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Preparation of Trutyadi Churna: An ayurvedic formulation for *Amavata* (Rheumatoid Arthritis)

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Abstract

Trutyadi churna is a formulation mentioned specifically in the context of *Amavata*, that contain *Amomum subulatum* (Bruhut Ela), *Syzygium aromaticum* (Lavanga), *Embelia ribes* (Chitraka), *Zingiber officinale* (Shunti), *Piper nigrum* (Maricha), *Piper longum* (Pippali), *Cyperus rotundus* (Musta), *Terminalia chebula* (Haritaki), *Commiphora mukul* (Shuddha Guggulu), *Cinnamomum tamala* (Tejopatra) and *Operculina terpehum* (Trivrut). This article gives an insight to this formulation being prepared using the modern pharmaceutical instruments strictly adhering to the norms of Ayurvedic Formulatory of India.

Keywords: Trutyadi churna, *Amavata*, Preparation

Introduction

Amavata (Rheumatoid Arthritis) is one among the common *Vatavyadhi* that one can get due to the consumption of unwholesome foods, stress and negligence to the various combinations of the foods. This disease typically presents with either *Ekanga* or *Sarvanga Sandhi shotha*, *Arthi*, *Graha*, *Gaurava*, *Jwara*, *Agnimandhya* and *Trushna* [1]. In modern parlance, we can consider autoimmune disease Rheumatoid Arthritis where the symptoms are indicating some inflammatory response which in turn lead to Antigen antibody reaction in the synovial joints [2]. This disease if not treated judiciously may lead to many *Upadrava*. Hence Bruhut Nighantu Rathnakara quotes the formulation *Trutyadi churna* in the chapter of *Amavata Rogadhikara* [3]. This unique formulation consists of many drugs that reach the target tissues and work against the pathology of the disease to minimize the chances of complications.

Materials and Methods

Ingredients of the formulation

1. *Amomum subulatum* (Bruhut Ela)
2. *Syzygium aromaticum* (Lavanga)
3. *Embelia ribes* (Chitraka)
4. *Zingiber officinale* (Shunti)
5. *Piper nigrum* (Maricha)
6. *Piper longum* (Pippali)
7. *Cyperus rotundus* (Musta)
8. *Terminalia chebula* (Haritaki)
9. *Commiphora mukul* (Shuddha Guggulu)
10. *Cinnamomum tamala* (Tejopatra)
11. *Operculina terpehum* (Trivrut)

1) *Amomum subulatum* (Roxb.) belonging to the family Zingiberaceae is popularly known as *Sthoolaila* or *Bruhat Ela*. Studies prove that the chemical constituents present in this drug are chalcone, cardomonin, flavanone, alpinetin, petunidin-3-5 diglycoside, a new aurone glycoside, subulin and leucocyanidin glucoside which were isolated from the seeds. Essential oils from the seeds contains cineol along with bisabolene, sabinene, terpinene, terpineol, terpinyl acetate and polymerised oil. The other constituents present in the oil are α -pinene, β -pinene, myrcene, α -terpineol and nerolidol. The seeds are thermogenic, deodorant, appetiser, carminative, digestive, constipating, depurative, cardiac and liver tonic, expectorant, diuretic, sudorific and hypnotic [3].

Ayurvedic PropertiesRasa - *Katu, Tikta*Guna - *Laghu, Ruksha*Veerya- *Ushna*Vipaka - *Katu*Doshagnata - *Tridoshashamaka*Rogagnata – *Mukharoga, Chardi, Trushna, Adhmana, Aruchi, Hrullasa, Agnimandhya, Yakrutvikara, Arsha, Kasa, Shawasa, Jwara, Daurbalya, Kandu, Shirashoola.*

2) *Syzigium aromaticum* (Linn.) belonging to the family Myrtaceae is popularly known as Lavanga. The chemical constituents present in the drug are Polyoxygenated chromone C-glucoside, isobiflorin (5,7-dihydroxy-2-methylchromone-8-C-beta-D-glucopyranoside) and biflorin (flower bud); 2-hydroxy-4,6-dimethoxy-5-methylacetophenone, eugenol, acetyleugenol, epoxydihydrocaryophyllene, caryophyllene and furfural traces, naphthalene, ellagitannin-eugeniin, caryophyllene oxide, caryophylla-3 (12), 6-dien-4-ol, caryophylla-3 (12), 7 (13)- dien-6 α -al, eugenol acetate. The pharmacological activities are antifungal, antimicrobial, anticarcinogenic, antioxidant, antibacterial, chalogogue, antiviral, radical scavenging activity, anticonvulsant, histamine release inhibitory activity [4].

Ayurvedic PropertiesRasa - *Katu, Tikta*Guna – *Laghu, Teekshna*Veerya – *Sheeta*Vipaka – *Katu*Doshagnata – *Kapha-pitta shamaka*Rogagnata – *Shirashoola, Pratishtyaya, Amavata, Katishoola, Ghridrasi, Dantashoola, Dhvajabhanga, Aruchi, Agnimandhya, Ajeerna, Adhmana, Udarashoola, Grahani, Visuchika, Yakrutvikara, Hrutdaurbalya, Rakthavikara, Kshaya, Mootrakruchra, Jwara, Samanya daurbalya.*

3) *Embelia ribes* Burm. F. belonging to the family Myrsinaceae is popularly known as *Vidanga*. The various chemical constituents present in this drug are embelin, quercitol, tannin, christembine, embelic acid, resinoid, vilanginin (fruit); pottasium embelate, 2,5-dihydroxy, 3-undecyl-1, 4-benzoquinone (plant). The known pharmacological activities are nematocidal, estrogenic, hypoglycaemic, anthelmintic, antibiotic, anti-tubercular, anti-implantation, anti-ovulatory, antifertility, anti-inflammatory, hypotensive, antipyretic, diuretic, hepatoprotective, anti-leishmanial, resorptive, anti-spermatogenic, anti-androgenic, anti-cancer, immunostimulant [5].

Ayurvedic PropertiesRasa – *Tikta, Katu*Guna – *Laghu, Ruksha, Teekshna*Veerya – *Ushna*Vipaka – *Katu*Doshagnata – *Kapha-vata shamaka*Rogagnata – *Shiroroga, Akshepaka, Apasmara, Pakshaghata, Krimidanta, Dantashoola, Agnimandhya, Ajeerna, Chardhi, Udarashoola, Adhmana, Vibandha, Arsha, Krimi, Kamala, Jeerna pratishtyaya, Rakthavikara, Gandamala, Mootrakruchra, Kushta, Charmoroga.*

4) *Zingiber officinale* Rosc. from the family Zingiberaceae in

its dry form is known popularly as *Shunti*. The chemical constituents present are Hepatane, octane, camphene, limonene, β -phyllandrene, 1,8-cineole, α -curcumene, α -farnesene, β -farnesene, zingerone, shogaol, dihydrogingerol, hexahydrocurcumin, cysteine, valine, isoleucine, leucine, and arginine (aerial parts and tuber). The pharmacological activities of the drug are anti-inflammatory, hypolipidemic, anti-atherosclerotic, anti-emetic, anti-ulcer, anti-pyretic, antioxidant, analgesic, hepatoprotective, hypouricaemic [6].

Ayurvedic PropertiesRasa – *Katu*Guna – *Laghu, Snigdha*Veerya – *Ushna*Vipaka – *Madhura*Doshagnata – *Vata-kapha shamaka*Rogagnata – *Amavata, Sandhi shotha, Shota, Vata vyadhi, Kati shoola, Aruchi, Chardhi, Agnimandhya, Ajeerna, Koshta vata, Adhman, Grahani, Gulma, Udarashoola, Anaha, Vibandha, Samanya daurbalya, Vishama jwara.*

5) *Piper nigrum* Linn from the family Piperaceae is known as *Maricha*. This contains the chemical constituents such as piperide characterised as isobutylamide of 11-(3,4-methyenedioxyphenyl)-2E,4E,10E-undecatrienoic acid, N-trans-ferloyltyramine and N-5-(hydroxy-phenyl-2E, 4E-pentadienoyl)piperidine, camphene, ascorbic acid, arginine, carotene, piperine, (2E,4E)-N-isobutyl-2-4-decadienamide(fruit). Studies prove that this has many pharmacological activities such as antioxidant, anticonvulsant, sedative, analgesic, muscle relaxant, antipyretic, anti-inflammatory, hepatoprotective, lipolytic, cyclo oxeganas inhibitory activity [7].

Ayurvedic PropertiesRasa – *Katu*Guna – *Laghu, Teekshna, Ruksha*Veerya – *Ushna*Vipaka – *Katu*Doshagnata – *Kapha-vata shamaka*Rogagnata – *Shwitra, Kilasa, Pama, Shothavedanayuktha Vikara, Vatavikara, Nadi Daurbalya, Yakridvikara, Agnimandhya, Ajeerna, Adhmana, Shoola, Krimi, Hridaurbalya.*

6) *Piper longum* Linn. from the Piperaceae family is known by the name *Pippali*. The chemical constituents present are two alkaloids piperlongumine and piperlonguminine characterised as N- (3,4 5- trimethoxy cinnamoyl)- Δ -piperidin- 2- one and isobutylamide of piperic acid respectively (stem and roots); n-hexadecane, n-heptadecane, two sesquiterpenes (essential oil from the dried fruits); piperine, piplartine, triacotane, reducing sugars, glcosides, sesamin and methyl-3,4,5-trimethoxycinnamate (roots) [8].

Ayurvedic PropertiesRasa – *Katu*Guna – *Laghu, Snigdha, Tikshna*Veerya – *Anushna sheeta*Vipaka – *Madhura*Doshagnata – *Kapha-vata shamaka*Rogagnata – *Shotha, sheetayuktha vedana*

7) *Cyperus rotundus* Linn. Belonging to the family Cyperaceae has the sanskrit name as *Musta*. This contains few Chemical constituents – β - sitosterol, 4 $\alpha,5\alpha$ - oxidoeudesm-11- en- 3 α - ol from rhizomes; pinene, cineol, alcohol-isocyperol; linolenic, linolic, oleic, myristic and stearic acids and glycerol (fatty oil); a sesquiterpeneketone- Mustakone and copaene, cyperotundone, sesquiterpenes- (+)- copadiene, (+)-epoxyguaine, (-)-rotundone and cyperolone. The tubers are anti-inflammatory, galactagogue, nervine tonic, digestive, carminative, reduce anorexia, reduce flatulence, inflammations, fevers, neurasthenia [9].

Ayurvedic Properties

Rasa – *Tikta, Katu, Kashaya*

Guna – *Laghu, Ruksha*

Veerya – *Sheeta*

Vipaka – *Katu*

Doshagnata – *Kaphapittashamaka*

Rogagnata – *kaphapaittika vikara, aruchi, agnimandhya, ajeerna, sangrahani, krimiroga, jwara, daurbalya, vishavikara.*

8) *Terminalia chebula* is a drug in the Family Combretaceae with synonyms as *Haritaki, Abhaya*. This contains many chemical constituents such as Anthraquinone Glycoside, Chebulinic Acid, Chebulagic Acid, Tannic Acid, Terchebin, Tetrachebulin, Vitamin C (Fruits); Arachidic, Behenic, Linoleic, Oleic, Palmitic and Stearic Acids (Fruit Kernels). This drug is thermogenic, anti-inflammatory, laxative, purgative, carminative, digestive, anthelmintic, cardio tonic, diuretic, depurative and tonic [10].

Ayurvedic Properties

Rasa- *Kashaya, Tikta, Madhura, Katu, Amla*

Guna – *Laghu, Ruksha*

Virya- *Ushna*

Vipaka – *Madhura*

Doshagnata – *Tridosha Shamaka, Especially Vatashamaka*

Rogagnata- *Shothahara, Vedanasthapana, Vranashodhana, Vrana Ropana, Medhya, Chakshushya, Deepana, Pachana, Yakrituttejaka, Anulomana, Mriduvirechana, Krimighna, Grahi, Shonitasthapana, Hrudya, Sroto Shodhna, Vrishya, Garbhashayashothahara, Samjaasthapana, Mootrala, Kushtaghna, Rasayana.*

9) *Commiphora mukul* being popularly known as *Guggulu* belongs to the family Bursaraceae. The chemical constituents of the same are E-guggulsterone and Oleoresin- z-guggulsterone. The known pharmacological activities of the drug are atheroscleroidal, antibacterial, antiviral, anti-inflammatory and anti-rheumatic [11].

Ayurvedic Properties

Rasa- *Tikta, Katu*

Guna – *Laghu, Rukshna, Tikshna, Vishada, Sukshma, Sara, Snigdha, Pichila*

Virya- *Ushna*

Vipaka – *Katu*

Doshagnata – *Vata-kapha hara*

Rogagnata- *Shotha, Gandamala, Apachi, Sthaulya, Amavata, Vatavyadhi, Prameha*

Karma- *Rasayana, deepana, Balya, Medohara, Amavatahara, Pramehahara, Bhagna, Sandhanakara.*

10) *Cinnamomum tamala* from the family Lauraceae is popularly known as *Patra* with the major chemical constituents such as Eugenol, d- α -phellandrene, cinnamic aldehyde, Linalool etc. [12]

Ayurvedic Properties

Rasa- *Madhura, Katu*

Guna – *Tikshna, Laghu, Picchila*

Virya – *Ushna*

Vipaka – *Katu*

Rogagnata- *Medoroga*

Karma- *Kapha-vata hara, Ruchya*

11) *Operculina turpethum* (Linn.) from the family Convolvulaceae known as *Trivrut* with the following chemical constituents which are an ether insoluble glycoside – turpethin and two other soluble glycosides α -turpethine and β -turpethins, coumarin – scopoletin along with sugars (glucose, rhamnose, fructose), luteolin and its derivative, vanillic, turpethenic acids A, B, C, D and E and saponins are the major components reported from the various parts of the plant [13].

Ayurvedic Properties

Rasa - *Katu, Tikta, Madhura, Kashaya*

Guna – *Laghu, Ruksha, Teekshna*

Virya – *Ushna*

Vipaka – *Katu*

Rogagnata- *Vataraktha, Amavata, Shwasa, Shotha, Jirnanaha, Vibandha, Arsha, Kamala, Udara, Pleehavridhi, Pandu, Jwara.*

Karma- *Sukhavirechaka, Rechana, Bhedana, Jwaraghna, Shothahara*

Collection and authentication of raw drugs

All the drugs mentioned above in detail were collected from the Sri Dharmasthala Manjunatheshwara Ayurveda Pharmacy, Kuthpady, Udipi, Karnataka, India.

Main Apparatus used for preparation of Trutyadi churna Capsules

Pulverizer – For the suitable size reduction of the above said raw materials.

Extractor – To accomplish the aqueous extraction.

Vaccum concentrator – For achieving the desired concentration of the aqueous extract.

Spray dryer – Conversion of the aqueous extract obtained as above to a completely deiscated powder form so that it can be easily encapsulated.

Capsule filing machine – To fill the dry powder in to the capsules.

Packing machine: For the final desired package presentation.

Method of preparation

The formulation was prepared using the specific parts of the drugs enlisted (Table no- 1) The first step is to do the *Shodhana* of the raw *Guggulu* by adding it with *Triphala Kashaya* followed by spray drying to obtain the purified *Guggulu* in a powder form (Fig 9). Rest of the raw materials viz. *Truti* (Fig 1), *Lavanga* (Fig 2), *Vidanga* (Fig 3), *Shunti* (Fig 4), *Maricha* (Fig 5), *Pippali* (Fig 6), *Musta* (Fig 7), *Haritaki* (Fig 8), *Tejopatra* (Fig 10) and *Trivrut* (Fig 11) - are given a wash, dried in a steam tray dryer and then subjected to Pulverizer (Fig 12) for the size reduction. This is then fed to

the extractor (Fig 13) with water as the media and given with a controlled boiling. The aqueous extract thus prepared is fed into the vacuum concentrator (Fig 14) and then to the spray dryer (Fig 15) to get a completely desiccated water extract powder. This is then mixed with the purified Guggulu powder to get the finished compound. Under controlled ambience, this is encapsulated in an automated capsuling machine (Fig 16) in a veg capsule of size zero to get 250 mg capsules of *Trutyadi churna*. The filled capsules are then packed by Packing machine (Fig 17) in plastic sockets and labelled as *Trutyadi churna* capsules.

Precautions to be taken

1. Moisture control is monitored throughout.
2. Capsules are to be tightly packed soon after the capsule filling to prevent the spoilage due to moisture.

Duration of preparation: 7 days

Discussion

This unique formulation though mentioned in the classical text is not widely used. The *Tikshna* property of *Guggulu* aids in the penetration of the drugs to the *Sukshma srotas* too and thereby aids in *Sroto shodhana*. *Truti* being *tridosahara*, acts on the weakness, *visha* (*Ama Visha* in *Amavata*) and considered as best *Rochaka*, *Vami* and *Kaasanut*. The major proportion of *Trivrut* is *Ushna Virya* and also has the *Rechana* property by virtue of which there will be a reduction in the signs and symptoms of *Amavata*. This formulation is a combination of many potent anti-inflammatory, anti-rheumatic, mild purgative and carminative drugs which act against the pathology of the Rheumatoid arthritis.

Conclusion

Most of the *Vata roga* are being widely treated using *Guggulu* because of the *Sroto Shodhana* effect and potency. The *churna* containing *Guggulu* is being capsulised considering the palatability.

Table 1: Ingredients of *Trutyadi churna*

Sl. No	Ingredient	Botanical Name	Part Used	Proportion
1	Truti (Bruhut Ela)	<i>Amomum subulatum</i>	Seeds	1 part
2	Lavanga	<i>Syzygium aromaticum</i>	Flowers	1 part
3	Vidanga	<i>Embelia ribes</i>	Seeds	1 part
4	Shunti	<i>Zingiber officinale</i>	Rhizome	1/3 part
5	Maricha	<i>Piper nigrum</i>	Fruit	1/3 part
6	Pippali	<i>Piper longum</i>	Dried fruit	1/3 part
7	Musta	<i>Cyperus rotundus</i>	Tuber	1 part
8	Haritaki	<i>Terminalia chebula</i>	Fruit	1 part
9	Shudha guggulu	<i>Commiphora mukul</i>	Resin	1 part
10	Tejopatra	<i>Cinnamomum tamala</i>	Bark	1 part
11	Trivrut	<i>Operculina turpethum</i>	Root	3 parts

Ingredients of *Trutyadi churna*



Fig 1: Truti



Fig 2: Lavanga



Fig 3: Vidanga



Fig 4: Shunti



Fig 5: Maricha

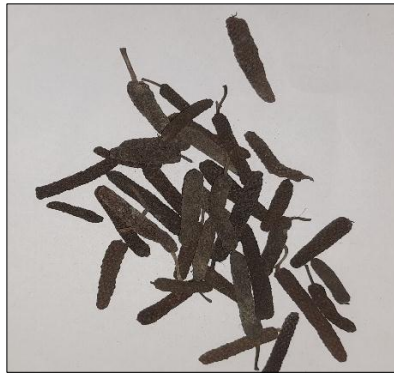


Fig 6: Pippali



Fig 7: Musta



Fig 8: Haritaki



Fig 9: Shuddha Guggulu



Fig 10: Tejopatra



Fig 11: Trivrut



Fig 12: Pulverizer



Fig 13: Extractor



Fig 14: Vacuum Concentrator



Fig 15: Spray Dryer



Fig 16: Automated Capsule filling machine



Fig 17: Packing machine



Fig 18: Packed Finished Product

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