



INDIGENOUS KNOWLEDGE OF TAITA COMMUNITY IN THE USE AND CONSERVATION OF MEDICINAL PLANTS: THE CASE OF TAITA HILLS, KENYA

Daniel M. Mwamidi¹, Shem M. Mwasi² and Abdrizak A. Nunow¹

¹School of Environmental Studies, Chepkoilel University College, P. O. Box 1124 Eldoret 30100 Kenya.

²School for Field Studies, Center for Wildlife Management Studies, P. O. Box 27743 Nairobi 00506 Kenya.

Email Id: dmwamidi@hotmail.com

(Received on Date: 19th April 2012

Date of Acceptance: 29th May 2012)

ABSTRACT

The Taita community is rich in indigenous knowledge regarding the use and conservation of different plants and this knowledge has been transferred orally through the generations. This study documented indigenous knowledge related to the use and conservation of medicinal plants found in the Taita Hills forests through qualitative group focus discussions and semi-structured interviews on elders living within the forests neighborhood. Qualitative data analysis on focus group discussion and interviews revealed the role of indigenous knowledge in solving health problems and in conservation of biodiversity. The study found that indigenous knowledge of the Taita had been a major tool used in utilization and conservation of indigenous forests in the past. However, for effective use and conservation of Taita Hills' medicinal plants to be attained, this study recommends the use of the largely untapped local indigenous knowledge in synergy with modern scientific knowledge in plant conservation and in determining the efficacy of these medicinal plants.

Keywords: Generations, Forests, Biodiversity, Utilization and Synergy

Number of Figures: 1

Number of Tables : 1

Number of References: 27

INTRODUCTION

Indigenous knowledge practices are increasingly recognized as a useful multidisciplinary tool to assist in achieving sustainable resource use in many rural communities, while securing the resource base (Rijal, 2008). Significant levels of global knowledge is said to have originated from indigenous knowledge. For instance, modern conventional and veterinary medicines have been developed as a result of the indigenous knowledge of many communities in the world (Brokensha *et al.*, 1980; Hardon *et al.*, 2004). People in all continents have used hundreds to thousands of indigenous plants for treatment of ailments since prehistoric times. In Kenya and many parts of the world, a large part of the rural communities depends on herbal medicines in primary healthcare (Muhia and Njenga, 2002; Rijal 1995). Many of the pharmaceuticals currently available to physicians have a long history of use as herbal remedies including opium, aspirin, digitalis and quinine (Huffman, 2003). The World Health Organization (WHO) estimates that 80 % of the world's population uses herbal medicine for some aspect of primary health care (Olsen, 1998).

The newly promulgated Kenya Constitution recognizes the role of communities' indigenous knowledge and practices as being a paramount tool to national development. Article 11 (2b and 3b) states that "the constitution recognizes the role of science and indigenous technologies in the development of the nation" and "recognize and protect the ownership of indigenous seeds and plant varieties, their genetic and diverse characteristics and their use by the communities of Kenya" (GoK, 2010). This indicates that indigenous knowledge can be nurtured and mainstreamed to the national development agendas for sustainable

development.

Taita Hills being part of the Eastern Afromontane biodiversity hotspot has high endemism in plants. A recent report indicates that there are 492 vascular plant taxa that are endemic which include 402 species plus 90 subspecies and varieties, and another 114 taxa of trees (Platts *et al.*, 2010). Despite of having and using many medicinal plants, Taita community's indigenous knowledge on the use and conservation methods has not been documented for the benefits of the community and for their future generation (CEPF, 2007). There is a serious risk of losing such knowledge on medicinal plants as only elders are in the custody of this knowledge and if not immediately documented it could become extinct. This study therefore was conducted to document the indigenous knowledge of the Taita community on use of medicinal plants and their conservation.

Study area

The study was conducted in Taita Hills found in Taita- Taveta County of what was previously known as Coast Province in Kenya (Figure 1). These Hills lie in the South-Western part of Kenya, south and west of Voi town, and rise abruptly above the semi-arid plains of Tsavo West National Park. The Taita Hills are divided into three main blocks. Sagalla Hill (1,450 m a.s.l), directly south of Voi, is separated from the rest of the hills by the Voi River on the plains. The main body of the hills, Dabida, which is situated 25km north-west of Voi, includes the high peaks of Ngangao (2,149 m a.s.l) and Vuria (2,228 m a.s.l). To the north-east of this range lies the massif of Mbololo at 2,209m a.s.l (Platts *et al.*, 2010).

Geologically, the hills are the northernmost outpost of the ancient Eastern Arc Mountains that extend southwards to south central Tanzania (Schluter, 1997). This is one of the world's most important regions for biodiversity with high endemism in plants, birds, mammals and amphibians (Mittermeier *et al.*, 2004).

At the base of the hills, rainfall is only 500mm/year with an temperature of 30°C. This rises to 1,500mm/year on the top, with an average temperature of 14°C (CEPF & EAWS, 2005). Dry bushland runs up the flanks of the hills, giving way rather abruptly near the top to smallholder cultivation and remnant patches of moist forest (Platts *et al.*, 2010). Despite their small size, the forests are important for water catchments (supplying the Voi River and various local streams), soil conservation (EAWS, 2001) and habitat to wild animals including mammals, birds, amphibians, reptiles and insects (Platts *et al.*, 2010). The indigenous forests in this area have been fragmented, degraded and some converted to exotic plantations (Mwang'ombe, 2007).

These forests are crucial for the livelihoods of the local people, existence of wildlife in the rangelands (Tsavo East and West National Parks and local ranches) and the rare and endemic species they hold (EAWS, 2001).

The Taita Hills forest complex comprises of Mbololo, Ngangao, Chawia, Kasighau, Sagalla forests and the lower dry land forests bordering Tsavo East and West National Parks. The total size of the forests is about 10,283.62 ha of which 1,118.21 ha is gazetted, and 9,165.41 is non-gazetted (EAWS, 2001). Thus most of the forests remain non-gazetted posing a risk of being destroyed by human activities. There are 48 small scattered forests which are mostly found on the top of the Taita Hills of which 28 are gazetted and are under government protection and management. These range in size from 500 m² with a few indigenous remnant trees to modestly vast 2 km² indigenous and exotic forests (Wilder *et al.*, 1998).

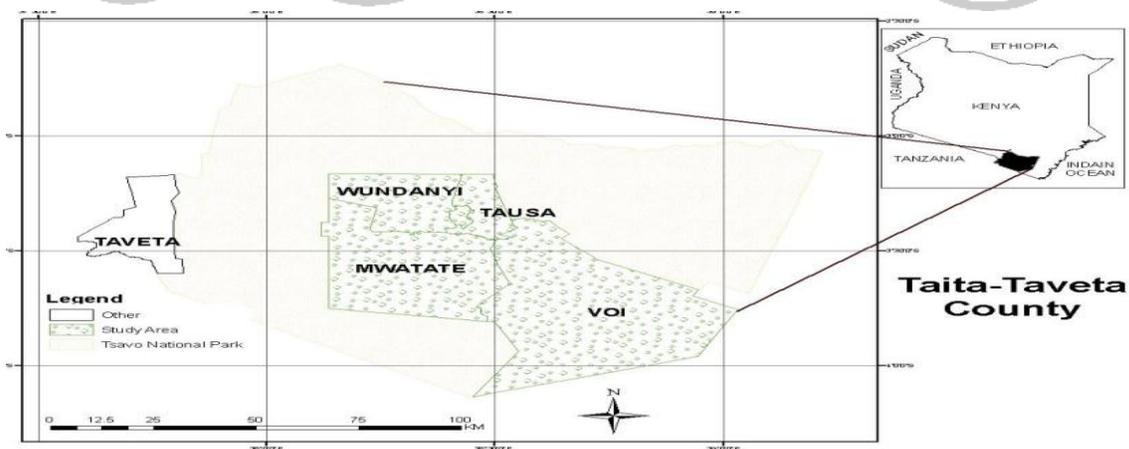


Figure 1: A map showing the location of the study sites

MATERIAL & METHODS

Initial community organizing, planning, establishing proper communications and rapport-building visits included discussions with local leaders, traditional herbalists and other key informants such as Forest officers, District Natural Resources officer and National Museums of Kenya Taxonomist . This helped to identify final key informants including 8 herbalists (2 from each division) and 8 community elders (2 from each division) of which were above sixty years of age. In Taita and Kenya coastal communities people younger than forty years are considered to be youth (Fedders & Salvadori, 1979). Semi-structured interviews were conducted with key informants the respondents were briefed on the reasons for the research and an interview was carried out on those who had agreed to be interviewed.

Forests visits were conducted with herbalists and community elders aiming at asking questions about the use of plants and their indigenous conservation methods. During forest visits, queries were made about plants not mentioned in the interviews in order to uncover knowledge of forgotten species. An official from East Africa Wildlife Society (EAWS), Wundanyi office was used to facilitate the interviews and translate the plant names to English and botanical names.

Triangulation of data was achieved when both unstructured interviews, observations, semi structured questionnaires and focus group discussions were used to source data. In administering member checks, we provided a summary of the data gathered for respondents to listen to and comment so as to validate it.

The data were analyzed using descriptive statistics. Since the data were mostly

collected in vernacular language, translation had to be done before analysis of the data to make it understood in English. It was thus mostly qualitative in nature. The data were analyzed using nominal scale (categorical variables) by coding it based on: themes, topics ideas, concepts, terms, phrases and keywords. Mode was used as a central tendency for the data.

RESULTS AND DISCUSSION

The study documented the most used medicinal plants for common ailments in Taita hills and their indigenous conservation mechanisms.

Blood flower (*Scadoxus multiflorus*) is used in the treatment of respiratory problems including asthma, bronchitis, tuberculosis, pneumonia and sinusitis. This is achieved by boiling its tuber and drinking the resultant fluid after cooling. The use of *S. multiflorus* in the treatment of asthma and broncho-asthma is important in local community healthcare. Modern phytochemical analyses of this plant indicate that it has antimicrobial properties that are beneficial in the treatment of several pathogenic afflictions (Saad *et al.*, 2012). This shows that it is possible for indigenous knowledge to be blended with contemporary scientific knowledge for successful utilization of wild biodiversity for human health benefits.

Lannea schweinfurthii is used to treat asthma and food allergies in the human digestive system and widely used as “herbal tea” for many years by boiling its roots and the bark and then mixing it with honey or sugar. The concoction of *L. schweinfurthii* is also used for tie and dye on fabrics. The use of *L. schweinfurthii* has many health

benefits and some studies have shown that it has many medicinal purposes in traditional cultures among the local communities in Zimbabwe, Swaziland, Mozambique, Zambia, South Africa (Kwazul-Natal), Kenya, Tanzania and Uganda (Hyde & Wursten, 2011).

Uvaria lucida has been used in baiting and killing of rodents such as rats, squirrel and moles that destroy crops. The sap secreted from this plant is mixed with maize or millet flour and dried, and placed on their paths. Other studies have not shown any uses by other communities in the world. For instance Hyde and Wursten (2011) found no indigenous uses of this plant species in South African countries.

Carandas plum (*Carisa edulis*) has been used to treat sexually transmitted diseases (STDs) such as syphilis, gonorrhoea, chancroid, vaginal discharge and general genital afflictions. The plant is believed to promote libido in men and women and improves fertility in both. The use of *C. edulis* as a treatment for venereal diseases is an important community asset. In Loliondo, Northern Tanzania, *C. edulis* is used by Reverend Babu Ambilikile Mwasapile to treat terminal ailments such as cancer, HIV-AIDS and other complications using a single dose (a cup) made up of its boiled roots and it is claimed to have “miracle cures” (Sheqafica, 2011) and it is also used in India in treating syphilis (Josh & Josh, 2000).

Tabernaemontana stapfian's leaves are used to treat viral and bacterial infections and people use it in treating sickness related to HIV-AIDS condition called psoriasis when mixed with *Carisa edulis* bark and root.

Local brewers use the fruit of *Kigelia africana* to make alcoholic drink. This fruit

is used as a catalyst to work on a substrate (Carbohydrates such as maize flour, millet) to produce alcohol. *K. africana* is used as a brewing “catalyst” by many other communities in Kenya such as the Kikuyu, Kamba, Meru, Embu and Maasai. According to Berkers (1993), *K. africana* is used to make local alcoholic beverages in most communities in Sub-Sahara Africa.

Pepper bark tree (*Warburgia stuhlmannii*) is used for the management of febrile fever brought by diseases such as malaria, typhoid, amoeba and pneumonia. The boiled bark and roots are used for aphrodisiac purposes especially in Kishushe, Mghange, Mwakitau and Mbololo. It is also used to predict mating seasons for porcupines (*Erethizon dorsatum*) and warthog (*Phacochoerus africana*). During their mating season, these animals dig and eat the roots. Due to this fact, the local community associates it with aphrodisiac uses.

Croton macrostachyus is utilized for malaria treatment by boiling its bark and roots. Culturally it is used for making beehives; the leaves are used by farmers in biological pest control when mixed with tobacco and boiled overnight. The resultant mixture is used as a biological pesticide for the control of maize stalk borers and aphids. The local community believes that the tree conserves water catchment areas since it grows on river banks and springs.

Livestock herders utilize *Euphorbia scarlatina*, for treatment of livestock infectious diseases such as anthrax, and foot and mouth. New sprouts of *E. scarlatina* are useful in the treatment of throat and stomach cancer in human beings. Farmers grow this plant and culturally protect it where it grows naturally hence conserving it in the process. In the lower ecological zone of Taita hills especially in Kishushe, Sangenyi, Kidaya,

Mbololo, Mbulia, Bura and Mghange-Nyika, the local people use *Ocimum kenyensis*, to repel and kill mosquitoes. The leafy branch which emits a strong scent is put at the window or at the door to repel mosquitoes. Its boiled leaves are used to treat malaria, prostate cancer, promote libido in men, respiratory ailments, and controls enuresis- urinating while asleep, occasionally experienced in young children. The community cultivates and plants *O. kenyensis* on their farm fences or homesteads as a way of conserving it.

Ocotea usambarensis has a strong scent which the local community used as fragrance during weddings. The leaves were put under the bed to aid in creating a “romantic” environment. The community believes that it cures common colds even by standing near this tree and “enjoying” its aroma. The bark and the root when boiled and taken ½ a cup twice daily for one month is believed to treat terminal diseases such as throat cancer and conditions related to HIV-AIDS; community elders also believe that it treats measles effectively. Farmers in the community use *O. usambarensis* for detecting the onset of army worms since this

tree is preferred by butterflies (*Cymothoe teita* and *Papilio desmondi teita*) as a breeding site. These worms are the larval stage of the butterflies. This will alert farmers to prepare pesticides to kill the larvae that destroy crops. The boiled bark of this tree is also believed to cure snake bites since many snakes are often found around this indigenous tree species.

Human-wildlife conflicts in the lower ecological zone of Taita hills is high and herders use *Acacia mellifera*'s twigs in fencing cattle pens so as to minimize the conflict with lions, since it has claw-like thorns which can injure lions when they step on it. It is believed that lions would not dare cross where the cattle pen is constructed using this plant. The root and bark of this plant is used to treat malaria, stomachache and skin diseases such as eczema and ringworms by boiling the roots and the bark and then orally consuming the resultant mixture. Table 1 summarizes the medicinal uses of different indigenous plants found in Taita hills.

Table 1: Indigenous Plants and their Medicinal Uses

Indigenous Plants	Indigenous medicinal uses in humans
<i>Euphorbia scarlatina</i>	-treats sore throat and upper respiratory tract diseases, Effective in palliative care for cancer patients, especially throat, prostate and breast cancers. Parts used- Sprouts that resembles asparagus. Preparation mode: infusion of sprouts.
Peacock fower (<i>Albizia gummifera</i>)	Treats stomach ulcers, headaches, malaria, back aches. Parts used- roots and the bark Preparation mode: Decoction of root and bark
Fig tree (<i>Ficus thoningii</i>)	-Treats malnutrition in children by the figs mashed and mixed with porridge and given to the child. -It has antiseptic properties. Parts used- figs and the bark. Preparation mode: Infusion of the bark and figs, mashed sun-dried figs.
Lucky bean tree (<i>Erythrina burtii</i>)	-Anti-epileptic, mumps, anti-motion/travelling sickness, used for schizophrenia. Parts used:-the bark and the root. Mode of preparation: Infusion of bark and roots for 12 hours.
Wild pepper (<i>Piper capense</i>)	Schizophrenia, depression, psychosis. Parts used- leaves Mode of preparation: Infusion of leaves
Red Stinkwood (<i>Prunus africana</i>)	Used to treat tuberculosis, asthma, pneumonia, bronchitis and sinusitis. -Promotes libido in men and women -improves fertility in women. -promotes appetite in human beings. Parts used: Bark, roots and leaves Mode of preparation: Infusion of leaves and decoction of root and the bark.

In harvesting indigenous medicinal plants consideration is made on which part to use and if it can affect the plant leading to drying up or being exposed to pathogens, direct sun that may also be detrimental to the plant's life. Whole plants, bark,

root/rhizome, and tuber/bulb collection could lead to extinction of species (Carvalho 2004; Rajal, 2011), whereas collection of bark and latex/sap might be threat if not done appropriately. The traditional practice of Taita community paid attention to avoid

destructive harvesting and have put cultural restriction measures on different plants. Taita also restrict the harvesting during dry seasons of plants such *S. multiflorus*, *C. edulis*, *L. schweifurthii* and *O. usambarensis*. In addition, Intergovernmental Panel on Climate Change has warned that several species have become vulnerable and endangered due to climate change (Kokwaro, 1999; Rajal, 2011).

CONCLUSION

The Taita community is found to be highly knowledgeable regarding uses of wild plants and how to conserving them using indigenous mechanisms. The common practices on biodiversity conservation by Taita people neighboring the Taita Hills utilized traditional indigenous knowledge and supported sustainable use of biodiversity.

The Taita people demonstrate a sound understanding of their indigenous plant conservation techniques. Documenting and cataloguing their indigenous knowledge is one way to help to conserve forests as it will foster transfer of the knowledge to generations. The government and other stakeholders in conservation of biodiversity should recognize its value and mainstream it to their conservation policies and also offer protection against bio-piracy and benefits such as those secured through patent rights. There is a need to validation of traditional medicine and establish safety and efficacy studies and conducting training to traditional health practitioners.

ACKNOWLEDGEMENTS

We thank the School of Environmental Studies, Chepkoilel University College for its material and financial support to this project. We owe a debt of gratitude to the

Taita community for their hospitality and assistance during our field research.

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