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ijirset@gmail.com



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Folklore Medicinal Plants Useful in Skin Diseases

DR. KAPTAIN K. BAJPAYEE

ASSOCIATE PROFESSOR AND HEAD, CENTER FOR RESEARCH IN ETHNO AND MEDICO BOTANY,
DR. RML PG COLLEGE, ALLIPUR, HARDOI, INDIA

ABSTRACT: Skin is an organ providing contact with the environment and protecting the human body from unfavourable external factors. Skin diseases, reflected adversely in its functioning and appearance, also unfavourably affects the psyche, the condition of which is important during treatment of chronic skin diseases. The use of folklore medicinal plants in treatment of various skin diseases results from their influence on different stages. The paper presents results of the study regarding activity of the folklore medicinal plant raw material related to its influence on skin. The mechanism of action, therapeutic indications and side effects of folklore medicinal plants used for treatment of diseases of the skin are described.

KEYWORDS: skin diseases, folklore, medicinal, plants, treatment, therapeutic

I. INTRODUCTION

Skin disorders have received less attention in health management than other life-threatening diseases that occur on a global scale. However, numerous skin problems are reported to primary health care systems worldwide, particularly in tropical locations. While modern physicians often address most skin conditions, it is estimated that over 70% of individuals with skin illnesses do not seek treatment. Traditional medicine dates all the way back to human civilization's inception. Numerous materials are utilized in traditional medicinal remedies, but the use of plants is particularly critical. Saudi Arabia is one of the world's most botanically varied countries, having an extensive folk medicine heritage. While several reviews on the use of plants to cure skin disorders has been published worldwide, very few have been undertaken in Saudi Arabia, much alone a comprehensive one. Many thousands of years ago, folk herbal medicine was used to treat skin health problems. Even our biologically close relatives, the great apes, used herbs for self-treatment. Herbs have been used differently on different continents, depending on their availability. Recently, skin diseases have become a major concern due to their association with Human Immunodeficiency Virus and Acquired Immunity Deficiency Syndrome (HIV/AIDS). According to the World Health Organization, over 80% of individuals in developing countries rely on traditional medicine to meet their primary health needs. India is considered to be the botanical garden of the world, as it is home to the largest collection of medicinal herbs globally. In addition to being nontoxic and easily accessible, medicinal plants play a vital role for pharmacological research and drug development, but they are also used as therapeutic agents directly or as starting materials for the synthesis of drugs [1, 2].

Functions of the skin the main functions of the skin include 1. Protection of the human body 2. Sensation i.e. transmitting to the brain information about surroundings 3. Temperature regulation 4. Immunity i.e. the role of the skin within the immune system 5. Enables movement and growth without injury .Excretion from the body of certain types of waste materials 7. Endocrine function e.g. re. Vitamin D.[1,2,3]

Several folklore medicinal plants used to treat Skin Diseases are:

1) ATOPIC ECZEMA

Atopic eczema is the most common form of eczema and causes your skin to become itchy, red, dry, and cracked. This is a long-term condition for most people, although it may improve over time, especially in children. It can affect any part of the body, but usually affects, the backs or fronts of the knees, outside or inside the elbows, around the neck, hands, cheeks or scalp.



Aloe Vera

Common name: Aloe Sabar

Family: Xanthorrhoeaceae

Habit: Perennial herb

Parts used: Leaf gel

Used in treatment of Skin diseases including eczema, irritation, burns, wounds, bruises, abrasions, psoriasis, cuts, scrapes, cold sores, sun buns, inflammation, hair loss, rejuvenating, complexion improvement, cosmetic uses, microbial skin diseases.

Since *A. vera* contains antifungal and antibacterial elements, its gel is applied directly on the eczematous skin, so the skin becomes softer and wounds heal rapidly. Many people reported decrease in eczema symptoms such as skin dryness, scaling and improved skin quality and also due to its antibacterial activity it prevents secondary infection.

Avena sativa

Common name: Oat, Shofan

Family: Poaceae

Habit: Annual herb

Parts used: Colloidal oat extract, decoction

Used in treatment of Skin diseases including eczema, wounds, irritation, inflammation, erythema, burns, itching, sunburn.

Different clinical studies are undertaken to research the effect of oats on eczema and these have all showed a big decrease in skin redness, dryness, scaliness, itching and erythema after application of oat extracts. These results were observed in adults and children oat extracts. These results were observed in adults and children (Nebus et al., 2012). In vitro, a colloidal oat extract demonstrated anti-inflammatory activity – inhibited releasing of the arachidonic acid from phospholipids and therefore the subsequent metabolism into prostaglandin and leukotrienes. Additionally, it inhibited the expression of phospholipase A2 (PLA2) and cyclooxygenase (COX-2) (Aries et al., 2003). A colloidal oat extract stimulated production of the anti-inflammatory transforming protein $\beta 1$ (TGF $\beta 1$) by keratinocytes, and inhibited production of interleukins [3, 4] (Aries et al., 1999).

Curcuma longa

Common name: Turmeric, Kurkum

Family: Zingiberaceae

Habit: Perennial herb

Parts used: Rhizome paste, powder

Used in treatment of Skin diseases including eczema, wounds, burns, cuts, chicken pox, shingles, allergy, scabies, sores, inflammation, microbial skin diseases, complexion improvement.

The active compound curcumin is supposed to have many biological effects including anti-inflammatory, antioxidant, antitumour, antibacterial and antiviral activities, which show potential in clinical medicine (Aggarwal et al., 2007). It is generally used by people for eczema treatment. It appears that the active ingredient curcumin present in turmeric has anti-inflammatory and bactericidal properties, which may assist to treat skin inflammation linked with eczema [5, 6].

Matricaria chamomilla

Common name; Chamomile, Babunaj

Family: Asteraceae

Habit: Annual herb

Parts used: Flower extracts, decoctions, oil

Used in treatment of Skin diseases including eczema, wounds, itching, irritation, inflammation, allergic conditions, dermatitis, erythema, bacterial skin diseases, nappy rash, frostbite, cosmetics uses.

It is found to be efficient in wound healing and skin inflammatory conditions, consequently employed in allergic conditions, atopic eczema. Flowers are made into tea and liquid extracts, capsules and tablets. It's applied to skin by converting them into ointment or cream (Blumenthal et al., 2000). Aertgeerts et al. (1985) performed a clinical study in 161 skin disorder patients employing a cream made up of chamomile extract, in comparison with steroidal and non-steroidal creams, it had been equally effective as steroidal cream and a lot more effective than non-steroidal cream. *Chamaemelum nobilis* helps in skin cell regeneration.

2) PSORIASIS

Psoriasis is characterized by flaky red patches of skin coated with silver scales that occur on the elbows, knees, and lower back, and can be uncomfortable or painful and sore. Psoriasis can be a small annoyance for some people, but it can be a severe problem for others. It has a negative impact on their quality of life. Psoriasis patients frequently experience periods of no or minor symptoms. Many herbs can help with psoriasis symptoms by reducing inflammation or slowing the proliferation of skin cells.

Mahonia aquifolium

The flowering plant *Mahonia aquifolium* is derived from the mahonia shrub. Oregon grape is another name for it. This herb has been used to treat inflammatory disorders like psoriasis in the past. Berberine, found in *Mahonia aquifolium*, may help to reduce some of the irritation caused by psoriasis. The plant also contains antiproliferative properties, which means it can halt the growth of cells.[4,5,6]

Mahonia aquifolium has one of the strongest evidentiary bases, according to the National Center for Complementary and Integrative Health (NCCIH). All herbal cures for psoriasis are available from this reliable source [7, 8].

Several systematic reviews concur that *Mahonia aquifolium* can help treat the symptoms of psoriasis.

Indigo naturalis

Qing dai, also known as indigo naturalis, is a traditional Chinese herbal medication used to cure skin disorders. It is extracted from a range of plants, including *Baphicacanthus cusia*, by manufacturers. Recent clinical trials have suggested that the medication can help with psoriasis, and a comprehensive review published in 2015[Complementary and alternative medicine for psoriasis: what the dermatologist needs to know], indicated that indigo naturalis, combined with *Mahonia aquifolium*, was an effective treatment for psoriasis.

In a recent study, 24 patients with mild psoriasis were given either indigo naturalis or a placebo for 8 weeks. People with psoriasis experienced much fewer symptoms after the experiment than those in the placebo group. They also showed reduced levels of interleukin-17 (IL-17), an inflammatory marker in psoriasis patients.

Aloe Vera

Antibacterial and anti-inflammatory effects are found in creams and gels containing Aloe vera extract. They may aid to calm the skin and prevent infection-causing bacteria.

According to the NCCIH, Aloe vera may assist with psoriasis, although there is less proof than for *Mahonia aquifolium* and indigo naturalis.

To treat psoriasis, use a topical aloe vera gel to the affected areas of the skin.

3) VITILIGO

Vitiligo is a skin condition that generates pale white patches on the skin that vary in size and can appear anywhere on the body.

They're more evident on parts like the face and hands that are exposed to sunlight, as well as on dark or tanned skin

Your hair may turn white if you have vitiligo on your scalp. Vitiligo is a chronic skin disorder. It's not contagious. Herbal medications of various natures and effects have been utilized for the treatment of vitiligo since ancient times.

Ginkgo biloba

Ginkgo extracts have been demonstrated to be useful in the treatment of a variety of diseases, including allergies, varicose veins, premenstrual syndrome, headaches, vertigo, and more . Ginkgo extracts have also been utilised to treat vitiligo in recent years. The medicine is manufactured as a tablet with various dosages that must be taken orally once to three times daily for more than three months to be effective.

Khellin

Khellin comes from the plant *Amni visnaga* and is a naturally occurring furanochromone. Since ancient Egyptian times, the plant has been utilised as a herbal medicine for various ailments (such as kidney illness, asthma, and others). Because of khellin's negative effects, such as liver dysfunction and allergic reactions, analogues of khellin with safer profiles and higher efficacies have been developed. And have been used in medicine for the treatment of vitiligo for several decades, where they have shown to be effective when combined with UVA phototherapy. Despite the fact that the specific mechanism of action is unknown, khellin stimulates melanocyte proliferation and melanogenesis. Khellin can be used topically or systemically (oral dosing).The treatment consists of taking khellin gelatin capsules orally and then having the patient irradiated with UVA after about 2.5 hours. Two to three times a week, the therapeutic session is repeated. The treatment is completely risk-free [9, 10].

Green Tea Polyphenols

Green Tea polyphenols are compounds from green tea leaves that have been utilised in medicine since antiquity. Because of their high content of Epigallocatechin – 3 – gallate (EGCG), they have anti-inflammatory, anti-oxidant, and immunomodulatory properties. The medication can be used both systemically and topically. Recent research suggests that Green Tea polyphenols may be effective in the treatment of vitiligo by reducing oxidative stress in the melanocyte-unit.

Capsaicin

Capsaicin is an active ingredient found in chilli peppers, which belong to the genus *Capsicum*. The medication has been offered as a therapeutic strategy for vitiligo treatments due to its antiinflammatory and antioxidant effects. An experimental investigation recently confirmed that incubating keratinocytes taken from a vitiliginous patient's perilesional skin with capsaicin prevented the cellular damage by ROS.[7,8,9]

4) ACNE

Acne is a skin disorder that occurs when oil and dead skin cells clog your hair follicles. It causes pimples, whiteheads, and blackheads. Teenagers are the most affected by acne, yet it affects people of all ages. Although there are effective acne treatments available, acne can be stubborn. There are many different treatment regimens for acne vulgaris, but none of them are without side effects, and their specific role in therapy is unclear.

Azadirachta indica

The ethanol extracts of *Azadirachta indica*, *G. glabra*, *Andrographis paniculata*, *Ocimum sanctum*, and green tea were found to have the capacity to inhibit acne in a study on an anti-acne formulation made from herbal extracts. The anti-acne compound was found to be effective against *Propionibacterium acnes* and *Staphylococcus epidermis* in the recent investigation. Aqueous extracts of *Azadirachta indica* leaves have also been shown to be chemopreventive against skin cancer in mice. In compared to the control group, skin cancers have been observed to increase the expression of proliferating cell nuclear antigen.

Cannabis sativus

Acne rosacea, seborrheic dermatitis, eczema, dermatitis, psoriasis, and lichen planus can all be treated using *Cannabis sativus* seed oil. This plant's leaves powder can be used to treat wounds and sores. Externally, cannabis sativus extract can help reduce itching skin irritation. The seed oil protects the skin by strengthening it and making it more resistant to bacterial, fungal, and viral infections.

Echinacea angustifolia and Echinacea purpurea

P. acnes, the major cause of acne vulgaris, has been demonstrated to be easily killed by *Echinacea purpurea* extract. *P. acnes* caused significant release of various pro-inflammatory cytokines, including IL-6 and IL-8, in cell culture models. The *E. purpurea*, on the other hand, was able to entirely reverse the effect on regular leaves. As a result, *E. purpurea* provided acne sufferers with a safe two-fold benefit by decreasing both bacterial-induced inflammation and organism development.

Rosmarinus officinalis

P. acnes, a type of bacteria that causes acne, has also been shown to be beneficial with *Rosmarinus officinalis* oil. The antibacterial capabilities of *R. officinalis* essential oil were tested against *P. acnes* in a study, and significant changes in the size and morphology of *P. acnes* were seen in response to treatment.

Melaleuca alternifolia

Tea tree oil applied topically in low doses offers anti-acne properties with few side effects. It works well in the treatment of persistent infected wounds and osteomyelitis [11, 12].

5) BASAL CELL CARCINOMA

Dome-like, pink or red, shining, and pearly patches that may have a sunk-in core, like a crater. Raised, firm, and pale portions that may resemble a scar. Blood vessels visible on the growth. Easy bleeding or leaking sore that doesn't seem to heal, or cures but resurfaces.

Basal cell carcinoma (BCC) is a kind of skin cancer that starts in the cells of the basal layer of the skin. The epidermis is lined by normal basal cells. Skin cells that replace old cells with new ones are known as keratinocytes. Tumors on the skin's surface develop from cancer of the basal cells. Sores, growths, lumps, scars, or red patches are common symptoms of these tumours.

BCC seldom spreads to other parts of the body (metastasizes), yet it can still cause deformity. It can spread to other parts of the body in rare situations. It could become life-threatening if this happens. The most frequent type of skin cancer is BCC.

Turmeric

Turmeric is a herb or spice that has been utilised in natural medicine for hundreds of years. Turmeric is mentioned in ancient Ayurvedic treatments, and it is recognised to provide a variety of health benefits. Turmeric contains curcumin, a powerful antioxidant that aids in the prevention of malignant development. Make a thick paste with turmeric and water and apply it to the affected region for around 20 minutes. Turmeric use has also been shown to boost immunity against all diseases.

Ginkgo Biloba

Ginkgo Biloba possesses anti-cancer qualities, according to an article published in the Journal of Food Science in the January 2008 issue, making it a holistic skin cancer remedy. Ginkgo Biloba herb comes in a variety of forms, including pills and extracts. This natural skin cancer treatment must be followed under the supervision of a herbalist and your doctor. Ginkgo Biloba seeds should not be eaten raw. Ginkgo Biloba may induce adverse effects such as headaches, nausea, and moderate gastrointestinal problems. Giddiness is also a possibility for some folks. Those with blood issues should avoid using Ginkgo Biloba since it raises the risk of severe bleeding. [10,11,12]

Green Tea

Green tea is currently a popular antioxidant source. Green tea enhances DNA repair and may prevent non-melanoma skin cancer, according to an article published in Archives and Biochemistry and Biophysics in November 2010. This natural skin cancer treatment has numerous health benefits, and drinking two cups will only enhance your health and aid in the healing of skin cancer.

Flaxseeds

Flax seed powder and flax seed oil have already established themselves in a number of cuisines. Flaxseeds include fibre, lignans, vitamins, and omega 3 fatty acids, among other things. Lignans aid in the prevention of malignant cell spread.

Astragalus

This natural skin cancer treatment boosts immunity and aids in the fight against malignant cells in the body. It is a Chinese medicinal root that can be used to treat a variety of ailments.

6) MELASMA

Dark patches on the face, neck, chest, and arms are common symptoms of this skin disorder. Pregnant women (chloasma) and people with darker skin who have had a lot of sun exposure are more likely to have it. Additional than skin darkening, there are no other symptoms. It could fade away on its own in a year or it could become permanent.

Melasma is a pigmentary condition that affects women's faces and is divided into four types: centrofacial pattern, malar pattern, mandibular pattern, and mixed.

Aloe vera

Using a topical, liposome-encapsulated aloe vera preparation on pregnant women with melasma greatly improved their melasma, according to a 2017 study <https://pubmed.ncbi.nlm.nih.gov/28139161/>

7) HERPES SIMPLEX

Herpes is caused by the herpes simplex virus (HSV), which is also known as HSV. Herpes can affect any region of the body, however it most usually affects the genitals and mouth. The herpes simplex virus is divided into two types:

HSV-1 causes cold sores and fever blisters around the mouth and on the face, and is predominantly responsible for oral herpes.

HSV-2 It is predominantly responsible for genital herpes outbreaks and is the primary cause of genital herpes.

Lemon balm (Melissa officinalis) is a mint family member with a lemon fragrance. The chopped leaves can be steam-distilled to produce an essential oil. Treatment of herpes simplex and small wounds are two examples of topical applications. After using 1

Herbs have a lot of potential for treating a variety of skin conditions. In India, more than 80% of people rely on traditional medicine and employ a variety of plant-based medicines to treat skin disorders. They are relatively inexpensive when compared to conventional allopathic drugs and can be of tremendous benefit to India's population in general, and poor people specifically. Herbals are high in active components and can be a safer and more cost-effective treatment for skin conditions ranging from rashes to deadly skin cancer. Because more than half of the plant species effective for treating skin illnesses tend to be restricted to forests, deforestation, habitat degradation, urbanisation, and other human activities may pose a severe threat to these species. The necessity of the hour is to conserve these plants with the support of local involvement and to conduct comprehensive research in this area to widen the prospects of herbal medications in the treatment of skin diseases.[13,14,15]

II. DISCUSSION

Ethnomedicinal Plants in Herbal Remedies Used for Treatment of Skin Diseases by Traditional Healers in Songkhla Province, Thailand

Skin disease is a global public health problem that often has physiological, psychological, and social impacts [1]. The occurrence of skin diseases usually affects human health, from newborns to elderly people. Common skin diseases impact global distribution both in resource-poor areas and advanced economic settings. Scabies and pyoderma are examples of skin diseases in resource-poor settings. Skin disorders such as atopic eczema, psoriasis, skin ulcers, and pruritus are commonly distributed in both resource-poor areas and advanced economic settings [2]. Infectious skin diseases include a variety of conditions ranging in severity. The clinical presentation and the pattern of infectious skin diseases depend on the type of causative pathogen, the layers and structures of the skin, and the underlying medical condition of the patient [3]. Although the prescribed accessible drugs have been applied for the medication of skin

diseases, many adverse effects of the drugs, for example skin irritation, erythema, pruritus, staining, and skin cancers can possibly occur [4].

Natural products and traditional medicines are valuable for the treatment and prevention of various diseases [5]. They are gaining popularity as alternative treatments for common skin conditions [6]. Natural medicines from plants have been continuously prominent due to many advantages, including fewer side effects, being inexpensive, and acceptable use for a long time. Moreover, medicinal plants are also applicable raw materials for the synthesis of novel therapeutic agents. Several plants, such as *Aloe vera* (L.) Burm.f., *Azadirachta indica* A.Juss., *Calendula officinalis* L., *Cannabis sativa* L., *Portulaca amilis* Speg., and others, have been investigated for the treatment of skin diseases ranging from itching to skin cancer and have been reported to be effective in various skin diseases [7]. One hundred and six plant species are utilized in the local communities of Northern Pakistan to treat skin problems such as wound healing, skin burns, boils, pimples, inflammatory abscesses, etc. [8].

Phytochemical substances are found in plants that are utilized to treat skin problems. Plant constituents, or phytoconstituents, are divided into primary and secondary metabolites depending on their activity in a basic metabolic process. Secondary metabolites have been demonstrated to have a variety of biological effects, providing a scientific foundation for the use of herbs in traditional medicine in many ancient cultures. Secondary metabolite classes include phenolics, lipids, saponins, carbohydrates, alkaloids, and terpenes according to their chemical structures [9]. Some phytochemical compounds used to treat skin diseases, including mangiferin, lutein, curcumin, resveratrol, embelin, naringenin, quercetin, lycopene, gingerol, and apigenin, as well as their mechanism of action against skin disorders such as inflammation reduction, reduction of skin infection, wound healing, treating skin cancer, and reducing skin aging have been reviewed [10].

Traditional healers are significant for public health in Thai communities, and many individuals have confidence in the healing attributes of herbal medicine [11]. The folk healer is one of the important sources for determining the use of herbal medicine for treating people in the local area, and it will be the initiation process for searching for the prominent plants. This study focused on the Songkhla province due to its large area in the south of Thailand. Although elderly folk healers in Songkhla actively cooperated, their wisdom has been transferred in a limited manner [12]. The ethnomedicinal surveys on plants used for disease treatment in Songkhla were documented [12,13,14,15]. However, there is no systematic ethnomedicinal study attended to polyherbal prescriptions used by traditional healers for the remedy of skin disorders in this area. This study aimed to determine the traditional knowledge and examine the utilization of medicinal plants for skin disease treatment by traditional healers in the Songkhla province, in the south of Thailand.

Totally, 66 plant species and one animal material (*Sepia* spp. cuttlebone) were included in the 25 prescriptions of herbal remedies. The plants were classified into 61 genera and 38 families (Table 2). In regard to the numbers of plant species used in the families, Fabaceae, Rubiaceae, and Zingiberaceae (7.6%) were the most notable families, followed by Acanthaceae (6.1%), as shown in Table 3. The plants in the Fabaceae family included *Acacia catechu* (L.f.) Willd., *Entada rheedii* Spreng., *Pterocarpus indicus* Willd., *Senna alata* (L.) Roxb., and *Senna siamea* (Lam.) Irwin & Barneby. *Mitragyna speciosa* (Roxb.) Korth., *Uncaria gambir* (Hunter) Roxb., *Prismatomeris tetrandra* (Roxb.) K. Schum, *Hydnophytum formicarium* Jack, and *Ceriscoides turgida* (Roxb.) Tirveng. were in Rubiaceae, while those in the Zingiberaceae consisted of *Zingiber montanum* (J.Koenig) Link ex A.Dietr., *Curcuma zedoaria* (L.) Roscoe ex Sm., *Curcuma longa* L., *Zingiber zerumbet* (L.) Roscoe ex Sm., and *Curcuma aromatica* Salisb. Fabaceae and Zingiberaceae are well known among plants used in traditional medicine. The study of medicinal plants used in Thai traditional medicine in modern healthcare services reported 89 medicinal plant species. The plants belonged to 37 families, with the highest numbers of medicinal plant species being Zingiberaceae (11 species) and Fabaceae (10 species) [21]. Similarly, Zingiberaceae, Fabaceae, and Rubiaceae were the major families of plant species used and cited by traditional healers in the Patthalung province, in the south of Thailand [11]. In addition, five plant species in the Fabaceae family and three species in the Rubiaceae family were used in herbal remedies for skin diseases treated by a folk healer in the Songkhla province. Thai traditional medicines as well as drugs developed from medicinal plants are included in the national list of essential medicines. The traditional healer is one of the most essential sources for determining the usage of herbal medicine for treating individuals in the community. The results from this study represent the polyherbal remedies used by experienced folk healers for the treatment of skin disorders in the Songkhla province, in the south of Thailand. Ethnopharmacological expertise is abundant among traditional healers. They have significant knowledge of many plant species used for a variety of skin disorder treatment. The utilization of medicinal plants was widespread in the prescriptions, with 66 species in 38 families. The poultice was the most frequent method of administration. The most prominent plant families were Fabaceae, Rubiaceae, and Zingiberaceae. The highest use values were reported for *Oryza sativa* L. and *Zingiber montanum* (Koenig) Link ex Dietr. Based on RFC, the highest was found for *Curcuma longa* L., *Eurycoma longifolia* Jack, *Knema globularia* (Lamk.) Warb, and *Senna siamea* (Lam.) Irwin & Barneby. Although local treatment of herbal prescriptions and ethnobotanical surveys are

underway, more research on phytochemicals and their pharmacological activities is needed to ensure the application of polyherbal prescriptions used by traditional healers, as well as product development in herbal medicine for the treatment of skin diseases, in order to promote the sustainable and safe use of natural resources.[16]

III. RESULTS

A Folk Knowledge on Medicinal Plants Used for the Treatment of Skin Diseases in Bhadrak District of Odisha, India

Herbal and natural products of folk medicine are practiced for centuries in almost all cultures worldwide. However, in most of the world countries, especially those in the African continent, Asia and South and Central America, the majority of the population (roughly 80%) still relies to a great extent on herbal medicine for their primary healthcare [1,2]. Moreover, in developing countries and rural societies, the use of medicinal plants is both a valuable resource and a necessity, and furthermore a real alternative for prevention of diseases. Despite the great progress in commercial drugs, the increasing confidence in alternative therapies (especially herbal therapies), even in western countries, stems from the fact that some of these remedies have so far proven to be very effective in countries like France and Germany [3]. It is suggested that many conventional drugs prescribed worldwide are exclusively of plant based [4,5]. Examples include salicylic acid, which upon acetylation produces aspirin, which is isolated from the bark of *Salix caroliniana*, anticancer drug Taxol isolated from *Taxus brevifolia*, the pain killer morphine and the anti-cough codeine from *Papaver somniferum* etc. [6]. However, scientists and medical professionals have found that the herbs themselves, which possess unique combinations of chemical components, are more effective than the chemical derivatives [7]. Herbalists and indigenous healers have used botanical medicines traditionally for the prevention and treatment of different ailments. Traditional knowledge that is developed through the combined experience of many generations and still practiced in many tribal and rural societies develops their own medical practices by trial and error method [8]. In every period, every successive century from the development of humankind and advanced civilizations, the healing properties of certain medicinal plants are identified, noted, and conveyed to the successive generations. The benefits of one society were passed on to another, which upgraded the old properties, discovered new ones, till present days. Consequently, historical texts from medical traditions in various countries of the world such as India, China, Egypt, Greek, Roman and Syria bring new insight into plant usage and become established as a rewarding tool for ethnopharmacological research. In India a number of studies have been in use, under indigenous systems of medicine like Ayurveda, Sidha and Unani. Ayurvedic texts viz., Charak Samhita, 'Sushrut Samhita', Sarangadhara Samhita, Bhavaprakasha Samhita, Satmya Darpan Samhita, Vaisajya Ratnabali, *Rasatarangini* etc. explain numerous remedies to treat different ailments. Indeed, many plant based medicines are still in demand for a variety of diseases like congestive cardiac failure, bronchitis, inflammatory conditions and other ailments [6,9-12]. Skin diseases are one such common disorder, effecting people worldwide, particularly in rural areas of developing countries due to poor sanitation and inattentiveness to dietary food supplements [13]. It is found in all ages with an incidence of 34% of all occupational diseases [14]. Common skins ailments include eczema, leucoderma, ringworm, itching, wound, scabies, swelling and many others without distinct symptoms and are caused by a variety of microorganisms and uncomfortable environment [15]. Micro-organisms responsible for skin infections can be bacterial, fungal, parasitic or viral in nature. Many allopathic drugs prescribed for skin diseases have adverse effects. Consequently, there is an increased interest and confidence in alternative therapies, like phytomedicine, in the treatment of skin ailments [16]. Currently, many natural products from plants have been used by various cultures all over the world to treat skin diseases or their symptoms caused by micro-organisms [17]. Although efforts are on to document ethnobotanical information for the treatment of skin ailments in different parts of India [17-23], reports from Bhadrak district of Odisha, India is nil. Therefore, the current investigation aims to, identify, collect and document the medicinal plants traditionally used for the treatment of skin disorders in Bhadrak district of Odisha, India. Documentation of traditional ethnomedicinal knowledge, indigenous herbal preparation for skin ailments could help in preserving knowledge and creating awareness regarding the need for conservation of biological resources.

Data on medicinal uses of plants are arranged alphabetically in the following sequence: scientific name, family, habit, vernacular name if any, parts used and modes of use.

Abutilon indicum (L.) Sweet. (Malvaceae) Habit: Herb, Local Name: Pedipedika

Fresh leaves are applied externally on the skin thrice daily to treat the ringworm infection.

Acalypha indica L. (Euphorbiaceae), Habit: Herb

To treat skin diseases leaf paste is used twice daily for a period of one week.

Achyranthes aspera L. (Amaranthaceae), Habit: Herb, Local Name: Apamaranga

To reduce the pain of the skin infected with worms as well as to expel the dead worms out, burned root ashes are applied topically.

Aegle marmelos (L.) Corr. (Rutaceae), Habit: Tree, Local Name: Bela

Paste prepared from leaf is applied topically over the skin twice daily to get relief from itches.

Allium cepa Linn. (Liliaceae), Habit: Herb, Local Name: Pijaja

Bulb paste mixed with turmeric powder is applied on itching affected area twice daily.

Amaranthus spinosus L. (Amaranthaceae), Habit: Herb, Local Name: Kanta saga

Warmed leaves are applied locally thrice daily for 5 days to cure boils and burns.

Anacardium occidentale L. (Anacardiaceae), Habit: Tree, Local Name: Saitamba

Oil extracted from the seed is effective for the treatment of skin diseases.

Andrographis paniculata (Burm. f.) Wall. ex. Nees. (Acanthaceae), Habit: Herb, Local Name: Chireita

To treat leprosy, scabies, eczema and ringworm infection, paste made from leaf is applied topically twice daily till cure. Plants are grinded into powder; pills are prepared with honey and taken internally for warts.

Annona reticulata L. (Annonaceae), Habit: Tree, Local Name: Atta

Crushed leaves or a paste is poulticed on boils, abscesses and ulcers.

Annona squamosa L. (Annonaceae), Habit: Tree, Local Name: Neua

Paste made from leaf is gently warmed and applied locally for early maturation of boils.

Argemone mexicana L. (Papaveraceae), Habit: Herb, Local Name: Kantakusum

Fresh leaves are ground to paste; the paste is applied topically to treat eczema.

Artocarpus lacucha Roxb. Ex Buch.-Ham. (Moraceae), Habit: Tree, Local Name: Jeutha

Bark when applied externally draws out purulent matter, heals boils, cracked skin and pimples.

Azadirachta indica A. Juss. (Meliaceae), Habit: Tree, Local Name: Neem

Leaves along with turmeric powder are made into a paste. This is applied topically for skin infection, small pox and chicken pox. Seed oil is applied locally for eczema.

Basella Alba L. (Basillaceae), Habit: Climber, Local Name: Poi

Leaf is rubbed over the affected part to cure irritation and swellings due to caterpillar.

Boerhavia diffusa L. (Nyctaginaceae), Habit: Herb, Local Name: Goudapuruni

Decoction of leaf boiled in coconut oil is applied locally twice daily to treat scabies and ringworm infection.

Brassica compestris Hook. f. and Thomas. (Brassicaceae), Habit: Herb, Local Name: Sorisha

The seeds are crushed and the paste is applied locally to cure skin diseases.

Buchnanian lanzan Spreng. (Anacardiaceae), Habit: Tree, Local Name: Chara

The root and bark made into paste, the paste is applied topically on chronic wounds.

Butea monosperma (Lam.) Taub. (Fabaceae), Habit: Tree, Local Name: Palas

Paste of seed is applied topically for the treatment of skin diseases.

Calophyllum inophyllum L. (Clusiaceae), Habit: Tree, Local Name: Polanga

Oil prepared from seed is applied topically for scabies and eczema.

Calotropis gigantea R. Br. (Asclepiadaceae), Habit: Herb, Local Name: Dhala Arakha

Latex mixed with turmeric powder is warmed in coconut oil and the extract is applied locally to treat eczema. Fresh milky latex is applied topically twice daily for 7 days to cure scabies.

Cassia alata L. (Fabaceae), Habit: Herb

Decoction of leaf is applied topically to treat ringworm infection.

Cassia fistula L. (Caesalpiniaceae), Habit: Tree, Local Name: Sunari

Leaf paste is applied externally thrice daily for three days to treat injuries/ wounds on the skin.

Cassia occidentalis L. (Caesalpiniaceae), Habit: Herb, Local Name: Chakunda

About 1 gm powder made from dried fruits and seeds with 5-10 ml seed oil of this plant are applied locally to cure scabies.

Cassia tora L. (Caesalpiniaceae), Habit: Herb, Local Name: Bana chakunda

Paste of leaves is applied for skin disease.

Cissampelos pareira L. (Menispermaceae), Habit: Climber, Local Name: Akanbindhi

Gently warmed leaf is kept on wounds to draw out purulent matter.

Clerodendrum inerme (L.) Gaertn (Verbenaceae), Habit: Herb, Local Name: Phuljholi

Paste made from leaf is very effective for skin inflammation, scabies and ringworm infection.

Couroupita guianensis Aubl. (Lecythidaceae), Habit: Tree, Local Name: Nagalinga Leaf paste is applied topically to cure skin disease.

Croton sparsiflorus Morong. (Euphorbiaceae) Habit: Herb, Local Name: Nandababulii

7-8 leaves are crushed in palm and its juice is applied over the cut for blood clotting.

Datura metel L. (Solanaceae), Habit: Herb, Local Name: Kaladudura

To treat pimples and other infections, leaves gently heated on flame are applied topically over the face once daily for a week.

Eclipta alba (L.) Hassk. (Asteraceae), Habit: Herb, Local Name: Bhrungaraj

Paste made from leaf is applied topically for ringworm infection. The Leaves are boiled with coconut oil and the extract is applied on head for seven days to treat dandruff.

Euphorbia hirta L. (Euphorbiaceae), Habit: Herb, Local Name: Hariharika

Latex is effective for healing of wounds.

Ficus religiosa L. (Moraceae), Habit: Tree, Local Name: Aswastha

Stem latex is applied locally on the foot twice daily for healing cracks and fissures.

Flacourtia indica (Burm. f.) Merr. (Flacourtiaceae), Habit: Shrub, Local Name: Bainchaikoli

Stem bark paste is rubbed over the skin for the treatment of eczema.

Glinus oppositifolius (L.) A. DC. (Molluginaceae), Habit: Herb, Local Name: Pitasaga

Whole plant is used either in raw or cooked form to cure various types of skin disease like scabies, itches etc.

Gmelina arborea Roxb. (Verbenaceae), Habit: Tree, Local Name: Gambhari

Decoction of root bark is used for washing and healing of septic wounds.

Holarrhena pubescens (Buch-Ham) Wall. ex G. Don. (Apocynaceae), Habit: Tree, Local Name: Kerua

Paste prepared from root is applied on cut, wound, abscess and boils.

Jatropha curcas L. (Euphorbiaceae), Habit: Shrub, Local Name: Lankajada

Paste prepared from leaf is applied topically to treat eczema, scabies and ringworm infection.

Justicia adhatoda Burn. f. (Acanthaceae), Habit: Shrub, Local Name: Dhalabasanga

Paste prepared from leaf is applied topically for scabies and ringworm infection.

Lantana camara L. (Verbenaceae), Habit: Shrub, Local Name: Nagaairi

Fresh leaves are applied on the affected part to cure insect stings, skin eruptions, and itch of measles.[17]

Lawsonia inermis L. (Lythraceae), Habit: Shrub, Local Name: Manjuati

Paste prepared from leaf is applied on cuts and wounds for a week.

Leucas aspera (Willd.) Link. (Lamiaceae), Habit: Herb, Local Name: Gayasa

Paste prepared from leaf is applied topically for ringworm infection.

Mangifera indica L. (Anacardiaceae), Habit: Tree, Local Name: Amba

Gum is gently heated and applied locally to treat cracks of soles. The tender stem is warmed in

slow flame and the oozing foam like juice is put to cuts, wounds, and cracks of the heels.

Michelia champaca L. (Magnoliaceae), Habit: Tree, Local Name: Champa

Cleaning of hair with leaf decoction helps in removing lice and dandruffs. Powder prepared from sun dried stem bark mixed with coconut oil is effective for treatment of skin diseases.

Mimosa pudica L. (Mimosaceae), Habit: Herb, Local Name: Lajakuli

The paste prepared from leaves is effective for eczema. A handful of entire plant paste is applied on cuts and wounds to promote healing.

Ocimum sanctum L. (Lamiaceae), Habit: Herb, Local Name: Tulasi

Leaf paste is applied daily once daily on ringworm affected area till it cures. Leaf paste is very effective for treating wounds of leprosy.

Peperomia pellucida (L.) Kunth. (Piperaceae), Habit: Herb

The paste prepared from leaves is applied over wounds.

Phyllanthus emblica L. (Euphorbiaceae) Habit: Tree, Local Name: Aonla

Barks are sundried and boiled with coconut oil; the extract is applied topically for scabies.

Piper nigrum L. (Piperaceae), Habit: Climber, Local Name: Golmaricha

Leaf paste is externally applied twice daily to treat the ringworm infection.

Plumbago zeylanica L. (Plumbaginaceae), Habit: Shrub, Local Name: Chintamani

Fresh leaves paste is applied externally to treat eczema, scabies and ringworm infection.

Pongamia pinnata (L.) Pierre. (Fabaceae), Habit: Tree, Local Name: Karanj

Powder made from the sun dried barks is gently boiled with coconut oil and the extract is applied topically to treat eczema, scabies and ringworm infection.

Portulaca quadrifida L. (Portulacaceae), Habit: Herb, Local Name: Balbalua

Whole plant decoction is effective to skin diseases. *Rauvolfia tetraphylla* L. (Apocynaceae), Habit: Shrub

The juice prepared from whole plant along with castor oil is applied externally to treat skin diseases.

Schleichera oleosa (Lour.) Oken (Sapindaceae), Habit: Tree, Local Name: Kusum

Stem bark is grinded into a paste and applied over skin as curative against itching. Oil is extracted from the seed and applied locally for gout and scabies. Seed paste is slightly warmed and applied over the cuts to prevent pain and to cure white patches on the skin.

Solanum nigrum L. (Solanaceae), Habit: Herb, Local Name: Nunununia

Leaf paste or juice is applied on ringworm affected area for 3-4 days.

Tephrosia purpurea (L.) Pers. (Fabaceae), Habit: Shrub, Local Name: Banakulathi

Paste of the whole plant is applied topically to treat injuries.

Tridax procumbens L. (Asteraceae), Habit: Herb, Local Name: Bisalyakarani

Decoction of leaf is applied topically on the boils, cuts, sores, wounds and eczema to promote healing.

Vernonia cinerea (L.) Less. (Asteraceae), Habit: Herb, Local Name: Poksunga

Leaf paste is used for the treatment of skin disease, threadworm infection and wounds.[16]

The plant species used as phytocure for skin diseases in Bhadrak district of Odisha, India include 57 species representing 34 families. The majority of abundant were species belonging to the family Euphorbiaceae (5) and Fabaceae (4). The remaining families were represented by fewer species. The most frequently mentioned plants being used were *Andrographis paniculata* (Burm. f.) Wall. ex. Nees., *Annona squamosa* L., *Azadirachta indica* A. Juss., *Calophyllum inophyllum* L., *Cissampelos pareira* L., *Croton sparsiflorus* Morong., *Glinus oppositifolius* (L.) A. DC., *Lantana camara* L., *Ocimum sanctum* L., *Pongamia pinnata* (L.) Pierre. and *Tridax procumbens* L. The analysis of the recorded medicinal plants based on growth habits showed highest proportion of herbs with 28 species (49.1%), followed by 18 trees (31.6%), 8 shrubs (14%) and 3 climbers (5.3%). Leaves were utilized more often constituting 55.9%, followed by bark (10.2%), seeds and whole plant (8.5%) each, and the remainders were root, latex, bulb, and gum.

IV. CONCLUSION

Skin health is fundamental to total health. The skin, along with the hair, glands and nails is the part of the integumentary system, the largest and most versatile organ system in the body [17]. It serves to protect our bodies from our external environment but is extremely susceptible to microbes that influence human health. Plants have traditionally served as man's most important weapon against pathogens. In aboriginal system of traditional medicines, people have been heavily dependent on plant products and have believed in their various remedial properties for a very long time. In certain areas, these folk medicinal prescriptions are endemic and have survived over hundreds of years. This traditional knowledge accumulated over the years is improved upon and disseminated orally from one generation to another in the form of folklore and folk sayings and contributed to the accumulation of a complex wealth of knowledge and skills. The most cited plant species to cure skin disorders in the current investigation are, *Azadirachta indica* A. Juss., followed by *Cassia tora* L., *Annona squamosa* L., *Pongamia pinnata* (L.) Pierre, *Lantana camara* L., *Tridax procumbens* L., *Argemone mexicana* L., *Calophyllum inophyllum* L., *Andrographis paniculata* Nees., *Amaranthus spinosus* L., *Bauhinia variegata* L., *Butea monosperma* (Lam.) Taub. Similar plant use

is recorded earlier in different parts of India [15] indicating the importance of traditional medicine in the treatment of skin disorders. Moreover, these reports differ in the parts of the plant used or in preparation and mode of use. For instance, bark of *Achyranthes aspera* is used by the people of Gujarat for skin diseases (itching) root paste of *Cassia fistula* and whole plant extract of *Eclipta prostrata* is used for skin disease by Tribals of Bankura Districts, West Bengal *Cissampelos pareira* root paste is used by the people of Villupuram district of Tamil Nadu for wound healing and skin disorders fresh and dried fruits of *Phyllanthus emblica* is used by the people of Assam and Manipur for the treatment of skin diseases whole Plant of *Tridax procumbens* is used by the inhabitants of Varanasi, Uttar Pradesh for boils, cuts and wounds, eczema and skin disorders Similarly, various workers have reported the effective use of several herbal remedies for skin ailments and have confirmed potentials for *Acalypha indica* and *Plumbago zeylanicum* *Amaranthus spinosus* *Buchanania lanzan* *Ficus religiosa* *Flacourtia indica* *Michelia Champaca* and *Solanum nigrum* External applications are more preferred for the management of skin disorders Of the reported growth forms, herbs make up the highest proportion of the medicinal species. Literatures on medical ethnobotany explain the potential use of herbs for the treatment of diseases and could be attributed to their wide range of bioactive ingredients In the present study leaves are predominantly utilized in herbal medication followed by fruit, root and whole plant. These findings are also similar to other countries including India [16] The results suggest that the people of Bhadrak district possessed quite extensive knowledge of the medicinal properties of plants that they used for treatment of skin ailments. The emergences of increasingly pathogenic and resistant microbes have stimulated a search for safer and more natural alternatives to the current conventional treatment methods. Thus the wealth of medicinal plants points to a great potential for research and the discovery of new drugs to fight skin diseases.[17]

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*Corresponding Author Dubale Suhas Dattatrya (B Pharm) At. Muggavon Post. Pimpalner (G) Tq Beed Dist Beed 431122.
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