A new distributional record of Psammogeton canescens subsp. cabulicus (Apiaceae) for Indian Flora

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January 30, 2024

Abstract

Psammogeton canescens subsp. cabulicus Wagenitz (Apiaceae), a new distributional record for the Flora of India is investigated in this work from Jammu district Jammu and Kashmir. Some intriguing plants were collected from the district Jammu between 2010 and 2018 as part of a field survey in the south-west regions, district Jammu of the state of Jammu and Kashmir. The taxa differing from others subspecies of the species by having lateral branches far exceeding the main axis, bracts ± 2 mm long, bracteoles ± 1.3 mm long, fruit 1.4 to 2.0 mm long. For ease in identification, a brief description, a key to subspecies of Psammogeton canescens and photographs of the plant and its parts are provided.

Introduction

Psammogeton Edgew. is a small genus with 14 species that are primarily found in Asia (Mousavi et al. 2022). There are currently only six species known to exist in India (Bhellum and Magotra 2023) and four of those are from Jammu and Kashmir. As part of the plant collections in the flora of Jammu and Kashmir, several intriguing sample specimens were collected during the plant exploration from the Jammu area of Jammu and Kashmir between 2010 and 2018.

This taxa has never been documented from India, according to a review of relevant taxonomic literature (Babu 1977, Ahmed and Koul 1980, Sharma and Kachroo 1981, Swami and Gupta 1998, Dhar and Kachroo 1983). After carefully examining the samples, it was eventually determined in the lab that these were new records for the flora for India. According to a review of the Indian floristic literature, the plant has not yet been recorded to the Flora of India and is thus *Psammogeton canescenssubsp. cabulica* listed as a new taxa. The subspecies of the genus are recognised by sparsely to densely pubescent herb, T-shaped hairs on fruits, bracts ranging from four to seven and presence of trichomes; bracteoles five to seven, margin ciliate; peripheral branches longer than the central main axis. For ease of identification, a brief description of the subspecies, blooming and fruiting dates, distribution, photographs, photo plates, and a key to its closely related subspecies are provided. The taxonomic accounts of the subspecies under investigation. are also included.

Material and Methods

The samples were collected in the district of Jammu's southwest. These samples were brought to the lab so that a stereoscope could be used to examine them. Standard techniques were utilised to prepare the specimens as herbarium specimens once they were gathered from their natural surroundings (Jain and Rao 1977). Using portable equipment to detect plants in the field has several beneficial applications. Together with a map showing the location of the specimen collection, images of the plants and their components are included. The samples were compared to existing literature and an investigation of the herbaria K, BM, RRLH and W collections. The language used to describe morphological characteristics was as follows: (Williomson et al. 2016). The fresh material was used to measure the different plants parts.

Taxonomy

Psammogeton canescens subsp. cabulica Wagenitz, Ber. Deutsch. Bot. Ges. 69: 233. 1956; Psammogeton cabulicus (Wagenitz) Nasir in Hassler, Synonymic Checklists of the Vascular Plants of the World. In O. Bánki, Y. Roskov, M. Döring, G. Ower, L. Vandepitte, D. Hobern, D. Remsen, P. Schalk, R. E. DeWalt, M. Keping, J. Miller, T. Orrell, R. Aalbu, J. Abbott, R. Adlard, E. M. Adriaenssens, C. Aedo, E. Aescht, N. Akkari, et al., Catalogue of Life Checklist (14.3, Nov 2022). – https://doi.org/10.48580/dfqt-3dd.

(Fig. 1, 2)

Specimens examined: India, Jammu and Kashmir, Mandal, district Jammu, 32^* 666718 N 74^* 7461 E, 285 m a. s. l. 10 Apr. 2018, Bhellum 15881–RRLH.

Description

A small annual 3- 20 cm tall, sparely to densely pubescent herb. Stem branched striate, pubescent, the lateral branches overtopping the main axis. Radical leaves long petioled, withering early, base with hyaline ciliate margins; cauline leaves shortly petiolate, 1- or 2- ternate, pinnatisect, segments oblong to oval, cuneate, base papery with ciliate hairy on margins, margins toothed, apex mucronate, softly pubescent. Umbels leaf-opposed or terminal. Peduncle elongate, striate, 5-8 cm long covered with spreading hairs. Rays 8-12, striate, softly hairy. Involucure of 5-6 nearly straight acuminate bracts, +- 2 x 0.2-0.5 mm, margins scarious, hairy; Involucel of 5-6 spreading, abruptly pointed to acuminate bractlets, +- 1.4 x 0.5-0.8 mm, margins scarious, midrib green, hairy. Flowers pedicellate, white with purple tinge. Calyx, adnate to ovary reduced. Corolla polypetalous with 5 subequal petals, white tinged purple, marigns slightly irregular, emerginate with pointed beak. Androecium with 5 free stamens, alternipetalous, anthers bithecous inflexed in bud, filament become arc shaped at maturity. Pollens rectangular or subrectagular with rugulate equatorial region. Ovary bicarpellary, syncarpous, inferior, bilocular, hairy, styles +- 1 mm long, dark purple, smooth, shining, stigmas somewhat capitate. Fruits ovoid or oblong, 1.4-2. 0 x 0.8-1.1 mm long schizocarp, hairy, hairs 1.1-2.4 mm long, terminally T-shaped with glochidiate base, primary ridges more prominent than secondary, slightly winged.

Key to subspecies of Psammogeton canescens (DC ex Boiss.) Vatke

1. Main axis elongate, lateral branches shorter than the main axis ————————————————————————————————————	
- Main axis and lateral branches arising from the base of axis ————————————————————————————————————	
2. Branches slightly shorter, never overtopping the main axis; peduncle up to 3 cm long————————————————————————————————————	—— <i>P</i>
- Branches always overtopping the main axis; peduncle up to 8 cm long ————————————————————————————————————	

Phenology

The flowering and fruiting Period March to end of April in low lands of Jammu.

Habitat and ecological note

The plant of this species grow on sandy situations and bank of transitory river in association with Aristida cyanantha Nees ex Steud., Artemisia nilagirica Pamp., A. scoparia Waldst. & Kit., Boerhavia diffusa L., Calotropis procera R. Br., Centipeda minima A. Br. & Asch., Crotalaria prostrataRottl., Cyperus niveus Retz, Eurphorbia hirta L., E. prostrata Ait., Evolvulus alsinoides (L.) L., Heliotropium strigosum Willd., Indigofera cordifolia Heyne ex Roth, I.linnaei Ali, Lindenbergia indica Vatke, Medicago polymorpha L., Soliva anthemoides R. Br., Tephrosia purpurea Pers., Themeda triandra Forssk., Zornia gibbosaSpan.

Discussion

The degree of variation in morphology, the structure of the trichomes and fruits, and the kinds of hair are important characteristics in the taxonomy of angiosperms. Drude (1898), Heywood and Dakshni (1971), Nasir (1972), Arora (1976) and Pimenov et al. (2019) have all investigated these characteristics, including the stylopodium, the number of sectretory ducts in the mericarps, and the main and secondary valleculae vittae. Micromorphological research has revealed that Psammoqetonspecies differ noticeably from one another. When Rechinger awarded the designation of holotype to the specimens kept in the herbarium W. he established that Wagenitz's identification of Psammogeton canescens (DC.) Vatke subsp. cabulicus Wagenitz was accurate (1982). The type specimens were gathered in Bagrami, which is close to Kabul. In 1980, Nasir changed the name of this subspecies to Psammogeton cabulicus (Wagenitz) Nasir, giving it the status of a species. In my opinion, Psammogeton cabulicus described by Nasir is strikingly dissimilar from the Psammogeton canescens subsp.cabulicus Wagenitz described earlier. There is either error in keeping P. canescens subsp. cabulicus as synonym under P. cabulicus (Wagenitz) Nasir as confirmed through the specimens undertaken to study by authors. Perhaps this is the main reason that these taxa remained unresolved so long without knowing the current status of these taxa and data available related to these taxa being insufficient. The identity of the species P. cabulicus (Wagenitz) is in fact different, therefore combination as given by Nasir misidentified, therefore unacceptable. Furthermore, the illustration of these two taxa are so different from each other that these cannot be treated as same. The authors urge that holotype of P. canescenssubsp. cabulicus should not be placed under synonym under P. cabulicus (Wagenitz) Nasir since P. canescens subsp.cabulicus is quite distinct supported by taxonomic characters.

References

Ahmed, I. and Koul, A. K. 1980. In I. O. P. B. chromosome number reports, LXVIII. – Taxon: 543.

Babu, C. R. 1977. Herbaceous Flora of Dehra Dun. – Council of Scientific and Industrial Research, New Delhi. 339.

Bhellum, B. L. and Magotra, R. 2023. *Psammogeton shivalikense* Bhellum & Magotra (Apiaceae) restricted to Shivalik hills of Jammu and Kashmir (North-West India). – Nord. J. Bot. 2023 (1). doi: 10.1111/njb.03813.

Dhar, U. and Kachroo, P. 1983. Alpine flora of Kashmir Himalaya. – Scientific Publishers, Jodhpur, India.

Drude, O. 1898. Umbelliferae. In: Engler A, Prantl K (eds) Die naturlichen Pflanzenfamilien, vol. 3. – Wilhelm Engelmann, Leipzig, pp 63–250.

Hassler, M. 2022. Synonymic Checklists of the Vascular Plants of the World. In O. Banki, Y. Roskov, M. Doring, G. Ower, L. Vandepitte, D. Hobern, D. Remsen, P. Schalk, R. E. DeWalt, M. Keping, J. Miller, T. Orrell, R. Aalbu, J. Abbott, R. Adlard, E. M. Adriaenssens, C. Aedo, E. Aescht, N. Akkari, et al., Catalogue of Life Checklist (14.3, Nov 2022). – https://doi.org/10.48580/dfqt-3dd. Last accessed 08/11/2022.

Heywood, V. H. and Dakshini, K. M. M. 1971. Fruit structure in the Umbelliferae – Caucalideae. In: Heywood, V. H. (ed.), The Biology, Chemistry of the Umbelliferae, London. pp. 217-232.

Jain, S. K. and Rao, R. R. 1977. A Handbook of Field and Herbarium methods. – Today and Tomorrow's Printer and Publisher, New Delhi, India.

Mousavi, S. S. et al. 2022. Systematics of Iranian genera *Aphanopleura*, *Demavendia*, *Haussknechtia*, *Psammogeton and Zeravschania* (Apiaceae tribe Pimpinelleae. – Pl. Syst. Evol. 308(2). 2022. https://doi.org/10.1007/s00606 – 021–01792 – x.

Nasir, E. 1972. Umbelliferae. In: Nasir, E. and Ali, S. I. (ed.) Flora of West Pakistan, 20. – Ferozson Ltd., pp. 1–169.

Pimenov, M., Degtjareva, G., Ostroumova, T., Samigullin, T. and Zakharova, E. What is Seseli? A comparative morphological and molecular appraisal of a critical species of the Umbelliferae. – Plant Syst. Evol. 305: 49–59. – https://doi.org/10.1007/s00606-018-1550-z

Rau, M. A. 1975. High altitude flowering Plants West Himalaya. – BSI. Howrah, Calcutta.

Sharma, B. M. and Jamwal, P. S. 1988. Flora of Upper Lidder Valleys of Kashmir Himalaya Vol. I. – Scientific Publishers, Jodhpur, India.

Sharma, B. M. and Kachroo, P. 1981. Flora of Jammu and plants of neighbourhood Vol. I. – Bishen Singh Mahendra Pal Singh, Dehra Dun, India.

Sharma, B. M. and Kachroo, P. 1983. Illustrations to the flora of Jammu and plants of neighbourhood Vol. II. – Bishen Singh Mahendra Pal Singh, Dehra Dun, India.

Sinha, B. K., Singh, P. and Das, S. S. 2019. Plants of Indian Himalayan region (An annotated Checklist and Pictorial guide) Part - I. – Botanical Survey of India.

Swami, A. and Gupta, B. K. 1998. Flora of Udhampur district. – Bishen Singh Mahendra Pal Singh, Dehra Dun

Williamson, J., Beentje, H. J. and Beentje, H. 2016. Kew Plant Glossary, the. – Royal Botanic Gardens, Kew



