Pharmacological Significance of Plants and Herbs Used in Islamic Medicine

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Abstract

This paper enlists some selected plants and herbs whose curative effects have already been proved by the modern researches and/or their active principles have been isolated. This shows correlation between empirical application and scientific use of medicinal plants for the treatment of certain diseases. In the end, some recent pharmacological screenings of medicinal plants carried out in our laboratories have been briefly described. (J.P.M.A. 35 28, 1985).

Introduction

Man's health and well-being has been a subject of his primary concern from time irnmemorial. Centuries of observations, trials and error and the innate sense of curiosity has equipped mankind with a great deal of knowledge and wisdom that it has today in the field of modern medicine. The knowledge of drugs goes back to prehistoric times as man has always continued to find remedies to his maladies through the materials available in his environment. Sometimes, this purpose was achieved through eating a particular animals flesh or through a ritual but mostly it was through the use of plants and herbs growing in his environment. Continued observations on trial and error basis particularly regarding the use of herbs and plants for the treatment of ailments finally enabled man to establish various systems of medicine. They have probably the longest history of serving humanity. The system so called Islamic medicine includes infact all developments which have been made in different countries of the world by different nations and the new edifice that was, thereafter, erected by the Muslim scholars and physicians on the foundations unearthed by them. The ancient Greek medicine was taken over by the Romans and then by the Muslims from whom, after its enrichment with Chinese and Indian medicines, it was taken over by the modern medicine. Thus medicinal plants have been serving through the ages as a constant source of medicaments for the treatment of diseases and indeed major contributions on the medicinal properties of plants were made by Arab physicians. Several such herbs and plants when later on subjected to clinical trials of pharmacological screening were found to be useful in curing diseases for which they have been empirically used since centuries.

During the past century, extensive researches have been conducted in the field of synthetic chemistry and medicine. These researches have produced remarkable results and have led to the dominance of synthetic drugs over the vegetable medicines particularly in the west. However, despite these great strides of synthetic chemistry, the use of plants and herbs has partially continued in many countries of the world. Even in U.S.A., for instance, out of the 1.53 billion prescriptions dispensed during 1973, about 25% contained one or more active ingredients obtained from higher plants with cost involvement of about 3 billion dollars[1]. The bulk of the rural population in Asia and Africa continues to rely mainly on drugs of plant origin for medical relief. The availability of synthetic drugs has, however, in general served to delay research on many potent drugs of plant origin. Nevertheless, many of the medicinal plants and herbs which have been subjected to scientific research have yielded really potent compounds. Indeed, several such compounds have been or are being commonly used in the cosmopolitan medicine.

Modern Drugs of Plant Origin

In an attempt to set out the perspective for drugs of vegetable origin, the names of some of plants and

their active principles included in the cosmopolitan therapeutic armaments are attached herewith. These examples clearly prove the curative effects of herbs and plants and it has been estimated that at best 30% of the total world plants have yet been tapped and a vast majority of them with limitless possibilities are still left uninvestigated[2-5]. Fortunately the interest in medicinal plants has been on the increase all over the world in the recent years. This is perhaps due to the reason that modern medicine has not been able to solve all health problems and is becoming out of reach of a common man.

Some Recent Pharmacological Screening of Medicinal Plants

Research on medicinal plants used in the medicine has been the topic of research department. Some of the researches are summarized below:

ORAL ANTIBACTERIAL/ANTIINFLAMATORY DRUGS

1) Acacia Arabica (Kikar) Anthraquinones, tannins
2) Adina microcepal Mitraphylline
3) Aegle marmelos Volatile oil, tannins
4) Azadirachta indica Margosine, Neem oil (Neem)
5) Diospyros barteri Scopolin,Naphthaquinones, fluorides
6) Gaultheria Procumbens Methylcellulose
7) Jatropha curcas Curcin, tannins
8) Pongainia glabra Pongamic oil (Sukhchain)
9) Rwnex erispus Rwnicin, lapathin, (Hummaz emmodm, tannin
10) Salyadora persica Salvadorine., trimethylamine, Chlorides
11) Sassafres àllidrum Safrole, essential oil

DRUGS FOR PARASifIC INFECTIONS

1) Artemesia martima Santonin (Afsanteen)
2) Aieca catechu (Sapari) Arecholme
3) Matricaria chamomile Chamomile oil (Gul-i-babunah) or flowers
4) Chenopodium ambro Oil of wormwood siodes var. anthelminticum

ANTICOAGULANT DRUGS

1) Melilotus officinalis Coumarin compounds
2) Dipteryx (Coumarounda) As aboveodorata
3) Anthoxanthum doodoratum (Sweet vernal grass)

DRUGS FOR HEART DISEASES

1) Nerium oleander Oleadrin (Kaner)
2) Strophanthus gratus Ouabin (Strophanthine) (Strophanthus)
3) Thevetia neriifolia Thevetin and Thevetoxin (Pila-Kaner)
4) Uroinea indica Scillarin A & B (Jungli-Piyaz)
5) Digitalis lanata and other Digitoxin, digoxine, species (Foxglove) gitoxin and lanatoside-C
6) Cinchona Officrnale Quinidine, the dextroi(Cinchona) somer of quinine
7) Ammi visnaga (Kheila) Kheilin (Coronary vasodilator)

DRUGS FOR MYASTHENIA GRAVIS

1) Galanthus waronowii Galanthamine
2) Leucojum aestivum Galanthamine
3) Ungernia victoris Galanthamine

LOCAL ANAESTHETIC DRUGS

1) Erythroxylum Coca Cocaine (Coca)

DRUGS FOR MIGRAINE

1) Claviceps purpurea Ergotamine (Ergot)
2) Camellia sinensis (Tea) Caffeine
3) Coffea arabica (Coffee) Caffeine and other Xanthines

ANTITUSSIVE AND EXPECTORANT DRUGS

1) Cephaelus ipecacuanha lpecae (Syrup and Tincture)
2) Eucalyptus Citriodera Cineol, Terpine hydrates, (Safeda) and Pelargonium volatile oils oderatissinrnm (Worm-seed)
3) Fagus ferrugines Creosote, Cresol and (American beech) Guanicol
4) Adhatoda vasica Bromhexine (Sythetic (Berg Bansa) derivative of Vasicine.
5) Papaver somniferum Codeine (Khashkhash, Afyum)
6) Glaucum flavum Glaucine
7) Glycyrrhiza glabra Extract (Root) (Liquorice)

DRUGS FOR CONSTIPATION

1. Plantago ovate Seeds and Husk jused (lsabghol) as such)
2. Rhamnus purshiana Anthraquinone glyco (Cascar) sides
3. Cassia angustifolia Anthraquinone glyco (Sanna-Makki) sides
4) Ricinus communis Castor oil (Castor)

ANTITLJBERCULOUS DRUGS

1) Stephania cepharantha Ceplaranthine and Stephania sasaki
2) Virginia wang Berberine
3) Coptis chiengis Berberine

DRUGS FOR GASTRIC DUODENAL ULCERS

1) Glycyrrhiza glabra Glycerhetic acid (Succenyl derivative or as aluminum salt)

MUSCLE RELAXANT DRUGS

1) Chondodendron d-tubocurarjne tomentosin (Curare)
2) Erythrina species Alkaloids
Erythrina symposium (8)

DRUGS FOR SEX DISORDERS

1) Glocine max(Soybean) Sigmasterol used for sex-hormone synthesis
2) Physostigma venosum As above(Calabar beam)
3) Cereal Grains
4) Dioscorea deltoidea and Diosgenin used for pro-
D. Floribunda and others ,gesterone synthesis
5) Irigonella Diogenin for Progesterone foenumgraecum synthesis
6) Corynanthe yohimbe Yohimbine (used as (Yohmibi) aphrodisiae)
7) Solanum la ciniatum Soiasodine used for corticosteroid synthesis
8) Claviceps purpurea Ergometrine (used as Ec (Ergot) bolic)

DRUGS FOR PESTS CONTROL

1) Chrysanthenum Pyrethxins and Cinerarins cinerariaefolium
2) Derris eliptica Rotenone

DRUGS FOR RHEUMATISM AND GOUT

1) Coichicum luteum Coichicine (Suranjan)
2) Prunus avium Blau (6) Keracyamin
3) Gloriosa superba Coichicine
4) Matricaria chamomilla Chamomile oil (Chamomile)

DRUGS FOR AMOEB1C/BACILLARY DYSENTERY

1) Cephaelis ipecacuanha Emetine (Kanduri)
2) Berberis aristata Berberine and other spp.
3) Holarrhena Conessine antidysentrica

DRUGS FOR ASTHMA BRONCHODILATORS

1) Cainellia sinensis (Tea) Theophylline derivates like aminophylline
2) Ammi visnaga (Khella) Cromolyn (uxed for asthma prophylaxis) (Ephedra spp.: Eohedrine (Eohedraceae)

DEYGS FOR CANCER

1) Vinca rosea (leaves) Vincristine and Vinvlastine
2) Podophyllum emodi Demethylepi-phyl (Papri) lotoxin thenylidene
3) Colchicum autumnale Dececoline and Colchine (Suranjan-talkh)
4) Stephania hernandifolia Tetrandrine (Aaknad)
5) Heliotropium indicum indicine (Hathi-Sundi Booti)

DRUGS FOR DIABETES MELLITUS

1) Ymca rosea (Sada-Bahar) and the certain extracts (teas) of this plant are marketed as Covinca and Vinculin
2) Vinca rosea (Sada-Bahar) Vindolinine and Farnsworth and Segelm Leurosine (Alkaloids) man(4)
3) Eugenia Jambolana Jambolina (Jarmun)

CARMINATWE AND AROMATIC DRUGS

1) Mentha arvensis (Mint) Menthol
2) Cymbopogon flexuosus Lemongrass oil (Citral) (Malabar grass)
3) Elettaria cardamomum Essential oil ticture (Cardamom)
4) Matricaria chamomilla Chamomile oil (Chamomile)

DRUGS FOR EYE DISEASES

1. Atropa belladonna Atropine (Angoor-Shefa)
2. Physostigma venosum Physostigmin (Eserine) (Baqia)
3. Piocarpus jaborandi Pilocarpine
4. Hamameis virgimmane Extract (Witch Hazel)

DRUGS FOR LEUCODERMA

1. Ammi majus Xanthotoxin
2. Heracleum camdicams Xanthotoxin
3. Psoralea corylifolia Psoralene

DRUGS FOR HYPERTENSION

1. Rauwolfia serpentina Reserpine, Ajmaline (Asrol, Chota-Chand)
2. Vinca rosea (Roots) Ajamaline (Sandberg (5)
3. Veratrum album Protoveratrine A & B (Heilebore)
4. Secale cornutum (Ergot) Ergotoxine Sclerotia of Vlaviceps purpura

DRUGS FOR DIARRHOEA AND DYSENTERY

1) Papaver sommiferum Opium alkaloids (Khashkhas)
2) Pyrus malus (Raw apples) Pectin and Citrus aurantium (orange fruit rinds).
3) Pterocarpus indicus and Kino P. marsupium (Chob Hejesar)
4) Quercus alba and many Tannic Acid species
5) Datura stramoni Hyosyamine and (Dhatura) Scopolamine
6) Atropa belladonna Atrophie (Angoor-Shefa)
7) Berberis aristata and : Berberine other species

DRUGS FOR DENTAL HYGIENE

1) Salvadora persica :Sarakan Tooth Paste (Extract)
2) Azadirachta indica :Nemodent Tooth Powder (Neem) Ext.
3) Eugenia aromatic : Clove oil (Added in tooth (Laung) achremedies

DRUGS FOR CNS DEPRESSION

1) Camellia sinensis (tea) : Caffeine and other Xand Coffea arabica (Coffee)
2) Anamirta cocculus : Picrotoxin (Fish berries seed)
3) Strychnos nuxvomica :Strychnine (Kuchla)
4) Corydalis cava :Bicuculline (GABA Antagonist
5) Lobelia inflata :Lobeline (Indian Tobacco)

DRUGS FOR CNS STIMULATION

1) Valerinna wallichfl : Valepotriate

DRUGS FOR PARKINSONISM

1) Mucuna prurita: L-dopa

Effect of Harm idine on Hypothalamic Amines.

The alkaloid harmidine isolated from Peganum harmala (Harmal) significantly raised the Norepinephrine and 5-HT contents of rat hypothalamus. This was probable through inhibiting the enzyme MAO. It is conceivable that harmidine can prove to be an effective and safe Antidepressant drug to treat patients developing suicidal tendency[6].

II) Effect of Momordica charantia (Karela) on Blood Glucose Levels.

Powdered whole Momordica charantia produced a significant and consistent hypoglycaemia in normal and diabetic rabbits. Results suggests that Momordica charantia contains more than one type of hypoglycaemic agents. These include an alkaloid and probably an orally active vegetable (V) insulin or some like substance[7].

Powdered whole Momordica charantia fruit (bitter gourd) was tried on eight patients suffering from uncomplicated maturity-onset diabetes. The patients were told to take the powdered drug in milk twice daily at the rate of 50 mg/kg body weight, to continue on the carbohydrate deficient diet as before, and not to take any other medication. The results obtained show that the drug produced a consistent hypoglycaemic effect in all the patients The mean blood sugar levels after drug treatment at fasting, 1/2 hour, 1 hour, 1½ hour and 2 hours after5O g oral glucose were found to be significantly lower than those before starting administration of Karela powder. No adverse side effects were observed in any of these patients.

Blood glucose levels of the normal and ailoxan-diabetic male albino rabbits were determined after oral administration of various doses of the powdered plants of Euphorbia prostrata, Lit. (Euphorbiaceae) and Fumaria Parviflora Lam. (Fumariaceae). From the data obtained, it is concluded that the powders of B. Prostrata and F. parviflora plants produce significant hypoglycaemic effects in the normal rabbits only. The methanol extract of E. prostrata also decreases the blood glucose of normal rabbits while that of F. parviflora did not produce this effect. In the alloxan-treated rabbits these plants do not lower the blood glucose levels. Moreover, acute toxicity studies and records of behavioural patterns carried out in rabbits and rats, respectively showed no adverse effects in the dosages tested. It is conceivable that both plants contain some hypoglycaemic principles which act probably by initiating the release of insulin from the pancreatic beta cells of normal rabbits.

Blood glucose and total lipid levels of normal and alloxan treated diabeticS rabbits were determined after oral administration of various doses of the Cuminum nigrum Linn seeds and their extracts in water and methanol.

From the data obtained, it is concluded that the oral administration of 1,2,3 and 4 g/kg of C nigrum seeds produces significant hypoglycaemic effect in normal as well as in diabetic rabbits. The water and methanol extracts also decreased the blood glucose level in normal and alloxan-diabetic rabbits. However, the total blood lipids were not influenced by this substance in both normal and diabetic rabbits. Virtually, the acute toxicity studies carried out in rabbits could not reveal any adverse or side effects of this folk medicine at the dosages tested. It is suggested that the C nignim seeds contain more than one types of hypoglycaemic principles which can significantly reduce the blood glucose but not total lipid levels in normal rabbits and in those with chemically induced diabetes[8].

Alleged antidiabetic property of a folkioric prescription containing Bergenia ligulata (Pakhan bed), Asteracantha longifolia (Tal Makhana), Cinnamomum cassia (Taj) and Argyria cumeater (Samundar Sakh) has been evaluated in rabbits after its oral administration. The indigenous drug prescription exerted a significant hypoglycaemic effect in both normal and diabetic rabbits. In normal rabbits, oral administration of 1 and 2 g/kg body weight doses of the compound powder caused maximum decrease

in blood glucose level at 10 and 24 hour intervals after its administration. In addition the 2 g/kg dose also produced a fall in blood sugar at 4 hours. In the alloxan treated diabetic rabbits, the 2 g/kg dose only could produce significant decrease in blood glucose levels at 10 and 24 hours. The maximum decrease in blood glucose was observed at 24 hours at all dosage levels in normal as well as diabetic rabbits. It is conceivable that this folk medicine contains some hypoglycaemic principles which can reduce the blood glucose levels of diabetics. The treated rabbits did not show any signs of acute toxicity. which encourages the possible use of this compound medicinal plant prescription by diabetic patients[9].

III). Antibacterial Effect of Essential Oil Extracts from Indigenous Medicines.

Essential oils of Apium graveolens (Ajmud), Ferual copoda (Chir), thmminum cyminum (Safed-Zira), Foeniculum vulgare (Ba-Sonf) and Trachyspermum ammi (Desi-Ajwain) exerted considerable in vitro antibacterial activity against 3 pathogenic bacteria isolated from ear, nose,throat and urinary tract infections. Their antibacterial activity was comparable or even greater than penicillin, streptopenicillin and tetracycline. It is conceivable that these oils contain potent antibacterial agents which mayprove to be very suitable for treating various infections.

Certain indigenous medicinal plants have been claimed to exert antisalmonellic property. To preliminarily screen the alleged activity, aqueous extracts of three such plants have been examined by the S.S. agar well technique for their activity against Salmonella typhi and Salmonella typhimurium. Total aqueous extracts of the green leaves of Melia azedarach (Bakayan), green stem of Tinospora cordifolia (Gilo) and dried berries of Berberis vulgaris (Zirishk) were found to possess considerable antimicrobial activity against Salmonella typhi and Salmonella typhimurium, Melia azedarach extract was most effective against Salmonella typhi while Berberis vulgaris extract produced maximum inhibition of the Salmonella typhimurium. It is conceivable that these folkloric medicinal plants contain some antisalmonellic principles[10]

IV) Diuretic Effect of Corchorus depressus.

The aqueous extract of whole Corchorus depressus (Bauphali) plant was administered orally to the anaesthetised dogs. At 125 mg/kg dosage level, its diuretic effect was observed at 1 hour and was maximum at 2 hour time interval with a mean ncrease of 49.5% in the urine flow rate. In case of 250 mg/kg, the effect started also at I hour and was maximum 2.5 hours with mean increase of 132.6%. The diuresis produced by 500 mg/kg of the extract started at I hour time interval and was maximum at 2.5 hours with a mean increase of 143.9%. These data indicate that the drug exerts a strong diuretic effect.

V) Diuretic and Cardiotonic Effects of Tribulus terrestris.

Alcoholic extract of Tribulus terrestris increased the urine flow at 1 and 2 ml per 100 g body weight dose levels. Studies on isolated rabbit heart revealed that the water extract exerts strong cardiotonic effect[12].

Conclusion

In the light of these and other available data it may be concluded that the medicinal herbs and plants which have been serving the humanity ever since the dawn of civilization by alleviating its sufferings due to diseases possess useful phar macologically potent substances. Our forefathers have intelligently used some of the plants and their products for therapeutic purposes. This knowledge has been passed on to us through their long and rich experience of thousands of years and this wealth of information is still avAilable with the Islamic system of medicine. It is now upto us to utilize it and make further improvements in the light of scientifie advancements and modern facilities available to us. The Islamic medicine has definitely much to offer to humanity at large but also to learn much from modern medicine. It is now high time that we take an unbiased scientific look at the time honoured herbal

medicine as such and scientifically evaluate their usefulness for treating specific diseases. It is my contention that we should first test the herbal drugs in the form they have been used since centuries and should not simply test the single chemical entities isolated from the plant drugs. This approach wifi take care of the view that the total effect produced by the whole indigenous formulation might also be due to the synergistic actions of different compounds present in it. These medicaments should be pharmac-otherapeutically tested on the normal and diseased experimental animals and at the same time in human patients at several hospitals under the unbiased medical supervision. The data collected would provide conclusive answers to the efficacy or otherwise of a particular herbal drug. More detailed work on isolation of active principles may be conducted later. In addition, before introducing into medical pharmacopias, it would be also essential to establish the safety of various herbal drugs by the toxicity studies. The fact that most of these plant drugs have been used over the ages for treatment is convincing evidence that the toxicity trials on modern scientific lines are still essential. Thus in order to make more extensive use of the medicinal herbs for the treatment diseases, there is need for further research and experimentation. In this connection, the presently incurable and chronic diseases merit our early attention. These efforts would alleviate the human sufferings and save, many precious lives through cheap and effective remedies. It is just possible that some newer therapeutic agents are discovered against the diseases for which cosmopolitan medicine has either no “curative” or “ideal” drugs. It may be that lies further contributions that the Islamic medicine can make to the further advancement of world health. It is, therefore, suggested that separate, full-fledged institutes should be established on the modern lines where teams of well- qualified and competent pharmacologists, clinical pharmacologists and physicians of both Islamic and modern systems of medicines should undertake cooperative researches on the medicinal plants and herbs.

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