**IJPSR (2014), Vol. 5, Issue 8** **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 06 December, 2013; received in revised form, 28 June, 2014; accepted, 17 July, 2014; published 01 August, 2014

# ETHNOPHARMACOLOGICAL SURVEY OF MEDICINAL PLANTS IN AGARO DISTRICT, JIMMA ZONE, SOUTH WEST ETHIOPIA

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**Keywords:**

Ethnopharmacology, Medicinal plants, Traditional medicine, Agaro District, Ethiopia

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**ABSTRACT:** Aim: Plants have been used for medicinal purposes for more than many centuries. The use of a given plant for the same purpose by people geographically distant or with dissimilar cultural backgrounds constitutes impressive evidences that the use is valid. The aim of this study was to document ethnopharmacology of medicinal plants in Agaro District, Jimma Zone, South West Ethiopia. Methods: A cross–sectional study was conducted in the district from June 01-July 31, 2013. A structured questionnaire was used to record pertinent information on the use of the medicinal plants and collect their specimens. The study involved 440 households living in the district. Result: Eighty medicinal plants were collected, of which sixty–eight were identified botanically and the remaining were reported in vernacular names. The identified species were distributed in thirty–eight families. Leaves were the major plant parts used accounting for 42(44.7%), followed by roots 21(22.3%), fruits 17(18.1%) and barks 7(7.4%). Regarding the method of preparation, vegetable drug was the most commonly used method accounting for 30(37.5%), followed by decoction 23(28.8%) and concoction 12(15.0%). Most of the medicinal preparations were taken orally 46(57.5%), followed by external application 25(31%) and nasal application 7(9%). Conclusion: The indigenous knowledge of the community of Agaro District on medicinal plants was documented. The local people knew which plant and which part of plant was used to treat what type of disease. Phytochemical and pharmacological investigations should be carried out on the most frequently used species of medicinal plants in the study area.

**INTRODUCTION: Background:** Traditional medicine (TM) is an ancient form of health care practice before the appearance of scientific medicine. It is a part of culture of many peoples. Moreover, it is accessible to the people in even the most remote areas, and it doesn't require sophisticated equipment. The obvious preference for TM in many parts of the world has both cultural and economic roots [1, 2].

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.5(8).3551-59

Article can be accessed online on: www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.5(8).3551-59

During the past few years, traditional systems of medicine have become a topic of global importance. The world health organization (WHO) estimates that 80% of the population in developing countries depends on traditional practitioners and medicinal plants (MPs) to meet primary health needs. In industrialized countries, plant products are gaining popularity as alternative and complementary therapies [3, 4].

Plants have been used for medicinal purposes for many centuries. Today medicinal herbs and their products are used worldwide as home remedies, over the counter preparations and raw materials for the pharmaceutical industry. They now account for a substantial proportion of the global drug market,

and increased attention is therefore being paid to assurance of their safety, quality and efficacy [5]. The use of a given plant for the same purpose by people geographically distant or with dissimilar cultural backgrounds constitutes impressive evidence that the use is valid [6].

The increased worldwide interest in MPs can be explained by limitation of human ability to synthesize products that satisfy all health care needs and the limitless potential of plants to produce enormous compounds for their own survival and development, toxicities of drugs of chemical origin, similarly between living organism of plant and animal origin which allows easy assimilation of compounds produced by plants, its adherence to traditionally accepted systems and cultures and the confidence gained about the therapeutic utility of plants over several millennia [7, 8].

Africa is a continent endowed with enormous wealth of plant resources. Over 5,000 distinct species are known to occur in the forest regions alone and most of them have been used for several centuries in TM for the prevention and treatment of disease. The continent is believed to have the oldest human habitation and is generally considered the cradle of human civilization [9].

The Ethiopian flora is estimated to contain between 6,500 and 7,000 species of higher plants of which about 12% are endemic. The country is well known for its significant geographical diversity, which favored the formation of different habitat and vegetation zones. Plants have been used as a source of medicine in Ethiopia from time immemorial to treat different ailments [10].

Though most practices and treatments in herbal medicine require specialists or professionals, who are referred generally to as herbalists, self-care using plants is common in Ethiopia. Although few studies on the MP resources of Ethiopia have been conducted, the extent and types of herbs used in self–care by the majority has not been documented [11].

Despite significant contribution to the society, TM has experienced very little attention in modern research and development, and less effort has been done to upgrade the practice. It is only recently that the Ethiopian health authorities have shown interest to promote and develop it. Loss of the knowledge has been aggravated by the expansion of modern education, which has made the younger generation underestimate its traditional values. Migration from rural areas to towns and resettlement of people from drought stricken regions to fertile areas has also resulted in the deterioration of traditional practices. Such weakening of traditional medicinal practices will greatly affect the national PHC [10]. Thus, this work is designed to document knowledge on the use of MPs in Agaro District, South Western Ethiopia.

## MATERIALS AND METHODS:

### Study Setting

This ethnopharmacological study was conducted in Agaro District, Jimma Zone, South West Ethiopia. The altitude of the study area is 1560 m above sea level. The study was conducted in the district from June 01-July 31, 2013.

### Data Collection

A structured questionnaire was used to assess the ethnopharmacology of MPs from a total of 440 households (HHs) in the district. Before data collection, the questionnaires were translated into local languages and data collectors were recruited and trained. The structured questionnaire was used to collect information on locality, scientific and vernacular names, part(s) of the plant used, method(s) of preparation for use, disease(s) for which plant is used. Fertile specimens of the plants were collected in the field, pressed and taken to the National Herbarium (NH) for taxonomic identification. Finally, data were compiled and further analyzed.

## RESULT:

### Sociodemographic characteristics

A total of 440 HH were included in the study. Around 62% of the respondents were males. The average age of the respondents was 34.25. About two third of the study population were Oromo followed by Gurage (12.7%), Amhara (10.7%) and Wolayita (7.1%). Three fifth of the total respondents were Muslims, followed by Orthodox (30.0%) and Protestant (7.3%) regarding

occupational status, farmers and merchants account for half of the total studied HH respondents. The average family size of the population was 4.8.

**Illnesses and actions taken**

One hundred twenty persons were reported to have an illness episode during a four weeks recall period preceding the interview date. Males were reported to have more morbidity than females and it is statistically significant. Febrile illnesses including malaria, common cold, tonsillitis and typhoid fever were the most frequently reported illnesses in the area. The point prevalence of diseases in the four weeks recall period was 22.2%. Seventy percent of population with reported perceived illnesses used MM and 15(12.5%) used home–made remedies.

**Ever use of traditional medicine and reasons for use**

About 47% of the respondents reported that they had used TM in the past. The ever use of TM were compared between subgroups (among different ages, sex, educational status) using chi-square tests. Males were more likely to use TM than females but the association was not statistically significant (P>0.05). Age was found to have a significant association with the use of TM (P<0.05). Respondents between ages group 25-34 used TM more than other age groups. Respondents of Oromo used TM more than other ethnic groups. Farmers were more likely to practice TM and statistically significant (P<0.005), the association between ethnicity, income and literacy status was statistically significant too. The most commonly cited reasons for the practice of TM were cheapness (37.9%), culture/belief (26.2%) and efficacy (20.9%) as shown in **Table 1.**

**TABLE 1 REASONS OF THE RESPONDENTS WHO PRACTICED TM FOR USING IT IN THE PAST, AGARO DISTRICT, JUNE 01-JULY 31, 2013.**

| Reasons | Frequency | % |
|---|---|---|
| Cheapness | 78 | 37.9 |
| Culture/ belief | 54 | 26.2 |
| Efficacy | 43 | 20.9 |
| Accessibility | 26 | 12.6 |
| Other | 5 | 2.4 |
| **Total** | **206** | **100** |

**Ethnopharmacology**

About seventy five percent of the total respondents knew and used MPs. In the survey, 80 MPs were collected, of which 68 were identified botanically and the remaining were reported in vernacular names (Afan Oromo and Amharic). The identified species were distributed in thirty–eight families, of which Labiatae, Acanthaceae, Euphorbionce, Caricaceae and Compositae were the dominant plant families **(Table 2, 3)**. *Ocimum lamiifolium*, *Deciliter laxata*, *Croton Macrostachys, Vernonia amygdalina, Carica papaya, Eucalyptus globules, Allium Sativam, Echinops maccrochaetus*, *Schinus molle,* and *Withania somnifera* were the top ten commonly used plant species **(Table 4)**.

The result of the study indicated that there was a practice of cultivating MP. About 26% MPs were cultivated at home garden and 42 (52.5%) grown at wild and the remaining were grown both at garden and wild.

**TABLE 2 MEDICINAL PLANTS USED AGAINST HUMAN AILMENTS IN AGARO DISTRICT, JIMMA, ETHIOPIA, JUNE 01-JULY 31, 2013.**

**(Key: R=Roots L=Leaf; Rh= Rhizome; S= Stem; F= Flower; Fr= Fruit; Se= Seed; La = Latex; Bu= Bulb; [O]Afan Oromo; [a]Amharic )**

| S. No | Vernacular name | Scientific name | Family | Uses (citation) | Part used | Mode of preparation and administration |
|---|---|---|---|---|---|---|
| 1. | Abishi[a] | *Echinops macrocheetus* | Asteraceae | Abdominal Colic (1) | Se | The seeds are ground and macerated with water then taken |
| 2. | Agamsa[o] | *Carissa edulis* | Apocynaceae | Evil eye (1) | R | The roots are ground and warmed on fire then inhaled |
| 3. | Ana[o] | *Lawsonia inermis.L* | Lythraceae | Toothache(2) | R | Roots are ground and held on tooth |
| 4. | Anamuro[o] | *Ajuga integrifolia ham.buch* | Labiatae | Diarrheae (2) | L | Leaves are ground and macerated with water then taken |
| 5. | Asher[o] | *Acmella caulirhiza* | Asteraceae | Toothache (1) | F | The flower is held on the tooth |

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| 6. | Atsefaris[a] | *Datura stramonium L.* | Solanaceae | Dandraff(4)<br>Toothache(4)<br>Streptothricosis(2) | L<br>L<br>L | Leaves are pounded and put on head and washed.<br>Leaves are chewed and fluid is spat away<br>Leaves are grounded, macerated with water then wound is washed with conc. |
| 7. | Bisana[a] | *Croton marcrostachys* | Euphorbionce | Scabies (28)<br>Streptothricosis (28)<br>Wound (28) | L | Fresh leaves are pounded and applied on skin |
| 8. | Bokolo[a] | *Zea mays L* | Graminae | Kidney disease (1) | Se | Dried seeds are grounded macerated then taken |
| 9. | Bosoke[o] | *Kalanchoe lanceolanta V.* | Crasulaceae | Cough(1)<br>Common cold(2) | L | Fresh leaves are pounded and juice is prepared |
| 10. | Bunna[a] | *Coffea Arabica linn* | Rubaceae | Bloody diarrhea (1) | Se | Dried seeds are ground after roasting and mixed with honey and taken |
| 11. | Damakase[a] | *Ocimun lamiifolium* | Labiatae | Mitchi(92)<br>Headache(92)<br>Common cold (92) | L<br>L | Fresh leaves are pounded and body is washed with concoct<br>The juice of pounded fresh leaves is prepared and drunk . |
| 12. | Dawula[a] | *Kalanchoe spp* | Crasulaceae | Wound (1) | L | Leaves are pound and held on wound |
| 13. | Dhegiso[o] | *Eleusine coracana* | Poaceae | Intestinal parasite (1) | L | Fresh leaves are pounded and macerated with water and taken after adding sugar. |
| 14. | Dimbilali[a] | *Coriandrum satuum L* | Umbellitereae | Kindney disease (1) | Se | Dried seeds are pound and macerated with water and taken |
| 15. | Dobbi[a] | *Girardinia bullosa (Hocrstex steud)* | Urticaceae | Streptothricosis (1) | L | Fresh pounded leaves are held on the wound |
| 16. | Dubba[a] | *Cucurbita pepo L.* | Cucurbitaceae | Intestinal parasiste (1) | Se | Dried seeds are pound and macerated with water and taken |
| 17. | Enchine[a] | *Pavonia urens* | Malvaceae | Streptothricosis (1) | L | Fresh leaves are pounded and put on skin |
| 18. | Feto[a] | *Lepidum sativum G.* | Crucifereae | Stomachache (8)<br>Malaria (8)<br>Tonsillitis (6)<br>STDs(1) | Se<br>Se | Dried seeds are grounded, macerated with water and taken after adding sugar |
| 19. | Gingible[a] | *Zingiber officinale Rose* | Zingiberaceae | Common cold (6)<br>Stomachache (6)<br>Tonsillitis (6) | Rh | Rhizomes are pounded and mixed with honey and taken |
| 20. | Grawa[a] | *Vernonia amygdalina delile* | Compositae | Wounds (24)<br>Toothache (24)<br>Stomachache (24)<br>Kidney problem (5) | L<br>L | Pounded fresh leaves are held on wound or teeth<br>Fresh leaves are pounded macerated with water and taken |
| 21. | Inkoy[a] | *Ximenia americana* | Olacaceae | Common cold (5)<br>Coughing (3) | Fr<br>L/R | The fruit is boiled and taken orally<br>The pounded root is applied on the skin |
| 22. | Indod[a] | *Phytolocca dodecandra L Herit* | Phytolaccaceae | Rabies (2)<br>Chokki[a] bite 91) | R<br>R | The root is pounded and juice is taken orally<br>The pounded root is applied on the skin |
| | Kalala[o] | *Stephania abyssinica (Dill and Rich ) walp.* | Menispermaceae | Wart (2) | L | The fresh leaves are warmed slightly and bandaged on skin of wart |
| 24. | Key bahirzaf[a] | *Euclaptus camaldalensis* | Myrtaceae | General body illness (4) | L | The fresh leaves are warmed and the smoke coming out is inhaled. |
| 25. | Key Shinkurt[a] | *Allium cepn L* | Liliaceae | Malaria (2) | St/Bu | The bulb is roasted or boiled and taken with honey |
| 26. | Kinchib[a] | *Euphorbia tirucalli* | Euphorbiaceae | Wart (1) | La | Latex from apical part of leaf is applied on wart |
| 27. | Komegna[o] | *Brucea antidysentrila J.F* | Simaroubaceae | Stomachache(1) | St | The stem is chewed and the juice is swallowed |

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| | | *miller* | | | | |
| 28. | Korchi[a] | *Erythrina abysinica* | Papilionoideae | Stomachache (1) | BA | The bark is chewed and the fluid/juice is swallowed |
| 29. | Kulkual[a] | *Euphorbia abysinicum* | Euphorbiaceae | Ameba (1) | La | Latex coming from stem is baked with red tef and taken |
| 30. | Kundo berbere[a] | *Schinus molle* | Anacrdiaceae | Tonsillitis (8) | L | The fresh leaves are chewed well and the juice is swallowed |
| 31. | Lenquanta[a] | *Grewia ferruginea* | Tiliaceae | Wart (1) | B | The bark is pounded and bandaged on skin |
| 32. | Lommi[a] | *Citrus aurantifolia (christm)* | Rutaceae | Wound (3)<br>Common cold (5) | Fr<br>Fr | The juice of the fruit is applied on the wound<br>The juice of the fruit is taken orally |
| 33. | Merasisa[o] | *Withania somnifera (L) Dunal* | Solanaceae | Stomachache (5)<br>Toothache (8) | R<br>R | The root is pounded and mixed with butter and taken orally<br>The root is held between the teeth |
| 34. | Mokmoko[a] | *Rumex abyssinicus Jacf* | Polygonaceae | Liver disease (1)<br>Lung problem (2) | R | The root is pounded, macerated with water and taken orally |
| 35. | Muzi[a] | *Musa sapientum L* | Musaceae | General body illness (1) | L | The leaves are pound and bandaged on skin |
| 36. | Nech Arti[a] | *Artemisia afra jacq facq* | Compositae | Stomachache (2) | L | Leaves are pounded and mixed with salt macerated in water and taken orally |
| 37. | Nech bahirzaf[a] | *Eucalyptus globalus* | Myrtaceae | Common cold (17)<br>General body illness (17) | L | The fresh leaves are burned slightly and the smoke is inhaled |
| 38. | Nech shinkurt[a] | *Allium sativam L* | Alliaceae | Malaria (10)<br>Common cold (13),<br>Headache (6) | Bu | The bulb is cut into pieces, pounded and juice taken orally |
| 39. | Papaya[a] | *Carica papaya L* | Caricaceae | Malaraia (21)<br>Wound (23)<br>Jaundice (20 | L, R, Fr | Either leaves, roots, or fruits are pounded and juice prepared and taken |
| 40. | Kbericho[o] | *Echinops macrochaetus M* | Asteraceae | Snake bite (9)<br>Stomachache(7) | R | Roots are pounded and mixed with lemon juice and taken orally |
| 41. | Senemeki[o] | *Senna didymebotry* Irwin and Barnely | Fabaceae | Jaundice (3) | R/Fr | The root or fruit is pounded and juice is prepared and taken orally |
| 42. | Sensel[a] | *Justicio shimperans* Hochst, ex Nees | Acanthaceae | Rabies (5)<br>Jaundice (2) | L | Leaves are pounded and juice is prepared and taken orally |
| 43. | Surmo[o] | *Pilea bambusteti Engi* | Urtacaceae | Fracture (1)<br>Pneumonia (3) | L | Leaves are pounded with sugar and juice is prepared and taken orally |
| 44. | Temenehay[a] | *Acokenthera schimperi votiken* | Apocyanaceae | Stomachache (27) | L | Leaves are grounded and mixed with honey and taken orally |
| 45. | Tena adam[a] | *Ruta chalepensis L* | Rutaceae | Stomachache (27) | L | Leaves are grounded, macerated with water and taken orally |
| 46. | Tikur arti[a] | *Artemisia rehan* | Compositeae | Stomachache (5) | L | Leaves are pounded with salt and juice taken orally |
| 47. | Tikur azmudi[a] | *Nigella sativa L* | Ranumculaceae | Asthma (2)<br>Stomachache(3) | Se | The pounded seed is mixed with honey and taken orally |
| 48. | Tikur inchet[a] | *Prunus africana* | Rosaceae | Asthma (2)<br>Toothache (3) | Ba | Smoke of slightly burned bark is inhaled<br>Bark is held on teeth |
| 49. | Togo[a] | *Dicipter laxata* C.B.Cl | Acanthaceae | Eye disease (31)<br>General body illness (31)<br>Common cold (31)<br>Stomachache(21) | L<br>L<br>L | Leaves are squeezed and fluid applied on eye<br>Leaves are grounded, macerated with water and applied on skin<br>Leaves are pounded, dispersed in water and taken |
| 50. | Tufo[o] | *Ageratum conizaides L* | Compositae | Bleeding wound (2) | L | Leaves are crushed and juice is prepared and applied on skin |
| 51. | Tulti[a] | *Rumex helpalensis* | Polygonaceae | Stomachache (3) | R | The root is chewed and the fluid is swallowed |

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| | | *Hochst ex Rich* | | | | |
| 52. | Warza[a] | *Cordia faricana Lim* | Boraginaceae | Spider bite (2) | L | Leaves are burned on fire, powdered, mixed with butter then applied on skin |
| 53. | Kosso inchet[a] | *Hagenia abyssinica* (Bruce ) J.F Gmel | Rosaceae | Intestinal parasite (8) | Se | Dried seeds are pounded and juice is prepared and taken orally |
| 54. | Arakissa[o] | | | Wound (1) | L | The fluid on the tip of leaves is dropped on the wound |
| 55. | Bagge[o] | | | Eye disease (1) | La | The latex from stem is dropped on the eye |
| 56. | Homtate[a] | | | Stomachache (1)<br>Hypertension (1) | Fr<br>Fr | The seeds are pealed and taken<br>Fruit is taken orally |
| 57. | Ibab hareg[a] | | | Stomachache(1) | L | Fresh leaves are pounded and juice is taken orally |
| 58. | Kelkelcha[o] | | | Stomachache (1) | Ba | Dried bark is pounded and macerated in water and taken orally |
| 59. | Sokoru[o] | | | Wound (1) | L | Burned and powdered leaves are applied on skin |

**TABLE 3 MEDICINAL PLANTS USED IN COMBINATION FORMS FOR THE TREATMENT OF HUMAN AILMENTS IN AGARO DISTRICT, JIMMA, ETHIOPIA, JUNE 01-JULY 31, 2013.**

**(Key: R=Roots L=Leaf; Rh= Rhizome; S= Stem; F= Flower; Fr= Fruit; Se= Seed; La = Latex; Bu= Bulb; [o]Afan Oromo; [a]Amharic )**

| S No | Vernacular name | Scientific name | Family | Uses (citation ) | Part used | Mode of preparation and administration |
|---|---|---|---|---|---|---|
| 1. | Altet[o]<br>Bunna[a] | *Coffea arabica linn* | Rubaceae | Stabbing pain (1) | R<br>S | Seed of coffee is pounded with root of alter and macerated with water and taken |
| 2. | Chat[a]<br>Injori[a] | *Catha edulis*<br>*Morus nigra L* | Celastraceae<br>Moraceae | Common cold (2) | R<br>R | Roots are pounded, macerated with water and taken |
| 3. | Chekka[o]<br>Senemeki[o]<br>Tumbaho[a] | *Senna spp*<br>*Sena didymeborty* | Fabaceae<br>Fabaceae | Snake bite (2) | L<br>L<br>L | Fresh leaves are pounded and held at the site of bite |
| 4. | Chikugni[a]<br>Tenadam[a] | *Ximenia Americana L*<br>*Ruta chalepensis L* | Olacaceae<br>Rutaceae | Stomachache (3)<br>Diarrhea (2) | L<br>L | Leaves are pounded and juice is prepared and taken |
| 5. | Embatch[o]<br>Senemeki[o]<br>Kobbo[o] | *Rumex nervosas vani*<br>*Senna didymebotery*<br>*Ricinus communis* | Polugonaceae<br>Fabaceae<br>Euphorbiaceae | Rabies (1) | L<br>L<br>L | Fresh leaves are pounded and juice is prepared and taken |
| 6. | Emboay[a]<br>Damakase[a] | *Solanium anguivilam*<br>*Ocimum lamiifolium* | Solanaceae<br>Labiateae | Epistaxis (2)<br>Wound(5) | L<br>L | The fresh pounded leaves are put in bleeding nose or on the wound |
| 7. | Indod[a]<br>Gomen[a] | *Phytolocca dodecandra*<br>*Brassica oleracea var capitata L* | Phytolaccaceae<br>Cruciferae | Abortion (2) | R<br>Se | Root of indod and seed of gomen pounded together, juice is prepared and taken. |
| 8. | Gizawa[a]<br>Damakase[a] | *Withania somenifera L*<br>*Ocimum lamiifolium* | Solanaceae<br>Labiateae | Stomachache(3), Evil eye(3), Stabbing pain (2) toothache (1) | L<br>L | Leaves are pounded and juice is prepared and taken<br>The pounded leaves are applied on teeth |
| 9. | Gumero[o]<br>Agami[a]<br>Temenehay[a] | *Carissa edulis*<br>*Acokenthera shimperi votlike* | Apocynaceae<br>Apocyanaceal | Evil eye (3)<br>Stomachache (4) | R<br>R<br>R | Their roots are grounded and juice is prepared and taken orally |
| 10. | Meltene[o]<br>Damakase[a]<br>Bisana[a] | *Pavonia verens cavan*<br>*Ocimum lamiifolum*<br>*Croton macrostachys* | Malvaceae<br>Labiatae<br>Euphorbionce | General body illness (3)<br>Diarrhea(2)<br>Stomachache(4)<br>Evil eye (1) | L<br>L<br>L | Their fresh leaves are pounded and along with water concoction is prepared and taken orally |
| 11. | Sensel[a]<br>Kobbo[a] | *Justila schimperans*<br>*Ricinus communis* | Acanthaceae<br>Euphorbiaceae | Rabies (2)<br>Jaundice(1) | L<br>L | Their fresh leaves are pounded, concoction is prepared with water and taken orally |

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|---|---|---|---|---|---|---|
| 12. | Tikur goddo[a]<br>Tena adam[a]<br>Tejisar[a] | *Artemisia afra*<br>*Ruta chalepensis L* | Asterceae<br>Rutaceae | Stomachache(4) | L<br>L<br>L | The leaves are pounded and juice is prepared and taken orally |
| 13. | Lewuzi[a]<br>Nugi[a] | | | Common cold (2) | Se<br>Se | The dried seeds are pounded, concoction is prepared with water and taken orally |

**TABLE 4: TOP TEN COMMONLY USED MPS IN AGARO DISTRICT, JIMMA, ETHIOPIA, JUNE 01-JULY 31, 2013.**

| No | Scientific name | Ailments | No (%) of informants |
|---|---|---|---|
| 1. | *Ocimum lamiifolium* | Febrile illness, headache, common cold | 92(20.9) |
| 2. | *Dicliptera laxata* | Eye disease, stomachache<br>Febrile illness, common cold | 31(7.1) |
| 3. | *Croton macrostachys* | Scabies, streptothricosis, wound, febrile illness | 28(6.4) |
| 4. | *Vernonia amygdalina* | Wounds, toothache, stomachache | 24(6.4) |
| 5. | *Carica papaya* | Malaria, wound, liver jaundice | 23(5.5) |
| 6. | *Eucalyptus globalus* | Common cold, *mitchi*[a] | 17(3.3) |
| 7. | *Allium sativam* | Malaria, common cold, headache | 13(2.9) |
| 8. | *Echinops macrochaetus* | Snakebite, stomachache | 9(1.6) |
| 9. | *Schinus molle* | Tonsillitis | 8(1.3) |
| 10. | *Withania somifera* | Stomachache, toothache | 8(1.3) |

The result of the study indicated that leaves were the major plant parts used 42 (44.7%) followed by roots 21(22.3%), fruits (17(18.1%) and barks 7(8.4%) **(Fig. 1).**

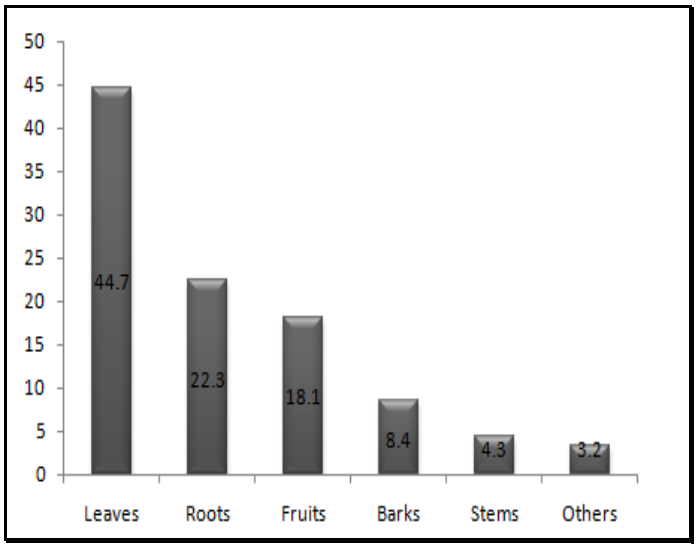


**FIGURE 1: COMPARISON OF PLANT PARTS USED AS SOURCES, AGARO DISTRICT, JUNE 01-JULY 31, 2013.**

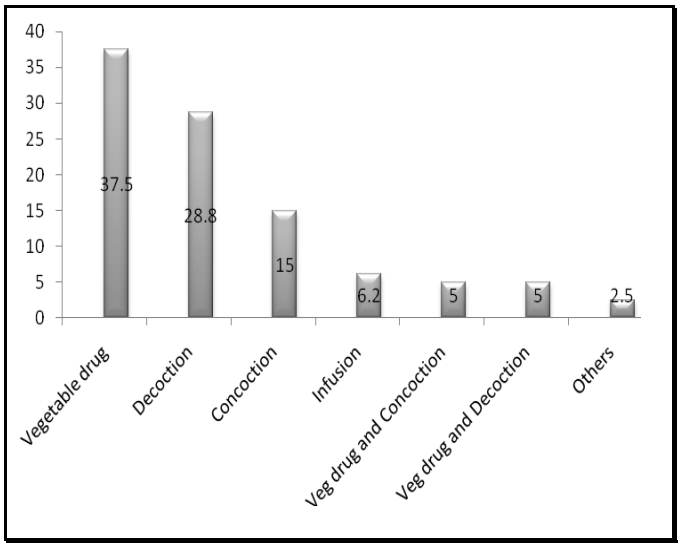


**FIGURE 2: COMPARISON OF METHODS OF PREPARATION OF MEDICINAL PLANT PRODUCT, AGARO DISTRICT, JUNE 01-JULY 31, 2013.**

Most of the preparations (37.5%) were taken raw (as vegetable drug), followed by decoction 23(28.8%) and concoction 12(15.9%) **(Fig 2)**. In majority of the MPs (82.5%) only a single plant part is used and in 17.5% of them more than one part is used.

The result of the study indicated that the major routes of administration was peroral accounting for 46(57.5%), followed by topical (applied externally on skin as bandaging or ointment, 25(31%) and nasal application 7(9%) **(Fig 3)**.

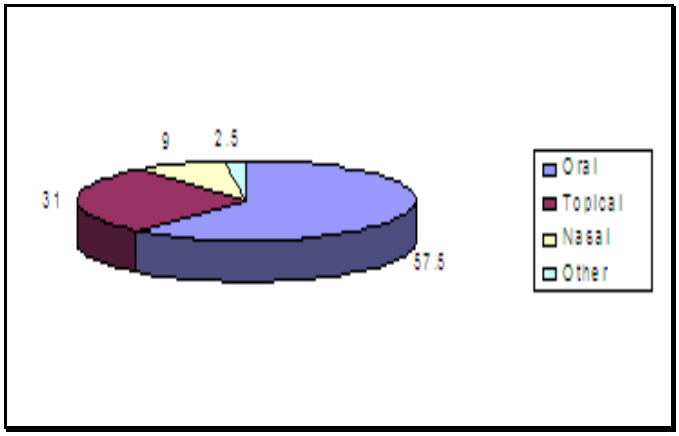


**FIGURE 3: COMPARISON OF DIFFERENT ROUTES OF ADMINISTRATION OF MEDICINAL PLANTS, AGARO DISTRICT, JUNE 01-JULY 31, 2013**

Abdominal colic, common cold, evil eye, febrile illness, toothache wound and rabies were the most common diseases treated by different MPs **(Table 5)**. Regarding the modes of uses of MPs, 3/4$^{th}$ of the plants were prepared and used fresh and 19 (23.7%) were used dry.

**TABLE 5 COMMON DISEASES TREATED BY THE MPS, AGARO DISTRICT, JUNE 01-JULY 31, 2013.**

| S. No | Common diseases | No of plants | % |
|---|---|---|---|
| 1. | Abdominal colic | 20 | 30.3 |
| 2. | Common cold | 11 | 16.7 |
| 3. | Evil eye | 8 | 12.1 |
| 4. | Febrile illness | 7 | 10.6 |
| 5. | Toothache | 7 | 10.6 |
| 6. | Wound | 7 | 10.6 |
| 7. | Rabies | 6 | 9.1 |
| | **Total** | **66** | **100.0** |

It was observed that appropriate dose measurement was not this mach practiced well in the study area. However, few people used glasses and cups for measurement of dose. They did not have adequate knowledge on adverse effects that appear upon taking the herbal preparation and use of antidotes.

**DISCUSSIONS:** Beliefs about causes of health problems are determinants of treatment seeking decisions. Hence, one of the alternatives for the solution of health problem, rise in a large segment of rural population is employing TM in general and MPs in particular [12].

The present study indicated that 47% of the total respondents had used TM is the past. However, the value is lower than the WHO estimated value (80%) [3]. On the other hand, the indicated value is high when compared with the 21% prevalence found in Woliso [13]. Males were more likely to use TM than females. This is not consistent to the result of pervious study done in rural and central Ethiopia on the use of MPs in self–care where females practiced TM more than males [11]. Cheapness, cultural belief, efficacy and accessibility were the main reasons for popularity of TM in the study area, which is consistent with other studies [11, 13].

One hundred and twenty persons were reported to have an illness episode during a four weeks recall period preceding the interview date, showing that the disease prevalence in the study area was 22.2%. Males were reported to have more morbidity than females which is inconsistent with the study of Gedif and Hahn in central Ethiopia. Febrile illness like malaria, common cold, were the most frequently reprorted illnesses both in the study area and in a study done in rural and central Ethiopia [11].

The present study reported 80 MPs as being used by the people of Agaro district. The number of plants is greater than what was reported by Giday M, *et al* among Zay people [14]. Most of the reported MPs were also used elsewhere in Ethiopia for their medicinal value. The fact that some MPs being used for the same purpose by more than one community might indicate the therapeutic effectiveness of these remedies. The major uses of different MPs for treatment of different disease in the present study area ranged from abdominal colic to wound and rabies based on distribution of species, experience and knowledge on practice of TM. In the study done in Jimma zone, the diseases ranged from pain to fatal diseases like malaria and cancer [12].

The study indicated that most of MPs were cultivated at the home garden but other study showed that most MPs are harvested from wild as in many parts of the country. [10] Regarding the partof the MPs, leaves were the major plant part used which complies with the studies done in Woliso [10], among Zay people [13] and Seka Chekorsa [15]. However, in the study conducted in Shirka District, roots were the major plant part used [16.] Collecting leaves does not cause a great danger to

the existence of an individual plant when compared with the collection of underground part, stem, bark or whole plant. Vegetable drug was the most frequently used method of preparation. In another study done in Seka Chekorsa, decoction and/or concoction were the frequently used method [15].

People of the study area have developed many methods of administration or application of the preparations depending on particular disease to be treated. Most of the remedies were taken orally, followed by external application and nasal application, which is similar with an earlier study done on Zay people [10]. Lack of precision in the determination of doses has been noted in the area. According to other study, the real drawbacks in TM stem mostly from lack of precision in dosage [10]. In the survey of ethnopharmacology of medicinal plants carried out in Mali, in the regions of Doila, Kolokani and Siby, about 50 medical indications were reported for the use of plants in TM. The most frequent indications reported were for malaria abdominal pain and dermatitis. The majority of the remedies were prepared from freshly collected plant material from the wild and a single species only. They were mainly taken orally, but some were prepared with a mixture of plants or other ingredients such as honey, sugar, salt, ginger and preparation and leaf powder was mostly used for the preparation of infusions. The part of plants most frequently used was the leaves [17].

**CONCLUSIONS:** The indigenous knowledge of the community of Agaro District on medicinal plants was documented. In the survey, 80 MPs were collected, of which 68 were identified botanically and the remaining were reported in vernacular names. The local people knew which plant and which part of plant was used to treat what type of disease. The result of the study indicated that leaves were the major plant parts used. Most of the preparations were taken raw (as vegetable drug). The result of the study indicated that the major routes of administration were peroral. Regarding the modes of uses of MPs, 3/4$^{th}$ of the plants were prepared and used fresh. Phytochemical and pharmacological investigations should be carried out on the most frequently used species of medicinal plants in the study area.

**ACKNOWLEDGMENTS:** We would like to extend our gratitude to respondents of households and traditional healers who showed their willingness to share their knowledge on the use of medicinal plants.

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**How to cite this article**:
Gabriel T and Guji T: Ethnopharmacological Survey of Medicinal Plants in Agaro District, Jimma Zone, South West Ethiopia. Int J Pharm Sci Res 2014; 5(8): 3551-59.doi: 10.13040/IJPSR.0975-8232.5 (8).3551-59.