

## A Literature Review on Mutalazma Bad Az Inqta-e-Tams (Post-Menopausal Syndrome) in Unani System of Medicine

Rabia kashfi<sup>1</sup>, Shahana Ayub<sup>2</sup>

<sup>1</sup>Assistant prof. dept. of Amraz-e-nswan wa Qabalat, Z.H Unani medical college & Hospital, Siwan, Bihar

<sup>2</sup>Assistant prof. dept. of Amraz-e-nswan wa Qabalat, A & U Tibbia college & Hospital, Karolbagh, New Delhi

### Abstract:

Sinn-e-yaas (Menopause) is the age at which there is natural cessation of menstrual periods. It is defined as the permanent cessation of menses. However, the manifestations that occur around the time of menopause are caused by the underlying ovarian changes, rather than by the absent of menstruation. All women who live beyond the age of 55-60 years and many young agers experience a period of transition from reproductive to non-reproductive life. Post-menopausal syndrome is a common condition that affects women during the transition from reproductive age to menopause. Unani System of Medicine is based on principles of natural healing and emphasizes the importance of balancing the four humours: blood, phlegm, yellow bile and black bile. The whole human body is divided in to four age groups, which are considered to carry their particular mizaj. Unani system of medicine is enriched with the concept of ehtibas-e-haiz (amenorrhoea) but there is no exact description of menopause, nevertheless it may revealed under ehtibas-e-tams and can be correlated with Sinn-e-Yaas (age of natural termination of menstruation). It is believed that, ehtebas-e-haiz (stoppage of menses) in women of this age occurs naturally due to change of mizaj. Symptoms are : Hot flushes, excessive sweating, dysuria, oliguria, dryness of vagina, Indigestion, anorexia, gastritis and ascites, epilepsy, headache, paralysis, hysteria, palpitation, fatigue, cough, asthma, backache, neck pain. As per Unani Physicians, Mutalazma bad az inqtae tams (Post-menopausal syndrome) can be managed with the drugs possessing the properties like Muhalil (anti-inflammatory), Musafi-e-khoon (blood purifier), Dafa-e-Tashanuj (antispasmodics), Muqawiyat reham (uterine tonics), Monawwim, Musakkin.

**Keywords:** *Mutalazma bad az inqtae tams, post-menopausal syndrome, mizaj, unani drugs.*

### Introduction:

Sinn-e-yaas (Menopause) is defined as the permanent cessation of menses. By convention the diagnosis of menopause is not made until the individual has had twelve months of amenorrhoea. Menopause is the age at which there is natural cessation of menstrual periods. All women who live beyond the age of 55-60 years and many young agers experience a period of transition from reproductive to non-reproductive life. Post-menopausal syndrome is a common condition that affects women during the transition from reproductive age to menopause. Menopause is not just cessation of menstruation it is "Depletion of Ovarian follicles" leading to decrease in ovarian hormones. Menopause is characterised by the menstrual changes such as oocyte depletion and subsequent reduction in ovarian hormone production. However, the manifestations that occur around the time of menopause are caused by the

underlying ovarian changes, rather than by the absent of menstruation.<sup>1</sup> The condition is characterised by a variety of symptoms including hot flashes, vaginal dryness, insomnia, mood changes and osteoporosis. Modern medicine offers various treatment to manage these symptoms. Traditional systems of medicine such as Unani offer a holistic approach to managing post-menopausal syndrome. It is an ancient healing system that originated in Greece and was later adopted and developed by Islamic scholars. It is based on principles of natural healing and emphasizes the importance of balancing the four humours: blood, phlegm, yellow bile and black bile. The whole human body is divided in to four age groups, which are considered to carry their particular mizaj.<sup>2</sup> Unani system of medicine is enriched with the concept of ehtibas-e-haiz (amenorrhoea) but there is no exact description of menopause, nevertheless it may revealed under ehtibas-e-tams and can be correlated with Sinn-e-Yaas

(age of natural termination of menstruation). Basic fundamentals of Unani system divide human life into four stages which are as follows:

1. Sinn-e-Namu (up to 30 years of age, Har Ratab Mizaj)
2. Sinn-e-Shabab (30-40 years of age, Har Yabis Mizaj)
3. Sinn-e-Kahulat (40-50 years of age, Barid Yabis Mizaj)
4. Sinn-e-Shaikhukhat (above 50 years of age, Barid Yabis Mizaj)<sup>3</sup>

The age group of 35-60 years is known as sinn-e-kahulat in which mizaj becomes barid (cold) and yabis (dry). In this age, production of ratubat-e-unsurya are decreased, to that extend that they are insufficient to maintain Hararat-e-unsurya and all the quwa (power) starts deteriorating<sup>4</sup>. It is believed that, ehtebas-e-haiz (stoppage of menses) in women of this age occurs naturally due to change of mizaj<sup>5</sup>. It was the Hippocrates (460-377BC) who firstly postulated the concept of disease is due to the imbalance of humors<sup>6,7,8,9</sup>. He mentioned in his book Tabiat-ul-insaan (Human Nature) Khilat-e-Sauda (Black Humour) is barid and yabis and elderly person are barid and yabis by temperament so it is dominant in this age group<sup>4,10</sup>. Tabaie sin-e-yaas (Natural Menopause) is attained at the age of 40 years, sometimes 60 years. The earliest reference of menopause come from Ebbes Papyrus a series of Egyptian text 1500 BC<sup>11</sup>. Aristotle says menstruation normally ceases at the age of 40 years<sup>12</sup>. Unani medicine recommends a combination of dietary modification life-style changes and herbal remedies to manage the symptoms of post-menopausal syndrome. The Unani medicine emphasize the consumption of foods that are rich in phytoestrogen such as soy, chickpeas, lentils and flaxseeds etc. These foods contains compounds that mimic the effects of oestrogen, which can help alleviate hot flashes and other symptoms associated with menopause.

### Aetiopathogenesis:

In Unani Medicine, the pathogenesis of general diseases has been attributed to three factors that is mizaj (temperament), tarkeeb (structure) and ittisal (continuity of tissues). Abnormalities of these factors are considered as: su-e-Mizaj (altered temperament),

su-e-Tarkeeb (altered structure) and tafarruq-e-Ittesal (discontinuity in tissues) respectively<sup>13,14</sup>. Mizaj is a specific and distinct state of an individual reflecting neuro-endocrine, normal menstruation genitometabolic and somato-environmental equilibrium at the optimum functional level of adjustment<sup>15</sup>. Unani medicine, as is well known, based on the Hippocratic humoral theory. This theory supposes the presence of four humours in the body which is: blood, phlegm, yellow bile and black bile. The mizaj of individual are expressed by word damwi (sanguine), balghami (phlegmatic), safrawi (choleric) and saudawi (melancholic) according to the dominancy of the humour. Every person is supposed to have a unique humoral constitution which represents his healthy state and any change in this state causes illness of the person. The severity of the disease depends directly upon the change in equilibrium from mizaj<sup>16</sup>. Most of the Unani scholar are of the opinion that change in the temperament towards the barid and yabis (sauda) is the leading cause of ehtibas-e-tams (amenorrhea) at menopause.

**Symptoms:** According to Ibn-e-sina following sign and symptoms occur during menopause<sup>17</sup>: Vasomotor symptoms: Hot flushes, excessive sweating<sup>18,19</sup> Genitourinary disorders: Dysuria, oliguria & dryness of vagina<sup>19</sup>. Gastrointestinal disorders: Indigestion, anorexia, gastritis and ascites<sup>20</sup> CNS disorders: Epilepsy, Headache, Paralysis, Hysteria<sup>21</sup> Cardio-vascular disorders: Palpitation, fatigue<sup>18,19</sup> Respiratory system disorders: Cough, Asthma<sup>21</sup> Musculoskeletal system: Backache, neck pain.<sup>19</sup>

Post-menopausal bleeding most women this happens around age 51, although it can vary from about ages 47 - 55. Some women find their periods stop quite suddenly and in others, the changes happen over the years with the periods becoming gradually lighter and/or some periods being missed occasionally. Once a woman has not had a period for twelve months, she is said to be menopausal (or post-menopausal). The menopause happens because the ovaries are no longer producing eggs or large amounts of the female hormones called oestrogen and progesterone that leads to changes such as endometrial atrophy (a thinning of uterine lining), vaginal atrophy, fibroids, or endometrial polyps. Vasomotor instability or menstrual irregularity to menstrual cessation, weight gain, skin and hair changes, genital prolapse, urogenital atrophy,

osteoporosis and fracture, cardiovascular disease, cerebrovascular disease, late psychological symptoms, sexual disorders, dementia and cognitive decline. Hot flush is characterised by sudden feeling of heat followed by profuse sweating. Oestrogen deficiency produces atrophic epithelial changes in genito-urinary organs. This may cause dyspareunia and dysuria. The urinary symptoms are – urgency, dysuria, recurrent urinary tract infection and stress incontinence. Oestrogen is often associated with decreased sexual desire and is thought to protect the function of central nervous system. Dementia and mainly Alzheimer disease are more common in postmenopausal women.<sup>1,22</sup>

### Management:

As described, alteration of mizaj of body is one of the fundamental factors which make body to stop physiological cyclical bleeding process accompanied with stressful symptoms<sup>23</sup>. In management of symptoms of menopause, our main motto is how to facilitate tabiyat for attaining the physiological mizaj of patient. Every human being has a specific Mizaj through which organs and systems of an individual perform his functions properly. Internal and external factors influence the human body leading to Su-e-Mizaj (altered/pathological temperament) that ultimately affect the whole body or a specific organ in the form of disease. The Unani principle of management of disease is to correct the altered temperament. Therefore, before commencing any treatment, Mizaj of a patient or organ has to be evaluated.<sup>24</sup>

Menopausal symptoms can be corrected by following approach.

1. Ilaj bil-Ghiza
2. Ilaj bit-Tadbeer
3. Ilaj bil-Dawa

**Ilaj-bil-ghiza (Dietotherapy):** Post-menopause occurs at the age of sinn-e-kahulat and that time temperament to be cold and dry. During menopause hot & moist diet is recommended for correction of temperament. Thus use of that diet (ghiza) which has hot and moist temperament.

Gram (*Cicer arietinum* Linn): It is hot in temperament, Isoflavones are important components in chickpea seeds and sprouts. They contain at least the following 8 phytoestrogens: biochanin A, formononetin, genistein, biochanin A-7-o-beta-D-glucoside, calycosin, trifolirhizin, onon and sissotrin. Which exhibits strong estrogenic effects, hyperlipidemic activity including stimulating uterine growth and preventing bone loss.<sup>25,26,27</sup> Seed contains pan gamic acid which has anti-stress, anti-hyperlipidemic properties.<sup>28</sup> Hence useful in postmenopausal depression and prevents cardiovascular disorders.

Honey: it is hot in temperament and contains flavonoids and has anti-bacterial, anti-inflammatory, vasodilators, anti-oxidant, anti-inflammatory and thrombotic properties.<sup>29,30</sup>

Soy: Soy foods are a unique and abundant source of isoflavones. Isoflavones are part of a group of plant based chemicals called phytoestrogens. Oestrogen plays a role in preserving bone strength. That's why risk of developing osteoporosis increases during menopause but soy may be helpful for preserving bone health in those whom gone through menopause.

### Ilaj-bit-tadbeer (Regimenal therapy):

Patient should take complete rest. At menopausal age a vast variety of free radicals are present in the body which is harmful. Motadil Riyazat (moderate exercise) is advised to elder people to overcome this situation. International menopausal society recommended at least 150 minutes of moderate-intensity exercise per week, it produce musakhin effect to body and it expels harmful substances from body, reduce hot flushes, enhance immunity, improves mood and quality of life and prevent chronic diseases like hypertension, diabetes mellitus, and osteoarthritis etc.<sup>31</sup>

Dalak motadil (moderate massage) with hot oil is recommended by Unani physician in post-menopause.<sup>32</sup> Study conducted by Oleivira et al. suggested that therapeutic massage is beneficial for improving subjective sleep quality, depression and anxiety in post-menopausal women. It produce taskheen in the body like roghan zaitoon, roghan badam, roghan narjeel etc.

Hijama is also indicated in obese women. Natool, hammam and inkabab also recommended.<sup>31</sup>

### Ilaj-bil-dawa (Pharmacotherapy):

**Phytoestrogens:** It also called dietary oestrogens are a diverse group of non-steroidal plant derived polyphenolic compounds. Which exhibits structural similarity and mimic the effect or modulate the actions of endogenous oestrogens usually binding to oestrogen receptors.<sup>33</sup> In vivo study suggested that phytoestrogens can affect the regulation of ovarian cycles, promotion of growth, differentiation and physiological functions of female genital tract, pituitary, breast, several other organs and tissues<sup>33</sup>. According to British Menopausal Society 2013 phytoestrogens consumption provide relief from perimenopausal vasomotor symptoms such as hot flushes, night sweats<sup>34</sup>.

In modern system of medicine, the drugs used for the management of Mutalazma bad az inqtae tams (Post-menopausal syndrome) have several limitations. Most of these drugs having potential adverse effects and producing only symptomatic relief.

In view of the above, it is evident that there is a need to develop a medicine from the herbal source which would be safe, less costly, more effective, easily available and efficacious for the treatment of Mutalazma bad az inqtae tams (Post-menopausal syndrome). As per Unani Physicians, Mutalazma bad az inqtae tams (Post-menopausal syndrome) can be managed with the drugs possessing the properties like *Muhalil* (anti-inflammatory), *Musafi-e-khoon* (blood purifier), *Dafa-e-Tashanuj* (antispasmodics), *Muqawiyat reham* (uterine tonics), *Monawwim*, *Makin*.

Following are the list of Unani drugs which possess different types of phytoestrogens and used in alleviating post-menopausal symptoms.

#### *Punica granatum*



1. Anar/Pomegranate (*Punica granatum*): It is a nutrient dense fruit rich in phytochemical compounds.<sup>35</sup> Some plants contains distinct families of phytochemicals, which are structurally similar to steroid hormone. These compounds are termed as phytoestrogens.<sup>36,37</sup> Phytoestrogens have captured major research and clinical attention due to its effectiveness in the prevention of peri-menopausal and menopausal symptoms, over hormone replacement therapy (HRT).<sup>38</sup>

#### *Asparagus racemosus*



2. Satavar (*Asparagus racemosus*): *Asparagus racemosus* mainly known for its phytoestrogenic properties. The major active constituents of *Asparagus racemosus* saponins which are present in roots. It has antioxidant, anti-stress, anti-diarrhoeal, anti-dyspepsia, anti-ulcerogenic, and Cardio-protective actions.<sup>28,33</sup>



Fennel (Saunf)



3. Badiyan/saunf/Fennel (*Foeniculum vulgare*): It has properties posses anti-oxidant, anti-inflammatory, anti-thrombotic, anti-diabetic, hepatoprotective. In vivo study has shown that ethanolic extract of *foenaculum vulgare* possesses osteoprotective effect in post-menopausal women.<sup>39,40</sup>

*Trigonella foenum*



4. Methi/Fenugreek (*Trigonella foenum*): Fenugreek has a broad range of pharmacological profile but also it has antidiabetic, antispasmodic, hypo-lipidemic, immunological, antibacterial, anthelmintic, anti-inflammatory, analgesic and antioxidant activity. Fenugreek is used to ease child birth as well as it helps to increase the milk flow of mother. The consumption of both fenugreek seed powder and extract is associated with the reduction of both the frequency and intensity of hot flashes.<sup>41,42</sup> Egyptian women are still taking Fenugreek for menstrual pain and tourist use it as hilba tea to remove stomach problem. As medicinal plant it shows its activity against allergies, appetite / loss of

catarrh, bronchial, cholesterol, diabetic retinopathy, gas, gastric disorders, lung infections, mucus excessive, throat/sore, abscesses, anaemia, asthma, boils, body odour, bronchitis, cancer, swollen eyes, fevers, gallbladder problems, heartburn, inflammation, sinus problems, ulcers, uterine problems etc. A study in India showed that Fenugreek seed is used to reduce the blood sugar and other harmful fats.<sup>43,44,45</sup>

*Linum usitatissimum*



5. Katan/Flax seeds/Linseed (*Linum usitatissimum*): Flaxseed is one of the richest of sources of phytoestrogens to reduce menopause complaints of menopausal women.<sup>46</sup> To consume phytoestrogen-rich soy products and diet products containing flaxseed in 145 women suffering from menopause during the 12- weeks shows significant reductions in menopausal symptoms of women.<sup>47</sup>

*Nardostachys jatamansi*



6. Sumbul-ut-teebe (Nardostachys jatamansi): Sumbul-ut-teebe is used as farzaja (vaginal suppository) for both kasrat-e-tams (menorrhagia)<sup>48</sup> and ihtibas-e-tams (amenorrhoea) and is helpful in maintaining pregnancy.<sup>49,50</sup>

Pharmacological studies also reported its antioxidant activity, hepato and renal protective properties.<sup>51,52</sup> This drug also contains phytoestrogens. It helps in relieving vaso-motor-symptom in post-menopausal women. This drug also possesses Emmenagogue, Antispasmodic, Stomachic, Diuretic, Depressant of CNS, Tonic, Deobstruent, Laxative, Aromatic adjunct, Antiseptic, Anti-arrhythmic, anticonvulsant, hepatoprotective, anti-diabetic, and Hypotensive antifungal properties.<sup>53</sup> Night sweats occur due to the action of heartat-e-gharizia on the morbid material which accumulates in the body due to cessation of menstruation. It has munaqqi action hence excretes morbid material from the body and its muqawwi jigar property it processes the food to form akhlat-e-salha (good quality) and decreased the production of morbid material, hence sweating was relieved.<sup>49,50,54</sup>

**Conclusion:** Menopause is the natural process which influences the fluctuation in physiological events lead to various problems in elderly women known as menopausal syndrome. Long-term hormonal deficiencies in post-menopausal women affect various organs of the body. Hormone replacement therapy (HRT) is the most common preferred treatment option in modern medicine but it has so many side effects. Unani System of medicine is enriched with herbs containing phytoestrogens. These herbs manage the menopausal syndrome symptomatically with suitable results without any side effect. But evidence based study need in future for confirming the claim.

## References:

1. Kumar P, Malhotra N. Jeffcoate's Principles of Gynaecology. 7th ed. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2008: 862-63.
2. Sayyad Kamal Uddin Hussain hamdani, usool-e-tib, qaumi konsil bra-e-frogh urdu zaban; 2015: 33-34.
3. Ahmad HSI, Al-Umoor Al - Tbiyah (Principles of human physiology in tibb) 1st ed. CCRUM 2009; 44, 129
4. Mazhar H. Shah(1998). The general principles of Avicenna's canon of Medicine 2nd edit Karachi Naveed. clinic; 37,46, 348, 378-79.
5. Ahmed S.IKulliyate Asri Delhi (1983) New public sector p.63- 65.
6. . Evans K, McGrath J, Milns R (2003). Searching for schizophrenia in ancient Greek and Roman literature:a systematic review. Acta Psychiatrica Scandinavica; 107: 323- 330.
7. Qadeer A(2005). Tareekh Tibwo Akhlaqiyat. 3rd ed. Delhi: Rabbani Printers; 32-41, 73-77.
8. Alqifti J(1231 H). Tareekh Al Hukama (Urdu Translation).PNM;140-146.
9. Zillurrahman S(2001). Aainah Tareekh Tib. Aligarh: Muslim University Press; 9-17.
10. Kabeeruddin M(1954). Burhanuddin Nafees Tarjama Kulliyate Nafeesi part 1Delhi kitabushshifa; 252-53.
11. Magner LNA History of Medicine New York; Marcel Dekker;33-34.
12. Aristotle (1897). Historia Animalian Book viic. 350bc Translated by cres Well R London; George Bell and sons ; 33- 35.
13. Kbeeruddin M (1954). Kulliyate Nafeesi. New Delhi: Idara Kitabul Shifa; 100-106, 123-151, 161- 166.
14. Kbeeruddin M (1930). Tarjumawo Sharah Kulliyate Qanoon. Vol.1st.Delhi: Barqi Press; 120-155, 162-174.
15. Zaidi IH (1999), Zulk M, Ahmad S N. Tempramentology: A Scientific Appraisal

- of Human Temperament. Aligarh: Dept. of Kulliyat AMU; 1-11.
16. Anonymous (1973). Theories and Philosophies of medicine. 2nd ed. New Delhi: Institute of history of medicine and medical research; 84, 89-91, 118-121.
  17. Kantoori GH (1930). Tarjam Qanoon. Vol 2, Lakhnow. Nawal Kishore: 57.
  18. Azam, H.K.M. 2011. Akseere Azam. Idara Kitabul Shifa, New Delhi, p. 798.
  19. Ibn, Sina. 2010. Al Qanoon Fil Tibb (Urdu trans by kantoori GH), Eijaz Publication house, New Delhi; 154, 1096-1097
  20. Razi, A.B.Z. 2001. Al Hawi Fil Tibb. Central Council of Unani Medicine, New Delhi. P. 154.
  21. Tabri, R.A.A. 2010. Firdousal Hikmat. Idara Kitabul Shifa, New Delhi, p. 255
  22. DC Dutta, A textbook of Gynaecology, 6<sup>th</sup> ed. 2013;
  23. Unani J. Third consensus meeting of Indian Menopause Society 2008; a summary. J Midlife Health. 2010 Jan-Jun; 1(1): 43-47
  24. Sussman M et al. Prevalence of menopausal symptoms among mid-life women: findings from electronic medical records. BMC Women's Health (2015) 15:58.
  25. Waldman TN. Menopause: when HRT is not an option. Part 2 J Women Health 1998;7: 673-83
  26. Barnabei VM, Grady D, et al. Menopausal symptoms in older women & the effects of treatment with hormone therapy. Obstetric Gynecol 2002; 100: 1209-18
  27. Zava DT, Dollbaum CM, Blen M. Estrogen and progestin bioactivity of foods, herbs and spices. Pro Soc Exp Biol Med 1998; 217:369-78.
  28. Khare, CP. 2007. Indian Medicinal Plants, Springer, Heidelberg, p.51, 67, 68, 145, 163, 165, 377, 401, 527, 676, 599, 711
  29. Itrat, M. and Zarnigar, Hadue, N. 2013. Concept of Aging In Unani Medicine. International Journal of Research in Ayurveda., 4: 450-462.
  30. Yaacob, L., Kadir, AA. and Sulaiman, S.A. 2013. Safety of money in postmenopausal women. International Medical Journal, 20: 25-28.
  31. Bhat S.A et al. Understanding Basics of Menopause in Greco-Arab Medicine; A Review Public Health and Preventive Medicine vol 1; 2015; 58-61.
  32. Villiers, De., Pines, A., Panay, N., Gambaccian, M. 2013. Updated 2013 International Menopause Society recommendations on menopausal hormone therapy and preventive strategies for midlife health. Climacteric, 16: 316-337.
  33. Ashajyothi, A., Rao, S. and Satyavati, D. 2009. Asparagus Racemosus: A Phytoestrogen. International journal of Pharmacy & Technology, 1(1): 36-47.
  34. Patisaul, H.B. and Jefferson, W. 2010. The pros and cons of phytoestrogens. National Institute of Health. 31 (4): 400-419.
  35. M. G. Miguel, M. A. Neves, and M. D. Antunes, "Pomegranate (*Punica granatum* L.): a medicinal plant with myriad biological properties—a short review," Journal of Medicinal Plant Research, vol. 4, no. 25, pp. 2836-2847, 2010.
  36. M. I. Elghamry and I. M. Shihata, "Biological activity of phytoestrogens. 3. Experimental studies on some biological properties of beta-sitosterol," Planta Medica, vol. 14, no. 3, pp. 352-357, 1966.
  37. S. Barnes, "Phytoestrogens and breast cancer," Bailliere's Clinical Endocrinology and Metabolism, vol. 12, no. 4, pp. 559-579, 1998.
  38. M. G. Glazier and M. A. Bowman, "A review of the evidence for the use of phytoestrogens as a replacement for traditional estrogen replacement therapy," Archives of Internal Medicine, vol. 161, no. 9, pp. 1161-1172, 2001.
  39. Kataoka H, Horiyama S, Yamaki M, Oku H, Ishiguro K, Katagi T, et al. Anti-inflammatory and anti-allergic activities

- of hydroxylamine and related compounds. Biol Pharm Bull. 2002; 25(11):1436-41.
40. Singh G, Maurya S, Lampasona MN. Chemical constituents, antifungal and antioxidative potential of *Foeniculum vulgare* volatile oil and its acetone extract, Food Control, 2006, 745–752.
41. U.C.S. Yadav *et al.* Pharmacological effects of *Trigonella foenum-graecum* L. in health and disease Pharm. Biol. (2014)
42. D.T. Nathiya S *et al.* Therapeutic role of *Trigonella foenum-graecum* [Fenugreek] – a review Int. J. Pharm. Sci. Rev. Res. (2014)
43. Youssef M, Wang Q, Cui S, Barbut S. Purification and partial physicochemical characteristics of protein free fenugreek gums. Food Hydrocolloid. 2009;23(8):2049- 2053.
44. El Nasri NA, El Tinay A. Functional properties of fenugreek (*Trigonella foenum graecum*) protein concentrate. Food Chem. 2007;103(2):582-589.
45. Naidu M, Shyamala B, Naik JP, Sulochanamma G, Srinivas P. Chemical composition and antioxidant activity of the husk and endosperm of fenugreek seeds. Food Sci Technol-Leb. 2011;44(2):451- 456
46. Soldamli, V., and S.F., Arslanoglu, Phytoestrogenic Plants; How Much Should Be Consumed? International Journal of Life Sciences and Biotechnology, 2019. 2(3): p. 183- 204.
47. Brezinski, A., et al., Short-term effects of phytoestrogen-rich diet on postmenopausal women. Menopause, 1997. 4: p.89-94.
48. IbnSina. Al Qanoon fit tib (Urdu trans. by Kantoori GH). Vol-II , Vol-III. New Delhi: Idarae kitabul shifa; 2007: 413-414, 1094-1103.
49. Ghani MN. Khazainul advia. New Delhi: Idara kitab-ul-shifa; YNM: 232-233
50. Kabeeruddin M. Khasul-advia. New Delhi: Aijaz publishing house; YNM: 356-357.
51. Dugaheh MA., et al. “Antioxidant effect and study of bioactive components of valeriana *sisymbriifolia* and *Nardostachys jatamansi* in comparison to valeriana *officinalis*”. Pakistan Journal of Pharmaceutical Sciences 26.1 (2013): 53-58.
52. Ali S., et al. “*Nardostachys jatamansi* protects against liver damage induced by thioacetamide in rats”. Journal of Ethnopharmacology 71.3 (2000): 359-363.
53. Rastogi RP and Mehrota BN. “Compendium of Indian medicinal plants”. Volume I. New Delhi: National institute of science communication 1 (1999): 286-287.
54. Ibn Baitar. “Al jamaul mufridatul advia wal aghzia”. Part 3. New Delhi: CCRUM (1999): 88-91.