size of nuts made from crushed almonds and honey: *tussi ... prosunt cum elelisfaco ac melle contrita* (LIII, 12), chestnuts roasted with honey in a dry clay pot: *tussientibus prosunt* (LVI, 2), juice of the jujube tree with honey: ... *tussim mitigat* (XLVIII, 7), which is used in alternative medicine as an anti-inflammatory and soothing agent for upper respiratory tract infections [24, 173]. Honey water with crushed forest hazelnuts, which ancient botanists referred to as "abellian," was considered an effective remedy for treating chronic cough: ... *vetustissimae tussis molestiam sedant* (LIV, 3). The disinfecting and expectorant effect of pine cones was used for hemoptysis: ... *excreantibus sanguinem salutare est* (LVIII, 7); The disinfecting and expectorant effect of pine cones was used for hemoptysis: ... *excreantibus sanguinem salutare est* (LVIII, 7); a decoction of pine buds is still recommended by doctors for inflammation of the upper respiratory

tract [24, 413]. Over the years, for the prevention and treatment of lung diseases and coughs, a powder made from rowan berries with barley groats and wine was also used, whose anti-inflammatory effect relieved disease symptoms, while its bactericidal properties destroyed pathogenic microflora: *pulmonis molestiam sentientibus obtulerunt* (L, 3), the decoction of peach tree trunk resin with saffron: *decocta cum croco ... vitia pulmonis expurgat* (XLIV, 12), the decoction of figs with hyssop: ... *pectus expurgat* (XLIX, 5).

In ophthalmology, Roman preparations from fruits were rarely used. From the analysis of the treatise text, only a recipe for eye pain relief based on pomegranate flower calyces: *ab oculorum dolore praestare* (XLI, 13), and an ointment made from powdered Assyrian plum seeds with oil and honey: ... *non abiecti vigoris xerocollyrium praestant* (LIX, 4) were found.

In general therapy practice, Roman physicians recommended baked quince for chronic fever: ... *aegris quorum diuturna iam febris est sine periculo dantur* (XLIII, 5), and for headaches, they applied an ointment made from peach pits, olive oil, and vinegar: *capitis dolori ... inlinitur* (XLIV, 10).

When the body was infected with helminths, Gargilius recommended applying compresses to the abdomen made from crushed peach tree leaves: ... *animalia perimunt et expellunt* (XLIV, 8).

The history of infectious diseases also goes back to ancient times as well. From the descriptions of ancient physicians, it can be concluded that infectious diarrhea and dysentery were endemic problems in the ancient world. In the treatise *Medicinae ex oleribus et pomis*, a number of recipes are dedicated to treating dysentery. For example, in cases of dysentery, Gargilius recommends consuming ripe or unripe quince: *dysentericis, sanguinem reiectionibus prosunt* (XLIII, 3), dried wild plums: ... *siccum etiam veteres dysentericos certum est adiuvere* (XLVI, 9), infusion of rowan berries: ... *dysentericis iniecta medicatur* (L, 4), or chestnuts: ... *dysentericis propinatur* (LVI, 3).

Ancient Romans also learned to prepare antidotes from fruits. Dried and crushed rowan leaves and bark with wine were considered a universal remedy against various poisons: ... *veneficis potionibus repugnare* (XLVII, 9), and one of the best remedies for alcohol intoxication was almond nuts: *Sicca etiam ebrietatem valent* (LIII, 4).

Preparations made from tree fruits were successfully used by ancient physicians in dermatology to treat baldness, lichen, and warts. An effective remedy for combating alopecia, according to Gargilius, is an ointment made from bear fat and crushed hazelnuts: ... *alopeciis inlita capillorum damna restituunt* (LIV, 6). The author provides a precise recipe for treating baldness based on nuts, including grinding and placing 100 young

nuts with skins in a clay pot, adding three pounds of crushed alum, three libras of good-quality olive oil, and infusing the mixture for 90 days (LVII, 5-8). In addition to medicinal treatments for alopecia, modern medicine recommends incorporating nuts rich in B vitamins, zinc, and essential fatty acids into the daily diet, which improve hair growth and volume [24, 119]. Lichen, known to physicians since ancient times, was treated with a mixture of plum tree resin and vinegar: ... *lichenas optime purgat* (XLVI, 10). For the treatment of papillomas and warts, ancient physicians used external remedies aimed at eliminating skin defects. Positive results were observed with the use of ointment made from apples, saffron, wine with raisins, fresh bread pulp, or sulfur: ... *in ceroti lentorem mollescant* (XLII, 14).

Surgery and traumatology were integral parts of ancient medicine. Ancient Roman physicians were skilled in treating various injuries, boils, ulcers, abscesses, fistulas, frostbite, bites, and more. In ancient times, people were not immune to dog bites, snakebites, scorpion stings, and infections by pathogens causing deadly diseases. For dog bites and cancerous ulcers, it was recommended to apply crushed almonds with honey: *Ulceribus canceratis et caninis morsibus trita cum melle subveniunt* (LIII, 9); for snakebites, crushed pistachios with wine were deemed effective: ... *morsum serpentium prosunt* (LV, 4). Applications of crushed figs with salt were used to treat scorpion stings: ... *scorpionum plagis medetur* (LIX, 11). Additionally, compresses made from figs boiled in wine were successfully employed in surgical practice to treat acute purulent-necrotic inflammation of the hair follicle and surrounding connective tissue: *Ipse panno inlita et impositae ... furunculos rumpunt* (XLIX, 7). Similarly, figs mixed with copper oxide were applied to wounds of the tibia bone: ... *tibiarum vulneribus imponuntur* (XLIX, 10), compresses made from crushed figs were also utilized to treat various ulcers: *Canceratis quanto pinguiores fuerint tritae et impositae tanto efficacius subveniunt* (XLIX, 12). In traditional medicine, figs are applied to abscesses to hasten their maturation and to remove calluses [24, 404]. The wound-healing properties of powder of peach tree leaf: ... *plagas cruentorum vulnerum claudunt* (XLIV, 9) and of pomegranate flowers... *exedit carnem quaecumque vulneribus* (XLI, 16) were widely used in surgical practice. Fresh pear pulp not only stopped bleeding but also promoted wound healing: *Recentibus certe admota vulneribus sistere sanguinem profluentem, perducere vulnus ad cicatrem* (XL, 2), and boiled and crushed tart and sour apples, when applied with lard, were used to alleviate swelling and hematomas: *Tumores atque livores ex aqua cocta et cum axungia trita compescunt* (XLII, 10). Compresses made from Assyrian plums with finely ground flour treated festering wounds effectively:

Trita et cum polline imposita collectiones suppurare non patiuntur (LIX, 3).

In gynecological practice, compresses made from quince soaked in rainwater were applied to uterine tumors: ... *et matricibus feminarum in tumore succurit* (XLIII, 8). Warm compresses made from figs and fenugreek were used for uterine diseases: ... *fomentum faciunt quod extinguit vitia matricum* (XLIX, 8). Roman physicians also recommended pregnant women suffering from morning sickness to consume sour cedar seeds: *praegnantibus fastidio laborantibus esui datum stomachum a nausea vindicat* (XL, 2).

Ancient Romans paid close attention to oral hygiene since halitosis was a common symptom of dental diseases. Dentists recommended rinsing the oral cavity with a decoction of plum leaves for gum diseases: *gingivas ... ab omni querela ore conluendo defendi* (XLVI, 11). For toothaches, chewing medlar fruits was advised: ... *dentibus ... subvenire, si in dolore mandatur* (XLVII, 5). Stomatitis was treated with pomegranate flowers crushed with honey: *Ulceribus oris itemque toxillis et uvae medetur* (XLI, 20). Additionally, remedies for oral diseases were prepared based on the juice of sour pomegranates, saffron, myrrh, alum, and honey, known as "stomatice" among the Greeks: *Hoc medicamento oris vitia sanantur* (XLI, 24-27).

CONCLUSIONS

For thousands of years, indigenous and sometimes original medicine has accumulated a rich experience in treating various pathologies. Ancient physicians sought remedies in nature, learning to utilize the bark, stems, petals of flowers, seeds, fruits, and other parts of plants for medicinal purposes, laying the foundations of modern phytotherapy. They left descendants many works that are a valuable source of information about therapeutic agents made on a plant basis. One such work is Quintus Gargilius Martialis' treatise *Medicinae ex oleribus et pomis*, dedicated to the application of vegetables, herbs, fruits, and nuts in the medical practice of ancient Romans. Roman physicians successfully used the fruits of fruit trees and nuts to strengthen the immune system, prevent and treat diseases of therapeutic and surgical profiles. The advantage of plant-based remedies is the possibility of prolonged use of natural medicines without side effects. In antiquity, the healing and preventive properties of pomegranates, plums, apples, pears, quinces, figs, almonds, and other plants were highly valued.

Studying the past of medicine provides important information about the development of the art of healing, means of disease prevention and treatment, and understanding the functions of the human body in ancient times.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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A – Work concept and design, B – Data collection and analysis, C – Responsibility for statistical analysis, D – Writing the article, E – Critical review, F – Final approval of the article

RECEIVED: 29.02.2024

ACCEPTED: 04.11.2024

