FLORAL AND POLLEN MORPHOLOGY OF *POGOSTEMON STRIGOSUS* BENTH. AND *POGOSTEMON QUADRIFOLIUS* (BENTH.) F. MUELL (LAMIACEAE) - FROM ASSAM, NORTH EAST INDIA

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Abstract

Floral and pollen morphology of *Pogostemon* strigosus and *Pogostemon* quadrifolius from Assam were studied by Light Microscope and Scanning Electron Microscope. A detailed taxonomic treatment of both the species were tabulated along with micrographs and live photographs were provided. The results of the paper furnish empirical basis for identification of both the species.

Key words: Lamiaceae, *Pogostemon strigosus*, *Pogostemon quadrifolius*, floral morphology, Pollen.

Introduction

*Pogostemon* Desfontaines belong to the tribe Pogostemoneae (Lamiaceae). The genus is distinguished from other genus of Lamiaceae bearing exserted stamens with moniliform hairs (Hasskarl 1842, Kuntze 1891, Press 1982, Bhatti & Ingrouille, 1997). It is one of the largest genus of the tribe *Pogostemoneae*. According to Bhatti and Ingrouille (1997), the highest species diversity was found in the India subcontinent. The genus is mostly distributed in the Southeast Asian countries, Northern Australia, Japan and the Korea.

*Pogostemon strigosus* (Benth.) and *Pogostemon quadrifolius* (Benth) F. Muell (Lamiaceae) were collected during the floristic survey of Assam. Both the species were annual herbs. The aerial parts of both the plant covered with densely pubescent hairs. The filaments of stamen are clearly hairy towards the middle called as moniliform hairs. (Benham, 1836, Hooker 1885 & Mukerjee, 1940).

Key to the species

◆ Floral characters

1a. Inflorescence single terminal spike; 4-8 cm × 5-8 mm, Flower white....................... *Pogostemon strigosus*

1b. Inflorescence branched; each branched terminated by a spike 8-12 cm×9mm, Flower purplish.........*Pogostemon quadrifolius*

◆ Pollen characters

1a. Pollen size, P 19.8 µm × E 14.6 µm ....................... *Pogostemon strigosus.*

1b. Pollen size, P 18.7 µm × E 13.9 µm ....................... *Pogostemon quadrifolius.*

Materials and Methods

To work out on the present study and to bring out the taxonomic account, extensive field survey was carried out by visiting various areas of Assam. During field survey specimen was collected in their flowering stages. Spot photographs were taken. Permanent pollen slides were prepared by acetolysis method followed by procedure of Erdtman (1952) with modification of Nair (1970). In this manuscript, an attempt has been made to provide complete information on floral and pollen morphology of both the species by light microscope and scanning electron microscopy (SEM). The specimens were identified with the help of relevant literatures and herbaria. (ASSAM, CAL, GUBH, BSI, Eastern Circle, Shillong). In
determining names of taxa, effort has been made to give up-to-date nomenclature by consulting various states, national and international literatures and verified by online database of Plant List for Angiosperm version 1.1 www.plantlist.

**Results**

A detail floral morphology and pollen description of both the taxa were recorded. The floral photograph of *Pogostemon strigosus* (Benth.) and *Pogostemon quadrifolius* Benth. were shown in Plate 1. The light microscopy and scanning electron microscopy micrographs of *Pogostemon strigosus* (Benth.) Kuntze and *Pogostemon quadrifolius* Benth. were also provided.

**Pogostemon strigosus** Benth

**Habitat:** Rocky dry shady areas.

**Flowering:** March-September

**Synonyms:** *Dysophylla strigosa* Benth.

**Exsiccate:** Assam, Karbi- Anglong (Baithalangso) Chayanika Bordoli 18400, dated 03-12-2017. (GUBH).

**Global distribution:** INDIA (Assam, Khasia Hills, Jowai, Dawki, Jaintia hills, Nongkrem, Cherrapunji), Bangladesh, Myanmar.

**Pogostemon quadrifolius** (Benth.) F. Muell

**Habitat:** It mostly grows near water and hilly regions and edges of forests.

**Flowering:** From August to November.

**Synonyms:** *P. stellatus* (Lour) Kuntz; *Anuragia quadrifolia* (Benth.) Raizada; *Dysophylla quadrifolia*; *Dysophylla rupestris* Dalzell; *Eusteralis quadrifolia* (Benth.) Panigrahi.

**Exsiccate:** Assam, Dhubri (Dhapdhepi), Chayanika Bordoli, 12443 dated 10/09/2016 (GUBH).

**Global distribution:** India, (Assam, Khasi & Garo
Plate: 1. **Pogostemon strigosus** A. Habit; B. Inflorescence; C. stamen bearded with moniliform hairs (Under Microscope). D & E Pollen (LM & SEM);

**Pogostemon quadrifolius** F. Habit; G. stamen bearded with moniliform hairs (Under Microscope). D & E Pollen (LM & SEM);
The pollen grain of *Pogostemon strigosus* and *Pogostemon quadrifolius* were newly recorded species for the flora of Assam. Both the species were not reported earlier in the *Flora of Assam* (Kanjilal et al., 1939). Detailed study of both the species were not worked out till date in Assam. However, both the species were reported from Khasi & Garo hills, Jowai, Dawki, Jaintia hills, Nongkrem, Cherrapunji from North East India (Mao et al.). The pollen attributes were potentially useful for both species identification and phylogenetic implication (Abdel Khalik, 2016) ‘Morphologically pollen grain are among the most conservative and constant structures and features of the spore coat that provide a tool for identification of genus or even species’ (Harris, 1955).

**References**


