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An Ethnobotanical Study of Plants Used for the Treatment of Eye Infections in the Eastern Cape Province, South Africa

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Abstract: Information on medicinal plants, used by the people of the Eastern Cape for the treatment of eye infections, was collected through questionnaires which were administered to herbalists, traditional healers and rural dwellers. The information collected revealed 12 plant species. These plants belong to 9 families, of which Sapindaceae was the most prominent. The leaves were reported to be the most used part of the plants, constituting 75% of herbal preparations. This was followed by bark and roots which constituted 25%. Generally, the plant parts are crushed and the sap squeezed directly into the infected eyes. In few cases, the material is mixed with water and boiled; after cooling, the extract is applied to the infected eyes. *Hippobromus pauciflorus* was the most commonly used plant species for the treatment of eye infections in the province. Majority of the plants used have been reported in literature to possess some other pharmacological activities.

Key words: Eye infections, herbal medicine, medicinal plants, *Hippobromus pauciflorus*

INTRODUCTION

Although recent advances in molecular biology and physiological chemistry have greatly enhanced our understanding and treatment of diseases, a large segment of the population still depends on traditional medicine as the preferred form of healthcare. The natural products derived from medicinal plants have proven to be an abundant source of biologically active compounds, many of which form the basis for the development of new lead chemicals for pharmaceuticals (Palombo, 2006). As there are approximately 500,000 plant species occurring worldwide, of which only 1% has been phytochemically investigated, there is great potential for discovering novel bioactive compounds (Palombo, 2006). However, according to the United Nations Environment Programme (World Conservation Monitoring Centre) current extinction rates of plants and animals mean that the world is losing one major drug every two years (Groombridge and Jenkins, 2002).

The usage of herbal medicine by a large proportion of the population in the developing countries is largely due to the high cost of western pharmaceuticals and healthcare. It is estimated that 27 million South Africans depend on traditional herbal medicines from as many as 1020 plant species (Dauskardt, 1990; Fennell *et al.*, 2004). The Eastern Cape Province of South Africa is particularly

known for its richness in plant species. The indigenous people of this province have a long history of traditional plant usage for the treatment of various diseases and ailments (Grierson and Afolayan, 1999a). Traditional medicine, being a significant element in the cultural patrimony, still remains the main recourse for a large majority of people for addressing health problems, with approximately 80% of the population using traditional medicine (Jager *et al.*, 1996). It encompasses the utilization of substances (plants, animals and mineral elements) and practices based on social-cultural norms and religious beliefs as well as witnessed experiences and observation of a specific group, mainly traditional healers and herbalists. According to Grierson and Afolayan (1999a) despite the long history of the treatment of infections using herbal remedies in the Eastern Cape Province, the knowledge and experience of these herbalists have not been scientifically documented. The aim of this study therefore, was to document the plants used for the treatment of eye infections, the part used and method of preparation and administration of the remedies. The information on traditional herbal practice in the province has been passed from one generation to the other through oral tradition posing the danger of losing some knowledge. Therefore, there is a need to carry out more research on the documentation of useful medicinal plants before they disappear.

A few ethnomedical surveys that have been carried out in the Eastern Cape have resulted in the compilation of lists of many plants that are used for treating various diseases (Grierson and Afolayan, 1999; Kambizi and Afolayan, 2001; Masika and Afolayan, 2003; Erasto *et al.*, 2005; Koduru *et al.*, 2007). In this study, we present the information gathered from traditional and elder rural dwellers, on plants used in the province for the treatment of eye infections. These infections are caused by the exposure of eyes to bacterial, fungal, viral or other microbiological agents and the symptoms include redness, swelling of the eyes, itching, increased tear production and photophobia. Many traditional healers and herbalists in the province have been treating eye infections for many years using various medicinal plant species. For this study, questions were administered among the traditional medicinal practitioners. This documentation is another contribution of our group to the knowledge of plants used in this province for the treatment of various diseases.

MATERIALS AND METHODS

Information presented in this study was collected from the herbalists and rural dwellers in the province. The study area falls within latitudes 30°00'-34°15'S and longitudes 22°45'-30°15'E. It is bounded by the sea in the south and the drier Karroo (semi-desert vegetation) in the west. The elevation ranges from sea-level in the south to approximately 2200 m in the north and the vegetation type is thorn veld.

Adopting the methods of Jovel *et al.* (1996), information was compiled through general conversations with the informants while questionnaires were used to

obtain additional information about the methods of treatment. The information collected included local names, the parts of the plant used, method of preparation, usage and personal experience of the users. The plants were identified by their vernacular names through consultations with the local people. Voucher specimens were prepared and deposited in the herbarium of the University of Fort Hare Botany Department.

RESULTS AND DISCUSSION

The results of this study revealed 12 Plant species belonging to nine families that are frequently used for the treatment of eye infections by herbalists, traditional healers and people of the Eastern Cape Province (Table 1). Members of the Sapindaceae family were the most commonly used plants. Other families were Rosaceae (two species) Fabaceae (two species) and rest of the families had one species each. The leaves were reported to be the most used part of the plants, constituting 75% of herbal preparations. This was followed by bark and roots which constituted 25%, respectively. The commonest method of herbal preparation involves crushing of the plant material and squeezing the sap directly into infected eyes or mixing the sap with water and boiling. After cooling, the extract is directly applied to the infected eyes. Application of the herbal remedies was generally by external use, usually on daily basis for short period of time.

Four plants were frequently mentioned and highly recommended by both the traditional healers and rural dwellers. These are *Malva parviflora*, *Helichrysum foetidum*, *Sutherlandia frutescens* and *Hippobromus pauciflorus*. Information from the literature revealed that these plants are used for the treatment of

Table 1: Plants used for the treatment of eye infections in the Eastern Cape, South Africa

Scientific name	Local name	Part used	Preparation
Asteraceae			
<i>Helichrysum foetidum</i> (L.) Moench	Isicwe	Roots	Fresh roots are crushed, boiled and applied dropwise into the infected eye
Boraginaceae			
<i>Cordia caffra</i> Sond	Umhlovuhlovu	Leaves	The leaves are crushed and squeezed into infected eye
Capparaceae			
<i>Boscia albitrunca</i> (Burch.) Gilg and Gilg-Ben	Umgqomogqom	Leaves	The leaves are crushed and squeezed into infected eye
Fabaceae			
<i>Sutherlandia frutescens</i> (L.) R.Br.	Umnwele	Leaves	The leaves are crushed and squeezed into infected eye
<i>Albizia adianthifolia</i> Schumacher	Umhlandlothi	Root	Fresh roots are crushed, W.F. Wight boiled and applied dropwise into the infected eye
Malvaceae			
<i>Malva parviflora</i> (L.)	Ujongelana	Leaves	The leaves are crushed and squeezed into infected eye
Strychnaceae			
<i>Strychnos spinosa</i> Lam	Isihlele	Bark	The bark is crushed, boiled and applied dropwise into the infected eye
Rosaceae			
<i>Lucosidea sericea</i> Eckl. and Zeyh	Umtiyiti	Leaves	The leaves are crushed and squeezed into infected eye
<i>Prunus africana</i> Hook.f.	Umkakase	Leaves	The leaves are crushed and squeezed into infected eye
Ranunculaceae			
<i>Clematis brachiata</i> Thunb	Ityholo	Leaves	The leaves are crushed and squeezed into infected eye
Sapindaceae			
<i>Hippobromus pauciflorus</i> (L.f) Radlk	Ulatile	Leaves	The leaves are crushed and squeezed into infected eye
<i>Pappea capeensis</i> Eckl. and Zeyh	Ilitye	Leaves	The leaves are crushed and squeezed into infected eye

other diseases of both human and livestock in the Eastern Cape Province. *Hippobromus pauciflorus* is reported to be effective in the treatment of eye infections in cattle (Masika and Afolayan, 2003), while *Malva parviflora* is used for the treatment of asthma, wounds, sores, inflammation, abscesses, pimples, angina inflammation, intestinal infections, parasitism, kidney infections, vaginal inflammation, fever, headaches, aphtas, spider stings, bronchitis, cough, colds, pharyngitis, tuberculosis, vaginal infections (oral, vaginal and topic) (Grierson and Afolayan, 1999). It is a plant containing specific proteins which are well-known for their antimicrobial and anti-inflammatory activity (Shale *et al.*, 1999; Grierson and Afolayan, 1999).

The leaves of *Helichrysum foetidum* (L.) Moench (Asteraceae) are used as a dressing for septic sores and wounds (Grierson and Afolayan, 1999) and are responsible for antibacterial, antioxidant activity and fibroblast growth stimulation (Steenkamp *et al.*, 2004). *Sutherlandia frutescens* has diverse medicinal uses, such as the treatment of patients suffering from internal cancers, inflammation and viral diseases, indicating that this plant might have advantageous effects on the immune system. HIV-infected individuals using *Sutherlandia* treatments gain weight and have improved CD4 counts, decreased viral loads, improved appetites and general mood improvements (Chaffy and Stokes, 2002; Rood, 1994). This study has revealed that medicinal plants still play a vital role in the primary healthcare of the people of the Eastern Cape Province. During the survey, it was observed that more than half of the total number of people questioned regularly used medicinal plants to treat many ailments, including eye infections. Among the members of the Sapindaceae family, it was observed that *Hippobromus pauciflorus* was the most frequently reported plant used for the treatment of eye infections.

Based on this observation, research is in progress on the phytochemical and pharmacological analysis of the plant.

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