

Herbal Remedies for Rheumatoid Arthritis used by Rural People of Rayalaseema Region, Andhra Pradesh, India

Suseelamma, M¹. and K. Venkata Ratnam^{2*}

¹ Department of Botany, Sri Maha Yogi Lakshammamma Govt. Degree College, Yemmiganur-518360

² Department of Botany, Rayalaseema University, Kurnool – 518 007

*Corresponding author: drvenkatapkd@gmail.com

Abstract

The aim of the present study is to collect traditional uses of medicinal plants used by the rural people of Rayalaseema region of Andhra Pradesh for Rheumatoid Arthritis (RA). Ethnobotanical field trips were conducted in the study area to collect medicinal plants used to treat rheumatoid arthritis. A total of fifty species belonging to 48 genera and 31 families were yielded during the field trips. Statistical analysis of collected data revealed that, Lamiaceae and Fabaceae constituted the highest number of medicinal plant species (each 6, 12%) followed by Euphorbiaceae (5 species, 10%), Caesalpiniaceae 3 species (6%), and etc. The partwise analysis of herbal drugs revealed that leaves and seeds (16 samples each) are the very common plant parts used by local people followed by whole plant and stem bark (5 samples each), roots (4 samples), fruits (3 samples) and latex, flower and wood with single sample. Regarding the route of administration, external (37 drug samples) administration was reported as the most common route of administration followed by oral application. External application of drug sample mixing with oil samples like gingelly, castor or mustard oil samples is common in the study area. In Ayurveda, an Indian Traditional Medicinal System, various herbs are available which are being employed in the treatment of rheumatoid arthritis. In the present study we observed that the local people of Rayalaseema region still depend chiefly on natural herbal remedies for daily healthcare. It is necessary to document traditional uses of medicinal plant resources and it should be carefully preserved, and used sustainably.

Index Terms: Herbal medicine, Rheumatoid Arthritis, Rayalaseema region

I. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic disease that causes severe damage to the joints and their surrounding tissue. It can lead to heart, lung or nervous system problems. Common symptoms include chronic pain, stiffness, tenderness, heat and swelling in the joints. RA can make it hard to move and perform daily activities. According to global burden of diseases survey the disease burden of RA in India is on the rise from 1990 to 2021. The prevalence of RA in different regions of India is significantly different, which may be related to local economy and development (Shi et al. 2025). Conventional drugs used to treat RA are Disease-Modifying Anti-Rheumatic Drugs (DMARDs), Corticosteroids (Steroids) and Nonsteroidal Anti-Inflammatory Drugs (NSAIDs). Long term usage of these drugs cause side effects like headache, dizziness, fatigue, nausea, vomiting, and malaise (Menachem Rubenstein, 2023). Many patients look for complementary and alternative medicine (CAM) options to treat RA and an estimated 60–90% of persons with arthritis use CAM. Among the most widely used alternative methods is herbal therapy (Shyama S. Kumar et al., 2015). Herbal medicine is easily available, safe and with minimum side effects.

II. MATERIALS AND METHODS

An ethno-botanical study was conducted to document first-hand information on traditional uses of medicinal plants used to treat by rural people of Rayalaseema region of Andhra Pradesh. Repeated interviews were conducted in the study area to collect the medicinal importance of herbal drugs. The phytomedicinal information of crude drugs such as local name, part used, mode of administration etc., was collected by standard methods (Jain and Rao, 1976). The collected information on medicinal/economic uses of plant species was recorded in the field note book.

The plant species collected from the study area were identified with the help of local and regional floras (Gamble, 1935, Venkata Raju and Pullaiah, 1995). The identification of plant materials was confirmed with the World Plant List online sources. Efforts have been made to collect plants in flowering and fruiting condition and have been provisionally identified by consulting the regional and local floras.

III. RESULTS AND DISCUSSION

The collected plants were arranged alphabetically with botanical name, family, part used and mode of preparation and administration of herbal drugs used to treat rheumatoid arthritis (Table 1).

Table 1. Medicinal plants used to cure rheumatism/Joint pains

S. No.	Botanical Name	Family	Part Used	Mode of Preparation
1.	<i>Abrus precatorius</i> L.	Fabaceae	Leaf	Leaf paste applied on swellings
2.	<i>Abutilon indicum</i> (L.) Sweet.	Malvaceae	WP	Boiled in water decoction given orally
3.	<i>Acalypha indica</i> L.	Euphorbiaceae	WP	Boiled in water, decoction given orally
4.	<i>Achyranthus aspera</i> L.	Amaranthaceae	Leaf	Leaves boiled in gingelly oil and applied externally
5.	<i>Acrocephalus indicus</i> (Burm.) O.	Lamiaceae	Leaf	Leaves boiled in gingelly oil and applied externally
6.	<i>Aegle marmelos</i> (L.) Cor.	Rutaceae	Fruit	Leaves boiled in mustard oil and applied externally
7.	<i>Alangium salvifolium</i> L. f.	Alangiaceae	Seed	Seeds crushed and boiled in gingelly oil and applied externally
8.	<i>Anisomelos indica</i> (L.) Ktze.	Lamiaceae	Whole Plant	Mixed with turmeric, boiled, cooled decoction applied externally on affected parts
9.	<i>Anisomelos malabarica</i> (L.) R. Br.	Lamiaceae	Whole Plant	Whole plant boiled, decoction applied externally on affected parts
10.	<i>Argemone mexicana</i> L.	Papaveraceae	Seed	Seed oil applied externally on joint pains
11.	<i>Aristolochia indica</i> L.	Aristolochiaceae	Whole Plant	Mixed with turmeric, boiled, decoction applied given orally and applied externally
12.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Stem bark	Mixed with garlic, ground, extract given orally
13.	<i>Caesalpinia bonduc</i>	Caesalpiniaceae	Seed	Seeds crushed and boiled in gingelly oil and applied externally
14.	<i>Calotropis gigantea</i> (L.) R. Br.	Asclepiadaceae	Leaf	Ground in gingelly oil, slightly warmed and applied externally
15.	<i>Cassia occidentalis</i> L.	Caesalpiniaceae	Leaf	Leaves crushed and directly applied on joint pains
16.	<i>Catunaregam spinosa</i> (Thumb.) Tirv.	Rubiaceae	Stem bark	Ground and paste as external application
17.	<i>Celastrus paniculatus</i>	Celastraceae	Seed	Seeds crushed and boiled in gingelly oil and applied externally
18.	<i>Citrullus colocynthus</i> (L.) Schard.	Cucurbitaceae	Fruit Leaf	Fruit burned, the pulp applied externally in hot condition on joint pains Leaf paste applied externally
19.	<i>Clerodendrum serratum</i> (L.) Moon.	Verbenaceae	Root	Paste applied externally
20.	<i>Coldenia procumbens</i> L.	Boraginaceae	Leaf	Ground, paste applied externally on swellings
21.	<i>Datura metel</i> L.	Solanaceae	Flower	Powder mixed with honey, given orally at night times
22.	<i>Dioscorea pentaphylla</i> L.	Dioscoriaceae	Root	Paste applied externally
23.	<i>Enicostemma axillariae</i> (Lam.). Roynal.	Gentianaceae	Leaf	Along with the stem of <i>Euphorbia tirucalli</i> , roasted in urine and applied externally
24.	<i>Erythroxylum monogynum</i> Roxb.	Erythroxylaceae	Leaf	Along with pepper, onion and given orally
25.	<i>Ficus racemosa</i> L.	Moraceae	Stem bark	Along with that of <i>F. benghalensis</i> , <i>F. religiosa</i> boiled in water, decoction given orally.

S. No.	Botanical Name	Family	Part Used	Mode of Preparation
26.	<i>Ficus religiosa</i> L.	Moraceae	Stem bark	Along with that of <i>F. benghalensis</i> , <i>F. racemosa</i> boiled in water, decoction given orally.
27.	<i>Garuga pinnata</i> Roxb.	Burseraceae	Fruit	Fruit oil applied externally
28.	<i>Hygrophylla auriculata</i> (Schum.) Heine.	Acanthaceae	Leaf	Macerated with butter and applied externally on joints for 7 days
29.	<i>Hyptis suaveolens</i>	Lamiaceae	Seed	Soaked overnight in water and consume early morning on empty stomach
30.	<i>Jatropha gossypifolia</i>	Euphorbiaceae	Seed	Seeds crushed and boiled in mustard oil and applied externally
31.	<i>Leonotis nepetiifolia</i> (L.) R. Br.	Lamiaceae	Leaf	Leaves crushed and boiled in gingelly oil and applied externally
32.	<i>Leucas aspera</i> (Willd.) Link.	Lamiaceae	Leaf	Leaves crushed and boiled in gingelly oil and applied externally
33.	<i>Mallotus philippensis</i> (Lam.) Muell.	Euphorbiaceae	Seed	Seed paste as external application
34.	<i>Melia azadirach</i>	Meliaceae	Seed	Seeds crushed and boiled in castor oil and applied externally
35.	<i>Mesua ferrea</i> L.	Guttiferae	Seed	Extracted oil applied externally
36.	<i>Moringa oleifera</i> Lam.	Moringaceae	Leaf Seed	Shade dried, made into powder along with salt, red chill and garlic. Given one tea spoon along with meals every day for one month. Seeds crushed and boiled in castor oil and applied externally
37.	<i>Oroxylum indicum</i>	Bignoniaceae	Seed	Seeds crushed and boiled in gingelly oil and applied externally
38.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Root	Boiled in water, decoction given orally twice a day for a week day
39.	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Stem bark	Fresh stem bark made into paste and applied externally on joints
40.	<i>Pterocarpus santalinus</i> L.	Fabaceae	Wood	Oil extracted from wood applied externally
41.	<i>Ricinus communis</i> L.	Euphorbiaceae	Seed	Crushed and boiled in water. Separate oil and applied on joint pains
42.	<i>Sesamum orientale</i> L.	Pedaliaceae	Seed	Seed oil applied externally
43.	<i>Sesbania grandiflora</i> (L.) Poir.	Fabaceae	Root	Ground in water made into paste and applied externally
44.	<i>Suregada angustifolia</i> (Muel.-Arg.) Airy	Euphorbiaceae	Leaf	Boiled in gingelly oil and applied externally
45.	<i>Tamarindus indica</i>	Caesalpiniaceae	Seed	One tea spoon powder given orally for a period of one month
46.	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Leaf	Juice given orally
47.	<i>Trigonella foenum-graecum</i> L.	Fabaceae	Seed	Ground along with jaggery, paste applied externally
48.	<i>Vitex negundo</i> L.	Verbenaceae	Leaf	Fresh leaves boiled in mustard oil, filtered and applied externally
49.	<i>Wrightia tinctoria</i> R.Br.	Apocynaceae	Latex	Applied externally
50.	<i>Xanthium strumarium</i> L.	Asteraceae	Seed	Seed oil as external application



Figure 1. *Aegle marmelos* (L.) Cor.



Figure 2. *Alangium salvifolium* L.f.



Figure 3. *Calotropis gigantea* (L.) R. Br.



Figure 4. *Celastrus paniculatus* Willd.

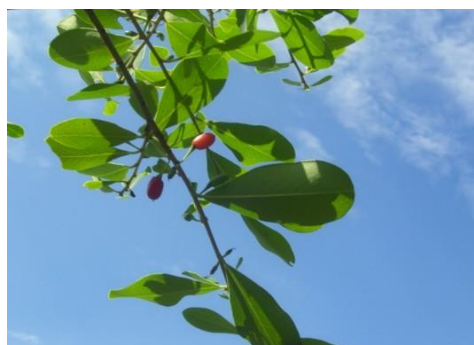


Figure 5. *Erythroxylum monogynum* Roxb.



Figure 6. *Plumbago zeylanica* L.

Ethnobotany is the scientific study of cultural practices and traditional knowledge in relation to religious, medicinal and other uses of plants. Ethno-botanists play a key role in ethnobotanical research to explore the importance of plants that are used as food, clothing, shelter, fodder, fuel, furniture, and medicinal use. Ethnobotanical field trips were conducted in the study area to collect medicinal plants used to treat rheumatoid arthritis. A total of fifty species belonging to 48 genera and 31 families were yielded during the field trips. Statistical analysis of collected data revealed that, Lamiaceae and Fabaceae constituted the highest number of medicinal plant species (each 6, 12%) followed by Euphorbiaceae (5species,10%), Caesalpiniaceae (3 species, 6%), Verbenaceae and Meliaceae (each with 2 species, 4%) the remaining families represented with single species (Figure 7). The partwise analysis of herbal drugs revealed that leaves and seeds (16 samples each) are the very common plant parts used by local people followed by whole plant and stem bark (5 samples each), roots (4 samples), fruits (3 samples) and latex, flower and wood with single sample (Figure 8).

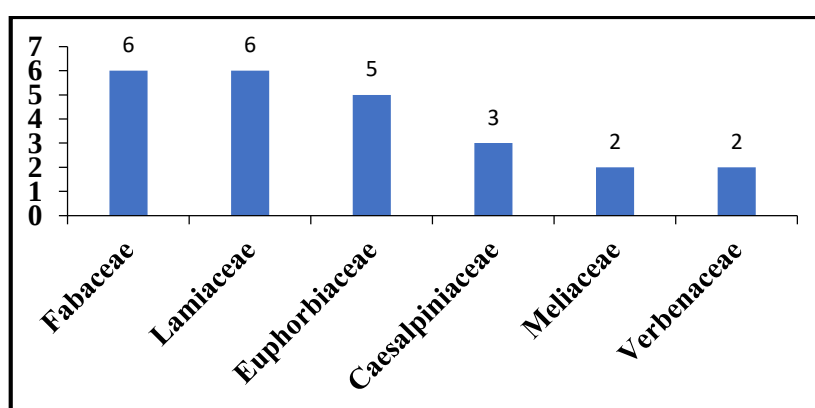


Figure 7. Top 5 Families of herbal drugs used for Rheumatoid Arthritis

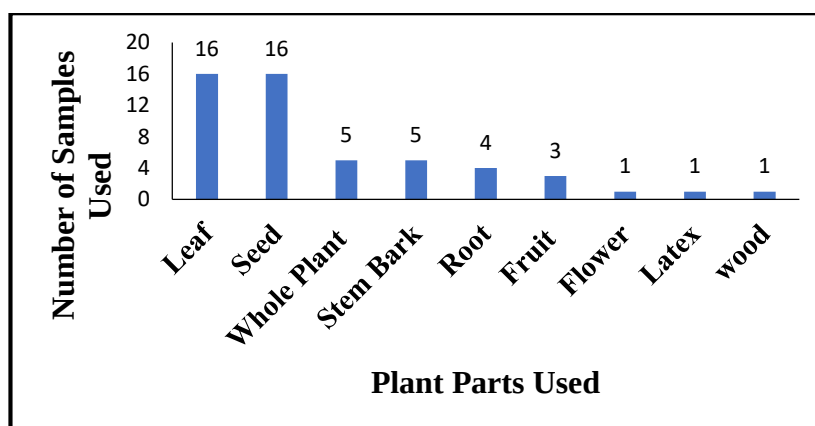


Figure 8. Partwise analysis of herbal drugs used for Rheumatoid Arthritis

Regarding the route of administration, external administration (37 drug samples) was reported as the most common route of administration followed by oral application. External application of drug sample mixing with oil samples like gingelly, castor or mustard oil samples is common in the study area. In Ayurveda, an Indian Traditional Medicinal System,

various herbs are available which are being employed in the treatment of rheumatoid arthritis. Specialized oil therapy, known as Sneha- Sweda, is the most popular and potent classical therapy for the treatment of rheumatoid arthritis and different seed oils have been utilized to serve the purpose. The massage (topical application) by oils on affected area in rheumatoid arthritis improves circulation and helps to reduce the inflammation in joints (Jayprakash et al., 2020). Among the oil samples used gingelly/ sesame oil is the most common oil using to prepare drug sample. Sesame oil is one of the oldest oil sample known to man. The first written record of usage of sesame dates back to 3000 BC. Sesame oil has been used to treat the joints pain in several traditional medicines. When gingelly oil mixed with the herbal oil applied topically through massage, it reduces joint pain, stiffness, and improves flexibility. Several scientific studies proved the anti-inflammatory activity of gingelly oil (Gupta and Sharma, 2017; Alireza Askari et al., 2019).

Another oil sample commonly used in herbal formulation preparation is mustard oil, obtained from *Brassica nigra* of family Brassicaceae. Historically, mustard seed oil has been applied externally to treat diseases like pneumonia and bronchitis that induce inflammatory in addition to helping lessen inflammation and signs of arthritis. Mustard oil contains alpha linoleic acid a form of omega-3-fatty acid present in the oil can reduce swelling and improve discomfort associated with illnesses like rheumatoid arthritis (Mandeep Singh et al., 2023). In the present report mustard oil is reported to use in the preparation of medicine from *Jatropha gossypifolia* seeds and *Vitex negundo* leaves. Castor oil is another sample used to prepare herbal formulation for external application. In the present study *Melia azedarach* seed crushed and boiled in castor oil and used as external application. The safety and efficacy of castor oil was clinically proved patients with osteoarthritis (Medhi et al., 2009).

IV. CONCLUSION

Ethnobotanical information on medicinal plants used to treat RA were collected from Rayalaseema region of Andhra Pradesh. A total of fifty species belonging to 48 genera and 31 families were yielded during the field trips. Family and part wise analysis revealed that Lamiaceae and Fabaceae are the dominant families and leaves and seeds are most common plant parts used to treat RA. The oil samples used to prepare herbal formulations are gingelly oil, mustard oil and castor oil. Among the three oil samples gingelly oil is most common sample used to prepare herbal formulation. External application of drugs is the common mode of drug administration method in the study area. In the present study we observed that the local people of Rayalaseema region still depend chiefly on natural plant remedies for daily healthcare. It is necessary to document traditional uses of medicinal plant resources and it should be carefully preserved, and used sustainably.

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