



## Two new species of *Pancratium* (Amaryllidaceae) from India

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### Article History

Received: 23 June 2018

Accepted: 07 August 2018

Published: August 2018

### Citation

Sadasivaiah B, Karuppusamy S. Two new species of *Pancratium* (Amaryllidaceae) from India. *Species*, 2018, 19, 132-139

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### General Note

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### ABSTRACT

Two new species of *Pancratium*, *P. bhramarambae* and *P. telanganense* from the Nallamala hills of Eastern Ghats of India are described and illustrated. A short review with a diagnostic key for all Indian *Pancratium* species is presented.

**Keywords:** Eastern Ghats; new species; Taxonomy

### 1. INTRODUCTION

The genus *Pancratium* L. (Amaryllidaceae) is represented by perennial herbs bearing fleshy bulbs, white and fragrant flowers in umbels, perianth tubes with narrow lobes, staminal filaments united through a membrane to form a corona and the corona with a toothed or lobed rim, ovules each in a cell and superposed, and seeds angled with a black testa. The genus was established by [Linnaeus](#) (1753) and is now represented by 21 species, 7 of them in Mediterranean region, 4 in Africa and 11 in tropical Asia (De Castro et al. 2012, The Plant list 2012). Variations in spathes' number and lobation, the length of perianth tube, the shape of staminal corona and the teeth on the rim, the length of staminal filaments and anthers, and inclusion/exclusion of style are used in species delimitation. Molecular studies on phylogeny are limited to Mediterranean (De Castro et al. 2012) and Egyptian species (El-Hadidy et al. 2011 & 2012) and no such attempt was made on Asian species.

Linnaeus (1753) proposed the genus *Pancratium*, while describing *P. zeylanicum* from India. Much later, Aiton (1789) described another species, *P. verecundum*, based on fresh material sent from India and flowered in Kew Gardens. In Roxburgh's Flora Indica (1832) included 4 species such as *P. zeylanicum* (India & Sri Lanka), *P. longiflorum* (India & Indonesia: Moluccas) and two (*P. biflorum* & *P. triflorum*), based on his own collections from Bengal. Herbert (1837) in his work enumerated 5 species from India, including two new species as *P. malabathricum* and *P. cambayense* (= *P. longiflorum*) described by him. *P. malabathricum* described based on Rheede's tabula (vol. xi, t. 40), was later synonymised under Roxburgh's *P. triflorum* by Baker (1888). Notably, *P. malabathricum* differs from *P. triflorum* in having 8-flowered umbellate heads, flowers sessile, perianth lobes ovate, much shorter than the tube and filaments faintly go beyond coronal rim (vs. 2-4-flowered umbels, flowers with short pedicels, perianth lobes linear, longer than the tube and filaments as long as the teeth in *P. triflorum*). Later, Dalziel (1850) described *P. parvum* from Dronoghiri (Concan region). Baker (1888) included 5 species and 1 variety from India. Three Indian species, *P. biflorum* (= *P. verecundum*), *P. malabathricum* (= *P. triflorum*) and *P. cambayense* (= *P. longiflorum*) were synonymised in his work.

A meticulous account of Indian *Pancratium* (8 species, two of them doubtful) was presented by Hooker (1892). He deliberated on diagnostics and descriptions and recognized *P. biflorum* as a distinct species. In later years, two more new species recognized from the Western Ghats, viz., *Pancratium st-mariae* Blatt. & Hallb. (1921) and *P. donaldii* Blatt. (1931). Karthikeyan et al. (1989) prepared a check list of Indian species. Sasikala & Kumari (2013) described *P. nairii* from Kerala. All the newly described *Pancratium* species, such as *P. biflorum*, *P. donaldii*, *P. malabathricum*, *P. parvum*, *P. st-mariae*, *P. verecundum* and *P. zeylanicum* are poorly represented in Indian herbaria. Further, fruits and seeds were not known in the majority of species. *Pancratium* species requires special care in processing as they possess fleshy bulbs and prone to infection. This is possibly one reason for being avoided by general explorers. Also, they escape from collections for being vegetative and epimeral habit for the most part of the year and with short flowering/fruitlet periods.

All the 10 species confined to Indian Subcontinent. Among six of them (*P. donaldii*, *P. nairii*, *P. malabathricum*, *P. parvum*, *P. st-mariae*, *P. verecundum*) are exclusively confined to India. Others extend beyond India: *P. biflorum* (Hong Kong), *P. longiflorum* (Indonesia) and *P. triflorum* & *P. zeylanicum* (Sri Lanka). In an exclusive exploration for bulbous plants in the Nallamala hills in 2015, the authors have spotted two white flowered *Pancratium* spp., one in the floor of dry deciduous forests near Vatuvarlapalli village and the other in that of moist deciduous forests near Farahabad village. These collections differ from hitherto known *Pancratium* spp. in India and hence described as new.

## 2. TAXONOMIC TREATMENT

***Pancratium bhramarambae*** Sadas. sp. nov. (Figs. 1, 2)

**Diagnosis:** Similar to *Pancratium st-mariae* but differs in scape being 8–12 cm long, spathe not lobed at apex, perianth tube 5.5–8 cm long, staminal corona 6-toothed between the filaments, each teeth bilobed or acute at apex and style 6–9 cm long and excluded from the corona.

**Type:** INDIA. Telangana: Mahabubnagar district, Nallamala hills, Mannanur range, near Farahabad, 16° 16' 12.76"N, 78° 43' 21.316"E, 861m, 14<sup>th</sup> June 2015, B. Sadasivaiah & K. Prasad 2018 (holo. CAL!).

Perennial herbs; bulb globose, 2–4 cm dia., tunica membranous, pale brown, veined; neck distinct, 4–7 cm long. Leaves hysteranthous, 1–4, bifarious, linear, c. 15 x 1 cm, obtuse at apex. Scape terminal, solitary, cylindrical, greenish, thick, 8–12 cm high, with longitudinal grooves; umbels usually 3–4-flowered, rarely 1–2-flowered. Spathe single, tubular at base, hyaline, broadly ovate, c. 3 cm long, apex obtuse or rounded, veined. Flowers fade by afternoon. Pedicels sub-sessile to 1 cm long, triangular, greenish. Perianth tube 5.5–8 cm long, narrow and greenish-white below, widened and white above; lobes linear-lanceolate, 2.5–3 x 0.2–0.4 cm, white, light yellow on midrib below, recurved in the middle. Corona cylindrical, 8–10 mm long, rim 6-toothed; teeth triangular, c. 4 mm long, acute or bilobed at apex. Filaments subulate, never exceed coronal teeth; anthers unequal, linear, c. 6 x 1 mm. Ovary ellipsoid-trigonal, 6–9 x 4 mm, green; ovules 5–10 in each locule. Style longer than the tube, filiformis, 6.5–9 cm long; stigma capitate, 3-lobed.

**Flowering:** April–June.

**Distribution:** Known in Nallamala hills (Telangana part) and Seshachalam hills (Andhra Pradesh).

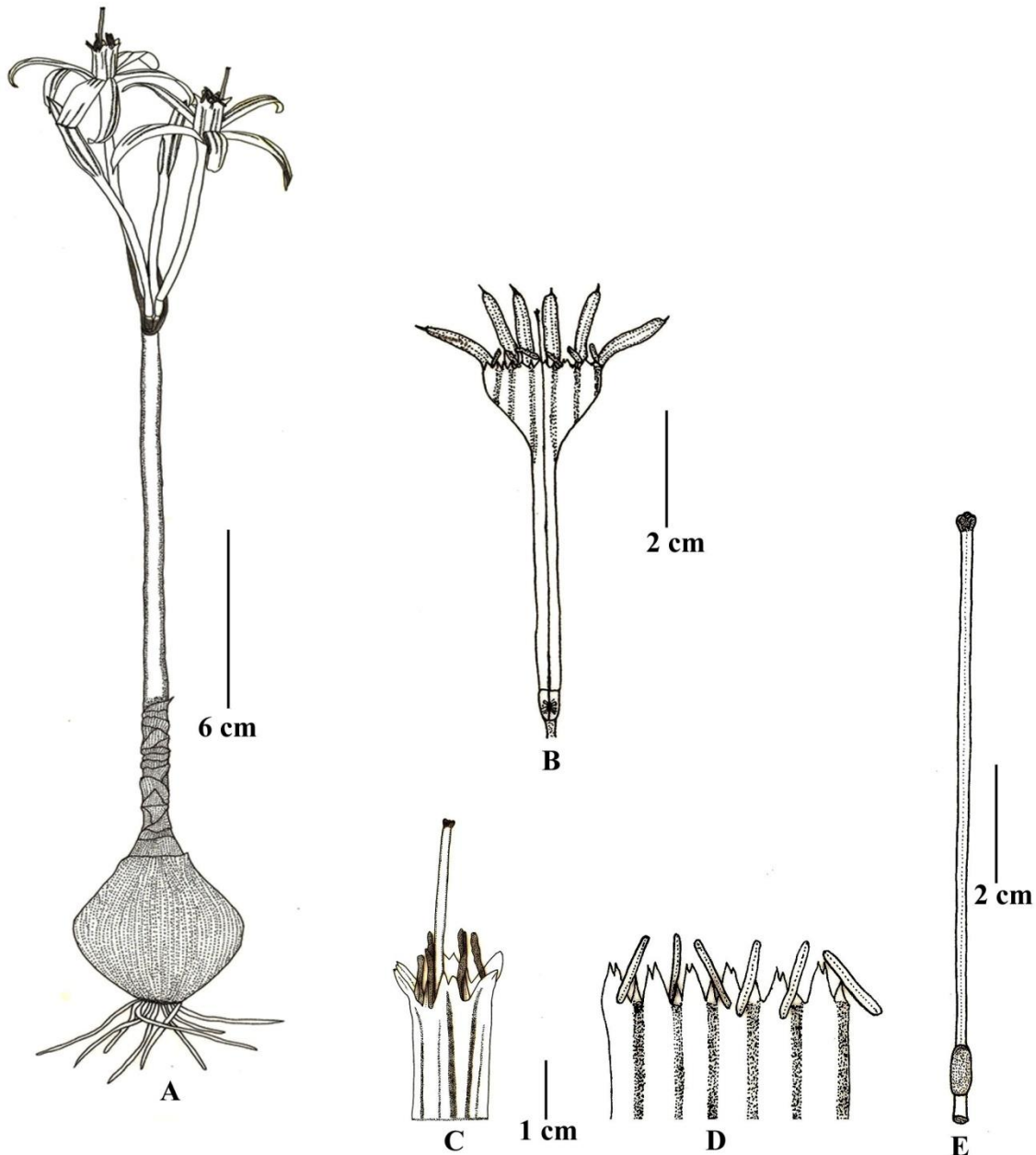
**Habitat and Ecology:** Moist deciduous forests at an altitude range of 700–900 m. The new species emerge out sprouting after first rains commence on end of the April and first week of June appears straight scapes with buds. Second week of June blossoms the white flowers even other associates are not commence the leaf flushing's. Before end of the June all the plants completes their flowering and fruiting, stipes becomes dried off. Then a few new leaves are produced and being fleshy and flexuous for at least a month. All other months, the plants perennates with bulbous underneath of soil as vegetative nature.

**Etymology:** The new species is named after the Hindu Goddess and a local deity of the collection locality (Bhramaramba Devi) of Sri Sailam.



**Figure 1**

*Pancratium bhamarambae* sp. nov. A, habit in June; B, habit in July; C, flower; D, corona lateral view; E, corona top view



**Figure 2**

*Pancratium bhamarambae* sp. nov. A, habit; B, flower spilt open; C, corona; D, corona spilt open; E, style

**Conservation status:** *Pancratium bhamarambae* is assessed as Data Deficient (DD) since only few individuals were seen in filed. Further explorations in the adjacent hill tracts are necessary to ascertain the status (IUCN, 2014).

**Additional specimens examined (paratypes):** INDIA. Telangana: Mahabubnagar district, Nallamala hills, Mannanur range, Farahabad, alt. 800m, 2<sup>nd</sup> August 2015, B. Sadasivaiah & K. Prasad 2045 (BSID).

**Notes:** *Pancratium bhamarambae* is closely allied *P. st-mariae* but differs from certain characters (Table 1).

**Table 1** A comparison of morphological features between *Pancratium st-mariae* and *P. Bhramarambae*

Characters	<i>Pancratium st-mariae</i>	<i>Pancratium bhramarambae</i> sp. nov.
Scape	15–20 cm long	8–12 cm long
Spathe apex	Bifid	obtuse or rounded
Perianth tube	c. 2.5 cm long	5.5–8 cm long
Staminal corona	12-toothed between the filaments, teeth acute at apex	6-toothed between the filaments, teeth bilobed or acute at apex
Style	included in corona, 3.5–4 cm long	excluded from the corona, 6–9 cm long

***Pancratium telanganense*** Sadas. sp. nov. (Fig. 3)

**Diagnosis:** Similar to *Pancratium triflorum* but differs in bulbs with 4–6 cm long neck, leaves bifarious, scape 6–9 cm long, perianth tube 3–4 cm long, as long as or shorter than the lobes, perianth lobes lanceolate, 3–4 cm long, filaments 1.6–1.8 cm long, go beyond the coronal teeth and anthers 8–10 mm long.

**Type:** INDIA. Telangana: Mahabubnagar district, Nallamala hills, Mannanur range, near Vatuvarlapalli, 16° 11' 24.072"N, 78° 49' 49.188"E, 742 m, 14<sup>th</sup> June 2015, B. Sadasivaiah & K. Prasad 2017 a (holo. CAL!) 2017 b (iso. BSID!).

Perennial herbs; bulbs c. 5 cm dia., tunica membranous, pale brown, veined; neck distinct, 4–6 cm long. Roots fibrous, vermiform, curved upwards. Leaves remain small till the appearance of scapes, bifarious, linear, c. 30 x 1.5 cm, obtuse at apex. Scape terminal, solitary, erect, sub-triangular, 6–8 cm high, sulcate, greenish; umbels 2-flowered. Spathe single, hyaline, tubular at base, broadly ovate, c. 3.5 cm long, veined, apex bilobed, lobes acuminate. Flowers fade by afternoon; pedicels c. 1.4 cm long, triangular, greenish. Perianth tube 3–4 cm long, narrow and green below, widened and faint greenish-yellow above; lobes lanceolate, 3–4 x 0.4–0.5 cm, white, midrib light yellow below, rugose near apex, awl shaped at apex. Corona infundibular, 1.6–2.0 cm long, rim 12-toothed; tooth triangular-acuminate, 2.5–3.5 mm long; filaments much longer than the teeth, subulate, 1.2–1.8 cm long; anthers unequal, linear-falcate, 8–10 x 1.2 mm. Ovary trigonus, 5–6 x 2–3 mm, green; ovules 4–6 in each locule; style filiformis, 8–9 cm long, longer than the anthers, green at base, white above; stigma capitate, 3-lobed, whitish. Capsules subglobose, 3-angled, c. 1 x 1.2 cm, with persistent perianth; seeds angled, testa black, c. 5 x 5 mm.

**Flowering & Fruiting:** June–July

**Distribution:** Endemic, presently known only in Nallamala hills of Telangana.

**Habitat and Ecology:** Grass dominated areas in dry deciduous forests at an altitude range of 600–800 m. This new species appeared among the grasses in epimeral nature for short period between June to July every year.

**Etymology:** The new species is named after the Telangana state from where it is described.

**Conservation status:** *Pancratium telanganense* is assessed as Data Deficient (DD), as only few individuals were located in this report. Further explorations in the adjacent hill tracts are necessary to ascertain its status (IUCN, 2014).

**Additional specimen examined (paratype):** INDIA. Telangana: Mahabubnagar district, Nallamala hills, Mannanur range, Vatuvarlapalli, 2<sup>nd</sup> August 2015, B. Sadasivaiah & K. Prasad 2046 (BSID).

**Note:** *Pancratium telanganense* is closely allied *P. triflorum* but differs in certain characters (Table 2). The persistent perianth tube holding the other floral parts is also known in *P. longiflorum* and *P. parvum*. There is no fruit/seed description for the remaining Indian species.

**Table 2** A comparison of morphological features between *Pancratium triflorum* and *P. telanganense*

Characters	<i>Pancratium triflorum</i>	<i>Pancratium telanganense</i> sp. nov.
Neck	Absent	present, 4–6 cm long
Leaves	not bifarious	Bifarious
Scape	15–22 cm long, 2–4-flowered	6–9 cm long, 2-flowered
Perianth tube	4–5 cm long, as long as or shorter than the lobes	3–4 cm long, longer than the lobes
Perianth lobes	linear, 2–3 cm long, acute at apex	lanceolate, 3–4 cm long, awl shaped at apex
Filaments	shorter or as long as or slightly longer than the teeth, c. 8 mm long	much longer than the teeth, 1.2–1.8 cm long
Anthers	5–6 mm long	8–10 mm long



**Figure 3**

*Pancratium telanganense* sp. nov. A, habit; B, leaves; C, flower; D, flower split open; E, perianth lobe; F, corona; G, filament; H, anthers; I, style; J, fruit; K, seeds



**Key to *Pancratium* spp. from the Indian subcontinent**

1. Bulbs with distinct neck; corona cylindrical or conico-trigonus.....2
1. Bulbs with or without neck; corona infundibular or campanulate or obconic.....4
2. Perianth lobes with 3–4 mm long awl-shaped structure at apex; corona broadly conico-trigonus.....*P. donaldii*
2. Perianth lobes not as above; corona cylindrical.....3
3. Perianth tube 5.5–8 cm long; corona 6-toothed at the rim.....*P. bhramarambae* sp.nov.
3. Perianth tube 2.5–3 cm long; corona 12-toothed at the rim.....*P. st-mariae*
4. Perianth tube less than 5 cm long.....5
4. Perianth tube more than 5 cm long.....9
5. Scape 8-flowered; perianth lobes much shorter than the tube, ovate..... *P. malabathricum*
5. Scape 1-4-flowered; perianth lobes linear or lanceolate.....6
6. Flowers solitary, sessile; spathe lanceolate.....*P. zeylanicum*
6. Flowers 2-4; spathe ovate.....7
7. Pedicels 1–2 cm long; perianth tube 2.5–3 cm long; filaments shorter than the anthers .....*P. nairii*
7. Pedicels c. 1 cm long; perianth tube more than 3 cm long; filaments longer than the anthers.....8
8. Bulbs with perfect neck; leaves bifarious; scape less than 10 cm long; perianth tube as long as or shorter than the lobes.....*P. telanganense* sp.nov.
8. Bulbs without neck; leaves not bifarious; scape more than 15 cm long; perianth tube longer than the lobes.....*P. triflorum*
9. Perianth tube more than 12 cm long; scape single flowered.....*P. longiflorum*
9. Perianth tube less than 12 cm long; scape more than two flowered.....10
10. Spathe solitary; filaments shorter than the teeth and the anthers.....*P. parvum*
10. Spathes two or more; filaments longer than the teeth and the anthers.....11
11. Spathes 3-4; corona funnel-shaped, sinuses between the filaments erose.....*P. biflorum*
11. Spathes 2; corona obconic, sinuses between the filaments toothed.....*P. verecundum*

**Acknowledgements**

Authors are thankful to Dr. G. Venu and Dr. K. Prasad, Botanical Survey of India, Deccan circle; Hyderabad and CNH, Kolkatta for consulting herbarium specimens and literature for confirm the novelty of the species.

**Funding:** This research received no external funding.

**Conflicts of Interest:** The authors declare no conflict of interest.

**REFERENCE**

1. Aiton W (1789) *Pancratium verecundum* Hortus Kewensis. George Nicol, London, 412
2. Baker, JG (1888) *Pancratium* L. *Handbook of the Amaryllidaceae*. George Bell & Sons, London, 117–120
3. Blatter E, Hallberg F (1921) *Pancratium st-mariae*. *Journal of Indian Botany, Madras* 2: 52
4. Blatter E (1931) *Pancratium donaldii*. *Journal and Proceedings of the Asiatic Society of Bengal* 26: 360
5. Dalziel JM (1850) *Pancratium parvum*. *Hooker's Journal of Botany and Kew Garden Miscellany* 2: 144
6. De Castro O, Brullo S, Colombo P, Jury S, De Luca P, Di Maio A (2012) Phylogenetic and biogeographical inferences for *Pancratium* (Amaryllidaceae), with an emphasis on the Mediterranean species based on plastid sequence data. *Botanical Journal of the Linnean Society* 170: 12–28
7. El-Hadidy A, Abd El-Ghani M, Amer W, Hassan R (2011) Systematic revision of the genus *Pancratium* L. (Amaryllidaceae) in Egypt with a new addition. *Notulae Scientia Biologicae* 3: 24–38
8. El-Hadidy A, Abd El-Ghani M, Amer W, Hassan R (2012) Morphological and molecular differentiation between Egyptian species of *Pancratium* L. (Amaryllidaceae). *Acta Biologica Cracoviensia Series Botanica* 54(1): 53–64
9. Herbert W (1837) *Pancratium* L. *Amaryllidaceae*. James Ridgway & Sons, Piccadilly, London, 202–209

10. Hooker JD (1892) *Pancratium* L. *Flora of British India*, Vol. VI. L Reeve & Co., London, 285–286
11. IUCN Standards and Petitions Subcommittee 2014. Guidelines for Using the IUCN Red List Categories and Criteria, Version 11. Prepared by the Standards and Petitions Subcommittee of the IUCN Species Survival Commission. Available from: <http://jr.iucnredlist.org/documents/RedListGuidelines.pdf>, accessed February 2014
12. Karthikeyan S, Jain SK, Nayar MP, Sanjappa M (1989) *Pancratium* L. *Florae Indicae Enumeratio: Monocotyledonae*. Botanical Survey of India, Calcutta, 4
13. Linnaeus C (1753) *Pancratium* L. *Species Plantarum*, Vol. 1. Stockholm, 289–291
14. Roxburgh W (1832) *Pancratium* L. *Flora Indica or Descriptions of Indian Plants*, Vol. 2. Serampore, Calcutta, 124–126
15. Sasikala K, Reema Kumari M (2013) *Pancratium nairii* (Amaryllidaceae)-A new species from Kerala, India. *Indian Journal of Forestry* 36 (4): 543–544
16. The Plant List (2010) Version.1. Published on the Internet; <http://www.theplantlist.org/> (accessed 10<sup>th</sup> April, 2013)