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MEDICINAL PLANTS USED IN THE MANAGEMENT OF MALARIA AMONG THE TRADITIONAL MEDICINE PRACTITIONERS (TMP'S) IN SOUTH WESTERN NIGERIA

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### **Abstract**

This study examined the type of medicinal plants used in the management of malaria in the Yoruba folklore in south western Nigeria. 87 Traditional medicine practitioners (TMP's) were interviewed. Plants available in the regions were considered in the survey and recorded with their local names, parts used, preparation and the modes of use. A total of 21 plant species used by TMP's in the management of malaria infections were identified. These species belong to 18 plant families.

**Key words:** Malarial management, TMP's, Yoruba.

### **Introduction**

Malaria is a major disease problem in tropical regions of the world, and is a vector-borne infectious disease that is widespread in tropical and sub-tropical regions. An estimated annual death of 1-3million from malaria only was made by WHO (1996) and Greenwood et al. (2005) with children being the most vulnerable in sub-Saharan Africa, while it infects between 300-500 million people yearly. Concerted effort had been made in combating the malarial parasite, and the disease vector.

Decades ago many antimalarial drugs were developed from plant based materials, for example an alkaloid (quinine) from the bark of *Cinchona* Spp, (Rubiaceae) and artemisinin from *Artemisia annua*, (Asteraceae). Despite some breakthroughs in the synthesis of antimalarial drugs, the parasite has developed resistance to most of the synthetic drugs, hence large population of people in the tropics still rely on plant based therapy. In the tropical regions of Asia, South America and Africa where the disease is prevalent people still use *Cinchona* bark and other plants respectively.

About 80% of the populations of many developing countries still use traditional medicines for their health care (Khan and Nkunya., 1991; Tuley De Silva, 1999). Over 90% of Nigerians in rural areas and about 40% of the population living in urban areas depend partly or wholly on traditional medicines (Osemeobo, 1993). Due to economic reasons, most of the people in developing countries are precluded from the luxury of access to modern therapy (Elmi, 1991). This has made the people to rely on plant and animal resources for their health care over centuries. A study in Ibadan (Nigeria), has shown that urban centres are areas where traditional medicine is widely practiced, (Cunningham, 1997). Odebiyi (1990) also opined that

2/3 of the healthcare practitioners in Nigeria are traditional healers, while Cunningham (1993) reported that in Benin City (Nigeria), the ratio of TMP to the population is 1:110 while that of western medical doctor is 1:16400.

Many trees and shrubs in Nigeria have medicinal values (Young, 1989). The survey and proper documentation of various plants used by TMP's in combating the infant killer disease (malaria) is pre-requisite to the preservation of indigenous knowledge of our rich plant resources. It is the aim of this paper to provide invaluable information on these plants for further scientific research in drug development from plant resources.

### Population and study area

The people of South Western Nigeria are mainly of Yoruba ethnic group and distributed over six States namely: Oyo, Ogun, Ondo, Osun, Ekiti, and Lagos States. The study area lies between latitude 5° 30'N - 8° 05'N and longitude 2° 45'E - 6° 00'E (Filani and Olabode, 1993). The natural vegetation is composed of coastal and swampy forest, high forest, rainforest and derived savannah towards the north. Four out of the six States were considered for the study with an average population of 2.5m/ State (1991 census). The major occupation of the people is agro based and mostly lived in rural area except in Lagos State where urbanization has reduced the farming population.

### Data Collection

A total of 87 traditional medicine practitioners (TMP's) were interviewed in 22 locations distributed over the selected 4 States. Seventy eight (78) respondents were male practitioners while nine (9) respondents were female practitioners representing 90% and 10% respectively.

**Table 1::** Questionnaire Distribution Table

States	No of questionnaire	%
Osun	49	56.3
Ogun	17	19.5
Oyo	12	13.7
Ekiti	09	10.3
<b>Total</b>	<b>87</b>	<b>100.0</b>

The surveys were conducted between the years 2001 and 2003.

Ethno-botanical data were collected through oral interviews and responses recorded since the TMP's were mainly non-literate. With the help of the TMP's on the field, plant specimens were collected and identified at the Herbarium of Forestry Research Institute (FHI), Ibadan Nigeria. (Herbarium voucher nos were collected. Towns visited for interview are as follows:

**Ogun State** – Abeokuta, Ijebu-Ode, Iperu, Isara, Ilisan.

**Osun State** – Ile-Ife, Gbongan, Oyan, Olode, Awo, Ilesa Osogbo, Ipetumodu, Ido Osun.

**Oyo State** – Iseyin, Ibadan, Oko, Kisi

**Ekiti State** – Ilawe, Oye Ekiti, Aramoko, Ido

### Results and Discussion

A total of 21 plant species used by TMP's in the management of malarial infections were identified. These species belong to 18 plant families. The plants were collected during the survey in the four (4) States of south western Nigeria and identified taxonomically. All the plants listed in the survey were available in all the forest regions of the 4 States. Results from

the survey showed that out of the 21 plant species cited, 52.4% were trees, 33.3% shrubs and 14.3% climbers; this is an indication that trees are often used than shrubs and climbers/creepers. Also 47.6% of the plants cited as antimalarial species were sourced from the wild, 14.3% from cultivated sources (farms and TMP's premises), while 38.1% are either from cultivated sources or from the wild. This showed that TMP's mostly sourced their plant materials from the wild (47.6%) while few are cultivated (14.3%) in the region surveyed. Also leaves were mostly used 44.5%, followed by stem bark 25.9%, seed/fruits/flowers 14.8%, roots 11.1% and plants used wholly represent only 3.7%.

Some of the plants have been reported to contain compounds with antimalarial activities while some are yet to be investigated biologically. Kansik. et al. (2002) have reported the components of the alcoholic extracts of leaves and seeds of *Azadirachta indica* to be effective against both chloroquine-resistant and chloroquine sensitive strains of the malarial parasite. Nimbolide, azadirachtin and gedunin isolated from *A. indica* inhibited the growth of the malarial parasite (Rochanakij et al., 1985; Khalid et al., 1989; Govindachari, 1992; Kraus, 1995). In Ghana and Nigeria, *Alstonia boonei*, *Rauvolfia vomitoria*, *Morinda lucida* and *Xylopiya aethiopia* have been reported to be widely used in treating malaria, (Agbovie. et al., 2002; Aiyeloja and Bello, 2006). *Momordica charantia* leaf was listed by Leslie (2005) as antimalarial component of Brazilian, Peruvian, Nicaragua and Panama herbal medicine. According to Awadh et al. (2004) studies have shown and confirmed extensive use of combination of these plants as antimalarial agents. But most of the antimalarial tests in the laboratory have not conclusively authenticated their antimalarial properties. It is, therefore, suggested that investigation on these antimalarial plant combinations should be carried out rather than investigating the plants individually as antimalarial agents, and antimalarial activities of the recipes should be investigated and developed.. *Lawsonia inermis* ranked high among the antimalarial plants in Yemeni herbal medicine (Awadh et al., 2004). *M. charantia* leaf contains momordin, alpha and beta-momorcharin, cucurbitacin B and charantins. Anthraquinones from *Morinda lucida* (Awe and Makinde, 1998) and active agents from *Garcinia cola* are all worth investigating biologically on malaria parasites using appropriate models.

**Table 2:** Plants used in the management of malarial in south western Nigeria

Name	Local names (Yoruba)	Part used	Preparations	Modes of use
1. <i>Usteria guinensis</i> Wild (Loganiaceae) (FHI 38336)	Esinsin ile	Leaves, stem	Leaves.& Stem macerated with local black soap	Bath with the soap daily.
2. <i>Hillieria latifolia</i> H.Walt (Phytolacaceae) (FHI 92002)	Ogo	Leaves.	Leaves plus Lvs of <i>Blighia. sapida</i> , <i>Carica papaya</i> , <i>Citrus aurantifolia</i> , <i>Anogeisus leocarpus</i> plus fruits of <i>Xylopia aethiopica</i> all boiled in water	35ml of the decoction thrice daily and bath with decoction
3. <i>Garcinia kola</i> Heckel- (Gutiferae) (FHI 90811)	Orogbo	Seeds	Macerated with <i>Plumbago zeylanica</i> roots, <i>Piper</i> fruits, <i>Allium ascalonicum</i> bulbs, <i>Parkia biglobosa</i> fruits, <i>Aframomum melegueta</i> seeds, table salts	One teaspoonful with pap daily
4. <i>Momordica charantia</i> Linn (Cucurbitaceae) (FHI 90843)	Ejinrin wewe	Fresh Leaves.	Macerated with <i>Vernonia amygdalina</i> leaf and juice of <i>Citrus aurantium</i> plus palm wine	One cup 3 times a day
5. <i>Jatropha curcas</i> Linn (Euphorbiaceae) (FHI 1986)	Botuje, Lobotuje, Lapalapa, Iyalode.	Stem bark (dry)	Pounded with black soap	Bath with soap 2 times daily
6. <i>Azadirachta indica</i> A. Juss (Meliaceae) (FHI 45479)	Dongoyaro	Leaves. and or stem bark	(1) Boiled with <i>Carica papaya</i> and <i>Mangifera indica</i> leaves  (2) Boiled with <i>Morinda lucida</i> , <i>Mangifera indica</i> , <i>Alstonia boonei</i> leaves and <i>Capsicum frutescens</i> fruits  (3) Decoction of the leaves (4) Decoction of leaf with <i>Cymbopogon citratus</i> , <i>Crinum jagus</i> and <i>Carica papaya</i> leaves plus root of <i>Morinda lucida</i> . (5) Decoction of stem bark in water	1 cup of decoction 2 times daily  1 cup of decoction 3 times daily  1 cup 2 times daily  1 cup 2 times daily  1 cup 2 times daily.

7. <i>Tetrapleura tetraptera</i> Taub (Mimosaceae) (FHI 56148)	Aridan Aidan	Fruits	(1) Pounded with <i>Carica papaya</i> roots, and <i>Citrus sinensis</i> , <i>Zanthoxylum xanthoxyloides</i> , <i>Securidaca longipedunculata</i> and <i>Allium ascalonicum</i> bulb mixed with local black soap. (2) Fresh mature fruits with <i>Kigelia africana</i> stem bark, roots of <i>Abrus precatorius</i> , <i>Olox subscopoides</i> , <i>Citrus aurantifolia</i> with fruits of <i>Capsicum frutescens</i> , <i>Piper guineense</i> and bulbs of <i>Allium cepa</i> & <i>Allium ascalonicum</i> (3) Fresh fruits plus dry fruits of <i>Xylopia aethiopica</i> , <i>Macaranga barterii</i> fresh leaves, <i>Allium ascalonicum</i> (whole plant), Sea shell and black soap are macerated together.	Bath twice daily with soap  All the materials are dried and ground. 1 tablespoonful of the powder mixed with pap 2 times daily for children  Soap used to bath 2 times a day.
8. <i>Jatropha gossipifolia</i> Linn (Euphorbiaceae) (FHI 107130)	Lapalapa pupa, Botuje pupa	Leaves	Macerated with black soap	Bath with it twice in 3 days
9. <i>Piper guineense</i> Schum & Thum (Piperaceae) (FHI 106409)	Iyere	Fruits	Powdered with dry twigs of <i>Celtis zenkeri</i> , <i>Capsicum frutescens</i> and table salt	Powder taken with hot pap or water 3 times daily
10. <i>Xylopia aethiopica</i> A.Rich (Annonaceae) (FHI 3849)	Eeru	Leaves plus Stem bark	Table salt plus leaves of <i>Dracaenia fragrans</i> , <i>Citrus aurantifolia</i> fruits of <i>Capsicum frutescens</i> , bulb of <i>Allium ascalonicum</i> are all dried and grounded together	Powder taken with hot pap or water 3 times daily
11. <i>Allium ascalonicum</i> Linn (Liliaceae)	Alubosa elewe	Whole plant	1. Powdered with <i>Mondia whitei</i> leaves, maize grains, fruits of <i>Capsicum frutescens</i> and table salt	Mixture taken with pap or water

			<p>2. Powder with roots of <i>Tetracarpidium conophorum</i>, <i>Plumbago zeylanica</i>, <i>Vernonia amygdalina</i> and <i>Parkia biglobosa</i> fruits plus salt</p> <p>3. Powdered with young <i>Carica papaya</i> fruits, <i>Gladiolus</i> bulbs, <i>Abrus precatorious</i> roots, fruits of <i>Capsicum frutescens</i> &amp; <i>Parkia biglobosa</i> and table salt</p>	<p>Powder taken with water or pap 3 times daily</p> <p>Powder taken orally with water or pap 3 times daily</p>
12. <i>Citrus aurantifolia</i> Swingle (Rutaceae) (FHI 89525)	Orombo wewe	Leaves	1. Decoction made with <i>Alchornea laxiflora</i> , <i>Culcasia scandens</i> , and <i>Pergularia daemia</i> leaves	A cup twice daily
			<p>2. Decoction prepared with <i>Cyclosorus afer</i>, <i>Blighia sapida</i> and <i>Anthocleista vogelli</i></p> <p>(3) Citrus leaf decoction with <i>Hillieria latifolia</i>, <i>Blighia sapida</i>, <i>Anogeisus leocarpus</i> and <i>Carica papaya</i>. <i>Xylopi villosa</i> stem bark is added in the decoction</p> <p>4) In decoction with <i>Aazadirachta indica</i>, <i>cajanus cajan</i> and <i>Morinda lucida</i> leaves</p> <p>5) In decoction with <i>Jatropha curcas</i>, <i>Jatropha gossypifolia</i> and <i>Chromolaena odorata</i></p> <p>(6) In decoction with <i>Lawsonia inermis</i>, <i>Vernonia amygdalina</i>, <i>Calotropic procera</i> and <i>Jatropha curcas</i> leaves</p>	<p>1 cup daily</p> <p>Oral administration of the decoction 2 times daily</p> <p>A cup 3 times daily</p> <p>1 cup daily</p> <p>A cup 2 times daily</p>
		Fruits		

<p>13. <i>Alstonia boonei</i> Dewild. (Apocynaceae) (FHI 85136)</p>	<p>Ahun, Awun</p>	<p>Stem bark</p>	<p>(1) Prepared in decoction with barks of <i>Morinda lucida</i>, <i>Enanchia chloranta</i>, <i>Terminalia avicenoides</i> and <i>Anthoclesti vogelii</i>                  (2) Powdered with bark of <i>Anthocleisti vogelii</i> and fruit of <i>Parkia biglobosa</i> add table salt                  (3) Prepared in decoction with bark of <i>Kigelia africana</i>, leaves of <i>Gossypium barbadens</i>, fruits of <i>Capsicum frutescens</i> and <i>Citrus auratium</i>.                  (1) Decoction of it with <i>Morinda lucida</i> and <i>Plumbago zeylanica</i> roots prepared in water.                  (2) Decoction of leaf prepared with <i>Leea guineensis</i> &amp; <i>Terminalia avicenoides</i> leaves and <i>Capsicum frutescens</i> fruits.</p>	<p>About 35ml of the decoction 3 times daily</p> <p>Oral administration with water or pap.</p> <p>35ml taken 3 times daily</p> <p>1 cup every morning</p> <p>1 cup 3 times daily</p>
<p>14. <i>Rauwolfia vomitoria</i> Afz (Apocynaceae) (FHI 106361)</p>	<p>Asofeyeje, Ira-igbo, Oora</p>	<p>Roots</p> <p>Leaves</p>	<p>(1) Decoction of the bark with <i>Harungana madagascariensis</i>, <i>Lawsonia inermis</i> &amp; <i>Chasmanthera dependus</i> barks and <i>Capsicum frutescens</i> fruits.</p>	<p>1 cup 2 times daily</p>
<p>15. <i>Enantia chloranta</i> syn- <i>Enanchia chloranta</i> Oliv. (Anonaceae) (FHI 101821)</p>	<p>Osopa, Yaru, Awopa</p>	<p>Stem bark</p>	<p>Decoction of the bark with <i>Harungana madagascariensis</i>, <i>Lawsonia inermis</i> &amp; <i>Chasmanthera dependus</i> barks and <i>Capsicum frutescens</i> fruits.</p>	<p>1 cup 2 times daily</p>
<p>16. <i>Morinda lucida</i> Benth (Rubiaceae) (FHI 7424)</p>	<p>Oruwo</p>	<p>Stem bark</p> <p>Leaves</p> <p>Roots</p>	<p>(1) Bark decoction prepared with <i>Khaya senegalensis</i>, <i>Alstonia boonei</i> and <i>Mangifera indica</i> barks                  (2) Decoction or Macerate and decant                  (3) Decoction of root with <i>Mallotus oppositifolius</i>, <i>Anthocleisti vogelii</i> root and rhizomes of <i>Curcuma domestica</i></p>	<p>1 cup 2 times daily</p> <p>1 cup 2 times daily</p> <p>1 cup once daily</p>

17. <i>Lawsonia inermis</i> Linn ( <i>Lythraceae</i> ) (FHI1100042)	Laali	Leaves	Leaves Infused With <i>Senna alata</i> , <i>Senna podocarpa</i> Leaves and Juice Of <i>Citrus aurantifolia</i>	1 cup 3 times daily
18. <i>Kigelia africana</i> (Jacq) D.C.. ( <i>Bignoniaceae</i> ) (FHI 4123)	Iyan, Pandoro Somunroro	Stem bark	Infusion Prepared With Stem Bark Of <i>Anacardium occidentale</i> , <i>Mangifera indica</i> and <i>Terminalia catapa</i>	1 cup 2 times daily
19. <i>Spondias monbin</i> Linn ( <i>Anacardiaceae</i> ) (FHI63948)	Iyeye, okika	Leaves	Decoction prepared with <i>Alstonia boonei</i> , <i>Harungana madagascariensis</i> , <i>Lawsonia inermis</i> , <i>Gossypium spp</i> , and <i>Cymbopogon citratus</i> leaves	1 cup 2 times daily
20. <i>Blighia sapida</i> Koenig ( <i>Sapindaceae</i> ) (FHI 89466)	Isin	Leaves	Decoction of leaves prepared with <i>Carica papaya</i> , <i>Tetracarpidium conophorum</i> leaves	1 cup daily
21. <i>Senna alata</i> Linn-Holl ( <i>Caesalpinaceae</i> ) (FHI 87305)	Asunwon oyinbo, Asunran oyinbo, Ajawa oyinbo	Root	Roots of <i>Senna alata</i> , <i>Senna podocarpa</i> , <i>Mondia whitei</i> , <i>Uvaria afzeli</i> and fruit of <i>Uvaria chammae</i> , <i>Capsicum frutescens</i> , <i>Parkia biglobosa</i> and sea shells plus table salt.	All the materials dried and ground, 1 table spoonful mixed with pap taken once daily.

\*The families and voucher numbers obtained at the Forest Herbarium, Ibadan, (FHI) for the plant specimens are put in parenthesis.

## References

1. Agbovie, T., K. Amponsah, O.R. Cretsil, F. Dennis, G.T. Odamtten and W. Ofusohene-Djan (2002). Conservation and Sustainable use of medicinal plants in Ghana. *Ethnobotanical Survey*. Ed. F. Dennis. Available on [www.unepwcmc.org/species/plants/-ghana](http://www.unepwcmc.org/species/plants/-ghana)
2. Aiyelaja A.A. and Bello, O.A. (2006). *Educational Research and Review* (1): 16-22. ([www.academicjournal.org/ERR](http://www.academicjournal.org/ERR)).
3. Awadh A.N. Ali, K. Al-rahwi and U. Lindequist (2004). Some medicinal plants used in Yemeni herbal medicine to treat Malaria. *Afr. J. Trad. CAM.* 1: 72-76.



4. Awe, S.O. and Makinde, J.M. (1998). Evaluation of sensitivity of *Plasmodium falciparum* to *Morinda lucida* leaf extract sample using rabbit *in vitro* microtest technique. *Indian J. Pharmacol.* . **30** (1): 51-53
5. Cunningham, A. B (1993). African medicinal plants: Setting priorities at the interface between conservation and primary Health Care. Working paper 1, WWF/UNESCO/Kew. People and plants initiative, Paris, France; UNESCO.
6. Cunningham, A.B (1997). An Africa-wide overview of medicinal plants harvesting, conservation and health care. In Global Initiative for traditional systems of Health, FAO, Eds, Medicinal plants for forest conservation and health care. NWFP series no 11.
7. Elmi, A.S (1991). Research into medicinal plants: The Somali experience. In: Mshigeni K.E, Nkunya M.H.H, Fupi V, Mahunnah R.L.A, Mshiu E.N. (Eds). Proceedings of international conference on Traditional plants. Arusha, Tanzania, 18-223 Feb. 1990. Dar es Salaam Univ. press. Dar es Salaam pp 27-32.
8. Filani, M.O. and A. Olabode (1993). Osun State (In) NIGERIA: Giant in the Tropic's Vol 2, 1993, Gabuno pub. Co. Ltd, Yaba, Lagos pp 379-387.
9. Govindachri, T.R. (1992). Chemical and Biological investigations on *Azadirachta indica* (The Neem Tree) *J. Curr. Sci.*, **63**: 117-122.
10. Greenwood, B.M., Bojang, K., Whitty, C.J. and Targett G.A. (2005) "Malaria". *Lancet* **365**: 1487-1498.
11. Kansik B, I. Chattopadhyay, R. K. Banerjee and U. Bandyopadhyay (2002). Biological activities and medicinal properties of Neem (*Azadirachta indica*). *Current Science*, Vol.82, No 11, pages 1336-1345.
12. Khalid, S. A., Duddect, H. and Gonzalez-Sierra, M. (1989). Isolation and characterization of an antimalarial agent of the neem tree *Azadirachta indica*. *J. Natural Products.*, **52**: 922-927.
13. Khan, M. R. and Nkunya, M.H.H, (1991). Antimicrobial activity of Tanzanian traditional medicinal plants. In: Mshigeni K.E, Nkunya M.H.H, Fupi V, Mahunnah R.L.A, Mshiu E.N. (Eds). Proceedings of international conference on Traditional medicinal plants. Arusha, Tanzania, 118-23 Feb. 1990. Dar es Salaam Univ. Press. Dar es Salaam.
14. Kraus, W. (1995), The Neem Tree :Source of Unique Natural products for Integrated pest Management, Medicine, Industry and other purposes (ed. Schmutterer, H.), 1995, pp35-88.
15. Leslie Taylor (2005). The Healing Power of Rainforest herbs. Pub: Square One Publishers Inc. Garden city Park NY pp.11040.
16. Odebiyi, A.L (1990). Western trained nurses assessment of the different categories of traditional healers in S/W Nigeria. *Nig. J. Nurse Studies.* **27**(4): 333-342.
17. Osemeobo, G.J. (1993). The hazards of Rural Poverty. Decline in common property Resources in Nigerian Rainforest Ecosystem, *J. Env. Management* **38**:201-212.
18. Rochanakij, S., Thebtaranonth, Y., Yeenjal, C.H. and Yuthavong, Y. (1985). Nimbolide a constituent of *A. indica* inhibits *Plasmodium falciparum* in culture. *Southeast Asian J. Med. Public Health*, **16**: 66-72.
19. Tuley De Silva (1999). Industrial Utilization of medicinal plant in developing countries (In) Medicinal plants for forest conservation and health care (Ed) G. Bodeker, Bhat K.K.S, Burley. J. and Vantomme P. FAO (NWFP 11) – Rome.
20. WHO (1996). Malaria distribution. *A Weekly epidemiological record* **71**(3): 17-34.
21. Young, R.L (1989). African workshop, Abidjan, Int. Union of Forestry Research Organizations.