IJPSR (2021), Volume 12, Issue 7 (Review Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 24 May 2020; received in revised form, 01 February 2021; accepted, 13 June 2021; published 01 July 2021

LOOKING FROM PAST TO PRESENT- CHAKSHUSHYA DRUGS IN BHAVAPRAKSHA NIGHANTU AND RESEARCH DONE ON THEM

Aiswarya V. Nair * and K. Sreekumar

Department of Shalakyatantra, Government Ayurveda College, Thiruvananthapuram - 695001, Kerala, India.

Keywords:

Review, Drugs, Chakshushya, Bhavaprakasha, Research

Correspondence to Author:
Aiswarya V. Nair

SRF,
Department of Shalakyatantra,
Government Ayurveda College,
Thiruvananthapuram - 695001,
Kerala, India.

E-mail: aiswarya.v24@gmail.com

ABSTRACT: Bhavaprakasha is unique in the sense that it shows the slow amalgamation of traditional Indian materiamedica with several new additions which came to the Indian subcontinent through trade and exchanges with foreign civilizations. The Nighantu portion of Bhavaprakasha is an excellent repertoire of herbs and minerals used in Ayurveda. Several plants with properties related to augmentation of ocular function like chakshushya, and to the treatment of eye diseases are mentioned in Bhavaprakasha nighantu. Many of these drugs have been subjected to various biomedical *in-vitro* and *in-vivo* studies globally over the past decades. They hold the promise of being new therapeutic agents against various ocular diseases like cataracts, diabetic retinopathy, which have no efficient treatment options in existence at the moment. There are more drugs yet to be studied upon. This article is a review of drugs with pharmacological properties related to ocular function or management of eye diseases described in Bhavaprakasha Nighantu and the modern scientific research done on them in recent times.

INTRODUCTION: Bhavaprakasha, one of the laghuthrayi texts, is unique in the sense that it shows the slow amalgamation of traditional Indian materiamedica with several new additions which came to the Indian subcontinent through trade and exchanges with foreign civilizations. It has added several new herbs to our repertoire. Herbal drugs form the yuktivyapasraya category of treatment in Ayurveda. They are, hence an integral part of maintaining health as well as treatment of diseases. This fact holds good for the Shalakyatantra branch as well. Chakshushya drugs are used to enhance the health of the eye and to ameliorate eye diseases. In an age of advancing technology, the health of vision, as well as treatment of diseases of eye, is a challenge as new diseases continue to develop.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.12(7).3611-17

This article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.12(7).3611-17

In this context, researching traditional medicinal plants using modern scientific methods for their scope in preventive and curative eye care is relevant. This article aims to review the drugs with properties related to eye or eye diseases described in Bhavapraksha Nighantu and the modern research carried out on them so far.

MATERIALS AND METHODS: For the study, the Bhavaprakasha Nighantu was researched for drugs with properties related to eye or eye diseases. Then research data on the action of these drugs on the eye was obtained from searching databases like Pubmed, Google Scholar, Science direct, *etc*.

RESULTS:

Drugs with Action on Eye in Bhavaprkasha: In a comprehensive review of Bhavaprakashanighantu, the words "chakshushya, netrahita, netramayahrit, akshirogahrit, drishtiprasadanam nakthandhyana-sanam" were found [1]. The word chakshushya means "chakshushelochanayahitam", that which is beneficial for the eyes. Netrahita also conveys the same meaning. "Drishtiprasada means" Drishau

netrau prasadayati". Prasadanais "nairmalyam". Thus drishtiprasada translates to that which clarifies vision. Netrarogahrit means "netrarogaan hantiiti", which alleviates diseases of eye. Akshirgahirt is a synonym of the same. Drugs which are chakshushya and netrahita are tabulated in **Table 1** and drugs with netramayahritguna is are summarised in **Table 2**.

TABLE 1: DRUGS WHICH ARE CHAKSHUSHYAAND NETRAHITA

Chakshushya		*Netrahita*	
Name of the drug	**Scientific name**	**Name of the drug**	**Scientific name**
Hareetaki	*Terminalia chebula*	*Vibheetaki*	*Terminalia bellerica*
Amalaki	*Emblica officinalis*	*Lasuna*	*Allium sativum*
SuklaJeerakam	*Cuminum cyminum*	*Palandu*	*Allium cepa*
Krishna Jeerakam	*Carum carvi*	*Sinduvara*	*Vitex negundo*
Kalajaji	*Nigella sativa*	*Kataka*	*Strychnos potatorum*
Yashti	*Glycyrrhiza glabra*	*Bhutrana*	*Cymnopogon martinii*
Lodhra	*Symplocos racemosa*	*Satavari*	*Asparagus racemosus*
Karpoora	*Cinnamomum camphora*	*Nimba*	*Azadirachta indica*
LataKastoori	*Abelmoschus moschatus*	*Rakta Chandanam*	*Pterocarpus santalinus*
Prapoundarikam	-	*Kumari*	*Aloe barbadensis*
Jeevanthi	*Leptademia reticulata*	*Kakamachi*	*Solanum nigrum*
Mudgaparni	*Phaseolus trilobus*		
Sigru	*Moringa oleifera*		
Ketaki	*Pandanus odoratissimus*		
Draksha	*Vitis vinifera*		

TABLE 2: DRUGS WHICH ARE NETRAMAYAHRIT

Name of the drug	Scientific name
Ajamoda	*Apium graveolans*
Thumburu	*Zanthoxylum alatum*
Manjishta	*Rubia cordifolia*
Daruharidra	*Coscinium fenestratum*
Aguru	*Aquilaria agallocha*
Sarala	*Pinus longifolia*
Tagara	*Valeriana wallichi*
Gunja	*Abrus precatorius*
Bhringaraja	*Eclipta alba*
Meshasringi	*Gymna sylvestre*
Akasavalli	*Cuscuta reflexa*
Varshiki	*Jasminum sambac*
Malathi	*Jasminum grandiflorum*
Kadali	*Musa paradisiaca*
Yuthika	*Jasminum auriculatum*
Loni	*Portulaca quadrifida*

The herb Aparajitha (*Clitorea ternatea*) has the action drishtiprasadanam, and Agasthi (*Sesbania grandiflora*) has the action nakthandhyanasanam, that which cures night blindness. Thus these actions can be broadly classified into preventive and curative modalities. Chakshushya, netrahita thus could be drugs that are beneficial for the general structural and functional welfare of the eyes. Drishtiprasada may be drugs that clarify and improve visual acuity. Netrarogahrit is a drug that can be used in the treatment of various inflammatory, infectious and degenerative diseases of eyes in different dosage forms for both internal intake and external kriyakramas (procedures).

The Current Research Scenario: Plants on which research has been done is given in **Table 3**.

TABLE 3: PLANTS ON WHICH RESEARCH HAS BEEN DONE

S. no.	Drug	Scientific name
1	*Amalaki*	*Emblica officinalis*
2	*Hareetaki*	*Terminalia chebula*
3	*Vibheetaki*	*Terminalia bellerica*
4	*Jeerakam*	*Cyminum cuminum*
5	*Karavi*	*Nigella sativa*
6	*Yashti*	*Glycyrrhiza glabra*
7	*Sigru*	*Moringa oleifera*
8	*Nirgundi*	*Vitex negundo*
9	*Draksha*	*Vitis vinifera*
10	*Lasuna*	*Allium sativum*
11	*Palandu*	*Allium cepa*
12	*Kumari*	*Aloe barbadensis*
13	*Agasthi*	*Sesbania grandiflora*
14	*Aparajitha*	*Clitoreaternate*

1. Amalaki (*Emblica officinalis*):

Recent Researches Done on Amalaki include:

- Quercetin is a natural polyphenolic flavonoid found in *Phyllanthus emblica*, significantly suppressed TGF-β1-induced proliferation and migration that is the main pathogenensis involved in proliferative vitreoretinopathy (PVR), suggesting that quercetin has potential to be a therapeutic agent against PVR [3].

- *Emblica officianalis* has a cytoprotective effect in age-related macular degeneration *in-vitro* [4].

- The progression of selenite-induced cataracts was delayed by an aqueous extract of *Emblica officinalis*. A combination of *Curcuma longa* and *Emblica officinalis* was useful in the prevention and treatment of cataracts in diabetic rats [5].

2. Hareetaki (*Terminalia chebula*):

- Chebulic acid, a chemical constituent of Hareetaki, has shown significant anti-proliferative potential on retinoblastoma cells [6].

3. Triphala:

- Triphala retards in vitro selenite-induced cataract due to antioxidant activity [7].

- Triphala was found to retardepithelial to mesenchymal transition of the retinal pigment epithelium in proliferative vitreoretinopathy [8].

4. Agasthi (*Sesbania grandiflora*):

- *Sesbania grandiflora* flower extract formulation had antifungal and antimicrobial action in the treatment of bacterial conjunctivitis [9].

- Aqueous leaf extract of *Sesbania grandiflora* significantly reduced IOP in alpha chymotrypsin induced experimental glaucoma in rabbits, against standard [10].

5. Jeerakam (*Cyminum cuminum*):

- Cumin has antiglycating properties that may be due to the modulation of chaperone activity of alpha-crystallin, thus delaying cataracts in diabetic rats [11].

6. Karavi (*Nigella sativa*):

- Treatment of experimental models of dry eye with Thymoquinone, a major chemical constituent of *Nigella sativa*, was associated with reduced inflammation in pathological examination [12].

- Liposome formulations containing thymoquinone were able to reduce the IOP significantly with sustained effect in the eyes of glaucomatous rabbits and also vastly improved the ocular tissue-induced histopathological lesions [13].

- Oil from *Nigella sativa* and thymoquinone were effective in preventing radiation cataractogenesis in the lenses of rats, wherein the oil component was found to be more effective between the two 14.

- Administration of thymoquinone reduced the ocular symptoms in ovalbumin-induced allergic conjunctivitis in mice by downgrading the recruitment of eosinophils, level of IgE, histamine, *etc.* [15]

7. Yashti (*Glycyrrhiza glabra*):

- The crude methanol extract of *Glycyrrhiza glabra* inhibited new vessel growth in the cornea following corneal burn and inflammation and hence could be a potential therapeutic agent for inflammation-associated corneal neovascularization [16].

- Glycyrrhizin 2.5% eye drops were effective in improving symptoms and ocular lesions in patients with moderate dry eye disease [17].

8. Sigru (*Moringa oleifera*):

- *Moringa oleifera* stem extract prevents oxidative stress-induced cataractogenesis in mouse lens by its improvement of the endogenous antioxidant system in the lens [18].

- *Moringa oleifera* leaf aqueous extract, when administered orally, reduced ocular hypertension [19].

- *Moringa oleifera* may be useful in preventing diabetes-induced retinal dysfunction through anti-oxidant, anti-inflammatory, and anti-angiogenic mechanisms [20].

9. Draksha (*Vitis vinifera*):

- The antioxidant function of grapes for the control of the ageing process and age-related

eye disorders may provide new light on the design of anti-ageing herbal medicines [21].

- Grape polyphenols have ocular promotive action through anti-oxidant, anti-microbial, anti-aging, anti-hypertensive, and anti-inflammatory properties [22].
- Grape powder, when given orally, protected the lens from UV radiation-induced cataract development in mice in a dose-dependent manner by directly regulating endogenous Nrf2 and its downstream target detoxifying/antioxidant genes [23].

10. Aparajitha (*Clitoria ternatea*):

- The *Clitoria ternatea* flower petal extracts and eye gel have anti-oxidant properties [24].

11. Lashuna (*Allium sativum*):

- Methanol extracts of garlic have amoebicidal and cysticidal properties on Acanthamoe batrophozoites and cysts, which cause keratitis [25].
- A garlic-derived compound, S-allyl-mercaptocysteine (SAMC) lowered IOPin rabbits with the elevation of ANP levels in aqueous humor [26].
- Normal ARPE-19 cells that were treated with diallyltetrasulfide, a garlic compound, recovered from the decrease in thiol concentration as opposed to cancer cells, thus failing to induce stress signal pathway and apoptosis in normal cells. A sample-based on garlic extracts was proven to be a potential urethane carrier for choroidal melanoma. Thus garlic has anti-cancerous properties [27].
- Intraperitoneal injection of aqueous extract of garlic effectively prevented selenite-induced cataract in Wistar rats [28].
- S-allyl L-cysteine, an active component from aged garlic extract, could modulate hydroquinone-induced oxidative damage in human RPE cells and hence could be a protective factor against pathogenesis of AMD [29].

12. Palandu (*Allium cepa*):

- In diabetes experimental animal models on a diet of fenugreek seeds and onion, delayed cataract formation was observed, thus implying their effect in preventing cataractogenesis [30].
- Onion extract was effective in preventing corneal haze development after air-assisted lamellar keratectomy in canine eyes [31].
- Installation of onion juice in rat eyes prevents selenite-induced cataract formation with increase in anti-oxidant levels and enzyme activities [32].

13. Nirgundi (*Vitex negundo*):

- Flavonoid fraction of *Vitex negundo* prevented selenite toxicity and cataractogenesis *in-vitro* by maintaining antioxidant status, and decreasing oxidative stress in lens [33].
- Luteolin, a flavonoid, isolated and characterized from the leaves of *Vitex negundo* prevented selenite induced oxidative stress and cataractogenesis [34].

14. Kumari (*Aloe barbadensis*):

- *Aloe vera* eye drops were used successfully to treat ocular surface squamous neoplasia [35].
- *Aloe vera* enhanced corneal re-epithelialization and decreased inflammatory response after alkali burn in normal and diabetic rats [36].
- A novel lid wipe formulation containing Aloe vera and hyaluronic acid had antimicrobial activity against bacteria and yeast in blepharitis [37].

DISCUSSION: Based on the review of current research on these drugs, the observations are summarized in **Table 4** and **5**. Broadly there are both ushnavirya as well as sheetavirya drugs with chakshushya property. They do not appear to have a common rasa, guna, virya or vipaka. Therefore it may be concluded that the property chakshushya may be depending on the prabhava of these individual drugs.

TABLE 4: PLANTS WITH PREVENTIVE PROPERTIES

Name of herb	Scientific name	Property preventive against
Amalaki -	*Emblica officinalis*	Age related macular degeneration
		Cataract
Triphala	-	Cataract
Jeerakam	*Cyminum cuminum*	Cataract
Karavi	*Nigella sativa*	Cataract
Sigru	*Moringa oleifera*	Cataract
		Retinal dysfunction due to DM
Draksha	*Vitis vinifera*	Age related eye disease
		Ocular promotive
		Cataract
Aparajitha	*Clitorea ternatea*	Oxidation in eye
Lashuna	*Allium sativum*	Oxidative stress in AMD
		Cataract
Palandu	*Allium cepa*	Cataract
		Corneal haze post surgery
Nirgundi	*Moringa oleifera*	Cataract

TABLE 5: PLANTS WITH CURATIVE PROPERTIES

Name of Herb	Scientific name	Curative against
Amalaki	*Emblica officinalis*	Proliferative vitreoretinopathy
		Cataract
Hareetaki	*Terminalia chebula*	Retinoblastoma
Sigru	*Moringa oleifera*	Ocular hypertension
Kumari	*Aloe barbadensis*	Ocular surface squamous neoplasia
		Ocular surface inflammation
		Corneal alkali burns, wounds
Agasthi	*Sesbania grandiflora*	Bacterial and fungal conjunctivitis
		Glaucoma
Karavi	*Nigella sativa*	Dry eye
		Lowers IOP
		Glaucomatous histopathological lesions
		Allergic conjunctivitis
Yashtimadhu	*Glycyrrhiza glabra*	Anti angiogenic in neovascularisation diseases like corneal neovascularization
		Dry eye
Lashuna	*Allium sativum*	Acanthamoeba keratitis
		Lowers IOP
		Anti cancerous
Triphala	*Terminalia chebula* *Terminalia bellerica* *Emblica officinalis*	Proliferative vitreoretinopathy

Even though they are all chakshushya, their individual pharmacological properties need to be assessed separately to pinpoint the vyadhiavastha in which they can be used. Drishti is sheetasatmya, and hence one would expect chakshushya drugs to be sheeta as well.

The long-term use of ushnaviryachakshushya drugs may need to be limited even if they have ocular promotive properties. For example, Lashunais chakshushya but can hardly be used in a rakta-pittadhika condition. But chakshu is a tejomaya indriya situated in a kaphasthana that is shiras. So even in healthy individuals chakshushya drugs should be used ideally in a combination of sheeta and ushna.

From the review of available literature, we find that there are many more medicinal plants with ocular promotive properties described in Bhavapraksha that are yet to be touched upon by modern research studies. As diseases become resistant to antibiotics and prevention of diseases is being viewed with greater importance than before, it becomes imperative that we look at the old traditional knowledge in a new light so that gems from the heaps of classical texts can be utilized for the present and future. Among the plants that have been researched, most drugs are preventive against cataract, have anti-angiogenic, anti-cancerous, anti-oxidant, and anti-inflammatory properties. These diseases like cataracts, cancer, neo-vascularising

diseases, and age-related degenerative diseases have no effective pharmacological agents at present. Hence researching these drugs may reveal alternatives that have the potential to be therapeutic agents against these diseases in both curative and preventive aspects.

CONCLUSION: The plants with ocular promotive and curative properties hold the potential to be therapeutic agents in the management of eye diseases as well as in preventive ophthalmology. So researching them with modern parameters is highly relevant.

ACKNOWLEDGEMENT: The authors thank all the staff of the Department of Shalakyatantra, GAVC TVM, for their help.

CONFLICTS OF INTEREST: none

REFERENCES:

1. SitaramB: Bhavapraksha Chaukhambhaorientalia, Varanasi, Reprint. 2015; 1.
2. Dev R: Shabdakalpadruma. Chaukhambhasurbharti, Varansai, First Edition 2015.
3. Cai W, Yu D, Fan J, Liang X, Jin H, Liu C, Zhu M, Shen T, Zhang R, Hu W, Wei Q and Yu J: Quercetin inhibits transforming growth factor β1-induced epithelial-mesenchymal transition in human retinal pigment epithelial cells via the Smad pathway. Drug Des Devel Ther 2018; 12: 4149-61.
4. Nashine S, Kanodia R, Nesburn AB, Soman G, Kuppermann BD and Kenney MC: Nutraceutical effects of *Emblica officinalis* in age-related macular degeneration. Aging (Albany NY) 2019; 11(4): 1177-88.
5. Khatavkar P, Dawane J, Bhosale M, Pandit V and Padalkar P: Evaluation of the effect of Nishamalaki on cataract in diabetic rats. Natl J Physiol Pharm Pharmacol 2019; 9(7): 639-46.
6. Kumar N, Gangappa D, Gupta G and Karnati R: Chebulagic acid from *Terminalia chebula* causes G1 arrest, inhibits NFκB and induces apoptosis in retinoblastoma cells. BMC Complement Altern Med 2014; 14: 319.
7. Gupta SK, Kalaiselvan V, Srivastava S, Agarawal SS and Saxena R: Evaluation of anticataract potential of Triphala in selenite-induced cataract: *In-vitro* and *in-vivo* studies. J Ayurveda Integr Med 2010; 1(4): 280-86.
8. Sivasankar S, Lavanya R, Brindha P and Angayarkanni N: Aqueous and alcoholic extracts of Triphala and their active compounds chebulagic acid and chebulinic acid prevented epithelial to mesenchymal transition in retinal pigment epithelial cells, by inhibiting SMAD-3 phosphorylation. PLoS One 2015; 10(3): e0120512.
9. Wagh VD, KH Deshmukh and Wagh KV: Formulation and Evaluation of in situ Gel Drug Delivery System of *Sesbania grandiflora* Flower Extract for the Treatment of Bacterial Conjunctivitis. J Pharm Sci & Res 2012; 4(8): 1880-84.
10. Lakshmi SVVNSM, Reddy, A. Siva Mallikarjuna and Vidya S: Pharmacological screening of aqueous extract of *Sesbania grandiflora* for anti-glaucomic activity in Rabbits. IJNPR 2019; 10(1): 43-47.
11. Kumar PA, Reddy PY, Srinivas PN and Reddy GB: Delay of diabetic cataract in rats by the antiglycating potential of cumin through modulation of alpha-crystallin chaperone activity. J Nutr Biochem 2009; 20(7): 553-62.
12. Kocatürk T, Erkan E, Meteoğlu İ, Ekici M, KarulBüyüköztürk A, Yavaşoğlu İ, Çakmak H, Dayanır V and Balkaya M: Effects of topical thymoquinone in an experimental dry eye model. Turkish Journal of Ophthalmology 2018; 48(6): 281-87.
13. Fahmy HM, Saad EAES, Sabra NM, El-Gohary AA, Mohamed FF and Gaber MH: Treatment merits of Latanoprost/Thymoquinone - Encapsulated liposome for glaucomatus rabbits. Int J Pharm 2018; 548(1): 597-08
14. Taysi S, Abdulrahman ZK, Demir E, Demir T and Akan M: The radioprotective effect of *Nigella sativa* on nitrosative stress in lens tissue in radiation-induced cataract in rat. Cutaneous and Ocular Toxicology 2015; 34(2): 101-6.
15. Hayat K, Asim MB, Nawaz M, Li M, Zhang L and Sun N: Ameliorative effect of thymoquinone on ovalbumin-induced allergic conjunctivitis in Balb/c mice. Curr Eye Res 2011; 36(7): 591-8.
16. Shah SL, Wahid F, Khan N, Farooq U, Shah AJ, Tareen S, Ahmad F and Khan T: Inhibitory effects of *Glycyrrhiza glabra* and its major constituent glycyrrhizin on inflammation-associated corneal neovascularization. Evidence-Based Complementary and Alternative Medicine 2018; 2018: 1–8.
17. Burillon C, Chiambaretta F and Pisella PJ: Efficacy and safety of glycyrrhizin 2.5% eye drops in the treatment of moderate dry eye disease: results from a prospective, open-label pilot study. Clin Ophthal 2018; 12: 2629-36.
18. Qi L, Zhou Y, Li W, Li W, Zheng M, Zhong R, Jin X and Lin Y: Effect of *Moringa oleifera* stem extract on hydrogen peroxide-induced opacity of cultured mouse lens.BMC Complement Altern Med 2019; 19(1): 144.
19. George GO, Ajayi OB and Oyemike AA: Effect of *Moringa oleifera* leaf aqueous extract on intraocular and blood pressure of normotensive adults in Edo State, Nigeria. JNOA 2018; 20(2): 75-81.
20. Gupta SK, Kumar B, Srinivasan BP, Nag TC, Srivastava S, Saxena R and Aggarwal A: Retinoprotective effects of *Moringa oleifera* via antioxidant, anti-inflammatory, and anti-angiogenic mechanisms in streptozotocin-induced diabetic rats. Srinivasan, et al. BPJ Ocul Pharmacol Ther 2013; 29(4): 419-26.
21. Bjørklund G, Dadar M, Martins N, Chirumbolo S, Goh BH, Smetanina K and Lysiuk RR: Brief challenges on medicinal plants: an eye-opening look at ageing-related disorders. Basic Clin Pharm Toxi 2018; 122(6): 539-58.
22. Natarajan SB, Hwang JW, Kim YS, Kim EK, Park PJ: Ocular promoting activity of grape polyphenols-A review. Environ Toxicol Pharmacol 2017; 50: 83-90.
23. Wu H, Liu X, Xavier C, Wang DS, Ananti P and Liu Y: Using Grapes as a Magic Bullet to Fight Against Free Radicals in the Eye: Application for Cataract Prevention. IOVS 2018; 59(9): 5646.
24. Kamkaen N and Wilkinson JM: The antioxidant activity of Clitoriaternatea flower petal extracts and eye gel. Phytother Res 2009; 23(11): 1624-5.
25. Polat ZA, Vural A, Ozan F, Tepe B, Ozcelik S, Cetin A: In vitro evaluation of the amoebicidal activity of garlic (*Allium sativum*) extract on *Acanthamoeba castellanii* and its cytotoxic potential on corneal cells. J Ocul Pharmacol Ther 2008; 24(1): 8-14.

26. Chu TC, Han P, Han G Acanthamoebacastellanii Potter DE: Intraocular pressure lowering by S-allylmercapto-cysteine in rabbits. J Ocul Pharmacol Ther 1999; 15(1): 9-17.
27. Munteanu MF, Ardelean A, Borcan F, Trifunschi SI, Gligor R, Ardelean SA, Coricovac D, Pinzaru I, Andrica F and Borcan LC: Mistletoe and garlic extracts as polyurethane carriers - a possible remedy for choroidal melanoma. Curr Drug Deliv 2017; 14(8): 1178-88.
28. Javadzadeh A, Ghorbanihaghjo A, Arami S, Rashtchizadeh N, Mesgari M, Rafeey M and Omidi Y: Prevention of selenite-induced cataractogenesis in Wistar albino rats by aqueous extract of garlic. J Ocul Pharmacol Ther 2009; 25(5): 395-00.
29. Sun ZW, Chen C, Wang L, Li YD and Hu ZL: S-allyl cysteine protects retinal pigment epithelium cells from hydroquinone-induced apoptosis through mitigating cellular response to oxidative stress. Eur Rev Med Pharmacol Sci 2020; 24(4): 2120-28.
30. Pradeep SR and Srinivasan K: Ameliorative Influence of Dietary Fenugreek (*Trigonellafoenum-graecum*) Seeds and Onion (*Allium cepa*) on Eye Lens Abnormalities via Modulation of Crystallin Proteins and Polyol Pathway in Experimental Diabetes. Cur Eye Re 2018; 43(9): 1108-18.
31. Kim S, Park YW, Lee E, Park SW, Park S, Noh H, Kim JW, Seong JK and Seo K: Effect of onion extract on corneal haze suppression after air assisted lamellar keratectomy. J Vet Med Sci 2016; 78(3): 419-25.
32. Tewari D, Samoilă O, Gocan D, Mocan A, Moldovan C, Devkota HP, Atanasov AG, Zengin G, Echeverría J, Vodnar D, Szabo B and Crişan G: Medicinal Plants and Natural Products Used in Cataract Management. Front Pharmacol 2019; 10: 466.
33. Rooban BN, Sasikala V, Sahasranamam V and Abraham A: Amelioration of selenite toxicity and cataractogenesis in cultured rat lenses by *Vitex negundo*. .Graefes Arch Clin Exp Ophthalmol 2011; 249(5): 685-92.
34. Rooban BN, Sasikala V, Gayathri Devi V, Sahasranamam V and Abraham A: Prevention of selenite induced oxidative stress and cataractogenesis by luteolin isolated from *Vitexn egundo*. Chem Biol Inte 2012; 196(1-2): 30-8.
35. Damani MR, Shah AR, Karp CL and Orlin SE: Treatment of ocular surface squamous neoplasia with topical Aloe vera drops. Cornea2015; 34(1): 87-89.
36. Atiba A, Wasfy T, Abdo W,Ghoneim A, Kamal T and Shukry M: Aloe vera gel facilitates re-epithelialization of corneal alkali burn in normal and diabetic rats. Clin Ophthalmol 2015; 9: 2019-26.
37. Vecchione A, Celandroni F, Lupetti A, Favuzza E, Mencucci R and Ghelardi E: Antimicrobial activity of a new aloe vera formulation for the hygiene of the periocular area. J Ocul Pharmacol Ther 2018; 34(8): 579-83.

How to cite this article:
Nair AV and Sreekumar K: Looking from past to present- chakshushya drugs in bhavapraksha nighantu and research done on them. Int J Pharm Sci & Res 2021; 12(7): 3611-17. doi: 10.13040/IJPSR.0975-8232.12(7).3611-17.