THE USE OF ETHNOBOTANICALS IN THE MANAGEMENT OF INFLAMMATION IN NIGERIA: A REVIEW

Fasola, T. R. 1* and Iyamah, P. C. 2

1Department of Botany, University of Ibadan, Ibadan, Oyo state, Nigeria
2Department of Biology, College of Education, Warri, Delta State, Nigeria

*Corresponding author’s e-mail: fasolatr@gmail.com

Abstract

Inflammation, one of the leading health issues in recent times call for concern. Many plants used in the management and treatment of inflammation in various parts of Nigeria have not been properly harnessed hence this review. The result of this review revealed that plants commonly used for the treatment of inflammation include: Zingiber officinale, Alstonia boonei, Plumbago zeylanica, Ocimum basilicum, Parquetina nigrescens, Peperomia pellucida, Abrus precatorius, Tetrapleura tetraptera, Alchornea cordifolia, Terminalia ivorensis, Aspilia africana, Ageratum conyzoides and Hymenocardia acida. Altogether 74 plant species are ethnobotanicals used in the management and treatment of inflammation. The plants were enumerated with their family names, common and local names, possible chemical constituents, part(s) used, route of administration and subsequent references where available.

Key words: Ethnomedicinal plants, Inflammation, Arthritis, Nigeria
Introduction
The use of medicinal plants constitutes an important part of traditional medicine which is a part of African heritage. Though modern or orthodox medicine has improved the lots of many people worldwide, it is noteworthy that in many cultures, modern medicine complements traditional practices as is obtainable in industrialized societies e.g. China and India (Odugbemi, 2006). It is estimated that there are about 500,000 species of plants on earth (Borris, 1996), of which a relatively small percentage (<10%) are used for food by humans and animals. It is possible that more serve as medicine (Moerman, 1996). Medicinal plants contain numerous biologically active compounds, such as alkaloids, quinines, terpenoids, flavonoids, carotenoids, sterols, simple phenolic glycosides, tannins, saponins and polyphenols.

Medicinal plant is defined as any substance with one or more of its organ containing substances that can be used for therapeutic purposes or which can be used as precursors for the synthesis of drugs (Sofowora, 1982, 1984). According to World Health Organization (WHO), as many as 80% of the world’s people depend on traditional medicine for their primary health care needs. Thus, they defined traditional medicine as health practice, knowledge and belief incorporating plants, animals and mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well being (WHO, 2005).

Inflammatory diseases such as arthritis and rheumatism are longstanding medical problems and major cause of morbidity throughout the world (Sofidiya et al., 2007). Inflammation is a reaction of the body that causes swelling, redness, pain and loss of motion in an affected area. It is a major physical problem in the most serious form of arthritis. Normally, inflammation is the way the body responds to an injury or the presence of disease agents. During this reaction, many cells of the body’s immune system rush to the injured area to wipe out the cause of the problem, clean up damaged cells and repair tissues that have been hurt. Once the “battle” is won, the inflammation normally goes away and the area becomes healthy again. In many forms of arthritis, the inflammation does not go away as it should; instead it becomes part of the problem, damaging healthy tissues of the body as this may result in more inflammation and more damage. The damage that occurs can change the bones and other tissues of the joints, sometimes affecting their shape and making movement hard and painful. Diseases in which the immune system malfunction and attacks healthy parts of the body are called autoimmune diseases. Inflammation
is characterized by four physical signs: warmth, redness, swelling and pain. Warmth and redness result from dilation of the small blood vessel in the injured area and increases local blood flow.

Inflammatory responses are associated with many pathological disorders and many Nigerian traditional medicine practitioners enjoy huge patronage and success in this area (Akah and Nwambie, 1994). Although a good number of plant species are used for this purpose, scientific and pharmacological information on them is scarce and not well harnessed (Akah and Njike, 1990). The plant kingdom is abundant in species that act as anti-inflammatory to human tissues. It should therefore be remembered that the steroidal anti-inflammatory drugs were developed from plant materials and are still largely synthesized from saponins such as diosgenin from Yam (*Dioscorea floribunda*). Although, the natural plants may not be as powerful as the steroid drugs, but are less dangerous. This work is a review of some ethnobotanicals used in the treatment of inflammation in Nigeria.

**Materials and methods**

This study reviewed both the published and unpublished articles which have been used in the treatment and management of arthritis. It revealed the plant species and families, common name, local names in Yoruba, Ibo and Hausa, plant part or parts used, mode of usage and chemical constituents where known.

**Diversity of plants used in the treatment of inflammation in Nigeria**

Since the discovery of aspirin from Willow’s bark (*Salix alba*), more than 100 years ago, many steroidal as well as non-steroidal anti-inflammatory drugs have been introduced. However, the prolonged use of most of these medications reportedly causes renal problems, gastrointestinal initiation and other adverse side effects (Bertolini *et al.*, 2001). The global interest has been aroused to discover plants which are traditionally used for aches, fever and rheumatic pain (Basu and Hazra, 2006).

The continuous search for natural plant products for use as medicines is encouraged by ethnobotanical surveys (Ogbole *et al.*, 2010). Igoli *et al.*, (2005) recognized ethnobotanical survey as one of the major approaches for selecting plants for pharmacological screening. Several workers have conducted ethnobotanical surveys among various tribes of the African continent and other parts of the world (Khan and Rashid, 2006; Sofidiya *et al.*, 2007; Ogbole *et al.*, 2010). The table below shows a diversity of plants used in the treatment of inflammation in Nigeria.
<table>
<thead>
<tr>
<th>Plant species with Family</th>
<th>Common Name</th>
<th>Local names</th>
<th>Chemical Constituents</th>
<th>Part(s) Used</th>
<th>Preparation and Administration</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Adansonia digitata L. Bombacaceae</td>
<td>Baobab tree</td>
<td>Ose (Y), Kukaa, Kaulambi</td>
<td>Tannins, Flavonoids, Saponins, Carbohydrates and Cardiac glycosides</td>
<td>Leaves</td>
<td>Leaf infusion</td>
<td>Odugbemi, (2008)</td>
</tr>
<tr>
<td>9. Allamanda cathartica L. Apocynaceae</td>
<td>Yellow allamanda, golden trumpet.</td>
<td>Allamonda (Y) 9,12,15-octadecatrienoic acid</td>
<td>Leaves</td>
<td>Leaves mixed with Piper nigrum</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. *Allium cepa* L. Liliaceae  
Onions  
*Alubosa* (Y) *Yabase* (I) *Albasa gudaji* (H)  
(Z,Z,Z), n-hexadecanoic acid, 3-O-methyl-d-glucose and 9,12,15-octadecatrienoic acid ethyl ester (Z,Z,Z).  
Allicin, Allistatin.  
Bulb  
Decoction or concoction with water or soda water  
Odugbemi, (2008)  
Ogbole et al., (2010)  

11. *Allium sativum* L. Liliaceae  
Onions  
*Ayu* (Y)  
Fruit  
Decoction or concoction with water or soda water  
Ogbole et al., (2010)  

12. *Allophylus africanus* P. Beauv Sapindaceae  
African currant  
*Akanro, Akaraesu* (Y)  
Terpenes, saponosides, cyanogenetic glucosides  
Bark, Root, Leaves  
Boiled in water and used as a drink  
Sofidiya et al., (2007)  

13. *Alstonia boonei* De wild. Apocynaceae  
Stool wood, pattern wood.  
*Ahun,Awun* (Y) *Eghu, Akp* (I)  
Alkaloids, Saponins, Tannins, Echitamine, Echitamidine.  
Leaves, Sap, Stem barks  
Topical application of the latex on the swollen part and leaf infusion drunk as desired. Decoction or concoction with *Citrus paradisi* fruits *Zingiber officinale* *Allium Sativum* and *Allium cepa* for *Rheumatoid arthritis*  
Sofidiya et al., (2007)  
Obute, (2007)  
Ogbole et al., (2010)  

14. *Alternanthera repens* (L) Kuntze Amaranthaceae  
Joy weed  
*Dagunro* (Y)  
Triterpene, Saponins  
Leaves  
Decoction used as tea  
Sofidiya et al., (2007)  
Odugbemi, (2008)  

Hemorrhage plant, Wild sunflower  
*Ako yunyun Yirim- yirrin* (Y) *Oranjila, Oramaejula* (I) *Kalankawa* (H)  
Tannins, Saponins.  
Leaves  
Chopped fresh leaves applied on inflamed sores  
Sofidiya et al., (2007)  

16. *Butyrospermum parkii* Kotschy Sapotaceae  
Shea butter  
*Ori* (Y)  
Fatty acids, (oleic, Stearic, Linoleic, Palmitic and Linolenic acids)  
Wax  
For external use mixture  
Ogbole et al., (2010)  

17. *Byrsocarpus coccineus* Schum. & Thonn. Connaraceae  
Crimson thyme  
*Amuje wewe, Oka abole* (Y) *mgba apezee, kimbare maharbaa* (I)  
Alkaloids  
Roots, Leaves  
Used topically  
Akindele and Adeyemi, (2007)  

18. *Cardiospermum*  
Heart seed  
* / Ako-ejirin* (Y)  
Protoanthocyanidin,  
Whole plant  
Leaves mixed with castor oil is  
Sofidiya et al., (2007)
<table>
<thead>
<tr>
<th>No.</th>
<th>Plant Name</th>
<th>Family</th>
<th>Genus</th>
<th>Common Name</th>
<th>Externally</th>
<th>Administered On</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>Species</td>
<td>Common Name(s)</td>
<td>Family</td>
<td>Primary Uses</td>
<td>Active Constituents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------</td>
<td>-------------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td><em>Ekebergia senegalensis</em> A.Juss Meliaceae</td>
<td>Stave wood</td>
<td><em>Oramu, Ayape Madachin dutsi</em> (Y), L.)</td>
<td>Limonoids</td>
<td>Infusion drunk as tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td><em>Eleusine indica</em> (Linn) Gaertn Poaceae</td>
<td>Goosegrass, wire grass</td>
<td><em>Ichite</em> (I)</td>
<td>Whole plant</td>
<td>Decoction drunk as desired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td><em>Entadrophragma cylindricum</em> Sprague Meliaceae</td>
<td>Cedar mahogany</td>
<td><em>Ijebo</em> (Y), <em>Papala Olu</em> (I), <em>Gedanohor</em> (I)</td>
<td>Triterpenoids</td>
<td>Stem bark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td><em>Ficus elastica</em> Roxb Moraceae</td>
<td>Sand paper tree</td>
<td><em>Ipin</em> (Y)</td>
<td>Emodin, Sucrose, Morin and Rutin</td>
<td>Decoction drunk as desired</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td><em>Garcinia cola</em> Heckle Clusiaceae</td>
<td>Bitter cola</td>
<td><em>Orogbo</em> (Y) <em>Adi</em> (H), <em>Akuilu</em> (I)</td>
<td>Lipids</td>
<td>Roots, Stem bark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td><em>Harpagophytum procumbens</em> DC Pedaliaceae</td>
<td>Devil’s claw, Grapple plant, Wood spider, or Harpago</td>
<td>Three iridoid glycosides viz. harpagoside, harpagide and procumbide</td>
<td>Roots</td>
<td>Prepared in the form of infusions, decoctions, tinctures, powders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td><em>Hippocratea indica</em> Willd Celastraceae</td>
<td>Mawoolule (Y)</td>
<td>Tannins, Saponins, and Alkaloids</td>
<td>Root bark</td>
<td>Decoction, poultice, infusion and ointment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td><em>Hunteria umbellate</em> Demouian</td>
<td>Aber (Y)</td>
<td>Alkaloids (acetyl)</td>
<td>Leaves, Roots</td>
<td>Decoction drunk as desired</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
40. *Hymenocardia acida* (Tul) Euphorbiaceae
    - **Apocynaceae**
    - **Corymine, Corylmine and Isocorymine, and Aberamines), Flavonoids, Tannins and Glycosides**
    - **Stem bark, Seeds**

41. *Icacina tricantha* Oliv
    - **Icacina**
    - **Gbegbe (Y)**
    - **Leaves. seeds**
    - **Infusion with *Lecaniodiscus cupanoides* drunk as desired**

42. *Jateorhiza macrantha* (Hook. F.) Excell
    - **Jateorhiza, calumba**
    - **Namunamu Atatu (Y)**
    - **Leaves**
    - **Topical application of leaf poultice**

43. *Khaya grandifolia* C.DC Meliaceae
    - **African Mahogany**
    - **Oganwo (Y)**
    - **Meliacin**
    - **Stems, Roots, Bark**
    - **Decoction drunk as desired**

44. *Khaya ivoriensis* A. Chev
    - **Meliaceae**
    - **Scopoletin, scoparone**
    - **Stems, Roots, Bark**
    - **Decoction drunk as desired**

45. *Lecaniodiscus cupanoides* (Planch) Sapindaceae
    - **Lecaniodiscus**
    - **Akika, Akaisin (Y) Kekera Kuchi (H) Okpu (I)**
    - **Triterpenoid saponins.**
    - **Roots, Leaves**
    - **Two teaspoon extract prepared from the root bark is taken daily orally early in the morning for 15 days and up to 3 months to cure arthritis and rheumatism**

46. *Lonchocarpus cyanescens* (Schum. and Thonn.) Benth
    - **Fabaceae**
    - **Elu. (Y) Talaki (H) nji, anamu (I)**
    - **Glycyrrhetinic (enoxotone), Triterpenes.**
    - **Roots, Stems**
    - **Macerated in alcohol and used as a drink**

47. *Microdesmis puberula* Hook.F. Pandaceae
    - **Hookeraceae**
    - **Esunsin, Osusin (Y)**
    - **Fruits, Leaves**
    - **Boiled in water and used as a drink**

    - **Anomoneaceae**
    - **Calabash, nutmeg.**
    - **Dario, Lakose (Y) Ehuru (I)**
    - **Essential oils**
    - **Leaves, barks**
    - **Chopped fresh leaves applied on inflamed sores**
<table>
<thead>
<tr>
<th></th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Family</th>
<th>Chemical Constituents</th>
<th>Plant Part Used</th>
<th>Medicinal Use</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Palisota hirsuta (Thumhb.) K. Schum Commelinaceae</td>
<td>Palisota</td>
<td>Palisota</td>
<td>Flavonoids, Antioxidants, Alkaloids, Tannins Terpenoids.</td>
<td>Leaves</td>
<td>Leaves and stem are used in treating rheumatism arthritis if taken as infusion</td>
<td>Obute, (2007)</td>
</tr>
<tr>
<td>52</td>
<td>Paullina pinnata L.</td>
<td>Hippo cola, five fingers, water cola</td>
<td>Sapindaceae</td>
<td>Triterpenoids, Paullinomide A, β-sitosterol</td>
<td>Leaves</td>
<td>Boil leaves and drink as desired</td>
<td>Sofidiya et al., (2007)</td>
</tr>
<tr>
<td>53</td>
<td>Peperomia pellucida (Linn) HBK</td>
<td>Silver bush</td>
<td>Lepidium</td>
<td>Alkaloids, Cardenoides, Saponins, Tannins, Secolignans, Tetrahydro-furan lignans.</td>
<td>Aerial parts</td>
<td>Squeezed juice used for eye inflammation and headache</td>
<td>Sofidiya et al., (2007)</td>
</tr>
<tr>
<td>56</td>
<td>Poga oleosa Pierre Rhizophoraceae</td>
<td>Inoi</td>
<td>Rhizophoraceae</td>
<td>Tannins, Saponins, Flavonoids and Alkaloids</td>
<td>Fruits</td>
<td>Decoction, poultice, infusion and ointment</td>
<td>Ogbole et al., (2007)</td>
</tr>
<tr>
<td>58</td>
<td>Salacia pallescens Oliv. Celastraceae</td>
<td>Elewekan</td>
<td></td>
<td>Leaves</td>
<td>Crushed with alcohol and used as poultice</td>
<td>Sofidiya et al., (2007)</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Schwenkia americana</td>
<td>Schwenkia</td>
<td></td>
<td>Leaves</td>
<td>Crushed and used as a poultice</td>
<td>Sofidiya et al., (2007)</td>
<td></td>
</tr>
</tbody>
</table>
L. Solanaceae

60. Sclerocarya birrea (A. Rich.) Hochst.
Anacardiaceae

Jelly plum, cat thorn, morula, cider tree, marula, maroula nut/plum

Phenolic compounds, flavonoids, tannins, Alkaloids.

Stem bark

Topical application of extract

Odugbemi (2008)

Anacardiaceae

61. Securidaca longipedunculata Fres.
Polygalaceae

Violet tree Ipeta (Y)

Saponins, Volatile compounds (methyl salicylate), Xanthones

Leaves, Roots

Paste of root bark and leaf is applied externally to cure rheumatism and sores.

Sofidiya et al., (2007)

Anacardiaceae

62. Stereospermum kunthianum Cham. Bignonaceae

Cham Sandrine Sansami (H)

Iridoid, Phenyl propanoid glycoside, Naphthoquinone, Anthraquinones.

Stem bark

Decoction drunk as desired

Ching et al., (2009).

Anacardiaceae

63. Strophanthus hispidus
Oliv Apocynaceae

Arrow poison plant Isagere (Y)

Resin, Mucilage, Trigonelline, choline, Fixed oil, Glycosides-K-strophantin.

Leaves

Decoction taken as tea

Sofidiya et al., (2007)

Apocynaceae

64. Terminalia ivoriensis
A. chev Combretaceae

Black Afara Epepe, Afara-duda Ipepe (Y)

Triterpenoid saponins, Ivorenoside A and B, Saponins.

Stem bark

Extract of Bark taken as tea

Iwu and Ayanwu, (1982)

Combretaceae

65. Tetrapleura tetraptera (Taub) Fabaceae

Aridan Aridan, Aidan(Y) Uziza (I) Kalangon Daji (H)

Triterpenoid glycoside (aridanin), coumarins, flavonoids.

Fruits

Decoction and infusion drunk twice daily

Sofidiya et al., (2007)

Meliaceae

66. Tithonia diversifolia
(Helmsl) A. Gray

Tree marigold, Mexican sunflower Agbale, jogbo (Y)

β-sitosterol, 2, 2-dimethy-6-acetyl-8-hydroxy-2H-chromen,6-methoxyl-Apigenin, Tagitinin A, Daucosterol, Tithonian 1,6-methoxyl-luteolin, 5, 6, 9-trihy droxyl-10-(E)-octadecenoic acid, Tithoniamide B, saponins.

Whole plant, Leaves, Roots


Asteraceae

67. Triclisia subcordata
Oliv Menispermaceae

Triclisia Alugbonron, Alugbinrin, Osanaparo (Y)

Phaeanthine, tricordatine, fancholine

Leaves

Used as infusion with leaves of Hymenocardia acida

<table>
<thead>
<tr>
<th>No.</th>
<th>Plant Name</th>
<th>Family</th>
<th>Part(s) Used</th>
<th>Chemical Constituents</th>
<th>Uses</th>
</tr>
</thead>
</table>
Prescriptions regarding the use of the plants listed in Table 1 could be based on a single plant part or combination of several plant parts. However, most herb sellers believe that combination of several plant parts cure disease rapidly and takes care of all signs and symptoms of the disease (Sofidiya et al., 2007). Methods of preparation as well as medical administration vary from decoctions to infusions which were mostly orally administered while poultice to paste were topically applied. It should however be noted that most of these plants are gathered from the wild.

Many African countries are taking advantage of the links to the ancient cumulative wisdom of the traditional practitioners. Ethnobotanical knowledge of the past as well as present folk is of immense value to the development of newer drugs with virtually little or no adverse effects. A few studies have contributed much in the understanding of the compound(s) responsible for the anti-inflammatory and analgesic action, their mechanism of action and therapeutic values.

**Pharmacological activity of some plants used in the treatment of inflammation**

Inflammation is a complex and dynamic condition in which many changes take place at the site of inflammation systemically. It involves a complex array of enzymes activation, release of mediators, extravasations of fluid, migration of cells, tissue breakdown and repair (Vane and Botting, 1995). It is known that the acute inflammatory response consists of three main vascular effects viz: vasodilation and increased vascular flow, increased vascular permeability and leucocytes migration to the injured tissues (Di Rosa et al., 1971). It is also known that anti-inflammatory effects can be elicited by a variety of chemical agents and there is no remarkable correlation between their pharmacological activity and chemical structure (Sertie et al., 1990). This coupled with the complexity of the inflammatory process that makes use of several different experimental models necessary when conducting pharmacological trials.

Carrageenan-induced rat paw oedema has been frequently used to screen natural products with anti-inflammatory potentials (Tapas et al., 2008). Inflammation induction with carrageenan involves the activation of platelet activation factor and release of pro-inflammatory mediators such as prostaglandins, kinins, tumor necrosis factor and nitric oxide (Tan-No et al., 2006). Carrageenan induces inflammation in three distinct major phases namely: the first phase which involves the release of histamine and serotonin, release of
kinins in the second phase and the activation of cyclooxygenase-2 enzyme and ultimate release of prostaglandins in the third phase (Agbaje et al., 2008). Formalin has been reported to induce inflammation via similar mechanism as described for carrageenan (Joseph et al., 2009). However, non-steroidal anti-inflammatory drugs such as aspirin, indomethacin and diclofenac are known to mediate their anti-inflammatory action via inhibition of these phases of inflammatory response (Vane and Booting, 1987; Noguchi et al., 2005).

The pharmacological anti-inflammatory activities of some plants listed in Table 1 using experimental animals have been reported: *Zanthoxylum zanthoxyloides* (Oriowo et al., 1982); *Lonchocarpus cyanescens*, *Costus afar* and *Terminalia ivorensis* (Iwu and Anyanwu, 1982); *Ficus elastica* (Sackeyfio and Lugeleka, 1986); *Alstonia boonei* (Olajide et al., 2000); *Chasmanthera dependens* (Morebise et al., 2001); *Acanthus montanus* (Adeyemi et al., 2004); *Bysorcarpus coccineus* (Akindele and Adeyemi, 2007), *Stereospermum kunthianum* (Ching et al., 2009), *Sclerocarya birrea* (Ojewole, 2004), *Harpagophytum procumbens* (Mahomed and Oyewole, 2004; Anilkumar, 2010), *Tithonia diversifolia* (Owoyele et al., 2004), *Palisota hirsuta* (Wood et al., 2009; Boakye-Gyasi et al., 2011), *Zingiber officinale* (Ojewole, 2006; Anilkumar, 2010), *Hippocratea indica* and *Poga oleosa* (Ogbole et al., 2007), *Securidaca longipedunculata* (Ojewole, 2008), *Tetrapleura tetraptera* (Ojewole, 2009), *Parquetina nigrescens* (Owoyele et al., 2008), *Hunteria umbellate* (Adeneye et al., 2011).

The plant genetic resources of Nigeria are great source of pharmaceuticals and therapeutics, though the plants are not adequately documented. Traditional medicine practice has existed in Africa and other cultures for centuries since man came into being. Until recently, this has been neglected or even outlawed in some cases due to undue pressure from the practitioners of modern medical practices and the unscientific background of the method of operation. There is therefore, a great need to harmonize traditional medicine practice with the orthodox practice rather than the disdain with which the later considers the former, in this part of the globe. This is obvious in the face of not only in the interdependence of the two but also for the fact that a greater number of people have it as their only available health care service as the orthodox is far removed from them. Furthermore, the traditional approach often treats some ailments that have defied modern medical practice. Apart from direct
traditional utility of these genetic resources, allopathic medicine is now taking recourse to traditional medicines because of its cheapness and availability to a greater percent of the world’s population. It is hoped that further research will be generated from this effort as is done elsewhere like China and India where modern medicine is viewed as complementary to traditional medicine and the poor are better off in accessing health care.

Scientific investigations of the plants and their medicinal properties on inflammatory diseases like arthritis, rheumatism, gout etc need to be carried out in various pharmaceutical industries and national laboratories. This will give a lead to the development of new natural drugs. The conservation of these plants is also very paramount in order to avoid there over exploitation and eventual extinction through proper education of the populace, establishment of medicinal plant farms, sustainable harvesting approach and setting aside of forest areas in the local communities as special zones.

References


