Ethnobotanical survey of medicinal plants used in the traditional treatment of viral infections in Jos, Plateau state, Nigeria

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Abstract: An ethnobotanical survey was conducted covering the three Jos North, Jos South and Jos East local government areas that makeup Jos in Plateau State - Nigeria, on plants used in treatment of viral infections through direct interview of Traditional Medicine Practitioners, Herbalist, Herb sellers and some indigenes/residents, using structured questionnaire supported with tape recorder and digital camera. The viral infections include common cold, measles, chickenpox, rabies, bird flu, hepatitis and HIV. The study was aimed at collection and documentation of medicinal plants used in the treatment of viral infections, within Jos. A total of 64 medicinal plants species, represented by 62 genera from 39 families were obtained from the ethnobotanical survey. The recipes for the treatment of the viral infections were also reported. The stem bark was the most commonly used plant used part in the treatment of viral infection with estimated value of 23.6%, followed by leaves (20.8%). Other plant parts used include roots, flower, fruits, rhizomes, seeds and in some cases the whole plant. The present findings, has revealed and documented medicinal plants used in treatment of viral infections in Jos, Plateau state, Nigeria for the first time. This information will be beneficial in public health, research and providing lead to plants that can be useful in antiviral drug discovery.

Keywords: anti-viral; ethnobotanical survey; medicinal plants; Nigeria; traditional medicine.

Introduction

Survey and documentation of a country’s or community’s natural resources is an important prerequisite for proper utilization of its raw materials. Full knowledge of various plants is necessary, so as to enhance proper utilization (Choudhary et al., 2008). Viral infection is one of the world’s most transmissible diseases; this is because it is almost always followed by a secondary bacterial infection. However available antiviral agents and vaccines have shown good results (WHO, 1983). The high cost of available antiviral drugs and their toxic side effects, viral resistance coupled with viral latency and conflicting efficacy in recurrent infection in immunocompromised patients has made viral disease a major and continuous public health burden (Ngono Ngare et al., 2011). There is the need for discovery of new antiviral compounds from plants that are safe, effective, which overcomes resistance and is also less toxic (Ngono Ngare et al., 2011). Recent studies showing antiviral potential of plant extract against viral strains resistant to conventional antiviral agents, has challenged modern drug discovery practices, and stimulated renewed interest in the exploration of medicinal plants with antiviral constituents (Mukhtar et al., 2008). Indigenous people have long history and expertise in the use of medicinal plants, but information on these plants and their uses is mainly passed from one generation to the other orally and even to date is poorly documented (Gurib-Fakim, 2006). The lack of an organized documentation for medicinal plant knowledge may also contribute to the loss of medicinal plant knowledge, particularly for plants that are neglected or non-preferred

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(Musa et al., 2011). Like every communities in the developing nations, the people of Jos in Plateau state, Nigeria depend on medicinal plants to meet their domestic and health needs. Majority of rural communities depend on traditional medicine, while most urban settlements depend mainly on orthodox medicine probably due to civilization. There is also the problem of holding information on use of plants as secrets due to distrust of researchers by traditional medicines practitioners because of previous bad experiences, and the desire to pass down information to offspring and/or, family members alone (Sofowora, 2008), and avoidance of competition in the practice. Eventually these people get older and dies, resulting into lost of vital information. The present study is aimed at collection and documentation of medicinal plants used in the treatment of viral infections within Jos, Plateau State, Nigeria, that can serve as a starting point for discovery of new antiviral agent.

Methods and materials

Study area

The study areas consist of Jos North, Jos South and Jos East Local government areas of Plateau state Nigeria. The areas consist of residents that are civil servants, farmers and traders. The area is a plateau that lies between latitudes 8° 22’ and 10° 24’ North and longitudes 8° 32’ and 10° 38’ East. Thus, Plateau State which derives its name from the Jos Plateau is located right in the centre of Nigeria-North central zone. The Jos – Plateau is the Upper part, and the Northern highland area of Plateau State, with a near temperate type. Weather conditions are warm during the rainy season (April-October) and cold during the Harmattan period (December-February). The mean annual temperatures in the state range between 20° and 25° centigrade, while the mean annual rainfall figures range from 131.75cm in the Northern part to 146cm in the Southern part.

Collection and Documentation of information on medicinal plants

The sample population comprises mainly of Traditional Medicine practitioner or Traditional healers and herb sellers, a few individuals with claims of medicinal plant knowledge according to the methods of Sofowora (2008). At least 10 individual was the target per LGAs. The sam-

Figure 1: Map of Plateau, State showing study Areas [Source: Geographic Information Systems (GIS) Laboratory, Department of Geography and Planning, University of Jos (2011)]
Int. J. Med. Arom. Plants

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pling technique employed for this survey research was snowball sampling or referral sampling. A list of the common viral diseases was made, and enquiry was made of their treatment. These viral infections include common cold, measles, chickenpox, rabies, bird flu, hepatitis and HIV/AIDS respectively. The data for this study were obtained by direct interview with the respondents from September 2011 to March 2012. Informed consent was obtained orally from each of the respondent, before an interview. Since most of the respondents were not educated, oral interview was adopted to obtain the relevant ethnomedical data. Each respondent was visited two to three times in order to verify the authenticity of the data obtained, and to gather additional information not mentioned during a previous visit. Any discrepancy between information obtained at different visit on a particular ailment and plant used in its treatment, makes the information unreliable and hence, rejected.

**Plant collection, Identification and Authentication**

The plant species mentioned during the interview were collected by the respondent or the person who normally prepares the remedies, so as to avoid collection of the wrong plant (Sofo-wora, 2008). Most of the plants were collected fresh, photographs of collected plant species were also made, so as to enhance their identification. The plants species obtained from the survey were identified using keys and description given in the Flora of west Tropical Africa (Hutchison and Dalziel, 1963) and the “Woody Plant of Ghana” (Irvine, 1961) at College of Forestry, Herbarium Unit, Jos, by Mr Azila and Dr Jemilat Ibrahim of the herbarium unit at the National Institute of Pharmaceutical Research and Development (NIPRD), Abuja. The identity of the plant was authenticated at the herbarium unit in the Department of Biological Sciences, Ahmadu Bello University, Zaria, Nigeria by the Taxonomist of the unit. Some were also authenticated at the Forestry herbarium Ibadan. Voucher numbers were obtained for each specimen.

**Data analysis**

The data gathered during the ethnobotanical survey were analyzed by extracting information from data available, so as to give a summary description of the subject. Descriptive statistical tools such as tables and multiple bar charts were used.

**Results**

**Medicinal plants used in the treatment of viral infections in Jos, Plateau State**

A total of 64 medicinal plants species, represented by 62 genera were obtained from 39 families. Table 1 gives a concise information on the medicinal plant species, their families, plant part used, medicinal use and there vernacular names in Hausa, Igbo, Yoruba and others.

<table>
<thead>
<tr>
<th>Family</th>
<th>Scientific Name</th>
<th>Local Name</th>
<th>Plant Part Used</th>
<th>Form of preparation</th>
<th>Mode of administration</th>
<th>Voucher Number</th>
<th>Medicinal Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agavaceae</td>
<td>Sanseveria liberica</td>
<td>Mooda (H)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal and external</td>
<td>ABU 1821</td>
<td>Hepatitis</td>
</tr>
<tr>
<td></td>
<td>Geromes Babroy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amaranthaceae</td>
<td>Aerva lanata (L.) Juss. ex Schult.</td>
<td>Efun (Y)</td>
<td>Leaves</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 70736</td>
<td>Common cold</td>
</tr>
<tr>
<td>Amaryllidaceae</td>
<td>Crinum giganteum Andr.</td>
<td>Gadaali (H)</td>
<td>Whole plant</td>
<td>Infusion</td>
<td>Internal</td>
<td>ABU 1408</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Anacardiaceae</td>
<td>Magnifera indica Linn.</td>
<td>Mangoro (H)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 1944</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Annonaceae</td>
<td>Annona senegalensis Pees.</td>
<td>Gwanda daji (H)</td>
<td>Leaves</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 90012</td>
<td>Measles</td>
</tr>
<tr>
<td></td>
<td>Xylopia aethiopica (Dun.)A. Rich.</td>
<td>Eruje (Y)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>FHI 108075</td>
<td>Hepatitis, HIV</td>
</tr>
<tr>
<td></td>
<td>Enantia chloranta</td>
<td>Awopa(Y)</td>
<td>Stem Bark</td>
<td>Decoction and powder</td>
<td>Internal and external</td>
<td>FHI 101821</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Apocyanaceae</td>
<td>Lantothia owarienses P. Beauv.</td>
<td>Ciwoop (H)Ree (B)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 1225</td>
<td>Hepatitis</td>
</tr>
<tr>
<td></td>
<td>Alostia boonei de Wild Carissa edulis (Forsk.) Vahl.</td>
<td>Awun (Ahun) (Y)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>FHI 103096</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Vernonia amygdalina Del.</td>
<td>Shawakaa(H)</td>
<td>Leaves</td>
<td>Maceration</td>
<td>Internal and external</td>
<td>ABU 595</td>
<td>Chickenpox Hepatitis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rabies Measles</td>
</tr>
</tbody>
</table>

Some were also authenticated at the Forestry herbarium Ibadan. Voucher numbers were obtained for each specimen.
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**Boraginaceae**  
*Heliotropium ovalifolium* Forssk.  
Shaunikasani (H)  
Root  
Powder  
Internal  
ABU 2037  
HIV

**Burseraceae**  
*Boswellia dalzielli* Hutch.  
Ararabi (H)  
Leaves and Stem bark  
Decoction and powdered  
Internal and external  
ABU 1314  
Rabies  
Chickenpox  
Hepatitis  
HIV

**Caesalpiniae**  
*Pilosigma thomningii* (Schum.)  
Kargo (H)  
Leaves and fruits  
Decoction  
Internal  
ABU 1132  
Measles

**Cassia singuena** (Del.) Lock.  
Runfu (H)  
Flowery tops  
Decoction and powder  
Internal and external  
ABU 6855  
Measles  
Hepatitis  
Chickenpox  
Hepatitis

**Deuterium microcarpum** (Guill and Sperr.)  
Tawra (H)  
Stem Bark  
Decoction  
Internal  
ABU 551

**Caricaceae**  
*Carica papaya* Linn.  
gwanda (H)  
Leaves  
Decoction  
Internal and external  
ABU 005  
Measles

**Chenopodiaceae**  
*Chenopodium ambrosiodes* kwalinisan (B)  
Whole plant  
Cold infusion  
Internal and external  
ABU 1921  
Measles

**Cochlospermae**  
*Cochlospermum planchoni* Hook.f.ex.Planch  
Rawaya (H)  
Root  
Decoction  
Internal  
ABU 900011  
Hepatitis  
HIV

**Combretiae**  
*Anogeissus leiocarpus* (DC.) Guill. & Perr.  
Marke (H)  
Stem Bark and Decoction leaves  
Internal  
ABU 900389  
Common cold

**Terminalia Avicennoides** (Guill. & Perr. Fl. Seneg. Tent.)  
Baushe (H)  
Stem Bark  
Decoction  
Internal  
ABU 900309  
Common cold

**Gnetaceae**  
*Gnetum senegaleensis* J.F.Gmel  
Sabara (H)  
Leaves  
Decoction  
Internal and external  
ABU 900165  
Chickenpox

**Curcubitaceae**  
*Cucumis metuliferus* E. Mey  
Buurar-zaaikii (H)  
Fruits  
Maceration  
Internal  
ABU 3232  
Bird flu

**Adenanthes breviflorus** Benth.  
Tagiri (Y)  
Fruit  
Maceration  
Internal  
FHI 107945  
Measles

**Ebenaceae**  
*Diospyros mespiliformis* Hochst.ex.A.DC.  
Kanya (H)  
Bark  
Decoction  
Internal  
ABU 901431  
HIV

**Euphorbiaceae**  
*Jatropha curcas* Linn.  
Biydazougu (H)  
Leaves and root  
Decoction or powdered  
Internal  
ABU 1911  
Hepatitis  
HIV

**Fabaceae**  
*Manihot esculenta* Linn.  
Rogo (H)  
Leaves  
Decoction  
Internal  
ABU 2347  
Measles  
Measles  
Chickenpox  
HIV

**Dialium guineense** Willd.  
Tsamiyfr illagandi (H)  
Whole plant  
Decoction and powdered  
Internal and external  
ABU 3792  
Measles

**Erythrina senegalensis** DC  
Minjiriya (H)  
Bark  
Decoction  
Internal  
ABU 7721  
Hepatitis  
HIV

**Abrus precatorius** L.  
Idon zakara (H)  
Whole plant/ leaves  
Decoction  
Internal  
ABU 1496  
Common cold

**Tamarindus indica** L  
Tsamiya (H)  
Leaves  
Decoction  
Internal  
ABU 900265  
Measles

**Acacia sieberiana** DC.  
Farar kaya (H)  
Root (H)  
Decoction  
Internal  
ABU 90032  
Hepatitis

**Garcinia kola** Heckel  
Orogbo (Y)  
Fruit/nut  
Maceration  
Internal  
ABU 1614  
Measles  
Measles

**Ocimum gratissimum** Linn.  
Effirin (Y)  
Leaves  
Maceration  
Internal and external  
ABU 661  
Measles

**Liliaceae**  
*Allium sativum* Linn.  
Tafamuwa (H)  
Bulb  
Decoction  
Internal  
ABU 423  
Common cold

**Talinanthes dodoneifolius** (DC.) Danser.  
Kauchi (H)  
Stem bark  
Decoction  
Internal  
ABU 6517  
Hepatitis

**Loranthaceae**  
*Hibiscus rostitiatus* Guill. & Perr.  
Dakwan (B)  
maratum (A)  
Whole plant  
Powder and decoction  
Internal  
ABU 1774  
Rabies  
Hepatitis  
HIV

**Meliaceae**  
*Khaya grandifolia* Oganwo (Y)  
Stem Bark  
Decoction  
Internal and external  
ABU 900181  
Chickenpox  
Rabies  
Hepatitis  
HIV

**Mimosaceae**  
*Acdaravichta Indica* A. Juss.  
Parkia biglobosa (Jacq.) R Br.  
Dogan yaro (H)  
Stem Bark, leaves  
Decoction and powder  
Internal  
ABU 900151  
Hepatitis  
Hepatitis  
Chickenpox  
Hepatitis  
HIV

**Moraceae**  
*Ficus thomningii* Blume  
Chediya(H)  
Stem Bark  
Decoction  
Internal  
ABU 651  
HIV

**Ficus vallis choade Dehile**  
Ogunro (Y)  
Stem Bark  
Decoction  
Internal  
ABU 547  
HIV

**Morina**  
*Ficus sycomorus* L.  
Baore (H)  
Root  
Decoction  
Internal  
ABU 1942  
Hepatitis

**Moringaceae**  
*Moringa oleifera* Lam.  
Zogallagandi (H)  
Root  
Decoction  
Internal  
ABU 571  
Hepatitis

**Myrtaceae**  
*Syzgium guineense* Wall.  
Malmo (H)  
Root  
Decoction  
Internal  
ABU 900295  
Hepatitis

**Psidium guianum** L.  
Guaba (H)  
Leaves  
Decoction  
Internal and external  
ABU 2846  
Measles

**Oliveaceae**  
*Ximenia americana* L.  
Tsaada (H)  
Root  
Decoction  
Internal  
ABU 1612  
Measles

**Ochnaceae**  
*Spondias amara* L.  
Jan magani (H)  
Roots  
Decoction  
Internal  
ABU 900121  
Measles

**Poaceae**  
*Sorgum guineense* Staph.  
Doro (H) okababa (Y)  
Seeds, stem  
Decoction  
Internal  
ABU 8501  
Measles  
Hepatitis  
Chickenpox  
HIV

**Polygalaceae**  
*Securidaca longepundulata* Fers.  
Sanya (H)  
Leaves  
Whole plant  
Powder and decoction  
Internal  
ABU 900141  
Common cold  
Measles  
Hepatitis  
HIV

**Rubiaceae**  
*Pavetta cissipes* K. Schum.  
Rubatari (H)  
Leaves  
Decoction  
Internal  
ABU 904  
Common cold

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<table>
<thead>
<tr>
<th>Plant Family</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Part Used</th>
<th>Preparations</th>
<th>Application</th>
<th>Code</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutaceae</td>
<td>Mitracarpus scaber</td>
<td>Googamassu (H)</td>
<td>Leaves</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 70701</td>
<td>Measles</td>
</tr>
<tr>
<td></td>
<td><em>Nauclea latifolia</em> Sm.</td>
<td>Egbesi (Y)</td>
<td>Stem bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 005</td>
<td>Chickenpox, Hepatitis</td>
</tr>
<tr>
<td></td>
<td><em>Spermocoe verticellata</em> Oldenlandia goens DC</td>
<td>Karyangarma (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 672</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raatsa-hanji (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal and external</td>
<td>ABU 9558</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td>Citrus aurantifolia</td>
<td>Lemun sami (H)</td>
<td>Leaves</td>
<td>Decoction and powder</td>
<td>Internal</td>
<td>ABU 1440</td>
<td>Measles, Hepatitis</td>
</tr>
<tr>
<td>Sapotaceae</td>
<td><em>Nauclea latifolia</em> Sm.</td>
<td>Egbesi (Y)</td>
<td>Stem bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 005</td>
<td>Chickenpox, Hepatitis</td>
</tr>
<tr>
<td></td>
<td><em>Spermocoe verticellata</em> Oldenlandia goens DC</td>
<td>Karyangarma (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 672</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raatsa-hanji (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal and external</td>
<td>ABU 9558</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td><em>Spermocoe verticellata</em> Oldenlandia goens DC</td>
<td>Karyangarma (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 672</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raatsa-hanji (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal and external</td>
<td>ABU 9558</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td>Citrus aurantifolia</td>
<td>Lemun sami (H)</td>
<td>Leaves</td>
<td>Decoction and powder</td>
<td>Internal</td>
<td>ABU 1440</td>
<td>Measles, Hepatitis</td>
</tr>
<tr>
<td></td>
<td><em>Spermocoe verticellata</em> Oldenlandia goens DC</td>
<td>Karyangarma (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 672</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raatsa-hanji (H)</td>
<td>Whole plant</td>
<td>Decoction</td>
<td>Internal and external</td>
<td>ABU 9558</td>
<td>Chickenpox</td>
</tr>
<tr>
<td></td>
<td>Citrus aurantifolia</td>
<td>Lemun sami (H)</td>
<td>Leaves</td>
<td>Decoction and powder</td>
<td>Internal</td>
<td>ABU 1440</td>
<td>Measles, Hepatitis</td>
</tr>
<tr>
<td>Scrofulariaceae</td>
<td><em>Striga hermontheca</em> (Del.) Benth.</td>
<td>Kujiji (H)</td>
<td>Stem Bark</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 1058</td>
<td>Common cold</td>
</tr>
<tr>
<td>Solanaceae</td>
<td><em>Nicotiana tabacum</em> L.</td>
<td>Guota kaji (H)</td>
<td>Fruits</td>
<td>Maceration</td>
<td>Internal</td>
<td>ABU 1664</td>
<td>Bird flu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taba (H)</td>
<td>Leaves</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 1611</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Verbenaceae</td>
<td><em>Vitex chrysocarpa</em> Planch. &amp; ex Benth.</td>
<td>Magani kaji (H)</td>
<td>Leaves</td>
<td>Maceration</td>
<td>Internal</td>
<td>ABU 1611</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Zingiberaceae</td>
<td><em>Zingiber officinale</em> Rosco.</td>
<td>Chitta (H)</td>
<td>Rhizomes</td>
<td>Decoction</td>
<td>Internal</td>
<td>ABU 2261</td>
<td>Common cold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atale (Y)</td>
<td>Leaves</td>
<td>Decoction</td>
<td>Internal</td>
<td>FHI 108004</td>
<td>Common cold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Atare (Y)</td>
<td>Leaves, root</td>
<td>Decoction</td>
<td>Internal</td>
<td>FHI 108004</td>
<td>Common cold</td>
</tr>
<tr>
<td></td>
<td>Aframomum melegueta K. Schum.</td>
<td>Atare (Y)</td>
<td>Leaves, seeds</td>
<td>Decoction</td>
<td>Internal</td>
<td>FHI 108004</td>
<td>Common cold</td>
</tr>
</tbody>
</table>

**Key:** H: Hausa; Y: Yoruba; B: Berom; A: Anaguta

### Distribution of informant’s age

The age distribution of informants showed that most of the informants encountered during the survey are within the age range 40-49 and 50-59. This is shown on Fig 2.

![Figure 2: Distribution of informant’s age.](image)

### Medicinal plant parts used in treating viral infections

The various plant parts utilized are represented on shown on Table 2.

Table 2 above shows that stem bark was the most used part with estimated value of 23.6%, followed by leaves (20.8%) and roots (12.5%) respectively. Other parts are used, but not as frequent as the stem bark, leaves and roots.

<table>
<thead>
<tr>
<th>Part used</th>
<th>Frequency</th>
<th>% Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulb</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Flower</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Fruits</td>
<td>7</td>
<td>9.7</td>
</tr>
<tr>
<td>Leaves</td>
<td>15</td>
<td>20.8</td>
</tr>
<tr>
<td>Leaves, fruit</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Leaves, root</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Leaves, stem bark</td>
<td>3</td>
<td>4.2</td>
</tr>
<tr>
<td>Leaves, seeds</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>Leaves, whole plant</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Rhizome</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Root</td>
<td>9</td>
<td>12.5</td>
</tr>
<tr>
<td>Root, whole plant</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Seeds</td>
<td>2</td>
<td>2.8</td>
</tr>
<tr>
<td>Seed, root</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Stem bark</td>
<td>17</td>
<td>23.6</td>
</tr>
<tr>
<td>Whole plant</td>
<td>7</td>
<td>9.7</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>100.0</td>
</tr>
</tbody>
</table>

![Figure 3: Sources of information.](image)

### Sources of information

The sources of information in the study are Traditional Medicine Practitioners, Herbalist, Herb sellers, indigenes and residents. Herbalist and Traditional Medicine Practitioners were the major source of information, while the herb sellers, indigenes and residents gave less information as presented by Fig 3.
Table 3: List of Plants frequently mentioned in the treatment of a Particular Viral Infection by two or more informants.

<table>
<thead>
<tr>
<th>Viral Infection</th>
<th>Scientific Name of Plant</th>
<th>No. of Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common cold</td>
<td>Anogeisus leioparusat</td>
<td>8(50%)</td>
</tr>
<tr>
<td></td>
<td>Pavetta crissipes</td>
<td>7(44%)</td>
</tr>
<tr>
<td></td>
<td>Striga hermontheca</td>
<td>5(31%)</td>
</tr>
<tr>
<td></td>
<td>Allium sativum</td>
<td>4(25%)</td>
</tr>
<tr>
<td></td>
<td>Abrus precatorus</td>
<td>4(25%)</td>
</tr>
<tr>
<td></td>
<td>Vernonia amygdalina</td>
<td>2(13%)</td>
</tr>
<tr>
<td></td>
<td>Chennepodium amboosiodes</td>
<td>2(13%)</td>
</tr>
<tr>
<td></td>
<td>Manihot esculenta</td>
<td>2(13%)</td>
</tr>
<tr>
<td>Measles</td>
<td>Vernonia amygdalina</td>
<td>2(13%)</td>
</tr>
<tr>
<td></td>
<td>Cucumis metaliferas</td>
<td>3(19%)</td>
</tr>
<tr>
<td></td>
<td>Solanum nigrum</td>
<td>7(44%)</td>
</tr>
<tr>
<td>Chickenpox</td>
<td>Jatropha curcas</td>
<td>2(13%)</td>
</tr>
<tr>
<td>Birdflu</td>
<td>Boswellia dalzielii</td>
<td>3(19%)</td>
</tr>
<tr>
<td></td>
<td>Enantia chlorantha</td>
<td>3(19%)</td>
</tr>
<tr>
<td>Rabies</td>
<td>Boswellia dalzielii</td>
<td>2(13%)</td>
</tr>
<tr>
<td></td>
<td>Moringa oleifera</td>
<td>4(25%)</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>Jatropha curcas</td>
<td>2(13%)</td>
</tr>
<tr>
<td></td>
<td>Enantia chlorantha</td>
<td>3(19%)</td>
</tr>
<tr>
<td>HIV</td>
<td>Moringa oleifera</td>
<td>4(25%)</td>
</tr>
</tbody>
</table>

Table 3 above shows that some of the medicinal plants discovered during the survey are more popular in viral infection therapy than others. This confirms the authenticity of information gathered and also the importance of such plants. Hence, informant’s consensus revealed that, *Anogeisus leioparusat* used in the treatment of common cold is the most popular plant, cited by 8 informants (50%), followed by *Pavetta crissipes* and *Solanum nigrum* used in the treatment of common cold and bird flu respectively, mentioned by 7 informants (44%). The next plant is *Striga hermontheca* cited by 5 informants (31%). *Allium sativum* and *Abrus precatorus* used in the treatment of common cold and *Moringa oleifera* used to treat HIV are the next, mentioned by 4 informants (25%).

**Discussion and Conclusion**

**Medicinal plants used in treating viral infection in Jos-Plateau state**

In the ethno botanical survey conducted in Jos-Plateau, a number of 64 medicinal plants from 39 families and their uses in treating some common viral infections were reported as shown by table 1. This demonstrates the depth of the knowledge of the people of Jos-Plateau on medicinal plants and their uses. These plants were said to be effective in the treatment of the seven (7) common viral infections mentioned earlier. This study has shown that different areas in different part of the world demonstrate the existence of considerable amount of indigenous ethnomedical knowledge (Tesfaye and Zemede, 2009).

**Recipes, dosage regimen and route of administration**

Decoction and maceration are the most common mode of preparation. Oral route is the major route of administration, followed by a combination of both oral and external route of administration, depending on the type of viral infection been treated. This finding is in agreement with studies by Hunde et al, (2004) and Musa et al, (2011) which also revealed that oral ingestion is the most frequently used route of administration in traditional medicine.

Like most studies in ethno botany, it was observed during this study that the TMP's usually has no knowledge of the strength of their remedies, dosing depends on each practitioner (Tesfaye and Zemede, 2009). This lack of standardization and precision in dosage is seen as one of the main disadvantage of traditional medicine (Sofowora, 2008).

**Distribution of informant’s age**

The study revealed that most knowledge on herbal remedies is handled by members of the community between the age range of 40-49 and 50-59, as shown on Fig. 2. This indicates that there is a wide gap of ethnomedical knowledge between the elderly and the younger generation. The majority of the informants are middle aged and elders who said that they had learned about medicinal plants during their childhoods and the knowledge had been orally passed down from family members, particularly grandparents and parents. Most of the adults reported that they learned about medicinal plants when trailing with their parents or grandparents to gather remedies in the forest when they were young. This situation seems to be the same in many parts of the world (Musa et al., 2011, Bussmann and Sharon, 2006). Cultural changes as a result of westernization and modernization (Voeks and Leony, 2004) has contributed in...
making the younger generation undermine our traditional values (Giday et al., 2003). Since traditional medicine remains the most popular medicine in solving health problems in the developing world. It is important to publicize medicinal plant knowledge within the young generation to raise awareness of and appreciation for their traditional values and for the conservation and sustainable use of the plants as well as to keep the traditional medical knowledge left in their community alive.

**Medicinal plants used in treating viral infection**

Table 2 shows that stem bark was most commonly used part in the treatment of viral infection than other plant parts in the study area. This was followed by the use of leaves, roots, fruits, whole plant, while seeds, bulb, flower and rhizomes were least used. This is similar to a study by Murthy (2012), in which stem bark ranked highest part used, followed by leaves and then the other parts.

**Sources of information**

Figure 3 shows that Traditional Medicine Practitioners (TMP) and Herbalist gave the highest response, while herb sellers and indigenes/residents showed little response. This was due to availability and willingness of the TMPs and Herbalists to share their knowledge. Some of the herb sellers were resistant, while the residents and indigenes had little knowledge on traditional medicine.

**Plants frequently mentioned in treatment of a particular viral infection by two or more informants**

The frequently mentioned plants in the treatment of a particular viral infection are shown on Table 3. Sixteen (16) plants were identified and grouped according to the different viral infections. The fact that some of the plants are having similar uses in different LGAs surveyed indicates their pharmacological effectiveness (Oladumoye and Kehinde, 2011). It also confirms the authenticity of the information gathered during the study.

In conclusion, this ethnobotanical study has revealed that there is high knowledge and use of medicinal plants in Jos, plateau state. Through this study medicinal plant with the potential to treat or prevent viral infections were documented. The information from this study can serve as a guide for the discovery of new antiviral agents from plants.

**Recommendation**

There is need for ethnobotanical survey in every state of the nation on medicinal plants used in treatment of viral infection. In order to preserve knowledge on medicinal plants and to update existing information. Most of the medicinal plants used in plateau state are from the wild, there is need to encourage and enforce cultivation of medicinal plants, so as reduce exploitation of plants growing in the wild, otherwise, extinction of useful medicinal plants. Traditional medicine is relatively cheap, its raw materials are readily available, it is a potential source of new drugs and of course, a source of cheap starting products for the synthesis of known drugs. Hence, the sale and use of medicinal preparations should be encouraged and supported by the government. Since viral infection is one of the world most transmissible diseases, there is need for both private and public organizations to invest in researches that will lead discovery of new antiviral compounds that is safe, effective and less toxic, particularly from plants. The information on medicinal plants gathered during this study is based on claims by the TMP. Hence, researchers need to carry out investigations on these plants, so as to ascertain the claims.

**Reference**


Ethnobotanical survey of plants used in viral infections in Jos, Nigeria


