

## Skin Aging Remedies in Traditional Persian Medicine

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**Context:** Traditional Persian Medicine (TPM) is an ancient temperamental medicine with a rich literature about aging mechanism. Temperament has an important function in maintaining the ideal healthy status of human body. Aging process and skin aging could be postponed by applying herbal medicine and some specific traditional rules.

**Evidence Acquisition:** The aim of this review study was gathering and discussing the mechanism of whole body aging and skin aging from perspective of TPM and introducing remedies to prevent it. Skin aging is caused by external and internal factors. According to TPM, loss of fat and water content in different skin layers is the main cause of skin aging and it could be avoided by considering simple essential commands.

**Results:** Skin aging begins with whole body aging process and entire body gets cold and dry in elderly. Wrinkle formation is highly associated with loss of "skin natural moisture". In the management, specific food supplements, simple massage therapy as well as herbal drugs were suggested. The current investigation was performed to show the knowledge of ancient Iranian scientists on aging process and related interventions.

**Conclusions:** Reported herbal drugs might be beneficial for further studies for the management of skin aging and aging process.

**Keywords:** Skin Aging; Medicine, Traditional; Prevention

### 1. Context

Skin is representative of all internal organs and is the first barrier against external stressors. Although environmental factors like sunlight, air pollution, seasonal changes (especially extreme cold or hot weather), chemical and mechanical stimulation are the main causes of skin aging, internal factors such as genetic, malnutrition, obesity, alcohol consumption, smoking, etc. via the production of free species of oxygen can speed up the process of aging (1-3).

In general, it seems that disruption in homeostasis can influence skin aging (4). Although sunscreens and topical antioxidants can postpone the process of skin aging, the role of dietary supplements and nutrients in preventing skin aging has been one of the most noteworthy factors (5). Long-term dietary supplements consumption in the form of chemical agents are likely to cause potential adverse effects and oral administration of natural foods such as fruits, vegetables, beans and grains can decrease the mentioned risk (6-9). Interestingly, loss of fat and water content in different skin layers is an important factor resulting in skin aging. As a result, elasticity and skin turgor is gradually reduced leading to a dry skin. Thus several skin disorders such as xerosis, wrinkles and itching happen (10-13). According to Traditional Persian Medicine (TPM), this factor is one of the main causes of

skin aging and could be avoided by considering simple essential commands named "Setteh-ye-Zarurieah" (six essential schemes for health) (14). Nutrition and applying herbal medicine in the form of additives to people's diet is considered completely in this scheme. According to TPM, it is believed that aging process and internal organ problems could be avoided or postponed by controlling dietary habits. Other alternative and complementary medical systems like Ayurveda, Unani medicine, etc. have the same attitude about people's diet (15). Therefore, the aim of this study was explanation of aging phenomenon, skin aging and herbal remedies to prevent it from perspective of TPM.

### 2. Evidence Acquisition

Medieval reports encompassing the profile of definition, terminology and etiology of aging were collected and analyzed from selected medical textbooks of TPM. The mentioned collection was based on the analysis of medieval Iranian textbooks from 9th to 18th centuries AD. In this regard, manuscripts namely Mansuri-Fi-Teb (9th and 10th centuries), Kamel-ol-sanaeh (10th century), Canon of Medicine (11th century), Zakhireh Kharazmshahi (12th century), Kholasat-ol-tajarob (16th century), Mofarah -ol-Gholoub (18th century), Kholasat-al- hekma

(18th century A.D) and Exir-e-Aazam (19th century) were selected for analysis (16-23). These texts have been the most famous and important sources among Iranian medical textbooks.

A search on databases such as PubMed, Science direct, Scopus and Google scholar was also performed to reconfirm anti-aging activities of reported herbs. Studies that included the evidences of mentioned information were selected for review. Only publications without available full text and letters to the editor were excluded from the review. Unpublished data was also excluded and duplication was avoided by excluding reviews of multiple copies of the same article in several databases.

### 3. Results

#### 3.1. Aging and Skin Aging Mechanism

Human body organs consist of four fundamental humors named “cardinal humors” including blood, phlegm, yellow bile and black bile. All of them composed of very specific quantity and quality and any kind of diseases can be resulted from an excess or deficit of one of these humors. Thus, any disease in TPM is based on distemperment or (Sue-Mizaj) (24, 25). Accordingly, aging process causes a big humoral change in the body. It looks like the whole body gets cold and dry (16-23).

Therefore, the skin gets cold and dry distemperment. It means skin layers lose their lipid, moisture and water content continuously and wrinkles appear at first step. At second step, skin detachment forms in wrinkled area. This phenomenon (skin detachment) in TPM is called “Tafarrogh-e-Ettesal”, which leads to a redundant skin in the affected areas. The cause of skin laxity is mentioned below:

At the beginning of human creation, all body organs such as skin, bones and muscles consist of certain type of moisture called “natural moisture”, which could give the organs ability to be flexible and soft enough. In the aging process, this essential material vanishes gradually and “exotic moisture “or (Rotoubat-e-Gharibe) replaces natural moisture and penetrates all over the body and skin; skin laxity is the result of exotic moisture replacement.



**Figure 1.** Brief Information About Skin Aging Mechanism

Therefore, superficial layers become wrinkled and dry and additionally, exotic moisture in deeper layers cannot penetrate the surface. Therefore, wrinkles, xerosis and flaccidity occur all together (Figure 1). Ancient Iranian scientists believed that aging phenomena could be

prevented or postponed effectively by simple specific instructions which are mentioned below.

#### 3.2. Remedies for Postponing Aging Process in the Body

##### 3.2.1. Sleep

“Sleep” raises entire body energy, causes complete food digestion and creates “natural moisture”, which can penetrate easily inside the organs such as skin. There is certain condition for proper sleep:

- Sleeping time should be performed after eating moderate meal and should be avoided during severe hunger or eating heavy amounts of meal. As both of them destroy body homeostasis. After the age of 40, sleeping hours increase (between 6 - 12 hours) as the body needs much more time for rehabilitation.

- Sleeping after sunrise is very harmful to the body and weakens digestive and nervous system (causes memory loss) (16-18, 20, 21).

##### 3.2.2. Diet

According to TPM, nutrition has an important role to prevent aging. The most important foods are listed below:

- Honey and Royall jelly
- Milk

Adding honey and a piece of ginger to a glass of boiling milk improves its property. Long-term continuous drinking of goat milk with “*Sisymbrium irio*” can prevent skin drying specifically.

- Egg Yolk
- Barleycorn (16, 17, 19, 21, 23).

##### 3.2.3. Herbal Medicines

There are some specific herbal medicines which can prevent aging process such as “Theryagh” and “Triphala” or (Etrifel). They are powerful antidotes and can strengthen body. “Theryagh-e-Kabir” is one of the most important traditional herbal drugs, which can strengthen and adjust the immune system. There are different types of “Triphala” (23). One of them known as “Etrifel-e-saqir” composed of *Terminalia chebula* and *Terminalia bellerica*. Table 1 illustrates the constituents and performance of mentioned drugs.

##### 3.2.4. Digestive System Strengthening

Whole body weakness and aging process in skin and body could be accelerated by gastrointestinal problems (51). Therefore, increasing the number of meals and reducing each serving size is preferable in a poor digestive system. The best time of eating is when men feel real hunger and digestive system could be strengthened by consuming different kinds of jams such as Ginger jam. Complete defecation is one of the treatment rules in TPM, as chronic constipation causes specific toxins accumulation in the intestinal loop and facilitates its spread all over the body.

**Table 1.** Teryagh-E-Kabir and Etrifel-E-Saqir, Herbal Components

Plant Family	Scientific Name	Traditional Name	Part	Current Finding of Anti-Aging Effect	Fraction/Constituent (s)
<b>Hycinthaceae</b>	<i>Urginea maritime</i>	squill	Bulb	high antioxidant activity (26) acetylcholinesterase inhibitory effect. preventive effect of brain aging (27)	glucosillarene a, proscillaridin a, scillarene a, scillicyanoside, scilliglaucoside (28)
<b>Piperaceae</b>	<i>Piper nigrum</i>	Felfel-syah (black pepper)	fruit	immunomodulatory and antitumour activity (29). Synergistic effect on hyaluronic acid in skin (30)	sabinene, limonene, caryophyllene, betapinene, alpha-pinene, delta3-carene, acid amides: piperine, piperilin, piperolein a and b, cumaperine, 3,4-dihydroxy phenyl ethanol glycosides, polysaccharides (28)
<b>Lauraceae</b>	<i>Cinnamomum verum</i>	Darchin	Bark	A source for antioxidants. delay aging (31)	cinnamaldehyde, weiterhin, eugenol, cinnamyl acetate, cinnamyl alcohol, o-methoxycinnamaldehyde, cinnamic acid, diterpenes: cinnzeylanol, cinnzeylanin, oligomeric proanthocyanidins, mucilages (28)
<b>Roseaceae</b>	<i>Rosa gallica</i>	Vard-e-ahmar	Flower	antioxidative properties (32)	oligomeric proanthocyanidins, citronellol, geraniol, nerol, phenyl ethanol, including as well linalool and citral (28)
<b>Iridaceae</b>	<i>Iris germanica</i>	Irsa	Root	antioxidant, antimutagenic activities (33)	irone: alpha-beta- and gamma-irone, triterpenes: iridale (mono, bi- and spirocyclic compounds, precursors of the irones), isoflavonoids: irilon, irisolone, irigenine, tectorigenin and their glycosides including iridine, flavonoids, xanthon: c-glucosylxanthones (28)
<b>Piperaceae</b>	<i>Piper elongatum</i>	Dar felfel	Leaf	inhibitor of tyrosinase activity (34) effective in age-related and cognitive disorders (35)	dill apiol, asaltone, parsley apiol, tannins, sesquiterpene: maticin (28)
<b>Iridaceae</b>	<i>Crocus sativus</i>	Saffron	stigma and style	antioxidant and possible anti-aging effects (36), immune-stimulating effect (37), anti-inflammatory, hepatoprotective (38)	apocarotinoic glycosides, picrocrocin, apocarotinoic acid and picrocrocin, components 4,5-dehydro-beta-cyclocitral (safranal), 4-hydroxy-beta-cyclocitral, carotenoids: lycopene, alpha-, beta-, gamma-carotene (28)
<b>Poaceae (Graminae)</b>	<i>Cymbopogon citratus</i>	Ezkher	Leaf	protective effect against hydrogen peroxide (H <sub>2</sub> O <sub>2</sub> )-induced oxidative stress (39, 40)	citral, myrcene (28)
<b>Lamiaceae (Labiatae)</b>	<i>Lavandula angustifolia</i>	Ostokhodus	Flower	Effects of Ultra-dry Treatment on Anti-aging Ability (41)	linalool, d linalyl acetate, cis-ocimene, terpinene-4-ol, betacaryophyllene, lavandulyl acetate, hydroxycoumarins, umbelliferone, herniarin, tannins, rosmarinic acid (28)
<b>Zingiberaceae</b>	<i>Costus speciosus</i>	Ghost	Rhizome	antioxidant activity (42)	Glycosides, flavonoids, triterpenoids, tannins, and steroids. Curcuminoids (28)
<b>Anacardiaceae</b>	<i>Pistacia lentiscus</i>	Mastaki	Resin	antigenotoxic and antioxidant activity. prevent cancer and delay aging (43)	triterpenes mastic acid, isomastic acid, oleanolic acid, alpha-pinene, myrcene, linalool, beta-pinene, beta-caryophyllene (28)
<b>Zingiberaceae</b>	<i>Zingiber officinale</i>	Zanjebil (Ginger)	Root	radical scavenging activity (44)	zingiberene, arcurcumene, beta-bisabolene and ar-curcumene, neral and geranial, d-camphor, beta-phellandrene, geranial, neral and linalool, (e)-alpha-farnesene, aroma carrier zingiberol, aryl alkanes gingerols, gingerdiols, diarylheptanoids (28)
<b>Combretaceae</b>	<i>Terminalia chebula</i>	Halileh	Fruit	cyto-protective effects (45) cytochrome P450 inhibitory effect (46) the effects of chebulic acid against the progression of AGE-induced endothelial cell dysfunction (47)	gallotannins, terchebulin, terflavin a, punicalagin, corilagin, chebulic acid, and chebulinic acid, d-glucose, d-fructose, saccharose, quinic acid, shikimic acid (28)
-	Honey	Asal		Antitumour and antioxidant activity (48), immunomodulator (49)	amino acids, proteins, carotenes, phenolic compounds, flavonoids, ascorbic acid, organic acids (50)

### 3.2.5. Moderate Rubbing Massage With Oil

Regular massage with appropriate oil such as olive oil or sweet almond oil can prevent the skin and body from drying. This kind of massage should be performed periodically to be effective.

## 4. Conclusions

According to both attitudes (Modern medicine and Traditional Persian Medicine), skin aging is followed by the whole body aging. Modern medicine believes that the main cause of skin aging contributes to environmental factors such as sunlight, air pollution, chemical and mechanical stimulation (1-3). On the other hand, internal factors such as malnutrition, obesity, alcohol consumption, smoking and etc can also speed up the process of aging with production of oxygen free radicals and DNA damage (2, 4, 5). Also in skin aging, loss of lipid and water content in different skin layers is one of the important damaging factors. As a result, skin disorders such as xerosis, wrinkles and itching occur constantly (10-12).

TPM also believes that external and internal factors are responsible for this phenomena and qualitative change of humors can destroy human body homeostasis (4). Ancient Iranian scientists believed that aging process induces cold and dry temperament in whole body and skin. Therefore, wrinkles and flaccidity appear after skin detachment, which is caused by loss of "skin natural moisture" (16, 18, 20-22). They believe that aging could be prevented or postponed by some specific instructions mentioned below.

**Sleep:** Iranian medicine acknowledges that "Sleep" raises entire body energy, causes complete food digestion and creates "natural moisture", which can penetrate easily inside organs such as skin (16, 18, 20, 21). Also Modern medicine believes that circadian rhythm of the body would be affected by insomnia, and ultimately skin collagen integrity would be disrupted gradually (52, 53).

**Diet:** According to Modern medicine and TPM, a healthy diet can have an important role to prevent aging in the body and skin (7-9). For example, honey and Royal Jelly consumption have anti-cancer effect and promote skin collagen formation incredibly (54-57). Long-term continuous drinking of goat milk can prevent skin drying and adding honey with a piece of ginger to a glass of boiling milk improves its property significantly (16, 17, 19, 21, 23). Egg yolks are also the main dishes of traditional medicine in the prevention of aging process and Modern medicine believes that egg yolks are particularly important sources of antioxidants such as carotenoids (58). "Medical beer" is a very dilute barleycorn soup and is one of the important nutritional supplements in TPM that can avoid aging process. Barley consists of the peptide Lunasin, so it has anti-inflammatory properties and is a powerful antioxidant agent (59, 60).

**Herbal Medicines:** There are some medicinal herbal drugs which can prevent aging process such as "They-

agh-e-Kabir" and "Etrifel-e-saqir". They prevent skin aging process by antioxidant effect and hyaluronic acid formation in the skin.

**Digestive system strengthening:** Aging process in skin and body could be accelerated by gastrointestinal problems (51). Also modern medicine believes that there is strong relationship between skin and digestive system (61). This important organ could be strengthened by consuming different digestive tonic such as ginger because of its gastro-protective effect (62).

**Moderate rubbing massage with oil:** Regular massage with sweat almond oil or olive oil can protect skin completely from environmental stress (63, 64). Also ancient Iranian scientists believed that moderate massage can eliminate waste products accumulation in the muscle and skin, therefore they become strengthened (16-18, 21, 22).

The current investigation was performed to show the knowledge of ancient Iranian scientists on aging process and related interventions. Reported herbal drugs might be beneficial for further studies for the management of skin aging and aging process. This review concludes in favor of TPM, but some ambiguities necessitate further research before claiming its efficacy.

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## Authors' Contributions

Laila Shirbeigi: Participated in all processes and wrote the main draft; Maryam Iranzadasl: Coordinated for gathering data and writing the paper; Parvin Mansouri: Study supervision; Somayeh Hejazi: Critical revision of the manuscript for important intellectual content; Jale Aliasl: Administrative, and material supports.

## References

1. Fanian F, Jeudy A, Lihoreau T, Messikh R, Ortonne JP, Elkhyat A, et al. Efficacy of micronutrient supplementation on skin aging and seasonal variation: a randomized, placebo-controlled, double-blind study. *Clin Interventions Aging*. 2013;**8**:1527-37.
2. Poljsak B, Dahmane R. Free Radicals and Extrinsic Skin Aging. *Dermatol Res Pract*. 2012;**2012**:1-4.
3. Sjerobabski-Masnec I, Situm M. Skin aging. *Acta Clin Croat*. 2010;**49**(4):515-8.
4. Slominski AT, Yan W, Zhang LL, Yan L, Zhang F, Yin NB, et al. Transcriptome Analysis of Skin Photoaging in Chinese Females Reveals the Involvement of Skin Homeostasis and Metabolic Changes. *PLoS ONE*. 2013;**8**(4):e61946.
5. Liakou AI, Theodorakis MJ, Melnik BC, Pappas A, Zouboulis CC. Nutritional clinical studies in dermatology. *J Drugs Dermatol*. 2013;**12**(10):1104-9.
6. Nguyen G, Torres A. Systemic antioxidants and skin health. *J Drugs Dermatol*. 2012;**11**(9):e1-4.
7. Lademann J, Patzelt A, Schanzer S, Richter H, Meinke MC, Sterry W, et al. Uptake of Antioxidants by Natural Nutrition and Supplementation: Pros and Cons from the Dermatological Point of View. *Skin Pharmacol Physiol*. 2011;**24**(5):269-73.

8. Evans JA, Johnson EJ. The Role of Phytonutrients in Skin Health. *Nutrients*. 2010;**2**(8):903-28.
9. Berson DS. Natural antioxidants. *J Drugs Dermatol*. 2008;**7**(7 Suppl):s7-12.
10. Papakonstantinou E, Roth M, Karakiulakis G. Hyaluronic acid: A key molecule in skin aging. *Dermato-Endocrinol*. 2014;**4**(3):253-8.
11. White-Chu EF, Reddy M. Dry skin in the elderly: Complexities of a common problem. *Clinics in Dermatol*. 2011;**29**(1):37-42.
12. Oh JH, Kim YK, Jung JY, Shin J, Kim KH, Cho KH, et al. Intrinsic aging- and photoaging-dependent level changes of glycosaminoglycans and their correlation with water content in human skin. *J Dermatol Sci*. 2011;**62**(3):192-201.
13. Jafferany M, Huynh TV, Silverman MA, Zaidi Z. Geriatric dermatoses: a clinical review of skin diseases in an aging population. *Int J Dermatol*. 2012;**51**(5):509-22.
14. Hedayati SH, Abdollahifard G, Rezaian J. "Setteye Zarorie" of Naseri's Health care; evidence of preventive medicine in Iranian traditional medicine. *Journal of Research on History of Medicine*. 2014;**3**(1).
15. Jennings HM, Merrell J, Thompson JL, Heinrich M. Food or medicine? The food-medicine interface in households in Sylhet. *J Ethnopharmacol*. 2015;**167**:97-104.
16. Arzani M. *Mofarah-ol-Gholoub*. Tehran: Almaee publications; 2011.
17. Abbas MAH, Kamil A. *Sanaae Al-tibbiya*. Egypt: Dar Rekaby; 2009.
18. Razi B. *Kholase al-tajarob*. Tehran: Rahe kamal -with tehran university of medical sciences; 2008.
19. Azam Khan M. *Exir-E-Azam*. Tehran: Ins His Studies, Islamic Complementary Med; 2008.
20. Aghili Khorasani S. *Kholase Al- Hekmah*. Quom: Esmailian; 2006.
21. Avicenna H. *Al-Qanun-Fi-Teb*. Beirut: Al-Ama Lemmatbuaat Publications; 2005.
22. Jorjani S. *Zakhireh Kharazmshahi*. Tehran: Bonyade Farhang; 1992.
23. Razi M. *Mansuri-Fi-Teb*. Tehran: Tehran uni med sci; 2008.
24. Mojahedi M, Naseri M, Majdzadeh R, Keshavarz M, Ebadini M, Nazem E, et al. Reliability and Validity Assessment of Mizaj Questionnaire: A Novel Self-report Scale in Iranian Traditional Medicine. *Iran Red Crescent Med J*. 2014;**16**(3):e15924.
25. Farsani G, Movahhed M, Motlagh A, Hosseini S, Yunesian M, Farsani T, et al. Is the Iranian Traditional Medicine warm and cold temperament related to Basal Metabolic Rate and activity of the sympathetic-parasympathetic system? Study protocol. *J Diabetes Metabolic Disorders*. 2014;**13**(1):74.
26. Mammadov R, Makasci-Afacan A, Uysal-Demir D, Gork C. Determination of Antioxidant Activities of Different *Urginea maritima* (L.) Baker Plant Extracts. *Iran. J. Chem. Chem. Eng*. 2010;**29**(3).
27. Hajimehdipoor H, Tehranifar T, Shafaroodi H. Acetylcholinesterase Inhibitory Effect of Some Medicinal Herbs Used in Iranian Traditional Medicine for Memory Improvement. *Global J Botanical Sci*. 2013;**1**(1):18-21.
28. Healthcare T. *PDR for herbal medicines*. Montvale: Thomson Healthcare; 2004.
29. Patel PB, Shah BN, Modi DC. Development of polyherbal formulation and immunomodulatory activity study. *Int J Pharm Res*. 2011;**3**(3):68-72.
30. Pujos M, Bernini D, Robert C, Doucet O. *Cosmetic composition for increasing hyaluronic acid synthesis in skin and its use for repairing wrinkles*.: Google Patents; 2013.
31. Yu CW, Li WH, Hsu FL, Yen PL, Chang ST, Liao VH. Essential oil alloanomadendrene from mixed-type *Cinnamomum osmophloeum* leaves prolongs the lifespan in *Caenorhabditis elegans*. *J Agric Food Chem*. 2014;**62**(26):6159-65.
32. Dehghan Kashani A, Rasooli I, Rezaee MB, Owlia P. Antioxidative properties and toxicity of white rose extract. *Iranian J Toxicol*. 2011;**5**(12):415-25.
33. Basgedik B, Ugur A, Sarac N. Antimicrobial, antioxidant, antimutagenic activities, and phenolic compounds of *Iris germanica*. *Industrial Crops and Products*. 2014;**61**:526-30.
34. Son ED, Min DJ, Chang HK, Choi HJ, Cho SA, Kim J. H. . *Cosmetic composition for improving skin elasticity*.: Google Patents; 2011.
35. Adams M, Gmünder F, Hamburger M. Plants traditionally used in age related brain disorders—A survey of ethnobotanical literature. *J Ethnopharmacol*. 2007;**113**(3):363-81.
36. Bathaie SZ, Farajzade A, Hoshyar R. A review of the chemistry and uses of crocins and crocetin, the carotenoid natural dyes in saffron, with particular emphasis on applications as colorants including their use as biological stains. *Biotechnic & Histochemistry*. 2014;**89**(6):401-11.
37. Nigar Z, Itrat M. Evaluation of a Unani polyherbal formulation (Tiryaqe wabai) as an immunostimulator in elderly persons. *Anc Sci Life*. 2013;**33**(2):19-22.
38. Hosseinzadeh H, Nassiri-Asl M. Avicenna's (Ibn Sina) the Canon of Medicine and saffron (*Crocus sativus*): a review. *Phytother Res*. 2013;**27**(4):475-83.
39. Rahim SM, Taha EM, Mubark ZM, Aziz SS, Simon KD, Mazlan AG. Protective effect of *Cymbopogon citratus* on hydrogen peroxide-induced oxidative stress in the reproductive system of male rats. *Syst Biol Reprod Med*. 2013;**59**(6):329-36.
40. Campos J, Schmeda-Hirschmann G, Leiva E, Guzman L, Orrego R, Fernandez P, et al. Lemon grass (*Cymbopogon citratus* (D.C) Stapf) polyphenols protect human umbilical vein endothelial cell (HUVECs) from oxidative damage induced by high glucose, hydrogen peroxide and oxidised low-density lipoprotein. *Food Chem*. 2014;**151**:175-81.
41. Zhao X, Bao Q, Wang G. Analysis of *lavandula angustifolia* essential oil and its anti-microbial and anti-oxidant effectiveness. *Detergent & Cosmetics*. 2013;**4**:010.
42. Jha MK, Alam MB, Hossain MS, Islam A. In vitro antioxidant and cytotoxic potential of *Costus speciosus* (Koen.) Smith rhizome. *Int J Pharm Sci Res*. 2010;**1**(10):139-44.
43. Bhouri W, Derbel S, Skandrani I, Boubaker J, Bouhler I, Sghaier MB, et al. Study of genotoxic, antigenotoxic and antioxidant activities of the digallic acid isolated from *Pistacia lentiscus* fruits. *Toxicol In Vitro*. 2010;**24**(2):509-15.
44. Singh S, Gupta AK. Evaluation of Phenolics Content, Flavonoids and Antioxidant activity of *Curcuma amada* (Mango Ginger) and *Zingiber officinale* (Ginger). *J CHEMISTRY*. 2013;**2**(1):32-5.
45. Mishra V, Agrawal M, Onasanwo SA, Madhur G, Rastogi P, Pandey HP, et al. Anti-secretory and cyto-protective effects of chebulinic acid isolated from the fruits of *Terminalia chebula* on gastric ulcers. *Phytomedicine*. 2013;**20**(6):506-11.
46. Ponnusankar S, Pandit S, Babu R, Bandyopadhyay A, Mukherjee PK. Cytochrome P450 inhibitory potential of *Triphala*—A *Rasayana* from Ayurveda. *J Ethnopharmacol*. 2011;**133**(1):120-5.
47. Lee HS, Koo YC, Suh HJ, Kim KY, Lee KW. Preventive effects of chebulic acid isolated from *Terminalia chebula* on advanced glycation endproduct-induced endothelial cell dysfunction. *J Ethnopharmacol*. 2010;**131**(3):567-74.
48. Noor N, Sarfraz RA, Ali S, Shahid M. Antitumour and antioxidant potential of some selected Pakistani honeys. *Food Chem*. 2014;**143**:362-6.
49. Majtan J. Honey: an immunomodulator in wound healing. *Wound Repair Regen*. 2014;**22**(2):187-92.
50. Itrat M, Khan JA. Anti-Aging Drugs in Unani Medicine. *J Community Med Health Educ*. 2014;**4**:275.
51. Yosefi SS, Kor NM, Sadeghpour O, Jokar A, Askarfarashah M. New aspects to digestive process and importance of stomach as basic cause for disease. *Euro J Exp Biol*. 2014;**4**(3):209-10.
52. Gupta MA, Gupta AK. Sleep-wake disorders and dermatology. *Clin in Dermatol*. 2013;**31**(1):118-26.
53. Kahan V, Andersen ML, Tomimori J, Tufik S. Can poor sleep affect skin integrity? *Med Hypotheses*. 2010;**75**(6):535-7.
54. Israili ZH. Antimicrobial Properties of Honey. *Am J Therapeutics*. 2013;**21**(4):304-23.
55. Burlando B, Cornara L. Honey in dermatology and skin care: a review. *J Cosmetic Dermatol*. 2013;**12**(4):306-13.
56. Park HM, Cho MH, Cho Y, Kim SY. Royal Jelly Increases Collagen Production in Rat Skin After Ovariectomy. *J Med Food*. 2012;**15**(6):568-75.
57. Park HM, Hwang E, Lee KG, Han SM, Cho Y, Kim SY. Royal Jelly Protects Against Ultraviolet B-Induced Photoaging in Human Skin Fibroblasts via Enhancing Collagen Production. *J Med Food*. 2011;**14**(9):899-906.
58. Hesterberg K, Lademann J, Patzelt A, Sterry W, Darvin ME. Raman spectroscopic analysis of the increase of the carotenoid antioxi-

- dant concentration in human skin after a 1-week diet with ecological eggs. *J Biomedical Optics*. 2009;**14**(2):024039.
59. Hernandez-Ledesma B, Hsieh CC, de Lumen BO. Chemopreventive properties of Peptide Lunasin: a review. *Protein Pept Lett*. 2013;**20**(4):424–32.
60. Jeong HJ, Jeong JB, Hsieh CC, Hernández-Ledesma B, de Lumen BO. Lunasin Is Prevalent in Barley and Is Bioavailable and Bioactive in In Vivo and In Vitro Studies. *Nutrition and Cancer*. 2010;**62**(8):1113–9.
61. Callen JP, Wortmann RL. Dermatomyositis. *Clin Dermatol*. 2006;**24**(5):363–73.
62. Haniadka R, Saldanha E, Sunita V, Palatty PL, Fayad R, Baliga MS. A review of the gastroprotective effects of ginger (*Zingiber officinale* Roscoe). *Food & Function*. 2013;**4**(6):845.
63. Evans-Johnson JA, Garlick JA, Johnson EJ, Wang XD, Oliver Chen CY. A pilot study of the photoprotective effect of almond phytochemicals in a 3D human skin equivalent. *J Photochemistry Photobiol B: Biol*. 2013;**126**:17–25.
64. Danby SG, AlEnezi T, Sultan A, Lavender T, Chittock J, Brown K, et al. Effect of Olive and Sunflower Seed Oil on the Adult Skin Barrier: Implications for Neonatal Skin Care. *Pediatric Dermatol*. 2013;**30**(1):42–50.