

ETHNOMEDICINAL PLANTS USED AGAINST SKIN DISEASES BY THE TRIBAL OF GANJAM DISTRICT OF ODISHA, INDIA

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Abstract : Ethno-botanical study is now of immense importance in medical science. Traditional medicine and ethno-botanical information play an important role in scientific research. India is one of the twelve mega biodiversity countries with a wide variety of medicinal plant and 65% of rural India still depends on medicinal plant for their health care needs.

The present investigation was conducted to survey traditional and folk medicines used against skin disease . The district is situated between 19.383° N latitude and 85.05° E longitude. We selected Mahurikalua hill side with tribal villages like Darubhadra, Lathi , Mahuda for our study. The information was gathered from tribal people, vaidyas , and ethnic peoples.

A total of 30 species belonging to 21 families and 30 genera were collected from the different parts and locations of the study area. Out of these 18 families belonged to dicots, 3 to monocots. Most dominating family is Fabaceae. Whereas Asclepiadaceae, Lamiaceae, and Solanaceae are contributed with two species each. Other 17 are least represented families with only one species. These are commonly occurring medicinally important plants used to treat various type of diseases like ringworm, , wound, wrinkle, abscesses, boils, sores, spots or warts, skin pigmentation, crack or heel, leprosy , itching, dandruff (psoriasis), hair treatment, eczema, herpes, leucoderma , fungal infection and scabies. Forty percentage tree species are the most commonly used plants followed by thirty four percentage herb species and fourteen percentage shrub species. Out of all collected species, only one climber was recorded. Comparison of the plant parts used as a medicinal source indicates that the leaf predominates followed by seed, bark, fruit, latex, root, whole plant, rhizome and bulb. Preparation of paste, juice and oil for the treatment of ailments is a common practice of tribal people of Ganjam. In this study it is found that the plant species *Argemone mexicana* L., *Leucas aspera* (Willd.) Link, *Milletia pinnata*(L.) Panigrahi , *Mimosa pudica* L.and, *Phyllanthus niruri* L.(1.50 each) have high use value is the indication of its importance in the herbal medicine practice.

Key words: Skin disease, Ethno-botany, plants ,herbs. tribal people.

I. INTRODUCTION

The traditional medical practices are an important part of the primary health care system in the developing world [1] . Traditionally this treasure of knowledge has been passed on orally from generation to generation without any written documents [2]. According to World Health Organization [3] about 65- 80% of the world's population in developing countries, due to the poverty and lack of access to modern medicine, depend essentially on plants for their primary health care. Through ethno botanical surveys, indigenous knowledge from local people and practitioners is collected and documented in order to identify plants that can be a source of drugs against infectious and non infectious diseases. Most inhabitants are poor or belong to the lower middle class and they cannot afford expensive synthetic drugs. Village communities residing in different ecosystems use a large proportion of existing biodiversity for human and veterinary healthcare. Of all different organisms, medicinal plants have been greatly used by rural communities as they help improve the health and economy of rural people. India's traditional system of medicine is related to richness of herbal plant's biodiversity and cultural biodiversity. An attempt was made to explore the traditional healthcare system of using medicinal plants by local community of Ganjam district for the treatment of various types of skin problems and ailments

Skin is the largest organ of the human body, and plants showing dermatological properties and the ability to stop bleeding, and to heal wounds and burns are of great significance to human health[4]. Skin diseases occur all over the world, but are more prevalent in tropical regions [5]. Skin diseases occur in various forms basically classified as non-contiguous and contagious diseases. Contagious diseases are primarily categorized as bacterial, fungal, viral or parasitic diseases. Skin diseases such as scabies may be caused by mites; rash and itch could be caused by something such as stinging nettles. Several plants identified specifically for different kinds of skin ailments are used by the tribal people. Since modernization has not yet touched several pockets of tribal communities, they rely upon homemade and readily available herbal cures. Many of these cures are highly reliable and relevant for all. In general, these communities interact closely with forest; derive their economic livelihood and often their cultural and spiritual identity [6].

Ethno-botany, is a research field of science, that highlights the people-plants relationship (plant use by indigenous cultures for food, medicine, pesticides, clothing, shelter and other purposes), is widely used especially in Asian countries for the documentation of indigenous knowledge on the use of plants and for providing an inventory of phyto-resources content of the local flora [7-11].

Odisha has rich and varied flora due to its varied climatic conditions and diverse topography. The state is inhabited by about 63 tribal communities. The rich flora, the vast forest and large tribal population provide suitable conditions for ethno-botanical studies. Tribal communities largely depend on forest produce for their day-to-day needs like food, medicine, shelter, oilseeds, fibre and beverages. In order to study the indigenous plants used by the tribal people of Odisha, several field trips were undertaken in the tribal pockets. During field studies, information on various aspects of plant usage were recorded in the plant

study. 17 unknown or less known plant species used by the tribal communities only as oil producing plants are discussed.

These include *Argemone mexicana*, *Butea parviflora*, *Combretum decandrum*, *Shorea robusta* and *Ventilago denticulata*. [12].

II. Focusing on the present day situation of ever increasing exploitation of plants and natural resources the main reason for showing interest towards ethno-botany is its vast outcome that is beneficial for every living being [13]. Wild plants are used as medicine, fodder, and for rituals and other functions [14].

III. The process of administration of ethno-medicinal plants used to treat skin problems by the people and tribals of Kuchinda sub-division of Sambalpur district in western parts [15]. It was reported that, 49 angiosperms belonging to 29 families and 45 genera having ethno-medicinal uses in skin diseases by the tribal people living in Nuapada district of Odisha [16]. *Cassia fistula* L. was studied against fungal infections and the study further emphasizes upon detailed analysis of the bioactive compounds in different plant parts and their possible use in preparation of medicines against skin diseases among the tribal (*Dongaria Kandha*) of Niyamgiri Odisha [17].

IV. About 50 plants species from the North West region of Ganjam district and their therapeutic information gathered where people rich in their old customs and culture and adopt herbal therapy for the treatment of majority of diseases because of strong belief on local practitioners [18]. Ethno-botanical studies can further lead to scientific assessment of the traditional medicines used which may provide a lead in drug development [19-20].

II. MATERIALS AND METHODS

Study area

Odisha State is situated in the eastern part of India having 30 districts. Ganjam is one among them and is situated in the southern coastal part of the State surrounded on the north by Khordha district on the east by the bay of Bengal on the west by Kandhamal and Gajapati Dist and on the south by Andhra Pradesh. It lies between 19.383°N latitude and 85.05°E longitude.

In Ganjam district skin diseases are the common health problems seen in rural as well as tribal area. The ethnic and indigenous people of forests and villages possess a rich knowledge on medicinal plants and their uses. Medicinal plants are traditional; accessible and affordable source of primary healthcare to marginalized people of Ganjam who cannot afford or access formal health care. Promoting traditional health systems to meet primary healthcare needs, as side effects of allopathic drugs scare people and the healthcare systems is going to becoming more and more, expensive. For these reason the village people use various plant and plant parts for treatment of skin diseases.

We had selected Mahurikalua hill side with tribal villages like Darubhadra, lathi, Mahuda for our study. The information was gathered from tribal people, vaidyas and ethnic people.

Sampling techniques and Data collection

Field Studies were conducted in regular intervals in different seasons between December 2018 to February 2019 to collect the primary data and information on medicinal plants found in the study site. The identification of the 'key informants' (Martin, 1995)[21] in the treatment of skin diseases was done. Botanical information was gathered from tribal people, vaidyas and ethnic peoples. In this study, questionnaires were used to collect information on the Odia names of the plants, plant parts used for preparation of medicine and method of use of the medicine was documented.

During the survey, depending on the convenience of the practitioner, guided field walk method [21,22] was followed. A walk through the forest and rural village with the healers allowed for both confirmations of the medicinal plants and the use for the treatment with the detailed information and about the medicinal plants. Each informant was interviewed more than twice and only those formulations having consistency were considered.

Identification and preparation of voucher specimens

Plants collected with the herbal healers during the guided field walk were authentically identified with the help of local flora. Their recent names of the plants have been given according to The Flora of Orissa, vol. 1-4. [23] All medicinal plants recorded for the treatment of skin diseases were photographed in the field; voucher specimens were made subsequently and are deposited in the Herbarium, P.G. Department of Botany, Khallikote Autonomous College, Berhampur, Odisha. With accession numbers (SKP/MB 1 to 30). Plants are arranged alphabetically with the correct nomenclature, family and Odia name, if available and the traditional medicinal uses of the plant.

Tabulation and data analysis

The collected data are represented systematically in the tabular form. The information such as botanical name, local name, family, habit, monocot or dicot with medicinal use for skin disease are provided for each species (Table No.1), family wise distribution of plants (Table No. 2), plants uses for different skin disease (Table No. 3), use value are provided for each species (Table No. 4), fidelity level (Table No.5).

Use Value (UV):

'Use value' is the positive correlation between the importance value of a plant (measured by the number of informants for a particular plant) and the number of uses cited by the informants [24]. The use value [25], is a quantitative method that demonstrates

the relative importance of a species known locally, was calculated according to the modified formula [26] . The fidelity level (FL) was calculated according to the following formula [27].

III. RESULTS AND DISCUSSIONS

MEDICINAL PLANTS AND THEIR USES REPORTED BY THE INFORMANTS

In all, 50 informants were interviewed. Among them 42 (36 male and 6 female individuals, aged between 31 and 78 years) are the 'key informants' who gave the information exclusively about the treatment of skin diseases. Survey of the study area indicated ethno medicinal information of 30 plant taxa belonging to 30 genera of 21 families to treat different types of skin diseases. Few of the herbal healers considered their herbal knowledge as traditional secrets and did not easily part with it till intimate contacts were established with them. The traditional healers were not pressurized to reveal their knowledge and were convinced that the information would be exclusively for academic purpose.

The first hand information collected from them by repeated visits included treatment for 19 different types of human skin infections viz. ringworm, wound, wrinkle, abscesses, boils, sores, spots or warts, skin pigmentation, crack of heels, leprosy, itching, dandruff and psoriasis, hair treatments, eczema, herpes, leucoderma, fungal infection and scabies.

FAMILY WISE CLASSIFICATION OF THE PLANTS

During the present investigation it was noted that 30 ethno medicinal plant species used belongs to 21 families. Fabaceae is the dominant family (7 species) followed by Asclepiadaceae (2 species), Lamiaceae (2 species), Solanaceae (2 species). The other 17 families contributed with one species each. In our study area the information gathered that a single medicinal plant is used for more than one affliction.

PLANT USE VALUE

As indicated in Table No.3, UV(Use Value) was calculated for all the species and the single use by the single informant is not considered for analysis. The plant species scored a high UV *Argemone mexicana* L., *Leucas aspera* (Willd.) Link, *Millettia pinnata*, *Mimosa pudica* L. and, *Phyllanthus niruri* L. (1.50 each), followed by *Curcuma longa* L., *Lawsonia inermis* L. and *Solanum lycopersicum* L. (1.33 each) and *Achyranthes aspera* L., *Aloe vera* (L.) (5 use reports by 4 informants with a UV value of 1.25). Plant with high UV is the indication of its importance in the herbal medicine practice as it is highly cited by many informants. The medicinal plant with a very low UV is *Tamarindus indica* L., which was reported by 4 informants with a UV of 0.25.

FIDELITY LEVEL

We analyzed the disease categories to highlight the most important plant species in each category of skin disease in terms of fidelity level. The plants cited only by a single informant are not considered for the fidelity level analysis. Out of the reported plants, five species had the highest fidelity level of 100% most of which were used in the single ailment category with multiple informants. The plants with the highest FL of 100% were *Achyranthes aspera* L., *Azadirachta indica* A.Juss., *Cuscuta reflexa* Roxb., *Pergularia daemia* (forssk) chiov., and *Tridax procumbens* L.

Table No-1. The details of plants collected from study area with their medicinal uses.

SL. NO	BOTANICAL NAME	LOCAL NAME	FAMILY	HABIT	*M/D	MEDICINAL USE	SKIN DISEAS
1.	<i>Achyranthes aspera</i> L.	ଅପାମାରଙ୍ଗ (Apamaranga)	Amaranthaceae	HERB	D	• LEAF – JUICE MIXED WITH PINCH OF SALT.	• BOILS • BLISTERS • CUTS-LEAF PASTE • HAIR RESTORATIVE
2.	<i>Allium Sativum</i> L.	ରଶୁଣି (Rasuna)	Liliaceae	HERB	M	• BULB – PASTE MIX WITH TURMERIC POWDER.	• ITCHING
3.	<i>Aloe vera</i> (L.) Burm.f.	ଘିଅ କୁଆଁରୀ (Ghee Kuanri)	Asphodalaceae	HERB	M	• LEAF – PASTE OR JUICE	• BURNS • WOUNDS • DARK SPOT • WRINKLE • FAIRNESS

4.	<i>Andrographis paniculata</i> (Burn.f.) Wall.	ଭୂଇଁ ନିମ୍ବା (Bhuin Nimba)	Acanthaceae	HERB	D	<ul style="list-style-type: none"> • LEAF / WHOLE PLANT - PASTE 	<ul style="list-style-type: none"> • LEPROSY • SCABIES • RING WORM
5.	<i>Argemone mexicana</i> L.	ଓଡ଼ଶ ମାରୀ (Odasha mari)	Papaveraceae	HERB	D	<ul style="list-style-type: none"> • LEAF- PASTE • LATEX POUNDED SEED MIXED WITH MUSTARD OIL 	<ul style="list-style-type: none"> • WARTS,COLD SORES • YELLOW LATEX • RING WORM • TREATS ITCHY SKIN
6.	<i>Azadirachta indica</i> A. Juss	ନିମ୍ବା (Nimba)	Meliaceae	TREE	D	<ul style="list-style-type: none"> • LEAF – PASTE MIX WITH TURMURIC • LEAF – POWDER MIXED WITH COCONUT OIL 	<ul style="list-style-type: none"> • RING WORM • SCABIS • WOUNDS • DANDRUF • POX • ECZEMA
7.	<i>Butea monosperma</i> (Lam.)Taub.	ପଲାଶ (Palasha)	Fabaceae	TREE	D	<ul style="list-style-type: none"> • SEED- PASTE MIXED WITH LEMON JUICE • MIXED WITH HONEY 	<ul style="list-style-type: none"> • RUBEFACIEN • ANTIFUNGAL AND ANTIBACTERIAL INFECTION
8.	<i>Calotropis gigantea</i> (L.) W. T. Aiton	ଅରଖ (Arakha)	Asclepiadaceae	HERB	D	<ul style="list-style-type: none"> • LATEX- MIX WITH TURMURIC POWDER • BARK- POWDER • LEAF- CRUSHED AND WARMED 	<ul style="list-style-type: none"> • PIMPLES, BOILS,STINGGS,LEPROSY • LEPROSY → • SORES AND BURNS →
9.	<i>Carica papaya</i> L.	ଅମୃତ ଭଣ୍ଡା (Amruta vanda)	Caricaceae	HERB	D	<ul style="list-style-type: none"> • LATEX • FRUIT – JUICE 	<ul style="list-style-type: none"> • REDUCE WRINKLE • BLACK SPOT • ECZEMA • FAIRNESS
10.	<i>Cassia fistula</i> L.	ସୁନାରୀ (sunari)	Fabaceae	TREE	D	<ul style="list-style-type: none"> • BARK – DECOCTION • LEAF PASTE 	<ul style="list-style-type: none"> • FUNGAL DISEASE • WOUNDS
11.	<i>Cicer arietinum</i> L.	ବୁଟ (Buta)	Fabaceae	HERB	D	<ul style="list-style-type: none"> • SEED – PASTE 	<ul style="list-style-type: none"> • RING WORM • ENHANCES PIGMENTATION
12.	<i>Curcuma longa</i> L.	ହଳଦୀ (Haladi)	Zingiberaceae	HERB	M	<ul style="list-style-type: none"> • RHIZOME - PASTE 	<ul style="list-style-type: none"> • ENHANCES PIGMENTATION • WRINKLE • RING WORM • WOUND • ITCHING
13.	<i>Cuscuta reflexa</i> Roxb.	ନିର୍ମୂଳୀ (Nirmuli)	Convolvulaceae	HERB	D	<ul style="list-style-type: none"> • WHOLE PLANT PASTE 	<ul style="list-style-type: none"> • ITCHY SKIN

14.	<i>Datura metel</i> L.	ଦୁଦୁରା (Dudura)	Solanaceae	HERB	D	<ul style="list-style-type: none"> • LEAF – PASTE 	<ul style="list-style-type: none"> • PIMPLE • BOILS AND SORES
15.	<i>Ficus racemosa</i> L.	ବର (Bara)	Moraceae	TREE	D	<ul style="list-style-type: none"> • LATEX 	<ul style="list-style-type: none"> • BOILS
16.	<i>Lawsonia inermis</i> L.	ମେହେନ୍ଦି (Mehendi)	Lythraceae	TREE	D	<ul style="list-style-type: none"> • LEAF PASTE 	<ul style="list-style-type: none"> • WOUND • HAIR DYE AND KILLS LICE • LEPROSY AND HERPES • CRACK AND HEEL
17.	<i>Leucas aspera</i> (Willd.) Link	ଗୟାଶା (Gayasha)	Lamiaceae	HERB	D	<ul style="list-style-type: none"> • LEAF – PASTE 	<ul style="list-style-type: none"> • RING WORM • WOUND AND SORES • SCABIES AND PSORIASIS
18.	<i>Solanum lycopersicum</i> L.	ଟାମାଟୋ (Tamato)	Solanaceae	HERB	D	<ul style="list-style-type: none"> • FRUIT – JUICE • LEAF MIXED WITH CASTOR OIL • PULPED FRUIT 	<ul style="list-style-type: none"> • RING WORM • WRINKLE • LEPROSY SPOT <p>FACE WASH →</p>
19.	<i>Millettia pinnata</i> (L.) Panigrahi	କରଞ୍ଜି (Karanja)	Fabaceae	TREE	D	<ul style="list-style-type: none"> • SEED- OIL • LEAF- PASTE • SEED PASTE → 	<ul style="list-style-type: none"> • ITCHING • PARASITIC SKIN INFECTION <p>SORES</p>
20.	<i>Mimosa pudica</i> L.	ଲାଜକୁଳୀ (Lajakuli)	Fabaceae	HERB	D	<ul style="list-style-type: none"> • LEAF- PASTE • ROOT 	<ul style="list-style-type: none"> • ECZEMA • WOUND • BURNING SENSATION AND LEPROSY
21.	<i>Neolamarckia cadamba</i> (Roxb.)	କଦମ୍ବ (Kadamba)	Rubiaceae	TREE	D	<ul style="list-style-type: none"> • LEAF – PASTE • BARK – PASTE 	<ul style="list-style-type: none"> • PSORIASIS • ITCHING • BLACK SPOT • PIMPLE
22.	<i>Ocimum sanctum</i> L.	ତୁଳସୀ (Tulshi)	Lamiaceae	HERB	D	<ul style="list-style-type: none"> • LEAF – PASTE • SEED- OIL 	<ul style="list-style-type: none"> • RING WORM • WOUND AND SPOTS
23.	<i>Pergularia daemia</i> (forssk) chiov	ଉତୁରୁଲି (Uturuli)	Asclepiadaceae	HERB	D	<ul style="list-style-type: none"> • LEAF – PASTE • ROOT- DECOCTION 	<ul style="list-style-type: none"> • WOUND • ITCHING
24.	<i>Phyllanthus niruri</i> L.	ଭୂଇଁ ଅଳା (Bhuin amla)	Phyllanthaceae	HERB	D	<ul style="list-style-type: none"> • LEAF – PASTE MIX WITH TURMURIC POWDER • LEAF – PASTE MIX WITH SALT 	<ul style="list-style-type: none"> • WOUND • SCABIES • RINGWORM

25.	<i>Psidium guajava</i> L.	ପିଞ୍ଜୁଳି (Pijuli)	Myrtaceae	TREE	D	<ul style="list-style-type: none"> • FRUIT • LEAF – PASTE • BARK – PASTE • DECOCTION OF BOTH 	<ul style="list-style-type: none"> • RING WORM • WOUND
26.	<i>Ricinus communis</i> L.	ଜଡ଼ା (Jada)	Euphorbiaceae	SHRUB	D	<ul style="list-style-type: none"> • SEED – PASTE WITH TURMERIC POWDER • SEED- OIL 	<ul style="list-style-type: none"> • WOUND • HAIR GROWTH
27.	<i>Saraca indica</i> L.	ଅଶୋକ (Ashoka)	Fabaceae	TREE	D	<ul style="list-style-type: none"> • LEAF - PASTE 	<ul style="list-style-type: none"> • PIMPLE • WOUNDS
28.	<i>Tamarindus indica</i> L.	ଡେଢୁଳି (Tentuli)	Fabaceae	TREE	D	<ul style="list-style-type: none"> • SEED – POWDER • FRUIT – PASTE WITH TURMERIC POWDER • SEED OIL 	<ul style="list-style-type: none"> • ABSCESSSES • LEUCODERMA • ANTIDAND RUFF
29.	<i>Terminalia arjuna</i> (Roxb.ex DC.) Wight. & Arn.	ଅର୍ଜୁନ (Arjuna)	Combretaceae	TREE	D	<ul style="list-style-type: none"> • LEAF – PASTE • BARK - PASTE WITH NEEM LEAF & COW URINE 	<ul style="list-style-type: none"> • WOUND HEALING • LEUCODERMA
30.	<i>Tridax procumbens</i> L.	ବିଶଲ୍ୟାକରଣୀ	Asteraceae	HERB	D	<ul style="list-style-type: none"> • LEAF - PASTE 	<ul style="list-style-type: none"> • WOUND • BOILS • ECZEMA • BLISTERS • HAIR RESTORATIVE

MAJOR DISEASES WISE PLANT DISTRIBUTIONS

A total of 30 plants have been found to be used for medicinal basis by the traditional healers of Ganjam District, Odisha. Maximum plants are used by the tribal healer for the curing of major skin diseases like leprosy (05 plants), ring worm(10 plants), Burns(07 plants) and Wounds (16 plants),eczema (04 plants). The sources of the medicinal plant knowledge are the main factor for difference in utilization and treatment of different ailments.

STATISTICS OF PLANT GROWTH FORMS

Out of total collected specimens there are twelve tree species. In addition two shrub species, fourteen species of herbs. Two species of shrubs are recorded from the Out of total collected species, only one climber recorded. Among them, 40% of plants were tree, 34% were herbs, 14% were shrubs & 8% were climber species. The diversity of these medicinal and aromatic plants revealed that there were 18 families belonging to dicotyledons and 3 to monocotyledons. Among dicotyledons, the maximum number of genera belonged to family Fabaceae.

PLANTS PARTS USED

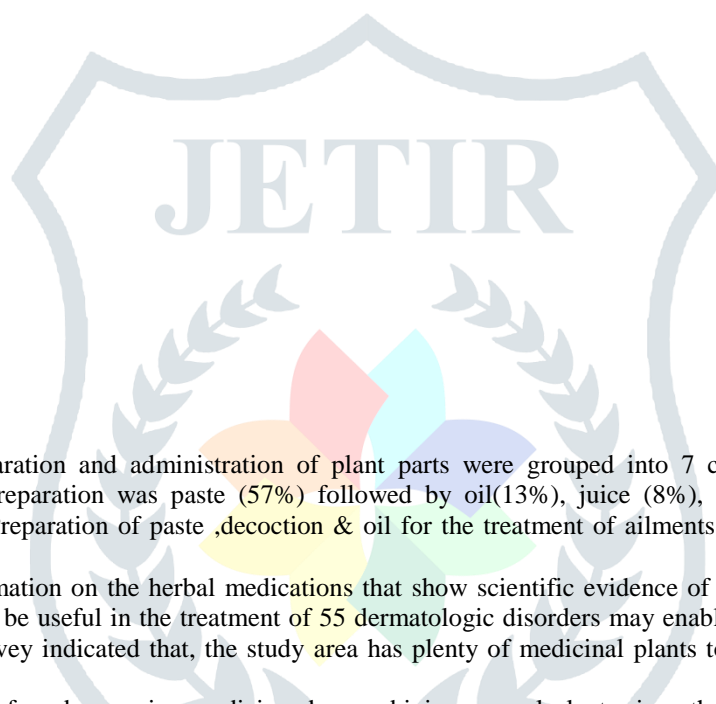
Most of the remedies are reported for the first time. The tribal population used herbal remedies for the treatment of common minor ailments and even for some major diseases leprosy, eczema etc. These people have a long history of traditional use of plants. Traditional medicine is still widely practiced throughout the region; it is now fast disappearing due to modernization. Most of the time drugs are utilized in the fresh or dried state. It is found that leaf paste drug preparations are mostly recommended as ethno-medicine followed by roots, seeds and fruits, stem or bark, rhizome and bulbs.

METHOD OF PREPARATION OF PLANTS FOR ADMINISTRATION

Traditional practitioners usually prefer external and internal applications or oral administration of the herbal preparations in the treatment of various types of skin ailments depending on the type and severity of the infections. The drug formulations are usually Paste of the drug parts with water, lime juice, lime water, rice washed water, coconut water, butter, ghee, milk obtained

from coconut gratings, coconut oil, honey, cow's milk or cow's urine; extraction of oil from the drug parts; juice extract from fresh juicy parts or with water; application of exudates of raw materials like latex; decoctions and infusions of drug parts with water; roasted and powdered raw plant material; fried plant material with coconut oil, ghee etc and ash of the burnt drug part.

The external application of the drug is used for all types of skin ailments except in the treatment of itching due to impure blood. Oral administration is for boils, itching due to impure blood, eczema, herpes, measles, scabies, septic due to skin allergies and intestinal sore. Treatments are done with either single plant formulation, combinations of several plants or even with many parts of the same plant. According to the herbal healers, the combinations of different plant species increases the activity of medicine and 'ill effect' of any plant (if any) will be 'neutralized' by the other [28]. Rapid cure and enhancement of immunity power in the patients is the aim of combinations. Similar concept is reported in the Indian Traditional Systems of medicine like Ayurveda and Siddha [29]. In some other cases the boiling process and storage of prepared drug is done in the copper vessel and applied topically to treat eczema, skin allergies, scabies and all types of skin diseases. Oral administrations also have the usage of non plant materials along with the plant drug parts, such as cow's milk in blood purification, eczema and boils, jaggery in blood purification, ghee in boils & honey in skin allergies. According to the practitioners this addition is to enhance the efficacy of herbal remedies or to make the remedy more palatable and it masks the undesirable taste of the plant drugs when they are taken orally. These non plant materials are used in both external and oral administrations. They play a major role as a media and some of them actively participate in curing the skin infections [30,31]. The antibacterial properties of cow's urine against several human pathogens causing skin diseases is also reported [30-33].



The method of preparation and administration of plant parts were grouped into 7 categories. Of which, the most commonly used method of preparation was paste (57%) followed by oil(13%), juice (8%), decoction (8%), powder (6%), exudates (6%), & pulp (2%).Preparation of paste ,decoction & oil for the treatment of ailments is a common practice of tribal people of Ganjam.

Compilation of information on the herbal medications that show scientific evidence of clinical efficacy, as well as the more common herbs shown to be useful in the treatment of 55 dermatologic disorders may enable more patients to benefit from these treatments [34]. The survey indicated that, the study area has plenty of medicinal plants to treat a wide spectrum of skin diseases.

The local people preferred preparing medicines by combining several plants since the combination rapidly cures the diseases and also enhance the immunity power of the patients. this is constant with the other general observation which has been reported earlier in relation to medicinal plant studies by the Indian Traditional System of Medicine like Siddha and Ayurvedha [35,36] different plants of these species, such as leaf ,stem or bark ,fruit ,seed ,root ,bulb , and rhizome were used in different forms like oil , powder , juice , pulp , decoction , exudates , and paste for management of various ailments as medicine .

Thus, the study also ascertains the value of a great number of plants used in tribal medicine, which could be of considerable interest in the development of new drugs. So that, measures should be taken into account to discover new drugs with active principles using ethno medicinal approaches.

Table No. 2 – Plants with their botanical names and use value

Sl. no	BOTANICAL NAME	$\sum U_i$	N	UV
1.	<i>Achyranthes aspera</i> L.	5	4	1.25
2.	<i>Allium Sativum</i> L.	1	2	0.50
3.	<i>Aloe vera</i> (L.) Burm.f.	5	4	1.25
4.	<i>Andrographis paniculata</i> (Burn.f.) Wall.	3	4	0.75
5.	<i>Argemone mexicana</i> L.	3	2	1.50
6.	<i>Azadirachta indica</i> A. Juss	6	6	1
7.	<i>Butea monosperma</i> (Lam.)Taub.	2	2	1
8.	<i>Calotropis gigantea</i> (L.) W. T. Aiton	4	5	0.80
9.	<i>Carica papaya</i> L.	2	2	1
10.	<i>Cassia fistula</i> L.	2	3	0.66
11.	<i>Cicer arietinum</i> L.	2	2	1
12.	<i>Curcuma longa</i> L.	4	3	1.33
13.	<i>Cuscuta reflexa</i> Roxb.	1	1	1
14.	<i>Datura metel</i> L.	2	2	1
15.	<i>Ficus racemosa</i> L.	1	1	1
16.	<i>Lawsonia inermis</i> L.	4	3	1.33
17.	<i>Leucas aspera</i> (Willd.) Link	3	2	1.33
18.	<i>Solanum lycopersicum</i> L.	4	3	1.33
19.	<i>Millettia pinnata</i> (L.) Panigrahi	3	2	1.50
20.	<i>Mimosa pudica</i> L.	3	2	1.50
21.	<i>Neolamarckia cadamba</i> (Roxb.)	3	4	0.75
22.	<i>Ocimum sanctum</i> L.	2	2	1
23.	<i>Pergularia daemia</i> (forssk) chiov	2	3	0.66
24.	<i>Phyllanthus niruri</i> L.	3	2	1.50
25.	<i>Psidium guajava</i> L.	2	2	1
26.	<i>Ricinus communis</i> L.	2	3	0.66
27.	<i>Saraca indica</i> L.	2	2	1
28.	<i>Tamarindus indica</i> L.	1	4	0.25
29.	<i>Terminalia arjuna</i> (Roxb.ex DC.) Wight. & Arn.	2	2	1
30.	<i>Tridax procumbens</i> L.	4	5	0.80

Table No. -3:- Fidelity level of the plants

BOTANICAL NAME	LOCAL NAME	DISEASE	Np	N	FL(%)
<i>Achyranthes aspera</i> L.	Apamaranga	BOILS	4	4	100%
<i>Andrographis paniculata</i> (Burn.f.) Wall.	Bhuin Nimba	LEPROSY	3	4	75%
<i>Azadirachta indica</i> A. Juss	Neem	RING WORM	6	6	100%
<i>Carica papaya</i> L.	Amrutavanda	ECZEMA	2	4	50%
<i>Cuscuta reflexa</i> Roxb.	Nirmuli	ITCHING	3	3	100%
<i>Ficus racemosa</i> L.	Bara	BOILS	2	3	67%
<i>Leucas aspera</i> (Willd.) Link	Gayasa	SCABIES	2	4	50%
<i>Pergularia daemia</i> (forssk) chiov	Uturuli	ITCHING	3	3	100%
<i>Phyllanthus niruri</i> L.	Badi Amla	SCABIES	2	3	67%
<i>Tridax procumbens</i> L.	Biswalyakarani	WOUND	5	5	100%

Fig. No. 1:- Family Wise Classification of the Plants used for skin diseases

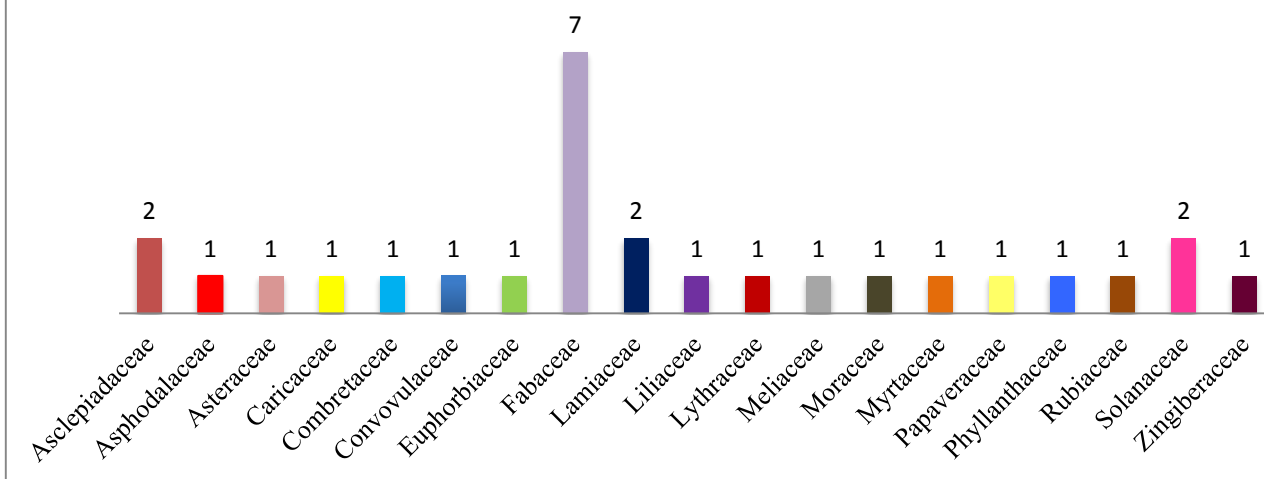


Fig. No. - 2 : Distribution of plants on the basis of habitat

■ Herb ■ Shrub ■ Tree ■ Climber

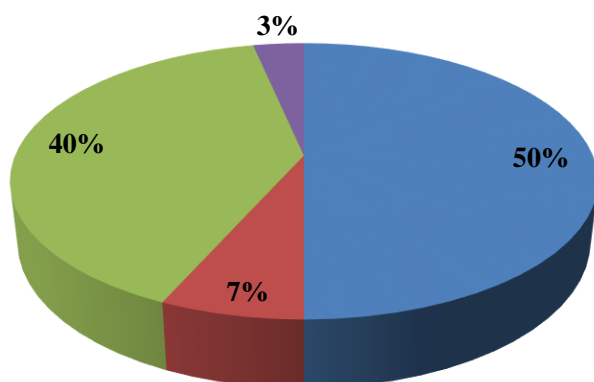
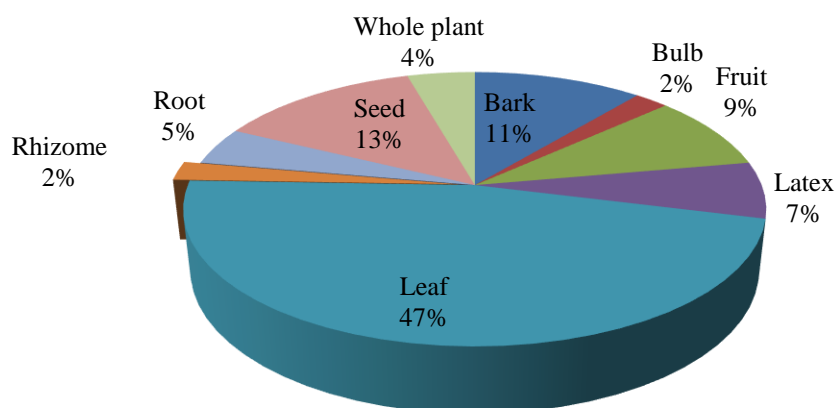
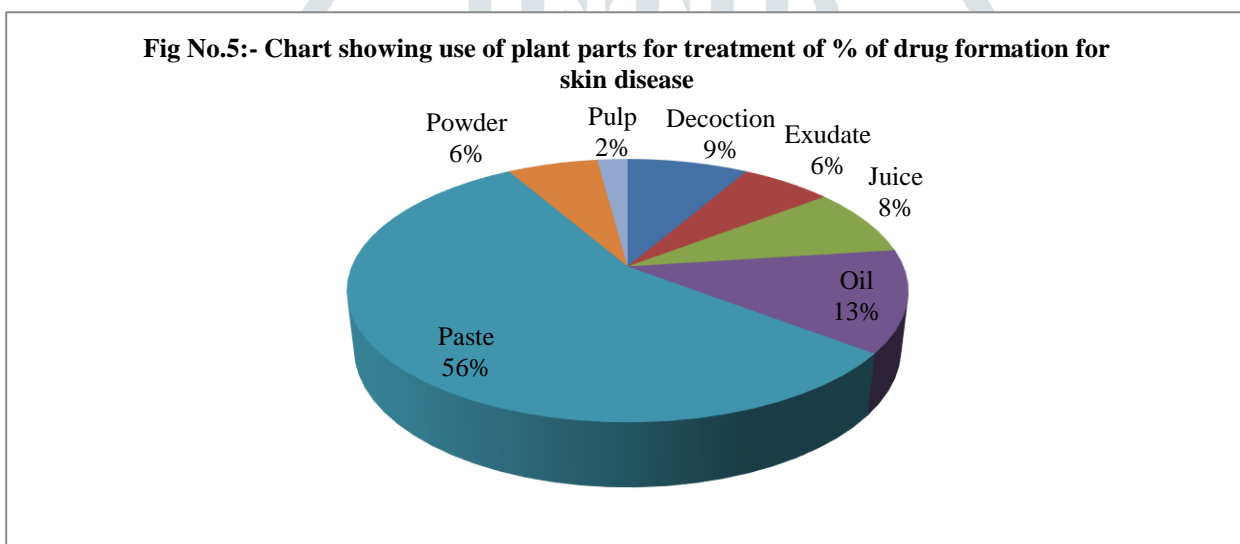
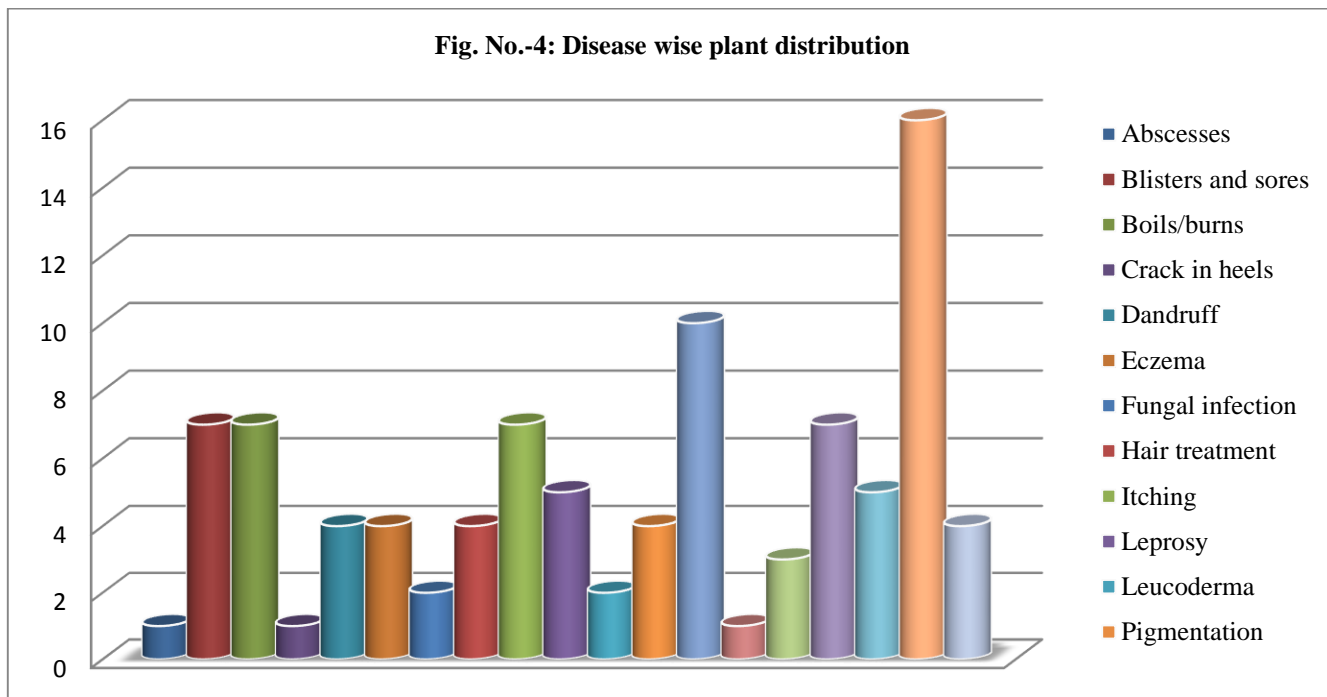


Table No. 4 : Plants species used for skin diseases (family wise)

Amaranthaceae	1	• <i>Achyranthes aspera</i> L.
Acanthaceae	1	V. <i>Andrographis paniculata</i> (Burn.f.) Wall.
Asclepiadaceae	2	VI. <i>Calotropis gigantea</i> (L.) W. T. Aiton VII. <i>Pergularia daemia</i> (forssk) chiov
Asphodalaceae	1	VIII. <i>Aloe vera</i> (L.)
Asteraceae	1	IX. <i>Tridax procumbens</i> L.
Caricaceae	1	X. <i>Carica papaya</i> L.
Combretaceae	1	XI. <i>Terminalia arjuna</i> (Roxb.ex DC.) Wight. & Arn.
Convovulaceae	1	XII. <i>Cuscuta reflexa</i> Roxb.
Euphorbiaceae	1	XIII. <i>Ricinus communis</i> L.
Fabaceae	7	XIV. <i>Butea monosperma</i> (Lam.)Taub. XV. <i>Cassia fistula</i> L. XVI. <i>Cicer arietinum</i> L. XVII. <i>Millettia pinnata</i> (L.) Panigrahi XVIII. <i>Mimosa pudica</i> L. XIX. <i>Saraca indica</i> L. XX. <i>Tamarindus indica</i> L.
Lamiaceae	2	XXI. <i>Leucas aspera</i> (Willd.) Link XXII. <i>Ocimum sanctum</i> L.
Liliaceae	1	XXIII. <i>Allium Sativum</i> L.
Lythraceae	1	XXIV. <i>Lawsonia inermis</i> L.
Meliaceae	1	XXV. <i>Azadirachta indica</i> A. Juss
Moraceae	1	XXVI. <i>Ficus racemosa</i> L.
Myrtaceae	1	XXVII. <i>Psidium guajava</i> L.
Papaveraceae	1	XXVIII. <i>Argemone mexicana</i> L.
Phyllanthaceae	1	XXIX. <i>Phyllanthus niruri</i> L.
Rubiaceae	1	XXX. <i>Neolamarckia cadamba</i> (Roxb.)
Solanaceae	2	XXXI. <i>Datura metel</i> L. XXXII. <i>Solanum lycopersicum</i> L.
Zingiberaceae	1	XXXIII. <i>Curcuma longa</i> L.

Fig. No. :3 Chart showing plant parts used for treatment of various skin disease





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BIBLIOGRAPHY

- Robbers S, Tyler V. 1996 Pharmacognosy and Pharmaco-biotechnology, Williams and wilkins. ;Baltimore, Maryland
- Davis BD, Dulbecco R, Eiser HN, Ginsberg HS. Microbiology:1980 Including immunology and Molecular genetics, Third edition Harper and Row, Newyork,
- World Health Organisation. WHO Traditional Medicine Strategy. [http.www.who.int/](http://www.who.int/), 2002.
- Bussmann RW, Gilbreath GG, Solio J, Lutura M, Lutuluo R, Kunguru K, Wood N and Methenge SG. 2006 J. Ethanobio. Ethanomed, ; 2:1186-1746.
- Fabricant DS, Farns Worth NL. Environmental Health perspective, 2001; 109:69-75.
- Byron, N. and Arnold J. E. M. 1999. What futures for the people of the tropical forests? *World Development* 27: 789-805.
- Kendler, B. S.; Koritz, H. G. and Gibaldi, A. 1992. Introducing students to ethnobotany. *The American Biology Teacher* 54: 46-50.

8. Cotton, C. M. 1996. *Ethnobotany- Principles and Applications*. John Wiley and Sons Inc.
9. Cunningham, A. B. 1989. Indigenous plant use: balancing human needs and resources. In: *Biotic diversity in southern Africa: concepts and conservation*, Ed. Huntley, B. J. Oxford University Press, Cape Town. Pp. 93-106.
10. Palit, D. and Gurung, S. 2008. Some phytoremedies used traditionally by Gurungs in Darjeeling, west Bengal, India. *Pleione* 2: 175-181.
11. Sharma, M. and Kumar, A. 2013. Ethnobotanical uses of medicinal plants: a review. *International Journal of Life Science and Pharma Research* 3: 52-57.
12. Panda, P.C. and Das, P. 1999. Medicinal Plantlore of the tribals of Baliguda sub-division, Phulbani District, Orissa. *J. Econ. Tax. Bot.*, 23 (2): 473-498.
13. Singh, U. and Bharti, A. K. 2015. Ethnobotanical study of plants of Raigarh area, Chhattisgarh, India. *International research Journal of Biological Sciences* 4: 36-43.
14. Ajesh, T. P.; Abdulla Naseef, S. A. and Kumuthakalavalli, R. 2012. Ethnobotanical documentation of wild edible fruits used by muthuvan tribes of Idukki, Kerala- India. *International Journal of Pharma and Bio Science* 3: 479-487.
15. Nath R. and Behera L. M., 2018 Ethnomedicinal plants used against skin diseases by the tribals of Kuchinda sub-division of Sambalpur district in western Odisha, *J of Med. Plants Std.*, ; 6(3): 38-42
16. Dhal N. K., Kandi B., Mohanty R. C. 2013. A Case Study on Indigenous Phytotherapy for Skin Diseases in Nuapada District, Odisha, India. *International Journal of Herbal Medicine* Volume: 1, Issue:2 (117-123)
17. Kumar Sanjeet, Jena P.K., Sabnam S., Kumari M. and Tripathy P.K. 2012, Study of plants used against the skin diseases with special reference to *Cassia fistula* L. among the king (Dongaria Kandha) of Niyamgiri: A primitive tribe of Odisha, India, *International Journal of Drug Development & Research*, (256-264)
18. Leelaveni, A., Sugyani Dash, Suraj Kumar Behera, Sangeeta Das and Amiya Kumar Mandal, 2018: Ethnomedicinal study in north west ganjam, odisha, *International Journal of Innovation Sciences and Research*, Vol.7, No, 08, pp.1167-1174,
19. Rout, S. M.; Choudary, K. A.; Kar, D. M.; Das, L. and Jain, A. 2009. Plants in traditional medicinal system- future source of new drugs. *International Journal of Pharmacy and Pharmaceutical Sciences* 1: 1-23.
20. Ghosh, S. K.; Guria, N.; Sarkar, A. and Ghosh, A. 2013. Traditional herbal remedies for various ailments within the rural communities in the district of Bankura and Purulia, West Bengal, India. *International Journal of Pharmacy and Pharmaceutical Sciences* 5: 195-198.
21. Martin, G.J., 1995. *Ethnobotany: A 'People and Plants' Conservation Manual*. Chapman and Hall, London.
22. Maundu, P., 1995. Methodology for collecting and sharing indigenous knowledge : a case study. *Indigenous Knowl. Dev. Monit.* 3, 3-5.

23.Saxena HO, Brahmam M. The Flora of Orissa, vol. 1-4. Orissa Forest Development Corporation Ltd, Bhubaneswar, India, 1994-1996, LXIV+2918.

24.Byg,A., Baslev,H.,2001.Diversity and used epalmsin Zahamena, Eastern Madagascar. Biodivers.Conserv.10,951–970.

25.Albuquerque, U.P.,Lucena, R.F.P., Monteiro, J.M., Alissandra, T.N.,Florentino, Fatima, C.de., Almeida,C.B.R., 2006. Evaluating two quantitative ethnobotanical techniques. Ethnobot.Res.Appl.4,51–60.

26.Phillips, O., Gentry,A.H.,1993b.The useful plants of Tambopata,Peru:II.Additional hypothesis testing in quantitative ethnobotany.Econ.Bot.47,33–43.

27.Alexiades, M.N., Sheldon, J.W., 1996. Selected Guidelines for Ethnobotanical Research: A Field Manual. New York Botanical Garden, New York.

28.Bhat Pradeep , Hegde Ganesh R., Hegde Gurumurthi, Mulgund Gangadhar S. 2014, Ethnomedicinal plants to cure skin diseases - An account of the traditional knowledge in the coastal parts of Central Western Ghats, Karnataka, India Journal of Ethnopharmacology 151 (493–502)

29.Sivaranjani, R., Ramakrishnan, K., 2012. Traditional uses of medicinal plants in treating skin diseases in Nagapattinum district of Tamilnadu, India. International Research Journal of Pharmacy 3, 201–204.

30.Sathasivam, A., Muthuselvam, M., Rajendran, R., 2010. Antimicrobial activities of cow urine distillate against some clinical pathogens. Global J. Pharmacol. 4, 41–44.

31.Shah, C.P, Patel, D.M., Dhani, P.D., Kakadia, J., Bhavsar, D., Vachhani, U.D., Trivedi, M. N., Joshi, V.J., 2011. In vitro screening of antibacterial activity of cow urine against pathogenic human bacterial strains. Int. J. Curr. Pharm. Res. 3, 91–92.

32.Jarald, E., Edwin, S., Tiwari, V., Garg, R., Toppo, E., 2008. Antioxidant and antimicrobial activities of cow urine. Global J. Pharmacol. 2, 20–22.

33.Ahuja, A., Pushpander, K., Verma, A., Tanwar, R.S., 2012. Antimicrobial activities of cow urine against various bacterial strains. Int. J. Recent Adv. Pharm. Res. 2, 84–87.

34.Bedi, K. and D.P. Shenefelt. 2002. Herbal therapy in demnatology. *Arch, dermatol.* 138:232-242.

35.Kirtikar KR , Basu BD ,2001. Indian Medicinal Plants, Vol.1. . Lalit Mohan Basu , Allahabad ,India ,pp. 34-35

36.Gogate VM .,2000. Ayurvedic Pharmacology and Therapeutic Uses of Medicinal Plants (Dravyagunavigyan) , First ed. Bharatiyar Vidya Bhavan (SPARC) , Mumbai Publications . 421-422