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Egyptian medicinal plants and stomach diseases

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Abstract:

Civilization in Ancient Egypt involved the pyramids and tombs and all aspects of human life. Health and wellbeing were some of the most cared arts by the pharaohs. Both the physicians and magicians participated in the field of medical care. From a holistic view, they conceived health and sickness as an unceasing fight between good and evil. Most of the complementary medicine modalities originated from ancient Egyptians. Medicinal plants are potential sources of natural products that play an important role in preventing different human diseases. Traditional medicine has used by the majority of the world population for thousands of years (Seifu 2004). The World Health Organization (WHO) 2007, reported that an estimated 80 % of the population in developing countries depend on traditionally used medicinal plants for their primary health care medicinal plant, which has medicinal properties that could treat or cure many diseases. Since old times all medicinal herbs and plants have played a vital role in treating diseases with rare side effects.

It published that almost 80% of the total population world depends on traditional medicine and products for its healthcare needs, particularly in third-world countries. Many sick people in developing regions gather normal medicine with traditional medicine. Traditional medicines are usually cheaper than modern medicines and may be the only natural remedies available, connected in buried rural communities in developing countries.

Key Words: Ancient Egypt, civilization, pyramids, tombs, pharaohs, Nile River, hieroglyphics, religion, agriculture, mummification, temples, Sphinx, dynasties, irrigation, trade, social hierarchy, papyrus, deities, art, architecture, medicine, mathematics, astronomy.

Introduction

Not all of Egyptian medicine based on dreaming, much was the result of experimentation and observation, and physical means supplemented the magical ones. Apart from spiritual healing and herbal medicine, Ancient Egyptians practiced massage and manipulation and made extensive use of therapeutic herbs and foods, but surgery was rarely part of their treatments (Zucconi, 2007). According to Herodotus, there was a high degree of specialization among physicians (Halioua et al., 2005) added that the Egyptians advanced medical practitioners for their time. They were masters of human anatomy and healing mostly due to the extensive mummification ceremonies. This involved removing most of the internal organs including the brain, lungs, pancreas, liver, spleen, heart and intestine. To some extent, they had a basic knowledge of organ functions within the human body. Their great knowledge of anatomy and (in the later dynasties) the crossover of knowledge between the Greeks and other culture areas led to an extensive knowledge of the functioning of the organs and branched into many other medical practices. Herodotus and Pliny were among the Greek scholars, who benefited from this cross-over and further contributed to the ancient and modern medical records, reached from the time of Ancient Egypt and into the modern era (Sanders, 1963). Ancient Egyptians were as equally familiar with pharmacy as they were with medicine. According to historical records, Ancient Egyptians involved in the medical and pharmaceutical profession used to recite certain incantations while preparing or administering medications. They were also familiar with drug preparation from plants and herbs such as cumin, fennel, caraway, aloe, safflower, glue, pomegranates, castor and linseed oil. Other drugs were made of mineral substances such as copper salts, plain salt and lead. Eggs, liver, hairs, milk, animal horns and fat, honey and wax also used in drug preparation

(Rosen, 1979).

Achillea fragrantissima

Singh et al, (2021) cited that Achillea fragrantissima used in Egypt for treating gastrointestinal disturbances, antibiofilm and anti-quorum sensing abilities reported in many desert plants, these plants have strong antimicrobial effects. Alshuail etal, (2019) added that Achillea fragrantissima (yarrow) is known in Arabic and distributed on the greatest scale in Arab countries. Patocka and Navratilova (2019) cleared that Achillea fragrantissima used in traditional medicine as a medicinal tea to treat of many disorders, such as respiratory infections, digestive problems and so on.

Hamdan and Afifi (2004) mentioned that A. fragrantissima is one of the desert herbs belonging to the family Asteraceae. This herb used in Arab countries as an alternative treatment for diabetes, gastrointestinal diseases, and respiratory diseases. Meanwhile Mohamed et al, (2015) illustrated that A. fragrantissima contains a high percentage of phenolic and flavonoid active constituents such as achillolide A, swertisin 2-arabinosideafroside, cirsimaritin, chrysoplenol, cirsiliol, eupatilin-7-methyl ether, and isovitexin 4′-methyl ether. Gach et al, (2015) added that Sesquiterpene lactones have active substances, which showed the greatest biological effect as anti-inflammatory, antioxidant, and neuroprotective compounds.

Vasisht and Kumar (2004) arranged that Achillea fragrantissima is a flowering plant belonging to the Asteraceae family. It contains approximately 100 species. Most of family modified by the biosynthesis of sesquiterpene lactones and flavonoids. Saeidnia et al, (2011) cleared that genus Achillea known in traditional medicine. They used to treat several ailments, such as stomach pain, menstrual disorders and bleeding. Eissa et al, (2014) confirmed that A. fragrantissima used in folk medicine in many Arab countries for the management of some popular health problems such as diabetes, respiratory disorders, gastrointestinal disturbances, and dysmenorrhea.

Aloe Vera

Eamlamnam et al, (2006) mentioned that Aloe vera is an herbal used as a remedy for several diseases in traditional medicine. It has a hepato-protective, anti-inflammatory, and anti-ulcerative cure. In addition, Werawatganon et al, (2014) showed that Aloe vera used as a strong laxative and as a substance to improve gastrointestinal motility.

Aloe Vera is a boon for our digestive system. It helps in cleaning the digestive system. It also helps in the movement of the bowels, preventing constipation and help in the treatment of irritable bowel syndrome (IBS). Aloe vera is a shrubby or arborescent, perennial, xerophytic, succulent, and pea-green color plant. It grows mainly in the dry regions of Africa, Asia, Europe, and America. It contains vitamins A (beta-carotene), C, and E, which are antioxidants. It provides calcium, copper, magnesium, potassium, and zinc which are essential for the proper functioning of various enzyme systems in different metabolic pathways and a few of them are antioxidants (Surjushe, 2008). Aloe has used extensively by the Egyptians, Assyrians, Mediterranean civilizations and in Biblical times.

Liu et al, (2013) cited that Aloe vera contains polysaccharides, proteins and amino acids, minerals, phenolics, anthraquinones, and enzymes. Bordoloi, and Deka, (2016) cleared that the previous contents of Aloe vera have functional properties of these compounds, Aloe vera has large scale used for wounds and inflammation and in the treatment of prevention of many diseases such as cancer, ulcers, diabetes, microbial and skin diseases, and others.

Caraway

Šarić-Kundalić et al, (2011) cited that caraway belongs to the family Apiaceae (formerly Umbelliferae) used in traditional medicine as a cure for a range of health problems, especially stomach ache, burping and flatulence, and intestinal spasms. Moreover, Seidler et al, (2010) added that caraway seeds have multiple phytochemical constituents, including fatty acids, essential oils, and volatile phenolic compounds which used in industry and medicine.

According to the European Union herbal monograph, caraway traditionally used for symptomatic comfort of digestive disorders (bloating and flatulence). Caraway fruits are used as a normal remedy to mask alcoholic breath, anemia, and as a prevent toxin agent against toxin pain. Caraway fruits used for flavoring rye bread and its infusion a remedy for colic and digestive disorders, and fight worms (Attokaran, 2017).

Caraway fruits have stimulant, expectorant and antispasmodic effects and used for stomachaches, constipation, and nausea. It increases gastric juice secretion and promotes bile discharge, which increases appetite and has digestive stimulatory effects (Peter, 2006). Caraway recommended by Persian traditional scholars to decrease flatulence. It acts by improving digestive systems and deleting accumulated gas from the gastrointestinal tract, humors from the stomach, which also decreases abdominal pain. For this purpose, the powder containing ajwain (Trachyspermum ammi), anise (Pimpinella anisum), cumin (Cuminum cyminum) and caraway with little rock candy is used daily as three teaspoons (Larijani et al, 2016). (Benaco et al, 2014) used hydro distillation with the assistance of the microwave method to separate the contents of caraway fruit essential oil. They cleared that limonene (48.1%), carvone (32.9%), and myrcene (7.9%) were the principal components of, while limonene (41.7%), carvone (55.8%), and myrcene were present in accelerated steam distillation assisted by microwave method. Hydro-distillation by direct induction heating assisted by magnetic field (DIHMF) and by water and 6% food salt as electrolyte solutions resulted in 2.11% (w/w) essential oil, where limonene (7.4%) and carvone (85.2%) were its main components. Cumin

Mandal and Mandal (2016) mentioned that the cumin plant (C. cyminum) is indigenous to countries in Southeast Asia and the East Mediterranean area. Bettaieb et al, (2011) observed that cumin seeds could use in culinary cultures across the entire world. They added the major volatile substances found in cumin seeds are terpenoids, cymene and cumin aldehyde. Muhammad et al, (2012) showed that cumin seed oil contains many volatile compounds are myrcene, 1-8-cineole, α-pinene, ρ-mentha-1, 3-dien7-ol, β-bisabolene, β-farnesene, limonene, caryophyllene, β-phellandrene, cuminyl alcohol and some oleoresin, gum, protein compounds, mucilage, and malates . Srinivasan (2018) cleared that cumin produced in wide range in many countries also used as a treatment of diseases like diabetes chronic dyspepsia and diarrhea, acute gastritis, and various other metabolic disorders . In Dditon Jagtap et al, (2010) reported that cumin seed extraction has antihyperglycemic activity, inhibition of free radical formation and anti-inflammatory activity.

Tuncturkand Tuncturk (2006) cited that Cuminum cyminum L. is an herbal medicine in Iran that belongs to the family Apiaceae. The origin of C. cyminum is Egypt, Turkistan, and the east of the

Mediterranean area. Moreover, the herb cultivated in a wide range in many countries. Allahghdri et al, (2010) cleared that cumin fruit has additional taste and flavor to foods, and have medicinal and therapeutic properties for centuries, they added that cumin fruit used in folk medicine as a diuretic, immunologic, antispasmodic, carminative, stimulant, astringent as well as a cure against indigestion, flatulence, toothache, dyspepsia, diarrhea, colic, epilepsy, and jaundice. Moreover, Hajlaoui et al, (2010) mentioned that cumin fruits have a yellow-colored fresh volatile oil (2–5% v/w) that causes the characteristic aroma and medicinal value.

Pegamun harmala L

Mikaili et al, (2012) cited that Peganum harmala L. belongs to the family Zygophyllaceae, cultivated spontaneously in semi-arid conditions, steppe areas and sandy soils, native to the eastern Mediterranean region. Wanntorp and Louis (2011) mentioned that the plant known in a wide range spread and used as a medicinal plant in Central Asia, North Africa and the Middle East. In addition, Elansary et al, (2020) cleared that P. Harmala methanol leaf extraction exposed antioxidant activities comparable to the standard quercetin and outside.

Faskhutdinov et al, (2000) extracted two alkaloids, dipegine and dipeginol. They added that there are four new flavonoids of acacetin 7-O-rhamnoside, 7-O-[6-O-glucosyl-2-O-(3-acetylrhamnosyl) glucoside, and 7-O-(2-O-rhamnosyl-2-O-glucosylglucoside), and the glycoflavone 2-O-rhanmosyl-2-O-glucosylcytisoside isolated from the aerial parts of P. harmala . Massoud et al, (2002) also referred that harmaline, the active principle of the seeds of P. harmala. Lamchouri et al, (2002) published that the major components of P. harmala were α-pinene (60.4 %), limonene (6.4 %0 and styrene (4.2 %) and their quantities, α-pinene (72.6 %), trans-verbenole (3.9 %) and sabinene (2.6 %).

Herraiz et al, (2017) isolated by Phytochemical screening from the leaves of P. harmala showed flavonoids, alkaloids, saponins, tannins, glycosides, terpenoids and steroids and the absence of anthraquinone. Asgarpanah and Ramezanloo (2012) indicated that the major alkaloids of P. harmala were harmine, harmaline, harmalol and harmol. Fatma et al, (2016) extracted alkaloids such as 1H-cyclopenta(b)quinoline, 2.3.5.6.7.8-hexahydro-9-amino-; Vasicine (1H-Pyrrolo [2.1-b] quinazolin-9-one,3-hydroxy-2.3-dihydro) and harmine from cultivated plant of P. harmala. Farouk et al. Khan et al, (2011) cleared that alkaloids, saponins, tannins, anthraquinones, flavonoids, flavones, terpenoids, phlobatannins, chalcones and cardiac glycosides of P. harmala.

Teucrium polium L

Bahramikia and Yazdanparast (2012) cited that Teucrium polium L. belongs to family Lamiaceae is a perennial wild flowering plant, spreader in North Africa, Europe, and South-Western Asia in wide scale and considered as a significant component in several traditional medicine prescriptions. They added that T. polium used for different pathological conditions, such as inflammations, gastrointestinal disorders, rheumatism, and diabetes in Iranian folk medicine. They cleared that the aqueous extract also used in wide range for traditional medicine as stomach ulcers in some Arabian countries. Abdollahi et al, (2003) mentioned that Teucrium polium L tea used for treating many diseases such as indigestion, common cold, abdominal pain, and urogenital. Mossa et al, (2000) reffered that, the injection of T. polium aerial parts and its tender leaves used by local peoples to treat vermifuge, stomach, febrifuge, and intestinal troubles In Saudi Arabian traditional medicine.

In (2005) Ricci et al, concluded that Teucrium polium is a perennial plant. It has terpenoids, glycosides, iridoids, saponins, polyphenols, flavonoids, and furano neoclerodane diterpenoids. They added that its drink normally used to treat abdominal colic, and indigestion, in folk medicine and T. polium also has

several types of flavonoids such as salvigenin, cirsiliol according to phytochemical studies. Meanwhile, Verykokidou and Vajias (1986) illustrated that the same plant contains on luteolin, diosmetin, apigenin, rutin, cirsimaritin, and eupatorin. In addition, Capasso et al, (1983) noticed that Teucrium polium has too many steroidal compounds such as clerosterol, β-sitosterol, stigmasterol, brassicasterol, and campesterol from several parts.

References

1. Iran. Red Crescent Med. J. 2016; 18:e23664
2. Ababa University: School of Graduate Studies; 2004. Adv. 2012; 4:40–4.
3. Abdollahi, M.; Karimpour, H.; Monsef-Esfehani, H.R. Antinociceptive effects of Teucrium polium L. total extract and essential oil in mouse writhing biological activities. Plants. 2020; 9:1086.
4. Allahghdri, T.; Rasooli, I.; Owlia, P.; Nadooshan, M. J.; Ghazanfari, T.; Taghizadeh, M.; Astaneh, S. D. A. Antimicrobial Property, Antioxidant Capac Cuminum Cyminum L. Essential Oil: A High Effectiveness against Vibrio Spp. Strains. Food Chem. Toxicol. 2010, 48, 2186–2192.
5. Alshuail N., Alehaideb Z., Alghamdi S., Suliman R., Al-Eidi H., Ali R., Barhoumi T., Almutairi M., Alwhibi M., Alghanem B., et al. Achillea and Cytotoxicity of Essential Oil from Cumin Produced in Iran. J. Food Sci. 2010, 75.
6. Asgarpanah J, Ramezanloo F. Chemistry, pharmacology and medicinal properties of Peganum harmala L. Afr J Pharm Pharmacol. 2012;6(22):1573–80.
7. Attokaran M. Natural food flavors and colorants. New Jersey: Wiley; 2017. pp. 107–109.
8. Bahramikia, S.; Yazdanparast, R. Phytochemistry and medicinal properties of Teucrium polium L. (Lamiaceae). Phytother. Res. 2012, 26, 1581–1593.
9. Baruah, A.; Bordoloi, M.; Deka Baruah, H.P. Aloe Vera: A Multipurpose Industrial Crop. Ind. Crops Prod 2016, 94, 951–963.
10. Benkaci-Ali F, Mékaoui R, Scholl G, Eppe G. World Acad. Sci. Eng. Technol. 2014;8:553–557.
11. Bettaieb, S. Bourgou, J. Sriti, K. Msaada, F. Limam, B. Marzouk Essential oils and fatty acids composition of Tunisian and Indian cumin cyminum L.) Seeds: a comparative study J. Sci. Food Agric., 91 (11) (2011), pp. 2100-2107.
12. Capasso F, Cerri R, Morrica P, et al. Chemical composition and anti-inflammatory activity of an alcoholic extract of Teucrium polium L. Boll Soc Ital Biol fragrantissima (Forssk.) Sch. Bip Flower Dichloromethane Extract Exerts Anti-Proliferative and Pro-Apoptotic Properties in Human Triple-content and its composition," Journal of Agricultural and Food Chemistry, vol. 58, no. 9, pp. 5271–5275, 2010.
13. Eamlamnam K, Patumraj S, Visedopas N, Thong-Ngam D. Effects of Aloe vera and sucralfate on gastric microcirculatory changes, cytokine levels and
14. disorders in Sinai Peninsula, Egypt. J. Ethnopharmacol. 2014, 151, 317–332.
15. Elansary H.O., Szopa A., Kubica P., Ekiert H., Al-Mana F.A., El-Shafei A.A. Polyphenols of Frangula alnus and Peganum

harmala leaves and associated Ethnopharmacol. 1986; 16:117–51.
16. Faskhutdinov MF, Telezhenestskaya MV, Levkovich MG, Abdullaev ND. Alkaloids of Pganum harmala L. Chem Nat Compd. 2000;36(6).
17. Fatma B, Fatiha M, El attafia B, Noureddine D. Phytochemical and antimicrobial study of the seeds and leaves of Peganum harmala L. against urinary tract fragrantissima and Nitraria Retusa. International Journal of Pharma and Bio Sciences. 2015; 6(1):P708–P722.
18. Gach K., Długosz A., Janecka A. The role of oxidative stress in anticancer activity of sesquiterpene lactones. Naunyn-Schmiedeberg's Archives of gastric ulcer healing in rats. World J Gastroenterol. 2006; 12:2034–2039.
19. Grindlay D, Reynolds T. The Aloe vera phenomenon: A review of the properties and modern uses of the leaf parenchyma gel. J Test. Pharmacol. Res. 2003, 48, 31–35.
20. Hajlaoui, H.; Mighri, H.; Noumi, E.; Snoussi, M.; Trabelsi, N.; Ksouri, R.; Bakhrouf, A. Chemical Composition and Biological Activities of Tunisian Gastroenterol. 2014; 20:18330 - 18337.
21. Halioua B, Ziskind B, DeBevoise MB (2005). Medicine in the days of the pharaohs, Harvard University Press. infection pathogens. Asian Pac J Trop Dis. 2016;6(10):822–6.
22. Jagtap A.G., P.B. Patil Antihyperglycemic activity and inhibition of advanced glycation end product formation by Cuminum cyminum in streptozotocin Infections. Appl. Biochem. Biotechnol. 2022:1–15. doi: 10.1007/s12010-022-03950-4
23. Khan AM, Qureshi RA, Ullah F, Gilani SA, Nosheen S, Sahreen MK, Laghari MY, Shafiq-ur-Rehman, Hussain I, Murad W. Phytochemical analysis of (Cuminum cyminum) Biol. Sci. 2006, 2, 336–340.
24. Lamchouri F, Settaf A, Cherrah Y, Hamidi MN, Tligui N, Lyoussi B, Hassar M. Experimental toxicity of Peganum harmala L. seeds. Ann Pharm Fr. (Cuminum cyminum) Biol. Sci. 2006, 2, 336–340.
25. Larijani B, Esfahani MM, Moghimi M, Shams Ardakani MR, Keshavarz M, Kordafshari G, Nazem E, Hasani Ranjbar S, Mohammadi Kenari H, Zargaran Levy, UK (2016), pp. 377-382
26. Massoud M, Jalilpour H, Salehian P. Toxicity of Peganum harmala L.: Review and a Case Report. Iran J Pharmacol Ther. 2002; 1:1–4.
27. Mikaili P, Sharifi M, SHayegh J, Sarahroodi SH. Etymological review on chemical and pharmaceutical substances of the oriental origin. Int J Anim Vet Cultures (eds.) Aiden and Eve Cockburn (Cambridge University Press: Cambridge).
28. Mohamed A. A., Ali S. I., El-Baz F. K., El-Senousy W. M. New insights into antioxidant and antiviral activities of two wild medicinal plants: achillea Negative Breast Cancer (MDA-MB-231) Cells: In Vitro and In Silico Studies. Pharmaceuticals. 2022; 15:1060.
29. Mossa, J.S.; Al-Yahya, M.A.; Al-Meshal, I.A. Medicinal Plants of Saudi Arabia; King Saud University Press: Riyadh, Saudi Arabia, 2000
30. Muhammad Nadeem, A. Riaz Cumin (Cuminum cyminum) as a potential source of antioxidants Pak. J. Food Sci., 22 (2) (2012), pp. 101-107
31. Patocka J., Navratilova Z. Achillea fragrantissima: Pharmacology Review. Clin. Oncol. 2019; 4:1601.
32. Peter K. Handbook of herbs and spices. Cambridge: Woodhead Publishing; 2006. of Teucrium marum (Lamiaceae). J Ethnopharmacol. 2005; 98(1-2):195-200.
33. Ricci D, Fraternale D, Giamperi L, Bucchini A, Epifano F, Burini G, et al. Chemical composition, antimicrobial and antioxidant activity of the essential oil. Flavour Fragr. J. 2007; 22:178–183.
34. Saeidnia, S.; Gohari, A.; Mokhber-Dezfuli, N.; Kiuchi, F. A review on phytochemistry and medicinal properties of the genus Achillea. DARU J. Fac. Pharm. Tehran Univ. Med. Sci. 2011, 19, 173–186.
35. Šarić-Kundalić B., C. Dobeš, V. Klatte-Asselmeyer, and J. Saukel, "Ethnobotanical survey of traditionally used plants in human therapy of east Pharmacology. 2015; 388(5):477–486.
36. Seidler-Lozykowska K., M. Baranska, R. Baranski, and D. Krol, "Raman analysis of caraway (Carum carvi L.) Single fruits. Evaluation of essential oil Qual. Saf., 2 (1) (2018), pp. 1-16
37. Seifu T. Ethnobotanical and ethnopharmaceutical studies on medicinal plants of Chifra district, Afar region, North Eastern Ethiopia. PhD Thesis. Addis selected medicinal plants of Margalla Hills and surroundings. J Med Plants Res. 2011;5(25):6017–23.
38. Singh N., Mishra S., Mondal A., Sharma D., Jain N., Aseri G.K. Potential of Desert Medicinal Plants for Combating Resistant Biofilms in Urinary Tract Solberg SO, Göransson M, Petersen MA, Yndgaard F, Jeppson S. Biochem. Syst. Ecol. 2016; 66:351–357.
39. Srinivasan K., Cumin (Cuminum cyminum) and black cumin (Nigella sativa) seeds: traditional uses, chemical constituents, and nutraceutical effects Food. Sper 1983; 5911: 1639–1643
40. Surjushe A, Vasani R, Saple DG. Aloe vera: A short review. Indian J Dermatol. 2008; 53:163–166.
41. Tuncturk, R.; Tuncturk, M. Effects of Different Phosphorus Levels on the Yield and Quality Components of Cumin (Cuminum Cyminum L.). Res. J. Agric. north-east Bosnia and Herzegovina," Journal of Ethnopharmacology, vol. 133, no. 3, pp. 1051–1076, 2011.
42. Vasisht, K.; Kumar, V. Compendium of Medicinal and Aromatic Plants; ICS-UNIDO: Trieste, Italy, 2004; Volume 1, p. 124.
43. Verykokidou-Vitsaropoulou E, Vajias C. Methylated flavones from Teucrium polium. Planta Med 1986; 52: 401–402.
44. Volume Series. 1 edition. Cambridge University Press; 2011. Nov 14, p. 326. 2011.
45. Wanntorp L, Louis P. Swedish Museum of natural history. In: Wanntorp L, editor. Flowers on the Tree of Life. Series: Systematics Association Special traditional medicine. Journal of Ethnopharmacology. 2004; 93(1):117–121.
46. Werawatganon D, Rakananurak N, Sallapant S, et al. Aloe vera attenuated gastric injury on indomethacin-induced gastropathy in rats. World J
47. Wichtmann EM, Stahl-Biskup E. Flavour Fragr. J. 1987; 2:83–89.
48. World Health Organisation. Health of indigenous peoples. Geneva, Switzerland: Factsheets N° 326; 2007.
49. Zucconi (2007). Medicine and Religion in Ancient Egypt, Religion Compass 1 (1): 26–37.