

# *Dioscorea* L. (Dioscoreaceae): A new addition to the Flora of Allahabad, Uttar Pradesh, India

Ankita Verma<sup>ID</sup> and Deepak Kumar Gond\*<sup>ID</sup>

CMP Degree College, Department of Botany (University of Allahabad), MG Marg, George Town, Prayagraj-211002, Uttar Pradesh, India

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Corresponding Author: **Deepak Kumar Gond** | E-Mail: [botanydeepakgond@gmail.com](mailto:botanydeepakgond@gmail.com)

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## ABSTRACT

During floristic field survey in different regions of Allahabad district for one and half year different species of *Dioscorea* L. was collected. These twinning, herbaceous and rhizomatous plants were growing abundantly in moist places of road side and forest area. Three species of *Dioscorea* are reported as new addition to flora of Allahabad. A detailed taxonomic description, current citation, phenology, photographs, ecology, conservation status, voucher specimen number and geographical distribution of all three species are given here for easy identification.

**Keywords:** Allahabad, *Dioscorea*, family addition, generic record, taxonomy.

## 1. Introduction

*Dioscorea* is the largest genus of the family Dioscoreaceae, which includes almost 600 species, while the family Dioscoreaceae contains 9 genera and 715 species. The family is considered one of the earliest families of the plant kingdom, Magnoliophyta [3] of order Liliales or liliiflorae [2]. *Dioscorea* has some vegetatively reproducing tubers, which are known as yams. The genus is distributed in Southeast Asia, Africa, Central America, South America, and other tropical and subtropical regions [5]. Traditionally, the plant is used in the treatment of goiter, skin infections, oncological diseases, arthritis, cough, asthma, circulatory disorders, chronic diseases, and intestinal disorders [3]. Some species of *Dioscorea* are used in the development of flour, pasta, and desserts [3]. Some secondary metabolites are also present in the plant like steroid saponin, dioscin, gracillin and trillin, which is used in the synthesis of hormonal drugs, as an anticancer, as an antioxidant, and in lowering lipid peroxidation activity, respectively [1].

In the present paper we have reported 3 species of *Dioscorea* L. as a new addition to Flora of Allahabad from Uttar Pradesh, India; based on a field survey. The authors observed an interesting rhizomatous, twinning, herbaceous plant growing luxuriantly along the roadsides of the Mau Aima, Georgetown, Naini, Fafamau, Shankargarh, and some other regions of the Allahabad district. Allahabad, currently known as Prayagraj is located in Southern Uttar Pradesh at 25° 28'N and 81° 50'E, stands at the confluence of the Ganga and Yamuna rivers. The annual mean temperature of the district is 26.1°C (79.0°F), and the monthly mean temperature is 18-29°C (64-84°F). The climatic condition of the district is characterized by the rainy or monsoon, winter, and summer seasons [10]. A comprehensive literature study from Uttar Pradesh [4,7] and a thorough examination of all the collected specimens revealed that they belong to different species of *Dioscorea*. These species, as well as the family, have not been reported by the earlier workers from

Allahabad and thus these are an addition to the Flora of Allahabad. A detailed taxonomic description, current citation, phenology, ecology, conservation status, photographs, geographical distribution, and voucher specimen numbers of the taxon have been given to identify the plant easily in the field.

## 2. Methodology

Multiple field surveys were done for one and a half year to collect the plant specimens. In the field, specimens were collected, kept in air-tight polythene bags for identification and to study taxonomic characters in the lab, by taking the help of existing regional flora. During the field survey, field notes were also prepared. Nomenclature of each taxon has been checked properly and updated with the help of Plants of the World Online (POWO). Conservation status of all three species is calculated by using IUCN Red List [6]. Then specimens were pressed in a plant press, poisoned in the solution of alcohol and mercuric chloride (2%), and mounted on herbarium sheet to submit to the Herbarium of CMP Degree College, Prayagraj, for future references.

## 3. Result and Discussion

### 3.1 *Dioscorea alata* L., Sp. Pl. 2:1033.1753. (Fig.1)

Climbing herb, dioecious, stem twining right, glabrous, usually 4-winged, broad base prickles. Bulbiferous, multiple bulbs, solitary, polymorphic, globose or pyriform, oblong, cylindrical, with yellowish white to purple flesh. Leaves monomorphic, simple, alternate or opposite, ovate, exstipulate, 9-16 × 5-9 cm, petiole 4-12 cm, base sub-cordate or hastate with acute or rounded lobes, 5 costate, margin entire, apex shortly acuminate or caudate, papery, glabrous. Male spikes 1 or 2 together, on leafless branches, 2-4 cm long. Male flowers: outer tepals broadly ovate, inner narrower, stamens 6, fertile. Female spikes solitary, 2 or 3 together, narrowly winged. Female flowers: tepals 6, staminodes 6. Capsulated to brown. Seeds winged all around.

**Local Name:** Khamalu

**Flowering & fruiting:** October-December

**Habitat:** Common in damp and shady places.

**Distribution:** Arunachal Pradesh, Daman & Diu, Dadra & Nagar Haveli, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Mizoram, Odisha, Tamil Nadu, West Bengal [11], Uttar Pradesh [7].

**Conservation status:** Not Evaluated (NE)

**Voucher specimen:** India, Uttar Pradesh, Allahabad, George Town, 25.44° N latitude and 81.85° E longitude, 13 October 2023, Ankita Verma: 072, Department of Botany, CMP Degree College, Prayagraj.

### 3.2 *Dioscorea bulbifera* L., Sp. Pl. 2: 1033. 1753. (Fig. 2)

Twining herb, dioecious, stem twining left, terete, grooved. Bulbiferous, solitary, globose to oval, axillary. Leaves monomorphic, simple, alternate, broadly ovate-cordate to sub-orbicular, exstipulate, 12-30 × 7-21 cm, petiole 9-11 cm, twisted at base, leaf base deeply cordate, margin entire or slightly undulate, sub-caudate at apex, glabrous. Male spikes 1-4 on up to 1 m long leafless branches, axillary, 5-8 cm long, pendulous. Male flowers: greenish white, pink or purple, fragrant, 1.6-2.6 cm long, tepals 6, biseriate, linear; outer up to 2.4 mm long, fleshy, inner narrower; pistillodes minute, stamens 6, fertile. Female spikes 1 or 2 from a leaf axil, 10-20 cm long, directed downward. Female flowers: white, tepals 6, staminodes 6, ovary 3-quetrous, 3-celled, stigma 3, recurved. Capsule oblong, 2.1-2.5 cm long, widened upward, reflexed, membranous. Seeds are dark brown, winged towards the capsule base.

**Local Name:** Ratalu, Garadu

**Flowering & fruiting:** July- November

**Habitat:** Common in damp forests and forest roads.

**Distribution:** Andaman & Nicobar Islands, Karnataka, Maharashtra, Madhya Pradesh, West Bengal [9], Uttar Pradesh [7].

**Conservation status:** Not Evaluated (NE)

**Voucher specimen:** India, Uttar Pradesh, Allahabad, Mau Aima, 25.71° N latitude and 81.91° E longitude, 21 September 2024, Ankita Verma: 019, Department of Botany, CMP Degree College, Prayagraj.

### 3.3 *Dioscorea hispida* Dennst., Schleuss. Hort. Malab. 15. 1818. (Fig. 3)

Twining herb, dioecious, stem twining left, with short, green, recurved, hard prickles, deciduously golden hairy. Tubers lobed or sub-globose, variable in size, poisonous, with white flesh. Leaves monomorphic, compound, palmately 3-foliate, exstipulate, middle leaflet elliptic, oblong or ovate, lateral leaflets smaller, ovate to elliptic to oblong, inequilateral, 11-22 × 8-14 cm, 5-costate, petiole 8-15 cm, acute at base, margin entire, acuminate at apex, glabrous or puberulous. Male spikes solitary, borne on 28-35 cm long, villous, leafless, axillary branches, pendulous. Male flower: bracts brown, hairy, shorter than the flower; tepals 6, biseriate, outer orbicular-ovate, membranous, shorter than the inner, ovate, incurved, stamen 6, fertile. Female spikes solitary, 11-19 cm long, directed downward. Female flowers: tepals 6 as in male, ovary 3-quetrous, 3-celled, tomentose, oblong. Capsules elliptic, 35-45 × 15-20 mm long, base and top truncately round. Seeds winged at the base.

**Local Name:** Gajakand

**Flowering & fruiting:** September- May

**Habitat:** Common in moist and humid areas.

**Distribution:** Odisha, Jharkhand, Telangana [8], Andhra Pradesh, Dadra & Nagar Haveli, Daman and Diu, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal [11].

**Conservation status:** Not Evaluated (NE)

**Voucher specimen:** India, Uttar Pradesh, Allahabad, Shankargarh, 25.1813° N latitude and 81.61903° E longitude, 28 August 2024, Ankita Verma: 123, Department of Botany, CMP Degree College, Prayagraj.

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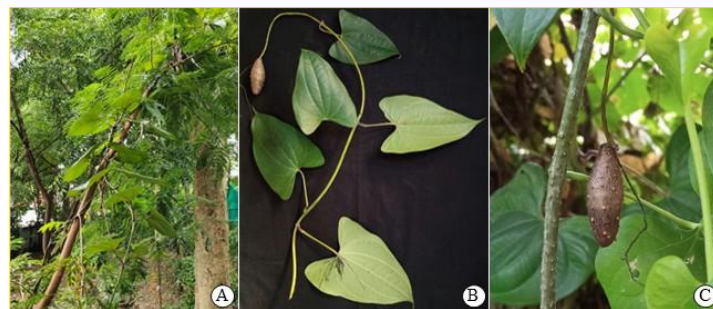


Figure 1. A. Habitat of *Dioscorea alata*, B. A twig of the plant, C. Pyriform bulb



Figure 2. A. Habitat of *Dioscorea bulbifera*, B. A twig of the plant, C. Male inflorescence, D. Female inflorescence



Figure 3. A. Habitat of *Dioscorea hispida*, B. A twig of the plant, C. Female inflorescence

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