e-ISSN: 2321-6182 p-ISSN: 2347-2332

Current Prospects of Herbal Medicines in the World

Arpita Pithava1* and Axay Pithava2

¹Department of Pharmacy, Vidyabharti trust College of Pharmacy, Gujarat, India ²Department of Biotechnology, Bangalore University, Karnataka, India

Review Article

ABSTRACT

Received: 10/12/2016 Accepted: 15/12/2016 Published: 18/12/2016

*For Correspondence

Arpita Pithava, Department of Pharmacy, Vidyabharti trust College of Pharmacy, Gujarat, India, Tel: 7093380006.

Keywords: Herbal medicine, Alternative Medicine, Kampo

E-mail:

arpita.npanchal@gmail.com

<u>Herbal medicines</u> include the natural plants and their parts which are being used as medicinal purpose. Herbal Medicine is one of the oldest types of medicine in human history. It is very popular and widely practiced all over the world. Herbal medicine practice also known as Herbalism. Herbalism is one of the forms of <u>Alternative Medicine</u>. A meticulous numbers of researchers are doing research on herbal medicines and numerous old books available about herbal medicine and their medicinal use. The countries like Egypt, China and India have the rich evident history of Herbal Medicine. The popularity of these medicines is increasing globally. The WHO (World Health Organization) estimated that approximately 75% to 80% of the population of some African and Asian countries using herbal Medicine for primary medication.

INTRODUCTION

Herbal medicines are the <u>natural plants</u> and their parts which are being used as medicinal purpose. This is one of the oldest types of medicine in human history ^{[1-9].} Herbal medicine is still widely practiced all over the world. This practice also known as Herbalism. Herbalism is one of the forms of Alternative Medicine. A number of old books available about the plants and their medicinal use called Herbals. The countries like Egypt, China and India have the rich evident history of Herbal Medicine. The WHO (World Health Organization) estimated that approximately 75% to 80% of the population of some African and Asian countries using herbal Medicine for primary medication ^{[10-16].}

Now a day people can avail wide range of literature on Herbal medicine through <u>Open Access platform</u> and increase awareness about the Herbal medicine in societies ^{[17-26].} There are plenty of Open Access Journals available on Herbal medicine, Natural products, <u>Traditional medicine</u>, Natural Plants, Medicinal Plants, Naturopathy, Alternative and Integrative medicine, etc. Open Access Journals publishes literature and articles from leading scientists from all over the world ^{[27-31].} They provide free access for articles on the up to date and current researches.

Major Herbal Medicine Societies in the World

The 16th and 17th centuries were the golden era of Herbal Medicine. The more and more plants incorporated during 18th and 19th centuries in Americas ^{[32-39].} In the 19th century, analysis of chemical came in practice. Researches and scientists began to extract and analyze active ingredients from plants. After that scientists started making synthesizing plant compounds by their own ^{[40-47].} Associations and societies formed to work towards the common goal of promoting and advancing excellence in Herbal Medicine. <u>Alternative and Traditional Medicine Research and Technology</u> and <u>Nepal Herbs and Herbal Products Association (NEHHPA)</u> are one of them. The NEHHPA is a world-wide organization of the herbal producers, manufacturers and traders. It was established in Nepal in 2002, to enlarge the viable enterprise system and has been running for the advancements of herbs and herbal sector. OMICS group publishes a journal titled Medicinal and Aromatic Plants which is associated with Nepal Herbs and Herbal Products Association Products Associated with Nepal Herbs and Herbal Products Association Plants which is associated with Nepal Herbs and Herbal Products Association Plants which is associated with Nepal Herbs and Herbal Products Association Plants which is associated with Nepal Herbs and Herbal Products Association [48-52].

Herbal Medicine: Area of Interest

There are copious numbers of eminent experts in the field of Herbalism all over the World. <u>Dr. Thomas</u> <u>Efferth</u> is the Chair of the Department of Pharmaceutical Biology in University of Mainz, Germany. He is Editor in Chief for the prestigious journal of Medicinal and Aromatic Plants^[53-59]. His major area of interest and research is

Research and Reviews: Journal of Pharmacognosy and Phytochemistry e-ISSN: 2321-6182

p-ISSN: 2347-2332

on natural products derived from medicinal plants. His latest publication on Ayurveda for Cancer Treatment published in journal of Medicinal and Aromatic Plants [60-68] Dr. Yoshinori Asakawa is Director at Tokushima Bunri University, Japan. He has published 660 original papers and 38 books of the field. His major area of interest is Isolation and structure elucidation of medicinal and aromatic plants. Gail Hughes from University of Western Cape. South Africa has recently taken a presentation on Medical pluralism in resource constrained communities: Utilizing indigenous knowledge and traditional (herbal) medicine practice for non-communicable diseases in International Conference on Restorative & Alternative Medicine held on October 24-25, 2016 in Chicago, USA [69-74]. Zhanqiu Yang, et al. from Wuhan University, China has taken presentation on Jiawei-Yupingfeng-Tang, a Chinese herbal formula, inhibits respiratory virus infection in vitro and in vivo at 2nd International Conference on Flu held on October 31 to November 02, 2016 at San Francisco, USA. Hajara Muhammed Ladan from Ahmadu Bello University, Nigeria presented work on phytochemical screening and antimicrobial activity of some marketed herbal preparations against clinical isolate of Salmonella typhi at International Conference and Summit on Industrial and Pharmaceutical Microbiology held on October 17-18, 2016 Kuala Lumpur, Malaysia. Anbu Jeba Sunilson J, et al. from KPJ Healthcare University College, Malaysia has worked on Hepatoprotective activity of isolated flavonoid from the roots of Hibiscus vitifolius and presented that valuable work in 2nd Global Summit on Herbals & Natural Remedies held on October 17-19, 2016 at Kuala Lumpur, Malaysia [75-86]. Muhammad Irfanullah Siddigui from Umm Al-Qura University, Saudi Arabia has worked on Comparison of allopathic and herbal medicine for the treatment of Entamoeba histolytica; a double blind clinical trial and presented in 4th Global Acupuncture & Therapists Annual Meeting and International Conference on Holistic Medicine and Holistic Nursing held on July 14-16, 2016 at Philadelphia, USA [87-97] PC Leung, Erik CH Ko and Gang Chen from The Chinese University of Hong Kong carried out study on the anti-inflammatory effects of an herbal formula. They have presented their study in 3rd World Congress on Pharmacology which was held on August 08-10, 2016 at Birmingham, UK ^{[98-105].}

Researches on Herbal Medicine

There are meticulous researches are going on worldwide. Study on Therapeutic Effectiveness of an <u>Herbal</u> <u>Medicinal Product of Hibiscus sabdariffa</u> in Hypertensive Patients: A 16 Week Controlled and Randomized Clinical Study carried out by Herrera-Arellano A ^{[106].} Dejene Tadasse Banjaw B has carryout a trial on Rosemary (Rosmarinus officinalis L.) variety verification at Wondogenet, South Ethiopia ^{[107].}

Maryam Farooqui, editorial board member of open access journal Alternative and Integrative Medicine has studied the Complementary and Alternative Medicines (CAM) and its Role in Thalassemia Treatment ^{[108].} Daming Zhu, Editor in Chief of the prestigious journal Natural Products Chemistry & Research published by Omics International. She has recently published an article on QS-21: A Potent Vaccine Adjuvant ^[109] Research on Impact of a Novel Plant-based Treatment Option in Improving Pulmonary Function Markers in Patients with Chronic Obstructive Pulmonary Disease and Asthma by Narinder Singh Parhar and Prevalence and Factors Associated with Parental Traditional Medicine Use for Children in Motta Town, Amhara Regional State, Ethiopia, 2014 by Tenaw Gualu Melesse may serve as an useful work [110,111]. Japanese scientist Dr. Shibata MA, Editorial board member of the journal Alternative and Integrative Medicine has written an editorial on A Novel Resveratrol Tetramer Vaticanol C from Stem Bark Acts as an Antimetastatic Action in a Mouse Mammary Cancer Model [112]. Various studies and researches carried out by eminent authors like Erica B. Oberg, Chikezie PC, Masanori Niimi, Mohammad Akram Randhawa, Danish Jahan and many more. A Systematic Review on Estimated Effects of Whole-system Naturopathic Medicine in Select Chronic Disease Conditions [113], research on Herbal Medicine: Yesterday, Today and Tomorrow, Induction of Regulatory T Cells and Prolongation of Fully Allogeneic Cardiac Grafts by Herbal Medicine, Shohangekabukuryo-to and Anti-Haemorrhagic Activity of Polyherbal Formulation in Menorrhagia: A Randomized Controlled Trial [114-116], review on Neuropsychiatric Effects of Nigella sativa (Black Seed) [117-125].

Current Status of Herbal Medicine

Herbal Medicine is also known as people's medicine as it is easily available and safe. It is widely acknowledged for its effectiveness and safety ^{[126-131].} Herbal medicines are becoming more popular because of the drawback of side-effects in allopathic medicines. In many developed countries like China, USA, Japan, South Korea and Thailand are using herbal medicine widely even though high quality and modern allopathic medicines and facilities available ^{[132-138].} Kampo is one of the herbal based medicines prescribed by 60% to 70% of allopathic doctors in Japan.

In Malaysia, traditional medicines such as Malay, Chinese, and Indian medicines are used widely. Chinese herbal medicines are used extensively in China. Use of herbal medicines has also expanded worldwide and getting popular day by day ^[139]. Various government and non-government reports state that the percentage of the population that has used Alternative and Integrative medicines is 46 per cent in Australia, 49 per cent in France and 70 per cent in Canada.

CONCLUSION

While reviewing the rich history of Herbal Medicine, it is evident that it is the most ancient and form of medicine. Scientist and researches from all over the world are actively in research of herbal medicine. Valuable work and studies has been done by the eminent scientists. The popularity of the Herbal medicine and other Alternative and Integrative medicines is increasing globally. It has many benefits against the side effects by allopathic medicines.

In near future we may expect more detailed researches, conferences and articles in the wide spectrum of Herbal medicines.

REFERENCES

- 1. Mushiwokufa W. Treating HIV Infection with Herbal Medicine: A Case Report. J Tradi Med Clin Natur. 2016;5:192.
- 2. Tsabang N, et al. Herbal Medicine and Treatment of Diabetes in Africa: Case Study in Cameroon. Diabetes Case Rep. 2016;1:112.
- 3. Toklu HZ. Pharmacovigilance of Herbal Medicine: Herbavigilance. Adv Pharmacoepidemiol Drug Saf. 2016;5:208.
- 4. Leung PC. Herbal Medicine for General and Disuse Osteoporosis. J Osteopor Phys Act. 2016;4:179.
- 5. Dubey NK, et al. Prospects of botanical pesticides in sustainable agriculture. Curr Sci. 2010;98:479-480.
- 6. Chaturvedi D, et al. ω-(2-Naphthyloxy) aminoalkanes as a novel class of anti-hyperglycemic and lipid lowering agents. Bioorg Med Chem. 2008;16:2489-2498.
- 7. Ram A, et al. Curcumin attenuates allergen induced airway hyperresponsiveness in sensitised guinea pigs. Biol Pharm Bull. 2003;26:1021-1024.
- 8. Thompson AB, et al. Preparation of bronchoalveolar lavage fluid with microscope slide smears. EurRespir J. 1996;9:603-608.
- 9. Hylkema MN, et al. The strength of the OVA-induced airway inflammation in rats is strain dependent. Clinexpimmunol. 2002;129:390-396.
- 10. Landano LM, et al. Peroxy nitrate, the coupling product of nitric oxide and super oxide, activates prostaglandin biosynthesis. Proc Nat Acad Sci. 1996;93:15069-15074.
- Nandini N. Comparative evaluation of 1% curcumin solution and 0.2% chlorhexidine irrigation as an adjunct to scaling and root planning in management of chronic periodontitis: A clinico-microbiological study. JPBMS. 2012;14:1-7.
- 12. Yin E, et al. Induction of Regulatory T Cells and Prolongation of Fully Allogeneic Cardiac Grafts by Herbal Medicine, Shohangekabukuryo-to. Altern Integr Med. 2015;4:198.
- 13. Eisenberg DM, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA. 1998;280:1569-1575.
- 14. Kubo T and Nishimura H. Antipyretic effect of Mao-to, a Japanese herbal medicine, for treatment of type A influenza infection in children. Phytomedicine. 2007;14:96-101.
- 15. Zhang Q, et al. Prolonged survival of fully mismatched cardiac allografts and generation of regulatory cells by Sairei-to, a Japanese herbal medicine. Transplantation. 2009;87:1787-1791.
- 16. De Paris F, et al. Pharmacochemical study of aqueous extracts of PassifloraalataDryander and Passifloraedulis Sims, ActaFarm. Bonaerense. 2012;21:5-8.
- 17. De Castro P F, et al. Possible Anxiolytic Effect of two extracts of Passifloraquadrangularis L. in Experimental Models. PhytotherRes. 2007;21:481-484.
- 18. Mutua ND, et al. Safety, Efficacy, Regulations and Bioethics in Herbal Medicines Research and Practice. J Clin Res Bioeth 2016;7:270.
- 19. Haller CA, Benowitz NL, Jacob P. Hemodynamic effects of ephedra-free weight-loss supplements in humans. Am J Med. 2005;118:998-1003.
- 20. Colker C, et al. Effects of Citrus aurantium extract, caffeine, and St. John's Wort on body fat loss, lipid levels, and mood states in overweight healthy adults. Current Therapeutic Research. 1999;60:145-153.
- 21. Linde K, et al. Echinacea for preventing and treating the common cold. Cochrane Database Syst 2006;CD000530.

Research and Reviews: Journal of Pharmacognosy and Phytochemistry p-ISSN: 2321-6182 p-ISSN: 2347-2332

- 22. Juma KK, et al. A Review of the Biochemical, Hematological and Histological Modulations in Acetaminophen Induced Hepatotoxicity and the Potential of Urticadioica in the Regeneration of the Liver. Journal of Drug Metabolism and Toxicology. 2015;6:1-7.
- 23. Miao Q, et al. Anti-Inflammatory Effects of Chinese Herbal Medicine on COPD: A Systematic Review. Lung Dis Treat. 2016;2:107.
- 24. Gagnier JJ, et al. Reporting randomized, controlled trials of herbal interventions: an elaborated CONSORT statement. Ann Intern Med. 2006;144:364-367.
- 25. Du C, et al. Effects of Ginkgo Bilobaextact (GBE) on the inflammatory cell and the level of interlukin-8 in induced sputum from patients with chronic obstructive pulmonary disease. The Journal of Practical Medicine. 2006;22:1246-1248.
- 26. Zhong M, et al. Effect of JiaweiJinshuiliujunjian on cytokine in patients with stable chronic obstructive pulmonary disease. Chinese Journal of Geriatric Care. 2012;10:11-12.
- 27. Xiao H, et al. Regulatory Effect of ZhenqiFuzheng Granule on Th1/Th2 in Lung-kidney-yin Deficiency Type of Stable COPD Patients. Chinese and foreign medical research. 2014;12:8-10.
- 28. OU J and Liu L. Chronic Obstructive Pulmonary Disease in Stable Stage Treated with JiajianBufei Decoction. Chinese Journal of Experimental Traditional Medical Formulae. 2013;19:303-306.
- 29. Guyatt G, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. J ClinEpidemiol. 2011;64: 383-394.
- 30. Yin E, et al. Induction of Regulatory T Cells and Prolongation of Fully Allogeneic Cardiac Grafts by Herbal Medicine, Shohangekabukuryo-to. Altern Integr Med. 2015;4:198.
- 31. King CL, et al. Neutrophil mediated smooth muscle cell loss precedes allograft vasculopathy. J Cardiothorac Surg. 2010;5:52.
- 32. Wood KJ and Sakaguchi S. Regulatory T cells in transplantation tolerance. Nat Rev Immunol. 2003;3:199-210.
- 33. Watanabe T, et al. The traditional herbal medicine saireito exerts its inhibitory effect on murine oxazoloneinduced colitis via the induction of Th1-polarized immune responses in the mucosal immune system of the colon. Int Arch Allergy Immunol. 2010;151:98-106.
- 34. Zhang Q, et al. Impact of sairei-to and its individual constituents on cardiac allograft survival. J Heart Lung Transplant. 2010;29:818-820.
- 35. Niimi M. The technique for heterotopic cardiac transplantation in mice: experience of 3000 operations by one surgeon. J Heart Lung Transplant. 2001;20:1123-1128.
- 36. Zhang Q, et al. Prolonged survival of fully mismatched cardiac allografts and generation of regulatory cells by Sairei-to, a Japanese herbal medicine. Transplantation. 2009;87:1787-1791.
- 37. Eisenberg DM, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA. 1998;280:1569-1575.
- 38. Jie YH, et al. Immunomodulatory effects of Panax Ginseng C.A. Meyer in the mouse. Agents Actions. 1984;15:386-391.
- 39. Zeller JM, et al. Enhancement of human monocyte and peritoneal macrophage chemiluminescence activities in women withendometriosis. Am J ReprodImmunolMicrobiol. 1987;13:78-82.
- 40. Cakmak H, et al. Immune-endocrineinteractions in endometriosis.Front Biosci (Elite Ed). 2009;1:429-443.
- 41. Lessey BA and Young SL. Integrins and other cell adhesion molecules in endometrium and endometriosis. SeminReprodEndocrinol. 1997;15:291-299.
- 42. Xu H, et al. Green tea epigallocatechin-3-gallateinhibits angiogenesis and suppresses vascular endothelial growth factorC/vascular endothelial growth factor receptor 2 expression and signalingin experimental endometriosis in vivo. FertilSteril. 2011;96:1021-1028.
- 43. Ozaki Y. Antiinflammatory effect of tetramethylpyrazine and ferulic acid.Chem PharmBull (Tokyo). 1992;40:954-956.
- 44. Sakamoto SA. Recent Advances in the Pharmacology of Kanpo (Japanese Herbal) Medicines, eds E.Hosoya and Y. Yamamura. ExcerptaMedica, Amsterdam 170-174.
- 45. Zhai Z, et al. Enhancement of innate and adaptive immune functions by multiple Echinaceaspecies. J Med Food. 2007;10:423-434.
- 46. Qu X and Ong M. Successful Treatment of Polycystic Ovarian Syndrome, Nonalcoholic Fatty Liver Disease and Infertility with Chinese Herbal Medicine: A Case Report. Endocrinol Metab Syndr. 2015;4:183.
- 47. Chikezie PC and Ojiako OA. Herbal Medicine: Yesterday, Today and Tomorrow. Altern Integr Med. 2015;4:195.

Research and Reviews: Journal of Pharmacognosy and Phytochemistry

- 48. Xie PS, et al. Value the Unique Merit of HPTLC Image Analysis and Extending its Performance by Digitalization for Herbal Medicines Quality Control. J Chromatograph Separat Techniq. 2014;5:249.
- 49. Schibli A and Reich E. Modern TLC: A Key Technique for Identification and Quality Control of Botanicals and Dietary Supplements.J Planar Chromatogr Modern TLC. 2005;18:34 -38.
- 50. Reich E. Chromatography: Thin-Layer (Planar). Historical Development, Reference Module in chemistry, molecular Science and chemical Engineering. Encyclopedia of Separation Science. 2000;834-839.
- 51. Rajani M and Kanaki NS. Phytochemical standardization of herbal drugs and polyherbal formulations. Bioactive Molecules and Medicinal Plants, Springer, India, 2008.
- 52. Peishan X and Yuzhen Y. Optimization of the TLC of Proberberine Alkaloids and Fingerprint evaluation of the Coptis Rhizome [J]. Journal of Planar Chromatography- Modern TLC. 1992;5:302-307.
- 53. Xie PS, et al. Searching the clue of the relationship between the alteration of bioactive ingredients and the herbal 'property' transformation from raw Rehmanniae radix (Sheng-Di-Huang) to steam-heating-processed Rehmanniae radix (Shu-Di-Huang) by chromatographic fingerprint analysis. Chinese Medicine. 2014;5:47-60.
- 54. Chatterjee S, et al. Hemidesmus indicus: A Rich Source of Herbal Medicine. Med Aromat Plants. 2014;3:e155.
- 55. Zhong LLD, et al. Efficacy-Driven Quality Control Platform for Chinese Herbal Medicine. Pharm Anal Acta. 2014;5:291.
- 56. Kustrin SA and Hettiarachchi CG. Quantitative High Performance Thin Layer Chromatography for the Analysis of Herbal Medicines: Problems and Advantages. Mod Chem appl. 2014;2:e118.
- 57. Suleiman AK. Attitudes and Beliefs of Consumers of Herbal Medicines in Riyadh, Saudi Arabia. J Community Med Health Educ. 2014;4:269.
- 58. Matsumiya M, et al. Japanese Herbal Medicine Hochuekkito Inhibits the Expression of Proinflammatory Biomarker, Inducible Nitric Oxide Synthase, in Hepatocytes. Medchem. 2014;2:112.
- 59. Kummalue T. Difficulties of Drug Development from Thai Herbal Medicine. Pharm Anal Acta S. 2012;15:002
- 60. Malki AM. Herbal Medicine: Is it Really Safe? J Genet Syndr Gene Ther. 2012;3:e110.
- 61. Kunjam SR, et al. Traditional Herbal Medicines for the Treatment of Snake Bite and Scorpion Sting by the Tribes of South Surguja, Chhattisgarh, India. Med Aromat Plants. 2013;2:120.
- 62. Rivera JO, et al. Use of Herbal Medicines and Implications for Conventional Drug Therapy Medical Sciences. Altern Integr Med. 2013;2:130.
- 63. Ayyanar M. Traditional Herbal Medicines for Primary Healthcare among Indigenous People in Tamil Nadu, India. J Homeop Ayurv Med. 2013;2:140.
- 64. Ziarati P. Determination of Contaminants in Some Iranian Popular Herbal Medicines. J Environment Analytic Toxicol. 2012;2:120.
- 65. Boldyreva LB. The Physical Aspect of Action of Biologically Active Substances in Ultra-Low Doses and Low-Intensity Physical Factors on Biological Objects: Spin Supercurrents. Altern Integr Med. 2013;2:110.
- 66. El Sayed SM, Mahmoud HS, Nabo MMH. Methods of Wet Cupping Therapy (Al-Hijamah): In Light of Modern Medicine and Prophetic Medicine. Altern Integr Med. 2013;2:111.
- 67. Anderson KT. Altered States of Embodiment and the Social Aesthetics of Acupuncture. Altern Integr Med. 2013;2:112.
- 68. Polukhin E. This Mysterious Botox. Altern Integr Med. 2013;2:113.
- 69. Wan Ismail WI and Mohd Radzi MNF. Evaluation on the Benefits of Date Palm (Phoenix dactylifera) to the Brain. Altern Integr Med. 2013;2:115.
- 70. Wahbeh H and Oken B. A Pilot Study of Clinical Measures to Assess Mind-Body Intervention Effects for those with and without PTSD. Altern Integr Med. 2013;2:116.
- 71. Meng S, et al. The Role of Genipin and Geniposide in Liver Diseases: A Review. Altern Integr Med. 2013;2:117.
- 72. Tellez G, et al. Probiotics for Human and Poultry Use in the Control of Gastrointestinal Disease: A Review of Real-World Experiences. Altern Integr Med. 2013;2:118.
- 73. Nourollahi S, et al. Bucher's Broom and Selenium Improve Lipedema: A Retrospective Case Study. Altern Integr Med. 2013;2:119.
- 74. Garg S, et al. Fingerprint Profile of Selected Ayurvedic Churnas/Preparations: An Overview. Altern Integr Med. 2013;2:125.
- 75. Bhatnagar B, et al. Acupuncture and Low Dose Gabapentin Effectively Treat Paclitaxel Induced Peripheral Neuropathy and Prevent Chemotherapy Dose Reduction. Altern Integr Med. 2013;2:126.

Research and Reviews: Journal of Pharmacognosy and Phytochemistry e-ISSN: 2321-6182

- 76. Xiang L, et al. Metabolomics Study of Protective Effects of Shexiang Baoxin Pill and its Bioactive Constitutes Combination in Treating the Early Period of Acute Myocardial Infarction in Rats. Altern Integr Med. 2013;2:127.
- 77. Gilca Ma. To Age or Not to Age-Modern versus Traditional Concepts. Altern Integr Med. 2013;2:128.
- 78. Ralston-Wilson J, et al. Utilization of Acupuncture Therapy among Pediatric Oncology Patients at a Tertiary Care Pediatric Hospital. Altern Integr Med. 2013;2:129.
- 79. Rivera JO, et al. Use of Herbal Medicines and Implications for Conventional Drug Therapy Medical Sciences. Altern Integr Med. 2013;2:130.
- 80. Cui Y. Open Communication between Patients and Doctors about Complementary and Alternative Medicine Use: The Key to Avoiding Harmful Herb- Drug Interactions among Cancer Patients. Altern Integr Med. 2013;2:e107.
- 81. Tachjian A, et al. Use of herbal products and potential interactions in patients with cardiovascular diseases. J Am Coll Cardiol. 2010:55:515-525.
- 82. McCune JS, et al. Potential of chemotherapy-herb interactions in adult cancer patients. Support Care Cancer. 2004:12:454-462.
- 83. Izzo AA and Ernst E. Interactions between herbal medicines and prescribed drugs: an updated systematic review, Drugs, 2009:69:1777-1798.
- 84. Davis EL, et al. Cancer patient disclosure and patient-doctor communication of complementary and alternative medicine use: a systematic review. Oncologist. 2012;17:1475-1481.
- 85. National center for complementary and alternative medicine. Statistics on complementary and alternative medicine national health interview survey, 2013.
- 86. Maiden MFJ, Lai CH, Tanner A. Characteristics of oral gram-positive species. St Louis: Mosby Year Book. 342-372.1999.
- 87. Nalina T, et al. Antimicrobial activities and HPLC profiles of the crude extracts of clove. Proceedings RMK7 IRPA Research Seminar. 2001;1:501-504.
- 88. Filoche SK, et al. Antimicrobial effects of essential oils in combination with chlorhexidine digluconate. Oral Microbiol Immunol. 2005;20:221-225.
- 89. Benson HJ. Microbiological Applications: Laboratory manual in general microbiology (8thedn), Boston: McGraw-Hill Higher Education, 2002.
- 90. Kopczyk RA, et al. Clinical and microbiological effects of a sanguinaria-containing mouthrinse and dentifrice with and without fluoride during 6 months of use. J Periodontol. 1991;62:617-622.
- 91. Fathilah AR. An in vitro study on the potential antiplaque effects of Piper betle and Psidium guajava. Faculty of Dentistry: University of Malaya, 2004.
- 92. Briner W, et al. Effect of two years' use of 0.12% chlorhexidine on plaque bacteria. Journal of Dental Research. 1989;68:1719-1721.
- 93. Kayombo EJ. Traditional Methods of Protecting the Infant and Child Illness/Disease Among the Wazigua at Mvomero Ward, Morogoro, Region, Tanzania. Altern Integr Med. 2013;2:103.
- 94. Kayombo EJ. Evaluation of Traditional Healers Training Programme in Kilosa District. A consultant Report Submitted to Kilosa District Commissioner's office, 2000.
- 95. Langwick S. The making of therapeutic objects in southeastern Tanzania Presented at the Society for the Social Studies of Science (4S) August 2004.
- 96. Geckil E, et al. Traditional postpartum practices of women and infants and the factors influencing such practices in South Eastern Turkey. Midwifery. 2009;25:62-71.
- 97. Dwivedi C. ω-3-Polyunsaturated Fatty Acids and Colon Cancer. Altern Integr Med. 2013;2:104.
- 98. Bommareddy A, et al. Effects of components present in flaxseed on human colon adenocarcinoma Caco-2 cells: Possible mechanisms of flaxseed on colon cancer development in animals. Drug Discov Ther. 2010;4:184-189.
- 99. Bhatia E, et al. Chemopreventive effects of dietary canola oil on colon cancer development. Nutr Cancer. 2011:63:242-247.
- Spera R, et al. Correlation of Changes of Cho-K1 Cells Metabolism to Changes in Protein Expression in 100. Camp Differentiation. Altern Integr Med. 2013;2:105.
- Mardor Y, et al. Noninvasive real-time monitoring of intracellular cancer cell metabolism and response to 101. lonidamine treatment using diffusion weighted proton magnetic resonance spectroscopy. Cancer Res. 2000;60:5179-5186.

Research and Reviews: Journal of Pharmacognosy and Phytochemistry p-ISSN: 2321-6182 p-ISSN: 2347-2332

- 102. Santini MT, et al. The relationship between 1H-NMR mobile lipid intensity and cholesterol in two human tumor multidrug resistant cell lines (MCF-7 and LoVo). Biochim Biophys Acta. 2001;1531:111-131.
- 103. Strathmann M and Simon MI. G protein diversity: a distinct class of alpha subunits is present in vertebrates and invertebrates. Proc Natl Acad Sci USA. 1990;87:9113-9117.
- 104. Xue YL, et al. Thyrotropin Suppressive Therapy in Differentiated Thyroid Cancer. Altern Integr Med. 2013;1:e106.
- 105. Biondi B and Cooper DS (2008) The clinical significance of subclinical thyroid dysfunction. Endocr Rev 29: 76-131.
- 106. Herrera-Arellano A, et al. Therapeutic Effectiveness of an Herbal Medicinal Product of Hibiscus sabdariffa in Hypertensive Patients: A 16 Week Controlled and Randomized Clinical Study. Med Aromat Plants (Los Angel). 2016;5:265.
- 107. Banjaw DTB, et al. Rosemary (Rosmarinus officinalis L.) Variety Verification Trial at Wondogenet, South Ethiopia. Med Aromat Plants (Los Angel). 2016;5:267.
- 108. Ismahanisa W, et al. (2013) Complementary and Alternative Medicines (CAM) and its Role in Thalassemia Treatment. Altern Integr Med. 2013;3:e111.
- 109. Zhu D and Tuo W. QS-21: A Potent Vaccine Adjuvant. Nat Prod Chem Res. 2015;3:e113.
- 110. Shah SA, et al. Impact of a Novel Plant-based Treatment Option in Improving Pulmonary Function Markers in Patients with Chronic Obstructive Pulmonary Disease and Asthma. Altern Integr Med. 2016;5:215.
- 111. Melesse TG, et al. Prevalence and Factors Associated with Parental Traditional Medicine Use for Children in Motta Town, Amhara Regional State, Ethiopia, 2014. Altern Integr Med. 2015;4:179.
- 112. Shibata MA, et al. A Novel Resveratrol Tetramer Vaticanol C from Stem Bark Acts as an Anti-metastatic Action in a Mouse Mammary Cancer Model . Altern Integr Med. 2015;4:e118.
- 113. Oberg EB, et al. Estimated Effects of Whole-system Naturopathic Medicine in Select Chronic Disease Conditions: A Systematic Review. Altern Integr Med. 2015;4:192.
- 114. Chikezie PC and Ojiako OA. Herbal Medicine: Yesterday, Today and Tomorrow. Altern Integr Med. 2015;4:195.
- 115. Yin E, et al. Induction of Regulatory T Cells and Prolongation of Fully Allogeneic Cardiac Grafts by Herbal Medicine, Shohangekabukuryo-to. Altern Integr Med. 2015;4:198.
- 116. Jahan D, et al. Anti-Haemorrhagic Activity of Polyherbal Formulation in Menorrhagia: A Randomized Controlled Trial. Altern Integr Med. 2016;5:219.
- 117. Randhawa AM and Alenazi AS. Neuropsychiatric Effects of Nigella sativa (Black Seed) A Review. Altern Integr Med. 2016;5:209.
- 118. Biondi B and Cooper DS. Benefits of thyrotropin suppression versus the risks of adverse effects in differentiated thyroid cancer. Thyroid. 2010;20:135-146.
- 119. Pisseri F, et al. Sustainable Animal Production, Systemic Prevention Strategies in Parasitic Diseases of Ruminants. Altern Integr Med. 2013;2:106.
- 120. Ahmed FA, et al. Natural Products to Control Postharvest Gray Mold of Tomato Fruit- Possible Mechanisms. J Plant Pathol Microbiol. 2016;7:367.
- 121. Yukihiro S, et al. Quality Control of Natural Products by Fingerprinting of Eastern Blotting. Pharm Anal Acta. 2016;7:494.
- 122. Dutra LA, et al. The Paradigma of the Interference in Assays for Natural Products. Biochem Pharmacol (Los Angel). 2016;5:e183.
- 123. Afroz R, et al. Honey-derived Flavonoids: Natural Products for the Prevention of Atherosclerosis and Cardiovascular Diseases. Clin Exp Pharmacol. 2016;6:208.
- 124. Patil J. Utilization of Novel Technologies in Natural Product Research: Radical Progress. J Pharmacovigil. 2016;4:e152.
- 125. Mitra S, et al. Screening of Novel Natural Product Derived Compounds for Drug Discovery in Inflammation. J Plant Biochem Physiol. 2016;3:159.
- 126. Gupta P. Natural Products as Inhibitors of Matrix Metalloproteinases. Nat Prod Chem Res. 2016;4:e114.
- 127. Bhargava K. Natural Product Drug Discovery. J Pharmacogn Nat Prod. 2015;1:e102.
- 128. Lloret FC, et al. 6α-Acetoxy-7α-Hydroxy-Vouacapan Isolated from Pterodon pubescens Benth. Fruit's with Selective Activity against Prostate Cancer Cell Line: Artifact or Natural Product? Med Aromat Plants. 2016;5:238.

Research and Reviews: Journal of Pharmacognosy and Phytochemistry p-ISSN: 2321-6182 p-ISSN: 2347-2332

- 129. Efferth T and Shan L. Natural Products for Cancer Therapy Is Economic Success Reachable?. Med Aromat Plants. 2016;5:e174.
- 130. Kwaambwa HM. Water Purification with a Natural Product. Chem Sci J. 2013;4:074.
- 131. Orekhov AN. Anti-atherosclerotic Drugs from Natural Products. Nat Prod Chem Res. 2013;1:121.
- 132. Pawar HA. Natural Product as a Source of Lead to the Design of New Drugs. Nat Prod Chem Res. 2014;2:156.
- 133. Sana M, et al. Miracle Remedy: Inhibition of Bacterial Efflux Pumps by Natural Products. J Infect Dis Ther. 2015;3:213.
- 134. Selmar D, et al. Horizontal Natural Product Transfer: A so far Unconsidered Source of Contamination of Plant-Derived Commodities. J Environ Anal Toxicol. 2015;5:287.
- 135. Conforti F. Natural Products, Especially Fruits and Vegetables are an Excellent Source of Chemical Structures with a Wide Variety of Biological Activity, Including Inhibition of Nitric Oxide Production. Biochem Pharmacol (Los Angel). 2012;1:e113.
- 136. Gonzalez-Sabin J. Natural Products: Back to the Future in Drug Discovery. Biochem Pharmacol (Los Angel). 2012;1:e112.
- 137. Siddiqui IA, et al. Nanoencapsulation of Natural Products for Chemoprevention. J Nanomedic Nanotechnol. 2011; 2:104e.
- 138. Wright AD. Marine Natural Products: Value, Sustainability, Funding, and the Future. J Marine Sci Res Development. 2012;2:e105.
- 139. Liu Y. Renaissance of Marine Natural Product Drug Discovery and Development. J Marine Sci Res Development. 2012;2:e106.