



Status of ethnobotanical invasive plants in western Madhya Pradesh, India

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ABSTRACT

Tribal community of Jhabua district uses the forest resources especially plants primarily for curing various ailments. Ethnobotanical practice has prevailed in this area since the ancient time and the invasive plants are not the exception. Thus, we documented the medicinal uses of the invasive plants. Exhaustive field surveys were conducted during 2008–2013 for the collection of the ethnobotanical data and voucher specimen. Information regarding ethnobotanical uses of plants was collected from the tribals using a semi-structured questionnaire. Several extensive reviews which studied invasive plant species are available. From this survey, a total of 102 plant species belonging to 38 families were reported for curing 37 types of ailments. Asteraceae was the dominant family and in lifeform category herbs stand dominant. Leaf is the most frequently used plant part, whereas decoction is the highly preferred preparatory method for medicine preparation in the study area. 56% of the invasive plants showed a use value of more than 0.50. This indicates the high acceptance of these plants in the primary health care. We also discussed the degree of invasiveness and habitat preference of these species. The use of invasive alien plant species relieves the pressure on the native plant species that leads to the native plant diversity conservation. Finding of this study can be used as an ethnopharmacological basis for selecting plants for future phytochemical pharmacological studies.

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1. Introduction

Medicinal plants have been used as sources of medicine since the time immemorial (Hill, 1952) by indigenous communities in different parts of the world (Matu and Van Staden, 2003). The use of traditional herbal medicine and phytotherapy remains popular, despite the increasing growth and development of the pharmaceutical industry. The World Health Organisation (WHO) reported that approximately 80% of the populations of developing countries rely upon traditional medicine for primary health care (WHO, 2002). Although about 422,000 angiosperm taxa were found worldwide (Govaerts, 2001) only 50,000 plants are used as a medicinal treatment (Schippmann et al., 2002). Moreover, only 5000 plants have been investigated phytochemically.

India is endowed with a rich wealth of medicinal plants, being perhaps the largest producer and rightly acclaimed as the Botanical garden of the world (Dubey et al., 2004). It has a strong base of many systems of medicines including Ayurveda, Yunani, Siddha and other health practices. The Indian subcontinent is being inhabited by over 54 million tribal people dwelling in about 5000 forest dominated villages spreading across the country comprising 15% of the total geographical area

(Nath and Khatri, 2010). Due to constant association with forest, ethnic groups have immense plantlore which they inherit and pass on from generation to generation just through oral conservation (Rao and Shanpru, 1981; Chhetri, 1994). In India, more than 43% of the total flowering plants are reported to be of medicinal importance (Pushpangadan, 1995).

Over the last many decades, a number of invasive species have been introduced in India from their native areas either accidentally or deliberately as fodder crops or ornamentals. Alien plants have various effects on the environment and economy of non-native areas, many of the exotic plants are of economic benefit and some have severe negative impacts. Some alien species, often cultivated, may provide food, medicine, fuel, or fodder to local communities (Kull et al., 2007; Roder et al., 2007) and some of them are responsible for endangerment and extinction of native species and have negative impact on crop production, forest regeneration, livestock grazing, and on human health (Sharma et al., 2005; Kohli et al., 2006). It is estimated that as many as 50% of invasive species, in general, can be classified as ecologically harmful, based on their actual impacts (Richardson et al., 2000). Several studies (Njoroge et al., 2004; Zhang and Hiziroglu, 2010) have shown that invasive alien plants also have positive economical, social and ecological contributions and that these need to be considered when assessing the costs resulting from invasions. It has also been recorded

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(Le Maitre et al., 2000; Richardson and Van Wilgen, 2004) that invasive alien plant species can be used in agroforestry for functions and services that cannot be provided by native species (Richardson et al., 2004). These services include rapid biomass accumulation, nitrogen fixation and reforestation of degraded land, improved fallows and contour hedgerows (Crooks, 2002). Several studies also show the importance of exotic plants in traditional medicine system (Khan et al., 2011; Semanya et al., 2012; Semanya et al., 2013; Das and Duarah, 2013; Rahman and Roy, 2014; Maema et al., 2016a, 2016b). A comprehensive study by Stepp and Moerman (2001), which focused on exotic species in the medicinal floras of the Highland Maya in Chiapas, Mexico and in the medicinal flora of Native North Americans revealed a remarkable discovery. They found that of the 2401 North American taxa that are used medicinally by native Americans, 620 are exotics. Furthermore, of 1178 species declared as weed or exotics Rios and Garcia (1998) in the Highland Maya of Chiapas, 35 are used by traditional healers as medicine.

In India, research has been done to identify the invasive species and their impact on ecosystem and biodiversity (Raizada, 1935, 1936; Matthew, 1969; Singh and Misri, 1974; Singh and Kachroo, 1983; Maheswari and Paul, 1975; Hajra and Das, 1982; Sharma, 1984; Sawarker, 1984; Pandey and Parmar, 1994; Kshirsagar, 2005; Negi and Hajra, 2007; Sekar, 2012; Das and Duarah, 2013; Srivastava et al.,

2014; Wagh and Jain, 2015), but no study especially on Western Madhya Pradesh was so far carried out solely on the status and traditional usage of invasive plants for medicinal purposes. Therefore, the present study aimed to document the ethnobotanical uses of the invasive alien plants. This paper further attempted to explore habitat preference and the degree of invasiveness and to study the importance of the invasive plant species in the traditional medicinal system in western Madhya Pradesh, India.

2. Materials and methods

2.1. Study site and ethnic background

Jhabua is the district head-quarter, situated in the western part of Madhya Pradesh and situated at 22° 47' N latitude and 71° 35' E longitude at an average altitude of 428 m above mean sea level (Fig. 1). The total area of the district is 6792 km². The total population of the district as per 2001 census is 13, 94,345. Most of the village habitants of Jhabua belong to tribal communities like *Bhil*, *Bhilala* and *Pataya*. Out of these tribes *Bhil* and *Bhilala* stand high in strength, scattered in most of the villages of the district. The *Bhil* tribe is one of the most important tribes and the third largest tribe in India. In the district, about 28% of the area is covered with forest whose total area counts to 1900 km².

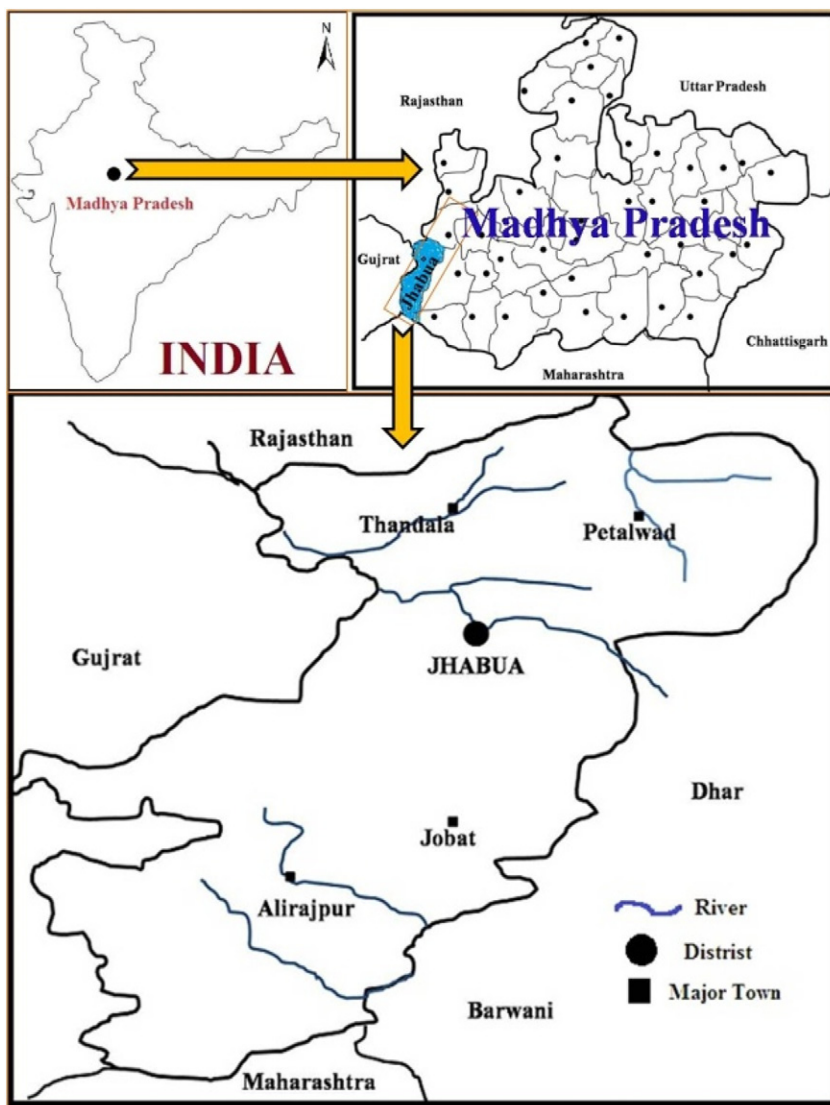


Fig. 1. Map of Jhabua district of Madhya Pradesh, India.

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