



A SINGLE CASE STUDY ON THE MANAGEMENT OF AMLAPITTA WITH MOKSHAYAN

Dr. Jivesh Kumar Mehta^{*1} and Dr. Shaheen F. Pinjari²

¹M.D. (Kayachikitsa), D.Y.A. – Ayushveda, The Ayurvedic Clinic, Sonipat, Haryana.

²M.D. (Kaumarbhritya) - Ayushveda, The Ayurvedic Clinic, Sonipat, Haryana.

***Corresponding Author: Dr. Jivesh Kumar Mehta**

M.D. (Kayachikitsa), D.Y.A. – Ayushveda, the Ayurvedic Clinic, Sonipat, Haryana.

Article Received on 20/11/2019

Article Revised on 10/12/2019

Article Accepted on 31/12/2019

ABSTRACT

Now a days *amlapitta* is commonly found as a disease & also as a symptom of various diseases. There are various causative factors like mental stress, late night work, day sleep, improper food habits, oily-spicy food habits, excessive use of pesticides etc. In contemporary science use of PPI & h₂ blockers gives a temporary management to the disease. This disease has been described in various classical texts like *yog ratnakar*, *kashyap Samhita* & *bhaishajya ratnavalai*. So the need for management of *amlapitta* led to the trial of *Mokshayan*.

KEYWORDS: *Yog ratnakar*, *kashyap Samhita* & *bhaishajya ratnavalai*.

INTRODUCTION

Amlapitta is a condition where *amlarasa* of the *Pitta dosha* gets amplified, in an unusual manner. For any *dosha*, the rise in a peculiar characteristic of it, even though it is its natural one, is considered as pathological. The normalcy of the various properties of a *dosha* is essential for its ideal functioning. In *Amlapitta*, the *Pitta* gets vitiated by one or all the *gunas*, causing various pathophysiological conditions of *annavaha srotus* and *purishavaha srotus*.^[1] *Amlapitta* has been mentioned in various Ayurvedic texts since *Samhita* period. This disease has been described in detail in classical texts such as *Kashyapa Samhita*,^[2] *Yoga Ratnakara*,^[3] and *Bhaishajya Ratnavali*,^[4] Excessive formation of vitiated *pitta* is thought to be the main pathological mechanism behind manifestation of this disease. Now a days *amlapitta* is commonly found as a disease & also as a symptom of various diseases. There are various causative factors like mental stress, late night work, day sleep, improper food habits, oily-spicy food habits, excessive use of pesticides etc. In contemporary science use of PPI

& h₂ blockers gives a temporary management to the disease.

CASE REPORT

A 36 year old male patient came with complaints of *avipaak*, *klama*, *utklesa*, *tikta amla udgaar*, *gauravata*, *hrit-kantha daha* and *aruchi*. Patient was on *rabeparazole* 20 mg & *domperidome* 30 mg empty stomach once a day with water from last 2 months. Patient was also having complaints of generalised weakness with mood irritability in doing day to day work. There were no associated complaints like constipation or diarrhoea. There was no any past history of injury, wound, in contact to any chemical or harmful dietary substance.

Examination

Vitals were normal. Local & systemic examination reveals no any abnormality. Bowel habits were normal. Micturation was 5-6 times in a day. No mouth ulcers were found.

Evaluation of Symptoms^[5]

Table 1: Grading of clinical features of *Amlapitta* according to severity.

Grades of Severity	Characteristics
Avipaak	
G0	no indigestion
G1	digests normal usual diet in 09 hours
G2	digests normal usual diet in 12 hours
G3	digests normal usual diet in 24 hours or more
Klama	

G0	no tiredness
G1	feel tired after exertion work
G2	feel tired after normal work
G3	feel tired even after taking rest
Utklesha	
G0	no nausea
G1	Feel nausea after eating some peculiar food
G2	feel nausea after eating all kinds of food
G3	full day nausea, not related to eating
Tikta amla udgaar	
G0	no sour and bitter belching
G1	sour and bitter belching after taking spicy food
G2	sour and bitter belching after taking any type of food
G3	sour and bitter belching having no relation with food intake
Guruta	
G0	no feeling of heaviness in the body
G1	heaviness after taking more quantity of heavy food
G2	heaviness even after taking light food
G3	heaviness even on empty stomach
Hrit-Kantha Daha	
G0	no Burning sensation
G1	burning sensation after intake of spicy food
G2	feeling of burning sensation even after intake of normal food
G3	burning sensation even empty stomach
Aruchi	
G0	no anorexia
G1	eat food only two times without any snacks in between
G2	eat only once
G3	have no feeling of appetite

Medication: 5 ml *mokshayan* daily at night after food for 30 days with no milk & milk products during the course of treatment.

Mokshayan- Contents.

Ayurvedic name	Botanical name
Haridra	Curcuma Longa
Punarnava	Boerhaavia Diffusa
Bilva	Aegle Marmelos
Lodhra	Symplocos Racemosa
Vacha	Acorus Calamus
Tulsi	Ocimum Sanctum L
Brahmi	Bacopa Monnieri
Manjishtha	Rubia Cordifolia
Amla	Embllica Officinalis
Ashwagandha	Withania somnifera
Guduchi	Tinospora Cordifolia
Ghrirkumari	Aloe vera
Raw honey	

Haridra^[6]

Gastrointestinal disorders, Respiratory disorders, Inflammatory disorders, Diabetes mellitus, Cardiovascular disorder, Hepatoprotective, Neuroprotective activity, Alzheimer's disease, Chemoprotective activity, Anti cancer activity, Anti allergic activity, Anti-dermatophytic activity.

Punarnava^[7]

Immunomodulatory effects, Immunosuppressive activity, Antidiabetic activity, Anti-metastatic activity, Antioxidant activity, Antiproliferative and Antiestrogenic activity, Analgesic and Anti-inflammatory activity, Antilymphoproliferative Activity, Anti-viral activity, Hepatoprotective Activity, Antibacterial Activity, Antistress & adoptogenic Activity, Nitric Oxide Scavenging Activity, Adaptogen Activity, Growth Inhibition of Struvite Crystals, Anti fibrinolytic activity, Chemopreventive action

Bilva^[8]

Antioxidant activity, Antifungal and Antibacterial activity, Anti-inflammatory activity, Antidiabetic activity, Hepato-protective activity, Anti-arthritis activity, Antidiarrheal activity.

Amalaki

Cytoprotective, immunomodulatory, prevent hepato and renal toxicity of heavy metals like lead and aluminium, hypolipidaemic,^[9,10] antioxidant^[11] mild CNS depressant, anti- atherosclerotic^[12] antiatherogenic^[13] anti-inflammatory, antidiabetic^[14]

antihypercholesterolaemic^[15] improves liver function^[16] adaptogenic^[17] analgesic^[18] possesses scavenging activity.^[19]

Ashwagandha

Adaptogenic^[20] attenuates nociceptive pain^[21] antidepressant^[22] antistress^[23] immunomodulatory^[24,25] free radical scavenger activity (antioxidant activity)^[26] reduces lipid peroxidation^[27] increases superoxide dismutase and catalase^[28] nootropic^[29] anxiolytic^[30] antiinflammatory^[31] hypoglycemic, diuretic^[32] hypocholestromaemic^[33] anti-apoptotic^[34] cardioprotective^[35] suppresses vascular endothelium growth factor (VEGF) induced neovascularization^[36] prevent osteoporosis^[37] prevents oxidative stress^[38] helps in regeneration of neural tissues^[39,40] improves memory impairment, neurite atrophy and synaptic loss in the cerebral cortex and hippocampus^[41] prevented loss of axons, dendrites, and synapses and causes regeneration^[42] antidiabetic^[43] hemopoietic and rejuvenating^[44] improves insulin sensitivity^[45] improves reduced locomotor activity and anxiety levels^[46] reduces elevated serum cholesterol, triglycerides, lipoprotein levels,^[47] anticoagulant, platelet antiaggregatory, lipoprotein lipase releasing,^[48] cytoprotective,^[49] increases Interferon gamma, IL-2 & Granulocyte macrophage colony stimulating factor, decreases TNF- α ,^[50] interleukin-1beta, cyclooxygenase & lipooxygenase.^[51] & other cell signaling intermediates, prevents glycation induced pathogenesis, prevents aging.^[52]

Lodhra^[53]

Management of Diabetic Complication, Antibacterial Activity, Anthelmintic effect, Anti-inflammatory activity, Anti-oxidant activity, Anti ulcer property, Hypolipidemic activity, Neuro supportive role, Hepato protective activity, Lipooxygenase and urease inhibitory activity

Tulsi^[54]

Anticancer activity, Chemopreventive activity, Radioprotective activity, Antioxidant activity, Antihypertensive and cardioprotective activities, Antimicrobial activity, Central Nervous System (CNS) depressant activity, Antiinflammatory activity, Analgesic activity, Antipyretic activity, Memory enhancer activity, Hepatoprotective activity, Antifertility activity, Antidiabetic activity, Antiulcer activity, Antiarthritic activity, Adaptogenic activity/antistress activity, Anticataract activity, Anticoagulant activity.

Bramhi^[55]

Anti Asthmatic Activity, Anti cancer activity, Anticonvulsive, Antidepressant, Anti inflammatory, Anti nociceptive activity, Antioxidant activity, Anti stress Activity, Anti Spasmodic Activity, Anxiolytic effect, Cardiovascular activity, Gastroprotective activity, Hepatoprotective activity, Learning and memory.

Manjistha^[56]

Anti-Inflammatory Effect:, Neuroprotective Properties, Antibacterial Activity, Hepatoprotective Activity, Anti Diabetic Property, Radioprotective Property,

Nephrotoxicity, Anti-proliferating Property, Protective effect, Antioxidant effect, Anti Ulcer Effect, Anti-Adipogenic Activity, Anti-HIV Activity, Wound Healing Effect, Anti-tumour activity.

Guduchi^[57]

Anti-stress activity, enhance verbal learning and logical memory, protects against neuro-degeneration, anti-inflammatory, mild analgesic effect, anti-allergic and bronchodilator, Antioxidant activity, effective in iron-mediated lipid damage and gamma-ray-induced protein damage, Antineoplastic and Radio-protective activity, Antipyretic, Anti-infective activity, hepato-protective activity, anti-hyperglycemic activity, immunomodulatory action, diuretic effects, cardio-protective, anti-leprotic activity in a combination formulation, Gastrointestinal and anti-ulcer activity, Antifertility Activity, anti-osteoporotic agent, increase the blood profile and has lead scavenging activity.

Vacha^[58]

Nootropic Activity, Anti-diabetic Activity, Anti-seizures Activity, Antidepressant Activity, Neuromodulatory Effect, Anticancer Activity, Antioxidant Activity, Antihypertensive Effect, Anti HIV Activity, Cytotoxic Effect, Immunosuppressive Activity, Radioprotection and DNA Repair Activity, Coronary Vasodilator Effect, Antispasmodic and Anti-diarrhoeal Effect, Insulin Sensitizing Activity, Wound-healing Activity, Anti-inflammatory Activity, Synergistic Anthelmintic Activity, Antihepatotoxic Activities, Anti-ischemic Heart Disease Activity, Antifungal Activity, Antibacterial Activity, Analgesic Effect, Antipyretic Activity, Bronchodilatory Activity, Licitidal Activity, Mosquito Larvicidal Activity, Repellent and Oviposition Deterrent Activity.

Ghritkumari^[59]

Antiinflammatory action, Anti-diabetic effects, Anti mutagenic effects, Anti-oxidant effects, Immunomodulatory effects, Antibacterial/ antifungal/ antiviral actions, Effect on gastric acid secretion and ulcers, Arthritis, Joint and Muscle Pain, Laxative effects, Antiseptic effect.

Honey^[60]

Antimicrobial Activity of Honey, Antibacterial Activity, Anti viral activity, Diabetic Benefits, Gastrointestinal Effects, Arthritis, Bladder Infections, Anti-cholesterol, skin infections, immune booster

Observation

Parameters	B.T.	A.T.
Avipaak	2	0
Klama	2	1
Utklesha	1	0
Tikta amla udgaar	3	1
Guruta	2	0
Hrit-Kantha Daha	3	1
Aruchi	2	0

DISCUSSION

There were remarkable changes in the grades of severity of amlapitta in the patient. The action of ingredients being hepato protective, gastro protective, antioxidant, anti stress and adaptogenic activity. By virtue of its properties, it pacifies aggravated pitta and thereby improves the digestion and metabolism. Due to the presence of above-mentioned properties, mokshayan helps in reducing the aggravated Pitta Dosha, stabilizes the state of Agni, helps in Ama Pachana (digestion of unmetabolised food), pacifies Vidagdhajirna and thereby improves digestion, absorption and assimilation, thus relieving the symptoms of Amlapitta.

One of the aetiology of amlapitta is mental stress & vice versa. The modern medicine has established that gastritis is resulting from the mental stress and strain which shows the imperative role played by the psychogenic factors, in the production of diseases like Amlapitta. so the ingredients mokshyana are having neuroprotective activity, anti stress activity, mild CNS depressant activity which gives relief in amlapitta due to mental stress or in mental stress due to amlapitta.

The role of mokshayan in relieving amlapitta is as important as to avoid apathya which includes avoiding oily spicy food, avoiding ratri jagran, specifically avoiding vegetables like potato, cauliflower, brinjal, lady finger, fenugreek & spinach as they all are having ushna guna property & thus increasing the pitta dushti.

Pathya includes specifically having vegetables like bottle gourd, ridged gourd, Indian round gourd & fruits like apples, avocados, coconuts, figs, melons, oranges, pears, plums, pomegranates.

However accuracy to the result can more justified with the large number of patients. In this study a single case study was selected because of the cost the medicine as it can't be afforded by a lower class or middle class patient.

REFERENCES

1. https://shodhganga.inflibnet.ac.in/bitstream/10603/86597/9/09_chapter%203.pdf.
2. Satyapal B, Kashyap samhita, vidyotini Hindi commentary, chaukhamba Sanskrit sansthan, Varanasi, 9th edition, chapter 16th amlapitta chikitsa adhikaar, 2004; 335.
3. Yogaratnakar, Hindi commentary by vaidya shri laxmipati shastri Ayurveda acharya, chaukhamba Sanskrit sansthan, Varanasi, uttarardha, amlapittanidaanam, 2009; 134.
4. Bhaisajya ratnawali, chaukhamba Sanskrit sansthan, Varanasi, 56th chapter, amlapitta chikitsa prakaranam, 1998; 332.
5. Study On Clinical Efficacy Of Avipattikar Choorna And Sutasekhar Rasa In The Management Of Urdhwaga Amlapitta.
6. https://www.researchgate.net/publication/332978011_pharmacological-activities-of-turmeric-curcuma-longa-linn-a-review-2167-12061000133.
7. https://www.researchgate.net/publication/266573574_Pharmacological_Potential_of_Boerhaavia_diffusa_An_Overview?enrichId=rgreq-336ffc1e27ae98c4029d9e39d16edfc4-XXX&enrichSource=Y292ZXJQYWdlOzI2NjU3MzU3NDtBUzoXOTYzMTEyMTIxMzg1MTFAMTQyMzgxNTY0ODkzMw%3D%3D&el=1_x_3&_esc=publicationCoverPdf.
8. PHARMACOLOGICAL INVESTIGATIONS ON BAEL (AEGLE MARMELOS LINN.).
9. Tandon N, Sharma M, Eds. Quality Standards of Indian Medicinal Plants, Vol. 8, New Delhi, Indian Council of Medical Research, 2010; 170.
10. Antony B, Merina B, Sheeba V, Mukkadan J, Effect of standardized Amla extract on Atherosclerosis and Dyslipidemia, *Ind J of Pharmaceutical Sciences*, 2008; 437-441; downloaded from www.ijpsonline.com on 5-8-09.
11. Rao TP, Sakaguchi N, Juneja LR, Wada E, Yokozawa T, Amla (*Emblca officinalis* Gaertn.) extracts reduce oxidative stress in streptozotocin-induced diabetic rats. *J Med Food*, 2005; 8(3): 362-8. PMID 16176148.
12. Sharma PC, Yelne MB, Dennis TJ, Eds., Database on Medicinal Plants used in Ayurveda, Vol 3, New Delhi, CCRAS, 2005; 14.
13. Duan from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2005.
14. Ganju L, Karan D, Chanda S, Srivastava KK, Sawhney RC, Selvamurthy W, Immunomodulatory effects of agents of plant origin, *Biomed Pharmacother*, 57(7): 296-300. PMID 14499177.
15. Jacob A, Pandey M, Kapoor S, Saroja R, Effect of the Indian gooseberry (*amla*) on serum cholesterol levels in men aged 35-55 years. *Eur J Clin Nutr*, 1988; 42(11): 939-44. PMID 3250870.
16. Qureshi SA, Asad W, Sultana V, The Effect of *Phyllanthus emblica* Linn on Type - II Diabetes, Triglycerides and Liver - Specific Enzyme, *Pakistan Journal of Nutrition*, 2009; 8(2): 125-128.
17. Rege NN, Thatte UM, Dahanukar SA, Adaptogenic properties of six *rasayana* herbs used in Ayurvedic medicine, *Phytotherapy Research*, 13(4): 275 - 91.
18. Perianayagam from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2004.
19. Kumaran from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2006.
20. Rege NN, Thatte UM, Dahanukar SA, Adaptogenic properties of six *rasayana* herbs used in Ayurvedic medicine, *Phytotherapy Research*, 13(4): 275 - 91.
21. Roughani M, Balouchnezhad MT, Khalili M, Mahdavi SSF, Evaluation of the effect of chronic oral administration of *Withania somnifera* root on

- pain score in male diabetic rats, *Scientific Medical Journal*, 2007; 6(2 (53)): 168-174.
22. Tripathi A.K, Dey S; Singh R.H; Dey P.K. Alterations in the sensitivity of 5th receptor subtypes following chronic Asvagandha treatment in rats, *Ancient Sciences of Life*, 1998; 17(3): 168-181.
 23. Bhattacharya S.K, Goel R.K, Kaur R, Ghosal S, Anti-stress activity of Sitoindosides VII and VIII, new Acylsterylglucosides from *Withania somnifera*; *Phytotherapy Research*, 1987; 1(1): 32-37.
 24. Ghosal S, Lal J, Srivastava R, Bhattacharya S.K, Upadhyay S.N, et al., Immunomodulatory and CNS effects of Sitoindosides IX and X, Two new Glycowithanolides from *Withania somnifera*; *Phytotherapy Research*, 1989; 3(5): 201-206.
 25. Rasool M, Varalakshmi P, Immunomodulatory role of *Withania somnifera* root powder on experimental induced inflammation: an *in vivo* and *in vitro* study. *Vas Pharmacol*, 2006; 44: 406-10.
 26. Panda S, Kar A, Evidence for free radical scavenging activity of Ashwagandha root powder in mice; *Ind. J. Physiol. Pharmacol.*, 1997; 41(4): 424-426.
 27. Dhuley, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 1998.
 28. Panda, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 1997.
 29. Bhattacharya S.K, Kumar A, Ghosal S, Effects of Glycowithanolides form *Withania somnifera* on an animal model of Alzheimer's Disease and perturbed Central Cholinergic Markers of Cognition in rats; *Phytotherapy Research*, 1994; 8: 1-4.
 30. M Ramanathan, J Srinivasan, C Saravanababu, B Viswanad, B Suresh, Comparative behavioral activity of methanolic and aqueous *Withania somnifera* root extracts in stressed rats, *IJPS*, 2003; 65(6): 601-4.
 31. Kulkarni SK, Akula KK, Dhir A, Effect of *Withania somnifera* Dunal root extract against pentylenetetrazol seizure threshold in mice: Possible involvement of GABAergic system. *Ind J Exp Biology*, 2008; 46: 465-9.
 32. Andallu, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2000.
 33. Visavadia NP, Narasimhacharya AVR, Hypocholesteremic and antioxidant effect of *Withania somnifera* (Dunal) in hypercholesterolemic rats. *Phytomedicine*, 2007; 14: 136-42.
 34. Mohanty, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2008.
 35. Kulkarni SR, Geoge B, Mathur R. Protective effect of *Withania somnifera* root extract on Electrographic activity in lithium-pilocarpine model of status epilepticus. *Phytother Res.*, 1998; 12: 451-3.
 36. Mathur R, Gupta SR, et.al. Evaluation of the effect of *Withania somnifera* root extract on cell cycle and angiogenesis. *J Ethnopharmacol*, 2006; 105: 336-41.
 37. Nagareddy PR, Lakshmana M, *Withania somnifera* improves bone calcification in calcium deficient ovariectomised rats. *J Pharm Pharmacol*, 2006; 58: 513-519.
 38. Bhattacharya A, Ghoshal S, Bhattacharya SK, Anti oxidant effect of *Withania somnifera* glycowithanolides in chronic footshock stress-induced perturbation of oxidative free radical scavenging enzymes and lipid peroxidation in rat frontal cortex and striatum. *J Ethnopharmacol*, 2001; 74: 16.
 39. Kulkarni, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2008.
 40. Singh, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2008.
 41. Tohda c from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2008.
 42. Kuboyama, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2005, 2006.
 43. Modak, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2007.
 44. Mishra, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2000.
 45. Anwer, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2008.
 46. Kumar, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2007.
 47. Hemalatha from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2006.
 48. Mary, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2003.
 49. Shukla, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2000.
 50. Davis, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 1999.
 51. Khanna, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2007.
 52. Babu, from <http://www.herbmed.org/Herbs/Herb221.htm> retrieved on 2/21/2011, 2007.
 53. International Journal of Pharmaceutical & Biological Archives, 2015; 6(1): 1 – 7. Lodhra- A Single Remedy For Different Ailments Pooja Singh*1, Rajeev Singh2 , L N Gupta3, Neeraj Kumar4 1 Junior resident, Dept. of Rasa Shastra; 2 Junior resident, Dept. of Shalya Tantra; 3 Asst. Professor, Dept. of Rasa Shastra; 4 Professor, Dept. of Rasa Shastra; Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University Received 09 Sep 2014; Revised 08 Jan 2015; Accepted 19 Jan, 2015.
 54. TY - JOURAU - Pandey, Govind AU - Sharma, Madhuri PY - 2014/12/31SP - T1 - Pharmacological activities of Ocimum sanctum (Tulsi): A review VL - 61 JO - International Journal of Pharmaceutical Sciences Review and Research ER.
 55. https://www.researchgate.net/publication/296549746_Critical_review_on_pharmacological_properties_of_Brahmi.
 56. <https://ijpsr.com/bft-article/rubia-cordifolia-a-review-on-pharmacology-and-phytochemistry/?view=fulltext>.

57. Role of Medhya Rasayana in the management of Dementia of the Alzheimer's type – An open trial.
58. Sweet flag (*Acorus calamus* Linn.): An incredible medicinal herb Hashmat Imam, Zarnigar Riaz, Mohd Azhar, Ghulamuddin Sofi¹, Azad Hussain² Departments of Preventive and Social Medicine, 1 Pharmacology, and 2 Moalajat, National Institute of Unani Medicine, Bangalore, Karnataka, India.
59. <http://globalresearchonline.net/journalcontents/v29-2/07.pdf>.
60. https://www.researchgate.net/publication/308694961_Pharmacology_of_Honey_A_Review.