

## PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *SHUNTHYADI* EYE DROPS

**Dr. Chandan Sharma<sup>1</sup>, Dr. Sarika Makwana<sup>2</sup>, Dr. D. B. Vaghela<sup>3</sup>, Dr. Harisha C R<sup>4</sup> and Dr. V. J. Shukla<sup>5</sup>**

<sup>1</sup>Final Year P.G. Scholar, Shalakyatantra Department, IPGT and RA, GAU, Jamnagar.

<sup>2</sup>Final Year P.G. Scholar, RSBK Department, IPGT and RA, GAU, Jamnagar.

<sup>3</sup>I/C HOD and Associate Professor, Shalakyatantra Department, IPGT and RA, GAU, Jamnagar.

<sup>4</sup>HOD of Pharmacognosy laboratory, IPGT & RA Jamnagar, India.

<sup>5</sup>HOD of Pharmaceutical laboratory, IPGT & RA Jamnagar, India.

**\*Corresponding Author: Dr. Chandan Sharma**

Final Year P.G. Scholar, Shalakyatantra Department, IPGT and RA, GAU, Jamnagar.

Article Received on 21/03/2019

Article Revised on 11/04/2019

Article Accepted on 01/05/2019

### ABSTRACT

**Background:** *Shunthyadi* eye drops contain drugs like cow *Ghrita*, *Shunthi* (Zingiber officinale), *Saindhava Lavana* (rock salt), which are claimed to be effective in *Shushkakshipaka* (Dry eye). In present study, it has been used as topical eye drop in Dry Eye. **Objective:** Present study is aimed to look out on herbal drugs used in the preparation of *Shunthyadi* eye drops and standardization of Pharmacognostical, Physicochemical parameters and HPTLC evaluation. **Methods:** Identification and Authentication of raw drug *Shunthi* was done by pharmacognostical study i.e. morphological features, organoleptic characters and powder microscopy. Physicochemical evaluation and HPTLC was carried out of final product. **Results:** Pharmacognostical Study of raw drug *Shunthi* showed presence of Scalariform vessels, Oleo resin content, Annular vessels, Simple starch grains of *Shunthi* etc. Pharmaceutical evaluation showed results Specific Gravity 0.89, Refractive Index 1.47, Acid Value 1.94, Saponification Value 220, Iodine Value 11.98, pH 6.00, Loss on drying 0.1, High Performance Thin Layer Chromatography results was found at 254 nm and 366 nm in to 6 and 5 spots respectively in before spray. **Conclusion:** Identification, authentication of herbal drug used in the preparation of *Shunthyadi* eye drops has been done. Physicochemical evaluation has been carried out of prepared drug which is further useful for standardization of *Shunthyadi* eye drops and clinical researches.

**KEYWORDS:** Dry Eye, Pharmacognosy, *Shunthyadi* eye drop, *Shushkakshipaka*, Pharmaceutical.

### INTRODUCTION

*Acharya Sushruta* has suggested that *Shunthi* rubbed over a stone-slab with Ghee and breast-milk is recommended as an *Anjana* (collyrium) in *Shuskakshipaka*.<sup>[1]</sup> *Acharya Sushruta* also states that *Vasa* of aquatic animals mixed with little quantity of powdered *Shunthi* and *Saindhava Lavana* should be applied to the eyes as an *Anjana* (collyrium) in *Shuskakshipaka*.<sup>[2]</sup> According to *Acharya Charaka* "if eye is affected with *Vata* an external application of soft extract (*Bidalaka*) may be prepared by making paste of *Shunthi* and *Saindhava* with the supernatant part of ghee is useful."<sup>[3]</sup> Thus it is evident from the above references that *Shunthi* and *Saindhava* have effect on *Vatika* eye diseases like *Shuskakshipaka*. Thus, an eye drop has been planned with *Shunthi* and *Saindhava*. *Vasa* which gets hardened in room temperature, and not accepted by some Hindu communities was not found suitable for the base of the eye drops. Hence, *Ghrita* was selected as the base. For the convenience of the patients *Aschyotana* was

selected instead of *Bidalaka* and *Anjana* because eye drops have the advantage that it is more liked by the patients than other *Kriyakalpa* since it is easy to use.

### OBJECTIVE OF STUDY

Present study, is aimed to look out on herbal drug used in the preparation of *Shunthyadi* eye drops and Standardization of Pharmacognostical, Physicochemical parameters and HPTLC evaluation. The purpose of Standardization of raw drugs and final product is to ensure therapeutic efficacy. Therefore, maintaining the quality of this product is an essential factor.

### MATERIALS & METHODS

#### Collection, identification, authentication of raw drugs Collection of raw materials

Raw drug *Shunthi*, *Go-Ghrita* and *Saindhava Lavana* were procured from the pharmacy of Gujarat Ayurved University, Jamnagar. The ingredients of *Shunthyadi* eye drops and its part used are given at Table No 1. The raw

drugs were identified and authenticated by Pharmacognosy Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. Identification was done

on basis of organoleptic characters [Table No 2, 3], morphological features and powder microscopy of raw drug *Shunthi* as per API standards for authentication.

**Table 1: Ingredients of *Shunthyadi* Eye Drops (*Anubhoota*).**

Sr. No.	Name of Ingredients	Botanical Name	Ratio
1	<i>Go Ghrita</i>	-	1 part
2	<i>Shunthi</i>	<i>Zingiber officinale</i>	1/16 part
3	<i>Saindhava Lavana</i>	-	1/16 part

#### Preparation of *Shunthyadi* Eye Drops (Plate: 1).

*Shunthi* and *Saindhava Lavana* were made into bolus of *Kalka* form by adding sufficient water. This bolus of *Kalka* was added to *Ghrita* and thaws added in mixture of *kalka* and *Go Ghrita*. The ratio of *Kalka: Sneha: Drava: Dravya* is 1/16: 1: 4. Throughout the procedure the temperature of heating source was maintained .so, as to generate only bubble in the mixture. The heating was continued till *sneha sidhdha lakshanas* were observed. After partially cooling, the mixture is filtered through four folded fine cotton cloth two times and packed into sterile jar. As the suitable condition is not available in the G.A.U. Pharmacy, the packing of eye drops was done at Indian Ophthalmics, Surendra Nagar, under aseptic conditions. The procedure in brief is as given below-

- Filtration by 2.0 microns glass filter followed by 0.2 microns nylon filter.
- Filtered solution was filled in 5 ml sterile plastic bottles under Laminar Air Flow in aseptic conditions.
- Plugging and capping was also done in aseptic area.

#### Pharmacognostical Study

Raw drug *Shunthi* was identified and authenticated by pharmacognosy department, IPGT & RA, Gujarat Ayurved University, Jamnagar. The identification was carried out on the basis of organoleptic features, morphological features and powder microscopy of raw drug.

#### Pharmaceutical Evaluation Physicochemical Parameters

*Shunthyadi* eye drops was analyzed by using qualitative and quantitative parameters at Pharmaceutical Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. The common parameters mentioned in Ayurvedic Pharmacopeia of India and CCRAS<sup>[4]</sup> guidelines i.e. Refractive index,<sup>[5]</sup> Specific gravity,<sup>[6]</sup> Acid value,<sup>[7]</sup> Iodine value,<sup>[8]</sup> Saponification value<sup>[9]</sup> were taken.

#### High Performance Thin Layer Chromatography (HPTLC)

##### Sample preparation

0.1 ml of oil was taken and 1 ml of hexane was added. The Solution was prepared used for chromatography. Thereafter pre chromatographic derivatization was done. Alcoholic KOH (base) and thereby heated for 10-15 minutes in CAMAG TLC plate heater. Sample application was done using CAMAG linomat 5.

HPTLC of *Shunthyadi* eye drops was carried out using the solvent system petroleum Ether: Diaethyl ether: Acetic Acid (9:1:0.1v/v). HPTLC study was performed for the normal phase separation of components of product. Post chromatographic derivatization was done with vanillin sulphuric acid spray reagents.<sup>[14]</sup>

#### OBSERVATIONS AND RESULTS

**Organoleptic characters:** Organoleptic characters like Taste, Colour, Odour, Touch and Texture were scientifically studied are as per detailed in Table 2,3.

**Table 2: Organoleptic characters of Raw drug *Shunthi*.**

Sr. No	Various parameters	Results
1.	Colour	Pale Yellow
2.	Odour	Aromatic
3.	Touch	Fine
4	Taste	Pungent

**Table 3: Organoleptic characters of *Shunthyadi* eye drops.**

Sr. No.	Various parameters	Results
1.	Colour	Golden yellow
2.	Odour	Characteristic
3.	Touch	Oily

#### Microscopic Characters of Raw Drug *Shunthi*

The diagnostic characters under microscope showed oleo resin content, group of simple fibres, scalariform vessels, parenchymal cells with oleo resin content, parenchymal cells with starch grains, Annular vessels, simple starch grains of *Shunthi*.

#### Pharmaceutical Analysis

Comparative Physicochemical Analysis of *Shunthyadi* eye drops i.e. Loss on drying, Specific gravity, Refractive index, Acid value, Iodine value, Saponification value, pH were scientifically studied and results were detailed in Table 4.

**Table 4: Physicochemical Parameters of *Shunthyadi* eye drops.**

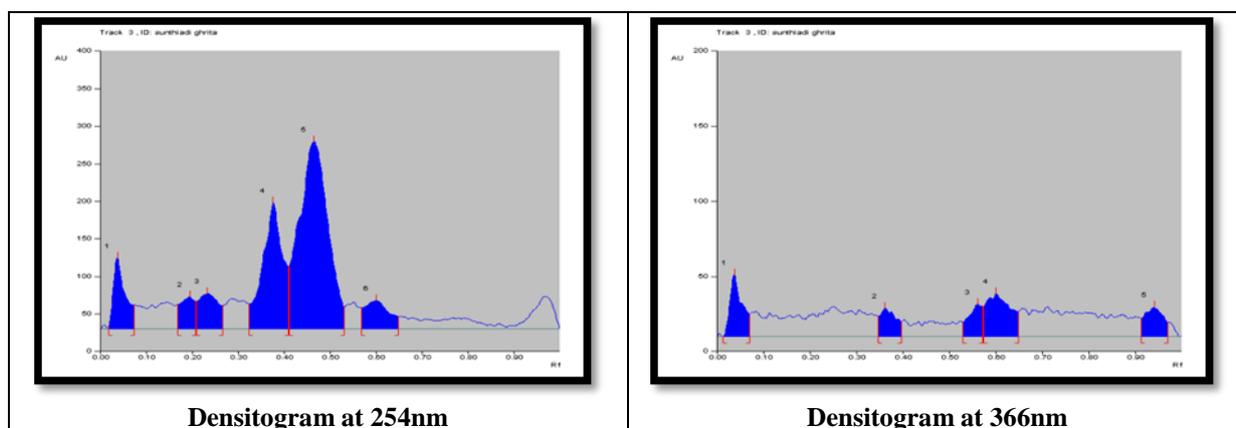
Sr. No.	Parameters	Results
1	Loss on drying	0.1%
2	Specific gravity	0.89
3	Refractive index	1.47
4	Acid value	1.94
5	Iodine value	11.98
6	Saponification value	220
7	pH	6.00

**HPTLC Study**

Chromatographic study (HPTLC) was carried out under 254nm and 366nm to establish fingerprinting profile. It showed 6 spots at 254 nm and 5 spots at 366 nm.

**Table 5: Results of *Shunthyadi* eye drops.**

Sample	Visualize under short UV (254 nm)		Visualize under short UV (366 nm)	
	No. of spots	Rf value	No. of spots	Rf value
<i>Shunthyadi</i> eye drop	6	0.07, 0.21, 0.27, 0.41, 0.53, 9.65	5	0.07, 0.40, 0.57, 0.65, 0.97

**Figure 1: Hptlc Of Methanolic Extract Of *Shunthyadi* Eye Drop.****DISCUSSION**

In the present research work, only suitable and available techniques were selected for the quality evaluation of *Shunthyadi* eye drops. Generally, *Ghrita* are given different characteristic color and odour relative to the herbs and other materials which were used to prepare the medicated *Ghrita*. This medicated *Ghrita* is golden yellow viscous liquid with characteristic odor. Authentication of used drugs was done by morphological and histological examination. This can prevent misuses of drug adulteration. The pharmacognostical evaluation showed that it contains ingredient which were observed in the microscopical characters. This shows the purity and quality of product.

Evaluation of Physico-chemical parameters and qualitative analysis helps to assess the quality and identify the presence of specific ingredients in a formulation and also to assess the purity by comparing with the standard ones. Loss on Drying is a widely use test method to determine the moisture content This medicated *Ghrita* having Loss on Drying value was 0.1%. It indicates moisture content of formulation should be less than 1%. Refractive index indicates the density of sample compared to air and liquid media; the value (1.47) of medicated *Ghrita* was within the limit.<sup>[10]</sup> Specific gravity indicates the presence of solute content

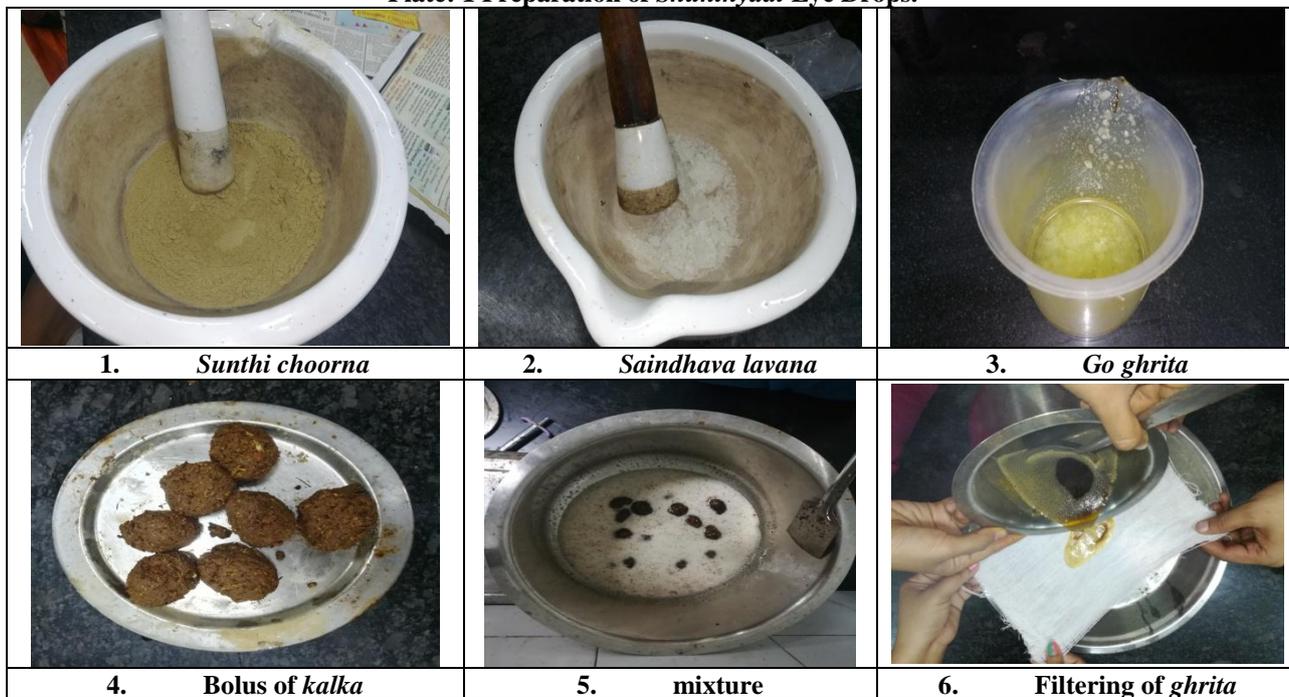
in the solvent; the value (0.89) for the same was appropriate for this *Ghrita*.<sup>[11]</sup> The amount of alkali needed to saponify a given quantity of *Ghrita* will depend upon a number of -COOH group present; the Saponification value (220) also indicates the average molecular weight/chain length of all fatty acids present. Longer the chains, fatty acid have low Saponification value, and shorter chain fatty acid have high Saponification value. Shorter chain fatty acid (high Saponification value) have a faster rate of absorption than longer chain fatty acid; Saponification value of *Shunthyadi* eye drops was found to be 220 mg/g.<sup>[12]</sup> The Acid value indicates the presence of free fatty acid in the *Ghrita* which is responsible for rancidity of compounds; higher the free fatty acid more is the rancidity, this helps to decide the shelf life of the *Ghrita*; acid value for *Shunthyadi* eye drops was found to be 1.94 thus, indicating the longer shelf life of *Ghrita*.<sup>[13]</sup> Iodine value (11.98) indicates the degree of unsaturation of *Ghrita*; greater the degree of unsaturation higher will be the possibility of absorption and atmospheric oxidation leading to rancidity.<sup>[14]</sup> The more iodine number, the more unsaturated fatty acid bonds are present; unsaturated fatty acid better absorbed than saturated fatty acids, the iodine value of *Shunthyadi* eye drops was found to be fair enough which indicates the less rancidity of this formulation. Normally, pH of healthy eye tears is 6.5 to 7.6,<sup>[15]</sup> (acidic-basic). pH of dry eye (7.89, basic)

is slightly higher from normal eye.<sup>[16]</sup> This medicated *Ghrita* having 6.00 pH. Thus, it may be reducing this value from basic to slightly acidic value.

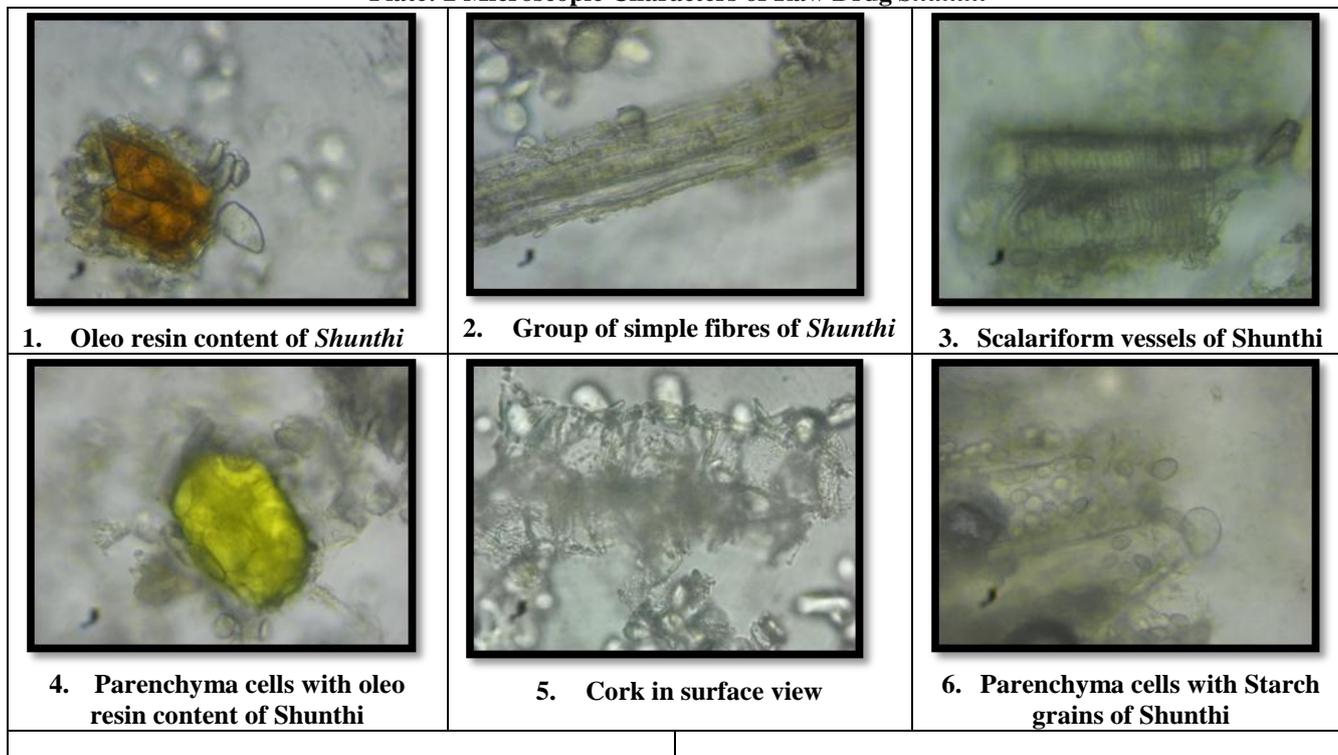
HPTLC method was developed in order to separate it from other interfering phytochemical constituents of formulation. This was achieved on HPTLC plates using petroleum Ether: Diethyl ether : Acetic Acid

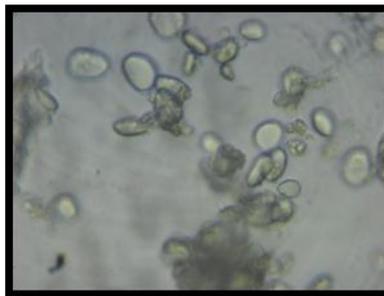
(9:1:0.1v/v) as a mobile phase. In HPTLC of *Shunthyadi* eye drops, six major spots were observed at 254 nm [Table 5, Figure 1] indicating its possible compounds of the matrix which may be responsible for its therapeutic activity. TLC finger print profile consists of 6, 5 prominent spots under UV light at 254nm and 366nm respectively before spray. These findings could be helpful in identification and authentication.

**Plate: 1 Preparation of *Shunthyadi* Eye Drops.**



**Plate: 2 Microscopic Characters of Raw Drug *Shunthi***



7. Annular vessels of *Shunthi*.8. Simple starch grains of *Shunthi*.

## CONCLUSION

Physico-chemical profile of *Shunthyadi* eye drops is an essential parameter for quality assurance; in present work the obtained results were found within prescribed limits. Chromatographic study results suggests presence and incorporation of active herbal drug in the lipid formulation. On the basis of observations and experimental results, this study may be used as reference standard in the further quality control researches and clinical researches.

## REFERENCES

1. Sushruta. Sushruta Samhita Dalhana Comm. - Nibandhasangraha, Chowkhambha Orientalia Varanasi, Uttaratantra, 2002; 9/23.
2. Sushruta. Sushruta Samhita Dalhana Comm. - Nibandhasangraha, Chowkhambha Orientalia Varanasi, Uttaratantra, 2002; 9/24.
3. Agnivesha, Charaka Samhita, Comm. Chakrapanidatta Ed. R.K. Sharma, Bhagawandash, Chaukhamba Sanskrit Series, Varanasi, Chikitsasthana, 2000; 26/232.
4. Parameters for qualitative assessment of Ayurveda, Siddha drugs, CCRAS, New Delhi, 2005.
5. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.1): 63.
6. Ayurvedic Pharmacopoeia of India, Part – 1, Vol – iv, First Edition, Appendix 3 / 1.3 Government of India. Ministry of health and family welfare. Department of ayush: Delhi, 2011.
7. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.12): 75.
8. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.11): 74.
9. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.10): 73.
10. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.1): 63.
11. Ayurvedic Pharmacopoeia of India, Part – 1, Vol – iv, First Edition, Appendix 3 / 1.3 Government of India. Ministry of health and family welfare. Department of ayush: Delhi, 2011.
12. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.10): 73.
13. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.12): 75.
14. The Ayurvedic Pharmacopoeia of India, Part II (Formulation), Volume I, First edition, Ministry of AYUSH, Government of India, New Delhi, Appendix, 2007; 3(3.11): 74.
15. <https://www.ncbi.nlm.nih.gov>.
16. <https://www.aaopt.org>.