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Rare and interesting plant of *Mahonia imbricata* T.S. Ying & Boufford – an addition to India from the Manipur State

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Abstract. *Mahonia imbricata* was reported for the first time from Manipur, India. This paper describes taxonomy, morphology, phenology, habitat requirements, ecology and world distribution of the species. On the basis of the examined specimens, notes and photographs for easy identification are presented.

Key words: India, Manipur, *Mahonia*, new record, Berberidaceae

1. Introduction

As part of survey and collection of medicinal plants across India, within the framework of the Center of Excellence programme supported by the Ministry of Environment and Forests & Climate Change (MoEF & CC), a botanical survey was undertaken in many places of Manipur state namely, Agiidziikhe, Asufii, Chokhurii, Esii Phi, Kapengho, Kapenho Karale, Karong, Khole, Khungho, Kozii, Koziir Korii, Makhan Khulloen, Punanamai, Sholitokhu, Soprie and Vanee. The botanical survey resulted in the collection of 267 plant species. The plant species were identified by referring floras such as Hooker (1872), Deb (1983), Haridasan & Rao (1985, 1987), Guha Bakshi (1993), Hajra *et al.* (1996), Kanjilal & Bor (repr. ed. 1997), Singh *et al.* (2000, 2002) and Giri *et al.* (2008). Of these, one genus, namely *Mahonia* does, failed to match any of the specimens in Indian flora and, later, it was identified and confirmed with the Flora of China (Chang *et al.* 1996; Ying *et al.* 2000) as *Mahonia imbricata* T.S. Ying & Boufford of Berberidaceae. This species has not been reported in any Indian literature and Indian Herbaria. The voucher specimen was deposited at FRLH National Herbarium of Medicinal Plants, Bengaluru, India.

2. Species description

Mahonia imbricata T.S. Ying & Boufford in T.S. Ying, Fl. Reipubl. Popularis Sin. 29: 309. 2001; Ying Junsheng *et al.* in Wu & Raven (eds.), Fl. China 19: 781. 2011. Berberidaceae (Fig. 1).

Morphology: Shrubs, up to 3 m high; stems hard, show light yellow when cut. Leaves 25-45 × 10-15 cm, alternate, imparipinnate, usually crowded at apex; leaflets 3-7 pairs (7-15 numbers), often unequal, sessile, truncate to sub-obtuse at base, acuminate at apex, margin spinose-dentate, glabrous, coriaceous, lower ones often smaller, ovate-suborbicular, terminal ones much bigger than others, ovate-oblong. Lower leaflets 2-4 × 2.5-3 cm; second pairs of leaflets 6-7 cm long apart from the rachis; third to seventh pair 3-4 cm apart from each other; terminal leaflets c. 8.5 × 5 cm, rounded at base. Spines 8-11 in each leaflet, 1-2 cm long, strong; nerves 5-7-nerved from base, inconspicuous, c. 12 nerved to the tip, forming an intramarginal looping

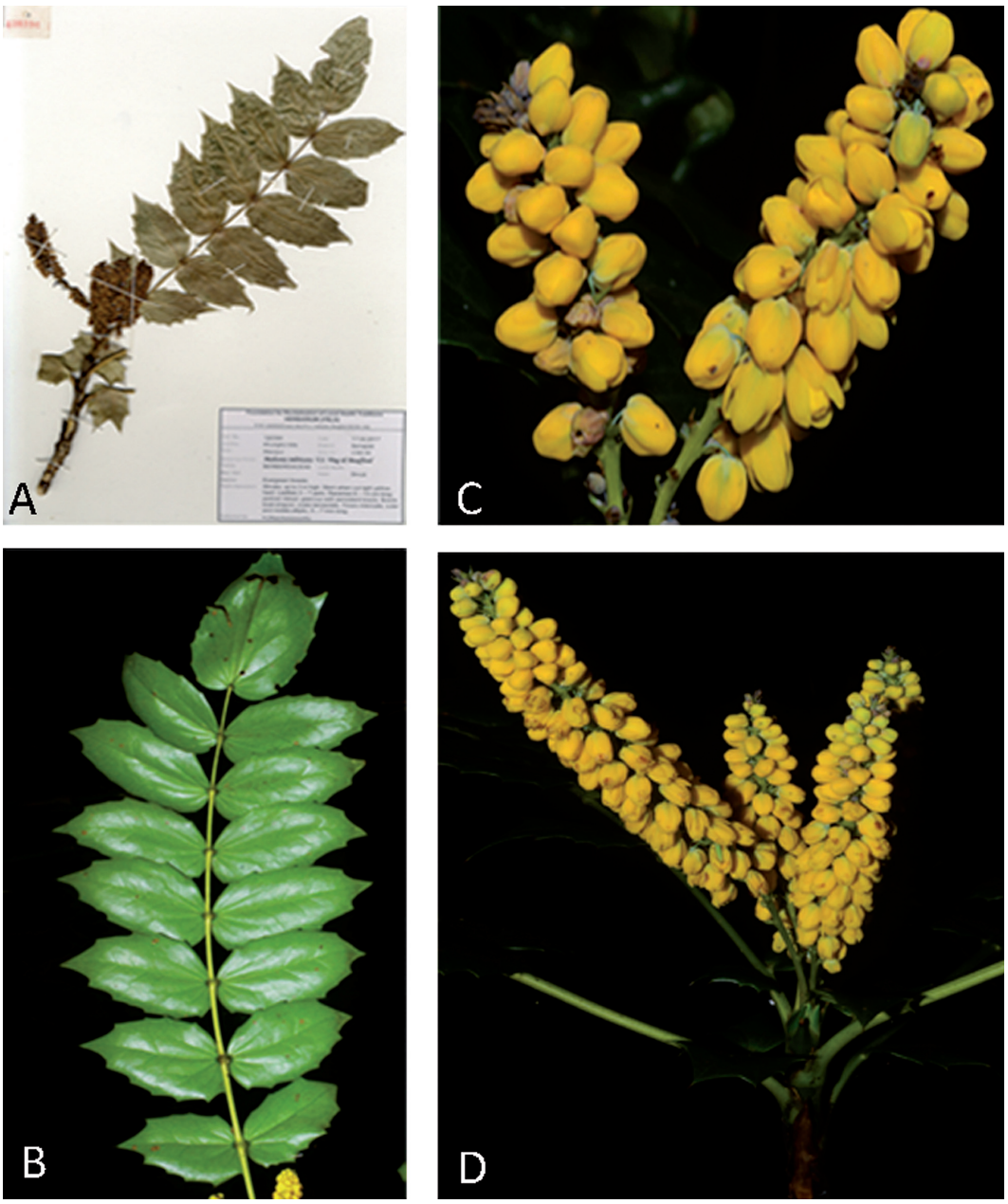

Fig. 1. *Mahonia imbricata* T.S. Ying & Boufford
Explanations: A – herbarium specimen, B – dorsal side of leaf, C – close-up of flowers, D – twig with inflorescences

below c. 2 mm from margin, reticulate. Rachis canaliculate, ribbed, glabrous, c. 2 mm wide, broaden-conical at base. Inflorescences 2-5 in raceme, 6-13 cm long; racemes c. 75-flowered; pedicel ribbed, glabrous with persistent bracts. Bracts boat-shaped, ovate-lanceolate, c. 4 × 2 mm long; Sepals 6, bright yellow, glabrous, outermost one ovate, 2- 3 × 1-1.5 mm across, obtuse at apex, 3-nerved at base; middle one elliptic, c. 5 × 2.5 mm, truncate at base, entire along margin, obtuse at apex; innermost one elliptic-oblong, 5-7 × 2-2.5 mm, truncate at base, entire along margin, obtuse at apex, 5-nerved at base. Petals 6, imbricate, glabrous; outer and middle ones elliptic, 5-7 × 3.5-4 mm, obtuse at apex, 5-nerved at base; inner one oblong, c. 6 × 4 mm, 2-lobed and obtuse at apex, 3-nerved at base. Stamens 6; filaments equal, flat, c. 3 mm long; anthers truncate-obtuse, c. 1 × 1 mm, pale yellow. Ovary single, cylindrical, 3-angled, c. 3.5 mm long; stigma truncate, c. 1 mm long. Fruits not seen.

Phenology: Flowering in February; Fruiting in March-April.

Habitat and Ecology: This species was recorded on the slopes of evergreen forests of Khungho hills, Senapati district (Fig. 2). Only 5 individuals were observed in the undisturbed hills. The associated plants found growing along with this species were *Bambusa* sp., *Brassaiopsis aculeata* (Buch.-Ham. ex D.Don) Seem., *Calamus* sp., *Elaeocarpus serratus* L., *Maesa*

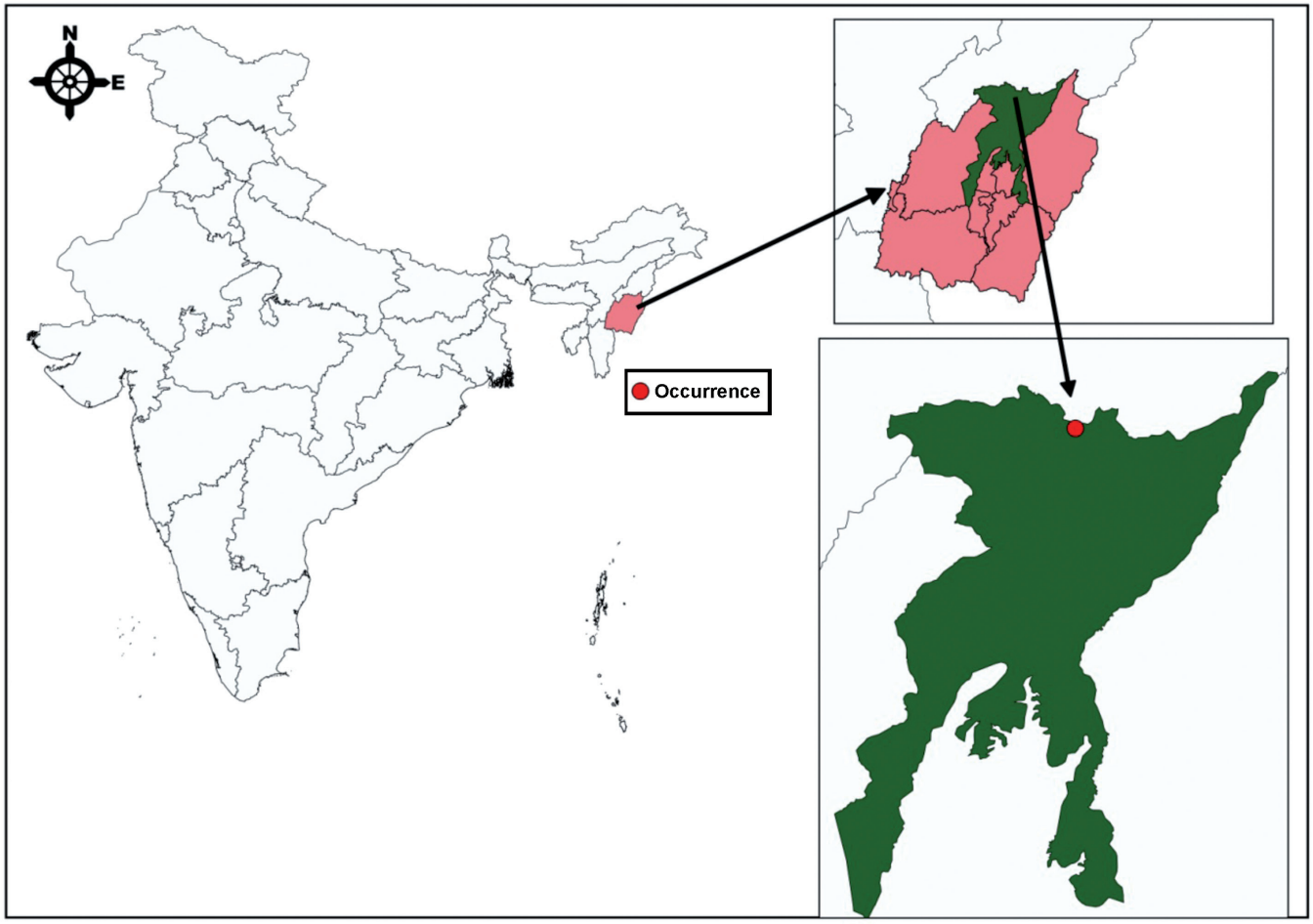

Fig. 2. Location of *Mahonia imbricata* in Khungho hills, 2380 m, Senapati district, Manipur, India

indica (Roxb.) A. DC., *Michelia doltsopa* Buch.-Ham. *ex* DC., *Mycetia* sp., *Quercus lamellose* Sm. and *Senecio scandens* Buch.-Ham. *ex* D. Don.

World distribution: It is native to south-western China and Guizhou and Yunnan Provinces (Ying *et al.* 2000). Recently, it has been reported from Manipur, India.

Specimens examined: India-Manipur, Senapati district, Khungho hills, 2380 m, 17th February 2017, (Fig. 1), N. Dhatchanamoorthy 120381, (FRLH). China, 08. 06. 1905, T.S. Ying & Boufford, holotype, 122, (PE 683573-01432139!); isotype, 122 (PE 2182929-01432140!).

Notes: *Mahonia* Nutt. is one of the largest genera in Berberidaceae, represented by 60 species. They are widely distributed in East and South East Asia, also in western North America, Central America and western South America. There are 31 species in China, of which 23 species and one subspecies are endemic (Ying 2001). In India, there are 13 species, of which 8 species and two varieties are endemic (Guha Bakshi 1993).

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