

## RESEARCH ARTICLE

# Plants: A major natural resource for curing disease rheumatism in Paschim Medinipur district of West Bengal- An overview

Arpita Chakraborty<sup>1\*</sup>, Jyoti Kumar<sup>2</sup>

## Abstract

Research has been carried out in different remote areas of Paschim Medinipur district to find out the herbal remedies which are used as an antidote of disease rheumatism. Herbs are one of the major natural resources of the Universe. In this survey 20 medicinal plants belonging to 15 plant families and 18 genera namely, *Ziziphus nummularia* (Burm. f.) Wight. & Arn. (Rhamnaceae), *Achyranthes aspera* L. (Amaranthaceae), *Cissus quadrangularis* L. (Vitaceae), *Desmostachys bipinnata* (L.) Moench (Malvaceae), *Euphorbia tirucalli* L. (Euphorbiaceae), *Cannabis sativa* L. (Cannabaceae), *Stachytarpheta jamaicensis* (L.) Vahl (Verbenaceae), *Terminalia arjuna* (Roxb. exDC) Wight & Arn. (Combretaceae), *Scoparia dulcis* L. (Plantaginaceae), *Abelmoschus esculentus* (L.) Moench (Malvaceae), *Allium ascalonicum* L. (Amaryllidaceae) are some of the medicinal plants which were documented after survey. Interviews with different rheumatic patients, herbal practitioners and different market sellers about the use of the same herbal formulations proves their true disease healing property against the specific said disease. The genuineness of the specific disease curing activity also indicates that these plants must contain some active constituents which are also proved in other literature reviews. So, it can be said, uses of these medicinal plants cum natural resources against rheumatism is not only a matter of folklore but scientific also. It is fact that many of the inhabitants of the district specially females of above the age of average 35 are suffering from different kind of rheumatic disorders. The disease is painful and very difficult to get cured by orthodox allopathic treatment process. This survey also noticed patients taking different ethnomedicinal formulation either orally or as an emollient for different rheumatic disorder give better results than prolonged orthodox costly allopathic medicine. It is also noticed during survey that those very essential medicinal herbs are left unnoticed in different places of the district. So, conservation of those plants is essential consciously and unconsciously even in this era of deforestation, urbanization, and modernization.

**Keywords:** Natural resource, Antidote, Rheumatism, Herbal practitioners, Active constituents, Ethnomedicinal formulation, Folklore, Deforestation.

## Introduction

From ancient time to till date the whole animal community including human largely dependent on plants for their food, medicines, cloths fuels and other needs. It is noticed carefully in different surveys that in a specific area natives use some

specific plants for different medicinal purposes. According to WHO, 1980, 80% of the total World's population totally dependent on traditional medicine for their primary health care need (Jain 1995, Sikarwar 2018). It is also proved by different surveys that a specific plant is used for a particular disease in different area but the formulation of drug and method of application of the drug is not in toto. But it is very much unfortunate that vast traditional knowledge cum assets of our natural resources has no documentation, it has been transmitted generation after generation verbally only (Singh *et al.* 2016). So, with the death of an old aged knowledgeable person a library ruins (Singh *et al.* 2014). Still, it is proved by the interaction with different patients and their rate of success from different diseases prove our traditional healing system is not only a matter of folklore but scientific also. Actually the branch ethnobotany is an interdisciplinary science between Anthropology and Botany (Silveira *et al.* 2023). Now it is a subject to study the traditional medicinal plants by their chemical and advance molecular study and proved it through in-vitro and in-vivo study. Although most

<sup>1</sup>Department of Botany, Narajole Raj College, Narajole, Paschim Medinipur (Affiliated to Vidyasagar University), West Bengal, India.

<sup>2</sup>University Department of Botany, Ranchi University, Ranchi, Jharkhand.

**\*Corresponding Author:** Arpita Chakraborty, Department of Botany, Narajole Raj College, Narajole, Paschim Medinipur (Affiliated to Vidyasagar University), West Bengal, India., E-Mail: arpitascmbotany88@gmail.com

**How to cite this article:** Chakraborty, A., Kumar, J. (2024). Plants: A major natural resource for curing disease rheumatism in Paschim Medinipur district of West Bengal- An overview. J. Indian bot. Soc., Doi: 10.61289/jibs2024.04.02.1217

**Source of support:** Nil

**Conflict of interest:** None.

of the countries depend on traditional medicines for their primary health care need, yet till date most of the cases it is transferred orally from man to man, generation after generation specially in different ill-developed or developing countries like Ethiopia. So, seriously it is a subject for documentation before the tradition /culture diminishes with modernization (Dubale *et al.* 2023). Traditional healers in these surveys are very efficient in their different areas of expertise such as rheumatism, menstrual disorder, diarrhoea and dycentery, diabetes etc. (Chakraborty *et al.* 2018). Some are dealt with a single disease occasionally. Among various diseases and surveys this work concentrates with rheumatism. Arthritis/rheumatism is one of the leading causes of disability among the middle aged or age-old persons in many countries of the World (Salihu *et al.* 2018). Rheumatism is a general term used for any aches and pains seen in bones, muscles, joints, ligaments, tendons i. e in the tough part of the body. It is assumed by the traditional healers that rheumatism attacks a person when body's immune system is affected in any way. The aches or pain are seen outwardly but the main reason remains hidden internally specially in their blood and nerves also as per saying of different medicine men. There are different kind of pain seen in rheumatism. Depending on the external features of the aches or pain, traditional healers classified rheumatism into different types in the Paschim Medinipur district of West Bengal such as Phula Bat, Gathia Bat, Sciatica Bat etc. Now-a-days, In vitro bioactivity assays are performed to assess the healing potential of some documented traditionally used plants to cure arthritis/rheumatism. Some times statistical analysis also done using the linear regression techniques (Rehman *et al.* 2023). The geographical location of Paschim Medinipur district is latitude 22. 4257°N and longitude 87. 3199°E (<https://www.paschimmedinipur.gov.in>).

## Materials and Methods

Field study is one of the best ways for collection of ethnomedicinal information (Kuiiri *et al.* 2002). Present authors done ethnobotanical survey during 2018-2020. Survey was done in different remote villages of Paschim Medinipur district. Ethnobotanical information was collected mainly by a semi-structured questionnaire method (Table 1) in Bengali language. The questionnaire method proposed firstly by Jain and Rao (1977) and the same method was followed Mahto and Kumar (2002). The questionnaire method is as under (Mahto *et al.* 2002).

Firstly, the authors make acquainted themselves with the local flora, fauna, tribal cultures etc. This process was continued for almost one years in this area. Then the authors usually visited minutely in the local forest guided by local medicine men/gunin/herbal healers. It was convenient process. Sometimes in another way authors took the unknown local plants/plant twigs to the herbalists and enriched their ethnomedicinal knowledge about the plants.

**Table 1:** Information from the herbal healers

<i>Date of visit</i>	
1	Name
2	Age
3	Sex
4	Experience in years
5	Clan
6	Education
7	Address
8	Specialization if any?
9	Self Started or Hierarchical
10	No. of such persons in the locality
11	Position they hold in the society
12	Patients come from which area?
13	Number of patients treated by him till now
14	From where plant materials are collected (forest/Wetlands/Garden/Cultivated land/Hat/Bazaar/Shop)?
15	Beside plant materials which other items is used for treatments?
16	Which type of preparation is used to apply the patients (self-made/others made/laboratory made/raw plant parts)?
17	Do you prefer collection of specific drugs on some specific days? (i) Morning (ii) Noon (iii) Evening/Night (iv) No moon/Full moon (v) Any day
18	Do you follow any special offerings /hymes before presenting the prepared medicines to the patients? Would your advice or like to direct them in any way?
19	Interaction with patients
<i>Mode of treatment in each case</i>	
i	Scientific name of the Plants used in medicine (with family)
ii	Local name
iii	Treatments of Ailments
iv	Parts used
v	Symptoms
vi	Preparation of medicine
vii	Method of application

In both the process antirheumatic plants, their different characteristic features, medicine preparation, mode of application discussed in Bengali language. Also, some plants having medicinal properties other than rheumatism were came into light during surveys. The collected plants in their reproductive stage kept for making herbarium sheets with the conventional herbarium techniques (Mitra *et al.* 2000, Singh 2021). Unknown plants were identified with the help of different experts of the field. After minute morphological study the accepted scientific name was verified from websites such as 'Tropicos' (<http://www.tropicos.org>). Colored photographs were also taken for documentation. The prepared herbarium sheets of each herbarium were 28

X 42 cm /11.5 X 16.5 inch and size of herbarium label was 11.5 cm X 10 cm as per Universal conventional methodology (Mitra *et al.* 2000, Singh 2021). Each herbarium label strictly maintains to present information of the respective plant as per rules of CNH, AJC Bose Indian Botanic Garden, Shibpur, Howrah. The collected herbarium sheets were arranged according to Bentham and Hooker's system of classification and kept in the herbarium of Ranchi University, Ranchi.

## Result and Discussion

The Plants enlisted and documented from this survey work are 20 in number belonging to 15 families and 18 genera. Local herbal practitioners in different cases uses mono-herbal and sometimes polyherbal formulations (Tables 2 and 3). During survey some medicine men said about a general rheumatic disorder, it's symptoms and details about the specific application methods where as some told about a specific plant formulation against some specific rheumatic disorder symptoms only and named them accordingly. So, the different rheumatic disorders are documented as:

### **Rheumatism**

A generalized formulation is applicable when body's immune system is affected in any way. The aches or pain are seen outwardly but the main reason remains hidden internally specially in their blood and nerves also (as per saying of different medicine men.)

### **Koti bat**

Formulation specific for rheumatic pain in waist region

### **Gathia bat**

Formulation is applicable when a patient suffering from rheumatic pain in his/her different joints

### **Aghat janita byatha (sprain due to blow)**

Formulation is given against any aches or pain originated due to any blow from outside.

### **Shiragata bat (jhinjhine bat)**

Formulation is given when the whole body have a sensation of cramp.

**Table 2:** Detailed Documentation Report

S. No.	Scientific Name/ Family/ Local name	Parts used	Symptoms	Preparation of medicine	Method of application
1.	<i>Ziziphus nummularia</i> (Burm. f.) Wight. & Arn. /Rhamnaceae /Parkul	Root bark	Rheumatism (All types of rheumatism)	First, the barks are to separate from the roots. The barks are to be clean in water, cut into pieces and to keep or preserve on a cloth sheet by giving water. The first 3 days the medicines are to be grinded with 84 black pepper and adequate amount of ghol (Mattha) of cow milk.  From the 4th day, grinding of medicine with 21 black pepper and ghol (mattha) of cow milk. He/she has to prepare ghol (mattha) from cow milk once and this ghol will be used for next 7 days. Anyone can grind medicine except mother of the patient. One single man /woman is required to grind medicine for 7 days.	Method of application The grinded mixture is to apply as an emollient on the affected area. The grinding pots are to be washed with a little amount of ghol for eating by the patient. After applying medicine patient has to stay on the Sun so that medicines remain on the body. Patient will stay separately and use blankets. Patient will lie on ground keeping mat or blanket.  Rules of fooding: First 7 days, the patient will take boiled rice and boiled potato, green banana, Bitter Gourd, Corm, Arum, Sandhak Salt, cow milk, ghee. Bringle and oil can not be taken. Patient can also take milk, Churah, sarbat, sago and barley. First seven days fried burnt vegetable, leafy vegetables, sour can not be taken.
		Root	Rheumatism	100 gm pure mustard oil is taken in a pot and boiled. During boiling, the following substances are added to oil: 1) Aniseed, Back cumin seed, Methi – total 25 gm being smashed. 2) 2-3 pieces root of parkul (near about 100gm) being smashed, 3) Smashed 2-3 pieces root of Lajjabati (Sensitive plant) (each about 5inch), 4) One smashed Dhutra fruit, 5) 20 gm smashed garlic. When all the mixed elements are fully fried i. e. no ear bubble is found in oil, then it is to cool down and filter the oil and keep in a jar /bottle. Afterwards, one pea like opium + 3 pieces of camphor + 5 gm dust salt, beat salt and sandak salt each of little amount is added to be boiled in water.	The oil is to use as 'malish' twice daily for two months at a stage to cure rheumatism. Patients suffering from rheumatic pain in waist, knee, shoulder or any parts of human body will get relief of pain and aches.

2.	<i>Stachytarpheta jamaicensis</i> (L.) Vahl /Verbenaceae /Neel Apang	Root	Rheumatism (Koti Bat)	The root of the plant (almost 5 inch) is bind with a white thread.	The patient has to wear the thread in the waist for 3 days to cure.
3.	<i>Achyranthes aspera</i> L. /Amaranthaceae /Apang	Root	Rheumatism	10 gm juice of yellow ganda + 10 gm juice of root of apang plant + 10 gm juice of dhutura leaf are mixed together in a pot.	The patient has to apply the mixture as 'malish' on the affected parts of the body thrice daily for 15 days to cure. The severe patients are to apply the medicine for 30 days to cure permanently. The medicine has to use by the blessings of God Siddheswar Sibha.
4.	<i>Cissus quadrangularis</i> L. /Vitaceae /Harjora	Root	Rheumatism (Shiragata Bat)	10 ml Root juice of Apang + 100 ml olive oil + 10 ml clove oil is mixed and boiled and the solution kept in a bottle	The patient has to rub the mixture gently as an emollient on the affected area twice daily till recovery.
		Stem	Rheumatism	i) Stems of the plant is to be pasted and small cakes of it (near about 6gms.) fried in mustard oil. ii) stems of the plant is to be taken and removing the bark of the stem to be mixed and grinded with 25 gms of pulses to prepare tikia each of 5-6 gms.	Patient has to fed the medicine. Tikia is to be taken with rice during lunch time or taken with muri during breakfast or tiffin time.
5.	<i>Desmostachys bipinnata</i> (L.) Stapf /Icacinaceae /Kush	Root	Rheumatism	Root of Kush plant + root of Apang + root of Nimua is to collect each in same amount.	It is to pour in an aumlet and the aumlet is to wear in hand either in the full moon day or no moon day.
6.	<i>Euphorbia tirucalli</i> L. /Euphorbiaceae /Lankaseez	Stem	Rheumatism	The oiled mixture is to prepared by taking 200 gm mustard oil + 25 gm of stem of lankaseez plant + 12 pieces of garlic + 10 gm of black pepper + 25 gm birikalai + 25 gm root of <i>Clerodendrum</i> flower plant + seeds of 8 thorn apple + 16 leaves of dhutura + 16 leaves of sun plant and boiled them to get a mixture.	The patient is to rub gently on the affected area of the body twice daily in the morning and at bed time in night for 30 days to get cure.
		Stem	Rheumatism	The stem is to bake in woven to take juice and mixed and grinded with 50 gm huskless garlic	Rub the medicine as emollient in the place of pain twice daily for minimum 10 days
		Stem stalk	Rheumatism	The stem stalk of <i>Euphorbia tirucalli</i> is smashed, mixed with mustard oil, boiled and filtered.	It is to rub on the affected parts as emollient twice daily for 10 days.
7.	<i>Cannabis sativa</i> L. /Cannabaceae / Ganja	Dried young inflorescence	Rheumatism (Gathia Bat)	100 gm mustard oil is to boiled in a frying pan and when the oil becomes without foam, then 10 gm grinded mixture of matted hair of hemp plant mixed in the oil. Then to filter the solution and keep the oil in a bottle. Now the oil is prepared from the matted hair of hemp-plant.	Aches and pain in the joints may be new or old – in this situation, the patient has to rub the prepared oil on the joints for few days
8.	<i>Terminalia arjuna</i> (Roxb. exDC) Wight & Arn. / Combretaceae / Arjun	Stem bark	Sprain due to blow (Aghat janita byatha)	25 gm Arjun stem bark + 25 gm turmeric + 10 gm leaves of tamarind plant is to grind and boil.	The patient has to rub gently on the affected place to cure from the problem regularly till recovery.
9.	<i>Scoparia dulcis</i> L. / Plantaginaceae / Bandhane	Root	Rheumatism	7 cm root of the plant is bind with white thread.	The patient has to wear the thread in hand in the morning before brushing to cure.
10.	<i>Abelmoschus esculentus</i> (L.) Moench / Malvaceae / Dhenras	Root	Rheumatism	7 cm root of the plant is bind with white thread.	It is to wear the thread in the morning before brushing to get comfort from rheumatic pain.

11.	<i>Allium ascalonicum</i> L. /Amaryllidaceae /Shallot (Muripyaj)	Bulb	Rheumatism	250 gm of Shallot is smashed after peeling of the skin to get juice of onion and mixing one pea like opium and ½ pieces of <i>Areca catechu</i> L. and to boil and make it small tablets.	Patient has to take 1 tablet in the morning before brush with a glass of water, kept during whole night for 3 days and then to stop taking tablets. If necessary, patient will take for another 3 days and so on. Diet: In this period, the patient is to take green coconut water.
12.	<i>Thespesia populnea</i> (L.) Sol. ex Correa / Malvaceae /Paras-pipal	Leaf /Root	Rheumatism (Gathia Bat)	The leaf /root of the plant in adequate amount is to grind and warm	Pain, swelling and burning sensation in one or two joints – sometimes fever may arise. Slowly, other joints are affected. In the morning, the joints became very tight or fully stretched out. When the ailment became old, the joints are deformed. In this situation, it is to rub on the joints for 3-4 times daily.
13.	<i>Nicotiana tabacum</i> L. /Solanaceae / Tamak	Leaf	Rheumatism (Bat Kantik)	100 mg of leaf dust is to be made.	Leaf dust is mixed with warm water and be taken twice daily till recovery.
14.	<i>Semecarpus anacardium</i> L. f. / Anacardiaceae / Vela	Whole plant	Rheumatism (Gathia Bat)	500 gm mixture of myrobalan fruit dust and dust of purified vela plant are mixed with ¼ th cup of warm milk.	The patient who are suffering from aches and pain of joints, he/she has to take the mixture twice daily for ten days to get comfort from the ailment.
15.	<i>Holarrhena antidysenterica</i> (L.) Wall. ex A. DC. /Apocynaceae / Kurchi	Stem bark	Rheumatism (Shiragata Bat)	Stem bark of near about 10-15 gm is boiled in 4 cups of water, when the mixture comes down to 1 cup, it is to filter	The disease comes from gene and also from adverse harmful food. Main symptoms of the ailment is swelling of body, sometimes discharging wounds. In this case, the mixture is to take twice daily for 7 days, then a gap for 7 days, then to take for next 7 days and so on for 49 days
16.	<i>Euphorbia antiquorum</i> L. / Euphorbiaceae / Bajbaran	Stem juice	Rheumatism	Stem juice of Bajbaran near about 100gms + stem juice of <i>Euphorbia tirucalli</i> near about 100 gms+ 50 gm huskless garlic + 100 gm root of kakrol plant are to be boiled with 500 gm of mustard oil and prepared an ointment	The mixture is to rub as emollient gently on the place of ache and pain twice daily for minimum 7-10 days
		Stem	Rheumatism	The stem of Bajbaran plant is to foment in fire to get juice and the juice is to mix with mustard oil and tarpin oil.	The mixture is to rub on the affected area gently twice daily for 10 days to cure.
17.	<i>Datura metel</i> L. /Solanaceae / Dhutra	Leaf	Rheumatism	Leaves of Dhutra + Nishinda are to be boiled in water, when the boiled mixture will become green then salt is to add in it	1 cloth duster is kept in boiled mixture and rub the cloth duster gently on the place of pain daily two times till recovery.
		Leaf	Rheumatism (Swelling of legs) (Phula Bat)	Leaf of Dhutra rubbing with mustard oil and baked in fire.	The one leaf is to keep on the place on the ache thrice daily for two days
		Leaf	Rheumatism (Phula Bat)	Juice of Dhutra leaves is to take and boiled to make concentrate juice like honey	The patient has to rub the mixture on the affected area by cotton. The swelling and pain diminishes. In some severe cases, the concentrate juice is mixed with Afing and Musubbar. It gives much better result.
		Leaf	Rheumatic pain (Bat Kantik)	Leaf juice of Dhutra is mixed with mustard oil and warmed	It is to rub on the affected place gently
18.	<i>Paederia scandens</i> (Lour.) Merr. / Rubiaceae /Gandal	Leaf	Rheumatism	Leaves of Gandal + Garlic seed vessel + 3-4 drops of wine is to grind.	Patient has to rub gently the mixture on the affected place once daily in the evening till recovery.

19.	<i>Allium sativum</i> L. / Amaryllidaceae / Rosun	Seed vessel	Rheumatism (Throb with pain) (Bat Kantak)	2-3 seed vessel of Garlic duly grinded and mixed with one spoonful of cow ghee	It is to be taken daily. The patient will come round from the pain of rheumatism
		Seed vessel	Rheumatic pain (Bat Kantak)	Garlic is being scorched in mustard oil and warm it	The patient is to rub the oil on the affected place to reduce the pain of gout
		Seed vessel	Rheumatic affections (Aam Bat)	One piece of garlic is mixed with Gandal leaves	Patient has to take the mixture for 3-4 days to feel comfort from pain
20.	<i>Withania somnifera</i> (L.) Dunal /Solanaceae /Ashwagandha	Stem dust	Rheumatism (Bat Ajirna)	Ashwagandha stem dust one tea spoon is mixed with a small amount of black sesame	The mixture is to be chewed for 7 days in the morning in empty stomach

**Table 3:** Scientific name of some plants used as local names in poly herbal formulation stated above

Local name	Scientific name	Family
Black pepper	<i>Piper nigrum</i> L.	Piperaceae
Mustard oil	<i>Brasica juncea</i> (L.) Czern.	Brassicaceae
Aniseed	<i>Pimpinella anisum</i> L.	Apiaceae
Black cumin	<i>Nigella sativa</i> L.	Ranunculaceae
Methi	<i>Trigonella foenum-graecum</i> L.	Fabaceae
Parkul	<i>Ziziphus nummularia</i> (Burm. f.) Wight. & Arn.	Rhamnaceae
Lajjabati	<i>Mimosa pudica</i> L.	Fabaceae
Dhutra	<i>Datura metel</i> L.	Solanaceae
Garlic	<i>Allium sativum</i> L.	Amaryllidaceae
Opium	<i>Papaver somniferum</i> L.	Papaveraceae
Camphor	<i>Cinnamomum camphora</i> (L.) J. Presl	Lauraceae
Ganda	<i>Tagetes erecta</i> L.	Asteraceae
Nimua	<i>Stephania japonica</i> (Thunb.) Miers.	Menispermaceae
Birikalai	<i>Vigna mungo</i> (L.) Hepper	Fabaceae
Thorn apple	<i>Datura metel</i> L.	Solanaceae
Turmeric	<i>Curcuma longa</i> L.	Zingiberaceae
Tamarind	<i>Tamarindus indica</i> L.	Fabaceae
Myrobalam	<i>Terminalia chebula</i> Retz.	Combretaceae
Kakrol	<i>Momordica dioica</i> Roxb. ex Willd.	Cucurbitaceae
Nishinda	<i>Vitex negundo</i> L.	Lamiaceae
Black sesame	<i>Sesamum indicum</i> L.	Pedaliaceae

### Bat kantak (rheumatic pain)

Formulation is given when pain and swelling with discomfort found in any part of body.

### Phula bat

Formulation is given when aches and pain with swelling is seen in heel or any joints, fingers accompanied by high fever.

### Aam bat (Rheumatic affection)

Formulation is given when round swelling is seen in any part of body with skin irritation, body becomes heavy and weak.

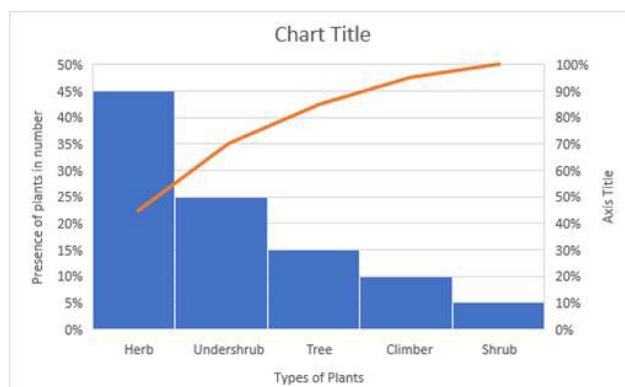
### Bat ajirna

Formulation is given when i) wind is formed in abdomen without any acidity or indigestion, ii) urine is clear but abdomen is concealed irrespective of rest or hard work, iii) wind does not blow out from body.

In the above study, family Solanaceae is the largest family bearing 3 plants having anti-rheumatic properties followed by Euphorbiaceae, Malvaceae, Amaryllidaceae bearing 2 plants. Apart from that, other 11 families namely, Rhamnaceae, Amaranthaceae, Vitaceae, Icacinaceae, Cannabaceae, Verbenaceae, Combretaceae, Plantaginaceae, Anacardiaceae, Apocynaceae, Rubiaceae bearing single representative against the said disease.

Among 18 genera of the 20 studied plants, genera *Euphorbia* and genera *Allium* have two species each followed by single genera of 16 plants.

During survey it is also noticed that most of the medicine men are under the age group of 80 years- 100 years, followed by 60 years- 80 years and 40-60 years of age. The age between 20-40 years is very less. So, it is proved from that gradually this traditional system going to be extinct.



**Fig 1:** Type of studied plants

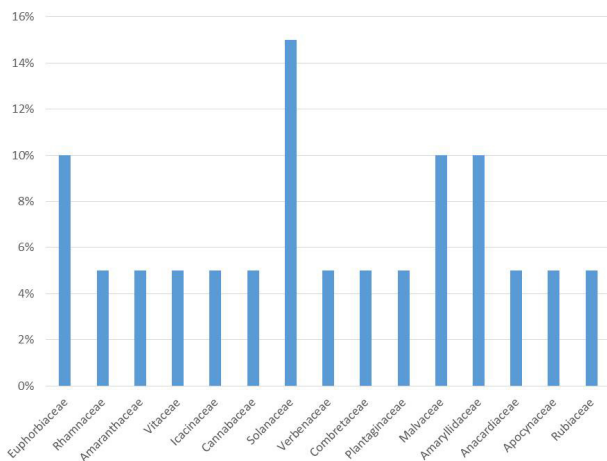


Fig 2: Different families of studied plants according to their presence

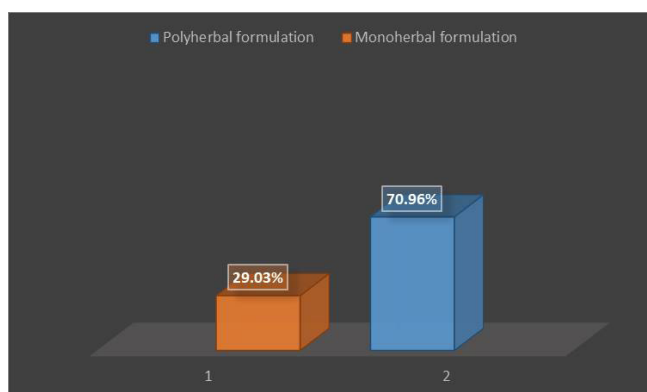


Fig 3: Types of ethnobotanical formulation

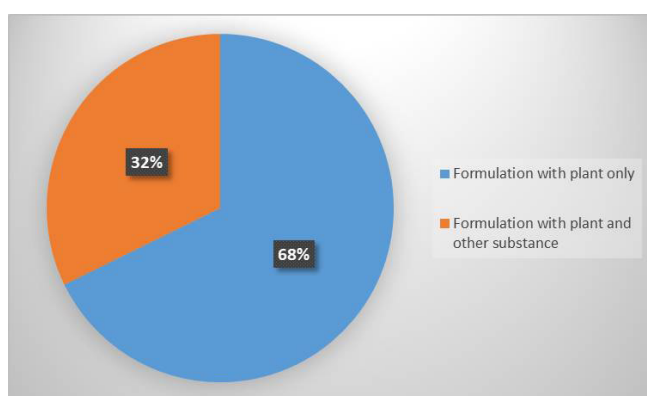


Fig 4: Ethnobotanical formulation category

So, according to CBD, 1992 (Source: <http://www.cbd.int/convention/txt>) this is the high time to document this knowledge in TKDL (Source: <http://www.iprsonline.org/>) and PBRs (Source: <http://www.iprsonline.org/>) before it diminishes fully. This documentation report shows 29.03% monoherbal ethnobotanical formulation and 70.96

% polyherbal ethnobotanical formulation (Fig 3). Here, out of total studied plants herbaceous plants represent the largest number i.e. 45%, followed by undershrub 25%, tree 15%, climbers 10%, shrub 5% (Fig 1). In case of ethnomedicinal formulation, only plants are used to prepare medicine is 32%, where as, plants are mixed with other substances for the same are 68% (Fig 4). Out of studied 15 families Solanaceae occupies the largest number i.e. 15%, followed by Euphorbiaceae, Malvaceae, Amaryllidaceae 10%. The families Rhamnaceae, Amaranthaceae, Vitaceae, Icacinaceae, Cannabaceae, Verbenaceae, Combretaceae, Plantaginaceae, Anacardiaceae, Apocynaceae, Rubiaceae show an average presence of 5% (Fig 2).

## Conclusion

During the entire investigation in the remote areas of the said district, the authors have got many more plants which are not documented here but useful in other diseases or in other purposes. From these vigorous surveys the researchers felt that there is no plant which is not useful for human society. For this work, the researchers met with at least 20 medicine men of this area and came into the conclusion that each medicine formulation and mode of administration of the herbal medicine of a particular medicine man is unique and specific and confidential also. Same plant is used to cure rheumatic disorder but the medicine formulation differs a little bit to large scale from man to man. As in many cases they are illiterate or uneducated, they believe in different superstition. Some are reluctant to interact with the people of other township/cities. Although it was a tough task to document the formulation from them, the authors came into success by making a friendship bonding with the medicine men and village people. By studying different literature review it is proved that plant *Ziziphus nummularia* (Burm. f.) Wight. & Arn. (Rhamnaceae) was documented first time in the district by treating different kind of rheumatism, although it is used here vigorously and successfully.

## Acknowledgement

The authors are grateful to the medicine men they have met and the authority of Ranchi University.

## References

- Chakraborty A, Das DC, Kumar J (2018). Study of used Weed flora in Paschim Medinipur district of West Bengal. *Biodiversity, Taxonomy and Conservation*. Srijan Samiti Publication. ISBN: 978-93-83583-24-9.
- Convention on Biological Diversity. United Nations, (1992). Source: <http://www.cbd.int/convention/txt>
- Dubale S Negera Abdissa, Dereje Kebebe, Asfaw Debella, Ahmed Zeynudin, Sultan Suleman (2023). Ethnomedicinal Plants and associated indigenous knowledge for the treatment of different infectious diseases in Ethiopia. *J. Herb. Med.*. ELSEVIER. Vol 40,100669.
- Dutfield G., Protecting Traditional Knowledge and Folklore.

- A review of Progress in diplomacy and Policy formation, June 2003, UNCTAD. *ICTSD Project on IPRS and sustainable development*. a Source: <http://www.iprsonline.org/>  
<http://www.tropicos.org>  
<https://www.paschimmedinipur.gov.in>
- Jain SK (1995). Ethnobotany in the Context of National Priorities and Healthcare Programme. *Manual of Ethnobotany*. ISBN: 978-81-7233-652-3 (HB), 978-81-7233-653-0 (PB): PP. 140-147
- Kuiri Indranarayan and Kumar Jyoti (2002). *Ecological and Ethnobotanical studies of medicinal plants of Baghmundi, Purulia district (W. B.)*. Ph. D. thesis, Ranchi University, Ranchi.
- Mahato Malati and Kumar Jyoti, (2002). *Investigations on ethnomedicinal plants for curing rheumatism in Khunti sub-division of Ranchi district (Jharkhand)*. Ph. D. thesis, Ranchi University, Ranchi.
- Mitra J. N. et. al (2000). *Studies in Botany*. Moulik Library, 18-B, Shyamacharan De Street, Calcutta-700 073. **Vol I**. PP. 987-1014.
- Rehman S, Bhatti A and John P (2023). Computational analysis to investigate the anti-rheumatic potential of plant-based small molecule inhibitor targeting tumor necrosis factor  $\alpha$ . *Front. Pharmacol.*, **vol(14)**. <http://doi.org/10.3389/fphar.2023.1127201>.
- Salihu T, Olukunle JO., Adenubi OT., Mbaoji. C and, Zarma MH (2018). Ethnomedicinal plant species commonly used to manage arthritis in North-West Nigeria. *South African Journal of Botany*. **118**:33-43.
- Sikarwar RLS (2018). An overview of Ethnoveterinary medicines of the Indo-Gangetic region. *Ethnobotany of India*. **Vol (5)**: PP. 211-319. ISBN 978-1-77188-599-7.
- Silveira D and Boylan F 2023. Medicinal Plants: Advances in Phytochemistry and Ethnobotany. **Vol.12(8)**. <https://doi.org/10.3390/plants12081682>.
- Singh G and Kumar J (2013). Studies on Traditional Knowledge of wild edible climbers among munda tribe of Khunti district, Jharkhand. *Indian Journal of Ethnobiology and Traditional Medicine*. **Photon 120** PP. 693-700.
- Singh G and Kumar J (2016). Diversity and traditional knowledge on some less known edible wild herbaceous plant resource from district Khunti, Jharkhand, India. *International Journal of Bioassays*. **5. 5** PP. 4557-4562
- Singh Gurcharan (2021). *Plant Systematics. Theory and Practice, 4<sup>th</sup> Edition*. CBS Publishers and Distributors Pvt. Ltd., New Delhi. ISBN 978-93-89688-08-5.
- Traditional Knowledge and Geographical Indications report of the Commission on Intellectual property Rights, London, (2002) (2<sup>nd</sup> Edition). Published by Commission on Intellectual Property Rights. Source: <http://www.iprsonline.org/>