



Four Flowering plants are new distributional records from Satpuda range of Khandesh region, Maharashtra

Tanveer A Khan^{1*}, Umesh K Patil²

¹ Department of Botany, H.J. Thim College of Arts and Science Mehrun Jalgaon, Maharashtra, India

² Biologist Ideal Organization, Jalgaon, Maharashtra, India

Abstract

Satpuda range of Khandesh region with great diversity of plants. The present paper deals with addition of four new flowering plants records from different parts of the Satpuda ranges of Khandesh region of Maharashtra are new distributional records for the first time. These species are *Campanula dimorphantha* Schweinf. (Campanulaceae), *Dipcadi saxorum* Blatt., (Asparagaceae), *Hygrophila ringens* (L.) Steud., (Acanthaceae), *Persicaria nepalensis* (Meissn.) Gross., (Polygonaceae) are reported for the first time for Satpuda ranges of Khandesh region of Maharashtra. The study provides a detailed taxonomic description, photographs and relevant information based on fresh collections.

Keywords: New distributional records, Satpuda Ranges, Khandesh region

1. Introduction

Regional floristic studies are very significant for getting information about vegetational diversity. It can be achieved by intensive exploration of smaller areas. It updates the data of regional area. Khandesh region consist of three districts Jalgaon, Dhule and Nandurbar. Khandesh includes varied topographical features and landscape. It lies between 20° 8' and 22° 7' North latitude and 73° 42' and 76° 28' East longitude. Khandesh covers a total area of 26,703.36 sq. km. The forest of the Khandesh region is of dry deciduous type. The vegetation varies with the changes in altitude, aspect and rainfall. While working on floristic of Khandesh region of Maharashtra we undertook frequent collection tours in every season to study plants.

Khandesh region though botanically rich in biodiversity have not been explored extensively except a few sporadic reports on floristic of Khandesh region by Patil 2003; Kshirsagar 2008; Khan 2016; Khan 2017 and Khan 2019 [7, 4, 1, 2, 3].

2. Materials and Methods

Satpuda ranges, which is one of the major hotspot of plants in Khandesh region of Maharashtra. During botanical exploration of Khandesh region in Maharashtra four interesting species are *Campanula dimorphantha* Schweinf. (Campanulaceae), *Dipcadi saxorum* Blatt., (Asparagaceae), *Hygrophila ringens* (L.) Steud., (Acanthaceae), *Persicaria nepalensis* (Meissn.) Gross., (Polygonaceae) was collected from open grassy filed, margins of water courses and in moist shady places in forest at high elevations. The species was identified with the help of pertinent literature (Lakshminarasimhan *et al.*, (1996), Singh *et al.*, (2001), Tomasz *et al.*, (2014), Meena *et al.*, (2015), Rupesh *et al.*, (2017). [5, 9, 10, 6, 8] and the taxa were confirmed by Dr. Milind Sardesai, Department of Botany, Savitribai Phule Pune University, Pune, and by consulting the BSI western Circle,

Pune, herbarium as well. The voucher specimens have been deposited in the herbarium of Department of Botany, H. J. Thim College of Arts and Science Mehrun, Jalgaon, Maharashtra.

3. Taxonomic description

The genus *Campanula* L. about 03 species are found in Maharashtra. *Campanula dimorphantha* Schweinf. is new distributional records for Satpuda range of Khandesh region. Detailed description of the specimens is given below:

Campanula dimorphantha Schweinfurth, Beitr. Fl. Aethiop. 140. 1867; Singh *et al.* Fl. Maharashtra St. Dicot. 2: 272.2001. *Campanula benthamii* Wall. ex Ritamura, Fl. Afg. 377.1960; *C. canescens* Wall. ex DC. Prodr. 8:473.1839 non-Roth, 1821; C.B. Cl. in Hook. f. Fl. Brit. India 3: 439.1881. *C. wallichii* Babu in J. Bombay Nat. Hist. Soc. 65:808.1968. Plate-I.

Annual herbs. Stems erect, 30-45 cm tall, simple, or branched from base and thus caespitose, hairy. Basal leaves occasionally rosulate, in a minute petiolate; blade spatulate or elliptic, withering initial, base cuneate or attenuate, margin serrulate and acute at apex. Cauline leaves winged, petiolate, 2-7 cm; blade spatulate, elliptic- linear, base attenuate, margin serrulate or subentire, acute or acuminate at apex. Cymes multiple, aggregated into a terminal panicle; pedicels unequal in length, those of upper flowers in a cyme longer. Hypanthium semiglobose to obconic, acute at base; calyx lobes narrowly triangular, 3-5 mm. Corolla purple or blue-purple, campanulate, outer side hispid, inner side glabrous; lobes equaling tube. Style included. Capsules globose hairy. Seeds yellow-brown, oblong or elliptic, compressed, 0.2-0.3 mm, smooth.

Flowering and Fruiting: December-March

GPS Reading: N 21° 8' 28.44" E 75° 32' 17.48" (Elevation 146.19 m)

Distribution: Rare. In Maharashtra only reported from Amravati and Nasik.

Specimens examined: India, Maharashtra, Jalgaon District: TAK 5961 (CAL), Date: 01.03.2020, Tapi river; TAK 5993 (CAL), Date: 08.03.2020, Aner river. Nandurbar District: TAK 6037 (CAL), Date: 22.03.2020, Amlibari forest. In satpuda ranges grow along the river bank.

The genus *Dipcadi* Medik. about 06 species are found in Maharashtra. *Dipcadi saxorum* Blatt., is new distributional records for Satpuda range of Khandesh region. Detailed description of the specimens is given below:

Dipcadi saxorum Blatter J. Bombay Nat. Hist. Soc. 32: 736 1928; Lakshmi. in Sharma *et al.*, Fl. Maharashtra St. Monocot. 131. 1996; Maurya *et al.*, J. Tropical plant research 4(2):330.2017. *Dipcadi maharashtrensis* Deb. & Dasgupta J. Bombay Nat. Hist. Soc. 72: 822-3, t.1, 1975. *Ornithogalum saxorum* (Blatt.) Manning & Goldblatt Edinburgh J. Bot. 60: 552 2003. Plate-I.

Bulb tunicate, 1.5-1.8 x 1.5-2.0 cm. Scape 35-50 cm long, terete, smooth. Racemes 15-20 cm long, slightly lax, 12-20 flowered. Bracts broadly ovate, scarious, long-acuminate, slightly finged near the base about 5-7 mm long. Pedicels stout, 1/2 longer than the bracts. Perianth 10-15 mm long, tubular, somewhat trigonous, linear-oblong, 3 outer side lobes connate for 1/3 length, obtuse, recurved from about the middle with a thick, glandular tip, the 3 inner side connate for almost 2/3 length, 2-3 mm broad ovate-obtuse, with recurved and somewhat thickened tip, all lobes whitish with an olive coloured central band. Filaments 0.7-1 mm long, a slight flattened; anthers up to 3 mm long, versatile, yellow. Pistil 7-10 mm long. Ovary 4-5 mm long, trigonous, clavate, shortly but markedly stipitate; style stout, 4-5 mm long minutely glandular upwards; stigma slightly thicker than style, 3-lobed. Capsule broader than long, deeply 3-sulcate, loculicidally 3-valved, membranous, stipitate, stalk stout, 2-2.5 cm long; 5 seeds slightly elliptical to nearly orbicular in outline, reaching 4-5 mm diameter, compressed, with a upraised margin, the bottom and upper most in each cell plano-convex.

Flowering and Fruiting: August-November

GPS Reading: N 21° 41' 2.06" E 74° 1' 25.15" (Elevation 863.3 m)

Distribution: Vulnerable. In Maharashtra reported only from Borivili (Bombay).

Specimens examined: India, Maharashtra, Nandurbar District: TAK 5017 (CAL), Date: 06.10.2019, Amlibari forest; TAK 5297 (CAL), Date: 20.10.2019, Dab; TAK 5716 (CAL), Date: 03.11.2019, Toranmal forest. In satpuda ranges grow on rocky hills.

The genus *Hygrophila* R.Br. emend. Heine about 08 species are found in Maharashtra. *Hygrophila ringens* (L.) Steud. is new distributional records for Satpuda range of Khandesh region. Detailed description of the specimens is given below:

Hygrophila ringens (L.) Steud. Nom. 1: 418. 1821; Singh *et al.* Fl. Maharashtra St. Dicot. 2: 635. 2001; Meena K.L. Indian J. Nat. Prod & Resour 6 (3) 241.2015. *Ruellia ringens* L. Sp. Pl. 635. 1753. *R. quadrivalvis* Buch.-Ham. in Trans. Linn. Soc. Lond. 14: 219. 1824. *Hygrophila quadrivalvis* (Buch.-Ham.) Nees in Wall. Pl. Asiat. Rar. 3: 80. 1832; Cl. in Hook.f. Fl. Brit. India 4: 407. 1884. *H. angustifolia* Cooke, Fl. Pres. Bombay 2: 430. 1958 (Repr.). Plate-I. Dhakta Kolsunda.

Erect or ascending annual herb, 1-1.5 m. Stems 4-angled, grooved, somewhat pubescent. Petiole pubescent, 0.4-1.0 cm. Leaves blade narrowly lanceolate to oblanceolate, 3-12 x 0.5-1.5 cm, pubescent on both surfaces, attenuate at base, decurrent on petiole, margin entire or slightly undulate, serrulate, acute to obtuse at apex. Flowers 3-12 clustered in leaf axils, sessile, purplish; Bracts ovate, margins and outer surface pubescent, inner surface glabrous; bracteoles narrowly ovate, 3-5 mm, margin and outer surface pubescent, obtuse at apex. Calyx narrowly campanulate, 0.8-12 mm, 5-lobed to middle; lobes linear-lanceolate, grayish pubescent or fulvous strigose, acuminate at apex. Corolla purple, 1.2-2.5 cm; tube 5-7 x 1-2 mm, glabrous; limb 2-lipped; lower lip obovate, 2-3 mm, 3-lobed to middle, lobes ovate with an obtuse at apex; upper lip elliptic, 2-3 mm, shallowly 2-lobed, outside puberulent. Stamens 4, included; filaments base hairy and terminating glabrous, longer pair 4-5 mm, shorter pair 2-3 mm; anther thecae 1-2 mm. Ovary glabrous; style filiform, 5-8 mm, included; stigma pubescent. Capsule narrowly oblong, 0.8-2.5 cm, glabrous, 14-25-seeded. Seeds 1-2 mm, pubescent, orbicular.

Flowering and Fruiting: August-December

GPS Reading: N 21° 40' 22.39" E 74° 1' 28.91" (Elevation 687.5 m)

Distribution: Rare. In Maharashtra reported only from Sindhudurg and Raigard.

Specimens examined: India, Maharashtra, Nandurbar District: TAK 5081, (CAL), Date: 06.10.2019, Amlibari forest; TAK 5317 (CAL), Date: 20.10.2019, Bhagadari forest. Jalgaon Dist., TAK 5916 (CAL), Date: 10.11.2019, Devjiri forest. In satpuda ranges grow on along streams and wet places.

The genus *Persicaria* (L.) Mill. about 10 species are found in Maharashtra. *Persicaria nepalensis* (Meissn.) Gross. is new distributional records for Satpuda range of Khandesh region. Detailed description of the specimens is given below:

Persicaria nepalensis (Meissn.) Gross. in Engl. Bot. Jahrb. Syst. 49: 277. 1913; Singh *et al.* Fl. Maharashtra St. Dicot. 2: 806. 2001; Tomasz *et al.*, Polish Botanical Journal 59 (2): 255-261, 2014. *Polygonum nepalense* Meissn. Monogr. Polyg. 48. t. 7. f. 2. 1826. *P. alatum* Buch. Ham. ex Spr. Syst. Veg. 154. 1826 nom. illeg.; Hook.f. Fl. Brit. India 5: 41. 1886. Plate-I.

Erect, ascending or decumbent annual herb, 18-60 cm. Stem generally branched, rooting at lower nodes, slender, glabrous except for whitish glandular trichomes on internodes of the upper parts. Leaves alternate, 1.3-5.0 x 1.0-3.0 cm; heterophyllous: lower leaves broadly ovate or rhomboid with truncate at base, petiolate, petiole 2-3 cm long, somewhat to moderately winged; upper leaves oblanceolate, subsessile or subamplexicaul with auricled at base. Lamina with entire and slightly scabrous at margin, undulate, revolute, glabrous on adaxial surface, pubescent on veins and punctate with yellow glands on abaxial surface, acute at apex. Ochreae tubular, truncate, 5-10 mm long, strigose proximally, brownish. Inflorescences terminal and axillary corymbose heads, 6-7 mm in diameter, subtended by sessile, subamplexicaul, ovate to lanceolate leaves 6.5-12 x 2.5-5.0 mm, peduncles 5-20 mm long, erect with glandular hairs below heads. Ochreolae ovate-lanceolate, acute at apex, 3-5 x 1.8-2 mm. Flowers 2.5-4.0 x

1.0-2.0 mm, shortly pedicellate. Tepals 4-5, 2.7-3.5 x 0.5-1.5 mm, obovate, obtuse, usually pink, sometimes white or lavender. Stamens 5-8, filaments 0.5-1.5 mm long, anthers black-purple, elliptic, ovary biconvex or trigonous with 2-3 unequal styles, stigmas capitate. Fruit nut biconvex or trigonous, 1.2-2.2 x 1.0-2.0 mm, dull, shining, densely and minutely pitted, light or dark brown to black, enclosed in perianth.

Flowering and Fruiting: August-December

GPS Reading: N 21° 21' 26.45" E 75° 36' 35.75" (Elevation 587.1 m)

Distribution: Rare. In Maharashtra reported only from Kolhapur, Raigard and Ratnagiri.

Specimens examined: India, Maharashtra, Jalgaon District: TAK 4794 (CAL), Date: 01.09.2019, Devjiri forest; TAK 4813 (CAL), Date: 08.09.2019, Langdha Aamba. Nandurbar Dist. TAK 5097 (CAL), Date: 06.10.2019, Amlibari forest. In satpuda ranges grow in wet places.

4. Conclusion

We have gone through all pertinent literature (Kshirsagar 2008, Patil 2003, Khan 2016, Khan 2017 and Khan 2019) [4,7,1,2,3] and by consulting the BSI Herbarium Pune. To find out the occurrence, distribution and habitat of these species. We found that, these species were not reported in any flora of the Satpuda range of Khandesh region in Maharashtra. This clearly reveals that, these species are rare to flora of Maharashtra State, even India as a whole. These species are new record to the flora of Satpuda range of Khandesh region of Maharashtra State. The voucher specimens are deposited in the herbarium of Department of Botany, H. J. Thim College of Arts and Science Mehrun, Jalgaon. On close examination of herbarium specimens and detailed scrutiny of literature published till today on these taxa, it can be claimed that these are new records for Satpuda range of Khandesh region of Maharashtra State.



Plate 1

5. Acknowledgement

The authors wish to express their gratitude to Dr. Milind Sardesai, (Department of Botany, Savitribai Phule Pune University, Pune.), Vinod Kumar Gosavi (Department of Botany, HPT Arts and RYK Science College, Nashik) they

confirmed the identity of these species. Dr. Nilesh V. Malpure for their support. Thanks, are also due to the Principal, H.J. Thim College, Jalgaon, for providing laboratory and library facilities.

6. References

1. Khan TA, Desai VV, Patil UK. Two New flowering plants are new distributional records from Satpuda range of Jalgaon District, Maharashtra. Indian Journal of Plant Sciences. 2016; 5(3):10-12.
2. Khan TA. Flowers of Jalgaon District A succinct field guide. Prashant publication Jalgaon in Association with Jalgaon Forest division Jalgaon, 2017, 37-79.
3. Khan TA. Wild Flowers of Jalgaon District A succinct field guide. Prashant publication Jalgaon, 2019, 34-76.
4. Kshirsagar SR, Patil DA. Flora of Jalgaon District, Maharashtra. Bishen Singh Mahendra Pal Singh, Dehradun, India, 2008, 193-311.
5. Lakshminarasimhan P, Sharma BD, Karthikeyan S, Singh NP. Flora of Maharashtra State: (Monocotyledons) (Botanical Survey of India, Kolkata, India), 1996, 131-133.
6. Meena KL. *Hygrophila ringens* (L.) R.Br. ex Spreng. A new record from Rajasthan. Indian Journal of Natural Products and Resources. 2015; 6(3):241-243.
7. Patil DA. Flora of Dhule and Nandurbar District (Maharashtra), Bishan Singh Mahendra Pal Singh Deharadun, 2003, 350-602.
8. Rupesh R Maurya, Umerfaruq M Qureshimatva, Sandip B Gamit, Rajdeo Singh, Hitesh A Solank. Journal of Tropical Plant Research. 2017; 4(2):330-331.
9. Singh NP, Lakshminarasimhan P, Karthikeyan S, Prasanna PV. Fl. Maharashtra St. Dicot, 2001; 2:271-806.
10. Tomasz Kowalczyk, Artur Pliszko, Szymon M. Drobnia. *Persicaria nepalensis* (polygonaceae), A new potentially invasive anthropophyte in the polish flora. Polish Botanical Journal. 2014; 59(2):255-261.
11. Deshpande S, Pawar U, Kumbhar R. Exploration and documentation of wild food plants from Satara district, Maharashtra (India). Int J Food Sci Nutr. 2019;4(1):95-101.