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*Nighantus (*Ayurvediclexicons*)* and their Contributions towards *Shalakya* (E.N.T) Related Disorders - A Comprehensive Review

Siba Prasad Rout[1]* and Rabinarayan Acharya[2]

[1,2]Dravyaguna Department, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India

Abstract

Ayurveda, the oldest system of medicines, describes the disease conditions under eight branches. The diseases related to supraclavicular region have been described under the category of *urdhajatrugata* rogas of *Shalakya* (E.N.T) tantra. Many of the diseases related to head, eye, ear, and nose have been dealt under these headings. However, the *nighantu granthas (*Ayurvedic lexicons), the compendia describing the pharmacological properties of plants, have not described the drugs based on the organ system specific actions. Very few texts are available till date which gives vivid description regarding the exclusive management of *Shalakya* (E.N.T) related disorders. It is observed that *nighantus (*Ayurvedic lexicons*)* of medieval periods have described many herbal drugs in the context of *urdhajatrugata chikitsa*, but in a scattered way. Single hand information regarding the drugs used in *Shalakya* (E.N.T) related disorders is not available. In the present study, an attempt has been made to review all the drugs indicated in *Shalakya* (E.N.T) related disorders from available 12 *nighantugranthas*(Ayurvediclexicons). It is observed that, out of total 179 drugs indicated in *urdhajatrugata vikaras*, 131 are of herbal origin, 25 of mineral origin and 19 of animal origin. Among them, 95 drugs have been reported for *netra chikitsa*, out of which *chakushya* drugs contribute maximum in numbers i.e., 45. To this context, 26 drugs have been described in *mukharoga chikitsa*, 24 in *kantha roga chikitsa*, 14 in *siroroga chikitsa*, 11 drugs in *karna roga chikitsa*and,and 09 drugs in *danta chikitsa*. Many of these drugs have been well studied scientifically for their classical claims and many yet to be evaluated scientifically. The present observation may give a lead to the researcher to explore new drugs in *Shalakya* (E.N.T) related disorders.

Keywords

Chakshushya, Nighantu, Shalakya (E.N.T), *Urdhajatrugata Vikara*

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INTRODUCTION

Man with highly evolved biological system is regarded to be the most conscious social creature of world who has developed all his special senses to a higher degree of perception. *Shalakya* (E.N.T) *tantra,* a branch of Ayurveda remains at upper hand in treating all the ailments resulting out of these sense organs of supraclavicular region. It is constantly advisable to take consideration of these sense organs. History reveals that much significance has been laid upon the care taking of these sense organs which is well evident in all *vedas, puranas, samhitas* and so forth *nighantus* also. *Nighantus* (Ayurveda lexicons) have been stayed as an incredible wellspring of knowledge and information since time immemorial. They give lot of information with respect to drugs and their usages. Its portrayal in regards to the utilization of medications in all *Shalakya* (E.N.T) issues have been very much depicted in various *vargas* (chapters) of *nighantu*.

Going through all the *nighantus* clearly tosses light upon unfurling numerous unexplored or less portrayed drugs. The significance of *Shalakya*(E.N.T) is well obvious in *nighantus* as various usefulness of numerous herbal drugs have been depicted thoroughly at various *Vargas*(chapters) of *Nighantus*. A single hand information about the drugs indicated in *Shalakya* (E.N.T) related disorders is lacking in today's available ayurvedic literatures. Hence the present study has been undertaken with an aim to study the drugs highlighted for the management of *Shalakya*(E.N.T)related disorders fromavailable *Nighantus.*

MATERIALS AND METHODS

Twelve available*nighantus* of *Dravyaguna*namely*Asthanga Nighantu(A.N)*[1], *Dhanvantari Nighantu(D.N)*[2], *Dravyagunasamgraha(D.G.S)*[3], *Shodhala Nighantu(S.N)*[4], *Madhava Dravyaguna(M.D)*[5], *Madanapala Nighantu(M.P.N)*[6], *Kaiyadeva Nighantu(K.N)*[7], *Bhavaprakasha Nighantu(B.P.N)*[8], *Raja Nighan*tu(*R.N*)[9], *Shaligrama Nighantu(Sha.Ni)*[10], *Priya Nighan*tu(*P.N*)[11] and *Gunaratnamala(G.R)*[12]were scrutinized chapter by chapter and drugs by drugs to compile the drugs indicated for the managements of *Shalakya*(E.N.T) related disorders. The botanical equivalent of each drug have been collected from Ayurvedic

Formulary of India (AFI) and obtained data are presented in tabular format.

RESULTS

In this review, it is observed that total 179 drugs of herbo-mineral and animal origins have been described with pharmacological properties in *Shalakya (*E.N.T) disorders. Out of which 95 are indicated in*netra rogas* (diseases of eye), 26 for *mukharogas* (diseases of oral cavity), 14 for *sirorogas* (diseases of head), 13 for *kantharogas* (diseases of throat),11 for *karna vikaras* (diseases of ear),10 for *swara vikaras*(diseases of larynx). Out of the total drugs described in the context of *Shalakya*(E.N.T)*chikitsa,* thebotanical sources of 111 drugs have been reported and botanical sources of 10 drugs are yet to be explored. The list of herbal drugs indicated in *Shalakya*(E.N.T) *chikitsa* have been tabulated in table-1,drugs of mineral origin in table-2, drugs of animal origin in table-3. The compiled drugs were grouped according to their indications in various *Shalakya* (E.N.T) disorders and tabulated in table-4. Evidence based pharmacological and clinical research studies of certain drugs are presented in table-05.

Table 1: List of drugs of herbal origin indicated in *Shalakya* (E.N.T) relateddisorders

SLNo	Drug	Latin name	Family name	Shallakya indications	Reference
1.	*Vacha*	*Acorus calamus* Linn.	Araceae	*Kanthya-ashya roga nrit*	D.N 01/07
2.	*Brihata ela*	*Amomum subulatum* Roxb.	Zingiberaceae	*Kantha roga*	D.N 01/47
3.	*Tvaka*	*Cinnamomum zeylanicum* Blume.	Lauraceae	*Kanthabaktra ruja hantri*	D.N 01/51
4.	*Dhanyaka*	*Coriandrum sativum* Linn.	Umbelliferae	*Chakshushya*	D.N 01/64
5.	*Aamalaki*	*Emblica officinalis* Linn.	Euphorbiaceae	*Chakshusya*	K.N 1/240
6.	*Ardraka*	*Zingiber officinalis* Linn.	Zingiberaceae	*Swarya*	D.N 01/94
7.	*Agaru*	*Aquillaria agallocha* Roxb.	Thymelaceaee	*Karna-akhiroganrit*	K.N 1/1271
8.	*Ajamoda*	*Apium graveolens* Linn.	Umbelliferae	*Netraamayahara*	M.P.N 01/7
9.	*Ajashrungi*	*Gymnema sylvestre* R.Br.	Asclepiadaceae	*Chakshushya*	R.N 09/34
10.	*Arjaka*	*Ocimum basilicum* Linn.	Labiatae	*Netaramayahara*	R.N 8/159
11.	*Aswakshura*	*Clitoreae ternatea* Linn.	Leguminoseae	*Chakshusya*	K.N 09/89

12.	*Balwaja*	*Pollinidiuma.angustifolium* Comb.	Gramineae	*Kanthashodhana*	K.N 01/1255
13.	*Bhabya*	*Dillenia indica* Linn.	Dilleniaceae	*Ashyasodhanam*	K.N 01/332
14.	*Bhringaraja*	*Eclipta alba* Hassk.	Asteraceae	*Sirorti-,Netrarujahara*	B.P 03/241
15.	*Bhurja*	*Betula utilis* D.Don.	Betulaceae	*Karna-rogavishapnruta*	K.N 01/818
16.	*Bhutumbi*	-	-	*Dantargalanasana*	R.N 05/168
17.	*Bibhitaka*	*Termenalia belerica* Roxb.	Combretaceae	*Chakshushya*	K.N 01/244
18.	*Chakshusya*	*Cassia absus* Roxb.	Fabaceae	*Netrasravahara*	D.N 03/141
19.	*Chameli*	*Jasminum grandiflorum*Linn.	Oleaceae	*Netrarogahara*	R.N 08/76
20.	*Chinaka karpura*	*Cinnamomum camphora* Nees. & Eberm.	Lauraceae	*Kanthadoshahara*	R.N 08/69
21.	*Choraka*	*Angelica glauca* Edgew.	Umbelliferae	*Nasamukharujahara*	R.N 08/138
22.	*Dadima*	*Punica granatum* Linn.	Punicaceae	*Kanthaasyaroghaghna*	K.N 01/308
23.	*Daruharidra*	*Berberis aristata* Roxb.	Berberidaceae	*Chakshushya*	M.P.N 01/01
24.	*Devasarshapa*	-	-	*Vaktraamayavishodhan*	R.N 07/295
25.	*Dhanwanga*	*Grewia tilliafolia* Vahl.	Tilliaceae	*Kanthaamayanasaprada*	R.N 07/111
26.	*Dharini Kanda*	-	-	*Vakradoshasamana*	R.N 05/92
27.	*Dirghasuka*	*Oryza sativa* Linn.	Poaceae	*Netrabhighatnasana*	K.N 03/14
28.	*Drakshya*	*Vitis vinifera* Linn.	Vitaceae	*Swarya*	D.N 05/50
29.	*Eraka*	*Typha elephanatania* Roxb.	Typhaceae	*Chakshushya*	K.N 01/1229
30.	*Ghontapugaphala*	*Areca catechu Linn.*	Araceae	*Kanthasudhikara*	R.N 08/245
31.	*Graishmi*	*Jasminum Species.*	Oleaceae	*Netraroganam nashini mata*	D.N 05/130
32.	*Guduchi*	*Tinospora cordifolia* Willd.	Menispermaceae	*Chakshushya*	K.N 01/11
33.	*Guggulu*	*Commiphora mukul* Hook.	Burseraceae	*Swarya*	D.N 03/117
34.	*Gunja*	*Abrus precatorious* Linn.	Fabacae	*Netraamayahara*	M.P.N 01/26
35.	*Haritaki*	*Terminalia chebula* Retz.	Combretaceae	*Chakshushya*	K.N 01/224
36.	*Hingu*	*Ferula narthex* Regel.	Umbelliferae	*Chakshushya*	R.N 04/74
37.	*Indivara*	*Nelumbo nucifera* Willd.	Nymphaceae	*Chakshusya*	K.N 09/65

38.	*Irimeda*	*Acacia fernesiana* Willd.	Leguminoceae	*Mukharogaharam*	D.N 05/122
39.	*Jalapippali*	*Phyla nodiflora* Linn.	Verbenacea	*Chakshushya*	K.N 01/732
40.	*Jambira*	*Citrus lemon* Linn.	Rutaceae	*Vaktrasodhi,asyavairasya nasana*	K.N 01/317-60
41.	*Jati*	*Jasminum grandiflora* Linn.	Oleaceae	*Chakhusya*	D.N 05/127
42.	*Jatipatra*	*Myristica fragrans* Houtt.	Myristicaceae	*Vaktra dourgandhya nasanam*	D.N 03/32
43.	*Jivanti*	*Leptadenia reticulate* W &A	Asclepiadaceae	*Chakshushya*	K.N 01/100
44.	*Kadali*	*Musa sapientum* Linn.	Musaceae	*Karnasoola Netragadahrita*	K.N 01/285-55 B.P 05/34
45.	*Kadamba*	*Anthocephalus cadumba* Edgew.	Rubiaceae	*Karnapuraka*	R.N 07/98
46.	*Kakadani*	-	-	*Urdhagadapaha*	D.N 04/25
47.	*Kakamachi*	*Solanum nigrum* Linn.	Solanaceae	*Swarya*	D.N 04/19
48.	*Kankola*	*Piper cubeba* Linn.	Piperaceae	*Vaktra vairashya nasanam*	D.N 03/36
49.	*Kapitha*	*Feronia elephantum* Correa.	Rutaceae	*Kanthashodhana*	K.N 01/416
50.	*Karavira*	*Nerium indicum* Mill.	Apocynaceae	*Chakshushya*	D.N 04/03
51.	*Kashamarda*	*Cassia occidentalis*Linn.	Caesalpinaceae	*Kanthasodhana*	K.N 10/172
52.	*Kataka*	*Strychnos potatorum* Linn.f.	Loganiaceae	*Chakshusya*	D.N 03/154-
53.	*Kataphala*	*Myrica esculenta* Buchh.	Myricaceae	*Kantha-amayaaruchi nasana*	M.P.N 01/203
54.	*Ketaka*	*Pandanus odoratissimus* Roxb.	Pandanaceae	*Drusthidayak, Netrya*	K.N 01/1485
55.	*Khadira*	*Acacia catechu* Willd.	Leguminoseae	*Dantya*	K.N 01/824
56.	*Kousumbha saka*	*Carthamus tinctorius* L.	Asteraceae	*Drusthiprasadam*	R.N 05/143
57.	*Kramuka*	*Areca catechu* Roxb.	Araceae	*Chakushya*	D.N 03/158
58.	*Krishna jiraka*	*Cuminum cyminum* Linn.	Umbelliferae	*Chakhushya*	D.N 01/71
59.	*Kshudra champaka*	*Michelia champak* Linn.	Magnoliaceae	*Chakshushya*	R.N 08/62
60.	*Kulatha*	*Dolichos biflorus* Linn.	Leguminoseae	*Netra-amayaghna Drusthiroganasanam*	D.N 06/95 K.N 03/77

61.	*Kumkuma*	*Crocus sativus* Linn.	Iridaceae	*Drusthi-sirorogahrit*	D.N 3/12
62.	*Kundah*	*Jasminum pubeseens* Willd.	Oleaceae	*Siroragapaha*	K.N 1/1516
63.	*Palandu*	*Allium cepa* Linn.	Alliaceae	*Kantha sosha samana*	R.N 05/61
64.	*Langala*	-	-	*Drusthikara*	K.N 03/19
65.	*Lavanga*	*Syzygium aromaticum,* Linn	Myrtaceae	*Chakshusya, murdharogahrit*	D.N 03/40 R.N.08-83
66.	*Lodhra*	*Symplocos racemosus* Roxb	Symplocaceae	*Chakshushya*	M.P.N 01/254
67.	*Madhu Karkati*	*Citrus decumana* Linn.	Rutaceae	*Karna sothavinasanam*	M.P.N 6/78
68.	*Mahasatavari*	*Asparagus sarmentosus* Linn.	Lilliaceae	*Nayanamayanasan*	M.P.N 1/181
69.	*Mahavari vacha*	*Alpinia galanga* Willd.	Zingiberaceae	*Hrit-kantha mukha shodhini*	B.P 01/105
70.	*Malati*	*Jasminum grandiflora* Linn.	Oleaceae	*Siroakhimukha-dantarti nasana*	B.P 04/28
71.	*Mallika*	*Jasminum sambac* Ait.	Oleaceae	*Netrotharujaharam*	D.N 05/124
72.	*Manjistha*	*Rubia cordifolia* Roxb.	Rubiaceae	*Akhisulanrit*	M.P.N 01-01
73.	*Meshashringi*	*Gymnema sylvestre* R.Br.	Asclepiadaceae	*Chakshushya*	K.N 01/739
74.	*Muchukunda*	*Pterocarpus acerifolium* Willd.	Sterculiaceae	*Sirortinasana*	K.N 01/1520
75.	*Mugda*	*Phaseolus aureus* Roxb.	Leguminoseae	*Netrya*	D.N 06/71
76.	*Mugdaparni*	*Phaseolus trilobus* Linn.	Leguminoseae	*Chakshushya*	K.N 09/36
77.	*Munja*	*Saccharum munja* Roxb.	Gramineae	*Akhirogajit*	K.N 1/1244
78.	*Nagadanti*	*Artimisia vulgorissyn*Willd.	Euphorbiaceae	*Kanthadosantikrit*	R.N03/88
79.	*Nalika*	*Litsea monopetala* Roxb.	Lauracaeae	*Chakshushya*	K.N 01/256
80.	*Nepali*	*Jasminum species.*	Oleaceae	*Netraashyakarna rogaghni*	K.N 01/1528
81.	*Shobhanjana*	*Moringa oleifera* Lamk.	Moringaceae	*Chakshushya*	R.N 05/29
82.	*Nimbuka*	*Citrus medica* Linn.	Rutaceae	*Asyasodhanam*	K.N 01/329
83.	*Nirgundi*	*Vitex negundo* Linn.	Verbenaceae	*Netrahita*	M.P.N 01/164
84.	*Nispavika*	*Dolichos lab-lab* Linn	Fabaceae	*Kanthasudhikara*	R.N 05/193
85.	*Paribhadra*	*Erythrina indica* Lam.	Leguminoceae	*Karnavyadhivinasanam*	K.N 01/896

86.	*Patulika*	-	-	*Kanthya*	R.N 08/254
87.	*Prapoundarika*	*Hedychium flavescens* Carey	Scitaminae	*Chakshushya*	B.P 02/131
88.	*Priyangu*	*Callicarpa .macrophylla* Vahl.	Verbenaceae	*Vaktrajadyavinashini*	B.P 02/104
89.	*Puga*	*Areca catechu* Linn.	Araceae	*Vaktravairasyanasan*	K.N01/5 16
90.	*Putranjiva*	*Putrajiva roxburghi* Wall.	Euphorbiaceae	*Chakshushya*	R.N 07/139
91.	*Rajika patra*	*Brassica juncea* Linn.	Brassicaceae	*Kantha-amayahara*	R.N 05/146
92.	*Rajataruni*	-	-	*Chakshushya*	R.N 05/128
93.	*Raktachandana*	*Pterocarpus santalinus* Linn.	Leguminoseae	*Netrahitam*	M.P.N 03/10
94.	*Rohini*	*Soymida febrifuga* A.Juss	Meliaceae	*Kanthashudhikaram*	R.N 08/148
95.	*Rohitaka*	*Tecomma undullata* Seem.	Bignoniaceae	*Karnarogaharam*	D.N 05/120-171
96.	*Sala*	*Shorea robusta* Gaertn.	Dipterocarpaceae	*Netrrogahara*	K.N 01/80
97.	*Salarasa*	*Liquidamber orientalis* Miller.	Hamameliadaceae	*Kanthya*	B.P 02/205
98.	*Sarala*	*Pinus longifolia* Roxb.	Pinaceae	*Karnkantha-akhirogahara*	B.P 01/27-
99.	*Sarvakshara*	-	-	*Chakshushya, Vaktravishodhana.*	R.N 04/259
100.	*Satapatri*	*Rosedama scena* Desf.	Rosaceae	*Mukhasphotahara*	R.N 08/80
101.	*Shalidhanya*	*Oryza sativa* Linn.	Poaceae	*Chakshushya,swarya*	K.N 03/10
102.	*Shaluka*	-	-	*Netra-amayahara*	D.N 04/52-
103.	*Shatavari*	*Asparagus racemosus* Willd.	Liliaceae	*Chakshushya,ratrandhyahara*	K.N 01/196
104.	*Shruta shruni*	-	-	*Netraamayakrintani*	K.N 10/37
105.	*Srivesthaka*	-	-	*Sirsharoganrita*	D.N 03/121
106.	*Sweta jiraka*	*Cuminum cyminum* Linn.	Umbelliferae	*Chakshushya*	R.N 04/59
107.	*Sweta kantakari*	*Solanum xanthocarpum* S & W.	Solanaceae	*Chakshushya*	K.N 10/67
108.	*Sweta lasuna*	*Allium sativum* Linn.	Lilliaceae	*Chakshushya*	R.N 05/51
109.	*Sweta maricha*	*Piper nigrum* Linn.	Piperacaeae	*Drusthirogaghna*	R.N 04/34
110.	*Sweta vrihati*	*Solanum indicum* Linn.	Solanaceae	*Nana netra amayapaha*	K.N 10/66
111.	*Swyonaka*	*Oroxylum indicum* Vent.	Bignoniaceae	*Netrahitam*	R.N 07/29

112.	*Tagara*	*Valeriana wallichi* DC.	Valerianaceae	*Netra,Siroroga*	D.N 03/52
113.	*Talisha*	*Abies webianna*, Nees.	Pinaceae	*Mukharogaharam*	R.N 54-79
114.	*Tamalaki*	*Phyllanthus niruri* Linn.	Euphorbiaceae	*Chakshushya*	D.N 03/94
115.	*Taruni*	*Rosa centifolia* DC.	Rosacea	*Mukhapakaghni*	R.N 08/126
116.	*Tila*	*Sesamum indicum* Linn.	Pedaliacae	*Dantyo*	K.N 03/316
117.	*Tilaka*	*Wendlandia exerta* DC.	Rubiaceae	*Dantarogajit*	D.N 05/145
118.	*Tumbura*	*Zanthoxylum .alatum* DC	Rutaceae	*Mukharogajit*	M.P.N 06/74
119.	*Tuni*	*Cedrellatoona* Roxb.	Meliacaea	*Sirortinasan*	R.N 08/74
120.	*Vadara patra*	*Zyzyphus jujuba* Lamk.	Rhamnaceae	*Netra-amayapaham*	R.N 08/139
121.	*Vakula*	*Mimusops elengi* Lam	Sapotaceae	*Sthirikaram Dantanam*	D.N 05/143
122.	*Valamuli*	-	-	*Kanthya*	R.N 05/22
123.	*Vallika*	-	-	*Netrarogapahantri*	R.N 08/84
124.	*Varshiki*	*Jasminum sambac* Linn.	Oleaceae	*Karna-akhi mukha rogaghni*	B.P 04/26
125.	*Vijapura*	*Citrus medica* Linn.	Rutaceae	*Kanthya*	M.P.N 06/75
126.	*Vrihati*	*Solanum xanthocarpum* Schrad and Wendll	Solanaceae	*Chakshushya*	K.N 01/61
127.	*Vrintaka*	*Solanum melongena* Linn	Solanaceae	*Chakshushya*	K.N 01/580
128.	*Yasthimadhu*	*Glycyrrhiza glabra* Linn	Leguminoseae	*Swarya*	R.N 04/148
129.	*Yuthika*	*Jasminum auriculatum* Vahl.	Oleaceae	*Dant-akshi-siroroga*	K.N 08/1479
130.	*Jivaniya panchamoola*	-	-	*Chakshushya*	K.N 01/76
131.	*Triphala*	-	-	*Chakshushya*	M.P.N 01/33

Table 2: List of drugs of mineral origin indicated in*Shalakya*(E.N.T) disorders

Sl. No	*Drug*	English Name	*Karma*	Reference
1.	*Anjana*	Galena	*Netrya*	D.N03/137
2.	*Gairika*	Red ochre	*Chakshushya*	M.P.N 04/28
3.	*Girisindura*	Red oxide of mercury	*Netrya*	D.N 03/100

4.	*Gorachana*	Cow bezoar	*Netra ruja jayeta*	D.N 03/20-94
5.	*Haritala*	Orpiment	*Ashyaroganrit*	K.N02/47
6.	*Hemamakshika*	Cupper pyrite	*Chakshushya*	D.N03/115
7.	*Hingula*	Cinnabar	*Chakshushya*	M.P.N 04/33
8.	*Kacha Lavana*	White salt	*Chakshushya*	K.N02/112
9.	*Kamsya*	Bronze	*Chakshushya*	M.P.N 04/08
10.	*Kaparda*	Cowry	*Netradoshantikrit*	R.N 09/125
11.	*Kashisha*	Green Vitrole	*Netrarogeshu*	R.N 09/80
12.	*Khatika*	Chalk	*Netranikruntini*	R.N 09/131
13.	*Kulathanjana*	-	*Chakshushya*	R.N 09/90
14.	*Makshika*	Copper pyrite	*Chakshushya*	K.N02/37
15.	*Neelanjana*	Galena	*Chakshushya*	R.N 09/89
16.	*Parada*	Mercury	*Chakshushya*	K.N02/28
17.	*Puspanjana*	Zinc oxide	*Sarvnetrapaham*	R.N09/92
18.	*Rasanjana*	Indian berberis	*Mukhanetravikarnrit,Naktandhyahara*	K.N02/72
19.	*Saindhava Lavana*	Rock salt	*Chakshushya*	K.N02/96
20.	*SamudraPhena*	Cuttle fish internal shell	*Chakshushya*	M.P.N 04/47
21.	*Shankha*	Conch	*Netrahita*	M.P.N 04/62
22.	*Soubiranjana*	Galena	*Chakshushya*	K.N02/73
23.	*Suvarna*	Gold	*Netrya,vagshudhikaram*	K.N02/05
24.	*Suvarchal lavana*	Black salt	*Swarya*	D.N 04/88
25.	*Tutha*	Blue vitriole	*Chakshushya*	R.N 09/103
26.	*Tuvari*	Ferrous sulphate	*Chakshushya*	R.N 09/63

Table 3 List of drugs of animal origin indicated in *Shalakya* (E.N.T) disorders

Sl. NO	*Drug*	English Name	*Karma*	Reference
01.	*Aaja navanita*	Fresh butter of Goat	*Chakshushya*	K.N6/259
02.	*Arghya madhu*	Honey	*Chakshushya*	K.N01/192
03..	*Aswa mamsa*	Horse	*Chakshyushya*	M.P.N12/05
04.	*Bhramara*	Black bee	*Karna-siro-mukharoga*	D.N 06/09
05.	*Ghreetamanda*	-	*Akshiroga*	K.N06/293
06.	*Hasti dugdha*	Elephant Milk	*Chakshushya*	K.N05/141
07.	*Hastini dadhi*	Female elephant	*Chakshushya*	K.N06/196
08.	*Kakabhasa*	-	*Chakshushya*	M.P.N 12/67

09.	*Kasturika*	Musk Deer	*Netrya*	M.P.N03/05
10.	*Kokila mamsa*	Hens-sparrow	*Chakshushya*	M.P.N 12//64
11	*Kukuta mamsa*	Hen	*Chakshushya*	M.P.N12/33
12	*Mayura mamsa*	Peacock	*Chakshyurogavinasanam*	06/351-240
13	*Nari Dadhi*	FemaleCurd	*Netrhitam*	K.N06/195
14	*Oudhaalaka madhu*		*Swarya*	K.N01/196
15	*Sarpa mamsa*	Snake	*Chakshushya*	M.P.N 12/107
16	*Simha sardula*	Lion	*Vataakhirogajit*	M.P.N 12/15
17	*Usthra*	Camel	*Chakshushya*	M.P.N 12/08
19.	*Malaya Jala*	-	*Kantha-Galarogeshu*	M.P.N 08/27
20.	*Sandhyakalika dugdha*	-	*Chakshushya*	M.P.N 08/126
21.	*Latakasturi*	Musk mallow	*Chakshushya*	K.N01/1298

Table 4 Categorizations of drugs as per various *Shalakya*(E.N.T)disease conditions

A. Netra-Roga

Sl. No	**Conditions**	**Drugs**		**No.of Drugs**
01.	*Chakshushya*	HerbalDrugs	*Dhanyaka, Krishna agaru, Lavanga, Jiraka, Karpura, Tamalaki, Kataka, Kramuka, Jalapippali, Karavira, Jati, Daruharaidra, Lodhra, Guduchi,Vrihati, Jivanti, Haritaki, Aamalaki, Bibhitaki, , Vrintaka, Meshasringi, Gunja, Shatavari, Kataka, Eraka, Tagaram, Karpura, Latakasturi, Lavanga, Nalika, Shalidhanya, Mugdaparni Aswakshura, Indivara, Swetakantakari, Jiraktraya, Yasthimadhu, Sobhajana, Lasuna, Ajasrungi, Putranjiva, Rajataruni* *Jivaniyapanachamoola, Trphala*	45
		Mineral Drugs	*Saindhava,Kachalavana,Puspakasisha,Hemamakshika,Anjana,Shankha,Puspanjana,Kamsya,Gairika,Tutha,Hingula,Parada,Makshika,Soubiranjana, Tutha, Samudraphena*	
		Animal Drugs	*Arghyamadhu*	
02.	*Netrya*	*Mudga, Nirgundi, Kasturika, Raktacandana,Yuthika, Ketaka, Langala, Girisundara*		08
03.	*Netraroganasana*	*Tagara, Sarala, Graishmi, Sala, Chameli*		05
04.	*Netraroganrit*	*Darvi, Munja, Nepali, Rasanjana,Varshika*		05

05.	*Nayanamaya*	*Satavari, Mahasatavari, Sweta vrihati*	04
06.	*Netra-amayahara*	*Gunja, Kulatha, Vanyakulatha, Ajamoda*	04
07.	*Netrarujahara*	*Bhringraja, Krishnaagaru*	04
08.	*Netrarujahara*	*Mallika, Malati, Gorachana, Kasisha*	04
09.	*Netraprasadana*	*Nirmali, Koushumbhasaka*	02
11.	*Akshirujahara*	*Manjistha, jati*	01
12.	*Dristhidosanasana*	*Tagara*	01
13.	*Dristhidoshaghna*	*Sveta maricha*	01
14.	*Dristhiroganrit*	*Kumkuma*	01
16.	*Kanduhara*	*Guduchi*	01
17	*Drusthidayaka*	*Ketaka*	01
18.	*Naktandhyanasi*	*Darvi*	01
19.	*Nayanartinasana*	*Karanja*	01
20.	*Nayanrujahara*	*Mulaka,Shaluka*	01
21.	*Netrakanduhara*	*Punarnava*	01
22.	*Netrasravahara*	*Chakshushya*	01
23.	*Ratrandhyahara*	*Satavari*	01
	B. *Mukharoga*		
1.	*Mukhavairasya Nasana*	*Jatipatra, Kankola, Jambira, Nimbuka, Bhabya, Puga, Tamravalli, Dharani kanda, Devasarshapa, Javitri, Haritala, Shobhajana.*	*13*
2.	*Ashyaroganrit*	*Vacha,Dadima,Nepali.*	*03*
3.	*Ashyashodhanam*	*Nimbukam,Bhabya,Tamravalli.*	*03*
4.	*Mukharoganrit*	*Talisha,Bhramara,Dadima,Tvak,Irimeda,Varshika.*	*03*
5.	*Mukhasphotaha*	*Satapatri,Taruni.*	*02*
6.	*Mukhasravaharm*	*Sarala.*	*01*
7.	*Vaktradourgandhya nasan*	*Jatipatra.*	*01*
8.	*Vaktrajadyahara*	*Priyangu,Malati.*	*01*
9.	*Vaktrakledamalapa ham*	*Puga.*	*01*
10.	*Vaktrarujaharam*	*Tvaka.*	*01*
	C. *Siroroga*		
01	*Siroroganrit*	*Kumkuma, Lavanga, Tagara, Srivesthaka, Bhramara, Sarala, Bhringraja, Varshiki, Yuthika, Kundaha, Muchukunda, Tuni, Malati*	14
	D. *Danta*		
01.	*Dantya*	*Shatapatri, Bhringraja, Bakula, Nimba, Khadira, Bhutumbi,Yuthika, Bhutumbi*	08
02.	*Dantasthirikarana*	*Tila*	01
	E. *Swara*		
01.	*Swarya*	*Yasthimadhu, Guggula,Kakamachi, Ardraka, Drakshya, Souvarchala, Oudhlaka madhu, Madhu*	09
02.	*Swarbhramsa*	*Sarala*	01
	F. *Kantha*		
01	*Kanthya*	*Vacha, Mahavarivacha, Bhadraela, Kataphala, Vijapura, Tamravalli, Nagadanti, Valamuli, Lalpiaja, Rajikapatra, Khadirasara, Karavira,*	*17*

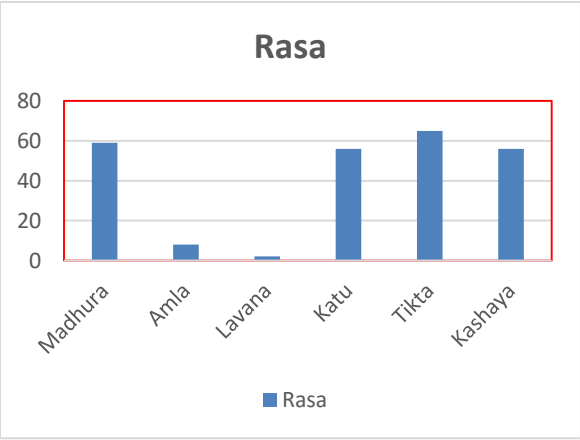
		Dhanwanga, Patulika, Chinaka karpura, Mulakadwaya, Salarasa.	
02	*Kanthashodhana*	*Kashmarda, Balwaja, Nimbuka, Ghontapugaphala*	*04*
03	*Kantharoganrit*	*Dadima, Sarala*	*02*
04	*Kantharujahara*	*Tvaka*	*01*

G. Karna

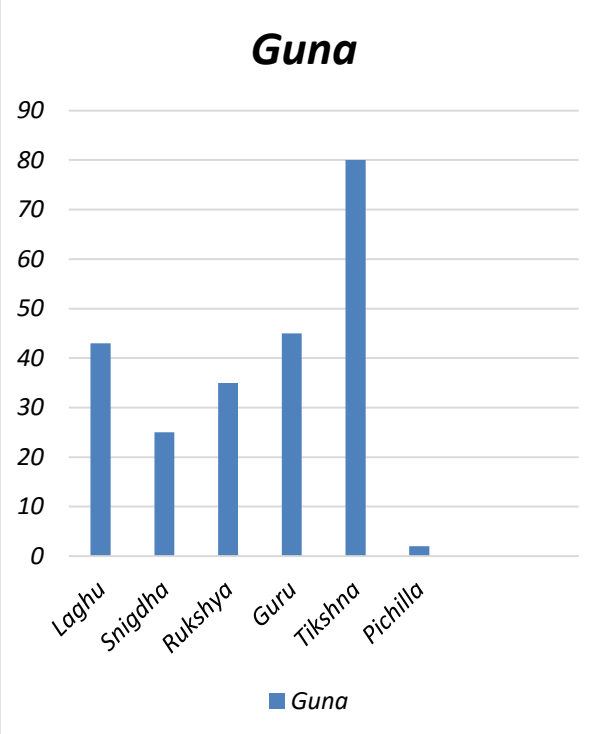
01.	*Karnarogahara*	*Rohitaka, Bhurja, Paribhadra, Sarala, Nepali*	*05*
02.	*Karnarujahara*	*Agaru, Nirgundi, Krishnaagaru*	*03*
03.	*Karnapaka*	*Samudraphena*	*01*
04.	*Karnasophanasana*	*Madhukarkatinasani*	*01*
05.	*Karnasoola*	*Kadali*	*01*

AYURVEDIC PHARMACODYNAMIC

*Katu rasa*has been proclaimed for possessing *Chakshuvirechayati* property (Clearing micro channels of eye) (*Ch.su.26/43). Madhura rasa*has been described by *Vagbhata*as *Akshaprasadana*. *Chakshu (*Eye*)* is the site of *Shleshmamahabhuta (ch.su.05/16). Madhura rasa* nourishes the eye. *Tikshna* property posseses *shodhana Shakti*. It helps in eliminating the accumulation of vitiated *doshas* through purification and excitation. Maximum diseases of *Shalakya*(E.N.T) are originated due to involvement of *kaphavata dosha*. As the drugs compiled from Various*nighantu* possesses *katu-vipaka* and *madhura rasa* inmaximum numbers (graph 01-04), it can be claimed that these drugs are helpful in treating*Shalakya*(E.N.T)disorders.



Graph 1 Shows that most of the drugs*Tikta, Kashaya Madhura rasa poperty,*



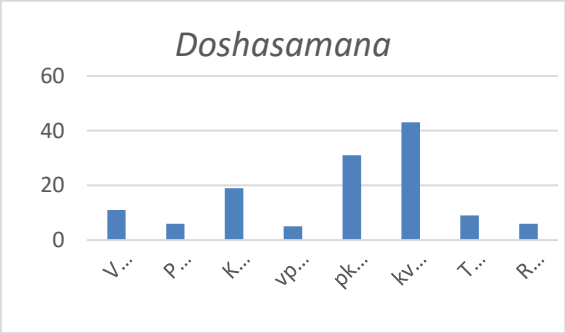
Graph 2 Shows the maximum number of the drugs posseses *tikshna, laghu* property

Reported evidence based research activity

Analysis of information obtained from various research journals reveals that out of

132 herbal drugs, 25 have beenexperimentally proved for their efficacy in*Shalakya* (E.N.T) disorders. Among them, 8 drugs are reported for possessing antimicrobial property against the bacteria.

Graph 3 Shows maximum drugs posseses *Katuvipaka* property.



Graph 4 Shows maximum drugs posseses *kaphavata samana* and *kapha pita samana* property.

Like *Salmonella typhi,Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus* which are known for causing maximum supraclavicular diseases (Table-05).

CONCLUSION

Sense organs play an essential role in human life. *Shalakyatantra* mainly deals with the managements of these sense organs located above supraclavicular (E.N.T) region. At present, a lot of expedite attempts are anticipated highly to interpret the ayurvedic terminology used in *Shalakya* (E.N.T) tantra into scientific presentation. This review article may enlighten the fields of *Shalakya* (E.N.T)and promote research activities to generate more evidence base research on certain unexplored drugs of *Nighantus (*Ayurvedic lexicons*)*reported in this review research article.

Table 5 Evidence based research activity of certain drugs from Ayurvedic lexicons indicated in *Shalakya* (E.N.T) disorders.

S. No	Plant	Activity	Part Used/Extract /Dose	Animal Model	Result
01	*Acorus calamus*[14]	Antibacterial	Rhizome, Leaf/ Methanolic	Male Rat	Inhibitory the bacterial strains of *Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus.*
02	*Amomum subulatum*[15]	Antimicrobial, Analgesic	Seeds /Methanolic extract/ dose 100&300mg/ kg	Rat	Showed significant P<0.001 Analgesic property.
03	*Emblica officinalis*[16]	Antiinflammatory	Dryfruit/Seeds	Clinical sudy/Collyrium	The dried fruit decoction / infusion of the seeds used as collyrium relieves inflammations of the conjunctive and other eye complaints. The exudates collected from incisions made on the fruit are applied externally on inflammation of the eye
04	*Zingiber officinalis*[17]	Antimicrobial	Root/Ethanolic extract/0.4mg /ml	In vitro assay	The ethanolic extract (0.4mg/ml) gave highest activity against *Klebsiella pneumonia, Proteus vulgaris, Streptococcus pyogenes* and *Staphylococcus aureus.* The zone of inhibition shows better than the standard reference antibiotic like nalidixic acid,Gentamycin etc
05	*Apium graveolens*[18]	Antimicrobial	Petiole/Ethanolic	In vitro study	The extract showed tested strains of microorganism and the inhibition zones ranged between 20.00+2.00 to 6.67+0.58 against *N. gonorrhoe*.
06	*Eclipta alba*[19]	Antinociceptive ,Analgesic	Stem/Alcoholic extract/200mg/kg	Pig	The results from this study show that both the ethanol extract as well as the total alkaloids produce good analgesic activity in all the different models of analgesia used.
07	*Terminalia bellerica*[20]	An timicrobial	Fruit/Crude extract/4mg	In vitro study	*T. bellerica* was highly effective against *S. aureus* with lower MIC values ranged from 300 to >2400 µg/ml and 250 µg to >2000 µg/ml. These results indicate that *T. bellerica* dry fruit possesses potential broad spectrum antimicrobial activity.
08	*Punica granatum*[21]	Antibacterial	Pericarp/Aqueos	In vitro assay	Hot aqueous, methanolic and ethanolic extracts of *Punica granatum* pericap show an average inhibitory zone diameter of 23.3, 22.3 and 24.5mm against *E.coli, S.aureus* respectively which is greater than that of the standard antibiotic Tetracycline (20.1mm).
09	*Berberis aristata*[22]	Antiinflammatory	Topical instillation with 2% Aqueous extract of B.ristata T.I.D For 3 days	Rabbit	*B. aristata*–treated groups:The inflammatory cell count: (P = 0.001 vs. control) cells/mL The protein content 8.24 ± 1.42 (P < 0.01 vs. control) mg/mL.The aqueous TNF-α level 654.09 ± 47.66 (P < 0.001vs. control) pg/mL *B. aristata*–treated groups, respectively.

10	*Tinospora cordifolia*[23]	Clinical study in Allergic rhinitis	Herbal extract	75 no Patients/8 weeks duration	TLC increased in 69% patients in drug treated group and in only 11% with placebo. After TC, eosinophil and neutrophil count decreased and goblet cells were absent in nasal smear. TC significantly decreased all symptoms of allergic rhinitis.
11	*Commiphora mukul*[24]	Antimicrobial	Ethanolic extract/gumresin/5mg/ml	In vitro assay	An active compound, 5(1-methyl,1-aminoethyl)-5-methyl-2-octanone, of the methanolic extract of *Guggula* gum possessed significant antibacterial activity against Gram-positive bacteria and moderate activity against Gram-negative bacteria
13	*Leptadenia reticulate* [25]	Immunomodulatory & Antioxidant	Leaf/Etahanolic extract/100.200 mg/kg	Rodent	Significant dose-dependent increase in antibody titre values; DTH reaction, potentiated percentage neutrophil adhesion to nylon fibers, as well as phagocytosis in carbon clearance assay,significant increase in haematological profile, GSH, SOD, CAT activity
15	*Acacia catechu*[26]	Anti-S. pyogenes activity	Core/Ethaolic extract/		5.60 % Extract produces inhibition zone of 11 with MIC >1000/>1000(µg/ml) poduces significant better activity against *S. pyogenes*
16	*Dolichos biflorus*[27]	Antiallergic	Seed/Ethanolc extract/	Wistar rats/Swiss Albino mice.	DB extract inhibited milk-induced leukocytosis and eosinophilia and also the compound 48/80 induced mast cell degranulation,significantly reducing passive paw anaphylaxis in a dose-dependent manner..
17	*Crocus sativus*[28]	Antidepessant clinical study	Petal/capsule/30mg /day BD	Clinical study /6 weeks	At 6 weeks, petal of *C. sativus* produced a significantly better outcome on Hamilton Depression Rating Scale than placebo ($d.f.=1, F=16.87, p<0.001$).
18	*Syzygium aromaticum*[29]	Oral Antibacterial activity	Leaf/Aqueous and Ethanolic Extract/	Clinical study	*Ethanolic Extract of Syzygium aromaticum* (10.5–78.0 µg/mL) showed the highest inhibitory effect against. *Streptococcus mutans* and *Porphyromonas gingivalis*
19	*Symplocos racemosa*[30]	Antihistaminic	Bark/eye drop/24gm/0.5ml	Guinea pig lleum	The magnitude of the contraction of the tissue with addition of 0.1 ml of histamine in organ bath was 48 mm, the magnitude of the contraction of the tissue with increasing dose (0.1, 0.2, 0.3 and 0.4 ml of histamine) was found to be 4 mm, 6 mm, 4 mm and 2 mm respectively.
20	*Asparagus racemosus*[31]	Anti-Cataract	Root/Aqueous extract/ 250 µg/ml and 500µg/ml	Goat lens	*Asparagus racemosus* root (AEAR) significantly prevented the glucose induced changes in biochemical parameters and Catalase. Photographic evaluation also indicated that AEAR prevented the opacity of the lens compared to model control group in vitro.
21	*Rubia cordifolia*[32]	Antihistaminic effect against allergic conjuctivitis	Stem/dried water soluble extract/500 mg/kg, p.o. for 7 days)	Wister Rat	*Rubia cordifolia* showed significant ($P < 0.05$) inhibition in by reduced level of histamine content in tears suggesting antihistaminic activity of RC.

22	*Gymnema sylvestris*[33]	Antiinflammatory	Leaf/aqueous extract/ 300mg/kg.	carrageenan induced rat paw oedema	The aqueous extract decreases the paw edema volume by 48.5% at the dose of 300mg/kg. Extract produced significant reduction in the granuloma formation.
23	*Tecoma undullata*[34]	Analgesic	Whole plant/Methanoli extract	hot water tail immersion test	*T. undulate* showed significant analgesic potential when compared with aspirin.
24	*Piper nigrum*[35]	Antiallergic	Fruit	Mice	Piperine strongly inhibits hepatic aryl hydrocarbon hydroxylase and UDP-glucuronyl transferase activities, thus prolonging hexabartital sleeping time and zoxazolamine paralysis time in mice
25	*Valerian wallchii*[36]	Central analgesic property	Ethanolic extract/3mg/ml	Clinical study	100 µM valerenic acid induced a 22.2% ± 3.4% inhibition with an IC_{50} of 23 ± 2.6 µM (both $P <$ 0.01). valerenic acid decreased the brainstem inhibitory effects produced by muscimol (both $P <$ 0.05).
26	*Mimosops elengi*[37]	antimicrobial agent against salivary micro flora	Bark/Acetone extrct/450 µg	In vivo study	A concentration of 450 µg of acetone extract is found to inhibit most of the salivary samples.130 µg is the dose required to attain 50 % inhibition of mixed micro flora.
27	*Glyccyrrhizaglabra*[38]	Antibacterial activity against oral pathogens	Root/Ethanolic extract/500gm	In vitro study	Antibacterial activity of chlorhexidinas a well-known antibacterial agent was not significantly greater than *Glycyrrhiza glabra* extract (p value more than 0.05).

REFERENCES

1. National Institute of Indian Medical Heritage (NIIMH), Hyderabad (2008), Astanga Nighantu-e book designed &developed by, Copyright *CCRAS, New Delhi*.

2. Sharma, P. V., & Sharma, G. P. (2005). Dhanvantari Nighantu. *Chaukhambha Orientalia, Varanasi.*

3. Vaidya Jadavji Trikamji (2006) Acharya Chakrapanidutta,Dravyagunasamgraha,*Varanasi, Chaukhambha Orientalia.*

4. Sodhala, S. N. (1978). Priya Vrit Sharma. Shodhala Nighantu.*OrientalInstitute*, *Baroda*.

5. Sharma, P. V *(2003)*, Madhav Dravyaguna, *Chaukhambha Vidhyabhavan, Varanasi*.

6. Pala Nighantu, M. (2009). Hariprasad Tripathi. *Chaukhambha Krisnadasa Academy, Varanasi*.

7. Sharma, P. V. (2006,). Kaiyadeva Nighantu,*ChaukhambhaOrientalia, Varanasi*.

8. Bhavamishra, B. N. (2013). Commentary by Prof. Late Dr. GS Pandey, *Chaukhambha Bharati Academy, Varanasi*.

9. Tripathi, I. (2006). Raja Nighantu of Narahari. *Krishanadas Academy. Varanasi.*

10. Vaishya, L. S. (1981). Shree Shaligrama Nighantu Bhushanam: *KhemrajShrikrushnadas ,SteemPress*.

11. Sharma, P. V., & Nighantu, P. (2004). *Chaukambha Surabharati Prakashana, Varanasi*.

12. Kailash Pati Pandey (2006) *Guna Ratnamala* edited with Prakash vyakhya, Chaukhamba *Sanskrit Bhavana-Varanasi.*

14. Manikandan, S., Devi, R. S., Srikumar, R., Thangaraj, R., Ayyappan, R., Jegadeesh, R., & Hariprasath, L. (2010). In-vitro antibacterial activity of aqueous and ethanolic extracts of acorus calamus.International Journal of Applied Biology and Pharmaceutical Technology 1(3) 1072-1075.

15.Bisht, V. K., Negi, J. S., Bh, A. K., & Sundriyal, R. C. (2011). Amomum subulatum Roxb: Traditional, phytochemical and biological activities-An overview. African Journal of Agricultural Research, 6(24), 5386-390**.**

16. Mirunalini, S., & Krishnaveni, M. (2010). Therapeutic potential of Phyllanthus emblica (Amlaa): the ayurvedic wonder. Journal of basic and clinical

physiology and pharmacology, 21(1), 93-105.

17. Rashmi, K. J., & Tiwari, R. (2016). Pharmacotherapeutic Properties of Ginger and its use in Diseases of the Oral Cavity: A Narrative Review.Journal of Advanced Oral Research, 7(2), 1-06.

18. Rani, P., & Khullar, N. (2004). Antimicrobial evaluation of some medicinal plants for their anti-enteric potential against multi-drug resistant Salmonella typhi. Phytotherapy Research, 18(8), 670-673.

19. Sawant, M., Isaac, J. C., & Narayanan, S. (2004). Analgesic studies on total alkaloids and alcohol extracts of Eclipta Alba (Linn.) Hassk. Phytotherapy research, 18(2), 111-113.

20. Elizabeth, K. M. (2005). Antimicrobial activity of Terminalia bellerica. Indian journal of clinical Biochemistry, 20(2), 150-153.

21. Khan, J. A., & Hanee, S. (2012). Antibacterial properties of Punica granatum peels. International Journal of Life Science and Pharma Research, 1(4), 164-172.

22. Gupta, S. K., Agarwal, R., Srivastava, S., Agarwal, P., Agrawal, S. S., Saxena, R., & Galpalli, N. (2008). The anti-inflammatory effects of Curcuma longa and Berberis aristata in endotoxin-induced uveitis in rabbits.Investigative ophthalmology & visual science, 49(9), 4036-4040.

23. Badar, V. A., Thawani, V. R., Wakode, P. T., Shrivastava, M. P., Gharpure, K. J., Hingorani, L. L., & Khiyani, R. M. (2005). Efficacy of Tinospora cordifolia in allergic rhinitis. Journal of ethnopharmacology, 96(3), 445-449.

24. Romero, C. D., Chopin, S. F., Buck, G., Martinez, E., Garcia, M., & Bixby, L. (2005). Antibacterial properties of common herbal remedies of the southwest. Journal of ethnopharmacology, 99(2), 253-257.

25. Pravansha, S., Thippeswamy, B. S., & Veerapur, V. P. (2012). Immunomodulatory and antioxidant effect of Leptadenia reticulata leaf extract in rodents: possible modulation of cell and humoral immune response. Journal of Immuno pharmacology and immunotoxicology, 34(6), 1010-1019.

26. Limsuwan, S., & Voravuthikunchai, S. P. (2013). Anti-Streptococcus Pyogenes activity of selected medicinal plant extracts used in Thai Traditional Medicine. Tropical Journal of Pharmaceutical Research, 12(4), 535-540.

27. Suralkar, A., & Kasture, S. (2013). Anti-allergic and anti-anaphylactic activities

of Dolichos biflorus. International Journal of Green Pharmacy, *7*(3), 196-202.

28. Akhondzadeh, S., Tahmacebi-Pour, N., Noorbala, A. A., Amini, H., Fallah-Pour, H., Jamshidi, A. H., & Khani, M. (2005). Crocus sativus L. in the treatment of mild to moderate depression: a double-blind, randomized and placebo-controlled trial. Journal of Phytotherapy Research, 19(2), 148-151.

29. Rosas-Piñón, Y., Mejía, A., Díaz-Ruiz, G., Aguilar, M. I., Sánchez-Nieto, S., & Rivero-Cruz, J. F. (2012). Ethnobotanical survey and antibacterial activity of plants used in the Altiplane region of Mexico for the treatment of oral cavity infections. Journal of ethnopharmacology, 141(3), 860-865.

30. Abdul, L., Abdul, R., Sukul, R. R., & Nazish, S. (2010). Anti-inflammatory and antihistaminic study of a unani eye drop formulation. Ophthalmologyandeyediseases, 2(3), 17-21.

31. Shah NK et. all (2013). Evaluation of Anti-Cataract Activity of *Asparagus Racemosus* Root Extract Using In-Vitro Model of Goat Lens. International Journal for Pharmaceutical research scholar, 2(3), 74 -79.

32. Rishit, Z., Chintan, G., Vaibhav, P., & Balaraman, R. (2009). Inhibitory effects of Tinospora cordifolia and Rubia cordifolia Linn. On egg albumin-induced experimental allergic conjunctivitis in rats. Oriental Pharmacy and Experimental Medicine, 9(1), 58-66.

33. Diwan, P. V., Margaret, I., & Ramakrishna, S. (1995). Influence of Gymnema sylvestre on inflammation. Journal of Inflammopharmacology, 3(3), 271-277.

34. Ahmad, F., Khan, R. A., & Rasheed, S. (1994). Preliminary screening of methanolic extracts of Celastrus paniculatus and Tecomella undulata for analgesic and anti-inflammatory activities. Journal of ethnopharmacology, 42(3), 193-198.

35. Hirata, N., Naruto, S., Inaba, K., Itoh, K., Tokunaga, M., Iinuma, M., & Matsuda, H. (2008). Histamine release inhibitory activity of Piper nigrum leaf. Biological and Pharmaceutical Bulletin, 31(10), 1973-1976.

36. Yuan, C. S., Mehendale, S., Xiao, Y., Aung, H. H., Xie, J. T., & Ang-Lee, M. K. (2004). The gamma-aminobutyric acidergic effects of valerian and valerenic acid on rat brainstem neuronal activity. Journal of Anesthesia & Analgesia, 98(2), 353-358.

37. Deshpande, R. R., Ruikar, A., Panvalkar, P. S., Kulkarni, A. A., Khatiwora, E., Adasul, V,& Deshpande, N. R. (2010). Comparative evaluation of different concentrations of Mimusops elengi (L) extract as an antimicrobial agent against salivary micro flora. Journalof Biomedical Science and Research, 2(3), 151-154.

38. Sedighinia, F., Safipour Afshar, A., Asili, J., & Ghazvini, K. (2012). Antibacterial activity of Glycyrrhiza glabra against oral pathogens: an in vitro study. Avicenna Journal of Phytomedicine, 2(3), 118-124.