CHAPTER 2

ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS WITH HEPATOPROTECTIVE EFFECTS ON ALCOHOL-INDUCED LIVER DAMAGE IN NKONKOBE MUNICIPALITY

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Ethnobotanical survey of medicinal plants with hepatoprotective effects against alcohol-induced liver damage in Nkonkobe municipality

Introduction

Alcohol is a socially accepted drink for partying and entertainment. Most often however, its abuse leads to drunkenness and violence. According to the World Health Organization, about two billion people consume alcoholic beverages and 76.3 million have alcohol use disorders. Therefore, a strategy to reduce the crime and violence is to reduce the availability of alcohol (WHO 2002).

South Africa has among the world's highest levels of alcohol consumption which is estimated to be 16.6 litres of pure alcohol per person in a year (Rehm et al., 2003; Parry, 2005). Drinking to intoxication is a significant contributor to South Africa's mortality and morbidity (Matzopoulos, 2005). Heavy episodic drinking by pregnant women is associated with foetal alcohol syndrome (FAS) in infants. The incidence of FAS in some South African communities is the highest in the world. Wine, beer, whisky, champagne, vodka and brandy are some of the alcoholic beverages commonly consumed by South African drinkers. The major ingredient in these beverages is ethanol, the content of which range from 5% in beer to 50% in vodka and whisky (Alibaba, 2009).

Alcohol affects many organ systems of the body, notably the central nervous system and the liver (Howard, 1998). Almost all ingested alcohol is metabolized in the liver and excessive alcohol intake can lead to acute and chronic liver disease. Alcohol abuse generally leads to three pathologically distinct liver diseases. These are fatty liver, hepatitis and cirrhosis (Howard, 1998). Fatty liver (steatosis), the most common alcohol-induced liver disorder, is marked by the
excessive accumulation of fat inside the liver cells. Alcoholic hepatitis is inflammation and more severe injury of the liver while in cirrhosis, normal liver cells are replaced by scar tissue.

Pharmacological therapy is the most commonly employed form of treatment. Propylthiouracil, corticosteroids and colchicine are examples of some of the drugs used (Marsano et al., 2003). However, these drugs have limited use because of their side effects. For example, naltrexone has the potential to cause hepatocellular injury (Srisurapaanont et al., 2005).

Medicinal plants have been used from time immemorial for the treatment of human diseases including liver diseases and for hepatoprotection. Several plants have been documented to have hepatoprotective activity. These include *Hibiscus sabdariffa* L., *Rosmarinus officinalis* L., and *Salvia officinalis* L., on azathioprine-induced toxicity in rats (Amin and Hamza 2005) and *Cichorium intybus* L., against carbon tetrachloride induced liver damage in rats (Sadeghi et al. 2008). However, there is dearth of information on plants with hepatoprotective effects on alcohol-induced liver damage in animals and human beings in South Africa.

Considering the high level of alcohol consumption in South Africa coupled, with the associated effect of liquor especially on the liver of heavy drinkers, there is need to identify indigenous medicinal plants with hepatoprotective properties, document information on them as well as the ingredients that bring relief and possible toxic implications of these plants. This chapter contains the report of the ethnobotanical survey carried out using questionnaires, interviews and general conversations with herbalists, traditional healers and rural dwellers.

**Study Area**

The study was conducted in Nkonkobe Municipality, Eastern Cape, South Africa. It is located 100 km northwest of East London on the Tyume River, at 32° 47' S and 26° 50' E with an
altitude of 1300 m above sea level. The vegetation type is known as the thorn veld (Masika & Afolayan, 2003).

**Methodology**

Information on this study was collected using structured questionnaires, interviews and general conversations with 10 herbalists and traditional healers as well as elderly rural dwellers. The data collected include the local names of the plants, parts used, availability of the plant, the method of preparation, mode of administration and duration of administration, observable adverse effects and efficacy of the plant remedies. The plant materials were collected and voucher specimens were deposited in the Griffen herbarium of the Department of Botany, University of Fort Hare.

**Results and Discussion**

The study revealed 10 different plant species belonging to seven different families (Table 1). The families include: Alliaceae, Asteraceae, Rubiaceae, Liliaceae, Ranunculaceae, Asphodelaceae and Geraniaceae.

**Table 1.** Medicinal plants used for the treatment of liver diseases in Nkonkobe Municipality, Eastern Cape Province

<table>
<thead>
<tr>
<th>Plant species</th>
<th>Family</th>
<th>Local names (Xhosa)</th>
<th>Parts used</th>
<th>Preparation and mode of administration.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Tulbaghia alliacea</em> L.f.</td>
<td>Alliaceae</td>
<td>Umwelela</td>
<td>Roots</td>
<td>Roots are grated, boiled in water and taken orally. Half glass (150 ml) to be taken in the morning and night.</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Family</td>
<td>Common Name</td>
<td>Part Used</td>
<td>Preparation</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------</td>
<td>-------------</td>
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</tr>
<tr>
<td><em>Arctotis arctotoides</em> (L.f.) O.Hoffm.</td>
<td>Asteraceae</td>
<td>Ubushwa</td>
<td>Leaves</td>
<td>Leaves are boiled in water and taken orally. Two tablespoonfuls (20 ml) daily.</td>
</tr>
<tr>
<td><em>Tulbaghia violacea</em> Harv.</td>
<td>Alliaceae</td>
<td>Itswele lomlambo</td>
<td>Bulb</td>
<td>Bulb infusions are taken orally. Two tablespoonfuls (20 ml) daily.</td>
</tr>
<tr>
<td><em>Euryops munitus</em> (L.f.) B.Nord.</td>
<td>Asteraceae</td>
<td>Umsola</td>
<td>Leaves</td>
<td>Leaves are boiled in water and taken orally. Two tablespoonfuls (20 ml) daily.</td>
</tr>
<tr>
<td><em>Pentanisia prunelloides</em> (Klotzsch ex Eckl. &amp;Zeyh.)Walp.</td>
<td>Rubiaceae</td>
<td>Icimamlilo</td>
<td>Rhizome</td>
<td>Fresh rhizome are crushed, boiled in water and taken orally. A cup (300 ml) to be taken three times daily.</td>
</tr>
<tr>
<td><em>Vernonia mespilifolia</em> Less.</td>
<td>Asteraceae</td>
<td>Uhlunguhlungu</td>
<td>Bark</td>
<td>Bark is crushed, boiled in water and taken orally. One teaspoonful (5 ml) to be taken three times daily.</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Family</td>
<td>Local Name</td>
<td>Part Used</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td><em>Aloe saponaria</em> (Ait.)Haw.</td>
<td>Liliaceae</td>
<td>Intelezi</td>
<td>Leaves</td>
<td>The juice from the leaves is taken orally. Two tablespoons (20 ml) to be taken twice daily.</td>
</tr>
<tr>
<td><em>Anemone tenuifolia</em> (L.f.)DC.</td>
<td>Ranunculaceae</td>
<td>Uxhobakhulu</td>
<td>Roots</td>
<td>Fresh roots are crushed, boiled and taken orally. One tablespoon (10 ml) to be taken daily.</td>
</tr>
<tr>
<td><em>Bulbine alooides</em> (L.)Willd.</td>
<td>Asphodelaceae</td>
<td>Irooiwater</td>
<td>Roots</td>
<td>Fresh crushed roots are boiled and taken orally. Half glass (150 ml) to be taken twice daily.</td>
</tr>
<tr>
<td><em>Pelargonium reniforme</em> Curt.</td>
<td>Geraniaceae</td>
<td>Uvendle</td>
<td>Roots</td>
<td>Fresh root boiled in water and the decoction is taken orally. Two tablespoons (20 ml) to be taken twice daily.</td>
</tr>
</tbody>
</table>
Members of the family Asteraceae were the most commonly used plants (with three species), followed by Alliaceae (with two species) while the remaining families all had one species of plant each. Different parts of *P. reniforme* are used by the local traditional healers for the treatment of alcohol-induced liver problems. These include the roots (40%), leaves (30%), bulb (10%), rhizome (10%) and stem (10%). Decoctions and infusions are the methods of preparation and the remedies are taken orally and continuously until the patient is healed.

All of the plants mentioned by the interviewees have been reported to be useful for curing several ailments. For example *Tulbaghia alliacea* and *T. violacea* are common in the Eastern Cape Province and have antibacterial and antihypertensive properties (Motsei et al., 2003). They have also been reported to be used for the treatment of fever, to expel intestinal worms, to treat influenza, colds, asthma, tuberculosis, stomach problems and cancer (Treurnicht, 1997). *Pentanisia prunelloides* is used for relieving inflammation, bacterial and viral infections, for the treatment of burns, swellings, rheumatism, heartburn, vomiting, stimulation of uterine contraction and tuberculosis (Barbara et al., 2002). *Arctotis arctotoides* is reported to be used for the treatment of epilepsy, indigestion and catarrh of the stomach, and the leaf juice or paste is applied topically to treat wounds. Studies have shown that extracts of the leaves have antibacterial properties (Van der Walt, 2002). *Aloe saponaria* is used for the treatment of cancer (Sampedro et al. 2004), while *Bulbine alooides* is used in the treatment of syphilis and rheumatism (Iwalewa et al. 2007) and for suppressing vomiting and diarrhoea, for treating urinary infections, diabetes and rheumatism. According to the survey, although monotherbal therapy could be effective, combination of some of the herbs are more effective in treating alcohol-induced liver disease. For example, the rhizome of *Pentanisia prunelloides* and bark of *Vernonia mespilifolia* are boiled together and the decoction taken orally for the treatment of
alcohol-induced liver problems. Also, the leaves of *Arctotis arctotoides* and bulbs of *Tulbaghia violacea* could be boiled and the decoction taken orally to relieve liver problems. *Pelargonium reniforme* is reported to be useful in curing stomach ailments, dysentery and blood in stools. Previous studies have revealed that the phenolic compounds in *Pelargonium reniforme* have high antioxidant property (Latte and Kolodziej, 2004). The demonstrated antioxidant properties of the polyphenols provide a clue for the plant’s beneficial effects in the treatment of liver disorders among several ethnic groups in some areas of southern Africa (Latte and Kolodziej, 2004).

Although alcohol-induced liver disease is common in the study area, most of the rural dwellers are not aware of the use of medicinal plants in the treatment of the disease. It is necessary therefore, to carry out detailed scientific studies of *P. reniforme* in order to validate its usage for the treatment of alcohol-induced human problems.
References

Alibaba, 2009. Retrieved from


www.cumc.columbia.edu/dept/gi/alcohol.html


