

Therapeutic Role of Herbs in Human Parasitic Diseases

Essay

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List of contents

Intoduction and aim of literature.....	1
Review of literature.....	7
<i>I. Helminthic infections.....</i>	<i>7</i>
A. Trematode infections.....	7
Fascioliasis.....	7
Clonorchiasis.....	19
Heterophiasis.....	23
Schistosomiasis.	28
Herbal molluscicides.	55
B. Cestode infections.....	65
Taeniasis.....	65
Diphyllobothriasis.....	72
Hymenolepiasis.....	74
Dipelediasis.....	80
C. Nematode infections.....	84
Ascariasis	84
Visceral and Ocular Larva Migrans.....	94
Enterobiasis.....	97
Hookworm infection.....	103
Trichostrongyliasis.....	108
Strongyloidiasis.....	110
Trichuriasis.....	116
Filariasis.....	120
Onchocerciasis.....	125
Dracunculiasis.....	131

<i>II. Protozoal infections.....</i>	136
Entamoebiasis.....	136
Giardiasis.....	144
Trichomoniasis.....	158
Leishmaniasis.....	167
African Trypasosomiasis.....	179
Chagas' disease.....	186
Malaria.....	194
Toxoplasmosis.....	213
Babesiosis.....	217
Cryptosporidiosis.....	221
Blastocytosis.....	223
<i>III. Arthropodal infections.....</i>	226
Mosquitoes.....	226
Flies.....	239
Fleas.....	248
Ticks.....	249
Lice.....	253
Mites.....	257
Scorpions.....	266
Other herbal insecticides.....	268
Summary and recommendations.....	270
References.....	277
Arabic summary.....	

List of abbreviations

%:	Percent
µg:	Microgram
µl :	Microliter
µm:	µm: Micrometer
ACE:	Angiotensin converting enzyme
ADI:	Average degree of infection
AIDS:	Acquired immunodeficiency syndrome
ALT:	Alanine transpeptidase
AME:	Aqueous methanolic extracts
AST:	Aspartate transpeptidase
ATP:	Adenosine triphosphate
C°:	Degree(s) Celsius
CL:	Cutaneous leishmaniasis
CNS:	Central nervous system
D:	Day
DAS:	Diallyl sulphide
DE:	Diammonium salt of embelin
DEC:	Diethyl carbamazine
Deet:	Diethyl toluamide
DEPA:	Diethylphenyl acetamide
DMP:	Dimethyl phthalate
DNA:	Deoxy ribo nucleic acid
DNase:	Deoxy ribo nuclease
DOC:	Drug Of Choice
DP:	Dorycnium pentaphyllum
DR:	Dorycnium rectum

 *List of tables*

ELISA:	Enzyme linked immunosorbent assay
FDA:	Food and drug administration
Fig.:	Figure
G:	Gram(s)
GI:	Gastrointestinal
GIT:	Gastro intestinal tract
GMEC:	Geometric mean egg count
GOT:	Glutamate oxaloacetate transaminase
GPase:	Glycogen phosphorylase
GPT:	Glutamate pyruvate transaminase
GRAS:	Generally recognized as safe
GSase:	Glycogen synthase
GSE:	Grapefruit juice extract
HH:	Houttuyniae Herba
HK:	Hexokinase
HPV:	Human papilloma virus
Hr:	Hour
IHAT:	Indirect heamagglutination test
IL:	Interleukins
IM:	Intra muscular
IT:	Time of inactivation
IV:	Intra venous
KP:	Kalanchoe pinnata
KSK:	Karanja seed kernels
L:	Larvae
LAWS:	low aromatic white spirits
LC:	Lethal concentration
LD:	Lethal dose

 *List of tables*

LDH:	Lactate dehydrogenase
LP:	Lotus pedunculatus
MAC:	Macfadyena unguis cati
MDH:	Malate dehydrogenase
ME:	Malic enzyme
Mf:	Microfilaria
MIC:	Minimal inhibitory concentration
Min:	Minutes
ml:	Milliliter
mm:	Millimeter
MT:	Mineral turpentine
MWF:	Methanol water fraction
NAG:	N-acetyl glucosamine
NDGA:	Nacetyl-D-glucosamine
Nm:	Nanometer
NO:	Nitric oxide
OCP:	Onchocerciasis Control Programme
Oz:	Ounce
PABA:	Paraamino benzoic acid
PBMCs:	Peripheral blood mononuclear cells
PEPCK:	Phosphoenol pyruvate carboxykinase
PFK:	Phosphofructokinase
PI:	Post infection
PK:	Pyruvate kinase
PMN:	Polymorphonuclear leucocytes
PO:	Per os
POA:	Pentacyclic Oxindole Alkaloids

PPM:	Part per million
PR:	Pippali rasayana
RNA:	Ribo nucleic acid
RNase:	Ribo nuclease
Spp.:	Species
TAS:	Total antioxidant status
TBARS:	Thiobarbituric acid reactive substances
TTO:	Tea tree oil
WGA:	Wheat germ agglutinin
WHO:	World Health Organization
Wk:	Week

List of figures

	Title	Page
Figure(1):	Myrrh	13
Figure(2):	Areca nuts	25
Figure(3):	Pumpkin seeds	26
Figure(4):	Treatment of experimental heterophyiasis with Areca nuts and pumpkin seeds	27
Figure(5):	<i>Artemisia annua</i>	33
Figure(6):	Light microscopic study showing the effect of myrrh on the liver of mice	46
Figure(7):	<i>Ferula assafoetida</i>	47
Figure(8a):	Effect of <i>Ferula</i> <i>assafoetida</i> on experimental murine <i>Schistosoma mansoni</i> infection (histopathology)	49
Figure(8b):	Effect of <i>Ferula</i> <i>assafoetida</i> on experimental murine <i>Schistosoma mansoni</i> infection (ultrastructure)	50

 List of tables

Figure(9):	<i>Nigella sativa</i>	51
Figure(10):	<i>Zanthoxylum spp.</i>	70
Figure(11):	Wild asparagus	71
Figure(12):	<i>Acacia auriculiformis</i>	79
Figure(13):	Papaya seeds	86
Figure(14):	<i>Chenopodium ambrosioides</i>	88
Figure(15):	<i>Fructus mume</i>	90
Figure(16):	<i>Embelia ribes.</i>	91
Figure(17):	Quassia.	94
Figure(18):	Tansy.	100
Figure(19):	Wormwood.	101
Figure(20):	Black walnut.	102
Figure(21):	<i>Thymus vulgaris.</i>	106
Figure(22):	<i>Gervao.</i>	114
Figure(23):	Elecampane.	119
Figure(24):	<i>Echinacea purpurea.</i>	123
Figure(25):	<i>Ginkgo biloba.</i>	128
Figure(26):	Erva tostao.	133
Figure(27):	<i>Uncaria tomentosa.</i>	140
Figure(28):	Wheat germ.	148
Figure(29):	<i>Berberis vulgaris.</i>	154
Figure(30):	Oregano.	157
Figure(31):	The effect of berberine on <i>T. vaginalis in vitro.</i>	164
Figure(31(1)):	<i>T. vaginalis</i> stained with methylene blue.	164
Figure(31(2)):	<i>T. vaginalis</i> stained with toluidine blue.	164
Figure(32)	<i>Melaleuca alternifolia.</i>	165
Figure(33):	Chinese licorice plant.	172

 List of tables

Figure(34):	<i>Scoparia dulcis.</i>	185
Figure(35):	<i>Kigelia pinnata.</i>	190
Figure(36):	<i>Ailanthus altissima.</i>	206
Figure(37):	<i>Kniphofia foliosa.</i>	212
Figure(38):	<i>Usnea longissimaseu.</i>	215
Figure(39):	Pine bark.	222
Figure(40):	<i>Neem tree.</i>	228
Figure(41):	Fennel.	233
Figure(42):	<i>Pelargonium citrosum.</i>	235
Figure(43):	<i>Lantana camara</i>	242
Figure(44):	<i>Eucalyptus globulus</i>	243
Figure(45):	<i>Chamaecyparis</i> <i>nootkatensis.</i>	251
Figure(46):	<i>Lippia multiflora.</i>	254
Figure(47):	<i>Ageratum conyzoides.</i>	260
Figure(48):	<i>Cnidium monnieri</i>	265

List of tables

Title	Page
Table(1) : Clinical symptoms and signs of 7 patients with fascioliasis.	15
Table(2) : Effect of treatment with myrrh on liver and renal functions in patients infected with schistosmiasis.	41
Table(3) : Side effects of myrrh in studied patients.	43
Table(4) : Effect of treatment with myrrh on electrocardiographic parameters among studied patients (n=10).	44
Table(5) : Antihelminthic activity of medicinal plants treating <i>H. nana</i> .	77
Table(6) : Plants reported as being used to treat cutaneous leishmaniasis, in Ecuador, 1993-1995.	175-176
Table(7) : Medical treatment of trypanosomiasis.	181
Table(8) : Artemisinin concentration in tea preparations of <i>Artemisia annua</i> .	199
Table(9) : Indigenous medicines used in treatment of malaria in Kenya.	204

Introduction

Parasitic diseases remain a major public health problem affecting hundreds of millions of people, particularly in tropical developing countries. The limited availability and affordability of pharmaceutical medicines mean that the majority of the world's population depends on traditional medical remedies, and it is estimated that some 20.000 species (spp.) of higher plants are used medicinally throughout the world (*Tagboto and Townson, 2001*). The traditional medicines hold a great promise as source of easily available effective antihelminthic agents to the people. Several plants or plant-derived preparations are consumed to cure helminthic infections (*Akerele, 1990*). The origin of many effective drugs is found in traditional medicine practices for their proclaimed antihelminthic efficacy (*Tangpu and Yadav, 2004*).

Led by instinct, taste, and experience, primitive men and women treated illness by using plants that were not part of their usual diet. Physical evidence of use of herbal remedies goes back some 60.000 years (*Solecki, 1975*). In a cave in northern Iraq, scientists found ordinary human bones surrounded by extraordinary quantities of plant pollen that could not have been introduced accidentally at the burial site. Someone in the small cave community had consciously gathered eight species of plants to surround the dead man. Seven of these are medicinal plants still used throughout the herbal world (*Bensky and Gamble, 1993*). All cultures have long folk medicine histories that include the use of plants. Even in ancient cultures, people methodically and scientifically collected information on herbs and developed well

defined herbal pharmacopoeias. Eighty percent (%) of the world population use herbal medicine for some aspect of primary health care. Herbal medicine is a major component in all indigenous traditional medicine and is a common element in Ayurvedic, homeopathic, naturopathic, traditional oriental, and Native American Indian medicine (*Farnsworth et al., 1985*).

Many well known drugs listed in the modern pharmacopoeia have their origins from nature, including, for example, quinine from the bark of the *Cinchona* tree for the treatment of malaria, which has been followed by the subsequent development of the synthetic derivatives chloroquine, amodiaquine, primaquine and mefloquine. More recently, the wider recognition of the antimalarial activity of artemisinin from the herb *Artemisia annua* has led current research to focus on the development of a large number of synthetic and semi synthetic compounds, which are more active than artemisinin. There is an increasing awareness of the potential of natural products, which may lead to the development of much needed new antiparasitic drugs (*Tagboto and Townson, 2001*).

The sophistication of herbal remedies used around the world varies with the technological advancement of countries that produce and use them. These remedies range from medicinal teas and crude tablets used in traditional medicine to concentrated, standardized extracts produced in modern pharmaceutical facilities and used in modern medical systems under a physician's supervision. A guiding principle should be that if the product has been traditionally used without demonstrated harm, no specific restrictive regulatory action should be undertaken unless new evidence demands a revised risk-benefit assessment. Prolonged and apparently uneventful use of a

substance usually offers testimony of its safety. For treatment of minor disorders and for nonspecific indications, some relaxation is justified in the requirements for proof of efficacy, taking into account the extent of traditional use; the same considerations may apply to prophylactic use (*WHO, 1991*).

The WHO guidelines cover two kinds of combination products: Old combination products that are already used in traditional medicine and new combination products which are well known substances that are now being used (*Schuster, 2001*).

Herbs and herbal preparations generally are self-administered. Often they are purchased through native herbalists who prescribe one or more herbs or preparations on the basis of medical and health approaches that often include concepts of attaining balance in the client's body, psychology, and spirit. Consequently, it is often difficult to assess the relative value of herbal remedies versus prescription drugs on a one to one basis. Indeed, herbal remedies of all types, including those from China, are composed of a multitude of ingredients whose interactions with the body are exceedingly complex. A high level of sophistication of research methodology is necessary to describe the interaction between the human body and substances as complex as those contained in many herbal remedies (*Bensky and Gamble, 1993*).

The increased use of plant medicines has potential for improving public health and lowering health care costs. Phytomedicines, if combined with the preventive model of medical practice, could be among the most effective, practical ways to shift the