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Ethnobotanical Knowledge of *Desplatsia dewevrei* (De Wild. & T. Durand) Burretby the Bini Tribe Edo State, Nigeria

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ABSTRACT

This study presents the ethnobotanical knowledge and uses of *Desplatsiadewevrei* amongst the bini tribe of Edo State. Using a non-structured (open-ended) questionnaire and oral interviews, ninety-one unknowledgeable and eighty knowledgeable and willing respondents; 65 locals and 15 herbalists from 42 bini speaking villages were interviewed between August 2015 and December 2016. Most of the respondents were women who claim the plant is majorly useful as food while some herbalists mention its usefulness in the management of convulsion, headaches, febrifuge and general pains. Laboratory studies to validate these claims are recommended so that this scarce species can be cultivated and sustainably used guided by indigenous knowledge of the plants' use. This will prevent the plant from being endangered as information on the availability and use of *Desplatsia dewevrei* is currently sparse as can be inferred from the ratio of knowledgeable and unknowledgeable respondents in this field research.

Keywords: Ethnobotanical, *Desplatsia dewevrei*, Bini, Edo State.

INTRODUCTION

The use of medicinal herbs is still a tradition adopted by ethnic communities who are living in undulating plains and at the foothills of dense forests (Dixit and Ali 2003)[9]. Ethnobotany is an integral part of aboriginal knowledge of a particular society (Lentini, 2000; Osawaru and Dania-Ogbe, 2010)[15, 20]. It may be defined as the study of relationships between humans and plantswith specific emphasis on traditional tribal cultures (Idu*et al*., 2009; Mesfin*et al*., 2013)[12, 18]. This type of study plays an important role in the conservation and documentation of sustainable use and importance of medicinal knowledge ofparticular area/civilization (Tor-Anyiin*et al*., 2003; Mesfin*et al*., 2009)[25, 17]. Over the centuries, human traditions have developed the knowledge and use of medicinal plants (Fakchich and Elachouri, 2014)[10], which belongs essentially to aged traditional practitioners especially in developing countries (Ouelbani*et al*., 2016)[22]. Several active compounds used in modern medicine are derived from ethnobotanical information, which is mostly based on popular and traditional medicine knowledge (Boudjela*et al*., 2013)[4]. Indigenous knowledge of plant species is the result of human interaction and selection of most desirable, powerful and successful plant species found in instantaneous environment at a specific time period (Venka-taswamy*et al*., 2010; Lulekal*et al*., 2013)[26, 16]. Thus, herbal practice is at risk of disappearing if not documented as they are typically transmitted from generation to generations by word of mouth (Benarba*et al*., 2015)[1]. Proper records of healing practices by traditional healer of ethnic groups are a necessity, for such knowledge can become an important source for the discovery of newer drugs (Rahmatullah*et al*., 2010)[23].

Desplatsia dewevrei is a forest tree named after Professor Desplats; a Frenchman in the nineteenth century (Keay, 1989)[14]. D. *dewevrei* is usually about 15-30 m high. The light colouredtrunk is often marginally slanting, having papery scales, 1 m girth with widely spreading crown. The coarsely toothed leaves are unequal at the base and have stellate hairs on the undersurface (Keay, 1989; Harris *et al*., 2011)[14, 11]. *D. dewevrei*is characterized by leaves (12-31 cm long by 4-12 cm broad) cordate on each side at base, with large white or yellow flowers (Keay, 1989)[14]. It flowers most of the year but, fruits between April to November yearly. The fruits are oblong-ellipsoid, 6-10 celled and longitudinally grooved, 10-20 cm long by 8-17cm broad. They young fruits are green while the ripe ones are yellow coloured. *D. dewevrei* is distributed across West African countries from Ivory Coast to Uganda (Burkill, 1985; Harris *et al*., 2011; Keay, 1989)[5, 11, 14]. The fruit are cherished by elephants, eaten by gorillas, chimpanzees and many other animals in the forest (Harris *et al*., 2011)[11]. Burkill (1985)[5] reported that the fruits and seeds of D. *dewevrei*are useful as food and medicines in the management of heart diseases, paralysis, epilepsy, convulsions and spasm. The bark of *D. dewevrei* is therapeutically useful in managing pain, nasopharyngeal infections,febrifuges and venereal diseases (Burkill, 1985)[5]. *Desplatsia dewevrei* have been listed as one of the major non-wood forest edible, localized products of Nigeria (Osemeobo and Uzor, 1999)[21] and a scare bioresource in the field genebank of the National Centre for Genetic Resources

and Biotechnology, Ibadan, Nigeria in dire need of conservation (Borokini*et al*., 2010)[3]. This study is aimed at documenting the ethnobotanical knowledge and use of *Desplatsia dewevrei* amongst the bini speaking tribein 42 villages encapsulated in seven Local Government Areas (Igueben, Ikpobaokha, Oredo, Orhionmwon, Ovia North-East, Ovia South-West, Uhunwonde) of Edo state, Nigeria as a way of unearthing reasons the plant should be cultivated in Nigerian medicinal farmlands and homesbefore it gets listed as an endangered species.

METHODOLOGY

Study area

The study area covered Bini speaking people of Edo State. Area of approximately 550 sq. km, situated between 60 15'N and 50 25'E of the equator. Forty-two villages in six Local Government Areas (Igueben, Ikpobaokha, Oredo, Orhionmwon, Ovia North East, Ovia North West and Uhunwonde LGAs) of Edo State, Nigeria were surveyed (Figure 1).

Data collection; Questionnaire design

Ethnobotany survey was carried out using a non-structured (open-ended) questionnaire for the educated and semi-educated informants. This was used to get as much information; medicinal, economical, and other uses of *Desplatsia dewevrei* known to the informants in this study. The illiterate, aged and knowledgeable native informants were orally interviewed and their responses documented. A total of 65 knowledgeable locals, 15 herbalists from August 2015- December 2016 were interviewed (Table 1). They volunteered their ethnobotanical knowledge at their volition.

Figure 1: Map of Edo state showing study areas.

Data Analysis

A slight modification of the methods used by Davids *et al*. (2016)[6] was followed in this study. After the surveys were completed, questionnaires were tartan for merit and completeness. After the oral interviews, which were recorded using a mobile device, derived information went through scrutiny and checks for originality and coherence.

RESULTS

Eightyknowledgeablerespondents were interviewed across all the villages in the six Local Government Areascovered in this study. The informants were divided into three different age groups (35-45, 45-55, 60 and above). All except three of the herbalists were men as shown on Table 1.

Table 1: Demographic features of the informants and number of cited medicinal plants by age group and educational level.

	Knowledgeable people		Unknowledgeable people	
	Herbalists	**Local people**	**Herbalists**	**Local people**
Informants	15 (18.8%)	65 (81.2%)	03 (3.3%)	88 (96.7%)
Age years				
35-45	2	18	0	43
45-55	5	21	1	35
60 and above	8	26	2	10
Educational level				
Illiterate	15		10	
Primary	36		18	
Secondary	21		27	
Tertiary	8		36	

Both sexes individuals of wereinvolved in this study. Majority of the informants in this study were women across boardas depicted on Figure 2.

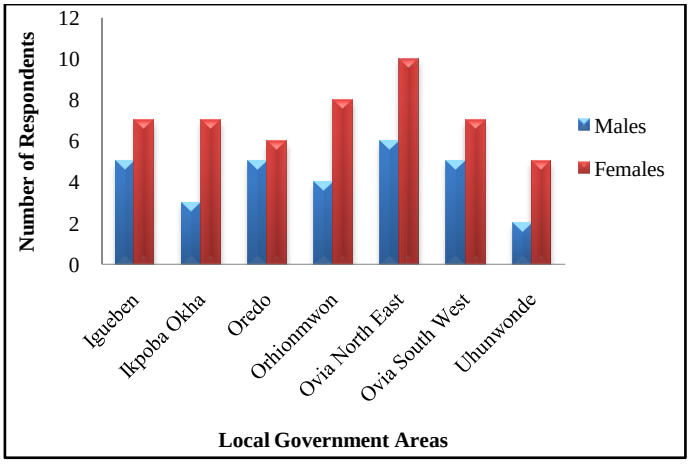

Figure 2: Gender distribution of respondents across the villages under-studied.

Eighty respondents knew the usefulness of *D. dewevrei* fruits as food material for making local soup. However some of the herbalists mentioned the plant as useful in the management of convulsion, heartaches and general pains in the body (Table 2).

Table 2: Ethnobotanical uses of *Desplatsiadewevrei*by the Binitribe of Edo state.

Ethnobotanical Uses	Plant parts/Mode of Preparation and Use
Herbalists	
▪ Food	▪ Juvenile fruits are used in making soup.
▪ Venereal disease	▪ The bark of the tree is ripped off, dried, diced and extracted with gin. The extract is drunk once daily for a week.
▪ Febrifuge	
▪ Convulsion	
▪ Heart-ache	▪ The leaves are similarly prepared and used as febrifuge, which is administered orally for a minimum of 2 weeks.
▪ General pains	▪ The tree bark is carved out using a machete, diced and extracted using boiling water or gin (optional) and ingested as the need arises. The decoction of the leaves is also useful as painkillers.
Locals	
▪ Food	▪ The fresh fruit is grated and used for making soup like *Abelmoschuse sculentus*.
	▪ The fresh fruits are boiled mildly, mashed using a mortar and pestle then used to make soup.
▪ Stains	▪ Fruits can be used as dye for clothes. It has a deep brown colour that hardly fades out.
▪ Fuel	▪ The dried fruits and young branches and twigs are reliable materials for making fire for cooking in the villages.

DISCUSSION

Indigenous people remain the ultimate source for retrieving information for the purpose of use, particularly in modern medicine (Idu 2009; Bibi*et al*., 2014)[13, 2]. This is evident in most survey studies carried out amongst local people, as it's the case in this study. The Bini speaking people from 42 villages of Edo state in this study are knowledgeable in the local use of D. *dewevrei*. Many were cross-examined in the course of this survey research but only a total of 80 respondents were apparently conversant with the plant in question. Of the 80 knowledgeable respondents documented in this study, 15(18.8%) were local herbalists while the others were villagers who claim to know the plant and have used it at one time or the other in their lifetime (Table 1). Unknowledgeable respondents representing 53.2% were more than the knowledgeable representing 46.8% of the total, in the villages surveyed. The informants between ages 35-45 were most unaware of the existence and use of *Desplatsia dewevrei*, which validates the localization, and scarce distribution of the plant in Southern Nigeria as claimed by Osemeobo and Ujor (1999)[21].Amazingly, most of the informants were women (Figure 2) as they are most involved and responsible in the preparation of food and the general health care of the family using carious medicinal plants. This trend happens to be in agreement with reports of De Oliveira *et al*. (2010)[8] and Müller-Schwarze (2006)[19] but, contrary to the views of Sujarwo*et al*. (2016)[24] who claim that men are more confident in divulging information during survey interviews. Like most survey research reports, the elderly (60 and above) across the 42 villages were more knowledgeable than the young ones on the plant existence and use (Table 1).Also, most respondents in this study appear to be educated only up to primary school level, which is typical of most rural dwellers.During this study, it was observed that where found existing, most of the aged respondents have the tree growing in the backyard of their homes and they claim they were there even in the days of their late fathers. Thus, they couldn't tell if the time/season of the year of plant collection affects the medicinal potency. This observation was similar in the study of De Brum*et al*. (2016)[7]. Most respondents didn't know how the tree is cultivated but a few say it is cultivated using stem cuttings of the matured tree branch. Although, Borokini*et al*., 2010[3] tried to document the biodiversity and conservation of plant genetic resources in Field Genebank of the National Centre for Genetic Resources and Biotechnology, Ibadan in Nigeria, this study shows there's a loophole on the conservation status of the D. *dewevrei* amongst the Bini tribe of Edo State. During the study, a lot of respondents lamented on the gradual extinction of the tree, which used to be very much readily available in their homestead in times past. This can be traceable to the effect of gross urbanization and deforestation for agricultural purposes or even wild fires.

Although D. *dewevrei* is a fairlyvanishingspecies,some herbalists and the elderly still recognize and use the plant majorly as food and medicine (Table 2). The recurrent way of preparing D. *dewevrei* for medicine was by soaking in local gin or water. Basically oral administration was the most prominent route of administration. Since there was high consensus among the informants about the use of this plant, its medicinal properties cannot be run-down. Some herbalists and locals encountered during this study claim that the bark and leaves of D. *dewevrei* are useful in the management of convulsion, heartaches, pains, febrifuge and venereal diseases (Table 2). These claims are comparable to the early survey study and findings of Burkill (1985)[5] on the ethnobotanical use of D. *dewevrei.* It is important that this ethnobotanical investigation led to pharmacological validation and drug development for the ailments claimed it could be used to treat as suggested by Idu (2009)[13].

CONCLUSION

In conclusion, Ethnobotany and the local populationsis key in the conservation and utilization guide of plant resources. The information shared in this survey on D. *dewevrei* might be fruitful as a pointer in the search for new plant origin drugs; as findings suggest, the plant is rich in bioactive compounds, which may be responsible for eliciting the pharmacological activities recounted by the villagers in this study. It is advocated that more people cultivate the tree in their homes not just as a shade-provider but a medicinal and food providing material available to all.

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Conflict of interest – Authors have no conflict of Interest.

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