



# *Research at a Glance*

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# **PREFACE**

## **Introduction**

The library of the Central Council for Research in Homoeopathy has been circulating "Research at a Glance". The main objective is to disseminate precise information/citation about scientific articles published in various journals/magazine other than the journals subscribed by this Council.

## **Scope**

This volume covers articles on Homeopathy, Ayurveda, Unani, Yoga.

## **Arrangement of Entries**

The articles are indexed under the name of the authors, arranged in alphabetical order. The entries have been made in the following order:

Author  
Title  
Name of Journal  
year of publication; Volume (issue no.): pagination  
Abstract

## **Acknowledgement**

We are grateful to Dr. R.K. Manchanda, Director General, CCRH for his encouragement and valuable suggestions from time to time. We sincerely acknowledge the cooperation of Mrs. Nisha Adhikari, DEO in compiling this bulletin.

**(Meenakshi Bhatia)**  
**Librarian Incharge**

## **HOMOEOPATHY**

**Homeopathy petition handed to Royal College. Vet Rec. 2018 Jan 20;182(3):66.**

**Keller D, Sundrum A. Comparative effectiveness of individualised homeopathy and antibiotics in the treatment of bovine clinical mastitis: Randomised controlled trial. Vet Rec. 2018 Jan 26. pii: vetrec-2017-104555. doi: 10.1136/vr.104555.**

### **Abstract:**

Based on the widespread use of homeopathy in dairy farm practice when treating mastitis, a blind randomised controlled trial (RCT) was conducted to assess the effectiveness of homeopathic treatment of clinical mastitis on four dairy farms. The study considered specific guidelines for RCTs as well as the basic principles of individualised homeopathy and involved 180 lactating dairy cows. Evaluation of cure rates was based on clinical investigation of the udder and on laboratory analysis of milk samples. In culture-positive cases, the antibiotic treatment provided suboptimal bacteriological cures (60-81 per cent) but was more effective than individualised homeopathy (33-43 per cent) whose effects appeared little different to those of placebos (45-47 per cent) ( $P \leq 0.05$ ). On the cytological cure level, all three treatment methods were similarly ineffective: antibiotic being 2-21 per cent, individualised homeopathy 0-8 per cent and placebo 3-13 per cent ( $P \leq 0.05$ ;  $P = 0.13$ ). Antibiotics, individualised homeopathy and placebo had similar effects on bacteriological and cytological cure in cases of culture-negative milk samples ( $P > 0.4$ ) and *Escherichia coli* infections ( $P = 1.0$ ). The study results implied that the effectiveness of individualised homeopathy does not go beyond a placebo effect and successful treatment is highly dependent on the specific mastitis pathogen. Thus, antimicrobial or alternative remedies used should be based on the bacterial culture of the milk sample.

**Wiesener S, Salamonsen A, Fonnebo V. Which risk understandings can be derived from the current disharmonized regulation of complementary and alternative medicine in Europe? BMC Complement Altern Med. 2018 Jan 10;18(1):11.**

### **Abstract:**

**Background:** Many European citizens are seeking complementary and alternative medicine (CAM). These treatments are regulated very differently in the EU/EFTA countries. This may demonstrate differences in how risk associated with the use of CAM is perceived. Since most CAM treatments are practiced fairly similarly across Europe, differing risk understandings may influence patient safety for European CAM users. The overall aim of this article is thus to contribute to an overview and awareness of possible differing risk

understandings in the field of CAM at a policymaking/structural level in Europe.

**Methods:** The study is a re-analysis of data collected in the CAMbrella EU FP7 document and interview study on the regulation of CAM in 39 European countries. The 12 CAM modalities included in the CAMbrella study were ranked with regard to assumed risk potential depending on the number of countries limiting its practice to regulated professions. The 39 countries were ranked according to how many of the included CAM modalities they limit to be practiced by regulated professions.

**Results:** Twelve of 39 countries generally understand the included CAM treatments to represent "high risk", 20 countries "low risk", while the remaining 7 countries understand CAM treatments as carrying "very little or no risk". The CAM modalities seen as carrying a risk high enough to warrant professional regulation in the highest number of countries are chiropractic, acupuncture, massage, homeopathy and osteopathy. The countries understanding most of the CAM modalities in the study as potentially high-risk treatments are with two exceptions (Portugal and Belgium) all concentrated in the southeastern region of Europe.

**Conclusion:** The variation in regulation of CAM may represent a substantial lack of common risk understandings between health policymakers in Europe. We think the discrepancies in regulation are to a considerable degree also based on factors unrelated to patient risk. We argue that it is important for patient safety that policy makers across Europe address this confusing situation. This could be done by applying the WHO patient safety definitions and EU's policy to facilitate access to "safe and high-quality healthcare", and regulate CAM accordingly.

## AYURVEDA

**Ahmad S, Hassan A, Abbasi WM et al. Phytochemistry and pharmacological potential of Cassia absus - a review. J Pharm Pharmacol. 2018 Jan;70(1):27-41.**

### **Abstract:**

**Objectives:** Cassia absus is a plant of the family fabaceae with Ayurvedic ethnomedical records. It is used in traditional medicine for the treatment of bronchitis, asthma, cough, conjunctivitis, leucoderma, renal and hepatic diseases, constipation, tumors, venereal ulcer, headache, hemorrhoids and wound healing. Preliminary in vitro and in vivo studies have provided valuable scientific evidence for its use. This review aims to summarize reported pharmacognosy, traditional uses, phytochemistry and pharmacological potential of C. absus while identifying potential areas of further research of plant.

**Key findings:** The review comprises literature pertaining to the evidence base therapeutic potential, pharmacognosy and phytochemistry of C. absus spanning from 1935 to 2016 using published articles in peer-reviewed journals, ethno botanical text books, and worldwide accepted scientific databases via electronic search (Elsevier, Google Scholar, PubMed, Scopus, Springer, Web of Science, Wiley online library). Kew Botanical Garden databases and the Plant List were used to authenticate the scientific names. Different pharmacological experiments in many in-vitro and in-vivo models have proved the potential of C. absus with antihypertensive, antifertility, antifungal, anti-inflammatory, anti-hyperglycemic, anti-glycation, antibacterial activity,  $\alpha$ - amylase inhibitory activity, antioxidant and reducing activity etc. chaksine, iso-chaksine, saturated and unsaturated fatty acids, chrysophanol, aloe-emodin and a wide range of chemical compounds have also been reported. Toxicity studies reveal the nontoxic nature of C. absus at a dose of 2000 mg/kg, however, plant possess reproductive toxicity and can be used as birth control or abortifacient.

**Summary:** Reported activities suggest that there is sufficient pharmacological potential for developing C. absus as a drug for hypertension, infections, diabetes and its complications. However, heterogeneity in study protocol and conflicting results mask the ability to replicate these studies. So, future studies should be replicated in line with best practices. More toxicological studies would aid the progress to clinical trial studies. Various ethno medical uses of C. absus have not been evaluated yet.

**Arya R. Ancient Indian concepts about phenomenology, biology, and therapeutics of epilepsy. J Hist Neurosci. 2018 Jan-Mar;27(1):56-71.**

**Abstract:**

This article discusses etiology, pathogenesis, symptoms, and treatment of epilepsy, as described in Charaka Samhitā (translation: Charaka's Compendium) and Sushruta Samhitā, the two core texts of Ayurveda, an ancient system of medicine. Ayurveda emphasized amnesia and loss of consciousness as core features of epileptic seizures (Sanskrit: apasmar; translation: apa negation, smaran memory) and recognized that seizures occur due to a disturbance in brain function or flow of "humors" to the brain. Semiology of various seizure types was well described. Epilepsy was attributed to both internal and multiple exogenous factors. Treatment of epilepsy with formulations of naturally occurring substances, their compounding and use, is described in remarkable detail. Lifestyle modifications to protect people with epilepsy are also documented. Cognitive comorbidities of epilepsy were recognized. Although none of the Ayurveda formulations have any empirical evidence supporting their safety or efficacy in the treatment of epilepsy, studies are needed to generate relevant evidence, to recognize their hazards, and to integrate traditional and complementary systems of medicine with modern health care in an informed and safe manner.

**Biswas S, Balodia N, Bellare J. Comparative neurotoxicity study of mercury-based inorganic compounds including Ayurvedic medicines Rasasindura and Kajjali in zebrafish model. Neurotoxicol Teratol. 2018 Jan 20. pii: S0892-0362(17)30239-8.**

**Abstract:**

Zebrafish behavioral model is a powerful tool for neuroscience research. Behavioral changes in the zebrafish are studied by administering drugs. With the aid of automated and open-source MATLAB program, high-accuracy tracking of zebrafish can be achieved, and the important behavioral parameters can be calculated. Although mercury is accepted as a potent neurotoxin, used as a key element for preparing certain Ayurvedic medicines. In this work, mercury-based inorganic compounds, including  $\text{HgCl}_2$ ,  $\text{HgS}$ , and Ayurvedic medicines (Rasasindura and Kajjali) were administered in zebrafish, and the effects on various behavioral parameters and cortisol levels were studied. A significant change in the basic locomotor parameters of fish was observed including speed (43% reduction), meander (150% increment), and a number of freeze points (125% increment), during 5-day treatment of  $\text{HgCl}_2$  along with a 3-fold increase in cortisol level against the control groups. Abnormal behavior was also recorded in color preference test, and novel tank

diving behavior of HgCl<sub>2</sub>-treated groups, which can be attributed to the neurotoxicity induced by the HgCl<sub>2</sub> administration. Contrary to this, the Rasasindura-treated group showed a significant increase in speed by 33%, decrease in meander by 20%, decrease in freeze points by 30%, and insignificant alteration in cortisol levels, which can be related to the rejuvenating nature of the Ayurvedic medicine Rasasindura. Additionally, Kajjali treated group did not show any substantial changes in zebrafish cortisol level and behavioral parameters except one in the diving test that indicates lowering stress. Similarly, HgS group showed normal behaviors except two irregular motor behaviors identical with the HgCl<sub>2</sub> group. From these results, it can be concluded that the mercury-based Ayurvedic Rasasindura and Kajjali did not show any adverse effect or toxicity on zebrafish behavior model.

**Bopage NS, Kamal Bandara Gunaherath GM et al. Dual function of active constituents from bark of *Ficus racemosa* L in wound healing. BMC Complement Altern Med. 2018 Jan 25;18(1):29.**

**Abstract:**

**Background:** Different parts including the latex of *Ficus racemosa* L. has been used as a medicine for wound healing in the Ayurveda and in the indigenous system of medicine in Sri Lanka. This plant has been evaluated for its wound healing potential using animal models. The aim of this study was to obtain an insight into the wound healing process and identify the potential wound healing active substance/s present in *F. racemosa* L. bark using scratch wound assay (SWA) as the in-vitro assay method.

**Method:** Stem bark extracts of *F. racemosa* were evaluated using scratch wound assay (SWA) on Baby Hamster Kidney (BHK 21) and Madin-Darby Canine Kidney (MDCK) cell lines and Kirby Bauer disc diffusion assay on common bacteria and fungi for cell migration enhancing ability and antimicrobial activity respectively. Dichloromethane and hexanes extracts which showed cell migration enhancement activity on SWA were subjected to bioactivity directed fractionation using column chromatography followed by preparative thin layer chromatography to identify the compounds responsible for the cell migration enhancement activity.

**Results:** Dichloromethane and hexanes extracts showed cell migration enhancement activity on both cell lines, while EtOAc and MeOH extracts showed antibacterial activity against *Staphylococcus* and *Bacillus* species and antifungal activity against *Saccharomyces* spp. and *Candida albicans*. Lupeol (1) and  $\beta$ -sitosterol (2) were isolated as the potential wound healing active compounds which exhibited significant cell migration enhancement activity on BHK 21 and MDCK cell lines (>80%) in par with the positive control,

asiaticoside at a concentration of 25  $\mu\text{M}$ . The optimum concentration of each compound required for the maximum wound healing has been determined as 30  $\mu\text{M}$  and 35  $\mu\text{M}$  for 1 and 2 respectively on both cell lines. It is also established that lupeol acetate (3) isolated from the hexanes extract act as a pro-drug by undergoing hydrolysis into lupeol in the vicinity of cells.

**Conclusion:** Different chemical constituents present in stem bark of *Ficus racemosa* L show enhancement of cell migration (which corresponds to the cell proliferation) as well as antimicrobial activity. This dual action of *F. racemosa* stem bark provides scientific support for its traditional use in wound healing.

**Choudhary D, Adhikary S, Ahmad N et al. Prevention of articular cartilage degeneration in a rat model of monosodium iodoacetate induced osteoarthritis by oral treatment with Withaferin A. Biomed Pharmacother. 2018 Jan 10;99:151-161**

**Abstract:**

Withaferin A (WFA), a highly oxygenated withanolide is used for anti-osteoporotic, fracture healing, obesity control as medicine and dietary supplement in Ayurveda and Unani medicine but its potential remains to be investigate for the osteoarthritis studies. In the present study, chondro-protective effects of WFA, under in vitro and in vivo conditions were evaluated. In-vitro pharmacological activity of WFA was tested on rat articular chondrocytes through MTT, DPPH, different staining, FACS and translation studies. In-vivo studies of WFA were evaluated through monosodium iodoacetate (MIA) induced osteoarthritis studies. DPPH assay, alcian blue and toluidine blue staining indicated the chondrogenic potential of WFA. Similarly, WFA enhance chondrogenesis through up-regulation of SOX9 protein. In addition, WFA reduced the ROS generation, mitochondrial depolarization and apoptosis induced by inflammatory cytokines IL-1 $\beta$  and TNF- $\alpha$ . Furthermore, WFA treatment in MIA treated rats alleviated cartilage erosion and improvement in sub-chondral bone micro-architecture by decrease in Tissue volume (~32%), and trabecular bone pattern factor (~28%). Taken together, our study provides convincing evidence for the candidature of WFA (10 mg kg<sup>-1</sup> day<sup>-1</sup>) as a potential agent for the treatment of cartilage degenerative diseases like osteoarthritis.

**Choudhary N, Singh V. Census of *P. longum*'s phytochemicals and their network pharmacological evaluation for identifying novel drug-like molecules against various diseases, with a special focus on neurological disorders. PLoS One. 2018 Jan 10;13(1):e0191006.**

**Abstract:**

*Piper longum* (*P. longum*, also called as long pepper) is one of the common culinary herbs that has been extensively used as a crucial constituent in

various indigenous medicines, specifically in traditional Indian medicinal system known as Ayurveda. For exploring the comprehensive effect of its constituents in humans at proteomic and metabolic levels, we have reviewed all of its known phytochemicals and enquired about their regulatory potential against various protein targets by developing high-confidence tripartite networks consisting of phytochemical-protein target-disease association. We have also (i) studied immunomodulatory potency of this herb; (ii) developed subnetwork of human PPI regulated by its phytochemicals and could successfully associate its specific modules playing important role in diseases, and (iii) reported several novel drug targets. P10636 (microtubule-associated protein tau, that is involved in diseases like dementia etc.) was found to be the commonly screened target by about seventy percent of these phytochemicals. We report 20 drug-like phytochemicals in this herb, out of which 7 are found to be the potential regulators of 5 FDA approved drug targets. Multi-targeting capacity of 3 phytochemicals involved in neuroactive ligand receptor interaction pathway was further explored via molecular docking experiments. To investigate the molecular mechanism of *P. longum*'s action against neurological disorders, we have developed a computational framework that can be easily extended to explore its healing potential against other diseases and can also be applied to scrutinize other indigenous herbs for drug-design studies.

**Ficke JR, Moroski NM, Ross SD et al. Integrative Medicine as an Adjunct to Orthopaedic Surgery. J Am Acad Orthop Surg. 2018 Jan 15;26(2):58-65.**

**Abstract:**

Patients often seek nontraditional forms of treatment, including alternative/complementary medical options, such as chiropractic care and acupuncture, to meet their personal needs. In the United States, interest has grown in methods to reduce pain and improve function through Ayurvedic medicine, which uses plant-based supplements, such as turmeric. Traditional allopathic medicine attempts to provide patients with evidence-based therapeutic regimens for their musculoskeletal conditions. Integrative medicine often is used to prevent and manage the sequelae associated with injuries and illnesses; however, competitive athletes and military personnel use complementary medicine for performance enhancement. Thus, physicians should be aware of the evolving field of integrative medicine, including the reported benefits as well as any potential drawbacks, to facilitate an educated discussion with their patients.

**Gill M, Kinra M, Rai A, Chamallamudi MR, Kumar N. Evaluation of antidepressant activity of methanolic extract of *Saraca asoca* bark in a**

**chronic unpredictable mild stress model. Neuroreport. 2018 Jan 17;29(2):134-140.**

**Abstract:**

It is well established that chronic exposure to stressful events plays an important role in the etiology of depression. *Saraca asoca* (Roxb.), De. wild, or *Saraca indica*, belonging to family Fabaceae, is endogenous to India. The flowers, seeds, bark, and leaves of the plant have been used widely in Ayurveda medicine. The bark extract of *S. asoca* has shown chemoprotection, myeloprotection, and antioxidant potential. Owing to the above-mentioned properties of the plant, the present study sought to evaluate the effect of a methanolic extract of *S. asoca* bark in rats exposed to chronic unpredictable mild stress (CUMS) daily for 8 weeks using a forced-swim test, an open-field test, and a sucrose-preference test. The effect of the extract on endogenous antioxidant levels in the brain was also assessed using catalase activity, superoxide dismutase activity, reduced glutathione levels, and malondialdehyde levels in the brain. Male Sprague-Dawley rats received 100 mg/kg (oral) of the extract daily 1 h before daily stress exposure for 8 weeks. The extract showed a significant reduction in the immobility time in the forced-swim test, increased the total number of line crossing, rearing, and grooming in the open-field test, and increased the sucrose consumption as well as the levels of endogenous antioxidants significantly in comparison with the CUMS control group. Therefore, *S. asoca* might be a useful agent for the treatment or alleviation of symptoms associated with depression possibly by reducing CUMS-induced oxidative stress and reactive oxygen species in the brain.

**Halpern M. A Review of the Evolution of Ayurveda in the United States. Altern Ther Health Med. 2018 Jan;24(1):12-14.**

**Jayasundar R, Ghatak S, Makhdoomi MA et al. Challenges in integrating component level technology and system level information from Ayurveda: Insights from NMR phytometabolomics and anti-HIV potential of select Ayurvedic medicinal plants. J Ayurveda Integr Med. 2018 Jan 3. pii: S0975-9476(17)30130-4.**

**Abstract:**

**Background:** Information from Ayurveda meeting the analytical challenges of modern technology is an area of immense relevance. Apart from the cerebral task of bringing together two different viewpoints, the question at the pragmatic level remains 'who benefits whom'.

**Objective:** The aim is to highlight the challenges in integration of information (Ayurvedic) and technology using test examples of Nuclear Magnetic Resonance (NMR) metabolomics and anti-HIV-1 potential of select Ayurvedic medicinal plants. The other value added objective is implications and relevance of such work for Ayurveda.

**Materials and methods:** Six medicinal plants (Azadirachta indica, Tinospora cordifolia, Swertia chirata, Terminalia bellerica, Zingiber officinale and Symplocos racemosa) were studied using high resolution proton NMR spectroscopy based metabolomics and also evaluated for anti-HIV-1 activity on three pseudoviruses (ZM53 M.PB12, ZM109F.PB4, RHPA 4259.7).

**Results:** Of the six plants, T.bellerica and Z.officinale showed minimum cell cytotoxicity and maximum anti-HIV-1 potential. T.bellerica was effective against all the three HIV-1 pseudoviruses. Untargeted NMR profiling and multivariate analyses demonstrated that the six plants, all of which had different Ayurvedic pharmacological properties, showed maximum differences in the aromatic region of the spectra.

**Conclusion:** The work adds onto the list of potential plants for anti-HIV-1 drug molecules. At the same time, it has drawn attention to the different perspectives of Ayurveda and Western medicine underscoring the inherent limitations of conceptual bilinguism between the two systems, especially in the context of medicinal plants. The study has also highlighted the potential of NMR metabolomics in study of plant extracts as used in Ayurveda.

**Kalachaveedu M, Raghavan D, Telapolu S et al. Phytoestrogenic effect of Inula racemosa Hook f : A cardioprotective root drug in traditional medicine. J Ethnopharmacol. 2018 Jan 10;210:408-416.**

**Abstract:**

**Ethnopharmacological relevance:** Roots of Inula racemosa are used as a cardio protective in Ayurveda in India, being prescribed as a medicine for precordial chest pain, cough and dyspnoea, both singly and as a poly herbal.

**Aim:** Evaluation of Phytoestrogenic activity of the root extracts of Inula racemosa and compounds isolated therefrom in vivo, in silico and in vitro.

**Materials and methods:** Alcohol (IrA) and hexane (IrH) extracts characterized by HPTLC/GC-MS analysis respectively and processed for compound isolation were evaluated for estrogenic activity (100 & 250mg/kg bw) by the Immature rat uterotrophic assay using ethinylestradiol (EE -30µg/kg bw) as standard drug. Alantolactone (ALT), Isoalantolactone (IALT) and Stigmasterolglucoside (SG) isolated from the extracts were characterized and screened in silico for ER $\alpha$ , ER $\beta$  binding affinity, assessed in vitro for growth modulatory effects on

MCF-7 cells by MTT assay and cell cycle distribution analysis using Flow cytometry. RT-PCR analysis evaluated the mRNA expression of pS2 in these cells post exposure to ALT, IALT and SG.

**Results:** In the IrA treated groups there has been a statistically significant increase ( $P < 0.05$ ) in absolute and normalised uterine weight, uterine diameter, endometrial thickness, luminal epithelial cell height, diameter of ovary and in the number of primary and secondary ovarian follicles relative to untreated controls. Presence of ciliated epithelial cells in the oviduct, elevated number of early growing follicles characterized by an increased oocyte diameter, and signs of vascularization in the cortex of ovarian sections in this group relative to EE treated group are indicative of pervasive activation of follicular growth and initiation. Virtual docking demonstrated ER $\alpha$  affinity for IALT, ER $\beta$  affinity for ALT, while SG showed a high binding affinity to both with a relatively greater ER $\beta$  binding affinity. Dose dependent decrease in cell viability mediated by IALT and SG in the MTT assay is corroborated by a statistically significant increase ( $p < 0.05$ ) in sub G0-G1 cells by SG at 200 and 400 $\mu$ M in cell cycle analysis and there has been an induction of pS2 by IALT and SG in the ER regulated MCF-7 cells.

**Conclusions:** Demonstration of classical morphological changes induced by estrogen stimulation mediated by IrA in vivo at both the tested doses, isolation of the antioxidant SG from IrA and its dose dependent growth inhibitory effect on estrogen sensitive MCF-7 cells through apoptotic induction and an up regulation of pS2 are suggestive of an anti-estrogenic effect through estrogen receptor binding affinity, typical of phytoestrogens that bind to ER but do not elicit a full estrogenic response. The observed estrogenic effect of IrA suggests a multi mechanistic molecular action involving antioxidant as well as redox signalling pathways acting in consonance with their anti-estrogenic effects owing to the weak estrogen like competitive receptor binding of SG.

**Kale B, Rajurkar N. Synthesis and characterization of Vangabhasma. J Ayurveda Integr Med. 2018 Jan 5. pii: S0975-9476(17)30166-3.**

**Abstract:**

**Background:** Bhasmas are unique Ayurvedic organometallic preparations used for medicinal purpose. Quality of bhasma depends upon quality of starting materials, processing ingredients, meticulous trituration and heating cycle. In Ayurveda, Vanga bhasma is traditional Indian medicine which is an organometallic preparation treated with plant extract. It is especially used in the treatments of diseases related to gastrointestinal tract and genitor urinary system. However detailed characterization studies after synthesis are important which shows authenticity of product.

**Objective:** The present study deals with the preparation of Vanga bhasma according to the procedure mentioned in the Ayurvedic literature. Synthesized bhasma was characterized by various analytical techniques and also compared with commercial sample.

**Material and method:** Different steps involved in synthesis of Vanga bhasma include shodhan (purification/detoxification), jaran (heating and stirring), bhavan (levigation) and maran (incineration). Bhasma was incinerated (maran process) by traditional method of heating as well as using muffle furnace. These two products obtained from Maran (incineration) and commercial sample were analyzed for quality control checks, on the parameters described in Ayurvedic texts as well as modern techniques such as TEM, SEM, EDX, XRD, DLS and FTIR were done to find out the nature and form of the drug prepared. The in vitro gastric and gastrointestinal (pancreatic) bioaccessibility of Bhasma were also determined.

**Results and conclusions:** The study reveals that the synthesized Bhasma was converted into its nontoxic oxide form and had a highly reduced particle size observed from SEM images. These studies reveal that Vanga Bhasma prepared by traditional method of heating (Sn1) has 50% nanoparticles (150-300 nm range) that prepared by using electric muffle furnace (Sn2) has 100% nanoparticles (50-100 nm range) while commercial samples (Sn3) has 50% nanoparticles (100-300 nm range). Study also confirmed the formation of organometallic compound (SnO<sub>2</sub>) at the end of the manufacturing process. The percentage bioaccessibility for gastrointestinal digestion is more than the gastric digestion. Hence, it is concluded that Vanga Bhasma can be useful nanomedicine.

**Karia P, Patel KV, Rathod SSP. Breast cancer amelioration by Butea monosperma in-vitro and in-vivo. J Ethnopharmacol. 2018 Jan 20. pii: S0378-8741(17)33688-7.**

**Abstract:**

**Ethnopharmacological relevance:** Butea monosperma belonging to family Fabaceae is used in the Indian traditional medicine (Ayurveda) for various ailments including abdominal tumors and possess anti-estrogenic activity.

**AIM of the study:** The present study is aimed at investigating the chemo-preventive potential of Butea monosperma in breast cancer and elucidating its mechanism of action by assessing its effect on key processes like apoptosis, angiogenesis and metastasis.

**Methods:** Cytotoxic potential of methanol extract of Butea monosperma flower (MEBM) was tested in MCF-7 (estrogen receptor positive), MDA-MB-231 (triple

negative) and MDA-MB-453 (HER2 positive) human breast cancer cells by MTT assay. Chemo-preventive potential was evaluated in-vivo in Methylnitrosourea (MNU) induced mammary cancer in nulliparous Sprague-Dawley rats. The mechanism for anticancer potential was screened by in-vitro studies involving Annexin V- FITC assay (apoptosis), Chick Chorioallantoic Membrane assay (angiogenesis) and Migration assay (metastasis). Statistical analysis was done by one way and two way ANOVA (for Growth Rate and feed consumption efficiency) followed by post hoc Bonferroni's test respectively with P value <0.05.

**Results:** It is observed that the exposure of MEBM, at various concentrations and time intervals to different cell lines, resulted in decreased cell proliferation. The IC<sub>50</sub> value of MCF-7 cells was found significantly less than that of MDA-MB-231 and MDA-MB-453 cells, which indicated that the extract of said medicinal plant were more potent inhibitors of estrogen positive breast cancer cells than other types of breast cancer cells in vitro. Corroborative evidences were acquired in MNU actuated mammary carcinogenesis where MEBM constricted tumor parameters, decreased expression of estrogen and progesterone, nucleic acid content and increased latency period. MEBM also induced apoptosis, inhibited angiogenesis and metastasis in-vitro.

**Conclusion:** Selective cytotoxic activity in MCF-7 estrogen positive breast cancer cells and inhibition of growth of mammary carcinoma in-vivo by methanol extract of *Butea monosperma* flowers (MEBM) suggests chemo-prevention through modulation of estrogen and progesterone receptor, apoptotic, anti-angiogenesis and anti-metastatic activity.

**Saha MR, Dey P, Sarkar I et al. Acacia nilotica leaf improves insulin resistance and hyperglycemia associated acute hepatic injury and nephrotoxicity by improving systemic antioxidant status in diabetic mice. J Ethnopharmacol. 2018 Jan 10;210:275-286**

**Abstract:**

**Ethnopharmacological relevance:** *Acacia nilotica* (L.) Delile is used as a traditional anti-diabetic remedy in Bangladesh, Pakistan, Egypt, Nigeria and is mentioned in Ayurveda as well.

**Aim:** The objective of the study was to evaluate the ethnomedicinal claim of *A. nilotica* leaf (ANL) extract for its efficiency in ameliorating diabetic complications.

**Materials and methods:** ANL was orally administrated (50 and 200mg/kg) to alloxanized mice (blood glucose > 200mg/dL) for 20d. Parameters of glucose metabolism, hepatotoxicity, hyperlipidemia and nephrotoxicity were measured

with emphasis on elevated oxidative stress. ANL was chemically characterized using GC-MS. Further, docking studies were employed to predict molecular interactions.

**Results:** ANL lowered (65%,  $P < 0.001$ ) systemic glucose load in diabetic mice, which was otherwise 398% higher than control. ANL lowered (35%) insulin resistance, without any significant effect on insulin sensitivity ( $P > 0.05$ ). Anti-hyperglycemic properties of ANL was further supported by lowering of HbA1c (34%;  $P < 0.001$ ) and improved glucose utilization (OGTT). Overall diabetic complications were mitigated as reflected by lowered hepatic (ALT, AST) and renal (creatinine, BUN) injury markers and normalization of dyslipidemia. Elevated systemic oxidative stress was lowered by increased catalase and peroxidase activities in liver, kidney and skeletal muscle, resulting in 32% decrease of serum MDA levels. Apart from high phenolic and flavonoid content, tocopherol, catechol and  $\beta$ -sitosterol, identified in ANL, demonstrated substantial binding affinity with Nrf2 protein (5FNQ) reflecting possible crosstalk with intracellular antioxidant defense pathways.

**Conclusion:** The present study revealed the potentials of *A. nilotica* to alleviate diabetes-related systemic complications by limiting oxidative stress which justified the ethnopharmacological antidiabetic claim.

**Sharma HB, Vyas S, Kumar J et al. Beneficial effect of ghee consumption over mustard oil on lipid profile: A study in North Indian adult population. J Complement Integr Med. 2018 Jan 24. pii: /j/jcim.ahead-of-print/jcim-2017-0101/jcim-2017-0101.xml**

**Abstract:**

Background Ghee (G) is attributed with numerous health benefits in Ayurveda. However, due to the high saturated fat content, it has been predicted to increase the cardiovascular disease risk. Hence, the current study was performed to evaluate the effect of G consumption as compared to mustard oil (MO) on lipid profile. Methods Two hundred (100 males) apparently healthy adults ( $\geq 40$  years) were randomly selected out of the total individuals interviewed in a house-to-house survey. They were divided into three groups based on G and MO consumption: (A) MO  $> 1$  L/month, G  $< 0.5$  kg/month; (B) MO 1-0.5 L/month, G 1.25-0.5 kg/month; and (C) MO  $< 0.5$ -0.2 L/month, G  $> 1.25$  kg/month. Serum lipid parameters were compared among the groups. Results Group C had the significantly lowest triglyceride (TG), total cholesterol (TC), low-density lipoprotein (LDL), very low-density lipoprotein (VLDL), TC/HDL and LDL/HDL and highest high-density lipoprotein (HDL). A similar finding was found when analysis was done separately for male and female.

Conclusions A favorable lipid profile might suggest a possible beneficial effect of predominantly G consumption over MO.

**Tiwari M, Gupta A, Sharma A et al. Role of Mitogen Activated Protein Kinase and Maturation Promoting Factor During the Achievement of Meiotic Competency in Mammalian Oocytes. J Cell Biochem. 2018 Jan;119(1):123-129.**

**Abstract:**

The oocyte quality remains as one of the major problems associated with poor in vitro fertilization (IVF) rate and assisted reproductive technology (ART) failure worldwide. The oocyte quality is dependent on its meiotic maturation that begins inside the follicular microenvironment and gets completed at the time of ovulation in most of the mammalian species. Follicular oocytes are arrested at diplotene stage of first meiotic prophase. The resumption of meiosis from diplotene arrest, progression through metaphase-I (M-I) and further arrest at metaphase-II (M-II) are important physiological requirements for the achievement of meiotic competency in mammalian oocytes. The achievement of meiotic competency is dependent upon cyclic stabilization/destabilization of maturation promoting factor (MPF). The mitogen-activated protein kinase3/1 (MAPK3/1) modulates stabilization/destabilization of MPF in oocyte by interacting either with signal molecules, transcription and post-transcription factors in cumulus cells or cytosolic factors (CSFs) in oocyte. MPF regulates meiotic cell cycle progression from diplotene arrest to M-II arrest and directly impacts oocyte quality. The MAPK3/1 activity is not reported during spontaneous meiotic resumption but its activity in cumulus cells is required for gonadotropin-induced oocyte meiotic resumption. Although high MAPK3/1 activity is required for the maintenance of M-II arrest in several mammalian species, its cross-talk with MPF remains to be elucidated. Further studies are required to find out the MAPK3/1 activity and its impact on MPF destabilization/stabilization during achievement of meiotic competency, an important period that decides oocyte quality and directly impacts ARTs outcome in several mammalian species including human.

**Tiwari R, Latheef SK, Ahmed I et al. Herbal immunomodulators, a remedial panacea for the designing and developing effective drugs and medicines: Current scenario and future prospects. Curr Drug Metab. 2018 Jan 29. doi: 10.2174/1389200219666180129125436.**

**Abstract:**

Constant exposure to various stressors, such as immune pressure, rapidly increasing population, deleterious changes in the ecosystem, climate change, infection with emerging and re-emerging pathogens, and fast-paced lifestyle, is

a critical factor in the globally increasing incidences of immunocompromising health conditions, as well as stress. Synthetic chemotherapeutic agents, which are widely available in the commercial market, may be highly efficacious, but most are immunosuppressive and exert many side effects. Undoubtedly, the pivotal characteristics of immunostimulants and immunomodulators in the maintenance of the health and productivity of humans, as well as animals, cannot be overlooked. Numerous herbs used in ethnoveterinary medicine can be successfully employed as adjuvant rehabilitators to negate the deleterious effects of chemotherapeutics. The sources of these medicinal remedies are part of long traditions in different regions of the world, such as Indian Ayurveda and Traditional Chinese Medicine, which have been developed through empirical experience. Traditional medicine employs a holistic approach to the prevention of disease and traditional herbal medicines are a source of many components with the high therapeutic value that is used in modern allopathic medicine. Globally, many studies have been conducted on these herbs and have revealed unique active constituents that activate the innate immune system through the stimulation of macrophages and lymphocytes, and modulation of the cytokine profile, which leads to a state of alertness with a subsequent reduction in the incidence of infection. Immunomodulatory constituents with herbal origins are termed as phytochemicals, including flavonoids, glycosides, polysaccharides, terpenoids, essential oils, various bitters, and alkaloids; all these compounds exert vital, multidimensional effects. Efforts have focused on screening plant preparations to identify immune adjuvant properties; furthermore, several potent phytol adjuvants have been experimentally proven to downregulate inflammatory reactions in addition to enhance specific adaptive responses to vaccines. In this review, we discuss the current status and potential utility of herbs and plants as immunomodulators in safeguarding the health of humans, animals, and poultry.

**Upadhyay P, Sadhu A, Singh PK et al. Revalidation of the neuroprotective effects of a United States patented polyherbal formulation on scopolamine induced learning and memory impairment in rats. Biomed Pharmacother. 2018 Jan;97:1046-1052.**

**Abstract:**

**Objective:** Alzheimer's disease (AD) is the most common cause of dementia yet treatment options are extremely limited. The disease is associated with cognitive impairment as well as structural irregularities, accumulation of plaques and neurofibrillary tangles, diminished levels of acetylcholine, oxidative stress, and inflammation in the brain. We have previously reported on the positive effects of a united states patented (US 7,273,626 B2) poly herbal test formulation, consisting of *Bacopa monnieri*, *Hippophae rhamnoides* and *Dioscorea bulbifera* extracts, on cognitive deficits in AD patients. The present

study was conducted to investigate the mechanism(s) of action of the formulation using scopolamine treated rats as an AD model.

**Method:** The formulation was administered daily along with scopolamine for a period of 14 days following which the elevated plus maze, passive avoidance, and Morris water maze tests were performed to assess learning and memory. Rats treated with scopolamine or vehicle only were also included in the experiment. Acetylcholine levels and activities of acetylcholinesterase (AChE) and anti-oxidant enzymes in the brain were also measured at the end of the treatment period.

**Results:** The study demonstrates that scopolamine treatment resulted in learning and memory deficits which were partially and significantly ameliorated by the formulation. The formulation also counteracted scopolamine-induced decreases in acetylcholine levels, increases in AChE activity, and decreases in activities of the antioxidant enzymes.

**Conclusion:** The study demonstrates the ability of the test formulation to reverse scopolamine-induced learning and memory deficits in rats which may at least partially be explained by the reversal of scopolamine-induced reductions in brain acetylcholine levels and antioxidant activities by the test formulation.

## UNANI MEDICINE

**Almaiman AA. Proteomic effects of wet cupping (Al-hijamah). Saudi Med J. 2018 Jan;39(1):10-16.**

### **Abstract:**

Wet cupping (Al-hijamah) is a therapeutic technique practiced worldwide as a part of the Unani system of medicine. It involves bloodletting from acupoints on a patient's skin to produce a therapeutic outcome. A thorough review of research articles on wet cupping with relevance to proteomics field that are indexed by Google Scholar, PubMed, and/or Science Direct databases was performed. Eight original research articles were summarized in this paper. Overall, wet cupping did not have a significant effect on C-reactive protein, Hsp-27, sister chromatid exchanges, and cell replication index. In contrast, wet cupping was found to produce higher oxygen saturation, eliminate lactate from subcutaneous tissues, remove blood containing higher levels of malondialdehyde and nitric oxide, and produce higher activity of myeloperoxidase. The proteomic effects of wet cupping therapy have not been adequately investigated. Thus, future studies on wet cupping that use systemic and sound protocols to avoid bias should be conducted.

**Barkat MA, Harshita, Ahmad J, Khan MA et al. Insights into the Targeting Potential of Thymoquinone for Therapeutic Intervention Against Triple-negative Breast Cancer. Curr Drug Targets. 2018;19(1):70-80.**

### **Abstract:**

**Background:** Thymoquinone (TQ) is a bioactive phytoconstituent obtained from *Nigella sativa* (black seeds). It has promising potential in cancer prevention.

**Objective:** Previous studies have shown that TQ can modulate signaling pathways responsible for cancer progression, thus enhancing the efficacy and improving the safety profile of clinically used anticancer drugs.

**Method:** TQ acts on cell cycle and inhibits progression from G1 to S phase by targeting various proteins (cyclin D1, cyclin E, and p27). It also exhibits histone deacetylase (HDAC) inhibitory effects, targets p21 and Maspin, and induces pro-apoptotic gene, Bax and downregulates anti-apoptotic gene Bcl-2. Breast cancer (BC) is reported as one of the most common malignancies in women.

**Results:** Despite the research and advancement, it remains one of the most common causes of cancer related deaths among women. Recent advancements in molecular screening of BC led to the identification of clinically challenging condition of triple negative breast cancer (TNBC). TNBC is characterized by the

absence of targetable receptors viz. estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) expressions. It is also characterized by reduced or absence of phosphatase and tensin homolog (PTEN) expression, a tumor suppressor gene having diverse functions including regulation of apoptosis, cell cycle, and metastasis.

**Conclusion:** Since TQ has been reported to up-regulate several growth factors such as vascular endothelial growth factor (VEGF), EGF and PTEN expression, the present review article discusses the targeting potential of TQ for therapeutic intervention against such types of breast cancer.

## YOGA

**Adair M, Murphy B, Yarlagadda S, Deng J et al. Feasibility and Preliminary Efficacy of Tailored Yoga in Survivors of Head and Neck Cancer: A Pilot Study. Integr Cancer Ther. 2018 Jan 1;1534735417753540. doi: 10.1177/1534735417753540**

### **Abstract:**

**Purpose:** Treatment for head and neck cancer (HNC) results in long-term toxicities and increased physical and psychosocial survivor burden. There are a limited number of treatments for these late effects. Yoga postures, breath work, relaxation, and meditation, may improve these late effects. The purpose of this study was to examine the feasibility of a tailored yoga program in HNC survivors and obtain preliminary efficacy data.

**Methods:** This was a randomized wait-list control study of yoga-naive HNC survivors who were >3 months post-cancer treatment. Baseline data were collected. Participants were randomized to either an 8-week hatha yoga intervention group or a wait-list group. Feasibility and efficacy data were collected. At 4 and 8 weeks, patients underwent a repeat assessment of health. Wait-list control group participants were offered the yoga program after data collection. Descriptive statistics evaluated feasibility. Mixed effects general linear models were used to generate estimates of the efficacy outcomes.

**Results:** Seventy-three individuals were screened and 40 were eligible. All eligible individuals consented and enrolled. Five of the intervention group discontinued early and none in the wait-list control group. Feasibility was affirmed as participants were recruited and retained in the study, there were no adverse events, fidelity to protocol was demonstrated, and satisfaction rates were high. Efficacy measures indicated potential benefit for shoulder range of motion (  $d = 0.57-0.86$ ,  $P < .05$ ), pain (  $d = 0.67-0.90$ ,  $P \leq .005$ ), and anxiety (  $d = 0.59$ ,  $P = .015$ ).

**Conclusion:** A tailored hatha yoga program is feasible and potentially efficacious for HNC survivors. Preliminary data supports further investigation of yoga in this population is needed.

**Agarwal RP, Maroko-Afek A. Yoga into Cancer Care: A Review of the Evidence-based Research. Int J Yoga. 2018 Jan-Apr;11(1):3-29.**

### **Abstract:**

To cope with cancer and its treatment-related side effects and toxicities, people are increasingly using complementary and alternative medicine (CAM). Consequently, integrative oncology, which combines conventional therapies

and evidence-based CAM practices, is an emerging discipline in cancer care. The use of yoga as a CAM is proving to be beneficial and increasingly gaining popularity. An electronic database search (PubMed), through December 15, 2016, revealed 138 relevant clinical trials (single-armed, nonrandomized, and randomized controlled trials) on the use of yoga in cancer patients. A total of 10,660 cancer patients from 20 countries were recruited in these studies. Regardless of some methodological deficiencies, most of the studies reported that yoga improved the physical and psychological symptoms, quality of life, and markers of immunity of the patients, providing a strong support for yoga's integration into conventional cancer care. This review article presents the published clinical research on the prevalence of yoga's use in cancer patients so that oncologists, researchers, and the patients are aware of the evidence supporting the use of this relatively safe modality in cancer care.

**Allison DB. The Conclusions Are Unsupported by the Data, Are Based on Invalid Analyses, Are Incorrect, and Should be Corrected: Letter Regarding "Sleep Quality and Body Composition Variations in Obese Male Adults after 14 weeks of Yoga Intervention: A Randomized Controlled Trial". Int J Yoga. 2018 Jan-Apr;11(1):83-84.**

**Amaravathi E, Ramarao NH, Raghuram N et al. Yoga-Based Postoperative Cardiac Rehabilitation Program for Improving Quality of Life and Stress Levels: Fifth-Year Follow-up through a Randomized Controlled Trial. Int J Yoga. 2018 Jan-Apr;11(1):44-52.**

**Abstract:**

**Objectives:** This study was aimed to assess the efficacy of yoga-based lifestyle program (YLSP) in improving quality of life (QOL) and stress levels in patients after 5 years of coronary artery bypass graft (CABG).

**Methodology:** Three hundred patients posted for elective CABG in Narayana Hrudayalaya Super Speciality Hospital, Bengaluru, were randomized into two groups: YLSP and conventional lifestyle program (CLSP), and follow-up was done for 5 years.

**Intervention:** In YLSP group, all practices of integrative approach of yoga therapy such as yama, niyama, asana, pranayama, and meditation were used as an add-on to conventional cardiac rehabilitation. The control group (CLSP) continued conventional cardiac rehabilitation only.

**Outcome measures:** World Health Organization (WHO)-QOL BREF Questionnaire, Perceived Stress Scale, Positive and Negative Affect Scale (PANAS), and Hospital Anxiety and Depression Scale (HADS) were assessed before surgery and at the end of the 5th year after CABG. As data were not

normally distributed, Mann-Whitney U-test was used for between-group comparisons and Wilcoxon's signed-rank test was used for within-group comparisons.

**Results:** At the end of 5 years, mental health ( $P = 0.05$ ), perceived stress ( $P = 0.01$ ), and negative affect (NA) ( $P = 0.05$ ) have shown significant improvements. WHO-QOL BREF score has shown improvements in physical health ( $P = 0.046$ ), environmental health ( $P = 0.04$ ), perceived stress ( $P = 0.001$ ), and NA ( $P = 0.02$ ) in YLSP than CLSP. Positive affect has significantly improved in CLSP than YLSP. Other domains of WHO-QOL-BREF, PANAS, and HADS did not reveal any significant between-group differences.

**Conclusion:** Addition of long-term YLSP to conventional cardiac rehabilitation brings better improvements in QOL and reduction in stress levels at the end of 5 years after CABG.

**Ayala SG, Wallson K, Birdee G. Characteristics of Yoga Practice and Predictors of Practice Frequency. *Int J Yoga Therap.* 2018 Jan 19. doi: 10.17761/2018-00012R2.**

**Abstract:**

Yoga is a globally popular mind-body practice used for health. The objective of this study was to characterize yoga practice and factors associated with frequency of practice. Yoga practitioners were sent invitations via email to participate in an online survey. Yoga characteristics and other sociodemographics were collected. Data from 309 consenting respondents were analyzed for patterns in practice characteristics (yoga techniques, location of practice, method of instruction, teacher status, and yoga type). Associations between characteristics of practice and yoga practice frequency were computed. The following characteristics were then analyzed as predictors of practice frequency in a regression model: location of practice, method of instruction, teacher status, yoga type, and techniques. Most respondents reported use of all three yoga techniques (movements, breathing, and meditation) and practiced an average of  $4.5 \pm 1.9$  days a week. Key characteristics such as location of practice, method of instruction, and frequency significantly differed by teacher status and by yoga type (Viniyoga practitioners vs. other yoga styles). In our regression model, being a yoga teacher, being taught a one-on-one yoga practice by someone else, and regular use of movement were positively associated with increased practice frequency. Our analyses provide insight into how yoga factors such as teacher status, method of instruction, and use of tools relate to practice frequency.

Understanding the relationships between practice characteristics and practice frequency may allow for the improved implementation of yoga for health.

**Beck AR, Verticchio H. Effectiveness of a Method for Teaching Self-Compassion to Communication Sciences and Disorders Graduate Students. Am J Speech Lang Pathol. 2018 Jan 30:1-15.**

**Abstract:**

**Purpose:** The purpose of this study is to explore the effects of a daily mindfulness practice and 2 types of journaling on participants' development of self-compassion.

**Method:** This was a between-groups design. All participants in a graduate counseling course engaged in a short daily mindfulness practice at the beginning of every class. Participants were randomly assigned to a counseling journal or a gratitude journal group. Participants were to write in their journals 2 to 5 times a week for the duration of the class. Participants completed the Self-Compassion Scale (Neff, 2003) and a questionnaire created by the 1st author before any mindfulness sessions were held and again at the completion of the course.

**Results:** Participants' level of self-compassion increased from pretest to posttest. The self-compassion scores of participants who kept counseling journals increased more than did those of participants who kept gratitude journals. Qualitative data indicated that participants believed that mindfulness was an important quality for clinicians to possess and that they were accepting of the daily mindfulness practice.

**Conclusions:** Engaging in a 12-min daily mindfulness practice utilizing simple yoga postures, breath work, reflective writing, and journaling done at a separate time appears to be an effective technique for increasing students' levels of self-compassion. Maintaining a counseling journal as opposed to a gratitude journal appears to enhance the effect of the daily mindfulness practice on self-compassion.

**Brenneman EC, Maly MR. Identifying changes in gait waveforms following a strengthening intervention for women with knee osteoarthritis using principal components analysis. Gait Posture. 2018 Jan;59:286-291.**

**Abstract:**

Lower limb strengthening exercise is pivotal for the management of symptoms related to knee osteoarthritis (OA). Though improvement in clinical symptoms is well documented, concurrent changes in gait biomechanics are ill-defined. This may occur because discrete analyses miss changes following an

intervention, analyses limited to the knee undermine potential mechanical trade-offs at other joints, or strengthening interventions not been designed based on biomechanical principles. The purpose of this study was to characterize differences in entire gait waveforms for sagittal plane ankle, knee, and hip angles and external moments; the knee adduction moment; and frontal plane hip angle and moment following 12-weeks of a previously designed novel lower limb strengthening program. Forty women with knee OA completed two laboratory visits: one at baseline and one immediately following intervention (follow-up). Self-report measures, strength, and gait analyses were completed at each visit. Principal components analyses were completed for sagittal angles and external moments at the ankle, knee, and hip joints, as well as frontal plane angle and moment for the hip. Participants improved self-report and strength ( $p \leq 0.004$ ). Two significant, yet subtle differences in principal components were identified between baseline and follow-up waveforms ( $p < 0.05$ ) pertaining to the knee and hip sagittal external moments. The subtle changes in concert with the lack of differences in other joints and planes suggest the lower limb strengthening program does not translate to changes in the gait waveform. It is likely this program is improving symptoms without worsening mechanics.

**Colletto M, Rodriguez N. Routine Yoga Practice Impacts Whole Body Protein Utilization in Healthy Women. J Aging Phys Act. 2018 Jan 1;26(1):68-74.**

**Abstract:**

Whole body protein utilization (WBPU), which includes flux (Q), protein synthesis (PS), protein breakdown (PB), and whole body protein balance (WBPB), provides insight regarding muscle mass, a criterion for sarcopenia. To characterize yoga's impact on WBPU, body composition and functional measures in healthy (50-65 years) women. WBPU and functional measures were compared between women who routinely practiced yoga (YOGA;  $n = 7$ ) and nonactive counterparts (CON;  $n = 8$ ). Q ( $0.61 \pm 0.06$  vs.  $0.78 \pm 0.07$ ,  $p = .04$ ), PS ( $3.07 \pm 0.37$  vs.  $4.17 \pm 0.40$ ,  $p = .03$ ), PB ( $2.59 \pm 0.48$  vs.  $3.80 \pm 0.48$ ,  $p = .05$ ) were lower, and lean body mass higher ( $64 \pm 1$  vs.  $58 \pm 2\%$ ,  $p \leq .01$ ) for YOGA vs. CON, respectively. WBPB and functional measures were similar. Routine yoga practice influenced WBPU in healthy older women. Study findings are novel and provide a basis for future investigations evaluating long-term benefits of yoga as an alternative mode of exercise for maintaining muscle mass in support of active aging.

**Gobec S, Travis F. Effects of Maharishi Yoga Asanas on Mood States, Happiness, and Experiences during Meditation. Int J Yoga. 2018 Jan-Apr;11(1):66-71.**

**Abstract:**

**Context/background:** Many studies showed positive effects of Yoga Asanas. There is no study on Maharishi Yoga Asanas yet. This research replicated and expanded observed improvements on the profile of mood states (POMS) as a result of 2-week Maharishi Yoga Asanas course. Thirteen college students taking part in a 4-week course on Maharishi Yoga Asanas were matched with 13 students taking other courses at the university.

**Aims and objective:** The main objective of the study was to assess the effects of Maharishi Yoga Asanas on mood states, degree of happiness, and experiences in Transcendental Meditation (TM) practice.

**Methods:** All students were given two psychological tests and additional question before and after their 4-week course: POMS, Meditation Depth Questionnaire, and question about the degree of happiness.

**Results:** Repeated measure MANOVA showed the 4-week Maharishi Yoga Asanas course resulted in significant increase in happiness during the day and significant improvements in (1) sense of personal self, (2) transpersonal qualities, and (3) transpersonal self during their TM practice.

**Conclusion:** This research shows that Maharishi Yoga Asanas affect more than body and mind. Rather they influence much deeper levels of one's subjectivity including one's transpersonal self.

**Hunter SD, Laosiripisan J, Elmenshawy A et al. Effects of yoga interventions practiced in heated and thermoneutral conditions on endothelium-dependent vasodilation: The Bikram yoga heart study. Exp Physiol. 2018 Jan 18. doi: 10.1113/EP086725.**

**Abstract:**

**We have previously documented improvements in endothelium-dependent vasodilation with a Bikram (hot) yoga intervention in middle-aged adults. Presently, the effect of environmental temperature in hot yoga on endothelial function is unknown.**

**Purpose:** The purpose of this investigation was to determine the effects of Bikram yoga interventions performed in the heated and thermoneutral conditions on endothelium-dependent vasodilation.

**Methods:** Fifty-two sedentary but apparently healthy adults aged 40-60 years were randomly assigned to one of three groups: Bikram yoga practiced at 40.5°C (n = 19), Bikram yoga practiced at 23°C (n = 14), or sedentary time-control (n = 19). The yoga interventions consisted of 90-minute Bikram yoga classes 3 times a week for 12 weeks. Endothelium-dependent vasodilation was measured noninvasively using brachial artery flow-mediated dilation (FMD).

**Results:** Body fat percentage determined via dual energy x-ray absorptiometry was significantly lower in the hot yoga group after the intervention than in the thermoneutral yoga and control conditions. Brachial artery FMD increased ( $P < 0.05$ ) in the thermoneutral yoga group and tended to increase in the hot yoga group ( $P = 0.056$ ). No changes occurred in the control group. There were no significant differences in FMD change scores between groups.

**Conclusions:** Bikram yoga practiced in thermoneutral conditions improved endothelium-dependent vasodilation in healthy, middle-aged adults. These novel findings highlight the effectiveness of hatha yoga postures alone, in the absence of a heated practice environment, in improving vascular health and are of clinical significance given the increased propensity toward heat intolerance in aging adults. This article is protected by copyright. All rights reserved.

**Justice C, Cheung C, Samson-Burke A. Development and Evaluation of a Yoga Intervention Program for Parkinson's Disease. Int J Yoga Therap. 2018 Jan 19. doi: 10.17761/2018-00015R2**

**Abstract:**

Preliminary research indicates that yoga could be a valuable tool for people suffering from Parkinson's disease (PD). However, little has been published about the process by which the yoga interventions were designed and evaluated. This study elaborates on the process of developing and testing a bi-weekly, 12-week yoga program to determine its safety and feasibility for people with PD. The lead yoga teacher used input from a focused literature review to design an initial draft of the intervention program. This draft was reviewed by a group of yogaexperts (n = 6) to develop the final intervention program. This 12-week intervention was implemented in 19 participants with PD (mean age  $63 \pm 8$ , range 49-75) via twice-weekly yoga classes. Through this comprehensive development process, a series of 24 individual 1-hour yogasequences was created. These sequences included yoga postures (asana), breathing techniques (pranayama), and mindfulness meditation principles specifically chosen to address concerns unique to the PD population. The feasibility of the program was supported with excellent attendance: 90% of participants attended  $\geq 75\%$  of the classes, with four participants attending

100%. No adverse events were reported. This development process produced a safe and enjoyable yoga program specific for the needs of people with PD. However, this methodology could serve as a template for future studies on how to develop safe and effective yoga interventions for other populations.

**Kelley K, Slattery K, Apollo K. Electromyographic analysis of selected asana in experienced yogic practitioners. J Bodyw Mov Ther. 2018 Jan;22(1):152-158.**

**Abstract:**

The purpose of this study was to assess electromyographic (EMG) output of the anterior tibialis (TA), medial head of the gastrocnemius (GA), rectus femoris (RF), bicep femoris (BF), and gluteus medius (GM) in experienced yogic practitioners during selected yoga asana. A secondary purpose was to examine the differences in EMG output in unilateral V. bilateral standing yoga asana. The study was a single occasion descriptive design. Thirteen healthy yoga practitioners (1 male, 12 females, average age of 37.5) with more than five years of experience were recruited. EMG activity was recorded during maximum voluntary isometric contractions (MVIC) of the TA, GA, RF, and BF using the Biodex Multijoint System®, and GM using manual muscle testing position. Subjects then performed the following yoga asana while EMG activity was recorded: downward facing dog, half-moon, tree, chair, and warrior three pose. Each asana was held for fifteen seconds and performed three times. EMG data were band pass filtered and the root mean square was obtained. Asana data were then amplitude normalized with the subjects' MVIC data. Integrated EMG was calculated for TA, GA, RF, BF and GM, in each asana. A multilevel regression analysis was performed, and peak EMG data was compared. Analysis between muscles showed that during CH and DD EMG activity was greatest in the TA muscle compared to the other muscles, while during HM and WR the GA muscle showed the greatest activity. Analysis within muscles showed low GA, BF, and GM activity during chair pose and downward facing dog compared to half moon, tree, and warrior three, and high RF activity during chair compared to the other poses. In conclusion, there were differences in frontal and sagittal plane muscle activation between single limb and double limb poses in experienced yogic practitioners.

**Koksoy S, Eti CM, Karataş M et al. Effects of Yoga in Patients Suffering from Subjective Tinnitus. Int Arch Otorhinolaryngol. 2018 Jan;22(1):9-13.**

**Kuppusamy M, Kamaldeen D, Pitani R et al. Effects of Bhramari Pranayama on health - A systematic review. J Tradit Complement Med. 2017 Mar 18;8(1):11-16.**

**Abstract:**

Pranayama, a branch of yoga practice is extremely beneficial to mankind in maintaining sound physical and mental health and this article aims to attain an insight on the studies conducted on the effectiveness of *Bhramari Pranayama* (Bhr.P) on health. The studies done until May 2016 were found using Medline, Embase, Google scholar and manual search. Studies conducted on the health effectiveness of Bhr.P specifically were included on the basis of prisma guidelines. The data were defined by their objectives, methodology, study setting, findings, interventions done and implications suggested in the study. Methodological Quality Rating Scale (MQRS) and Newcastle-Ottawa Scale (NOS) were used in reviewing and reporting results of the included studies. 6 studies satisfied the inclusion criteria; 2 studies were done on the cold pressor test, one on heart rate and BP, one on EEG changes, one each on the inhibitory response and tinnitus condition. In the included studies, the Bhr.P practices have shown para-sympathetic dominance. There are some encouraging effects of Bhr.P on various physiological systems. Methodological quality of the included studies was evaluated to be very low and none of them were RCTs. Yet the available studies are heterogeneous, dealing in different grounds and this heterogeneity serves as a resource for the limited scope of studies on Bhr.P. Therefore, further large-scale, properly designed, randomized trials of Bhr.P on various systems have to be done to justify these effects efficiently.

**Litchke LG, Liu T, Castro S. Effects of Multimodal Mandala Yoga on Social and Emotional Skills for Youth with Autism Spectrum Disorder: An Exploratory Study. Int J Yoga. 2018 Jan-Apr;11(1):59-65.**

**Abstract:**

**Context:** Youth with autism spectrum disorder (ASD) demonstrates impairment in the ability to socially and emotionally relate to others that can limit participation in groups, interaction with peers, and building successful life relationships.

**Aims:** The aim of this exploratory study was to examine the effects of a novel multimodal Mandala yoga program on social and emotional skills for youth with ASD.

**Subjects and methods:** Five males with ASD attended 1 h yoga sessions, twice a week for 4 weeks. Multimodal Mandala yoga comprised 26 circular partner/group poses, color and tracing sheets, rhythmic chanting, yoga cards, and games. Treatment and Research Institute for ASD Social Skills Assessment (TSSA) scores were collected before and after the eight yoga sessions. The Modified Facial Mood Scale (MFMS) was used to observe mood changes before

and after each yoga class. Paired sample t-tests were conducted on TSSA and MFMS scores to compare social and emotional differences post the 4-week camp. Narrative field notes were documented after each of the eight yoga sessions.

**Results:** A significant improvement from pre- to post-test was found in overall TSSA ( $t(4) = -5.744$ ,  $P = 0.005$ ) and on respondent to initiation ( $t(4) = -3.726$ ,  $P = 0.020$ ), initiating interaction ( $t(4) = -8.5$ ,  $P = 0.039$ ), and affective understanding and perspective taking subscales ( $t(4) = -5.171$ ,  $P = 0.007$ ). Youth's MFMS scores increased from 80% to 100% at the end of eight yoga sessions demonstrating a pleasant or positive mood. Thematic analysis of the narrative notes identified three key factors associated with the yoga experience: (a) enhanced mood and emotional expression, (b) increased empathy toward others, and (c) improved teamwork skills.

**Conclusion:** This multimodal Mandala yoga training has implication for developing positive social and emotional skills for youth with ASD.

**Nagendra HR. Cancer: Prevention and Rehabilitation through Yoga. Int J Yoga. 2018 Jan-Apr;11(1):1-2.**

**Naik GS, Gaur GS, Pal GK. Effect of Modified Slow Breathing Exercise on Perceived Stress and Basal Cardiovascular Parameters. Int J Yoga. 2018 Jan-Apr;11(1):53-58.**

**Abstract:**

**Context:** Different types of breathing exercises have varied effects on cardiovascular parameters and the stress levels in an individual.

**Aim:** The aim of this study was to assess the effect of a modified form of isolated alternate nostril, slow breathing exercise on perceived stress, and cardiovascular parameters in young, male volunteers.

**Settings and design:** This was a randomized control study carried out at Advanced Centre for Yoga Therapy Education and Research, Department of Physiology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry in 2014.

**Subjects and methods:** Hundred healthy male volunteers were randomized into control group,  $n = 50$  and slow breathing group (study),  $n = 50$ . Slow breathing exercise training was given to study group for 30 min a day, 5 times/week for 12 weeks, under the supervision of certified yoga trainers. Perceived Stress Scale (PSS) using Cohen's questionnaire, anthropometric parameters such as body mass index (BMI), waist-hip ratio (WHR), and cardiovascular parameters such as heart rate (HR), systolic blood pressure

(SBP), and diastolic blood pressure (DBP) were recorded at baseline and after 12 weeks. The control group did not receive any intervention. Slow breathing exercise training was provided for the study group. During the study period, one volunteer opted out of the study group due to personal reasons.

**Results:** HR, SBP, DBP, and PSS decreased significantly ( $P < 0.05$ ) in the study group following 12 weeks slow breathing exercise training, while no significant change ( $P > 0.05$ ) was observed in BMI and WHR. There was no significant change in the control group.

**Conclusion:** Twelve weeks of modified slow breathing exercise reduced perceived stress and improved the cardiovascular parameters. The above results indicate that our modified slow breathing exercise is effective in reducing stress and improving the cardiovascular parameters.

**Praveena SM, Asha G, Sunita M et al. Yoga Offers Cardiovascular Protection in Early Postmenopausal Women. Int J Yoga. 2018 Jan-Apr;11(1):37-43.**

**Abstract:**

**Context:** Postmenopause, an estrogen deficient state comes with increased incidence of cardiovascular diseases (CVDs). Yoga has been described as having a beneficial effect on heart rate variability (HRV), a marker for cardiac autonomic activity which can assess cardiovascular risk, in various populations.

**Aim:** the aim of the study was to study the effect of 3-month long Yoga practice on HRV in early postmenopausal women.

**Settings and design:** A prospective longitudinal study of 67 women within 5 years of menopause between 45 and 60 years of age attending menopause clinic of Department of Gynaecology, Sucheta Kriplani Hospital fulfilling inclusion and exclusion criteria and consenting were enrolled for the study.

**Subjects and methods:** HRV of 37 cases (Yoga group) and 30 controls (non-Yoga group) was recorded pre and 3-month postintervention.

**Statistical analysis used:** GraphPad Prism Version 5 software was used. Values are a mean and standard error of mean. Statistical significance was set up at  $P < 0.05$ .

**Results:** In HRV, frequency domain analysis showed a significant fall in low frequency (LF) in normalized units (nu) and LF: high frequency (HF) ratio and significant rise in HF in nu in the Yoga group (depicting parasympathetic dominance) against a significant rise in LF (nu) and LF: HF ratio and significant

fall in HF (nu) in non-Yoga group (indicating sympathetic dominance). Time domain analysis showed a significant decrease in Standard Deviation of NN intervals in Non-Yoga group against nonsignificant changes in Yoga group indicating deterioration in parasympathetic activity in non-Yoga group.

**Conclusions:** Three-month long Yoga practice improved HRV in early postmenopausal women significantly and has the potential to attenuate the CVD risk in postmenopausal women.

**Reinhardt KM, Noggle Taylor JJ, Johnston J et al. Kripalu Yoga for Military Veterans With PTSD: A Randomized Trial. J Clin Psychol. 2018 Jan;74(1):93-108.**

**Abstract:**

**Objectives:** This randomized controlled trial of yoga for military veterans and active duty personnel with posttraumatic stress disorder (PTSD) evaluated the efficacy of a 10-week yoga intervention on PTSD.

**Method:** Fifty-one participants were randomized into yoga or no-treatment assessment-only control groups. Primary outcome measures included questionnaires and the Clinician Administered PTSD Scale.

**Results:** Both yoga (n = 9) and control (n = 6) participants showed significant decreases in reexperiencing symptoms, with no significant between-group differences. Secondary within-group analyses of a self-selected wait-list yoga group (n = 7) showed significant reductions in PTSD symptoms after yoga participation, in contrast to their control group participation. Consistent with current literature regarding high rates of PTSD treatment dropout for veterans, this study faced challenges retaining participants across conditions.

**Conclusion:** These results are consistent with recent literature indicating that yoga may have potential as a PTSD therapy in a veteran or military population. However, additional larger sample size trials are necessary to confirm this conclusion.

**Rshikesan PB, Pailoor S, Singh D. Response to Comment on "Sleep Quality and Body Composition Variations in Obese Male Adults after 14 Weeks of Yoga Intervention: A Randomized Controlled Trial" by Rshikesan <i>et al</i>., 2017. Int J Yoga. 2018 Jan-Apr;11(1):85.**

**Sharma K, Chandra S, Dubey AK. Exploration of Lower Frequency EEG Dynamics and Cortical Alpha Asymmetry in Long-term Rajyoga Meditators. Int J Yoga. 2018 Jan-Apr;11(1):30-36.**

**Abstract:**

**Background:** Rajyoga meditation is taught by Prajapita Brahmakumaris World Spiritual University (Brahmakumaris) and has been followed by more than one million followers across the globe. However, rare studies were conducted on physiological aspects of rajyoga meditation using electroencephalography (EEG). Band power and cortical asymmetry were not studied with Rajyoga meditators.

**Aims:** This study aims to investigate the effect of regular meditation practice on EEG brain dynamics in low-frequency bands of long-term Rajyoga meditators.

**Settings and design:** Subjects were matched for age in both groups. Lower frequency EEG bands were analyzed in resting and during meditation.

**Materials and methods:** Twenty-one male long-term meditators (LTMs) and same number of controls were selected to participate in study as per inclusion criteria. Semi high-density EEG was recorded before and during meditation in LTM group and resting in control group. The main outcome of the study was spectral power of alpha and theta bands and cortical (hemispherical) asymmetry calculated using band power.

**Statistical analysis:** One-way ANOVA was performed to find the significant difference between EEG spectral properties of groups. Pearson's Chi-square test was used to find difference among demographics data.

**Results:** Results reveal high-band power in alpha and theta spectra in meditators. Cortical asymmetry calculated through EEG power was also found to be high in frontal as well as parietal channels. However, no correlation was seen between the experience of meditation (years, hours) practice and EEG indices.

**Conclusion:** Overall findings indicate contribution of smaller frequencies (alpha and theta) while maintaining meditative experience. This suggests a positive impact of meditation on frontal and parietal areas of brain, involved in the processes of regulation of selective and sustained attention as well as provide evidence about their involvement in emotion and cognitive processing.

**Tiwari KK, Shaik R, Aparna B et al. Comparative Study on the Effects of Vintage Nonpharmacological Techniques in Reducing Myopia (Bates eye exercise therapy vs. <i>Trataka Yoga Kriya</i>). Int J Yoga. 2018 Jan-Apr;11(1):72-76**

**Abstract:**

**Background:** Human eye captures light rays as they come and fall on the retina and convert them into an image. However, in myopia, light rays fall in

front of retina, causing blurring of image. Correction of this is generally done using correcting devices such as corrective glasses and contact lenses. Existence of some alternative therapies is also noticed in literature.

**Aim:** To compare the effects of Bates eye exercises and Trataka Yoga Kriya on myopia.

**Materials and methodology:** Ethical clearance was obtained from the institution, and informed consent was taken from participants. In this randomized comparative study, 24 participants (48 eyes) were taken based on inclusion and exclusion criteria and were randomly divided into two groups: Group A and Group B, where Bates eye exercise therapy and Trataka Yoga Kriya were given, respectively, for 8 weeks. Participants were assessed for their refractive errors and visual acuity pre- and post-intervention.

**Results:** Data were analyzed by SPSS version 20. Results obtained revealed that both Bates exercises and Trataka Yoga Kriya were not significantly effective in reducing refractive errors and in improving visual acuity (P value of refractive error in right eye: 0.4250; left eye: 0.4596; P value of visual acuity in right eye: 0.5691; left eye: 0.8952).

**Conclusion:** This study concludes that nonpharmacological approaches such as eye exercises and Trataka Yoga Kriya are not significant on myopia.

**Uebelacker L, Dufour SC, Dinerman JG et al. Examining the Feasibility and Acceptability of an Online Yoga Class for Mood Disorders: A MoodNetwork Study. J Psychiatr Pract. 2018 Jan;24(1):60-67**

**Abstract:**

**Background:** Despite ongoing advances in the treatment of mood disorders, a substantial proportion of people diagnosed with major depression or bipolar disorder remain symptomatic over time. Yoga, which has been shown to reduce stress and depressive symptoms, as well as to improve overall quality of life, shows promise as an adjunctive treatment. However, dissemination of yoga for clinical populations remains challenging. The purpose of this pilot study was to test the feasibility and acceptability of an online yoga intervention for individuals with mood disorders.

**Methods:** In total, 56 adults who reported being diagnosed with a mood disorder (bipolar disorder, major depressive disorder, cyclothymia, or schizoaffective disorder) were recruited from MoodNetwork, an online community of individuals with mood disorders. A feedback survey and a measure of positive and negative affect were administered before and after a 30-minute online Hatha yoga class.

**Results:** In total, 44 individuals (78.6%) completed all components of the yoga class. The mean score on a 10-point Likert scale rating how much participants liked the online yoga class was 7.24 (SD=2.40). Most participants (67.9%) reported that they would be "somewhat likely" or "very likely" to participate in an online yoga program again. There was a statistically significant decrease in negative affect after completing the class ( $t=-6.05$ ;  $P<0.001$ ), but positive affect did not change ( $P>0.10$ ).

**Discussion:** These preliminary data support the utility of online yoga tailored specifically for people with mood disorders as a possible adjunctive intervention that warrants further investigation.

**Wong AP, Kassab YW, Mohamed AL et al. Beyond conventional therapies: Complementary and alternative medicine in the management of hypertension: An evidence-based review. Pak J Pharm Sci. 2018 Jan;31(1):237-244.**

**Abstract:**

Hypertension is one of the major causes of morbidity and mortality. Worldwide, Hypertension is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS. This led WHO to set a target of 25% reduction in prevalence by 2025. To reach that, WHO has adopted non-conventional methods for the management of hypertension? Despite worldwide popularity of such non-conventional therapies, only small volume of evidence exists that supports its effectiveness. This review attempted to make a critical appraisal of the evidence, with the aim to (1) describe the therapeutic modalities frequently used, and (2) review the current level of evidence attributable to each modality. Databases from Cochrane Library, MEDLINE, PUBMED, and EMBASE were searched from 2005-2015. A total of 23 publications have been identified and selected. Out of these, 15 systematic reviews and/or meta-analysis of RCTs, 5 RCTs, 1 non-RCT, and 2 observational studies without control. Among those 23 publications, therapeutic modalities identified are: fish oil, qigong, yoga, coenzyme Q10, melatonin, meditation, vitamin D, vitamin C, monounsaturated fatty acids, dietary amino-acids, chiropractic, osteopathy, folate, inorganic nitrate, beetroot juice, beetroot bread, magnesium, and L-arginine. The followings were found to have weak or no evidence: fish oil, yoga, vitamin D, monounsaturated fatty acid, dietary amino-acids, and osteopathy. Those found to have significant reduction in blood pressure are: magnesium, qigong, melatonin, meditation, vitamin C, chiropractic, folate, inorganic nitrate, beetroot juice and L-arginine. Coenzyme Q10 on the other hand, showed contradicting results were some studies found weak or no effect on blood pressure while others showed significant blood

pressure reduction effect. By virtue of the research designs and methodologies, the evidence contributed from these studies is at level 1. Results from this review suggest that certain non-conventional therapies may be effective in treating hypertension and improving cardiac function and therefore considered as part of an evidence-based approach.