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Exploration of Hidden Remedies To Counter Autoimmune Diseases (Rheumatoid Arthritis)

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ABSTRACT

Our body's immune system protects us from diseases and infections. But having an autoimmune disease, immune system attacks healthy cells of our body by mistake. Autoimmune diseases can affect many parts of the body. Rheumatoid Arthritis (RA) is an autoimmune disease. It causes chronic inflammation of the joints including hands and feet. RA is a disease which keeps clinical similarity with *Amavata.* According to the Ayurvedic system of medicine the formation of endotoxins is called '*Aam'. Aam* is main pathogenic factor in the disease *Amavata*. '*Aam'* is basically undigested material of our body. So, Gastrointestinal regulation is the mainstay of Ayurvedic treatment in *Amavata*. Modern system of medicine uses anti-inflammatories, DMARDs, immune-suppressive agents. But these drugs have bad impact on the quality of life & have so many side effects. *Ayurvedic Aushadhi* have a potential to treat symptoms of RA like inflammation and pain etc, it also treats arthritis at immune and free radical level. There are many herbs documented for their immunosuppressive action, anti-inflammatory action, analgesic action and antioxidant action. *Dhanvantri Nighantu* is the oldest *Nighantu* on drugs dealing with synonyms, properties and activity of drug available at present. There are 10 to 15 drugs described which can treat *Amavata.* All drugs are useful in *Amavata* with different ways and *Rogavastha.*

Key words: Autoimmune disease, *Amavata, Aam, Dhanvantri Nighantu*

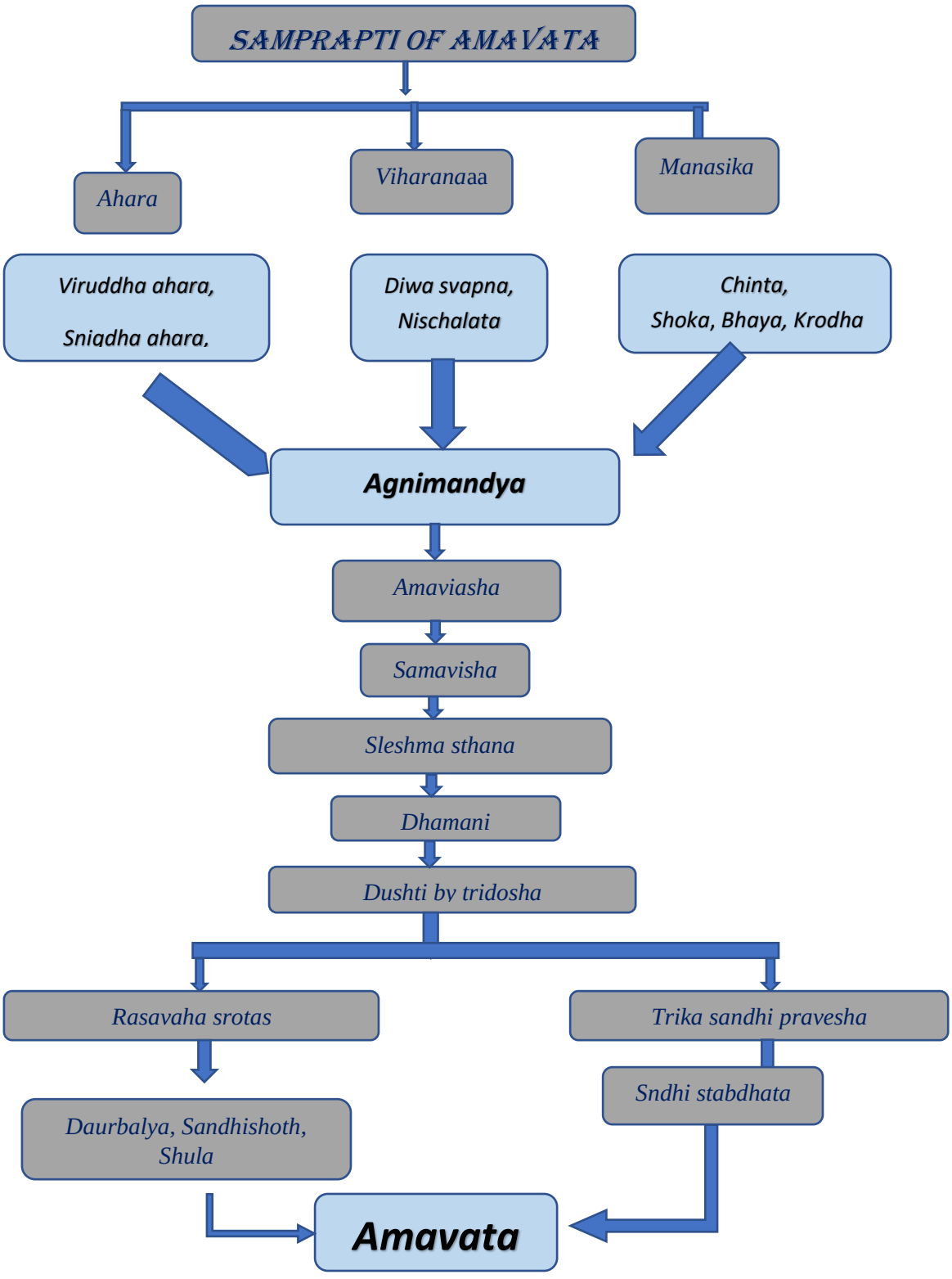
INTRODUCTION

The immune system of our body protects us against illnesses and infections. But with an autoimmune disease, by accident, the immune system attacks our body's healthy cells. Autoimmune disorder is a condition caused by an irregular immune response to a normal part of the body. Several parts of the body can be affected. It happens when the body works hard to protect our bodies against potentially hazardous substances such as allergens toxins infections or food. .
Rheumatoid arthritis affects about 1% of the world's population.[1] Rheumatoid arthritis is a chronic inflammatory condition of the autoimmune system. The hallmark feature of RA is chronic inflammatory cavities, known as synovial joints, which usually involve peripheral joints in a symmetrical distribution, where synovium is inflamed causing discomfort, redness, swelling and pain.[2] Several extra-articular symptoms includes rheumatoid subcutaneous nodules, vasculitis. Pleuropulmonary, digestive, cutaneous, neurologic, ocular hematologic and cardiovascular complications may associate with RA.[3] However, Conventional treatments like NSAID's, DMARD' and corticosteroids are rarely totally effective. There are usually associated with side effects.

Ayurveda is generated many useful leads in developing medications for chronic diseases. Plants are natural and traditional sources of medication in large parts of the world. A wide variety of herbs are used successfully with modern medicine to reduce pain, reduces inflammation of joints in osteoarthritis and rheumatoid arthritis in *Ayurveda*.[3] In recent years, research on Ayurvedic medicines increases significantly because of its safety and efficacy in management of chronic diseases. Remedies are made from single or multiple herbs and minerals for various medical conditions like asthma, flu, diabetes, arthritis, heart disease, digestive problems, mental health and skin problems. In this paper, literature review was carried out on single ayurvedic drug which showed promising activity against different inflammatory and arthritis conditions. According to *Ayurveda*, Rheumatoid arthritis can be compared as '*Amavata'*. However, *Amavata* is described the first time as a separate entity by *Acharya Madhavakara.*[4]

Aetiopathogenesis of *Amavata*

The symptoms of *Amavata* mentioned in *Ayurveda* are found slightly identical and very much similar symptomatically to Rheumatoid arthritis. Its detail description of aetiopathogenesis, signs & symptoms, and prognosis of disease are very well explained in *Ayurvedic* classics. *Ayurveda* described the pathogenesis of *Amavata* by production of *Ama* due to *Mandagni*, which vitiated *Vata Dosha*. Thus, *Vata dosha* takes the *Ama* into systemic circulation and into the body tissue. *Ama* and vitiated the *Shleshaka Kapha* (synovial membrane of joint) produces the symptoms like *Sandhisotha* (Swelling of joints), *Sandhi Shula* (joint Pain), *Stabdhata* (stiffness of joint). Other symptoms are *Agnidaurbalya* (loss of appetite), *NidraViprayay* (disturbed sleep), *Gauravam* (heaviness), *Jwara* (fever), *Angamarda* (body aches), *Karmahani* (loss of physical activity), *Jadata* (stiffness).[5]



Single Ayurvedic drug for management of *Amavata*

1. ***Eranda (Ricinus communis):*** *Eranda* tail is considered as the king of the medicines for treating arthritis. Of the two varieties, red and white, the white is used medicinally. The leaf and the root are also highly prized medicines for arthritis.[6]

Mechanism of action

A. Antioxidant effect:

- communis seed extracts contain the antioxidant activity so that it can be very effective for the treatment of oxidative stress-related disease. Methyl ricinoleate, ricinoleic acid, 12-octadecadienoic acid and methyl ester produces antioxidant activity.[7]

B. Anti-inflammatory activity:

- Petroleum ether root bark extract exhibits anti-inflammatory activity as it prevents the secondary inflammation process. [8,9,]
- The anti-inflammatory activity of the leaves and root extract of R. communis was reported in rats.[10] R. Communis leaves of methanol extract have a protective effect in preventing cellular events during the formation of oedema and at all stages of acute inflammation..[11] R.Communis methanol extract's anti-inflammatory ability was due to the presence of flavonoids against carrageen-induced paw edema rats..[12]

C. Immunomodulatory activity:

The presence of tannins in the R. communis leaves significantly increased human neutrophils ' phagocytic activity and resulted in a potential immunomodulatory impact.[13]

2. ***Apamarg (Achyranthes aspera):***

A. Anti-inflammatory, anti-arthritic and Anti-oxidant activity:

Alcoholic extract of the roots of *Achyranthes aspera*, was found to exhibit anti-inflammatory activity in Wistar rats using carrageenan-induced paw edema method and cotton pellet granuloma test, as studied by Vijaya Kumar et al. (2009).[14]

3. ***Devaru (Cedrus deodara):***

A. Antioxidant Activity:

The chloroform extract of *C. deodara* showed strong antioxidant activity on 1, 1-diphenyl-2-picrylhydrazyl (DPPH) free radical.[15]

B. Anti-inflammatory and anti-arthritic activity:

Aqueous extract of airdried stem bark of the plant was screened for its anti-inflammatory and anti-arthritic activity.

C. Immunomodulatory activity:

Volatile oil of *cedrus deodara* at a dose 50 and 100mg/kg significantly inhibit neutrophil adhesion to nylon fibres and also inhibit type III hypersensitivity reaction.

4. ***Shigru (Moringa oleifera):***

A. Antioxidant activity:

Ethanol extract of leaves has Strong antioxidant activity.[16]

B. Anti-arthritis activity:

Methanol extracts from M. oleifera's root or leaf are effective in reducing pain caused in rats by full Freund's adjuvant.[17]

Exhibited ethanol extract, decreased percentage of body weight, decreased paw edema volume and decreased arthritic index score significantly compared to diseased control animals. This confirmed plant has promising anti-arthritis properties.[18]

C. Immunomodulatory effects:

The methanolic leaf extract of *M. oleifera* increased both the cell-mediated and humoral immune responses in rats.[19]

5. ***Pippali (Piper longum):***

A. Anti-inflammatory and anti-arthritic activity:

In carrageenan rat paw edema, Piper longum fruit extract was confirmed to have anti-inflammatory activity.[20,21] The aqueous extract of *piper longum* shows antiarthritic effect on Complete Freuds Adjuvant induced arthritis in rats.[22]

B. Immunomodulatory activity:

Hemagglutination title (HA), macrophage migration index (MMI) and phagocytic index (PI) in mice assessed the immunomodulatory potential of Piper longum fruit extract. Ayurvedic preparation *Pippali Rasayana* was tested in Giardia lamblia infected mice and found to produce significant activation of macrophages as shown by an increased MMI and phagocytic activity.[23]

6. *Ativisha* (*Aconitum heterophyllum* Wall).

A. Anti-inflammatory activity

A. heterophyllum tuber (ethanolic extract) has significant anti-inflammatory activity, thereby providing scientific evidence for a traditional medicinal claim as *shotha/shophahara karma* (anti-inflammatory action).[24]

B. Immunomodulatory activity

Ethanolic extract of *A. heterophyllum* tubers has immunomodulatory activity along with other medicines of the Ayurveda and Unani systems of medicine.[25]

7. *Kantakari (Solanum surattense)*

A. Anti-inflammatory activity:

Fruits of *S. Surattense* are used as anti-inflammatory agents in the traditional medicine.[26]

B. Antioxidant activity:

S. surattense plant extract exhibited remarkable antioxidant activity at all test doses in a dose-dependent manner.[27] Fruit extracts also reported antioxidant activity.[28]

Poongothai et al. (2014) reported that *S. surattense* leaf extracts increase the level of anti-oxidant enzymes. Plant extracts increased the anti-oxidants to normal level.[29]

8. *Sarshapa (Brassica campestris):*[30]

A. Anti-oxidant activity:

Aqueous extract of the mustard at 300 mcg/ml inhibited lipid per oxidation induced Feso4 ascorbate or human erythrocyte membrane. And also inhibited the formation of diene, triene, tetrane conjugates in human erythrocyte membrane.

B. Anti-inflammatory activity:

Sarshapa shows anti-inflammatory activities in vitro and in vivo. It was found from the phytochemical analysis that the plant extracts contained flavonoids. Universally, flavonoids have an anti-inflammatory effect.

9. Bhringraj (Eclipta Alba):

A. Anti- inflammatory activity:

The anti-inflammatory activity which estimated by using carrageenan induced paw oedema model. The extract of *Eclipta Alba* has the potent inhibitor of the pro-inflammatory transcription factors.

B. Antioxidant activty:

Antioxidant activity of *Eclipta prostrata* was determined by FRAP, radical scavenging activity, reducing activity, and DPPH assay. The antioxidant capacity was increased by increasing the concentration of the extracts from 25 to 100mg/ml27. The antioxidant activity of the hexane, ethyl acetate, ethanol and water extracts of *E. prostrata* was determined by ferric thiocynate (FTC) [31].

10. *Khadira (Acacia catechu Willd)*

A. Anti-inflammatory activity:

Khadira (Acacia catechu Willd)'s main active chemical components are flavonoids which inhibit Cyclooxygenase and 5-Lipoxygenase and hence decrease inflammation. Baicalin from *Scutellaria baicalensis* and catechin from *Acacia catechu Willd* are responsible for dual inhibition of Cyclooxygenase and 5Lipoxygenase and also found to inhibit COX1, COX2 and 5-LOX. [32].[33]

B. Anti-oxidant Activity:

Since the *Khadira (Acacia catechu Willd)* produces several strong flavonoids such as catechin in this plant, it plays an important role as an antioxidant. Catechins and rutin are the most essential free radical scavengers' constituents.[34]

C. Immunomodulatory Activity

Acacia catechu Willd extract showed an increase in the neutrophil adhesion to the nylon fibres produced a significant increase in the phagocytic index and a significant protection against cyclophosphamide induced neutropenia indicating its effect on cell mediated immunity.[35]

Probable mode of action of ayurvedic perspective:[36]

1. ***Eranda tail*** due to its *sukshma Guna* penetrate into micro channels and remove obstruction in them also due to *Katu Rasa* and *Ushna Virya* it potentiates digestive fire, acts as *Vata Shamaka* due to its *Snigdha Guna*, finally it enters at *Dhatu* level (cellular level) where it acts as *Ama Pachaka* and *Kapha Shamaka* drug.
2. ***Apamarg*** due to *Katu, Tikta Rasa* and *Ushna virya* potentiates digestive fire. It acts as *Amaghna* and *Kaphanashana* drug.
3. ***Devaru*** due to *Ushna virya* increases *pachakagni*. It acts as *Shleshma-Vatajit* and *Amadoshanivartaka* drug.
4. ***Shigru*** due to *Katu, Tikta Rasa* and *Ushna Virya* increases *pachakagni*. It acts as *Kapha* and *Vatajit* and *Amaghna* drug.
5. ***Pippali*** due to *Katu Rasa* potentiates digestive fire. It acts as *Vatashamak* due to *Snigdha Guna.* It acts as *tridoshahar* and *Amaghna* drug.
6. ***Ativisha*** due to *Katu Rasa* and *Ushna Virya* potentiates digestive fire. It acts as *Amadoshahar* and *Kaphahar* drug.
7. ***Kantakari*** due to *Katu, Tikta Rasa* and *Ushna Virya* increases *pachakagni.* It acts as *Vata-Amadoshahar* drug.
8. ***Sarshapa*** due to *Ushna Virya* increases *pachakagni.* It acts as *KaphaVatajit* and *Amadoshghna* drug.
9. ***Bhringraj*** *due to Tikta Rasa and Ushna Virya increases pachakagni. Due to Ruksha Guna it acts as Kaphashamaka* drug. It is *Amadoshghna and shothghna* drug.
10. ***Khadira*** due to *Tikta Rasa* it acts as *Amadoshnashaka* and *Kaphanashaka* drug.

Mode of action *Tikta* and *Katu Rasa*:

- *Tikta dravyas* are *Ama* and *Pitta pachaka* and *Srotomukhvishodhanam.*
- *Katu rasa* is *Chedaka, Margavivaraka* and *Kapha shamaka*.
- *Tikta & Katu Rasa* is *Laghu Ushana* and *Tikshana* in properties, which are very useful for *Amapachana*. These are also *Deepana* and *Pachana,* so by means of these properties digestion of *Ama,* restoration of *Agni (Deepana*) removal of excessive *Kledaka Kapha* and bringing of the *Pakva dosha* to the *Kostha* from the *Shakha* takes place.
- *Tikta rasa* is *Vishaghna* and *Lekhana.*
- Both are *Kleda* and *Medanashaka.*
- Totally they bring about *Deepana. Pachana. Rochana* and *Laghuta* in the body. *Katu Dravya* like *Apamarg, Eranda, Pippali*, etc. & *Tikta Dravya* like *Ativisha, Khadira* etc.
- But care should be taken in monitoring the extent of vitiation of *Vata dosha* because the *Tikta-Katu Rasa Dravya* increases the *Vata dosha*. The drugs selected with *Tikta* and *Katu Rasa* should also possess the *Vataghna* properties "*Pippali*" has such properties. Because of its *Snigdha Guna* and *Madhura Vipaka* it inhibits more vitiation of *Vata.*

DISCUSSION

Amavata (Rheumatic arthritis) is challenging to the physician. Inspite of the administration of best available modern drugs, the disease has a tendency to persisting progress and disables the patients. Major events that take place in the pathogenesis of *Amavata* are *Ama* that is produce due to *Agnimandya, Tridosa* especially of *Kapha* and *Vata, Sroto Vibandha*. In modern point of view free radical also play important role in destruction of joint. The increased free radical levels and diminished activity of body antioxidant system are also the major responsible factors for the cartilage damage and the disease progression. For this single drug

is better approach because majority of these drugs having *Katu, Tikta Rasa, Ushna Virya* and *Kapha Vata shamak, Amaghna* properties.

CONCLUSION

*Amavata (*Autoimmune disease) severe degree of pain and progressive disability associated, so it needs active and urgent care which has no side effect on the health for long term use of medicine. For this single drug is very effective in reducing symptoms of *Amavata* due to its *Katu, Tikta Rasa, Ushna virya, Vata-Kapha Shamaka*, antioxidant properties, anti-inflammatory property, immunomodulatory property, it is very suitable for interrupting the pathogenesis of the disease. Anti-oxidants are the key elements in the immune system which the body uses in order to neutralize the activity of dangerous and over the long term, deadly free radical enemies.[37]

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REFERENCES

1. A. Gibofsky, Overview of epidemiology, pathophysiology, and diagnosis of rheumatoid arthritis, Am. J. Manag. Care 18 (2012) S295-S302.
2. Meenakshi kumawat, Jyoti damor, Chandan Singh. Role of medicinal herbs in the management of *Amavata* (Rheumatic arthritis): An Ayurvedic approach. IJAPR January 2018, vol 6| issue 1.
3. A. Chopra, M. Saluja, G. Tillu, Ayurveda–modern medicine interface: A critical appraisal of studies of Ayurvedic medicines to treat osteoarthritis and rheumatoid arthritis, J. Ayu. Integrat. Med. 1 (2010) 190-198.
4. Srikanta Murthy KR Delhi, India: Chaukhambia Orientalia; 1993. *Madhava Nidanam (roga viniscaya)* of *Madhavakara* (English translation) Chapter 28.
5. *Vagbhata, Ashtanga Hridayam, NidanaSthana Vatashonita Adhyaya* (2012) 16/1-4, In: Kaviraja Atrideva Gupta (ed), Hridayam, NidanaSthana, Chaukhamba Prakashana, Varanasi, p: 381
6. Pole S. Ayurvedic medicine: The Principles of Traditional Practice. 1st ed.London: Churchill Livingstone Publishers;2006. P. 153
7. Manoj Kumar. A Review on Phytochemical Constituents and Pharmacological Activities of Ricinus communis L. Plant International Journal of Pharmacognosy and Phytochemical Research 2017; 9(4); 466-472.
8. Kr BK, Parimi S, Ayaz A. Antiinflammatory activity of eranda paka against carrageenan induced paw oedema in albino rats. Int.Ayurvedic Med. J.2014;2(3):337-341.
9. Vd.Mukund Sabnis. Chemistry and Pharmacology of Ayurvedic Medicinal Plants. 1st ed. Varanasi: Chaukhamba Amara Bharati Prakshan.2006. p. 451.
10. Ilavarasan R, Mallika M and Venkataraman S. Antiinflammatory and free radical scavenging activity of Ricinus communis root extract. Journal of Ethnopharmacology, 2006; 103: 478-480.
11. Valderramas AC, Moura SHP, Couto M, Pasetto S, Chierice GO and Guimaraes SAC. Anti-inflammatory activity of Ricinus communis derived polymer. Brazilian Journal of Oral Sciences, 2008; 7(27): 16661672.
12. Saini AK, Goyal R, Gauttam VK and Kalia AN. Evaluation of anti-inflammatory potential of Ricinus communis Linn. leaves extract and its flavonoids content in Wistar rats. Journal of Chemical and Pharmaceutical Research, 2010; 2(5): 690-695.
13. Bhakta S. and Das SK. In praise of the medicinal plant Ricinus communis L.: A review. Global Journal of Research on Medicinal Plants & Indigenous Medicine, 2015; 4(5): 95-105.
14. Gayathri DS, Archanah A, Abiramasundari P, Priya V, Uma K, Abirami T (2009) Indian Journal of Nutrition and Dietetics, 46(12), 485-490.

15. Gupta, Anu Walia And Rajat Malan. Phytochemistry And Pharmacology of *Cedrus Deodera***:** An Overview International Journal of Pharmaceutical Sciences and Research.
16. Moyo B, Oyedemi S, Masika PJ, Muchenje V. Polyphenolic content and antioxidant properties of Moringa oleifera leaf extracts and enzymatic activity of liver from goats supplemented with Moringa oleifera leaves/sunflower seed cake. Meat Science. 2012; 91(4): 441-447.
17. Manaheji H, Jafari S, Zaringhalam J, Rezazadeh S, Taghizadfarid R. Analgesic effects of methanolic extracts of the leaf or root of Moringa oleifera on complete Freund's adjuvant-induced arthritis in rats. Journal of Chinese Integrativemedicines. 2011; 9(2): 216-222.
18. Mahajan SG, Mali RG, Mehta AA. Protective Effect of Ethanolic Extract of Seeds of Moringa oleifera Lam. against Inflammation Associated with Development of Arthritis in Rats. J Immunotoxicol. 2007; 4(1): 39-47.
19. Joshua Nfambi, Godfrey S. Bbosa,* Lawrence Fred Sembajwe, James Gakunga, and Josephine N. Kasolo. Immunomodulatory activity of methanolic leaf extract of *Moringa oleifera* in Wistar albino rats. J Basic Clin Physiol Pharmacol. 2015 Nov 1; 26(6): 603–611.
20. Kumar S, Arya P, Mukherjee C, Singh BK, Singh N, Parmar VS, et al. Novel aromatic ester from Piper longum and its analogues inhibit expression of cell adhesion molecules on endothelial cells. Biochemistry, 2005; 6; 44: 15944−52.
21. Choudhary GP. Mast cell stabilizing activity of piper longum Linn. Indian J Allergy Asthma Immunol, 2006; 20: 112−6.
22. Yende SR, Sannapuri VD, Vyawahare NS et al. (2010). Antirheumatoid activity of aqueous extract of piper longum on freunds adjuvant-induced arthritis in rats. IJPSR. 1(9): 129-133 39.
23. Mananvalan G and Singh J. Chemical and some pharmacological studies on leaves of P.longum Linn., Indian J. Pharm.Sci, 1979; 41: 190.
24. Verma S, Ojha S, Raish M. Anti-inflammatory activity of *Aconitum heterophyllum* on cotton pellet-induced granuloma in rats. J Med Plants Res. 2010; 4:1566–9.
25. Atal CK, Sharma ML, Kaul A, Khajuria A. Immunomodulating agents of plant origin. I: Preliminary screening. J Ethnopharmacol. 1986;18 :133–41.
26. Ramanarayana Reddy RV, Uma Maheshwara Rao K, Vangoori Y, Mohana Sundharam J. Evaluation of diuretic and anti-inflammatory property of ethanolic extract of Solanum surattense in experimental animal models. Int J Pharm Pharm Sci, 2014; 6(1):387–9.
27. Muruhan S, Selvaraj S, Viswanathan PK. In vitro antioxidant activities of Solanum surattense leaf extract. Asian Pac J Trop Biomed, 2013; 3(1):28–34.
28. Rehman Shah MA, Khan H, Khan S, Muhammad N, Ullah Khan F, Muhammad A, Khan YM. Cytotoxic, antioxidant and phytotoxic effect of Solanum surattense burm F fruit extracts. Int J Pharmacogn Phytochem, 2013; 28(2):1154–58.
29. Poongothai K, Ponmurugan P, Ahmed KS, Kumar BS, Sheriff SA. Antihyperglycemic and antioxidant effects of Solanum xanthocarpum leaves (field grown & in vitro raised) extracts on alloxan induced diabetic rats. Asian Pac J Trop Med, 2014; 4(10):778–85.
30. Dr. Neethu P, Dr. Vijitha Vijayan, Dr. Athulya CM and Dr. Arathi Rajesh. A review on anti-toxic effect of sweta sarshapa. The Pharma Innovation Journal 2019; 8(1): 261-264
31. Karthikumar S, Vigneswari K, Jegatheesan K. Screening of antibacterial and antioxidant activities of leaves of Eclipta prostrata (L). Sci. Res. Essays. 2007; 2(4): 101-04. 19
32. Altavilla, D, Squadrito, F, Bitto, A, Polito, F,.Burnett, B,.Di Stefano, V, & L, Minutoli,. (2009). Flavocoxid, a dual inhibitor of cyclooxygenase and 5-lipoxygenase, blunts proinflammatory phenotype activation in endotoxin- stimulated macrophages. British journal of pharmacology, 157(8): 1410-18
33. Burnett, B, Jia, Q, Zhao, Y, & Levy, R (2007). A medicinal extract of Scutellaria baicalensis and Acacia catechu acts as a dual inhibitor of cyclooxygenase and 5-lipoxygenase to reduce inflammation. Journal of medicinal food, 10(3): 442-51. 46
34. Guleria S., Tiku A., Singh G., Vyas D and Bhardwaj A. Antioxidant Activity and Protective Effect Against Plasmid DNA Strand Scission of Leaf, Bark, and Heartwood Extracts from Acacia catechu. J of Food Science, 2011; 76(7): 959-6438.

35. Ismail S and Asad M. Immunomodulatory activity of Acacia catechu. Indian J Physiol Pharmacol., 2009; 53(1): 25–33
36. Dhanvantari Nighantu, Chaukhambia Orientalia; 2016. Prof. P.V. Sharma(ed), Dr. Guru prasad sharma (Hindi translation)