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The traditional use of plants to manage candidiasis and related infections in Venda, South Africa

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ABSTRACT

Ethnopharmacological relevance: This paper presents results of an ethnobotanical survey of medicinal plants used for the management of candidiasis and related fungal infections in the Venda area, South Africa.

Materials and methods: Ethnobotanical data about the uses of plants were gathered from eleven rural traditional healers using semi-structured interviews.

Results: A total of 45 species belonging to 24 different families were identified, of which the dominant family was the Fabaceae with 13 species (28.9%) followed by the Asteraceae and Solanaceae with 3 species each (6.7%). A total of 28 of these plant species (62.2%) have been shown to have anticandidal activity and 14 species (31%) have been recorded for antifungal uses in the literature. Amongst the 45 species recorded, 51% were trees, 33% were shrubs, and 16% were herbs. The most widely used plant species were *Acacia caffra*, *Clerodendrum glabrum*, *Croton gratissimus*, *Elaeodendron transvaalense*, *Faurea saligna*, *Hippocratea longipetiolata*, *Osyris lanceolata*, *Richardia brasiliensis*, *Schkuhria pinnata*, *Schotia brachypetala*, *Spilanthes acmella*, *Strychnos potatorum*, *Vangueria infausta* subsp. *infausta* and *Withania somnifera*. The plant parts mostly used in the therapeutic preparations were roots (27.7%), bark (23.2%), and a combination of roots, bark (18.7%) and leaves (14.3%). Decoctions (44.4%), infusions (20%), macerations (17.7%), burning (11.4%) and paste (6.5%) were used. Most of the herbal remedies were administered orally. The main factors threatening the conservation status of these plants are unsustainable methods of harvesting, logging for firewood, building materials and crafts.

Conclusion: The Venda area is rich in plant diversity and local indigenous knowledge of medicinal plants can play an important role as a model for low cost primary health care. Further studies are in progress to validate the indigenous plants recorded as traditional remedies in this area

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1. Introduction

Since ancient times, plants have been used all over the world as unique sources of medicines and constitute the most common human use of biodiversity (Ribeiro et al., 2010). In Africa and in other developing countries many people depend on medicinal plants because they have no access to modern medicines (Runyoro et al., 2006). The dependence on medicinal plants and traditional healers may be attributed to the low proportion of medical doctors to patients in Africa (South Africa 1:1639; Ethiopia 1:33,000; Kenya 1:7142; Tanzania 1:33,000; Uganda 1:25,000, Malawi 1:50,000; Mozambique 1:50,000; Swaziland 1:10,000) (Bekalo

et al., 2009). In these communities, traditional healers operate closer to the people, taking advantage of the diversity of plant species in such areas to treat various diseases and ailments (Kambizi and Afolayan, 2001).

Herbal medicines have been used to treat many diseases that are obstinate and incurable in other systems of medicine and they are gaining popularity because of several perceived advantages such as fewer side effects, better patient tolerance, relatively lower expense and more ready acceptance due to a long history of use (Vermani and Garg, 2002). However, indigenous knowledge on medicinal plants is being lost at a rapid rate with the increase of modern education, which has led the younger generation not appreciating its traditional values (Zerabruk and Yirga, 2012). This useful information about medicinal plants is also still passed on from one generation to another by oral communication, posing the danger of loss of valuable knowledge (Maregesi et al., 2007). There

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is still a need of detailed documentation on the use of medicinal plants in South Africa (Taylor et al., 2001). It is becoming increasingly urgent to document the medicinal use of African plants because of the rapid loss of the natural habitat for some of these plants due to anthropogenic activities (Bisi-Johnson et al., 2010). Thus, there is a need to document the medicinal plants used traditionally before this important knowledge is lost.

Ethnobotanical studies are important in disclosing locally important plants used by communities in the management of a range of ailments affecting them. There is a wide interest in the use of medicinal plants by Venda people and this has led to several publications (Mahwasane et al., 2013; Mulaudzi et al., 2011, 2013; Samie et al., 2010; Tshikalange et al., 2005; Mabogo 1990; Arnold and Gulumiam, 1984). In this region, traditional medicine still plays a significant role in the lives of local people, despite recent advances in Western medicine (Meyer et al., 2008). As far as our literature search could ascertain, this is one of the few studies on the medicinal plants claimed to be used to treat candidiasis and related infections.

Candida infections are relatively easy to identify and it is not difficult to see a positive outcome of treatment. There could therefore be a good correlation between traditional use and *in vitro* efficacy. With the high incidence of HIV/AIDS, about 5.6 million infected people in South Africa (UNAIDS, 2011), candidiasis is a serious challenge to the public health system. The major concern with candidiasis is that it is associated with a mortality rate of 10–49% in immune compromised patients (Pfaller and Diekema, 2007). Thus, the search for alternative cures from traditional medicine is justified. Therefore, the aim of the study was to investigate and document plants used by local traditional practitioners for the management of candidiasis and related fungal infections

2. Materials and methods

2.1. Study site and Venda community

The study took place in four main rural areas of Venda (Mutale, Thohoyandou, Nzhelele and Mashau), Limpopo Province, South Africa (Fig. 1). In this region, traditional medicine still plays a significant role in the lives of local people, despite recent advances in Western medicine (Meyer et al., 2008). The region lies in the north-eastern corner of the Soutpansberg and is located between latitudes 22° 15" and 23° 45" S. and longitudes 29° 50" and 31° 30" E. (Lahiff, 1997) with an estimation of 1.1 million people (Bornman et al., 2012). Male and female roles are clearly defined, with the men responsible for keeping livestock, ploughing and the building of huts, while the women do most of the harvesting as well as all the domestic duties. Maximum temperatures vary from 25 to 40 °C in summer and from 22 to 26 °C in winter. Rainfall is seasonal with 80% occurring between October and March (Mzezewa et al., 2010). The Venda community is one of the most remote tribes in South Africa with their own language and a distinct culture and knowledge of medicinal plants. They depend on the natural environment for their health care and survival (Mulaudzi et al., 2012). It is an area covered by the north-eastern mountain sourveld vegetation (Acocks, 1988), used in alleviating hunger, for shelters, fuel, artifacts and traditional medicine (Mabogo, 1990).

2.2. Interviews with the local traditional healers

Traditional healers were identified in the selected villages after consultation with the headman of each area and permission was granted by the headman to conduct the study. Main areas visited included Nzhelele, Hamashau, Thohoyandou and Mutale. The first

author is of Venda origin, teaches ethnobotany at the University of Venda and because he grew up in the rural environment, speaks the local language and knows all the local customs he was trusted by the traditional healers. The aim of the study was explained to the traditional healers before the interview was conducted, and informed consent was obtained so that they could share their knowledge. Ethnobotanical data were collected using semi-structured interviews in the local language (Tshivenda) and later translated into English. The informants were queried about the symptoms of candidiasis as well as information about the plants they use, including their local names, nature of the plant, plant parts used, methods of preparation, administration techniques, dosage form of the remedy and conservation status of the plants. Personal information was also recorded. A monetary incentive was given to the traditional healers for their time.

2.3. Plant collection and preparation of herbarium specimens

Plants were collected from the wild between September 2010 and June 2011 with the assistance of traditional healers, identified by two botanists from the University of Venda and were authenticated by SANBI (South African National Biodiversity Institute) in Pretoria. Voucher specimens were prepared, deposited at the University of Venda herbarium, South Africa and voucher numbers are recorded in Table 1.

2.4. Statistical analysis

Analysis of data was done using inferential and descriptive statistics such as percentages and frequencies. Frequency index (Table 1) was calculated using the following formula:

$$FI = FC/N \times 100$$

where FI is % of frequency of citation for one plant species by informants, FC is the number of informants who cited the use of the plant species, and N is the total number of informants (11 in this study) (Madikizela et al., 2012).

3. Results and discussion

3.1. Interviews with traditional healers

Eleven traditional healers were interviewed, namely three males (27.3%) and eight females (72.7%), ranging in age from 36 to 69 years. The four age groups 30–40, 41–50, 51–60 and 61–70 were represented by 5%, 16%, 52% and 27% of the total respectively. Some of them (18%) received primary school education while 82% did not have any formal schooling. Nine out of these 11 traditional practitioners were registered with the Vhembe Traditional Healers Association and have membership certificates. The association is recognized by the Department of Health but they are not yet allowed to practice in public health facilities. Nevertheless, 18% of the traditional healers indicated that occasionally they refer patients to the hospital for check-up after treatment.

According to some traditional healers, candidiasis is known as "Makuma", a Tshivenda word referring to ulcers, which may be either oral or genital. They believe that the ulcers begin in the stomach and move up the alimentary tract until they manifest externally either in the mouth or the genitals. With regard to the causes, there are two schools of thoughts: some believe that it is caused by germs and others believe that it is caused by the transmission of sexually transmitted diseases from one person to another. To ensure that the traditional healers understood the symptoms of candidiasis, we described the symptoms as painful

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