

REVIEW ON ROLE OF *TINOSPORA CORDIFOLIA* AND *ZINGIBER OFFICINALE* IN *AMAVATA* (RHEUMATOID ARTHRITIS)

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ABSTRACT

Amavata is a term derived from words *Ama* & *Vata*. Derangement of *Agni* is the main cause for this disease which results in the production of *Ama*. The entity *ama* is a disease in which the body's many disorders have a poisonous effect. When *ama* gets circulated in the body with the vitiated *vata dosha*, it occupies the *shleshma sthana* in the body particularly *sandhis* i.e joints which results in the formation of painful disease *Amavata*. *Amavata's* clinical manifestations are strikingly similar to a specific type of rheumatological condition known as Rheumatoid Arthritis, which is a chronic, progressive, auto-immune, inflammatory disease with clinical features like pain, stiffness, swelling, redness over synovial joints in the body and some other extra-articular manifestations. The disease *Amavata* is mentioned in *Ayurveda* since the era of *Madhavakara* (16th Century A.D.) under the category of *Vatakaphaja vikaras*. *Viruddhahara*, *Mandagni*, Exercise after

a large meal, and other *Amavata hetus* are told by *Madhavakara*. *Ama* being the main causative factor for pathogenesis of the disease, the treatment regimen described in *Ayurveda* includes *Langhan*, *Swedan*, *deepana*, *pachana*, *Virechan*, *Basti* etc. Ayurvedic herbal medicines include anti-inflammatory and immunomodulatory properties that may be effective and appropriate for the treatment of *Amavata*. *Tikta*, *Kashaya Rasa*, *Madhur Vipak*, and *Ushana Veerya* are all found in *Guduchi*, as well as the dual effect of and *Bruhana* and *Vata*

shamana on the tissues, particularly the *Asthi Dhatu*. It is also used for immunomodulatory and anti-inflammatory actions. *Sunthi* possess *katu rasa*, *laghu* and *snighdha guna*, *ushna veerya* and *madhura vipaka* and is *kapha* and *vata shamaka*. It also has best *deepana* and *pachana* properties. So, the present study deals with systemic review of role of *Tinospora cordifolia* (*Guduchi*) and *Zingiber officinale* (*Sunthi*) in *Amavata*.

KEYWORDS: *Amavata*, *Ama*, Rheumatoid arthritis, *Tinospora cordifolia*, *Zingiber officinale*.

INTRODUCTION

Ayurveda's vast knowledge includes explanations of *Dinacharya* and *Rutucharya*. Following these rules allows the body's vital homeostasis to be maintained. It teaches how to choose food, how to adapt procedures to food, when to eat, how to eat, and how to adjust food and lifestyle modifications according to the season.

In the today's erroneous way of life, not only improper diet plan, but also the flawed way of lifestyle brings a lot of disturbance in human life both physical & psychological aspects. This leads to impairment of *Jatharagni* which results in genesis of *ama*. *Amavata* is a condition that occurs when the *Ama* and *Vata doshas* become vitiated at the same time and enter the *Trika pradesh* and *Sandhi* (joints), resulting in *stabdhata* (stiffness) of the body.^[1]

Acharaya Madhavkara has clearly quoted the *Roopas* (sign & symptoms) of *Amavata* in *Madhav Nidana*. The *Pratyatma Linga* (Cardinal symptoms) are *Gatrastabdhata*, *Sandhishoola*, *Sandhishoth*, *Sparshasahatva* and *Samanya Linga* (Generalized symptoms) are *Angmarda*, *Aruchi*, *Trishna*, *Alashya*, *Gaurav*, *Jvara*, *Apaka*. *Amavata* has similarities to many arthritis disease condition, but it mainly imitates the Rheumatoid Arthritis which is a long-term autoimmune inflammatory systemic disorder that affects synovial joints with some extra-articular manifestations.^[2]

The global prevalence of RA is estimated to be between 0.3 and 1%, with females in affluent countries being the most affected.^[3] Because modern medicine is unable to provide a complete cure for *Amavata*, the Ayurvedic approach to its treatment is urgently needed. *Amavata* is a hard and burning topic in medical science. Considering *ama* as a chief factor in pathogenesis of the disease, *deepana* and *pachana* along with the *langhana*, *swedana*, *virechana* and *basti* is the mainstay of the management of the disease. In *Chakradatta*, it is

said that शुण्ठ्याऽऽमवातं शमयेद् गुडूची।।^[4] *Guduchi* has remarkable anti-inflammatory and immune-modulatory effects.^[5] and *Sunthi* has best *deepana* and *pachana* properties.^[6] RA being an auto-immune inflammatory disorder and due to wide spectrum of disease, much prevalence in the society and lack of effective medicine, the study is planned to review the role of *Tinospora cordifolia* (*Guduchi*) and *Zingiber officinale* (*Sunthi*) in this disease.

OBJECTIVES

To review the role of *Tinospora cordifolia* (*Guduchi*) and *Zingiber officinale* (*Sunthi*) pertaining *Amavata* (Rheumatoid arthritis)

MATERIAL AND METHODS

All the related articles from 2009 to 2020 are included in this review.

OBSERVATION AND RESULTS

Sr. No.	Name of author and year of publication	Title of study	Key finding
1.	P. S. Lekurwale Kamlesh Pandey P. Yadaiah Lecturer (2010)	“Management of <i>Amavata</i> with ‘ <i>Amrita Ghrita</i> ’: A clinical study”	28 patients were given <i>Shunthi Siddha</i> milk for one week, followed by 45 days of ‘ <i>Amrita Ghrita</i> ’ 15 g BD with milk. <i>Deepan</i> , <i>Pachan</i> , <i>Ama Nashan</i> , <i>Ama Shoshak</i> , and <i>Vata-Kaphahara</i> are all adversaries of <i>Amrita Ghrita</i> 's current build. This medicine is beneficial in treating the disease <i>Amavata</i> 's pathological condition. ^[7]
2	Rohit Waskar J.K. Sharma (2019)	“A Clinical Study to Evaluate the Effect of <i>Mahaushadhi Kwath</i> in the Management of <i>Amavata</i> ”	In <i>abhaktakala</i> , <i>Mahaushadhi kwath</i> was given to 30 <i>amavata</i> patients at a dose of 48 ml twice daily (2 pala). All of the indicators, including prodromal symptoms and related symptoms of <i>amavata</i> , have improved significantly. ^[8]
3	Sah Mahesh Prasad Bhusal Nirmal Rai N P (2020)	“Clinical Study on the Efficacy of <i>Rasna Sunthi Churna</i> in the Management of	The study included a total of 15 patients. Based on the findings of this study, it can be concluded

		<i>Amavata.</i> "	that <i>Rasna</i> and <i>Shunthi Churna</i> have a beneficial effect on the majority of <i>Aamvata</i> symptoms. ^[9]
4	Daneshwari S Kanashetti Byadgi P.S. Dwivedi K. N. (2020)	A randomised clinical trial evaluating effectiveness of <i>Guduchi</i> and <i>Sunthi kwath</i> in <i>Amavata</i> (Rheumatoid Arthritis) in comparison with Indomethacin	Total 90 patients of <i>Amavata</i> were included in the study. (3 groups - 30 in each) Gp.A- <i>Guduchi</i> and <i>Sunthi kwath</i> 45 ml BD Gp.B- Indomethacin 75 mg BD Gp.C- Both (<i>Guduchi Sunthi kwath</i> and Indomethacin) <i>Guduchi</i> and <i>Sunthi kwatah</i> are almost equally effective like standard group on Indomethacin in majority of the symptoms. ^[10]
5	Sourabh Deshmukh, Vinod Ade Trupti Thakre (2018)	"Comparative study on efficacy of <i>Eranda Haritaki</i> and <i>Eranda Sunthi</i> in the management of <i>Amavata.</i> "	For 30 days, 40 patients received <i>Erandaharitaki taila</i> in the form of <i>Abhyantarpana</i> –15 ml and <i>Matrabasti</i> -60 ml, and 40 patients received <i>Eranda sunthi taila</i> in the form of <i>Abhyantarpana</i> –15 ml and <i>Matrabasti</i> -60 ml. Both groups show very significant outcomes, although Group A's <i>Abhyantarpana</i> & <i>Matrabasti</i> with <i>Erandaharitaki Tailam</i> showed better improvement than Group B's <i>Abhyantarpana</i> & <i>Matrabasti</i> with <i>Erandashunti Tailam</i> . ^[11]
6	Kiran S. Satpute Rajan B. Kulkarni Eknath G. Kulkarni (2015)	"Clinical evaluation of <i>Guduchi Kwatha</i> in management of <i>Amavata</i> "	Total 60 patients (2 groups – 30 in each) of <i>amavata</i> were included in the study. Gp.A- <i>Guduchi kwath</i> 40 ml BD before meal for 21 days Gp.B- <i>Gandharvhastadi kashaya</i> 40 ml BD before meal for 21 days It is found that <i>Guduchi Kwatha</i> is more effective than <i>Gandharvahastadi kashay</i> in reducing pain,

			swelling, stiffness and tenderness of the affected joints in <i>Amavata</i> . ^[12]
7	Milan Jayantibhai Prajapati (2017)	“A Pharmaco-clinical study of <i>Sunthi</i> (Zingiber Officinale Roxb.) in the management of <i>Amavata</i> w.s.r. to Rheumatoid arthritis.”	Total 30 patients of <i>amavata</i> were administered 2gm of <i>Sunthi</i> churn BD with anupana ushnodak. Significant reduction is seen in sandhiruj, sparshasahatva, stabdhata, VAS, and walking time. ^[13]
8	Divya.K.Das Shincymol V.V P.Y.Ansary (2017)	“Amapachana property of <i>Sunthi</i> (Zingiber Officinale Roxb.) in raised ESR associated with <i>Amavatha</i> - A clinical study”	A total of 30 <i>Amavata</i> patients were administered a <i>sunthi churn</i> capsule at a split dose of 2 gm per day for 30 days. The experimental drug <i>sunthi</i> demonstrated a considerable reduction in clinical symptoms and a mild decrease in ESR value, according to the findings of this study. ^[14]
9	Amrit Godbole KM Shweta O. Abhinav O.P. Singh (2019)	“The effect of <i>T.Cordifolia</i> and <i>Z.Officinale</i> in the Treatment of Rheumatoid Arthritis”	Total 40 patients of <i>amavata</i> were divided in 2 groups. Gp.A – <i>Virechana</i> followed by <i>Guduchi Ghana vati</i> (4 tab 500 mg TDS) and <i>Sunthi churna</i> 5 gm BD for 12 weeks Gp.B – Tab. Etoricoxib 90 mg OD for 12 weeks Based on observations and results, trial formulations are significantly effective in RA patients, although the efficacy is augmented by <i>Virecana</i> medication. ^[15]

DISCUSSION

As per observations, the probable mode of action of herbo-mineral formulations, mainly *Guduchi* (*Tinospora cordifolia*) and *Sunthi* (*Zingiber officinalae*) is discussed as follows

- 1) To create *Amrita Ghrita*, *Guduchi* and *Shunthi* are processed in *Ghrita*. *Deepan*, *Pachan*, *Ama Nashan*, *AmaShoshak*, and *Vata-Kaphahara*, all enemies to the current entity, have been established by the *Amrita Ghrita*. *Shunthi* is notable for *Vata-Shleshma Vibandhahara* because of its *Katu Rasa* and *Ushna Virya*. *Shunthi* possesses the

fundamental qualities of *Deepan* and *Pachan*, which help *Jatharagni*.^[16] It digests and absorbs vitiated *ama* by its *ushna virya* and *shoshana karma*. It also contains the active principles gingerol, dehydrozingerone, and gingerdione, which are powerful inhibitors of prostaglandin synthesis, implying an anti-arthritis action.^[17] *Guduchi* possesses *Tikta*, *Kashaya Rasa*, *Madhur Vipak*, and *Ushana Veerya* characteristics. *Guduchi* and *ghrita* have a synergistic effect on the *asthi dhatu*, similar to *vata shaman* and *brihana*.^[18] *Guduchi* contains glycosides, which have anti-inflammatory and anti-arthritis properties similar to nonsteroidal anti-inflammatory drugs.^[19] This medicine is beneficial in treating the disease *Amavata's* pathological condition.

- 2) *Sunthi* and *Guduchi* are the main constituents in *Mahaushadhi kwath*. *Sunthi* has properties such as *Deepana*, *Pachana*, *Anulomana*, *Amadoshahara*, *Vatakaphahara*, and *Hrudya*. *Guduchi* has properties such as *Tridoshashamak*, *Samgrahi*, *Balya*, *Dipana*, *Rasayan*, *Raktasodhak*, *Jwaraghna*, and *Sunthi* has properties such as *Deepana*, *Pachana*, *Anulomana*, *Amadoshahara*, *Vatakaphahara*, the drug's *Agni deepaniya* action also enhances the *Agni bala* in the body, i.e. *Pachakagni* and *Dhatvagni*, and so prevents the production of *Ama* in the body. *Sandhishula*, *Sandhisotha*, *Sandhi-sparsha-asahyata*, and *Sandhi-stabdhata* are among the *Pratyatma Lakshana* (Cardinal clinical aspects) of *Amavata*.
- 3) *Rasna sunthi churna* has *katu tikht rasa* and *ushna virya*. It also possesses *deepan pachana* property. By virtue of their *laghu*, *ushna* and *sukshma guna* it pacifies *ama* which is one of the primary and major etiological factors in *Amavata*. Therefore it can be concluded that the combined effect of *Rasna Sunthi churna* is helpful in significant reduction in the symptoms of *amavata*.
- 4) *Guduchi* and *Sunthi* both drugs possess multidimensional properties that help in subsiding or preventing the severity of *Amavata*. The probable mode of action may be assessed based on *rasa panchaka*. *Guduchi* is having *Katu*, *Tikta*, *Kashaya rasa* and *Ushna virya*, it does *Ama pachana*. It also acts as *Agni dipaka*, *Amahara* and *Vatahara*. *Sunthi* having the property of *agneya guna* helps in *pachana* of *ama*. It possesses *Laghu guna*, *Ushna virya* and *Madhura vipaka* thus helps in alleviating *Vata*. Because of having *Ushna virya* both drugs enter *sukshma srotas* and helps to remove *ama* out of *srotas* and clear them for smooth functioning of *Vata* thus *srotorodha janita Vata prakopa* is pacified. Both drugs act as *kaphahara*, as *adhithana* of *Amavata* is *shleshmasthan* so they help in subside

the disease process.^[20] This substantiates the effect of *Guduchi* and *Sunthi kwath* in *amavata*.

- 5) *Eranda taila* is used for *Basti* and oral administration, resulting in *ama Pachana* through their *Tikta*, *Katu rasa*, and *Ushna Veerya*. Oil balances *vata* due to *Snigdha* and *Ushnaguna*.^[21] *Erandataila* is provided with *Haritaki*, which contains *Katu*, *Tikta*, *Kashaya*, *Laghu*, and *Rooksha*, as well as *Vataghna* due to *Amla* and *Madhura rasa* and *Ushna Veerya*. This can also be used as a *Shoolahara* and *Shootha hara*. It is *Depana* and *Pachana* due to its *Tikta rasa* and *Ushnaveerya*, and *Anulomana* due to its *Kashaya rasa*. It removes the *Strotorodha* and therefore clears the route, nourishing all *Dhatus* by removing obstructions, refreshing the body and increasing strength, and stimulating the *Dhatvagni*.^[22] *Sunthi*, which is *Kaphaghna*, is given with *Eranda Taila*, which is *Katu* in *Rasa*, *Laghu* and *Snigdha* in *Guna*, *Ushna* in *Veerya* as well as *Vataghna* and *Amapachana*.^[23] Together, *Eranda* and *Sunthi* aid in the pacification of the *Sandhishotha* and *Shoola*. At a major level, *Matra Basti & Abhyantrapana* has offered better alleviation in most of the Cardinal, General, and related characteristics of the *amavata*.
- 6) The *Guduchi kwatha* possess *shothahara*, *shulaprashamana* and *amapachana* qualities and gives desired *rasayan* effect. It helps to digest the *Ama* and removing of the obstruction to the normal movement of *Vata* with *vatashamana* effect and anti-inflammatory effect. The drug has osteoblastic effect, antioxidant effect. Free radicle scavenging property and immunomodulator property. It suitably acts on vitiated *vata* & *kapha* and produce the ultimate effect.
- 7) *Ama* is the primary pathogenic element in the development of *Amavata*, and it is the offspring of both *Jatharagni* and *Dhatavagni Mandya*. *Sunthi* has *laghu*, *ruksha guna*, *katu rasa*, *madhura vipaka* and *ushna virya*. With the help of these properties, *sunthi* shows *amapachank* and *vatashamak* effect. It also reduces *guru* and *snigdha guna* of *ama*. Therefore, *sunthi churn* along with *anupan ushnodak vatanulomak* and *amapachak* drug and is effective in management of *amavata*.
- 8) The trial drug *sunthi* has *laghu guna*, *snigdha guna*, *katu rasa*, *madhura vipaka* and *ushna virya*. It also has *deepan* and *pachana* properties. This helps in digestion of *ama* and *anulomana* of *vata dosha*. *Snigdha guna* and *madhura vipaka* alleviate *vata dosha*. *Ushna virya* and *laghu guna* alleviates *kapha* and thus helps to alleviate *aruchi*, *alasya* and

gauravata. *Deepana pachana* property alleviates *apaka*. *Sunthi* has *grahi* property which acts as *drava shoshaka* and it helps to reduce *sandhishotha*. As a result, this medicine can be used to effectively treat *Amavata*'s subjective symptoms. After treatment, there is no discernible difference in ESR. The ESR has decreased slightly. Because this is a chronic inflammatory illness, more time is required for a better outcome.

- 9) *Tinospora cordifolia*, often known as *Guduchi*, is a medicinal plant utilised for its immunomodulatory and anti-inflammatory properties.^[24] By preventing fluid exudation, it reduces acute inflammation. *T. cordifolia* has also been shown to have analgesic properties in studies. *Zingiber* (ginger) has anti-inflammatory properties through decreasing prostaglandin and leukotriene production.^[25] 6-gingerol, a major phytochemical ingredient in *Zingiber officinale*, is responsible for *sunthi*'s analgesic and anti-inflammatory properties.^[26] The study concludes that when *Guduchi Ghana Vati* and *Sunthi churna* are combined with *Shodhana* karma in the form of *Virecana Karma*, the trial formulation of *Guduchi Ghana Vati* and *Sunthi churna* produces better results.

CONCLUSION

Despite the fact that numerous pharmacological therapies are described in various Ayurvedic texts, potential and long-term results are not found due to the failure to address the root cause. As a result, proper implementation of the *chikitsa sutra* stated in our classics for a holistic approach with nutrition, lifestyle intervention, and continuing use of pharmaceuticals should be given special attention in order to achieve good disease control and improved quality of life.

Amavata is one of the most prevalent disabling disorders due to its chronicity and implications, and *ama* and *vata* have traits that are diametrically opposed. So, in *Amavata*, therapy is associated with *Langhana* and goes via *Swedana*, *Tikta Katu Dipana Dravyas*, *Virechana*, *Snehapana*, and *Basti*, with the ultimate intention of attaining *Amapachana*, *Vatashamana*, and *Strotoshodhana*, *Sthana balya chikitsa*.

Guduchi is described as “the one which protects the body”. Its therapeutic power is derived from its rejuvenating and strengthening properties, as well as its ability to detoxify and cleanse the entire system. It has immunomodulatory effect, antioxidant effect, anti-inflammatory effect and anti-arthritis effect. *Guduchi* has *Katu*, *Tikta*, *Kashaya rasa* and *Ushna virya*, it does *Ama pachana*. It also acts as *Agni dipaka*, *Amahara* and *Vatahara*.

Immunomodulatory, antitumorigenic, anti-apoptotic, anti-inflammatory, anti-hyperlipidaemic, anti-hyperglycaemic, and anti-emetic activities are among the principal pharmacological properties of *Sunthi* and its isolated components. Ginger is an antioxidant that can either reduce or prevent the formation of free radicals. *Sunthi* having the property of *agneya guna* helps in *pachana* of *ama*. It possesses *Laghu guna*, *Ushna virya* and *Madhura vipaka* thus helps in alleviating *Vata dosha*.

According to the overall success demonstrated in clinical research, the synergistic impact of *Guduchi* and *Sunthi* aids in the better resolution of *Amavata*. At the same time, the medications are safe and can be used for longer periods of time without causing harm.

CONFLICT OF INTEREST

The authors have no conflicts of interest regarding this investigation.

REFERENCES

1. Tripathi B, editor. Madhav Nidana of Madhavkar, Vol. 1, Ch. 25, Ver. 1-5. Reprint Ed. Varanasi: Chaukhabha Sanskrit Sanshtan; 2006; 571.
2. Milind Y. Nadkar, API textbook of medicine, Rheumatology Chapter 7, Rheumatoid Arthritis, Association of Physicians of India, Mumbai, 8th ed. 2008; 291.
3. Who.int [internet]. Geneva: World Health Organisation; c 2016 [updated 2016; cited 2016 May 11]. Available from: <http://www.who.int/chp/topics/rheumatic/en/>. Sharma P. V., Cakradatta, Chaukhambha Orientalia Delhi, 23(9): 216.
4. Singh SS, Pandey SC. Chemistry and medicinal properties of *Tinospora Cordifolia* (*Guduchi*) Indian Pharmacol, 2003; 35: 83–91.
5. Dr. A P Deshpande, Textbook of Dravyaguna Vijnyana, Medicinal Herbs, Edited by Dr. Subhash Ranade Pune, Anmol Prakashan, 2007; chapter 113, volume 2, 611.
6. P. S. Lekurwale, Kamlesh Pandey, P. Yadaiah, Management of *Amavata* with *Amrita Ghrita*, AYU | Oct-Dec 2010; | Vol 31 | Issue 4
7. Rohit Waskar, J.K. Sharma, A Clinical Study to Evaluate the Effect of *Mahaushadhi Kwath* in the Management of *Amavata*, Int J Ayu Pharm Chem., 2019; Vol. 10 Issue.
8. Sah Mahesh Prasad, Bhusal Nirmal, Rai N P, Clinical Study on the Efficacy of *Rasna Sunthi Churna* in the Management of *Amavata*, International Journal of Health Sciences and Research, February 2021; 11(2).

9. Daneshwari S. Kanashetti, Byadgi P.S., Dwivedi K N, A randomised clinical trial evaluating effectiveness of Guduchi and Sunthi kwath in Amvata (Rheumatoid Arthritis) in comparison with Indomethacin, *Int. J. Res. Pharm. Sci.*, 2020; 11(2): 1936-1943.
10. Sourabh Deshmukh, Vinod Ade, Trupti Thakre, Comparative study on efficacy of Eranda Haritaki and Eranda Sunthi in the management of Amavata, *IJAPR* | May 2018; 6(5).
11. Kiran Satpute, Rajan B. Kulkarni, Eknath Kulkarni, Clinical evaluation of Guduchi Kwatha in management of Amavata, *National Journal of Research in Ayurved Science*, ISBN 978-93-5173-179-3
12. Milan Jayantibhai Prajapati, A Pharmaco-clinical study of Sunthi (*Zingiber Officinale* Roxb.) in the management of Amavata w.s.r. to Rheumatoid arthritis, *International Journal of Development Research*, June, 2017; 07(06): 13029-13031.
13. Divya K. Das, Shincymol V.V., P.Y. Ansary, Amapachana property of Sunthi (*Zingiber Officinale* Roxb.) in raised ESR associated with Amavatha- A clinical study, *AYUSHDHARA*, January - February 2017; 4(1).
14. Amrit Godbole, KM Shweta, O. Abhinav, O.P. Singh, The effect of *T.Cordifolia* and *Z.Officinale* in the Treatment of Rheumatoid Arthritis, *International Journal of Pharmaceutical and Phytopharmacological Research*, August 2019; 9(4): 1-9.
15. Sharma PV. *Dravyaguna Vighyan*. New Delhi: Chaukhambha Publication, 1999; 331. http://en.wikipedia.org/wiki/Ginger#cite_note-UMMC-7
16. Sharma PV. *Dravyaguna Vighyan*. New Delhi: Chaukhambha Publication; 1999; 680.
17. Singh SS, Pandey SC. Chemistry and medicinal properties of *Tinospora Cordifolia* (Guduchi). *Indian Pharmacol*, 2003; 35: 83-91.
18. Manjrekar P.N., Jolly C. I., Narayanan S. 2000, Comparative studies of the immunomodulatory activity of *Tinospora cordifolia* and *Tinospora sinensis*. *Fitoterapia*, 71(3): 254-257.
19. Dr. A P Deshpande, *Textbook of Dravyaguna Vijnyana, Medicinal Herbs*, Edited by Dr. Subhash Ranade, Pune, Anmol Prakashan, 2007; chapter 105(2): 583.
20. Dr. A P Deshpande, *Textbook of Dravyaguna Vijnyana, Medicinal Herbs*, Edited by Dr. Subhash Ranade Pune, Anmol Prakashan, 2007; chapter 41, volume 2, 388.
21. Dr. A P Deshpande, *Textbook of Dravyaguna Vijnyana, Medicinal Herbs*, Edited by Dr. Subhash Ranade Pune, Anmol Prakashan, 2007; chapter 113, volume 2, 611.
22. Rege NN, Thatte UM, Dahanukar SA. Adaptogenic properties of six rasayana herbs used in Ayurvedic medicine. *Phytotherapy Research: An International Journal Devoted to*

- Pharmacological and Toxicological Evaluation of Natural Product Derivatives. 1999 Jun; 13(4): 275-91.
23. Altman RD, Marcussen KC. Effects of a ginger extract on knee pain in patients with osteoarthritis. *Arthritis & Rheumatism*, 2001 Nov; 44(11): 2531-8. DOI: 10.1002/1529-0131(200111)44:11< 2531:: AID-ART 433 >3.0.CO; 2-J).
24. Young HY, Luo YL, Cheng HY, Hsieh WC, Liao JC, Peng WH. Analgesic and anti-inflammatory activities of [6]-gingerol. *Journal of ethnopharmacology*, 2005 Jan 4; 96(1-2): 207-10.