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Research paper

Ethnobotanical study of medicinal plants from degraded dry afromontane forest in northern Ethiopia: Species, uses and conservation challenges

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ABSTRACT

The large variation in climate, geology and land forms in Ethiopia has led to a great variety of ecosystems with high plant species diversity. The authors sought to provide a comprehensive documentation on forest based medicinal plants, indigenous knowledge, and conservation challenges in degraded dry afromontane forest in northern Ethiopia. Ethnobotanical data were collected using semi-structured interviews (n = 272) and focus group discussions (n = 26) with key informants. Frequencies were calculated and cross tabulated to see the medicinal value of plants found and effect of demographic characteristics on medicinal plants use. Thirty-four medicinal wild plants species belonging to 33 genera and 26 families used as cure for 35 human and livestock ailments were documented. Shrubs were dominantly used (48.8%), followed by trees (25.6%), and herbs (16.3%). The largest number of remedies (29%) was used to treat gastro-intestinal disorders followed by joint pain (25.8%). The administration routes for human medicines were oral (42%), traditional smoke bath (36%), dermal (7%), nasal (5%) and auricular (2%); while oral (32%), dermal (25%) and tie (27%) were for veterinary medicines. Leaves (33%), roots (22%) and stem (16%) were commonly used plant parts for herbal preparation. The authors suggest encouraging in situ conservation of the existing medicinal plants. As a result of heavy exploitation, many forest associated medicinal plants in the area, like *Laggera tomentosa*,*Phytolacca dodecandra*, *Verbena officinalis*, and *Zehneria scabra* are becoming rare and difficult to find. The authors suggest domestication of some of the wild medicinal plants by households or usage of communal lands for long term conservation of the species and continued availability for the use by local communities.

1. Introduction

Since ancient times plants have been indispensable sources of both preventive and curative traditional medicine preparations for both human beings and livestock. Historical accounts of traditionally used medicinal plants depict that different medicinal plants were in use as early as 5000–4000 BC in China, and 1600 BC by Syrians, Babylonians, Hebrews and Egyptians (Dery et al., 1999). Much of an indigenous knowledge system, from the earliest times, is also found linked with the use of traditional medicine in different countries (Farnsworth, 1994).

Out of a total of 422,000 flowering plants reported from the world (Govaerts, 2001), more than 50,000 are used for medicinal purposes (Schippmann et al., 2002). Almost 80% of the human population in developing countries is dependent on plant resources for healthcare because they cannot afford the high cost of western pharmaceuticals and health-care, and because traditional medicines are more acceptable from a cultural and spiritual perspective (Farnsworth et al., 1985).

Modern pharmacopoeia still contains at least 25% drugs derived from plants harvested from the wild on forest lands and only a very small number of species are cultivated (FAO, 1997). The large variation in climate, geology and land forms in Ethiopia has led to a large variety of ecosystems with high plant species diversity (EFAP, 1994; Teketay, 2001). As a consequence the country possesses a

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large potential source of herbal medicine (Desta et al., 1996; Pankhurst, 2001). This large potential has been made accessible by a rich and long-standing indigenous knowledge on the use of plants in traditional medicine (Balemie et al., 2004), on which 80% of the rural communities in the country depend (Dawit and Ahadu, 1993; Tesfaye et al., 2009; Birhane et al., 2011). Even in cities where modern health services are more accessible and specialized, many people still continue to go to traditional healers (Lambert, 2001).

The knowledge and use of plants for medicinal purposes is an integral part of many ethnic rural cultures in Ethiopia (Tesfaye et al. 2009). This ancient knowledge about use of traditional medicinal plants is maintained by traditional healers. In the countryside, either the knowledge from herbalists is passed secretively from one generation to the next through words of mouth (Jansen, 1981) or their descendants inherit the medico-spiritual manuscripts (Tilahun and Giday, 2007). As modern medicine is expected to gradually take over, it is therefore timely to conserve and document the wisdom of processing and using these medicinal plants by local healers and communities which otherwise could be lost over time.

The majority of medicinal plants in Ethiopia, with few exceptions, is harvested from wild habitats (Giday, 1999; Zemede, 1999). Due to human population growth these plants face overexploitation and loss of habitat and habitat fragmentation due to associated land use change (Friis, 1992). There are no specific conservation or resource management measures in place. This may have serious implications on the survival of several of these useful plant species, many of which may face genetic erosion or extinction in the near future.

The harvest and use of forest plants for medicinal purposes is an important provisioning and cultural service (MEA, 2005), in addition to other ecosystem services of the forest (Giday, 1999; Zemede, 1999). Local knowledge associated with the use of these medicinal plants could become an important argument for the conservation of forest relics as indigenous people living in and around forests are potentially in a good position to know, use and protect biodiversity (Plotkin, 1994).

It becomes clear that both the conservation of indigenous medicinal knowledge and of the natural ecosystems where the medicinal plants occur are at stake, as modernity is progressing on the African countryside (Martin, 1995; Balick and Cox, 1996; Bussmann, 2006). Through the sustainable use of these plant species, medicinal knowledge and biodiversity conservation could reinforce each other. The current loss of medicinal plants in the country due to natural and anthropogenic factors links with the missing of valuable indigenous knowledge associated with the plants. This strong link suggests a need to conduct ethnobotanical research and to document the medicinal plants and the associated indigenous knowledge. Such studies are useful to identify threatened plants and to take appropriate conservation measures. A first important step in this process of conservation and sustainable management is the identification and inventory of medicinal plants and their uses. The objective of this study is

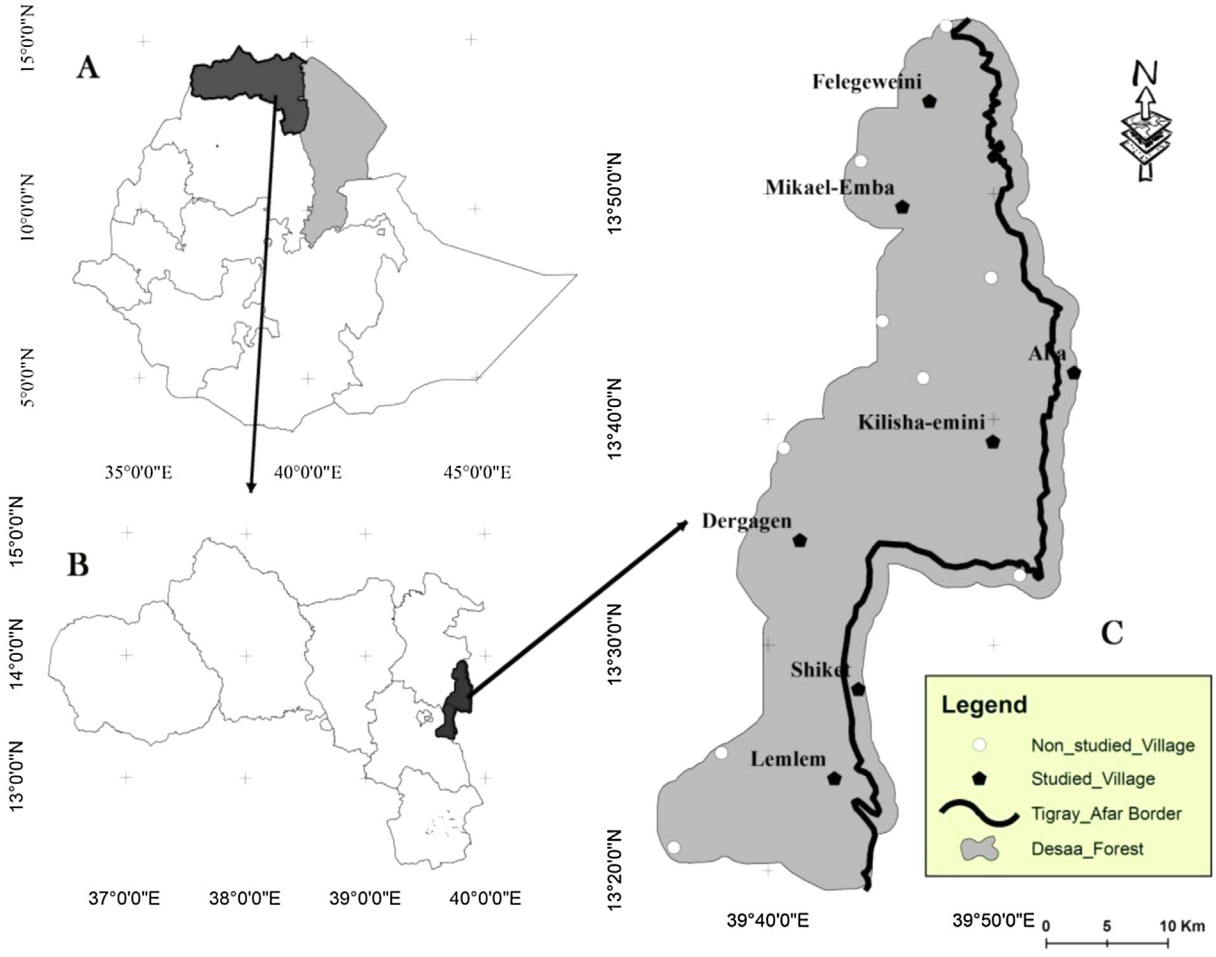

Fig. 1. Study area (A) location of Tigray and Afar Regions within Ethiopia. (B) Location of Desa'a forest within Tigray region. (C) Desa'a forest with border between Tigray and Afar region and study villages.