



The local knowledge of medicinal plants trader and diversity of medicinal plants in the Kabanjahe traditional market, North Sumatra, Indonesia



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ABSTRACT

Ethnopharmacological relevance: Market is the main place for transactions of medicinal plants and traditional ingredients by local community in the Karo regency, North Sumatra, Indonesia. This is the first study to document the local knowledge of traders on and the diversity of the medicinal plants. The investigation was carried out in the Kabanjahe traditional market, in the Karo regency. The research goal was to reveal the local knowledge, diversity and utilization of medicinal plants, which have been traded in the Kabanjahe traditional market, as a basis for conservation efforts.

Materials and methods: The study was conducted through ethnobotanical approach using market surveys. All traders of medicinal plants were surveyed applying in-depth interviews and participative observations. Data were analyzed qualitatively using descriptive statistics. The diversity of medicinal plants was expressed in term of the Shannon–Wiener diversity index (H'), whereas the similarity among traders was indicated by Jaccard index (J_i).

Results: Traders of medicinal plants stored the simplicia of medicinal plants in chest of drawers, plastic baskets, plastic bags, and in the air by suspending them from the the stall ceilings. We recorded 344 species, 217 genera and 90 families of medicinal plants. Those that were sold mostly belong to *Zingiberaceae* (20 species), *Poaceae* (19 species), and *Asclepiadaceae* (17 species), and the species received high consumers demand, mostly belong to *Zingiberaceae*, *Rutaceae*, and *Asclepidiaceae*. *Asclepidiaceae* was used to treat diseases like cancer and heart problems. The Shannon–Wiener diversity index of medicinal plants at the Kabanjahe traditional market was high ($H' = 5.637$). The high Jaccard similarity index ($J_i > 0.56$) suggested that the traders were trading similar species of medicinal plants.

Conclusion: Kabanjahe traditional market is the center for the sale of medicinal plants as traditional ingredients. Several species are well known for their pharmacological properties but others, [such as: *Dischidia imbricata* (Blume) Steud., *Dischidia nummularia* R.Br., *Hoya macrophylla* Blume, and *Hoya coriacea* Blume] have been used for cancer treatment by local communities, but pharmacologically unknown, hence they are promising candidates for further investigation.

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1. Introduction

World Health Organization (WHO) estimated that about 60–80% of the world population still derive their medical treatments which are of plant origin (Joy et al., 1998; Fabricant and Farnsworth, 2001). Utilizing data obtained from studies on treatments using traditional medicinal plants by local communities are an effective way in terms of time and cost to find new chemical

compounds that might be useful as a medicine (Purwanto, 2002). To secure data on the usage of medicinal plants by local communities could be done in various ways, such as a market survey (Martin, 1995; Hoang et al., 2008).

A market survey method has various advantages compared to other methods, such as the ability of revealing a wide range of knowledge of local communities (Lee et al., 2008), recognizing the benefits and values, (Martin, 1995; Betti, 2002), revealing species conservation status (Betti, 2002; Van Andel et al., 2012), and formulating a plan for further development of medicinal plants

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(Van Andel et al., 2012). These advantages imply various functions of the market for local communities, such as as a place for trading, transactions, information exchange on the use of plants (Lee et al., 2008), place to improve the economy (Revene et al., 2008), and site to earn livelihood (Toksoy et al., 2010).

The study of medicinal plants through market surveys has been carried out in other countries as has been reported by: Betti (2002), Macia et al. (2005), Verma and Singh (2008), Lee et al. (2008), Setshogo and Mberreki (2008), Toksoy et al. (2010), Idu et al. (2010), and Van Andel et al. (2012), but in Indonesia little has been done. To date studies in Sumatra has been largely concerned with community survey on the use of plants by local communities or ethnic groups, such as Batak Toba (Simbolon, 1994), Rejang (Darnaedi, 1999), Malay (Setyowati and Siagian, 2004; Setyowati and Wardah, 2007; Sunesi and Wiryono, 2007; Rahayu et al., 2007; Hariyadi and Ticktin, 2011), Batak (Silalahi, 2014), Batak Simalungun (Silalahi et al., 2015). Investigations on the utilization of medicinal plants applying market surveys have been reported by Kriswiyanti et al. (2011) and Nasution (2009). Some markets in Indonesia, especially the traditional markets, including the Kabanjahe traditional market, North Sumatram are the main sources to acquire plants as an ingredient in traditional medicines practiced by local communities. The Kabanjahe traditional market has been the main source of acquisition of plants and traditional medicines for people in North Sumatra. The aims of this study are: (1) to document the local knowledge of medicinal plant traders in Kabanjahe traditional market, (2) to document diversity of medicinal plants which are sold in Kabanjahe traditional market, and

(3) to provide information on the pharmacological properties of the most commonly used plants in the preparation to cure diseases, especially cancer.

2. Materials and methods

2.1. Study area

Our study site is located at the Kabanjahe traditional market in the *Kabupaten* (District) Karo, North Sumatra Indonesia. Kabanjahe traditional market is the main market in the Karo District, which is located at N 3°11' and E. 98°31', at a distance of 76 km from Medan, the capital North Sumatra Province, with the elevation of 1100 above sea level (Fig. 1). Kabanjahe has at ropical climate with a bimodal seasonality (dry season from April to Agustus and rainy season from Agustus to April). The average annual temperature varies from 19 to 25 °C. Trading activity in the market is done every day from 7:00 until 18:00, but the market day is Monday.

2.2. Interviews and data collection

Information on the use and diversity of medicinal plants traded in Kabanjahe traditional market was obtained through interviews (semi-structured, in-depth, and participative observation). Interviews were conducted with all the traders of traditional medicinal plants (5 people) in Kabanjahe. Guidelines for conducting interviews were modified from Martin (1995), Alexiades (1996), and



Fig. 1. Study site at Kabanjahe traditional market in North Sumatra, Indonesia.

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