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Ghana's herbal market

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ABSTRACT

Ethnopharmacological relevance: Medicinal plant markets not only provide a snapshot of a country's medicinal flora, they also reflect local health concerns and the importance of traditional medicine among its inhabitants. This study aimed to describe and quantify the Ghanaian market in herbal medicine, and the diversity of the species traded, in order to evaluate their economic value.
Materials and methods: Initial visual surveys on the markets were followed by a detailed quantitative survey of 27 stalls in August 2010. Market samples were processed into herbarium vouchers and when possible matched with fertile vouchers from the field.
Results: We encountered 244 medicinal plant products, representing 186–209 species. Fourteen species were sold at more than 25% of the market stalls. Seeds and fruits that doubled as spice and medicine (*Xylopia aethiopica*, *Monodora myristica*, *Aframomum melegueta*) were in highest demand, followed by the medicinal barks of *Khaya senegalensis* and *Pteleopsis suberosa*. Plants sold at the market were mostly used for women's health, in rituals, as aphrodisiacs and against sexually transmitted diseases. An estimated 951 tons of crude herbal medicine were sold at Ghana's herbal markets in 2010, with a total value of around US$ 7.8 million. Between 20 and 30% of the Ghanaian medicinal flora was encountered during this survey. Roots were less dominant at the market than in dryer parts of Africa. Tons of *Griffonia simplicifolia* and *Voacanga africana* seeds and *Fadogia agrestis* bark are exported annually, but data on revenues are scanty. None of these species were sold on the domestic market.
Conclusion: Our quantitative market survey reveals that the trade in Ghanaian herbal medicine is of considerable economic importance. Regarding the specific demand, it seems that medicinal plants are used to complement or substitute Western medicine. Further research is needed on the ecological impact of medicinal plant extraction.

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1. Introduction

West Africa has a historically high human population density, concentrated settlements, and a history of well-developed long-distance trade. Medicinal plants are in high demand as trade goods, since their small size makes them easy to transport in countries with a defective transport system (Van der Geest and Reynolds Whyte, 1989). High levels of unemployment, rapid urbanization and low levels of formal education among rural to urban migrants are other reasons behind the increasing trade in herbal medicine in West Africa. This trade has a significant socio-economic importance as it allows millions of people, especially women, to generate an income by plant collection and marketing (Cunningham, 2001; Sunderland and Ndoye, 2004; Williams, 2007).

Medicinal plant markets not only provide a snapshot of a country's medicinal flora, but they also reflect the concerns about health and illness and the importance of traditional medicine among its inhabitants. Between 60 and 95% of the Africans are said to depend on traditional medicine for their primary health care needs (Anyinam, 1995; WHO, 2000; Cunningham, 2001). There exists a general concern that the trade in herbal medicine threatens the wild populations of popular West African plant medicines (Cunningham, 1993; Blay, 2004; Ndam and Marcelin, 2004), which can in turn affect their availability for primary health care (Grifo and Rosenthal, 1997; Hamilton, 2004). Overexploitation is a growing problem for many West African medicinal species in areas where population growth, lack of access to western medicine, poverty, and growing markets fuel unsustainable harvesting practices (Osemeobo, 1992; Cunningham, 1993; Hamilton, 2004; Boon and Ahenkan, 2008). Market surveys remain indispensable for sound conservation and development planning. Learning which

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species are sold, their prices, and the volumes marketed are the first steps in identifying species with conservation or resource management priorities. Wild species that are sold frequently and in high quantities are at greater risk of overharvesting (Cunningham, 1993; Williams, 2007). On the other hand, Padoch (1992) argues that knowledge on the commercialization of plant products can also increase the value of forest products, stimulate conservation efforts and enhance the income of rural people.

The marketing of medicinal plants is an important, but neglected area of research. Reliable official statistics are often limited to export figures, while the bulk of the plant material is sold locally (Padoch, 1992). People who harvest or sell medicinal plants are generally self-employed and form part of a 'hidden economy', and thus remain unrecognized in government figures (Cunningham, 2001). As most transactions are only marginally legal and competition is high, vendors are reluctant to be questioned, and middlemen are notoriously difficult to interview (Padoch, 1992; Olowokudejo et al., 2008; Kadiri, 2009). Merchants of different ethnicities are present on the market, so products derived from a single botanical species may be sold under a variety of vernacular names (McMillen, 2008). Finally, when plants are sold in the form of roots, bark, wood or shredded leaves, botanical identification can be very difficult (Johnson & Johnson, 1976; McMillen, 2008; Mati and de Boer, 2010).

Few quantitative market surveys have been carried out in West Africa. The trade in herbal medicine has been studied in Benin (CENPREBAF, 1999; Vodouhê et al., 2008), Cameroon (Betti, 2002), Nigeria (Johnson and Johnson, 1976; Olowokudejo et al., 2008; Sonibare and Gbile, 2008; Kadiri, 2009), and Ghana (Falconer, 1994; Blay, 2004; Obiri and Addai, 2007). Although these researchers have interviewed vendors and listed (part of) the marketed species, none of them has estimated the frequency, volumes or value of the herbal medicine offered for sale, like it has been so thoroughly done for South Africa (Williams, 2007; Williams et al., 2005, 2007) and Tanzania (McMillen, 2008).

This paper presents the results of a quantitative market survey conducted in Ghana in 2010. With an economic growth of about 20% for 2011, Ghana was listed as the world's fastest growing economy (Economy Watch, 2011). The country has 24.7 million inhabitants, and its capital Accra, with an annual growth rate of 3.4%, is one of Africa's most populated and fastest-growing cities today (CIA, 2011). Almost half of Accra's residents are migrants: either from the countryside or from neighboring states. The country has three distinct ecological zones: closed canopy forest, a forest-savanna zone and dry savanna. As a result of population growth, logging and land clearing for cash crop agriculture, Ghana has lost one third of its forest cover between 1990 and 2010. The rain forest area in southern Ghana is now less than 25% of its original size (Repetto, 1990). Savanna trees are disappearing due to bush fires and the expansion of agricultural practices (Gyasi et al., 1995). At the same time, some 80% of the rural villagers in southern Ghana rely on wild plants as their main medicinal source (Falconer, 1994). Access to primary health care has a strong urban bias: the number of patients per public doctor varies between 6200 in Accra to 42,200 in remote rural areas (Van den Boom et al., 2008). As a rapidly urbanizing region with a high level of endemic plant taxa, and a population that heavily depends on herbal medicine, Cunningham (1993) has indicated Ghana has as a priority area for cooperative action between healthcare professionals and conservationists.

While the aim of the British colonial government was still to 'liquidate native practices of traditional medicine' (Twumasi and Warren, 1986), these practices were embraced as part of the national identity after independence in 1957 (Brown, 1995). From then onwards, Ghana's medicinal flora has been well documented (Irvine, 1961; Ayensu, 1978; Abbiw, 1990; Brown, 1995; Mshana et al., 2000; Asase et al., 2005). Much research has been devoted to traditional healers and their possible cooperation with western-trained health personnel (e.g., Warren et al., 1982; Fink, 1990; Ventevogel, 1996). In 1974, the Center for Scientific Research into Plant Medicine was established to study the efficacy of local herbs, carry out domestication trials and serve as a traditional health clinic (www.csrpm.org, assessed 26 September 2011; Boon and Ahenkan, 2008). If Ghana wants to guarantee its residents their access to herbal medicine in the future, it needs to conserve the medicinal plants that are so critical for their health. However, before vulnerable species for conservation or management can be prioritized, it is necessary to know which species are sold and in what quantities. Apart from the domestic market in chewing sticks in Kumasi (Blay, 2004), an overview of forest products sold around Kumasi (Falconer, 1994) and the export of *Griffonia simpicifolia* and *Voacanga africana* seeds (Arthur, 2010; Gbewonyo, 2002), no quantitative figures exist on the export or domestic market of medicinal plants from Ghana.

Our main objectives were to describe and quantify the Ghanaian market in herbal medicine, and the diversity of the species traded, in order to evaluate their economic importance. Additionally, we would like to answer the following questions: Which species are in highest demand? What role do these plants play in local health care? What percentage of Ghana's medicinal flora is being commercialized? The outcomes of this market survey can be used to identify species most susceptible to overharvesting due to their high demand in the (inter-) national trade. Data on the conservation priorities for Ghanaian species in trade will be published elsewhere.

2. Materials and methods

2.1. Market survey

This study formed part of the research project "*Plant Use of the Motherland: Linking Afro-Caribbean and West African Ethnobotany*", carried out by the Netherlands Center for Biodiversity Naturalis, in collaboration with the University of Ghana. Fieldwork was conducted in Ghana from 21 June till 7 September 2010 (in the rainy season), during which we regularly visited the five largest markets in the capital Accra. We counted the number of market stalls on both quiet and busy days. From the first visit on, we bought fresh medicinal plants when they were available, processed them into herbarium vouchers and collected information on vernacular names, processing methods, uses and prices. Living rhizomes and bulbs were propagated to produce leaves, after which they were pressed and dried into herbarium vouchers. After becoming familiar with most of the commercial species, we conducted a systematic quantitative survey in August 2010 of in total 27 market stalls in the country's largest cities: Accra (pop. 3.9 million), Kumasi (pop. 1.6 million), and Tamale (pop. 390,730), and in Cape Coast (pop. 154,204), the 8th largest town (www.world-gazetteer.com, assessed 12 December 2011). Additionally, we surveyed a village market in Akoase (pop. ca. 3000), near Nkawkaw (see Fig. 1), an area where commercial extraction takes place.

Per stall, we counted all plant products offered for sale, the amount of sales units (bundles, bags, bottles or loose plant parts) per species, we observed whether material was sold fresh or dried, and estimated the volume of additional stock packed in bags behind the stalls. Additionally, we recorded the ethnicity and gender of the vendors and asked them to estimate their weekly sales of plant material and indicate species that were becoming expensive or increasingly difficult to obtain. Chewing sticks that were sold on medicinal plant stalls were included in our survey, but we excluded stalls selling only chewing sticks, since the marketing of this product was adequately described by Blay (2004). Unknown herbs and leafy twigs were purchased and pressed as herbarium specimens;

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