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Review Article

Egyptian medicinal plants and prostate enlargement

Mohammed Sayed Aly Mohammed

Medicinal and Aromatic Plants Research Department, Industries of pharmaceutical and drugs production Research Institute, National Research Center, Dokki, Cairo, Egypt.

Corresponding Author: Mohammed Sayed Aly Mohammed, Medicinal and Aromatic Plants Research Department, Industries of pharmaceutical and drugs production Research Institute, National Research Center, Dokki, Cairo, Egypt.

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Abstract

Medicinal plants used as alternative medicine in world cultures, since older times by healers, who used them in the remedy of many diseases. It known that many medicinal plants play an important role alone, and others combined with chemical ones. Egyptian flora has been famous since ancient times. Medicinal plants contain chemical compounds that affect many diseases, such as essential oils, alkaloids, terpenes, and glycosides. The ancient Egyptian healers recorded the greatest knowledge about the drugs that used for many diseases, and many of them still used in medicine now. In the 19th century, compounds such as ephedrine, quinine, morphine and strychnine isolated and studied too. Prostate enlargement appears in men between 50 and 60 years, this enlargement seems tumor, and sometimes the tumor may be non-malignant. This causes weakness in getting rid of urine, and these effects on kidneys, but it will due to toxicity, which needs to wash many times. According to my experiment with a chemical drug (Tamsolin), due to dead of Sperm. Therefore, it is very important to resort to finding medicinal plants for exchange by chemical drugs, because medicinal plants are safe, and have no side effects. Some Egyptian plants, that affect prostate enlargement will be clarified through the present view article, with publishers that proved the affections of these medicinal plants on prostate enlargements, such as Capsicum annum, Curcuma longa, Egyptian Artemisia, Foeniculum vulga , Moringa oleifera, Morus alba, and Rosmarinus officinalis.

Keywords: Alternative medicine, Egyptian, Medicinal plants, Prostate disease.

1. Introduction

Medicinal plants have acquired increasing significance in development cooperation over the last few years. Their use and conservation are cross-sectoral concerns that embrace not only health care but also nature conservation, biodiversity, economic assistance, trade, and legal aspects (e.g., intellectual property). Even today, the majority of the world's population is dependent upon traditional medicine and thus also on the use of plants and plant extracts. This is particularly true of poorer sections of the population in developing countries because natural remedies are not only cheaper than modern medicines but are often the only medicines available in remote rural regions.

According to the WHO, 80% of the world's population is dependent on health care provided by medicinal plants. The use of traditional medicine and medicinal plants in most developing countries, as a normative basis for the maintenance of good health, has been widely observed . Furthermore, an increasing decline in the use of medicinal plants in industrial societies has been followed by the extraction and development of many drugs and chemotherapeutics from these plants as well as from traditionally used rural herbal remedies. Moreover, in these societies, herbal remedies have become more popular in the treatment of minor ailments because of the increasing costs of personal health maintenance. Besides using medical and cultural functions, medicinal plants in developing countries have an important economic role. However, the economic importance of medicinal plants exposed far behind the national markets in developing countries. The sustainable purchase of plant materials can therefore considerably improve trade balances in the countries of origin and save major potential in terms of development. The basis for this is the unique biodiversity that exists in developing countries, where 90% of the earth's genetic diversity found. Indeed, the market and public demand have been so great that there is a great risk that many medicinal plants today, face either extinction or loss of genetic diversity. Due to fewer communication means, poverty, ignorance and unavailability of modern health facilities, most people especially rural people are still forced to use medicinal plants for their common day ailments [1-15].

Also, according to the World Health Organization (WHO), the goal of Health for All cannot accompanied without herbal medicines. While the required for herbal medicines is

growing in developing countries including Egypt, there are indications that consumers in developed countries are becoming disillusioned with modern healthcare and are seeking alternatives in traditional medicines. There is, therefore, an increasing consumer demand for herbal medicines in developed countries. For example, in Germany, the value of prescriptions written for the anti-depressant St. John's Worth is twice that for Prozac, a top selling antidepressant. The increasing demands for herbal medicines by consumers in both developing and developed countries have renewed interest in the multinational pharmaceutical industry in bio prospecting. However, the lack of national legislation or effective international agreements on the conservation and sustainable use of biodiversity has resulted in the destructive harvesting of medicinal plants and the greatest depletion of biodiversity. Further, the lack of coordination has also due to a critical research gap, there is a sorry absence of any research community working on socioeconomic and policy aspects of medicinal plants, such as that which exists with regard to agro technology, biotechnology, etc. In fact, scientists working in natural sciences themselves conducted socio economic research in medicinal plants resulting in generally unprofessional analysis leading to oversimplification of complex issues and providing very general suggestions to tackle socioeconomic issues [16-30].

1.1. Capsicum annum

Many studies illustrated that, the anti-neoplastic activity of capsaicin in many cancer cell lines as well as in vivo. In particular, capsaicin has shown anti-tumor properties against prostate cancer, inhibiting prostate tumor cells growth in vitro and reducing prostate growth in animal models. Several convergent studies revealed that capsaicin caused cell cycle arrest and triggered apoptosis in human prostate carcinoma cells. (660reported that capsaicin is able to inhibit the growth of prostate cancer cells in mice, without producing any toxicity; tumor weight was reduced to ~50% when 5 mg/kg/d capsaicin was administered to mice 3 days per week for 4 weeks. In addition, they also reported the effect of capsaicin on the apoptosis of prostate tumor PC-3 cells. It seems that the mechanism by which capsaicin induces apoptosis in cancer cells is associated with the production of reactive oxygen species (ROS), and disruption of the mitochondrial transmembrane potential by the suppression of a NADH-oxidoreductase. An enzyme that transfers electrons from cytoplasmic NADH via coenzyme Q (ubiquinone) to external electron acceptors such as oxygen. Recent studies examined the ability of capsaicin to trigger autophagy in prostate cancer androgen-sensitive cells and the role of autophagy in capsaicin-induced cytotoxicity, they arranged that capsaicin significantly affected in prostate enlargement.

published that capsaicin is an odorless white crystal with an intense sharpness. They added that one part in 100,000 could sense by tasting and has a molecular weight of 305.4118 g/mol, a melting point of 65 °C, a boiling point at 0.01 mm Hg of 210–220 °C, a sublimate at 115 °C, a UV max at 227 and 281 nm, and is faintly soluble in carbon disulfide and hot water. Discovered that the anti-invasive activity of capsazepine, which another capsaicin analog, against human prostate cancer cells, found that capsazepine strongly inhibited human prostate cancer cell invasion. Added that capsaicin and its analogs widely used medicinally for centuries, meanwhile recently it has been extensively studied for its analgesic, antioxidant, anti-inflammatory, and anti-obesity properties, and, most recently, its anticancer activity against a variety of cancer types such as prostate cancer.

1.2. Curcuma longa

Cited that Curcumin, one of the most studied chemo preventive agents, which is a natural ingredient of turmeric compounds extracted from Curcuma longa. Moreover, he added that studies that done show that curcumin modulates numerous cell-signaling pathways implicated in the growth and survival of various cancer cell types including prostate cancer. Arranged that curcumin, the major compound from the turmeric rhizome Curcuma longa has used for medicinal purposes as an antiseptic and for wound healing. In addition, they illustrated curcumin's therapeutic effectiveness in vitro and in vivo in prostate cancer models.

Extracted curcumin the principal is ingredient of Curcuma longa was phenolic compound and it is yellow pigment from the rhizome, which used in wide scale for curries and mustards, they reported, the effects of anti-inflammatory, anti-oxidant, and anti-septic effects of curcumin. Cleared that curcumin works as elicit in wide variety, because of its capability to act as free radical scavenger. In additionally study illustrated that curcumin can change the gene translate patterns of various stress fating proteins and genes containing in angiogenesis. Found that curcumin could inhibit the activity of several important transcription factors [31-45].

Cleared that curcumin is a primary component of Curcuma longa turmeric, which has many proven health benefits, and it considered as a safe natural agent for prevention and treating many diseases. Showed that this active compound of turmeric has many genous properties such as anti-tumour activities. Suggested several evidences that curcumin has anticancer activity. suggested that this bioactive compound might have a beneficial impact on other inflammatory prostate conditions.

1.3. Egyptian Artemisia (Artemisia Judaica L.)

Cited that Artemisia Judaica L. is one of the important species of Artemisia commonly grown in the Mediterranean area, including Saudi Arabia, Egypt, Algeria, Libya, and Jordan. used Artemisia judaica L., an Egyptian medicinal plant, use in the treatment of gastrointestinal disorders, they were mass-propagated and grown using solid, paper-bridge-support liquid, liquid-flask and bioreactor cultures to clear the best one. They found that the liquid-flask culture using 50 ml MS liquid medium in 250 ml flask yielded significantly greater shoot proliferation than either solid cultures or paper-bridge-support liquid cultures. They added that increasing flask capacity from 100 to 500 ml improved, shoot proliferation and growth, mass-propagation efficiencies of various bioreactor systems, viz. temporary immersion reactors and bubble column reactors, also compared. The temporary immersion bioreactor and found to have significant advantages for A. judaica shoot proliferation.

Also added that A. judaica exhibit maximum potential therapeutic for gastrointestinal disorders, inflammatory disorders, sexual dysfunction, heart diseases, hyperglycemia, cancers, arthritis, oxidative stress, and wound healing. In addition, the chemical constituents of the genus Artemisia have greatest previous researches, which showed that this genus contain many potentially bioactive classes of compounds include flavonoids, polyphenols, tannins, sesquiterpene lactones and essential oil (EO). Extracted that EOs from the genus Artemisia cleared that essential oil has multiple biological and pharmacological effects including anticancer [46-50]

1.4. Foeniculum vulgare

Many herbs and spices used for different health issues. Foeniculum vulgareMill, popularly known as fennel, which most widely used as herb throughout the world. Fennel seeds contain essential oils, alkaloids, flavonoids, phenols, fatty acids and amino acids. Cited that Anethole, a major constituent of Foeniculum vulgare (fennel) essential oil, used in wide scale in folk medicine. He added that anethole as a possible proposed for prostate cancer therapy. Published that Foeniculum vulgare considered a member of Apiaceae family with name of fennel in traditional medicines. Studied the effect of different of fennel extracts and noticed anti-cancer effects on different type of tumors such as skin and prostate cancer. Published that many scientific researches include to supposing the anti-cancer potential of Foeniculum vulgare plant components against different kinds of cancers, and included anisaldehyde, γ-asarone, carvone, chlorogenic acid, estragole, eugenol, fenchone, γ-terpinene, D-limonene, myrcene, α-pinene, quercetin-3-O-beta-D-glucuronide, tarns-anethole, α-terpineol, and vinylguaiacol. Extracted coumarin from the dried fruits of fennel contained antioxidant effects, promoted the production of inflammatory factors and inhibited the growth of tumor cells.

1.5. Moringa oleifera

Moringa oleifera, Lam. (Moringaceae) is the most widely cultivated tree in Asian and African countries. Its various parts viz. root; stem, leaves, pods, and fruits have been traditionally. Included that the leaves of Moringa oleifera also contain a number of phytochemicals such as flavonoid (kaempferol, isoquercitrin, rhamnetin, and kaempferitrin), glycoside, glucosinolates, isothiocyanates, and showed significant anti-cancer potential in-vitro. In-vitro studies cleared that Moringa oleifera leaf extract showed strong anticancer activity in several cancer cell lines.

Moringa oleifera (MO), an indigenous tree to Egypt, in wide scale. Referred that it is among of family Moringaceae and is cultivated for medicinal and industrial purposes, they added that the anticancer property could return to specific ingredients of MOE such as 4-(α-L-rhamnopyranosyloxy) benzyl glucosinolate, 4-(α-L-rhamnopyranosyloxy) benzyl isothiocyanate, benzyl isothiocyanate and niazimicin. The leaves contain quercetin-3-O-glucoside and kaempferol-3-O-glucoside, which plays a role in antioxidant defight as its scavengers for free radicals, thus reducing oxidative stress. Published that all parts of the MO plant possess medicinal properties, but the leaves have high nutritional value (high levels of vitamins C and A, potassium, proteins, calcium and iron). In addition, proved that the leaves contain phytochemicals such as carotenoids, alkaloids and flavonoids, and rich in amino acids such as cystine, lysine, methionine and tryptophan, MO used in traditional treatmentmedicine [51-60].

Moreover, noticed that It contains a rich source of rhamnose, glucosinolates and isothiocyanates. Thiocarbamates such as niazimicin found in the leaves and could use as a chemo preventive agent. Suggested that the anticancer and chemo preventive property of MO could return to niazimicin. Showed that the extracts of Mo leaf inhibited lipid peroxidation as it scavenged free radicals and reduced oxidative stress. Illustrated that a methanolic extract of moringa leaves appeared an anti-cancerous effect on the human prostate cancer cells.

1.6. Morus alba

Concluded that the root bark of Morus albaLinn.contains many active compounds such as prenylated flavonoids, stilbenes, benzofurans, alkaloids, and other phenolic compounds. Isolated Morusin, a prenylated flavonoid from the root bark of Morus alba Linn., added that Morusin showed anti-microbial activity, scavenging activity against superoxide anion radical. Cleared that M. alba L. root bark extracts showed anticancer activity. Morus alba, belongs to the family Moraceae, used in traditional medicine, many studies discovered the anti-growth effects of type extracts of different Morus specie. Discovered that dimethyl sulfoxide extract of M. nigra, they noticed that the phenolic compounds have antioxidant activity and the probable cytotoxic effect in human prostate adenocarcinoma cells. They concluded that M. nigra might be a member for the development of new natural product in therapeutic agents against prostate cancer. Morus alba Linn belongs to the family Moraceae, and a considered traditional medicine, related to the identification and isolation of biologically active compounds, with flavonoids as the major class of phyto compounds, from this plant [61-70].

1.7. Rosmarinus officinalis

Published that rosemary (Rosmarinus officinalisL.),reback to Mediterranean countries, has the polyphenolscarnosic acid (CA), rosmarinic acid(RA), and carnosol (COH) in high concentrations. discovered that rosemary extractraction of polyphenols have antioxidant, antimicrobial, and anti-cancer properties. Bower et al, cleared that rosemary grow in different parts of the world, particularly in Mediterranean and South American countries, belongs to the Lamiaceae family. Moreover, added that it has antitumor effects. Reported that the most principal constituents pharmacologically active of R. officinalis are carnosic acid, carnosol, rosmarinic acid and essential oil [7]. They added that the greatest constituents of rosemary essential oil are camphor (5.0–21%), 1,8-cineole (15–55%), α-pinene (9.0–26%), borneol (1.5–5.0%), camphene (2.5–12%), β-pinene (2.0–9.0%) and limonene (1.5–5.0%) in other concentration according to the vegetative stage and bioclimatic conditions.

Found that carnosic acid, a natural diterpene, alone constitutes 1.5–2.5% of dried leaves of rosemary, it is the strongest

anti-oxidant agents of rosemary, carnosic acid also has effective anti-cancer properties. They added that it has significant growth rejecter and cytotoxic properties in prostate cancer cell lines. Another study by, also illustrated the anti-proliferative and cytotoxic properties of carnosic acid depends on the concentration of its prostate cancer cell lines, they added that the carnosic acid done a significant antiproliferative effect on prostate cancer cell lines. Mentioned that R. officinalis crude extraction and its synthesis compounds such as carnosic acid, carnosol, and rosmarinic acid greatest used as phytochemical supplements for cancer prevention and curing.

1.8. Urtica dioica

Urtica dioica L. (stinging nettle) is an herbaceous perennial flowering plant, belongs to the family of Urticaceae and genus Urtica. Mentioned that Nettle have wide therapeutic properties and it used for treatment of prostatic hyperplasia widely. They added that nettle improved prostatic hyper-plasia. Found that root extraction of nettle has commercially available preparations for the symptomatic treatment of lower urinary tract symptom companied with benign prostatic hyperplasia (BPH) used as a single agent. Referred that Urtica dioica contains steroids, terpenoids, phenylpropanoids, lignans, coumarins, polysaccharides, lectins and flavonols, they added that nettle contains quercetin-3-O-glucoside, kaempherol-3-O-rutinoside, and isorhamnetin-3-O-glucoside in the arial parts. Added that Urtica dioica phenolic contents have antioxidative action and confirm lipid peroxidation. Polyphenolic compounds have event effects on mutagenesis and carcinogenesis. Cited that Urtica Dioica belongs to the Urticaceae family. Found that flower of U. Dioica has highest amount of phenols and flavonoids.

Published that nettle contains kinds of active compounds such as formic acid, histamine, and acetylcholine, meanwhile cleared that nettle contains important compounds like flavonoids, tannins, phytosterols, saponins, proteins, and amino acids. Mentioned that flavonoids of nettle include flavonols, flavanones, and flavonoid glycosides. They added that extractions of water and alcoholic of aerial parts nettle arial parts include vitamins such as thiamine, riboflavin, pyridoxine, folic acid, nicotinic acid, and ascorbic acid. Isolated different compounds such as quercetin, trans-ferulic acid, beta-sitosterol, erucic acid, dotriacotane, ursolic acid, scopoletin, rutin, and p-hydroxylbenzalcohol from the whole nettle. Used GC–MS analysis of nettle essential oil, they found that composes of 43 compounds and cleared that the principal components are carvacrol (38.2%), carvone (9.0%), naphthalene (8.9%), (E)-anethol (4.7%), hexahydrofarnesyl acetone (3.0%), (E)-geranyl acetone (2.9%), (E)-β-ionone (2.8%), and phytol (2.7%).

Spotlight on many studies, explained that U. dioica plant has nemours therapeutic potential effects on many disorders such as prostatic hyperplasia. Noted that most common use of nettle root was for disorders of the prostate gland. That most identify nettle medicine in the treatment of prostate cancer and its different extracts showed anti-prostate effects. In addition, arranged that most greatestt compounds in nettle root, which have pharmacological effects, contain lignans, sterols, flavonoids, polysaccharides, lectins, and fatty acids. Added that Aqueous extraction of nettle leaves significantly prevents the activity of adenosine deaminase in prostate tissue, also hydrophilic steroid compounds of nettle root extraction stop the activity of the sodium-potassium pump of the prostate membrane, for this destroy the metabolism and cell growth of the prostate. Reported that nettle root extraction has anti-proliferative properties on prostate cells in experimental done in laboratory [71-74].

2. Conclusion

It is very clear from the former information, which cited by many investigators, that some Egyptian medicinal plants might use for prostate disease as substituted for the synthetic chemical for pharmaceutical cure. These medicinal plants used as a whole or some of their parts, such as leaves or rots. Sometimes the extracts of whole plants or their parts with a wide range of solvents to get on the effected compounds to be succeed in their benefits for destroy prostate disease, which spread in men above 55 or more ages. It illustrated from the researchers applied in this field that we could create mixture of the mentioned medicinal plants in the present article for fighting this danger disease, which called Prostate disease. In coming review article will try to clear the amount of these plants that help incurring the prostate diseases.

References

1. Aggarwal, B. B. (2008). Prostate cancer and curcumin: add spice to your life. Cancer biology & therapy, 7(9), 1436-1440.
2. Ahmadi, M. A. H. B. O. O. B. E. H., Hajihashemi, S. A. E. E. D., Chehrei, A., & Hosseini, N. A. S. S. E. R. (2014). Therapeutic effects of Urtica dioica methanolic extract on gentamicin induced nephrotoxicity in rats. Koomesh, 15(2).
3. Ahmed, H. M. (2018). Ethnomedicinal, phytochemical and pharmacological investigations of Perilla frutescens (L.) Britt. Molecules, 24(1), 102.
4. El Barnossi, A., Moussaid, F., & Housseini, A. I. (2020). Antifungal activity of Bacillussp. Gn-A11-18isolated from decomposing solid green household waste in water and soil against Candida albicans and Aspergillus Niger. In E3S Web of Conferences (Vol. 150, p. 02003). EDP Sciences.
5. Akbay, P., Basaran, A. A., Undeger, U., & Basaran, N. (2003). In vitro immunomodulatory activity of flavonoid glycosides from Urtica dioica L. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives, 17(1), 34-37.
6. Andrade, J. M., Faustino, C., Garcia, C., Ladeiras, D., Reis, C. P., & Rijo, P. (2018). Rosmarinus officinalis L.: an update review of its phytochemistry and biological activity. Future science OA, 4(4), FSO283.
7. Andrade, J. M., Faustino, C., Garcia, C., Ladeiras, D., Reis, C. P., & Rijo, P. (2018). Rosmarinus officinalis L.: an update review of its phytochemistry and biological activity. Future science OA, 4(4), FSO283.
8. Bagherniya, M., Johnston, T. P., & Sahebkar, A. (2021). Regulation of apolipoprotein B by natural products and

nutraceuticals: a comprehensive review. Current Medicinal Chemistry, 28(7), 1363-1406.
9. Bagherniya, M., Nobili, V., Blesso, C. N., & Sahebkar, A. (2018). Medicinal plants and bioactive natural compounds in the treatment of non-alcoholic fatty liver disease: A clinical review. Pharmacological Research, 130, 213-240.
10. Batanouny, K. H., Aboutabl, E., Shabana, M., & Soliman, F. (1999). Wild medicinal plants in Egypt (Vol. 154). The Palm press, Cairo.
11. Bellik, Y., Boukraâ, L., Alzahrani, H. A., Bakhotmah, B. A., Abdellah, F., Hammoudi, S. M., & Iguer-Ouada, M. (2012). Molecular mechanism underlying anti-inflammatory and anti-allergic activities of phytochemicals: an update. Molecules, 18(1), 322-353.
12. Bower, A., Marquez, S., & de Mejia, E. G. (2016). The health benefits of selected culinary herbs and spices found in the traditional Mediterranean diet. Critical reviews in food science and nutrition, 56(16), 2728-2746.
13. Pérez-Sánchez, A., Barrajón-Catalán, E., Ruiz-Torres, V., Agulló-Chazarra, L., Herranz-López, M., Valdés, A., ... & Micol, V. (2019). Rosemary (Rosmarinus officinalis) extract causes ROS-induced necrotic cell death and inhibits tumor growth in vivo. Scientific Reports, 9(1), 808.
14. Brederson, J. D., Kym, P. R., & Szallasi, A. (2013). Targeting TRP channels for pain relief. European journal of pharmacology, 716(1-3), 61-76.
15. Jordan, B. C., Mock, C. D., Thilagavathi, R., & Selvam, C. (2016). Molecular mechanisms of curcumin and its semisynthetic analogues in prostate cancer prevention and treatment. Life sciences, 152, 135-144.
16. Cajuday, L. A., & Pocsidio, G. L. (2010). Effects of Moringa oleifera Lam.(Moringaceae) on the reproduction of male mice (Mus musculus). Journal of Medicinal Plants Research, 4(12), 1115-1121.
17. Cetinus, E., Kilinc, M., Inanc, F., Kurutas, E. B., & Buzkan, N. (2005). The role of urtica dioica (urticaceae) in the prevention of oxidative stress caused by tourniquet application in rats. The Tohoku journal of experimental medicine, 205(3), 215-221.
18. Chendil, D., Ranga, R. S., Meigooni, D., Sathishkumar, S., & Ahmed, M. M. (2004). Curcumin confers radiosensitizing effect in prostate cancer cell line PC-3. Oncogene, 23(8), 1599-1607.
19. Decomposing Solid Green Household Waste in Water and Soil against Candida Albicans and Aspergillus Niger. E3S Web Conf. 2020, 150.
20. Durak, I., Biri, H., Devrim, E., Sözen, S., & Avcı, A. (2004). Aqueous extract of Urtica dioica makes significant inhibition on adenosine deaminase activity in prostate tissue from patients with prostate cancer. Cancer biology & therapy, 3(9), 855-857.
21. El-Amier, Y. A., Al Borki, A. E. N. S., & Elagami, S. A. (2019). Potential of wild plant Artemisia judaica L. as sustainable source of antioxidant and antimicrobial compounds. J. Exp. Sci, 10, 4-8.
22. Elkady, Ayman I. Anethole Inhibits the Proliferation of Human Prostate Cancer Cells via Induction of Cell Cycle Arrest and Apo. Anti-Cancer Agents in Medicinal Chemistry (Formerly Current Medicinal Chemistry - Anti-Cancer Agents), cancer cells. Saudi Pharm J. 2017 Feb; 25.
23. Ghorbanibirgani, A., Khalili, A., & Zamani, L. (2013). The efficacy of stinging nettle (Urtica dioica) in patients with benign prostatic hyperplasia: a randomized double-blind study in 100 patients. Iranian Red Crescent Medical Journal, 15(1), 9.
24. Gonzalez-Vallinas, M., Molina, S., Vicente, G., de la Cueva, A., Vargas, T., Santoyo, S., ... & de Molina, A. R. (2013). Antitumor effect of 5-fluorouracil is enhanced by rosemary extract in both drug sensitive and resistant colon cancer cells. Pharmacological research, 72, 61-68.
25. Gopalakrishnan, L., Doriya, K., & Kumar, D. S. (2016). Moringa oleifera: A review on nutritive importance and its medicinal application. Food science and human wellness, 5(2), 49-56.
26. Goyal, B. R., Agrawal, B. B., Goyal, R. K., & Mehta, A. A. (2007). Phyto-pharmacology of Moringa oleifera Lam.—an overview.
27. Gözüm, S., Tezel, A., & Koc, M. (2003). Complementary alternative treatments used by patients with cancer in eastern Turkey. Cancer nursing, 26(3), 230-236.
28. Gülçin, I., Küfrevioğlu, Ö. İ., Oktay, M., & Büyükokuroğlu, M. E. (2004). Antioxidant, antimicrobial, antiulcer and analgesic activities of nettle (Urtica dioica L.). Journal of ethnopharmacology, 90(2-3), 205-215.
29. Singh, H. (2006). Prospects and challenges for harnessing opportunities in medicinal plants sector in India. Law Env't & Dev. J., 2, 196.
30. Hergenhahn, M., Soto, U., Weninger, A., Polack, A., Hsu, C. H., Cheng, A. L., & Rösl, F. (2002). The chemopreventive compound curcumin is an efficient inhibitor of Epstein-Barr virus BZLF1 transcription in Raji DR-LUC cells. Molecular Carcinogenesis: Published in cooperation with the University of Texas MD Anderson Cancer Center, 33(3), 137-145.
31. Hirano, T., Homma, M., & Oka, K. (1994). Effects of Stinging Nettle Root Extracts and Their Steroidal Components on the Na+, K+-ATPase of the Benign Prostatic Hyperplasia1. Planta medica, 60(01), 30-33.
32. Turan, I., Demir, S., Kilinc, K., Burnaz, N. A., Yaman, S. O., Akbulut, K., ... & Deger, O. (2017). Antiproliferative and apoptotic effect of Morus nigra extract on human prostate cancer cells. Saudi Pharmaceutical Journal, 25(2), 241-248.
33. Ji, T. F., Liu, C. H., Wang, A. G., Yang, J. B., Su, Y. L., Yuan, L., & Feng, X. Z. (2007). Studies on the chemical constituents of Urtica dioica L. grown in Tibet Autonomous Region. Zhong yao cai= Zhongyaocai= Journal of Chinese Medicinal Materials, 30(6), 662-664.
34. Joshi, B. C., Mukhija, M., & Kalia, A. N. (2014). Pharmacognostical review of Urtica dioica L. International Journal of Green Pharmacy (IJGP), 8(4).
35. Kar, S., Palit, S., Ball, W. B., & Das, P. K. (2012). Carnosic acid modulates Akt/IKK/NF-κB signaling by PP2A and induces intrinsic and extrinsic pathway mediated apoptosis in human prostate carcinoma PC-3 cells. Apoptosis, 17, 735-747.
36. Kato, K., Ito, H., Kamei, K., & Iwamoto, I. (1998). Stimulation of the stress-induced expression of stress proteins by curcumin in cultured cells and in rat tissues in

vivo. Cell stress & chaperones, 3(3), 152.
37. Ke, W., Wang, H., Zhao, X., & Lu, Z. (2021). Foeniculum vulgare seed extract exerts anti-cancer effects on hepatocellular carcinoma. Food & Function, 12(4), 1482-1497.
38. Khan, F., Pandey, P., Jha, N. K., Jafri, A., & Khan, I. (2020). Antiproliferative effect of Moringa oleifera methanolic leaf extract by down-regulation of Notch signaling in DU145 prostate cancer cells. Gene Reports, 19, 100619.
39. Konrad, L., Müller, H. H., Lenz, C., Laubinger, H., Aumüller, G., & Lichius, J. J. (2000). Antiproliferative effect on human prostate cancer cells by a stinging nettle root (Urtica dioica) extract. Planta medica, 66(01), 44-47.
40. Ledda, A., Belcaro, G., Dugall, M., Luzzi, R., Scoccianti, M., Togni, S., ... & Ciammaichella, G. (2012). Meriva®, a lecithinized curcumin delivery system, in the control of benign prostatic hyperplasia: a pilot, product evaluation registry study. Panminerva Medica, 54(4), 17.
41. Lee, H. J., Lyu, D. H., Koo, U., Nam, K. W., Hong, S. S., Kim, K. O., ... & Mar, W. (2012). Protection of prenylated flavonoids from Mori Cortex Radicis (Moraceae) against nitric oxide-induced cell death in neuroblastoma SH-SY5Y cells. Archives of pharmacal research, 35, 163-170.
42. Lee, J. H., Kim, C., Baek, S. H., Ko, J. H., Lee, S. G., Yang, W. M., ... & Ahn, K. S. (2017). Capsazepine inhibits JAK/STAT3 signaling, tumor growth, and cell survival in prostate cancer. Oncotarget, 8(11), 17700.
43. Lichius, J. J., Renneberg, H., Blaschek, W., Aumüller, G., & Muth, C. (1999). The inhibiting effects of components of stinging nettle roots on experimentally induced prostatic hyperplasia in mice. Planta medica, 65(07), 666-668.
44. Mahboubi, M. (2019). Foeniculum vulgare as valuable plant in management of women's health. Journal of menopausal medicine, 25(1), 1-14.
45. Mandal, P., Misra, T. K., Singh, I. D., Das, J. K., & Bhunia, M. (2009). Free-Radical–Scavenging Activity in the Infl orescence of European Nettle/Sisnu (Urtica dioica L.). Journal of Young Pharmacists, 1(2), 129.
46. Manguro, L. O. A., & Lemmen, P. (2007). Phenolics of Moringa oleifera leaves. Natural Product Research, 21(1), 56-68.
47. Menon, V. P., & Sudheer, A. R. (2007). Antioxidant and anti-inflammatory properties of curcumin. The molecular targets and therapeutic uses of curcumin in health and disease, 105-125.
48. Mohajeri, M., Bianconi, V., Ávila-Rodriguez, M. F., Barreto, G. E., Jamialahmadi, T., Pirro, M., & Sahebkar, A. (2020). Curcumin: a phytochemical modulator of estrogens and androgens in tumors of the reproductive system. Pharmacological Research, 156, 104765.
49. Mohan, R., Sivak, J., Ashton, P., Russo, L. A., Pham, B. Q., Kasahara, N., ... & Fini, M. E. (2000). Curcuminoids inhibit the angiogenic response stimulated by fibroblast growth factor-2, including expression of matrix metalloproteinase gelatinase B. Journal of Biological Chemistry, 275(14), 10405-10412.
50. Mousavi, M., Zaiter, A., Becker, L., Modarressi, A., Baudelaire, E., & Dicko, A. (2020). Optimisation of phytochemical characteristics and antioxidative properties of Foeniculum vulgare Mill. seeds and Ocimum basilicum L. leaves superfine powders using new parting process. Phytochemical analysis, 31(2), 154-163.
51. Musfiroh, I. D. A., Mutakin, M. U. T. A. K. I. N., Angelina, T. R. E. E. S. Y. E., & Muchtaridi, M. U. C. H. T. A. R. I. D. I. (2013). Capsaicin level of various capsicum fruits. Int. J. Pharm. Pharm. Sci, 5(1), 248-51.
52. Nam, S. Y., Yi, H. K., Lee, J. C., Kim, J. C., Song, C. H., Park, J. W., ... & Hwang, P. H. (2002). Cortex mori extract induces cancer cell apoptosis through inhibition of microtubule assembly. Archives of pharmacal research, 25, 191-196.
53. Namazi, N., Esfanjani, A. T., Heshmati, J., & Bahrami, A. (2011). The effect of hydro alcoholic Nettle (Urtica dioica) extracts on insulin sensitivity and some inflammatory indicators in patients with type 2 diabetes: a randomized double-blind control trial. Pakistan journal of biological sciences: PJBS, 14(15), 775-779.
54. Nieto, G., Ros, G., & Castillo, J. (2018). Antioxidant and antimicrobial properties of rosemary (Rosmarinus officinalis, L.): A review. Medicines, 5(3), 98.
55. Olennikov, D. N., Zilfikarov, I. N., & Khodakova, S. E. (2013). Phenolic compounds from Serenoa repens fruit. Chemistry of Natural Compounds, 49, 526-529.
56. Otles, S., & Yalcin, B. (2012). Phenolic compounds analysis of root, stalk, and leaves of nettle. The Scientific World Journal, 2012.
57. MaherAbou-Hashem, Dina MohamedAbo-elmatty , Noha MostafaMesbah ,Ahmed MohamedAbd EL-Mawgoud,. Induction of sub-Garrest and apoptosis by seed extract of Moringa peregrina (Forssk.) Fiori in cervical Res 66:3222–3229.
58. Paul, Arpita; Rajiung, Monami; Zaman, Kamaruz; Chaudhary, Sushil K.; Bhat, Hans R.; Shakya, Anshul An Overview of Phytochemical and Pharmacological Profile 0f Morus alba Linn. Current Bioactive Compounds, Volume 17, Number 8,
59. Purwal, L., Pathak, A. K., & Jain, U. K. (2010). In vivo anticancer activity of the leaves and fruits of Moringa oleifera on mouse melanoma. Pharmacologyonline, 1, 655-665.
60. Raimova, K. V., Abdulladjanova, N. G., Tashpulatov, F. N., Juraev, S. S., Matchanov, A. D., Rakhimov, R. N., ... & Kadirova, S. O. (2020). Comprehensive study of the chemical composition of Urtica dioica L. Journal of Critical Reviews, 7(5), 750-755.
61. Ramos-Torres, Á., Bort, A., Morell, C., Rodríguez-Henche, N., & Díaz-Laviada, I. (2016). The pepper's natural ingredient capsaicin induces autophagy blockage in prostate cancer cells. Oncotarget, 7(2), 1569.
62. Rodriguez-Fragoso, L., Reyes-Esparza, J., Burchiel, S. W., Herrera-Ruiz, D., & Torres, E. (2008). Risks and benefits of commonly used herbal medicines in Mexico. Toxicology and applied pharmacology, 227(1), 125-135.
63. Safarinejad, M. R. (2005). Urtica dioica for treatment of benign prostatic hyperplasia: a prospective, randomized, double-blind, placebo-controlled, crossover study. Journal of herbal pharmacotherapy, 5(4), 1-11.
64. Sanchez, A. M., Sanchez, M. G., Malagarie-Cazenave, S., Olea, N., & Diaz-Laviada, I. (2006). Induction of apoptosis in prostate tumor PC-3 cells and inhibition of xenograft prostate tumor growth by the vanilloid capsaicin. Apop-

tosis, 11, 89-99.
65. Siddhuraju, P., & Becker, K. (2003). Antioxidant properties of various solvent extracts of total phenolic constituents from three different agroclimatic origins of drumstick tree (Moringa oleifera Lam.) leaves. Journal of agricultural and food chemistry, 51(8), 2144-2155.
66. Sreelatha, S., & Padma, P. R. (2011). Modulatory effects of Moringa oleifera extracts against hydrogen peroxide-induced cytotoxicity and oxidative damage. Human & experimental toxicology, 30(9), 1359-1368.
67. Sreelatha, S., Jeyachitra, A., & Padma, P. R. (2011). Antiproliferation and induction of apoptosis by Moringa oleifera leaf extract on human cancer cells. Food and Chemical Toxicology, 49(6), 1270-1275.
68. Liu, C. Z., Murch, S. J., El-Demerdash, M., & Saxena, P. K. (2004). Artemisia judaica L.: micropropagation and antioxidant activity. Journal of Biotechnology, 110(1), 63-71.
69. UNESCO, 1996.Culture and health, orientation texts-world decade for cultural development 1998-1997. Document CLT/DEC/PRO-1996, Paris, France, pp: 129.
70. UNESCO, F. (1998). Terminal report: Promotion of ethnobotany and the sustainable use of plant resources in Africa.
71. Zari, A. T., Zari, T. A., & Hakeem, K. R. (2021). Anticancer properties of eugenol: A review. Molecules, 26(23), 7407.
72. Zong, Y. Y., Ip, S. P., Dong, T. X., & Che, C. T. (2007). Determination of morusin in cortex mori. Zhongguo Zhong yao za zhi= Zhongguo Zhongyao Zazhi= China Journal of Chinese Materia Medica, 32(11), 1038-1040.
73. Yesil-Celiktas, O., Sevimli, C., Bedir, E., & Vardar-Sukan, F. (2010). Inhibitory effects of rosemary extracts, carnosic acid and rosmarinic acid on the growth of various human cancer cell lines. Plant foods for human nutrition, 65, 158-163.
74. Woo, M. S., Jung, S. H., Kim, S. Y., Hyun, J. W., Ko, K. H., Kim, W. K., & Kim, H. S. (2005). Curcumin suppresses phorbol ester-induced matrix metalloproteinase-9 expression by inhibiting the PKC to MAPK signaling pathways in human astroglioma cells. Biochemical and biophysical research communications, 335(4), 1017-1025.