ISSN: 2377-6196
The American Journal of
SCIENCE AND MEDICAL RESEARCH, 3(3), 1-7

Research Article Open Access

Medicinal Plants Used By Traditional Medicine Practitioners In The Management Of HIV/AIDS-Related Diseases In Tribal Areas Of Adilabad District, Telangana Region

Swapna Gurrapu[1] and Estari Mamidala[2]*

[1-2] *Infectious Diseases Research Lab, Department of Zoology, Kakatiya University, Warangal – 506 009. Telangana State, India.*

Email: swapnagurrapu@kakatiya.ac.in, drestari@kakatiya.ac.in

Abstract

Sexually transmitted infections have been of major concern recently due to their association with the Human Immunodeficiency Virus and Acquired Immunity Deficiency Syndrome (HIV/AIDS). The study area (tribal areas of Adilabad district) has the highest HIV infection rate in Telangana region of India, which made them more prone to a wide range of infections. Information was obtained from the traditional healers and other experienced persons, having some knowledge on medicinal plants. A total of seven lay people, were interviewed on their knowledge of medicinal plants used to treat symptoms of HIV and opportunistic infections like diarrhoea, coughing, malaria, skin rashes and tuberculosis. Forth-three plant species from 31 families were recorded in the present survey for the treatment of 7 different infections and symptoms of HIV disease. The most plant parts used were leaves (32.5%), followed by fruits (25.5%), seeds (18.6%), bark (13.95%), whole plant (9.3%) and stem (6.7%). Leaves ranked the highest, especially for use in topical preparations. Oral administration was the most frequently used route of administration. Further research is needed to isolate and identify the active chemical compounds present in those plants and understand their modes of action.

Keywords: HIV/AIDS, Adilabad, Traditional healers, Telangana, Sexually transmitted Infections

INTRODUCTION

Globally in 2015, there were 2.1 million new HIV infections (1.8 million to 2.4 million), 36.2 million prevalent HIV cases (34.0 million–39.8million), and 1·1 million HIV deaths (940 000–1.3 million) (UNAIDS, 2016). National AIDS Control Organisation (NACO), Ministry of Health and Family Welfare, Government of India periodically undertakes HIV estimations to provide the updated information on the status of HIV epidemic in India. The first HIV estimation in India was done in 1998, while the last round was done in 2015. The Indian National AIDS Control Organisation (NACO) estimated that approximately 21.17 lakhs people were living with HIV and have around 86 thousand new HIV infections in India in 2015 (NACO, 2016). Undivided Andhra Pradesh and Telangana have the highest estimated number of people living with HIV (3.95 lakhs) followed by Maharashtra (3.01 lakhs), Karnataka (1.99 lakhs) and other states (NACO, 2016).

Since ancient times, several societies have resorted to nature, mainly to plants as medical and health sources. Today, a great percentage of the world population, particular in developing countries, uses plants for facing primary needs of medical assistance (Tene et al, 2007). Human beings have used plants for medicinal purposes for centuries. It has been estimated that such use of medicinal plants possibly go back in time to around 3000 years B.P (Sofomora, 1982). Traditional forms of medicine have existed and still exist in many countries of the world including countries in the Indian subcontinent like India, Pakistan and Bangladesh. The various alternative medicinal systems of India (Ayurveda, Unani, Siddha) uses more than 7500 plant species (Mukherjee and Wahile, 2006). Documentation of these traditional medicinal systems is important as a number of important modern

How to Cite this Article:
Swapna Gurrapu and Estari Mamidala (2016). Medicinal Plants Used By Traditional Medicine Practitioners In The Management Of HIV/AIDS-Related Diseases In Tribal Areas Of Adilabad District, Telangana Region. *The Ame J Sci & Med Res*, 3(3):1-97. doi:10.17812/ajsmr3301.

Received: 30 May 2017; Accepted:2 July 2017;
Published 12 July 2017

pharmaceuticals have been derived from plants used by indigenous people.

Despite the rollout of antiretroviral therapy (ART), Cataldo et al (2015) stated that the HIV-infected persons still seek treatment from traditional healers. Thus, although some western trained health care providers remain suspicious of traditional healers, most agree that traditional healers play an important and complementary role in the provision of effective HIV prevention or treatment (Burnett et al, 1999). Kaboru (2007) also found that many biomedical health practitioners believe that traditional healers can help control HIV/AIDS. Undoubtedly, several patients seek herbal remedies for conditions related to acquired immune deficiency syndrome (AIDS) before seeking care at health centres (Munthali, 2011). This is because there are many deficiencies in the provision of biomedical services for STIs and HIV/AIDS in India (Kaboru, 2007). Moreover, traditional healers have good knowledge of STIs (Ndulo et al, 2001). Most of them use herbal preparations in the form of roots or powders administered orally to induce diarrhoea, vomiting, and diuresis. However no survey has been done in tribal areas of Adilabad district to document the medicinal plants used to treat various infectious diseases. The aim of the present study was to collect ethnomedicinal knowledge from lay people in tribal areas of Adilabad district, Telangana State for the application of medicinal plants as a treatment for HIV/AIDS related diseases. This is the first survey done in this region which specifically focuses on these diseases.

MATERIALS AND METHODS

Study Area:

The study area is depicted in fig-1. Adilabad district lies between 77^0 47' and 80^0 0' of the eastern longitudes and 18^0 40' and 19^0 56' of northern latitudes. The district is bounded on North by Yeotmal, on the East by Chanda districts of Maharashtra and on the South by Karimnagar and Nizamabad and on the West by Nanded district of Maharashtra State. As of 2011 Census of India, the total population of the district was 27,41,239 (Telangana State Portal, 2014) out of which the tribal population is 5,12,602 (Census of India 2011). Among scheduled tribes Gonds, Lambada, Kolams, Pradhans, Manne, Naikpods, Thoties, Yerikalas, Koyas are the major communities in Adilabad District, Telangana State, India. It is the second largest district in the Telangana state, including the inhabited and 167 uninhabited village and 11 towns. There are 7 Municipalities in the District. The District is conveniently formed into 5 divisions 1) Adilabad, 2) Nirmal, 3) Utnoor, 4) Asifabad and 5) Mancherial. Forest in the district covers 44.8 percent of the total area, whereas its famous trees, teak covers 58.49 percent of the whole forest. The district has population of 2,741,239 which accounts for 3.13% of the total population of the State.

Figure 1. Study area – Adilabad district located in Telangana State, India.

Ethnobotanical Data Collection:

The ethnobotanical survey was carried out during June-July 2016 to obtain information on medicinal plants traditionally used to treat HIV/AIDS-related diseases in the study area and the using methods similar to our previous studies (Prasad Paindla et al, 2013; Rajendra Prasad Gujjeti and Estari Mamidala, 2012). A total of seven lay people, were interviewed on their knowledge of medicinal plants used to treat symptoms of HIV and opportunistic infections like herpes zoster, diarrhoea, coughing, malaria, meningitis, and tuberculosis. Before conducting interviews the objective of the study was clarly explained and a form of consent was signed from the knowledge holders. The questionnaire was designed to obtain information about the locality; socio-demographic details (age, gender and educational background); HIV/AIDS-related diseases treated by the plants, vernacular names of plants mentioned, parts used, method of preparation, dosage forms and method of administration. The focus of the survey was to determine which plants that are growing in and around the traditional healers are used to treat HIV/AIDS-related diseases. Plant species recorded in the survey were collected and the voucher specimens have been deposited in the herbarium of the Department of Zoology, Kakatiya University, India. Identities of plants sampled were authenticated by senior taxonomist from the Department of Botany, Kakatiya University, India.

RESULTS

Plants to treat HIV/AIDS-related diseases

The Medicobotanical study has identified 43 plants belonging to 31 families, which are used in the treatment

Table-1. Medicinal plants used for the treatment and management of HIV/AIDS-related diseases by traditional healers of Adilabad district.

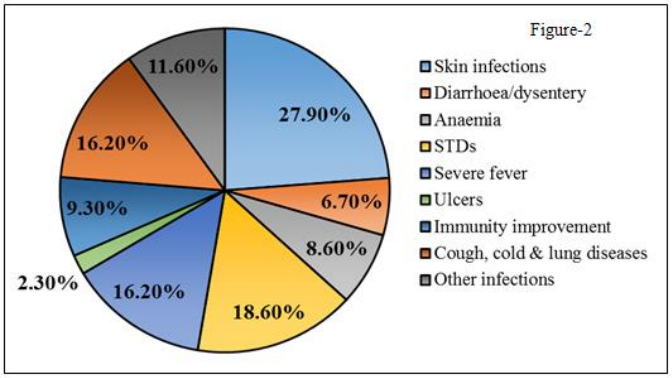
S. No	Botanical Name	Common Name	Family	Part Used	Medicinal Uses
1	*Adhatoda vasica*	Malabar nut	Acanthaceae	Leaves	Treatment of cold related diseases and skin infections
2.	*Aegle marmelos*	Bilva	Rutaceae	Fruit	Treatment of Chronic diarrhoea
3.	*Andrographis paniculata*	Neelavemu	Acanthaceae	Leaves	Treatment of Anaemia, Immunity development
4.	*Aquilaria agallocha*	Agarwood, agaru	Thymelaeceae	Stem-bark	Removing coldness
5.	*Asparagus racemosus*	Shatavari	Asparagaceae	Tuberous Roots	Treatment of gastric ulcers and dyspepsia
6.	*Bambusa arundinacea*	Bamboo	Poaceae	Leaves	Reduces inflammation
7.	*Boerhaavia diffusa*	Punarnava	Nyctaginaceae	leaves	Pain relief
8.	*Calotropis procera*	Rubber bush, apple of Sodom, Arka	Asclepiadaceae	Leaves, roots, latex	Treatment of skin blemishes, Antidiarrheal and anti-syphilitic properties
9.	*Cinnamomum tamala*	Indian Bay Leaf	Lauraceae	Leaves	Immunity development
10.	*Cinnamomu zeylanicum*	Cinnamon	Lauraceae	Inner bark, leaves	Relieve of Respiratory, digestive and gynaecological ailments
11.	*Curcuma zedoaria*	White turmeric	Zingiberaceae	Roots, rhyzomes	To treat Inflammation, Wounds, skin diseases
12.	*Cyperus rotundus*	Garika	Cyperaceae	Leaves	Wound healing
13.	*Desmodium gangeticum*	ticktrefoil	Fabaceae	Root, Bark and Leaves	To treat Fever and kidney disorders
14.	*Dioscorea bulbifera*	air potato, adavidumpa	Dioscoreaceae	Tuber, bulbils	To treat skin infections and Antidiabetic
15.	*Elettaria cardamomum*	Elaki,cardamom	Zingiberaceae	Seed	Treatment of Colic and disorders of the head
16.	*Gmelina arborea*	Peddagumudutekku ,gamhar	Verbenaceae	Whole plant	To treat fevers and urinary discharge
17.	*Inula racemosa*	puskaramul	Asteraceae	Root	Treatment of cardiovascular and respiratory problems
18.	*Leptadenia reticulata*	Jiwanti	Asclepiadaceae	whole plant	Treatment of Skin Infections
19.	*Martynia diandra*	cat's claw	Martyniaceae	Leafs and roots	Treatment of Tuberculosis and sore throat
20.	*Mesua ferrea*	Cobra saffron, Indian rose chestnu	Calophyllaceae	Fruits, Seeds, Flowers	Treatment of fever, vomiting, urinary tract disorders
21.	*Nymphoea stellata*	Blue lotus,star lotus,water lily	Nymphaeaceae	seeds	Treatment of Sexually transmitted infections
22.	*Ocimum sactum*	Tulasi	Lamiaceae	Leaves	To treat Skin rashes

23.	*Oroxylum indicum*	midnight horror, Indian trumpet flower	Bignoniaceae	Seed, root bark	To remove the tumour's and skin infections
24.	*Phaseolus trilobus*	Wild gram	Leguminosae	Leaves and fruit	To treat Fever and cough. It is also used in eye-diseases
25.	*Phyllanthu Amarus*	Nalla Usiri	Phyllanthaceae	Fruit	To treat Viral fever
26.	*Phyllanthus niruri*	Nela Usiri	Phyllanthaceae	Root, Stem, Seed	To develop Immunity and treatment of Kidney diseases
27.	*Phyllanthus Emblica (Emblica officinalis)*	Amla	Phyllanthaceae	Fruit	Treatment of STD's & Skin diseases
28.	*Piper longum*	Pippallu	Pipereceae	Fruit	Treatment of Lung infections, Digestive problems
29.	*Pistacia integerrima*	zebrawood	Anacardiaceae	fruit	Treatment of cough, asthma, fever, vomiting, and diarrhea
30.	*Premna Integrifolia*	Agrau	Verbenaceae	Root bark, leaf	Treatment of cardiovascular disease, STD'S
31.	*Pueraria tuberosa*	Indian kudzu	Fabaceae	Tubers	Treatment of Urinary disorders
32.	*Santalum album Linn*	Sandalwood	Santalaceae	Wood and Oil	Treatment of skin diseases, fever and headache
33.	*Sida cordifolia*	Country Mallow	Solanaceae	Root, seeds	To treat Weight loss, cold and headache
34.	*Solanum indicum Linn*	Poison Berry, Indian Nightshade,tomato	Solanaceae	root , fruit	Treatment of respiratory disorders
35.	*Solanum xanthocarpum*	Yellow-fruit nightshade	Solanaceae	Whole plant	Treatment of Diabetes, arthritis, gonorrhoea
36.	*Stereospermum suaveolens*	Rose Flower Fragrant	Bignonaceae	Root, bark, flower, seed, leaf	To treat Neural and Liver diseases
37.	*Teramnus labialis*	Adavi Mahasaha	Fabaceae	Root, Whole Plant	To cure bleeding disorders and skin rashes
38.	*Terminalia chebula*	Myrobalan	Combretaceae	Fruit	Treatment of Cough, lung diseases, constipation
39.	*Tinospora cordifolia*	Tippatheega	Menispermaceae	Leaves	To treat STD's
40.	*Tribulus terrestris*	Puncture Vine, Goathead	Zygophyllaceae	fruits	Treatment of sexual dysfunction and various urinary disorders
41.	*Uraria picta*	Indian uraria	Fabaceae	Dried roots	To cure Heart disease, STD's
42.	*Vitis vinifera*	grape vine	Vitaceae	Leaves, fruit and the oil extracted from the seeds	To treat Cancer, skin and eye diseases
43.	*Withania sominifera*	Ashwagandha	Solanaceae	Stem-bark	Immunity development

of HIV/AIDS-related diseases and this data including the plants scientific names, vernacular names, families, parts used and medicinal uses as shown in Table-1. Forty-three plant species were recorded in the present survey for the treatment of 9 different HIV/AIDS-related diseases. These disorders include skin, diarrhoea, anaemia, ulcers, severe fever, Sexually Transmitted Infections, Immunity improvement, cold, cough and lung diseases and others. Of these 31 families, *Solanaceae* and *Fabaceae* are the most represented (9.3%) followed by *Phyllanthaceae*, (6.7%), *Asclepiadaceae*, *Zingiberaceae*, *Lauraceae*, *Verbenaceae*, *Bignoniaceae* (4.65%) and others represented by 2.32%.

Figure-2 presents the proportions of plant species used to treat various HIV/AIDS-related disease conditions: skin infections (27.9%), STDs (18.6%), cough, cold & lung diseases (16.2%), severe fever (16.2%), Anaemia (8.6%), Immunity improvement (9.3%), diarrhoea/dysentery (6.7%), Ulcers (2.3%) and other infections (11.6%).

Figure-2. Percentage use of plants to treat HIV/AIDS-related diseases



Plant parts used and routes of administration:

During plant collection, it was observed that some plants had more than one vernacular name due to the different local dialects used in the area. The medicinal use of certain plants or plant parts were commonly mentioned by informants. Thus, in some cases, especially shrubs and trees, the whole plant had medicinal application. Leaves and roots were the most frequently used plant parts, especially for topical application, constituting 32.5%, followed by fruits (25.5%), seeds (18.6%), bark (13.95%), whole plant (9.3%) and stem (6.7%) (Figure-3).

The recorded plant species were prepared in a variety of ways. The plant materials were used either fresh or dry in decoctions, macerations, pastes or powders. Administration of the different plant parts were mostly applied topically as a paste, powder, sap or latex on the affected part and followed by decoctions that were taken orally. The methods of preparation fall into few categories, i.e.,: plant parts applied as a paste (42%), juice extracted from the fresh plant parts (34%), powder made from fresh or dried plant parts (16%), some fresh plant parts (6%), and decoction (11%) (Figure-4).

Figure-3. Percentage of plant parts used

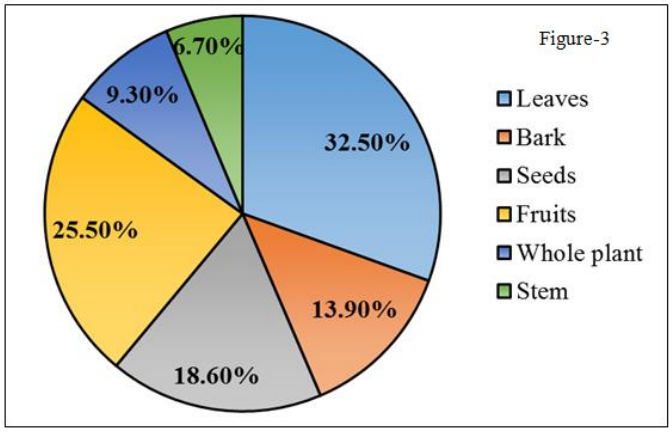
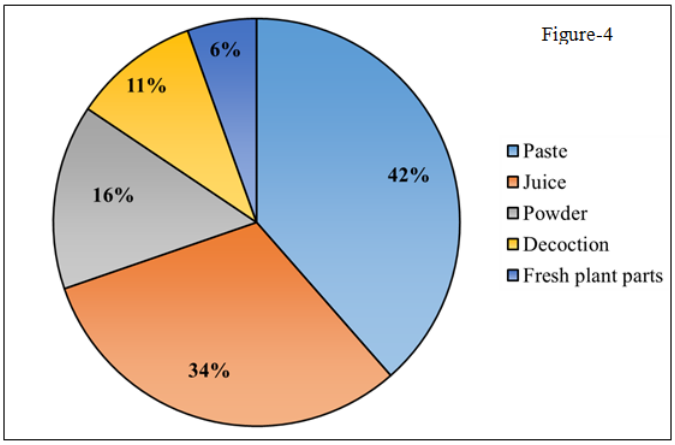


Figure-4. Percentage of plant preparation methods



External applications (mostly for skin diseases and wounds) and internal consumption of the preparations were involved in the treatment of diseases. It was observed that, most of the remedies consisted of single plant part and more than one method of preparation. However, many of the remedies consisted of different parts of the same plant species to treat single or more diseases. Children's dosages were usually less than those of adults. Baths were a popular way of treating rashes or itchy skin problems and steaming was used for acne. In most cases, the use of a given drug preparation was continued up to at least three days after a symptomatic relief was achieved. This was especially the case for oral dosage forms, to make sure that the infection was cleared.

DISCUSSION

Medicinal plants have important contributions in the healthcare system of local communities as the main source of medicine for the majority of the rural

population. Many reports estimated that about 80% of population in developing countries still relies on traditional medicine for their primary healthcare (WHO, 2011). The importance of families Anacardiaceae and Euphorbiaceae in sexually transmitted infections regimen has been reported by previous authors (Ajibesin *et al*. 2011, Chinsembu & Hedimbi 2010). There may be need to explore these families for their bioactive constituents, as well as Fabaceae and Apocynaceae, the highest frequency families in this study. In addition, the use-value of plant parts has implications for conservation of the species diversity. The leaves are regenerative, and their use in recipes offers the advantage in sustainable use of biodiversity over root and whole plant. Results obtained in this study compares favourably with findings by Steenkamp (2003) who reported the widespread use of root and bark remedies by South African women for gynaecological complaints. Similar findings were reported by Hedge et al. (2007) who noted the extensive use of root and bark remedies for treating reproductive ailments in India.

It was observed that some of the plants recorded in this survey are well known in the management of HIV/AIDS-related diseases worldwide despite diversity of plants and cultures. Rahmatullah et al. (2011) studied the medicinal plants used by folk and tribal medicinal practitioners of Bangladesh for the treatment of gonorrhea. According to his study, among a total of 96 plants from 54 families were *A. comosus, Jatropha curcas L., S. alata,* and *O. gratissimum.* Hedge et al. (2007) in a survey of medicinal plants of South Africa, reported the use of *A. sativum, Zingiber officinale Roscoe*, and *Citrus limon* (L.) Osbeck in the treatment of opportunistic fungal infections in HIV/AIDS. Allabi et al. (2012) also reported the efficacy of natural products in the treatment of HIV/AIDS. Traditional healers correctly cite symptoms associated with HIV/AIDS such as STDs, skin disorders, severe fever, ulcers and others. Many of the medicinal plants are locally available, especially in developing and underdeveloped countries. Also, plants are often less prone to the emergence of drug resistance. Due to all these advantages, plants continue to be a major source of new lead compounds. Medicinal plants have a long history of use and their use is widespread in both developing and developed countries.

Globally, there is an ongoing research interest on survey of medicinal plants with therapeutic values in diseases due to the prevalence of infectious diseases and resistance to drugs in developing countries. Qureshi et al. (2006) documented 27 plant species used for the treatment of diseases in the Gilgit District and surrounding areas of northern Pakistan. Phondani et al. (2010) documented 86 plant species from 43 families used in the treatment of 37 ailments by Bhotiya tribal communities of Central Himalaya, India. In a survey of medicinal plants used for the management and treatment of skin diseases and related ailments, Ajibesin (2012) recorded 183 medicinal plant species from 59 families in Akwa Ibom State, Nigeria.

Diarrhoea is one of the most prevalent opportunistic infections during AIDS. Our study documented 6.7% different plant species used to manage diarrhoea in Adilabad district, Telangana State (Table-1). Most of these plants have also been reported to treat chronic diarrhoea and dysentery in other studies (Rajendra Chary Vijayagiri, et al, 2012; Jernigan, 2009; Kayode, 2006 and Titanji et al, 2008). Severe fever and skin disorders are common condition among AIDS-patients in Telangana region, is managed with 16.2% and 27.9% plant species respectively. Some of these plants were found to treat these diseases in other studies conducted elsewhere (Runyoro et al, 2006; Titanji et al, 2008; Botsaris, 2007 and Prasad Paindla et al, 2013).

Acknowledgements

Authors are thankful to all the traditional practitioners of Adilabad district (Telangana state) for co-operating with the survey and disclosing their valuable knowledge.

Competing interests

The authors have declared that no competing interests exist.

References

[1]. Abbink J, Medicinal & ritual plants of the Ethiopian South West: An account of recent research, *Indigenous knowledge and development monitor*, 32 (1995) 6–8.

[2]. Abo KA, Adeite DA, Ethnobotanical survey of medicinal plants used in the treatment of infertility and STD in South West Nigeria, *African Journal Medicinal Sciences, 29* (2000) 325-327.

[3]. Ajibesin K.K, Ethnobotanical survey of plants used for skin diseases and related ailments in Akwa Ibom State, Nigeria*. Ethnobotany Research and Applications* ,10 (2012) 463–522.

[4]. Allabi A.C, Dossa R, Djeigo J.G , Yombi J.C, Diombo K, Bigot A & Giambattista P, (2012). Effectiveness of the medicinal plant R019 in the treatment of HIV infection: An observational study. *Journal of Applied Pharmaceutical Science* 2(2):59–65.

[5]. Ankli A, Yucatic Mayan medicinal plants: evaluation based on indigenous uses. Journal of Ethnopharmacology(2002) 79, 43- 53.

[6]. Botsaris AS,Plants used traditionally to treat malaria in Brazil: the archives of Flora Medicinal. J Ethnobio Ethnomed 3(18), (2007).

[7]. Burnett A, Baggaley R, Ndovi-MacMillan M, Sulw J, Hang'Omba B and Bennett J, Caring for people with HIV in Zambia, are traditional healers and formal health workers willing to work together, *AIDS Care*, 11 (4) (1999) 481–491.

[8]. Cataldo F, Kielmann K, Kielmann T, Mburu G, and Musheke M, "'Deep down in their heart, they wish they could be given some incentives': a qualitative study on the changing roles and relations of care among home-based caregivers in Zambia," BMC Health Services Research, vol. 15, article 36, 10 pages, (2015).

[9]. Chinsembu K.C & Hedimbi M, An ethnobotanical survey of plants used to manage HIV/AIDS opportunistic

infections in Katima Mulilo, Caprivi region, Namibia. *Journal of Ethnobiology and Ethnomedicine* 6(25) (2010).dx.doi. org/10.1186/1746-4269-6-25
[10]. Diallo D, Hveem B, Md. MA, Betge G, Paulsen BS, Maiga A, An ethnobotanical survey of herbal drugs of Gourma dist., Mali. Pharmaceutical Biology 37, (1999)80-91.
[11]. Edeoga HO, Okwu DE, Mbaebie BO, Phytochemical constituents of some Nigerian medicinal plants, African Journal of Biotechnology 4(2005) 685-8.
[12]. Gilani AH, Rahman AU, Trends Ethnopharmacology, Journal of Ethnopharmacology 100,(2005))43- 49.
[13]. Graf J, Herbal and antiinflammatory agents for skin disease, Skin therapy Letter Journal 5,(2000) 3-5.
[14]. Hegde H.V., Hegde G.R. and Kholkute, S.D., Herbal care for reproductive health: Ethno medicobotany from Uttara Kannada district in Karnataka, India. Complement. Ther. Clin. Pract. **13** (2007) 38-45.
[15]. Hill AF, Economics Botany, A text book of useful plants & plant products, 2nd Edn., (Mc Graw Hill Book Company, Inc., New York),1989.
[16]. Hussain A, Virman OP, Popli SP, Dictionary of Indian Medicinal Plants, Lucknow, India, CIMAP,1992, 2008, 384.
[17]. Jernigan KA, Barking up the same tree,a comparison of ethnomedicine and canine ethnoveterinary medicine among the Aguaruna. J Ethnobio Ethnomed 5(33) (2001).
[18]. Kaboru B, The Interface between Biomedical and Traditional Health Practitioners in STI and HIV/AIDS Care: A Study on Intersectoral Collaboration in Zambia, Institutionen for folkh ¨ alsovetenskap/Department of Public Health Sciences, ¨(2007).
[19]. Kayode J, Conservation of indigenous medicinal botanicals in Ekiti State, Nigeria. J Zhejiang Univ SCIENCE B 7(9) (2006)713-718.
[20]. Mukherjee PK, Wahile A, Integrated approaches towards drug development from Ayurveda & other Indian system of medicines, Journal of Ethnopharmacology 103(2006) 25-35.
[21]. Munthali S.C, Acceptability of antiretroviral drugs among adults living in Chawama, Lusakaa [MPH dissertation], University of Zambia, Lusaka, Zambia, 2011.
[22]. National AIDS Control Organization (2016). India HIV Estimations 2015,Technical Report. Retrieved from http://www.naco.gov.in/upload/2015%20MSLNS/HSS/India%20HIV%20Estimations%202015.pdf
[23]. Ndulo J, Faxelid E, and Krantz I, "Traditional healers in Zambia and their care for patients with urethral/vaginal discharge," The Journal of Alternative and Complementary Medicine, vol. 7, no. 5, pp.(2001) 529–536.
[24]. Otang W.M., Grierson D.S & Ndip R.N, Ethnobotanical survey of medicinal plants used in the management of opportunistic fungal infections in HIV/ AIDS patients in the Amathole District of the Eastern Cape Province, South Africa, J*ournal of Medicinal Plants Research* 6(11)(2012)2071–2080.
[25]. Phondan P.C., MaikhuriR.K, RawatLS, Farooquee N.A, Kala C.P, Vishvakarma S.C.R, Rao K.S&SaxenaK.G,Ethnobotanica luses of plants among the
Bhotiya tribal communities of Niti valley in Central Himalaya, India. *Ethnobotany Research and Applications* 8, (2010)233–244.
[26]. Pramono E, The commercial use of traditional knowledge and medicinal plants in Indonesia multistake holder dialogue on Trade, Intellectual property and biological resources in Asia, BRAC centre for development management, April 19-21, Rajendrapur, Bangladesh,(2002) 1- 13.
[27]. Prasad Paindla, Rajendra Chary Vijayagiri and Estari Mamidala, Ethnobotanical Survey In Different Mandals Of Adilabad District, Andhra Pradesh, India. International Journal of Sciences, 2(1)(2013) 77-83.
[28]. Qureshi R.A., Ghufran M.A, Sultana K.N, Ashraf M & Khan A.G, Ethnobotanical studies of medicinal plants of Gilgit District and surrounding areas, *Ethnobotany Research and Applications* 5,(2016)115–122
[29]. Rahmatullah M, Jahan R, Seraj S, Islam F, Jahan F.I, Khatun Z, Sanam S, Monalisa M.N, Khan T& BiswasK.R, Medicinal plants used by folk and tribal medicinal practitioners of Bangladesh for treatment of gonorrhoea, *American-Eurasian Journal of Sustainable Agriculture,* 5(2)(2011)270–281.
[30]. Rajendra Chary Vijayagiri and Estari Mamidala, Ethnobotanical investigations among traditional healers in Warangal district of Andhra Pradesh, India. Phcog J, Vol 4, Issue 34(2012) 13-17. DOI: 10.5530/pj.2012.34.2.
[31]. Runyoro DKB, Matee MIN, Ngassapa OD, Joseph CC, Mbwambo ZH, Screening of Tanzanian medicinal plants for anti-Candida activity, BMC Compl Alter Med 6(11)(2006).
[32]. Sofomora A, Medicinal plants and traditional medicine in Africa, John Willey & sons, New York. 1982.
[33]. Steenkamp V, Traditional herbal remedies used by South African women for gynaecological complaints,J. Ethnopharmacol, **86** (2003) 97-108.
[34]. Tene V, Malago O, Finzi PV, Vidari G. An ethnobotanical survey of medicinal plants used in Loja and Zamora chinchipi, Equador. Journal of Ethnopharmacology 111(2007) 63-81.
[35]. Titanji VPK, Zofou D, Ngemenya MN, The antimalarial potential of medicinal plants used for the treatment of malaria in Cameroonian folk medicine, Afr J Trad CAM, 5(3)(2008)302-321.
[36]. Traditional medicine WHO, 2011 http://www.who/int/topics/tradition al-medicine/en/.
[37]. UNAIDS. Joint United Nations Programme on HIV/AIDS. Fact Sheet 2016. Retrieved from http://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf
[38]. WHO (World Health Organization),*Guidelines for the Assessment of Herbal Medicines*, Programme on Traditional Medicines, Geneva, Switzerland ,2011.