

Original Research Article**DOI: 10.26479/2023.0902.01**

FOLKLORE KNOWLEDGE OF PLANTS USED AS REMEDIES IN DIFFERENT JOINT DISEASES BY ABORIGINAL PEOPLE OF PURULIA DISTRICT, WEST BENGAL

Sujit Kumar Mandal*, Sudeshna Mukherjee

Taxonomy of Angiosperms and Biosystematics Laboratory, Department of Botany,
Sidho-Kanho-Birsha University, Sainik School, Purulia-723104, West Bengal, India.

ABSTRACT: Ethnomedicine with folklore knowledge is the key component to understanding and interpreting the knowledge of plant diversity, traditional practices of their medicinal values based on the bioactive compounds, dealing with the effectiveness as well as sustainability of both plants and animal diversity throughout the World. Rheumatoid arthritis is an autoimmune disorder that causes painful swelling near joints by releasing certain chemicals that destroy the cartilages and bones. Joint pain, inflammation, tenderness, stiffness etc., are the symptoms of rheumatoid arthritis. Foregoing study deals with the complementary and alternative medicine that are the extracted form of phytoconstituents. As conventional drugs have so many side effects so now a days people rely on herbal medicine in the treatment of various chronic disease which have no side effect at all.

Keywords: Ethnomedicine, folklore, bioactive, phytoconstituents, Purulia.

Article History: Received: March 04, 2023; Revised: March 22, 2023; Accepted: April 08, 2023.

Corresponding Author: Sujit Kumar Mandal* Ph.D.

Taxonomy of Angiosperms and Biosystematics Laboratory, Department of Botany,
Sidho-Kanho-Birsha University, Sainik School, Purulia-723104, West Bengal, India

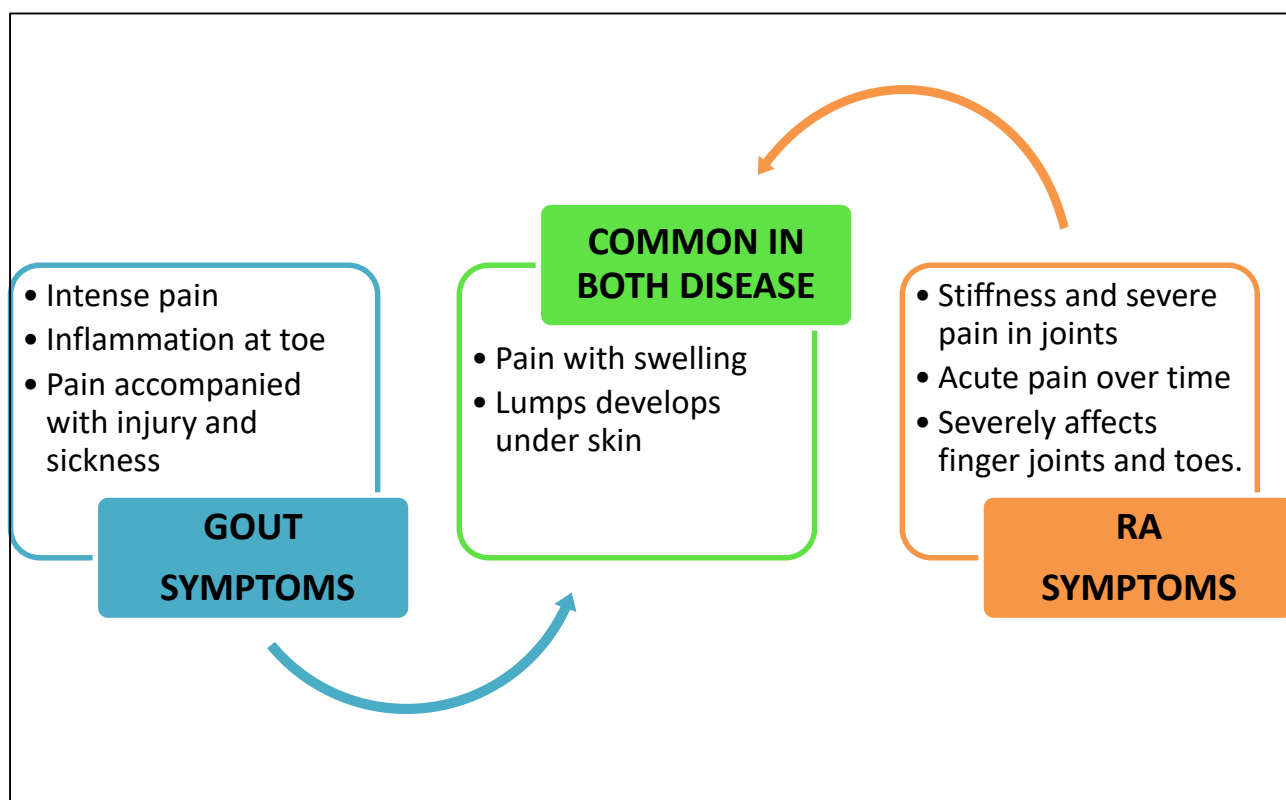
Email Address: smondal.bot@gmail.com

1.INTRODUCTION

Plants have had great functional activity for medicinal purposes from the prehistoric period. Ancient India believed in traditional medicine and this process continue year after year, therefore India has been known to have a wide range of forest repositories rich in a large number of medicinal and aromatic plants [1],[2]. WHO (World Health Organization) estimated that about 80% of people mostly from rural and remote areas completely depend upon herbal medicine all over the World. Indigenous

Mandal and Mukherjee RJLBPCS 2023 www.rjlbpcs.com Life Science Informatics Publications

medicine systems contain mainly Ayurveda, Unani and Siddha as well as folklore knowledge of tribals. Among these, in ancient times Ayurveda and Unani both are used as alternative medical treatments with authority [3]. Arthritis is a chronic, inflammatory, autoimmune disorder of synovial joints where the immune system mistakenly attacks the body's healthy cell through its auto-antibodies [4]. Rheumatoid arthritis (RA) is characterized by synovial hyperplasia where pro-inflammatory cytokines such as interleukin (IL-1) and tumor necrosis factor (TNF- α) are the main factors [5]. It mainly causes the degeneration of joints, and bones and also may affect internal organs [3], [6]. There are different types of arthritis such as Osteoarthritis (OA), Juvenile arthritis (JA), and Rheumatoid arthritis (RA), besides that infectious arthritis, relative arthritis, gout, pseudo gout and fibromyalgia [7], [8]. Among all of these OA and RA, are the most major and severe kind of arthritis. Conventional treatment for both RA and OA are the use of nonsteroidal anti-inflammatory drugs (NSAIDs), traditional disease-modifying antirheumatic drugs (DMARD), Corticosteroids etc. [7]. Some other complex types like Gout are characterized by sudden attacks of inflammation, redness, swelling and tenderness of joints. Lower back pain often described as Lumbago. It can be caused by several factors like repetitive bending movements, improper lifting etc. [8].



2. MATERIALS AND METHODS

The present study emblemizes the extensive survey of the Raghunathpur subdivision and Kashipur block along with the adjoining villages of both the area of Purulia district from July 2022-December 2022. A substantial ethnobotanical survey has been carried out in different villages of Purulia district.

Mandal and Mukherjee RJBPCS 2023 www.rjlbpcs.com Life Science Informatics Publications
Primarily data were collected by interviewing the herbal healers (Kaviraj) through semi-structured and open-ended questionnaire method. Collected data were reevaluated, verified and confirmed by local old experienced people and also by some common aboriginal people. Additional essential information about the herbs, which parts are used for which disease etc were gathered through repeated queries to herbal healers (kaviraj) as villagers are predominantly dependent on local herbal healers due to limited accessibility of health centers and hospitals facilities. Besides that, electronic searches in some databases such as PubMed, Science Direct, Springer, Google Scholar, Wiley have also been consulted for some helpful information.

2.1. COLLECTION AND IDENTIFICATION OF PLANTS

The collection of the plants conducted over a period of 6 months. After the collection plants were dried properly and various plant parts were kept to study thoroughly and to work out in the laboratory. For the identification of the collected plants standard taxonomic literatures was consulted [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22]. Besides that, POWO (Plants of the World Online) [23] and WFO (World Flora Online) [24] were used for checking the accepted names of the identified specimen. Plant specimens were mounted on the herbarium sheets for the preservation after drying properly. The prepared herbarium sheets were deposited in the Herbarium, Taxonomy of Angiosperms and Biosystematics Laboratory, Department of Botany, Sidho-Kanho-Birsha University, Purulia.

2.2. MODE OF PREPARATION AND PRESERVATION

According to the Ayurvedic healer the different medicinal plants were dried under shade or some required direct sunlight. They mainly collect the plant specimens from nearby villages, its adjoining areas and some of them from hilly region of the Purulia district. After drying properly material were either crushed or grinded by grinder to make powder. Then ground material sieved by fine cotton cloth and dried again in sunlight for few hours. After that dried powdered form of plant parts are preserved into the container. For making paste raw plant extract is mixed with water or oil.



Figure 1: A few glimpses of field survey along with Bhagabat Patra.

3. RESULTS AND DISCUSSION

Herbal plants are generally used as complementary component along with the conventional drugs practiced clinically for the treatment of rheumatoid arthritis. The various plants like *Aeschynomene aspera*, *Alstonia scholaris*, *Cardiospermum halicacabum*, *Cleome viscosa*, *Centella asiatica*, *Cissus quadrangularis*, *Curcuma amada*, *Dalbergia sissoo*, *Gossypium herbaceum*, *Mesosphaerum suaveolens*, *Hemidesmus indicus*, *Jatropha gossypifolia*, *Justicia adhatoda*, *Lawsonia inermis*, *Nyctanthes arbortristis*, *Shorea robusta*, *Sida rhombifolia*, *Vitex negundo*, *Xanthium strumarium*, *Zingiber officinale* etc. have been found effective in different formulation for arthritis. The plants are listed in (Table 1) comprising the parts used and method of application. Among the total of 18 families Malvaceae is the most dominant family (Graph 1) followed by Apocynaceae, Fabaceae, Lamiaceae and Acanthaceae.

Mandal and Mukherjee RJLBPCS 2023 www.rjlbpcs.com Life Science Informatics Publications
 The total of 32 species are responsible to play their active role as anti-inflammatory herbal drug. The preclinical trial of documented herbs provides evidence-based data for inhibiting the mediators or active signalling pathway responsible for rheumatoid arthritis.

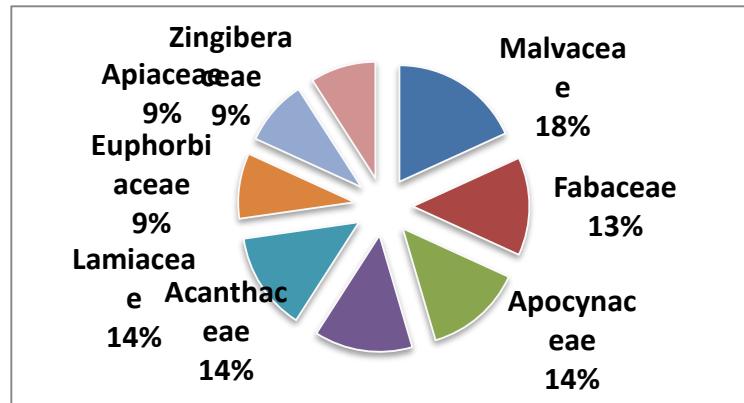
Table 1: Plants Used for The Treatment of Arthritis in Purulia District.

Sl. No	Scientific names	Family	Habit at	Parts used	Method of application
1	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Sh	R,B and S	In the form of paste.
2	<i>Acalypha indica</i> L.	Euphorbiaceae	H	L	Leaves extract with castor oil.
3	<i>Aeschynomene aspera</i> L.	Fabaceae	Sh	R	3-5 ml of root extract.
4	<i>Allium cepa</i> L.	Amaryllidaceae	H	WP	Whole plant extract.
5	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	T	B	Paste of bark.
6	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees	Acanthaceae	H	L	Paste and extract of leaf.
7	<i>Azadirachta indica</i> A. Juss.	Meliaceae	T	L	Leaves extract..
8	<i>Bauhinia acuminata</i> L.	Fabaceae	Sh	B	Powder.
9	<i>Calotropis procera</i> (Aiton) W.T. Aiton	Apocynaceae	Sh	L, B and R	Leaves and bark as juice and root as powder.
10	<i>Cardiospermum halicacabum</i> L.	Sapindaceae	C	L	100 mg dry powder of leaf with 300 ml ethanol.
11	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	H	WP	In the form of ointment.
12	<i>Cissus quadrangularis</i> L.	Vitaceae	H	WP	Powder form.
13	<i>Cleome viscosa</i> L.	Cleomaceae	H	L	leaf extract in cream and gel form.
14	<i>Coriandrum sativum</i> L.	Apiaceae	H	L and S	Leaves powder, Seed and water.

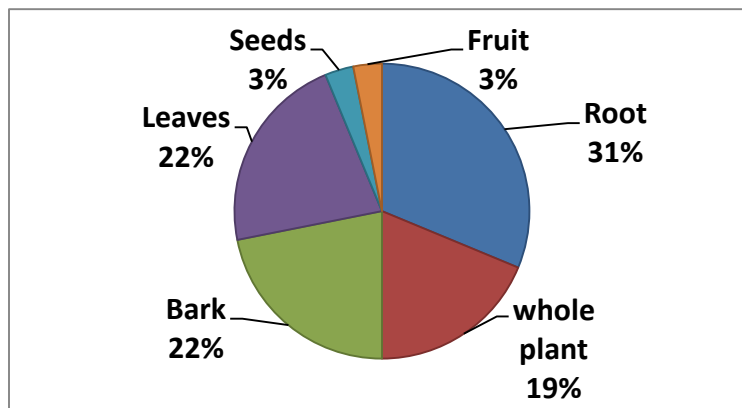
15	<i>Curcuma amada</i> Roxb.	Zingiberaceae	H	R	Root powder.
16	<i>Dalbergia sissoo</i> Roxb. ex DC.	Fabaceae	T	L and B	Leaves and bark paste.
17	<i>Gossypium herbaceum</i> L.	Malvaceae	Sh	L	Dried powder of leaves with methanol extract.
18	<i>Hemidesmus indicus</i> (L.) R.Br.	Apocynaceae	H	R	100 g powdered mixed with 80% ethanol and 20% water.
19	<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae	H	R,L and S	Ethanollic Leaf extract and root powder.
20	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Sh	L	Leaves extract in form of oil.
21	<i>Justicia adhatoda</i> L.	Acanthaceae	Sh	R and L	Root powder and leaf decoction.
22	<i>Lantana camara</i> L.	Verbenaceae	Sh	Fr	Fruit powder.
23	<i>Lawsonia inermis</i> L.	Lythraceae	Sh	L	Ethanollic extract of leaf.
24	<i>Mesosphaerum suaveolens</i> (L.) Kuntze	Lamiaceae	Sh	B	Powder form.
25	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Sh	WP and L	Ethyl acetate extract of leaf juice decoction.
26	<i>Ocimum basilicum</i> L.	Lamiaceae	Sh	WP and L	Leaf extract decoction.
27	<i>Shorea robusta</i> C.F. Gaertn.	Dipterocarpaceae	T	L and B	Powder form.
28	<i>Sida acuta</i> Burm.f.	Malvaceae	H	R and L	Extract of whole plant.
29	<i>Sida rhombifolia</i> L.	Malvaceae	H	R and L	Extract of whole plant.
30	<i>Vitex negundo</i> L.	Lamiaceae	Sh	R	Powder form.

31	<i>Xanthium strumarium</i> L.	Asteraceae	H	WP, Fr	Extract of whole plant.
32	<i>Zingiber officinale</i> Roscoe	Zingiberaceae	H	L	Decoction of leaves.

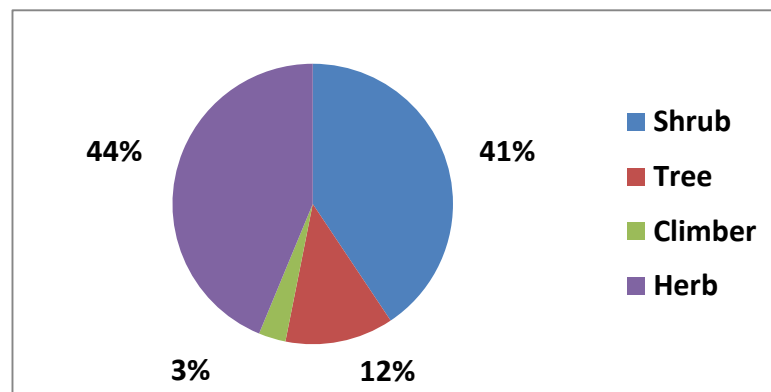
H-Herb, Sh-Shrub, T-Tree, C-Climber, S-Seed, Fr-Fruit, L-Leaves, B-Bark, R-Root, WP- Whole Plant.



Graph 1: Recorded dominant families in the study area



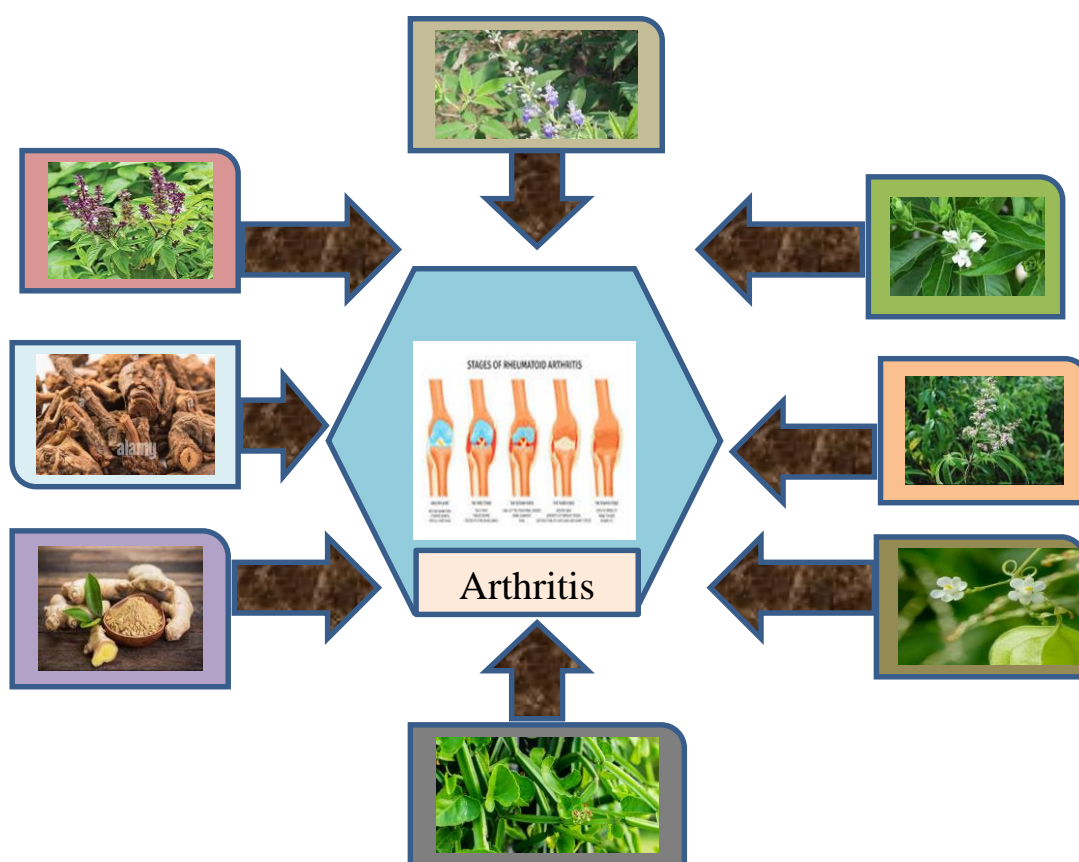
Graph 2: Recorded plant parts used as medicine



Graph 3: Recorded plants according to their habitat.

4. CONCLUSION

Despite the highly success rate of conventional clinical practiced drugs in treating the symptoms and prevention the progression of various chronic as well as autoimmune disease development. Herbal medicines are treated as most ancient and traditional method of treatment. Due to presence of long term toxic chemical side effect of the synthetic available drugs, herbal drugs are treated as highly demanding complementary medicines by the therapeutic experience of generation of kaviraj or vaidya of ancient era. The present research concluded that herbal drugs are most effective with no side effect in comparison with the clinically practiced drug for Rheumatoid Arthritis (RA). Therefore, the modern treatment showing the blending of both including the use of modern technology like 'physiotherapy' and shifting towards the most preferable herbal medication as alternative and complementary treatment.



ACKNOWLEDGEMENT

Authors extend their extreme thanks and gratitude to Bhagabat Patra, Herbal healer, Baneswar Sridam, Ayurved Medicinal Centre of the village, Gobindapur, Purulia, for providing valuable information and therapeutic experience regarding the herbal medicine used in the treatment of rheumatoid arthritis.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No Animals/Humans were used for studies that are base of this research.

CONSENT FOR PUBLICATION

Not applicable.

FUNDING

None.

CONFLICT OF INTEREST

No conflict of interest.

REFERENCES

1. Kolar M, Brulc U, Strazar K, Drobnic M. Patient-reported joint status and quality of life in sports related ankle disorder and osteoarthritis. *Int.Orthop.*2021;45:1049-1055.
2. Singh BK, Trivedi N, Das RR, Arora R, Verma AK, Verma A. Rheumatoid Arthritis and gout: medicinal plants as a drug alternative. *J.Adv.Sci.Res.*2021;12(02 Suppl 1):79-96.
3. Tiwari RK, Chanda S, Udayabanu M, Singh M, Agarwal S. Anti-inflammatory and antiarthritic potential of standardized extract of *Clerodendrum serratum* (L.) Moon. *Front. Pharmacol.*2021;12:1-11.
4. Jo HG, Song HS, Lee D. Oral administration of east Asian herbal medicine for rheumatoid arthritis: A protocol for systematic reviews and meta-analysis. *Medicine* 2022; 101:1-6.
5. Kukreti N, Rani R, Varshney VK, Chitme HR. Important medicinal plants recommended in management of rheumatoid arthritis. *Bangladesh Pharm. J.*2022;25(2):125-136.
6. Zhang RJ, Li SF, Shi HJ, Zhao JL, Geng Y, Fan HC, et.al. Anti-inflammatory effects of Tabersonine in rheumatoid arthritis. *J. Explor. Res. Pharmacol.* 2022;7(3):125-132.
7. Marrelli M, Amodeo V, Perri MR, Conforti F, Statti G. Essential oils and bioactive components against arthritis: A novel perspective on their therapeutic potential. *Plants* 2020; 9:1-17.
8. Singh S, Singh TG, Mahajan K, Dhiman S. Medicinal plants used against various inflammatory biomarkers for the management of rheumatoid arthritis. *J. Pharm. Pharmacol.* 2020; 72:1306-1327.
9. Soeken K, Miller SA, Ernst E. Herbal medicines for the treatment of rheumatoid arthritis: a systematic review. *Rheumatology* 2003; 42:652-659.
10. Chang JM, Cheng CM, Hung LM, Chung YS, Wu RY. Potential use of *Plectranthus amboinicus* in the treatment of rheumatoid arthritis. *Evid. Based Complementary Altern. Med.* 2010; 7(1):115- 120.
11. Singh H, Krishna G, Baske PK. Plants used in the treatment of Joint diseases (rheumatism, arthritis, gout and lumbago) in Mayurbhanj district of Odisha, India. *Rep. Opinion* 2010;2(9):22-26.
12. Choudhary M, Kumar V, Gupta P, Singh S. Investigation of antiarthritic potential of *Plumeria alba* L. leaves in acute and chronic models of arthritis. *Biomed Res. Int.* 2014;1-12.
13. Reddy VJS, Rao P, Lakshmi GR. A review on antiarthritic activity of some medicinal plants. *J. Glob. Trends Pharm.Sci.*2014;5:2061–2073.

14. Wadekar JB, Sawant RL, Patal UB. Rheumatoid arthritis and herbal drugs: A Review. J. Phytopharm. 2015; 4(6):311-318.
15. Farzaei MH, Farzaei F, Abdollahi M, Abbasabadi Z, Abdolghaffari AH, Mehraban BA. Mechanistic review on medicinal plants used for rheumatoid arthritis in traditional Persian medicine. J. Pharm. Pharmacol. 2016; 68:1233–1248.
16. Chandrasekar R, Chandrasekar S. Natural herbal treatment for rheumatoid arthritis-a review. Int. J. Pharm.Sci.Res.2016;8(2):368-384.
17. Alamgeer, Uttra AM, Hasan UH. Antiarthritic activity of aqueous-methanolic extract and Various fractions of *Berberis orthobotrys* Bien ex Aitch. BMC Complement Altern. Med. 2017; 17(1):1-16.
18. Wang N, Zhao X, Huai J, Li Y, Cheng C, Bi K, et. al. Arachidonic acid Metabonomic study for understanding therapeutic mechanism of Huo Luo Xiao Ling Danon rat model of rheumatoid arthritis. J. Ethnopharmacol. 2018; 217:205–211.
19. Kohler BM, Gunther J, Kaudewitz D, Lorenz HM. Current therapeutic options in the treatment of rheumatoid arthritis. J. Clin. Med. 2019; 8:1-15.
20. Khaleghi M. New arthritis foundation guidelines on CBD use could be first of many more to come. Altern. Ther. Health Med.2020;26:8–11.
21. Sen SK, Behera LM. Ethnomedicinal use of *Acalypha indica* L. in Western Odisha, India. World J.Pharm.Med.Res.2021;7(1):46-48.
22. Kavita, Singh N, Sharma OP. Medicinal plants and their role in healthy life. World J. Pharm. Med. Res.2022; 8(9):197-199.
23. POWO. “Plants of the World Online Facilitated by the Royal Botanic Gardens, Kew Published on the internet: <http://www.plantsoftheworldonline.org/>Retrived 4th April 2023”.
24. WFO: World Flora Online. Published on the internet: [http:// www.worldfloraonline. org.](http://www.worldfloraonline.org/) 4th April, 2023.