

# 3 New Species from Bangladesh

Zinia Nasrin Shumon\*

PhD Candidate, Bangladesh University of Professionals, Bangladesh

\*Corresponding Author

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## ABSTRACT

*Putranjiva pundrabogura* Zinia & Miraz is described and illustrated (Fig-1) as a new species from the district of Bogura, Bangladesh. *Putranjivaceae* contains 3 genera and about 210 species of evergreen trees of the tropics, especially Africa to Malesia. *Drypetes* (about 200 species) is found throughout this area. It is morphologically similar to *P. roxburghii* but is distinguished by the tree size, leaves texture, bark texture, fruiting position, smallest leaf size etc. *Putranjiva pundrabogura* Zinia & Miraz, this new species available in Bogura district and RDA campus. After the rainy season seedlings are available under this tree. After diagnostic the morphological characters for *Putranjiva pundrabogura* Zinia & Miraz include the round wavy trunk (Images-G & H), not hairy leaves and branches. These are the main characteristics of this new species. Whitish-ash color bark on trunk and branches of this species compare with another species *P. roxburghii* Wall. Morphologically (Fig-1) most similar, which is also available in Bangladesh. Also, the fruits shape, leaves-shape difference showing below in mentioned of these 2 species (Fig-2). Showing chart (Fig-3). Distribution showing in map (Fig-4) also. Medium to big tree also seen in *P. pundrabogura* Zinia & Miraz. But *P. roxburghii* Wall seen as a medium tree. Mentioning also that Chinese *Putrajivi* is a big shrub. "The leaves are dotted beneath with glands which exude a waxy excretion. Seed 1.2 x 0.55 cm, drying orange brown."- *Putranjiva zeylanica*. This narration not matching with *P. pundrabogura* Zinia & Miraz leaves, fruits color and seeds. Showing these 3 species differences below.

**Keywords:** *Putranjivaceae*, *Putranjiva*, New species, Bangladesh.

## INTRODUCTION

*Putranjivaceae* is a rosid family that is composed of 218 species in 2 genera of evergreen tropical trees that are found mainly in the Old-World tropics, but with a few species in tropical America. Botanical Journal of the Linnean Society. 161 (2): 105–121. (Christenhusz, M. J. M.; Byng, J. W. (2016) & First published in Pl. Vasc. Gen. [Meisner] Tab. Diagn. 345, Comm. 258. 1842 [13-15 Feb 1842] (as "*Putranjiveae*") (1842) isonym. Angiosperm Phylogeny Group (2009). Botanical Journal of the Linnean Society. 161 (2): 105–121. Retrieved 2013-06-26. Christenhusz, M. J. M.; Byng, J. W. (2016). First published in Pl. Vasc. Gen. [Meisner] Tab. Diagn. 345, Comm. 258. 1842 [13-15 Feb 1842] (as "*Putranjiveae*") (1842) isonym.

## METHOD

Description of this species is based on living plant. All the Images captured from 2/3 tree, from the same species. Flowers, Fruits, Twigs, Seeds collected from living trees. And also compare with another species that seen in Bangladesh, *P. roxburghii*. Collected fruit and seeds from this living tree. Also, from Scientific Illustration of *P. roxburghii*. Color Illustration painted by Miraz Rahman Zarif on the base of living tree at the location, RDA campus in Bogura district. Measurement showing in images with scales. That's also help to complete the full description. Mr. Miraz collected all the herbarium sheet elements. Twigs, Leaves, Fruits, Inflorescence (Images), seeds & seedlings. Mr. Miraz also collected most of photographs from living tree at RDA campus, Bogura. Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east.

## Taxonomic Treatment

*Putranjiva pundrabogura* Zinia & Miraz sp. nov. p- 17, Figs. 1, 2, 3, 4

**TYPE:** Bangladesh, Bogura district, RDA campus, Doshmile. Latitude. Fig-3: Map & Location: Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east.

## Diagnosis

Morphologically *Putranjiva pundrabogura* Zinia & Miraz is similar to *P. roxburghii*. But differs in its Tree size, Leaves, Fruits, Seed-shell, Trunk, Trunk color, Bark texture, Fruit position, Branch-texture, Bottom leaves. Also, tomentose leaves and branches a main character. (See-Table-1) Showing differs in both illustrations. “The leaves are dotted beneath with glands which exude a waxy excretion. Seed 1.2 x 0.55 cm, drying orange brown.”- *Putranjiva zeylanica*. This is another species showing differ with *P. pundrabogura* Zinia & Miraz.

## Taxonomic tree

Kingdom: Plantae

Clade: Tracheophytes

Clade: Angiosperms

Clade: Eudicots

Clade: Rosids

Order: Malpighiales

Family: *Putranjivaceae*

Genus: *Putranjiva* Wall.

Species: *Putranjiva pundrabogura* Zinia & Miraz

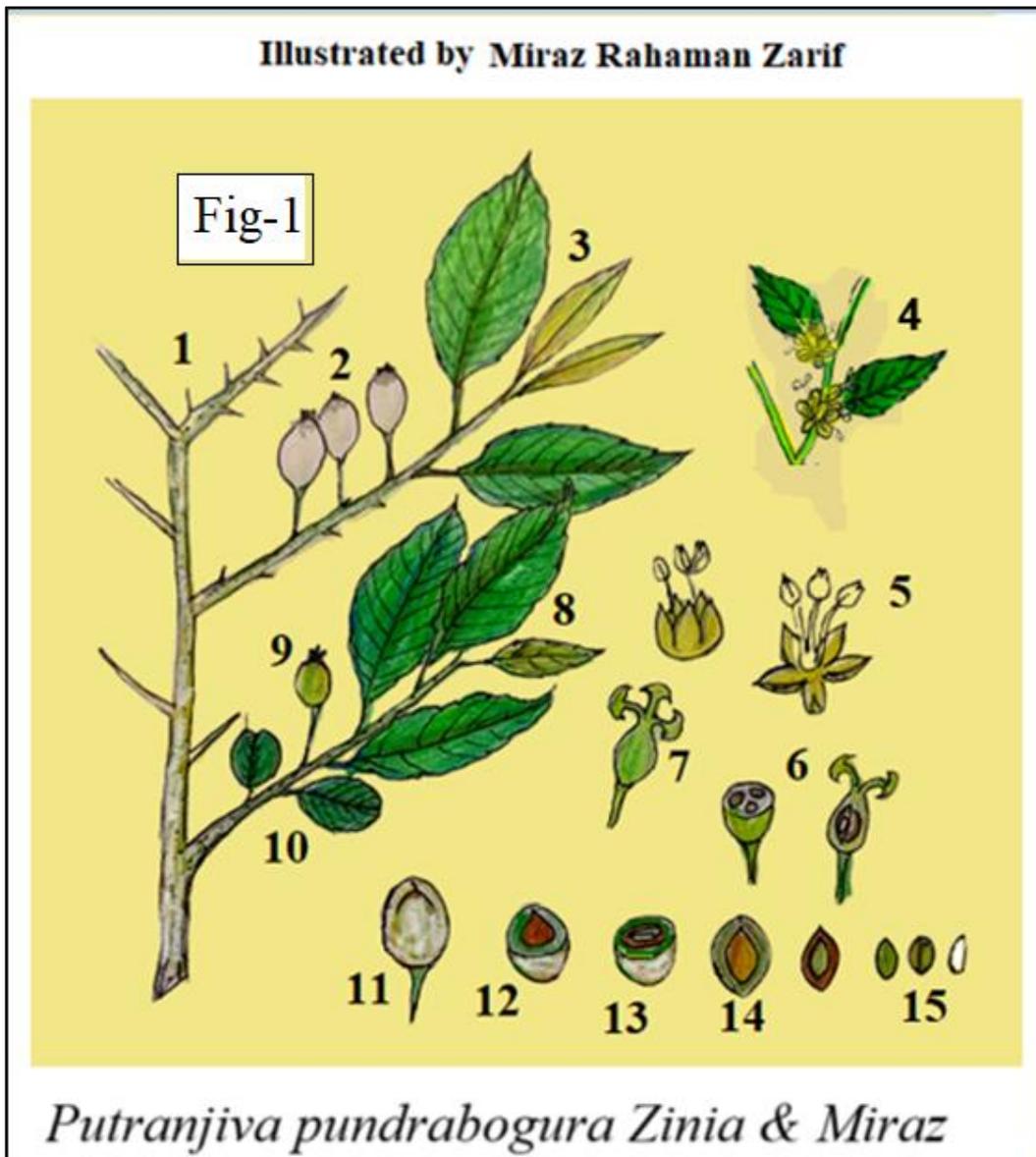
## Description

Tree, Medium to big (15-17m), evergreen. Trunk has a round wavy shape-which is the main characteristic of this species. Old tree trunk of *Putranjiva pundrabogura* Zinia & Miraz showing at Nawabbari Palace Museum about 40 inches dia. At RDA campus, about 25 inches dia. Bark color whitish-ash. Young tree bark smooth, not rough like *P.roxburghii*. (Fig-2: Difference between *Putranjiva pundrabogura* Zinia &Miraz & *Putranjiva roxburghii*) Drooping branches look like Salix tree. Whitish branch skin has small wart like texture. Leaves undulate, sometimes deeply. Light color underneath. Size (1’3-10cm) X (1-3’5cm). Pointed tip usually curled. Petiole (4-5mm). 14-15 lateral veins. Prominent midrib. Margin serrate. Opposite. Small round shape leaves on bottom of branch. New light green glossy leaves with dark green glossy leaves. Dioecious flower. Yellowish male flowers as round axillary clusters on branches. Female flowers from axil 1-3, greenish. Drupes 1’5-6cm, ellipsoid. Narrowly pointed 2 sides. Skin whitish-green, 3 loop-shape at apex. Branches, leaves, fruit-skin not tomentose at all like *Roxburghii*. Pedicels 9-12 mm. Fruits grow only leaf-axil of fruiting branch. Stone pointed both sides. Very hard to crake. Size about 1’5cm. 3 parts of stone and seed like a nut. 2 parts, size 1’2-1’4 cm. Green outside and whitish outside (Fig-1: Botanical Illustration).

Seeds taste like mustard oil.

**Season** - March-May the flowering season. Fruiting – October-December.

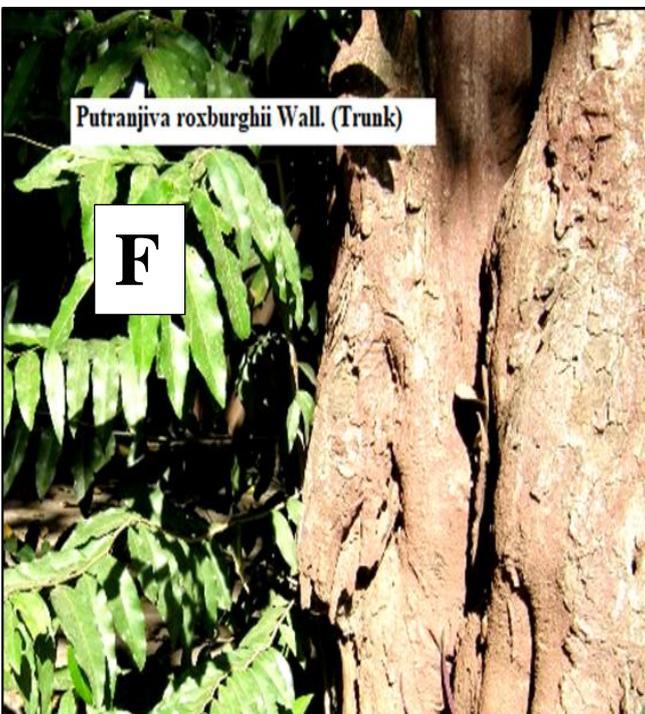
**Illustration (Fig-1)**

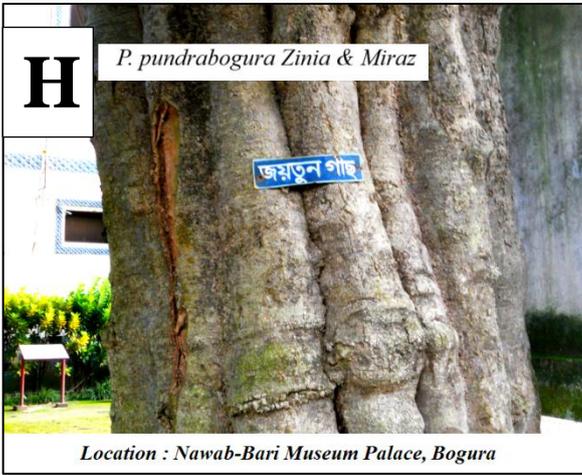


1. Fruiting twigs.
2. Mature grey-whitish fruits.
3. New leaves.
4. Inflorescence on leaf axil only.
5. Single male flowers.
6. Showing ovary.
7. Female flower turning into fruits.
8. Immature light green leaves always seen with mature dark-green leaves.
9. Immature fruits with greenish color.
10. Bottom small and round leaves.
11. Mature fruit.
12. Cut the skin, showing pointed half-fruit.
13. Cut the fruit, showing inside nut.
14. Fruit skin and seed shape.
15. Nut showing inside seed-shell, whole nut with green skin, 2 parts of nut and white texture inside.

**Fig-2. Difference between *Putranjiva pundrabogura* Zinia & Miraz & *Putranjiva roxburghii*.**

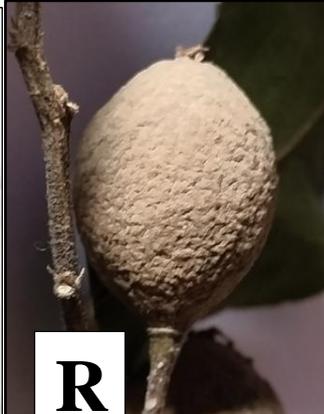
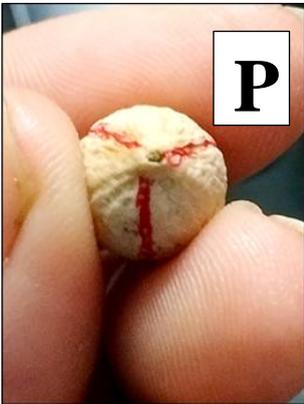
Characters	<i>Putranjiva pundrabogura</i> Zinia & Miraz	<i>P. Roxburghii</i>
Tree size	Medium to Big (17m)	Medium to big (20m)
Leaves	Glossy dark green mature, new leaves bright green	Green & Tomentose.
Fruits	Narrowly pointed both sides.	Globosely pointed. Wider in middle.
Seed-shell	Narrow & boat shape.	Wider than new species.
Trunk	Wavy-rounded smooth trunk	Rough trunk, not round
Trunk color	Whitish-ashy. Branches whitish, wood white.	Brown color.
Bark texture	Smooth when young, not so rough in old.	Rough and showing inside wood.
Fruit position	Only from leaf-axil.	From axil & branches also.
Branch-texture	Branches showing white color with small warty texture.	Not known
Bottom leaves	Round-shape (1'3-2cm)	Lance-shaped
Fruit shell	Not fleshy, skinny.	Showing fleshy in Illustration (See-X)





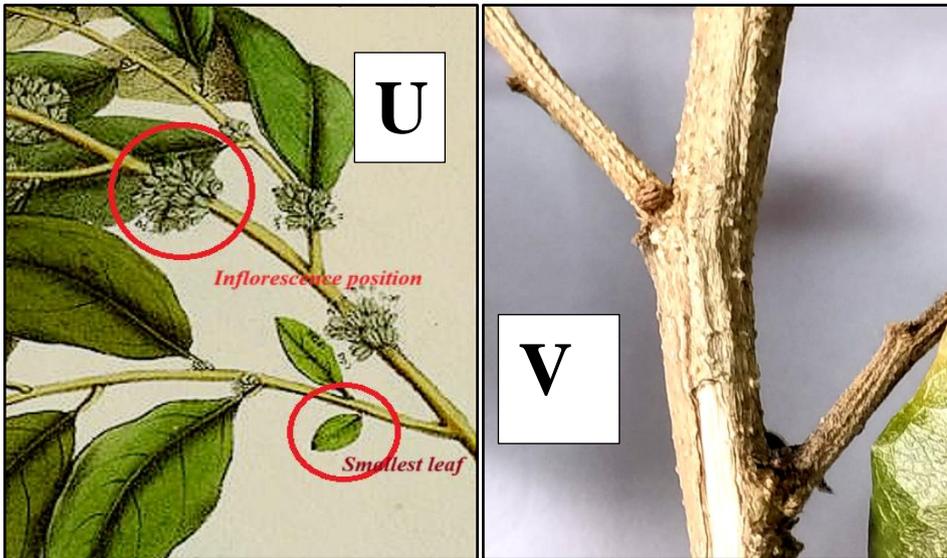
Location : Nawab-Bari Museum Palace, Bogura



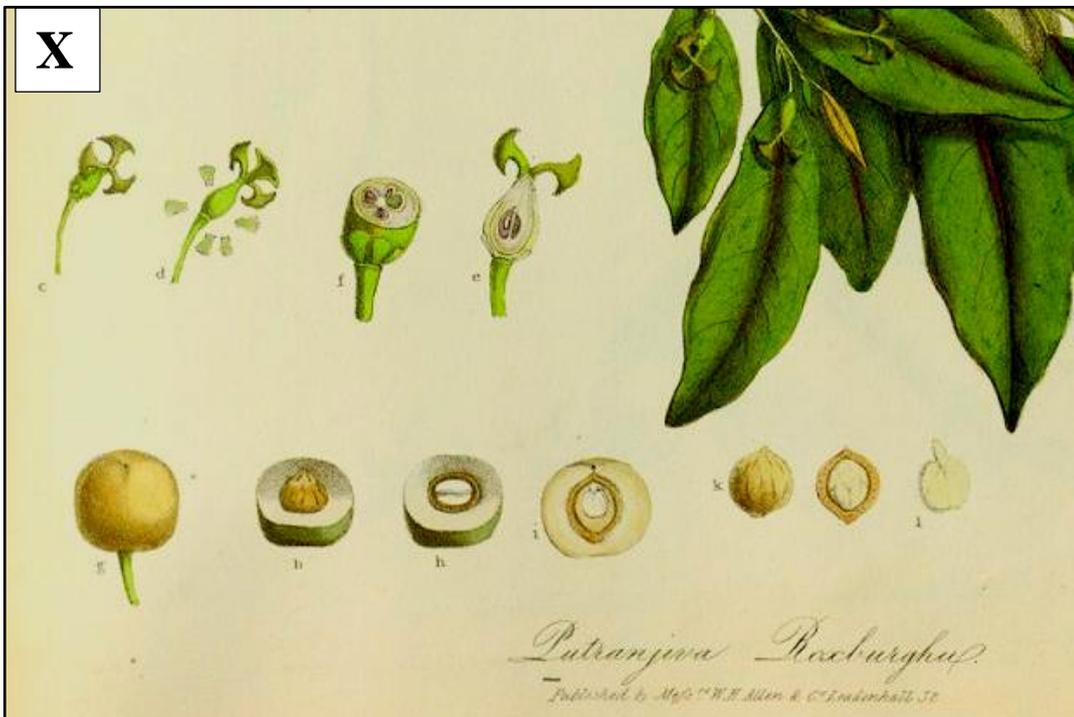


**T**

**\*\*\* Female Inflorescence on leaf axis.**



- A. Habitat in RDA campus with *Zinia nasrin*.
- B. At RDA campus, Bogura.





- C. Showing details with scales. Making necklace from seeds.
- D. Showing nut inside seed-shell.
- E. *Roxburghii* seeds, nut with scale.
- F. *Roxburghii* rough tree trunk.
- G. RDA putrajivi tree ashy-white trunk.
- H. Old tree trunk of **Pudra Jeoputa** at Nawab-Bari Palace Museum, Bogura.
- I. Rough tree trunk of *Roxburghii*.
- J. Fruiting twigs of *Roxburghii*.
- K. Fruiting twigs of **RDA Putrajivi**.
- L. Brown tomentose branch, leaf & petiole.
- M. 3 loops type part of fruit.
- N. Details showing with scale, undulate leaves, tips, 1'2cm round-shape bottom leaf.
- O. **RDA Putrajivi** seed shell.
- P. 3 parts showing on seed-shell.
- Q. Mature fruit skin.
- R. New bright green new leaves with oily dark green old leaves.
- S. Fruit cut – showing skin, nut & seed texture.
- T. Inflorescence.
- U. Branches showing white color with small warty texture.
- V. Illustration showing inflorescence on axil & branches also. Small lance-shaped bottom leaves. Mat tomentose over all.
- W. Drooping branches and crown like Salix tree. Very old **Pudra Jeoputa tree** at Nawab-Bari Palace Museum, Bogura.
- X. Fruits, seeds, leaves and other details of another Putranjiva species with brown-orange fleshy fruits.
- Y. About 1cm bottom leaves size, showing warts all over branches, sub-branches and fruit's petiole also.

### Putranjiva zeylanica (For compares')

Tree about 20m tall. 1mm long stipule. Leaf size (5'5-12cm) X (1'5-4'5cm). Which is bigger than *P.roxburghii* & *P. pundrabogura* Zinia & Miraz. Leaves and branches whitish green. No light green leaves like *P. pundrabogura* Zinia & Miraz. The leaves are dotted beneath with glands which exude a waxy excretion. (Ref.) Male flowers pedicellate. Several flowers in leaf axil. Groups of female flowers about 3. So group of 2/3 flowers also seen in this zeylanica species. The buds excrete a gum (Ref.). This character made differ with *P.*



*pundrabogura* Zinia & Miraz.

Fruit size also big. 2 x 1.25cm. Seed 1'2 x 0'55cm. Drying color orange-brown.

### Etymology

The name of this new species *Putranjiva pundrabogura* Zinia & Miraz. Here. "Pundra" word comes from the 3000 years ago capital of Mauryan empire- "Pundranagar". Another word 'bogura' from Bogura district, Bangladesh.

## Habitat

In Primary bamboo forest. Near Local area. Planted in Hindu temple also.

## Key identifying characters

The smallest leaf is round and 1cm. In branches no hair at all. Wavy trunk. Black-ashy bark.

## Specimen examined

At RDA campus. Old tree at Bogura town (At Nawab-Bari palace). 26.10.23, Zinia Nasrin Shumon, Herbarium sheet number - ZNS 501 (AAHBAU)

## Distribution

The genus distributed in India and Sri Lanka.

## Economic uses/values/harmful aspects

Putranjivah is an Indian native medicinal plant used to treat many diseases such as treatment of mouth and stomach ulcers, hot swellings, smallpox, burning sensation and ophthalmopathy. The main medical uses for fertile woman for child. Myth is the garland of seeds protect the ill mother and child. This's why it is called "Save the Child" tree.

## Ethical approval

Sample collected from live tree at RDA campus, Bogura. Illustration made using the plants' parts like flowers, leaves, fruits and seeds. Also testing the seeds. It was belonging to brassica family. And 3 parts of seed belongs to *Euphorbiaceae*.

## Author's contribution

Zinia Nasrin Shumon completed the manuscript and prepared the images. And Dr. Ashrafuzzaman Sir did the final task.

## Conflicts of interests

The author declares that there are no conflicts of interest.

## ACKNOWLEDGMENT

At first thanks to Sir Dr. Md Ashrafuzzaman for writing technique of new species.

Thanks to Wadud Aleem. Thanks to Mohammad Salah Uddin for his contribution.

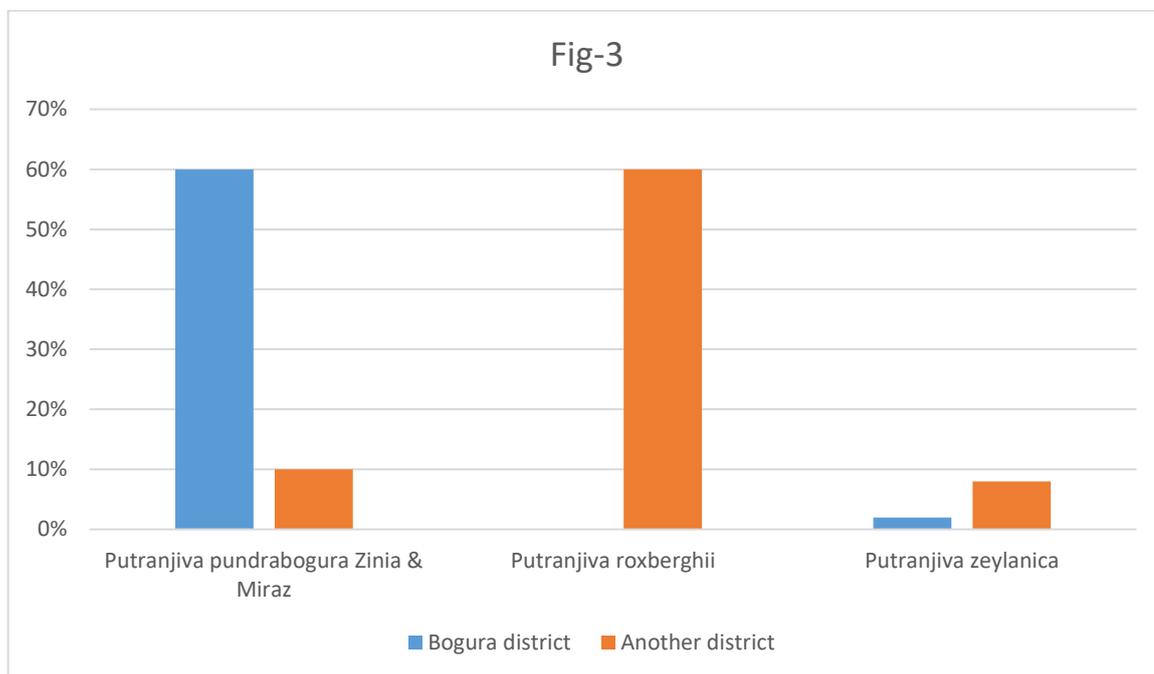
We thanks to Mr. Miraz for collecting all of the herbarium materials for getting the full description. He made herbarium sheet. Botanical Illustration also done by him. Mohammad Zainul Abedin for guiding to take photographs with white paper and scale. Thanks to Dr. AKM Zakaria, Firoz Hossain to make RDA campus green with planted many wild species. This's why RDA campus known as "Green RDA". Mentioning Khalid Aurangozeb & Rebeka Sultana for their contribution.

## Common name & Meaning

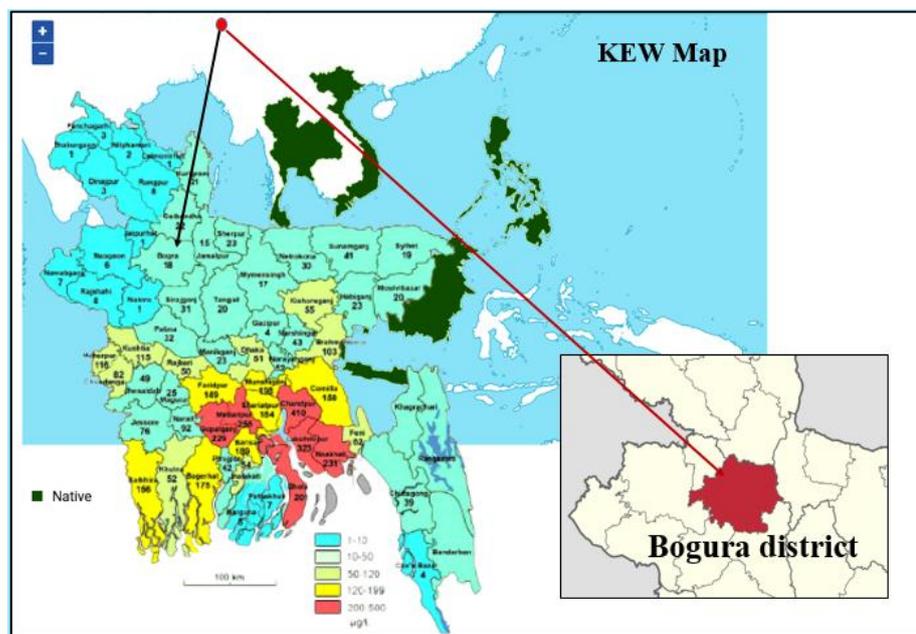
Common name of this new species "Pundra Jeoputa" for its medicinal value from thousand years in Indian Sub-continent. পুন্ড্র জিয়াপুতা in Bengali language. "RDA Putrajivi" in English RDA from Rural Development Academy, Bogura, Bangladesh. \*Pundra\* from Ancient 3000-2500 years ago Fort-capital named "PUNDRANAGAR", NOW BOGURA.

## CONCLUSION

After all the discussion, it is sure that Putranjiva pundrabogura Zinia & Miraz is new to taxon. We illustrated and described a new species of Putranjiva genus, Family - Putranjivaceae (Old Euphorbiaceae) in Bogura district, Bangladesh. There're showing differences with *P. roxburghii* and *P. zeylanica*. Members of this family have 2-ranked; coriaceous leaves, which, if fresh, typically have a radish-like or peppery taste. The flowers are fasciculate and usually small, and the fruits of these species are a single-seeded drupe crown by the persistent stigmas. This family has its origin in Africa and Malesia. It is the only family outside Brassicales that produces mustard oils.



## Distribution Map (Fig-4)



Bogura district, RDA campus, Doshmille. *Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east*

## REFERENCE

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14. [pubmed.ncbi.nlm.nih.gov/31232117/#:~:text=Putranjivah%20\(Putranjiva%20roxburghii%20Wall%20C%20family,smallpox%2C%20burning%20sensation%20and%20ophthalmopathy.](http://pubmed.ncbi.nlm.nih.gov/31232117/#:~:text=Putranjivah%20(Putranjiva%20roxburghii%20Wall%20C%20family,smallpox%2C%20burning%20sensation%20and%20ophthalmopathy.)
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## 2. *Lasianthus Bangladeshinensis* ZMA, A new species from Bangladesh.

### ABSTRACT

*Lasianthus bangladeshinensis* ZMA is described and illustrated as a new species from the district of Bogura, Latitude: 24.843559, Longitude: 89.370108 Bangladesh. It is morphologically similar to *Lasianthus* species (Trans. Linn. Soc. London 14: 125 (1823), nom. cons., but not matched to anyone. There are 2 species are recorded from Bangladesh, they are - 1. *Lasianthus hirsutus* (Roxb.) Merr (J. Arnold Arbor. 33: 229 (1952) and 2. *Lasianthus constrictus* Wight (J. Nat. Hist. 6: 515 (1846). There are some differences of those 3 species in fig-2, described below.

*Lasianthus* is a large genus from *Rubiaceae* family. There are 180 species in the Old World. Some species found in Tropical Asia. 59 species from Malay Peninsula. 37 from Indo-china. 28 species from Java and 47 recorded from Thailand. *Lasianthus* species usually grows in rainforests. Also, habitat to grow primary forests and bamboo forest. This is the interesting distribution patterns.

**Keywords:** *Rubiaceae*, *Lasianthus*, New species, Bangladesh.

### INTRODUCTION

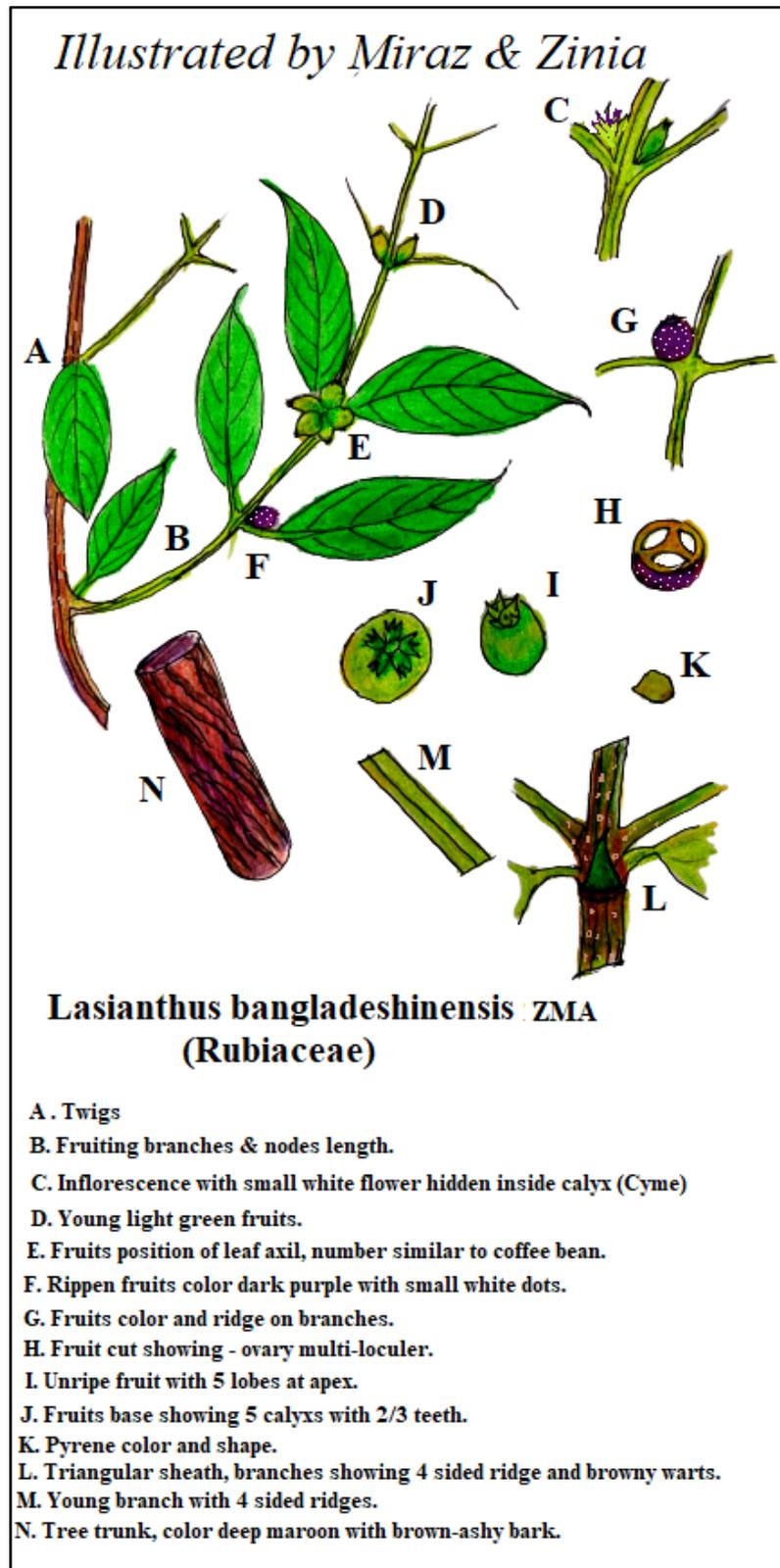
*Lasianthus* has about 180 species. The type species for the genus is *Lasianthus cyanocarpus*. In 2012, a revision of *Lasianthus* in Malesia described 131 species. Another 30 or so species grow elsewhere in tropical Asia. Most of these are described in Flora of China or in A Revised Handbook to the Flora of Ceylon. 14 or 15 species are native to the Western Ghats of southwestern India, including the endemic *Lasianthus agasthyamalayanus*. Fifteen species or perhaps as many as 20 species are known from tropical Africa. Two species (*Lasianthus panamensis* and *Lasianthus lanceolatus*) or possibly three, are native to the neotropics. *Lasianthus strigosus*, from Queensland, is the only species known from Australia. The Australian *Ixora baileyana* had at one time been placed in *Lasianthus* as *Lasianthus graciliflorus*. How many in Bangladesh, not known except two species. 1. *Lasianthus hirsutus* (Roxb.) Merr 2. *Lasianthus constrictus* Wight, (*Rubiaceae*). Uddin (2018). p. 40. Bandarban: Alikadam, Matamuhuri Forest. Native range of this species from Java and Indo-china. Because it grows in Primary Forest with other wild species in Bogura district. Bangladesh.

### Taxonomic treatment:

*Lasianthus Bangladeshinensis* ZMA sp. nov. p-13, figs.1,2,3,4

**TYPE:** A small tree species from Bogura district. Location: Sajapur, Shahjahanpur, Bogura district. Latitude: 24.843559, Longitude: 89.370108.

Diagnosis: Fig-1 (Botanical Illustration)



### Taxonomic tree

Kingdom: Plantae

Phylum:

Class: Magnoliopsida

Order: Gentianales

Family: *Rubiaceae*

Genus: *Lasianthus*

Species:

*Putranjiva pundrabogura*

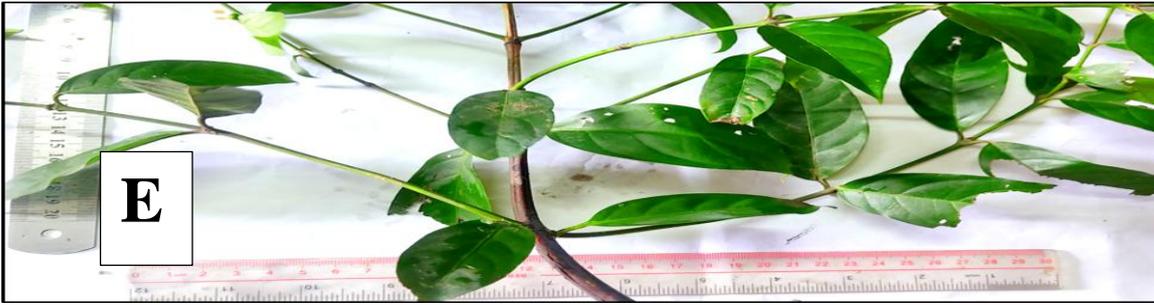
Zinia & Miraz

### Description

Small tree with trunk about 6” inches dia. (Fig-1). Trunk is covered with rough bark with deeply parallel cracks. Purplish-brown in color. Branches drooping in nature. Mature branches purplish. Branches have 4-sided ridges. Sometimes twisting. Leaves node are long in length. Not comparable with any *Lasianthus* species. Size of fruiting branches up to 9”-1” (Inches). Sub-branch nodes 4’5in – 0’4inches. These are the main characteristics of this **Bogura wool flower**. Branches color deep maroon and warty in texture. Leaves simple, opposite, distichous. Undulate. 11-12 lateral veins. Branches & leaves are not hairy at all, Glossy. Size 7-13cm x 3-4cm. Pointed tip. Petiole about 1cm. interpetiolar stipules triangular and persistent. Size - 1cm. Fruiting branches node size 2-11cm. Also different from another *Lasianthus* species. Axillary Inflorescences are sessile. Flowers are very small, white in color. Hidden inside the bracts. Half covering cymes or entirely covering cymes, Bracts 5 Calyx with 2/3 teeth, persistent. Ovary multi-loculer. Axille patterns. Fruit is a small juicy drupe about 1cm in size. Fruit has 5 lobes and a small hole in middle. Dark purple color with white dots. Stony seed has thick wall. Pyrenes 3, 4. Fruit Size 4mm dia. Fruits persistent calyx teeth 2/3.

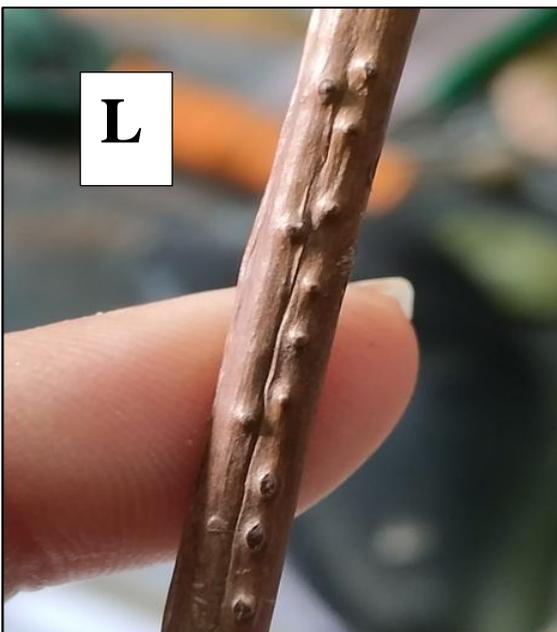
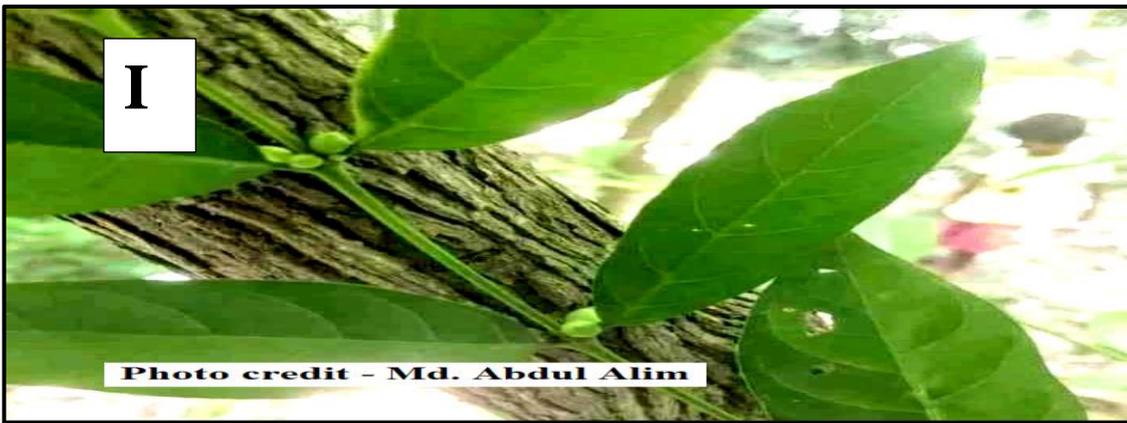
### Images





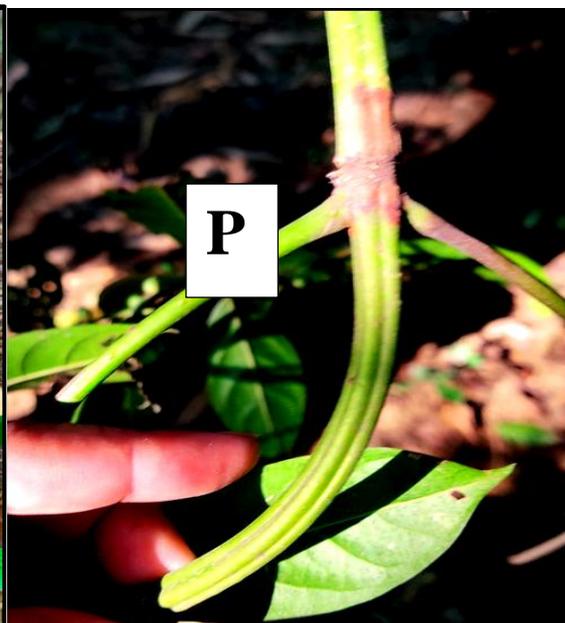
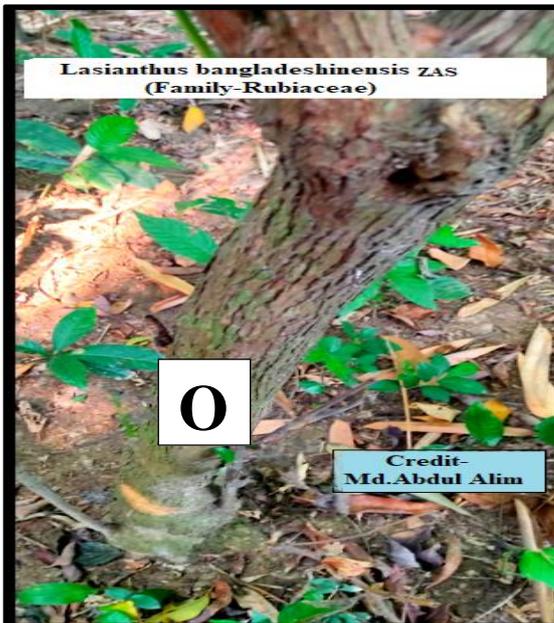
- A. Dark purple fruit with white dots.
- B. Unripe fruits with 5 lobes.
- C. Small white flowers inside the bracts & the toothed calyx.
- D. Fruit cut section showing the axille patterns of Stone & Pyrenes.
- E. A twig showing Leaves shape. Leaves position nodes, 4-ridged branches.
- F. Opposite leaves with unripe fruits. Leaves size with scale.
- G. Ripen purple juicy layer fruit with stone.
- H. Unripe fruit with persistent toothed calyx.







- I. A twig with tree trunk.
- J. Pyrenes with scale.
- K. Unripe with apex 5 lobes and a small hole in the middle.
- L. Hairless dark brown branch with warty texture.



- M. Triangular sheath with reddish coating.
- N. Leaves shape variation and petiole length with scales
- O. Tree trunk. Purplish cracking trunk of small tree.
- P. Interpetiolar stipules triangular and persistent.
- Q. Ridged branches with coating reddish color in joint.
- R. *Lasianthus hirsutus* (Roxb.) Merr with white big flowers and blue fruit.
- S. Fruiting branch with big leaves.



: Fig-2: Compare between *Lasianthus, bangladeshiensis* ZMA, *Lasianthus hirsutus* (Roxb.) Merr & *Lasianthus constrictus* Wight

Characters	<i>Lasianthus bangladeshinensis</i> ZMA	<i>Lasianthus hirsutus</i> (Roxb.) Merr	<i>Lasianthus constrictus</i> Wight
Leaf size	7-13cm x3-4cm	14-20 x 5-7 cm	10-15X3'5-4'5cm
Tree size	Small tree	Small shrub-big shrub	Small shrub-big shrub
Flower-size	2mm	15mm	Not known
Veins	11-12 pairs	8-11 pairs	6-7 pairs
Fruit-size	4mm (dia)	4-5mm (dia)	5mm (dia)
Fruit color	Dark purple	Blue	Blue
Pyrenes	4	5	4

## MATERIALS & METHODS

This new species collected from a primary bamboo forest in Sajapur, Bogura district. Bogra Latitude: 24.843559, Longitude: 89.370108.(Fig-3) There are 200 wild plants there. This species area flooded with nearby Bhadraboti (ভদ্রাবতী) river. With the local relatives, survey that area. There are more shrubs there, but this is a small tree with a trunk with bark. This is an uncommon characteristic among another *Lasianthus* species. Survey of this area taken time 2022 (May) – 2023(October). Fruiting time of this new species. Watch Table-1 also for comparison.

## Etymology

Word “*bangladeshinensis*” for Latin name of Bangladesh. “Z” for Zinia Nasrin Shumon. “A” for Ashrafuzzan. M for “Miraz”. A for Alim also. Generic name *Lasianthus* comes from the Greek lasios, which means "shaggy, velvety and hairy". Anthos = "flower". This genus was named in 1823 by Botanist William Jack.

## Habitat

In Primary bamboo forest. Sweet water swamp forest. River side. (Fig-3) showing all over Bangladesh.

## Key identifying characters

1. The fruits purple color with small dots.
2. Branches, leaves nodes are larger than other species.
3. Not hairy at all.
4. It is a small tree, not a shrub.

## Specimen examined

At Sajapur, Bogura district, Bangladesh. Herbarium sheet number - ZNS 502 (AAHBAU)

## Distribution

The genus distributed in Bangladesh and Indo-Chinese countries. The genus *Lasianthus* (Rubiaceae) consists of approximately 180 species, of which the greatest species diversity is found in tropical Asia.

## Economic uses/values/harmful aspects

It is related to coffee family. Edible fruits. Some of the *Lasianthus* species have been used in folk medicine to treat tinnitus, arthritis, fever, and bleeding.

## Ethical approval

Sample collected from live tree at Sajapur, Bogura river side primary Bamboo Forest. Location: Sajapur, Shahjahanpur, Bogura district. Latitude: 24.843559, Longitude: 89.370108.

## Author's contribution

Zinia Nasrin Shumon completed the manuscript and prepared the images. Dr Md Ashrafuzzaman did the final proceedings.

## Conflicts of interests

The author declares that there are no conflicts of interest.

## Funding

The study has not received any external funding.

## Data and materials availability

All data associated with this study are present in the paper.

## Common name & Meaning

According to its Greek name, English name is "Wool flower". These wool flowers may be Velvety, Hairy & Thick hairy or wooly. So, we named its name "Bogura wool flower" – বগুড়া উল ফুল. Collected from Bogura district. *Lasianthus hirsutus* (Roxb.) Merr common name – "রোমশ উল ফুল", *Lasianthus constrictus* Wight – "ভেলভেট উল ফুল"।

## ACKNOWLEDGEMENTS

At first thanks to Sir Dr. Md Ashrafuzzaman for writing technique of new species. Also, Mohammad Salah Uddin for his contribution. Dr. Mahbuba Sultana also.

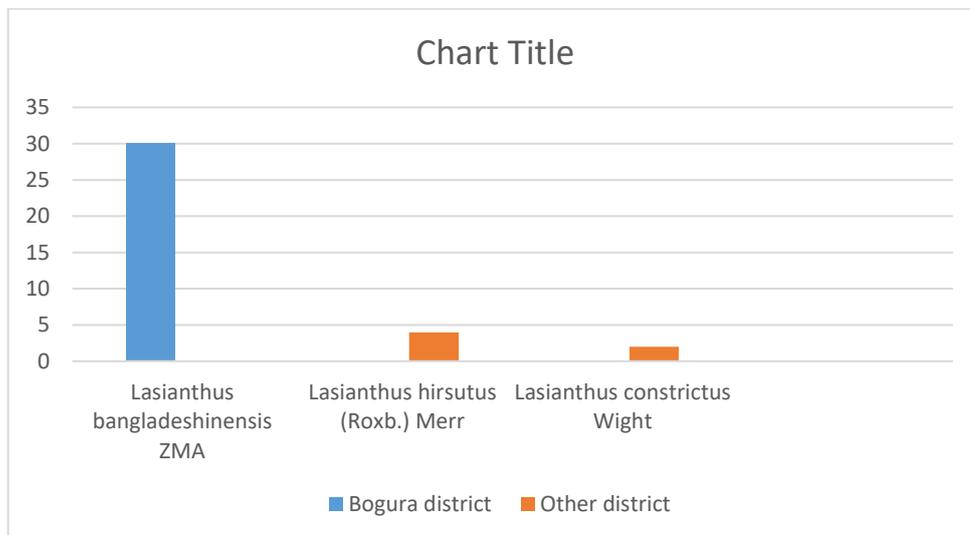
Mr. Miraz made herbarium sheet. Botanical Illustration also done by him. Thanks to Mr. Md Alim for finding this tree with his curiosity for plants. Made herbarium sheet with his help. Thanks also to one of his relative. Alim made & sell medicine from fresh plants available those area. Thanks to Mr. Mahfuz Russel for his photograph of *Lasianthus hirsutus* (Roxb.) Merr.

## DISCUSS & CONCLUSION

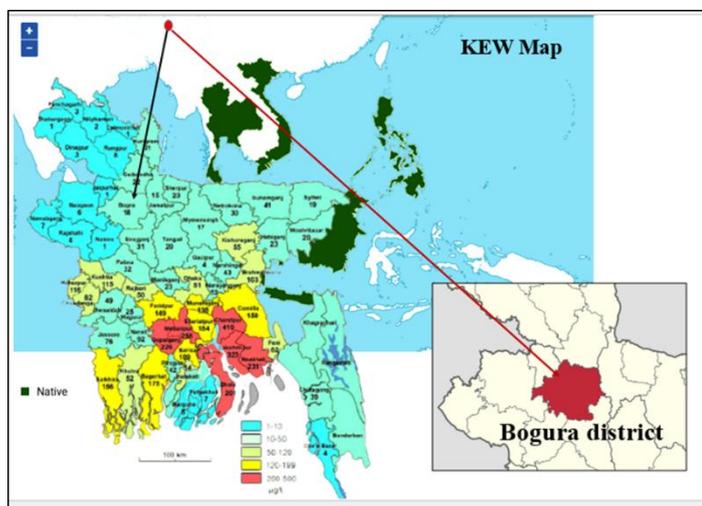
On the Basis of the Malesian species of the genus *Lasianthus* total of 131 species (H. Zhu<sup>1</sup>, M.C. Roos<sup>2</sup>, C.E. Ridsdale). Also, from (Dang, Van-Son & Naiki, Akiyo, 2023, A revision of the genus *Lasianthus* Jack (Rubiaceae) from Vietnam, Phytotaxa 581 (1), pp. 1921-1935: 1921-1935) asianplant.net/Rubiaceae/*Lasianthus*\_constrictus.htm

After analysis all this information, Sizes, Description, flower size, fruits color—etc, nothing matched with this new species. Also mentioned in Table-1, carefully discussion that, This *Lasianthus* species id new to world. With live herbarium with scales, Illustration from living tree and more information of that area. A primary forest nearby river, became a swamp forest in rainy season. A good environment of this genus.

### Fig-3



### Distribution Map (Fig-4)



**Location:** Sajapur, Shahjahanpur, Bogura district. Latitude: 24.843559, Longitude: 89.370108

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### 3. *Mentha alba zinia* & B. Uddin, A new species from Bangladesh

**Zinia nasrin Shumon**<sup>1</sup> Dr. **Shaikh Bokhtear Uddin**<sup>2</sup>

Independent researcher, RDA campus, Bogura, Bangladesh<sup>1</sup>

Ethnobotany and Pharmacognosy Lab, Department of Botany, University of Chittagong, Chattogram 4331, Bangladesh<sup>2</sup>

Corresponding author: [zinianasrin5@gmail.com](mailto:zinianasrin5@gmail.com)

#### ABSTRACT

*Mentha alba zinia* & B. Uddin was described and illustrated (Fig-1) as a new species from the district of Bogura, Latitude: 24.843559, Longitude: 89.370108, Bangladesh. It's belonging to Family- *Lamiaceae*. However, 2 *mentha* species half wild in Bangladesh. They are 1. *Mentha arvensis* L. & 2. *Mentha spicata* L. This new species is compared with these 2 species and other 2 species. (See fig-2,3,4) Family- *Lamiaceae*. Flower color white and long stigma are the main differences from those 2 species.

**Keywords:** *Lamiaceae*, *Mentha*, New species, Bangladesh.

#### INTRODUCTION

*Mentha* (also known as mint, from Greek μίνθα míntha, Linear B mi-ta is a genus of plants in the family *Lamiaceae* (mint family). The exact distinction between species is unclear; it is estimated that 13 to 24 species exist (Bunsawat, Jiran; Elliott, Natalina E.; Hertweck, Kate L.; Sproles, Elizabeth; Alice, Lawrence A. (2004). "Phylogenetics of *Mentha* *Lamiaceae* family (Harley, Raymond M.; Atkins, Sandy; Budantsev, Andrey L.; Cantino, Philip D.; Conn, Barry J.; Grayer, Renée J.; Harley, Madeline M.; de Kok, Rogier P.J.; Krestovskaja, Tatyana V. (2004). "Labiatae". In Kubitzki, Klaus; Kadereit, Joachim W. (eds.). *The Families and Genera of Vascular Plants*. Vol. VII. Berlin; Heidelberg, Germany: Springer-Verlag. pp. 167–275. Liddell, Henry George; Scott, Robert).

## METHODS

Description of this species is based on living plant. All the Images captured from living species. Twigs and leaves collected from living plant. And also compare with another species that seen in Bangladesh, Also from Scientific Illustration from net. Color Illustration painted by Miraz Rahman Zarif on the base of photos captured in RDA campus in Bogura district. Measurement showing in images with scales. That's also help to complete the full description. Mr. Miraz collected all the herbarium sheet elements. Twigs, Leaves. Mr. Miraz also collected most of photographs from living plant t at RDA campus, Bogura (Fig-5). Also showing habitat of mentioning species in Chart (Fig-4).

### Taxonomic treatment:

*Mentha alba* Zinia & B. Uddin sp. nov. p-19 Figs.1,2,3,4,5

**TYPE:** Bangladesh, Bogura district, RDA campus, Doshmile. Latitude. Fig-3: Map & Location: Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east. (Fig-5)

**Diagnosis:** Morphologically *Mentha alba* Zinia & B. Uddin compared with *Mentha arvensis* & *Mentha Canadensis*.

Taxonomic tree:

Kingdom:

Family: *Lamiaceae*

Genus: *Mentha*

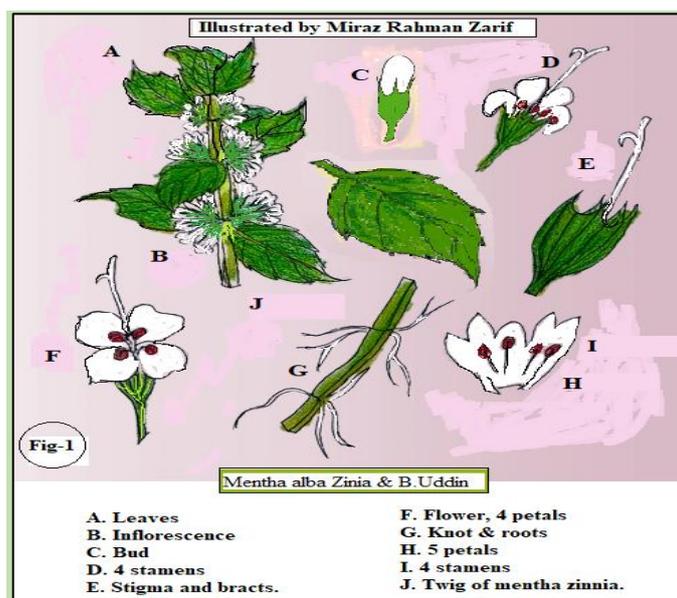
Species: *M. alba* Zinia & B. Uddin

Binomial name

*Mentha alba* Zinia & B. Uddin

### Description

15-20 cm in height. Leaves 2-4 cm & 2 cm. Petiole about 5mm. Leaves shape round at base, fate in middle, apex to long pointed tips. Inflorescence bell shaped. The flowers are whorled around the upper leaf axils. They are 4 - 7 mm long, 2 lipped, irregular and white in color. They have longer (double in size) stigma than petals. Y-shaped. 4-5 lobed petals. 5 lobed calyxes with sharp pointed lobes. 4- Angeles stem with reddish color. 4 anthers and stamens are inside, cause they're short. (See fig-1) The fruits are dry and split open when ripe releasing the two seeds. About 2 seeds. An upper ground creeping white rhizome and upright shoots. They bloom from June to August.



Botanical Illustration

Fig-2. Difference between *Mentha arvensis* and *Mentha Canadensis*.

Characters	<i>Mentha arvensis</i>	<i>Mentha Canadensis</i>
Plant size	10-60 cm	46 cm (18 inches)
Leaves	2-6 cm long & 1-3 cm wide	Leaf: 1.5-5(8) cm
Petiole	Petiole up to 10 mm on lower leaves.	Petiole 5-25 mm
Inflorescence	Verticillasters all distant, many-flowered, sub-globose, c. 1.5 cm in diameter.	Axillary
Flower position	Flowers all in axils of middle and upper leaves	They are arranged in a spiral around the inflorescence.
Flower size	Corolla white or pale lilac, 4-4.5 mm; tube rather broad, as long as calyx or slightly exerted; lobes ± erect, broad, rounded. The flowers are pale purple (occasionally white or pink), in whorls on the stem at the bases of the leaves. Each flower is 3 to 4 mm (1/8 to 5/32 in) long.	Corolla 4-7 mm, white to pink or violet. The flowers are borne in spikes at the tips of the shoots. The flowers may be bluish, pink or white.
Flower Petals, Lobes & Stamens	Four-lobed corolla with the uppermost lobe larger than the others and four stamens.	Each flower has five sepals, four petals, four stamens and a superior ovary.
Number of flowers	20 flowers.	
Leaves shape	Leaves ovate to ovate-elliptic	Each leaf is borne on a short stalk and has a wedge-shaped base and is lanceolate or ovate, with a toothed margin and a hairy surface.
Calyx	Five-lobed hairy calyx	Bracts minute or 0. Flower: calyx 1.5--3 mm, short-hairy outside.
Stem	Stems erect or ascending, simple or branched above, often purplish below, quadrangular, leafy, with a ± sparse indumentum of eglandular simple, usually retrorse, hairs.	Stem: 1--5(8) dm, puberulent to short-hairy.
Fruits	The fruit is a two-chambered carpel.	The fruits are dry and split open when ripe releasing the two seeds.
Seeds/Nutlets	Nutlets 4, globose c. 1 x 1 mm, smooth, rounded.	2 seeds.
Roots	Perennial with white creeping rhizomes.	Perennial plant with an underground creeping rhizome and upright shoots.

Fig-3. Difference between *Mentha alba* Zinia & B. Uddin and *Mentha Canadensis*.

Characters	<i>Mentha alba</i> Zinia & B. Uddin	<i>Mentha Canadensis</i>
Plant size	15-20 cm	46 cm (18 inches)
Leaves	2-4 cm & 2 cm	Leaf: 1.5-5(8) cm
Petiole	About 5mm	Petiole 5-25 mm
Inflorescence	Bell shaped	Axillary

Flower position	The flowers are whorled around the upper leaf axils.	They are arranged in a spiral around the inflorescence.
Flower size	They are 4 - 7 mm long, 2 lipped, irregular and white in color.	Corolla 4-7 mm, white to pink or violet. The flowers are borne in spikes at the tips of the shoots. The flowers may be bluish, pink or white.
Flower Petals, Lobes, stigma & stamens	They have longer stigma than petals. 4-5 lobed petals.	Each flower has five sepals, four petals, four stamens and a superior ovary.
Number of flowers	18-20	Not known
Leaves shape	Round at base. Fate in middle. Apex to long pointed tips.	Each leaf is borne on a short stalk and has a wedge-shaped base and is lanceolate or ovate, with a toothed margin and a hairy surface.
Calyx	5 lobed calyx with sharp pointed lobes.	Bracts minute or 0. Flower: calyx 1.5--3 mm, short-hairy outside.
Stigma & pistil	Y-shaped, double size than petals	Y-shaped, double size than petals
Number of anthers	4	4
Size of stamens	Inside the flowers.	Outside the flowers
Stem	4- Angeles stem with reddish color.	Stem: 1-5(8) dm, short-hairy.
Fruits	The fruits are dry and split open when ripe releasing the two seeds.	The fruits are dry and split open when ripe releasing the two seeds.
Seeds/Nut-lets	About 2 seeds	2 seeds.
Roots	An upper ground creeping white rhizome and upright shoots.	Perennial plant with an underground creeping rhizome and upright shoots.

Fig-4. Difference between *Mentha alba* Zinia & B. Uddin and *Mentha arvensis*.

Characters	<i>Mentha arvensis</i>	<i>Mentha alba</i> Zinia & B.Uddin
Plant size	10-60 cm	15-20 cm
Leaves	2-6 cm long & 1-3 cm wide	2-4 cm & 2 cm
Petiole	Petiole up to 10 mm on lower leaves.	About 5mm
Inflorescence	Verticillasters all distant, many-flowered, sub-globose, c. 1.5 cm in diameter.	Bell shaped
Flower position	Flowers all in axils of middle and upper leaves	The flowers are whorled around the upper leaf axils.
Flower size	Corolla white or pale lilac, 4-4.5 mm; tube rather broad, as long as calyx or slightly exerted; lobes ± erect, broad, rounded. The flowers are pale purple (occasionally white or pink), in whorls on the stem at the bases of the leaves. Each flower is 3 to 4 mm (1/8 to 5/32 in) long.	They are 4 - 7 mm long, 2 lipped, irregular and white in color.
Number of flowers	About 20	18-20
Flower Petals, Lobes & Stamens	Four-lobed corolla with the uppermost lobe larger than the others and four stamens.	They have longer stamens than petals. 4-5 lobed petals.
Number of anthers	4	4

Stamen size		Unequal & outside petals	Smaller than petals
Leaves shape		Leaves ovate to ovate-elliptic	Round at base. Fate in middle. Apex to long pointed tips.
Stigma		Y-shaped, double size than petals.	Y-shaped, double size than petals.
Calyx		Five-lobed hairy calyx	5 lobed calyx with sharp pointed lobes.
Stem		Stems erect or ascending, simple or branched above, often purplish below, quadrangular, leafy, with a ± sparse indumentum of glandular simple, usually restores hairs.	4- Angeles stem with reddish color.
Fruits		The fruit is a two-chambered carpel.	The fruits are dry and split open when ripe releasing the two seeds
Seeds/Nutlets		Nutlets 4, globose c. 1 x 1 mm, smooth, rounded.	About 2 seeds
Roots	Perennial with white creeping rhizomes.	An upper ground creeping white rhizome and upright shoots.	

- A. Details images of *Mentha alba* Zinia & B.Uddin.
- B. Inflorescence compare with *M. arvensis* & *M. canadensis*.
- C. Twigs compare with *M. arvensis*.
- D. Twigs compare with *M. canadensis*.
- E. Compare Applemint, Spearmint & Peppermint.
- F. Showing of buds, bracts, stamens, stigma & anthers.
- G. Compare by illustrations of *Mentha spicata* & *Mentha alba* Zinia & B.Uddin.
- H. Leaves and stem of *Mentha alba* Zinia & B.Uddin.
- I. Compare twigs of spearmint & peppermint.
- J. Herbal tea with menthe species.
- K. Menthol Chrystal.



- L. Comparison of 3 species.
- M. *Mentha spicata*.



**Mentha alba** Zinia & B.Uddin



**M. canadensis**



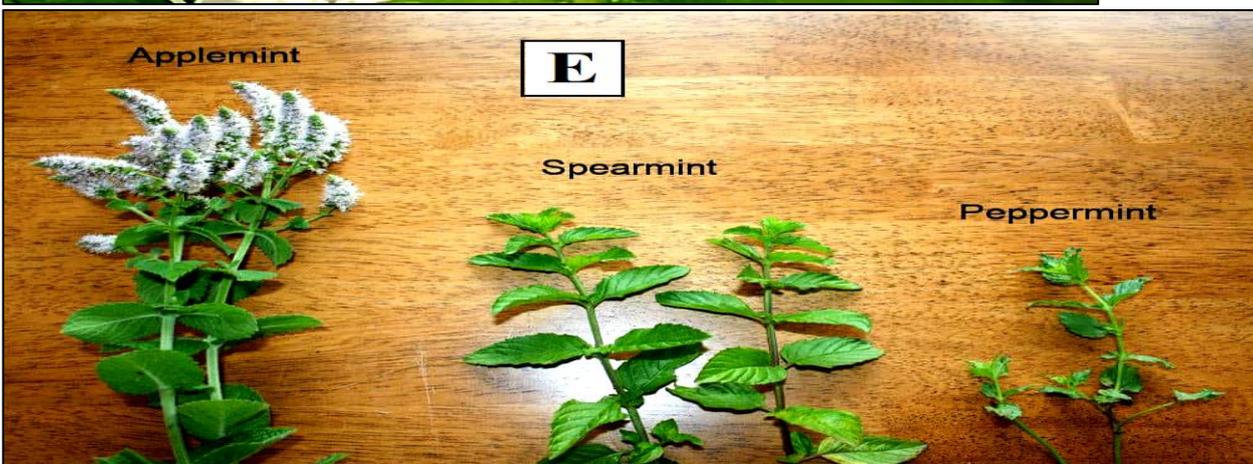
**Mentha alba** Zinia & B.Uddin

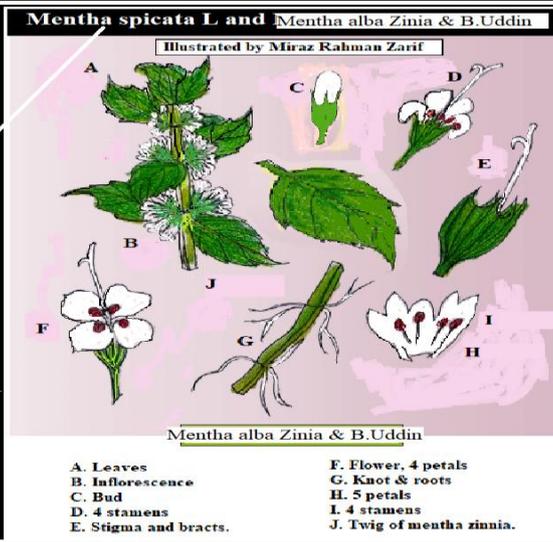
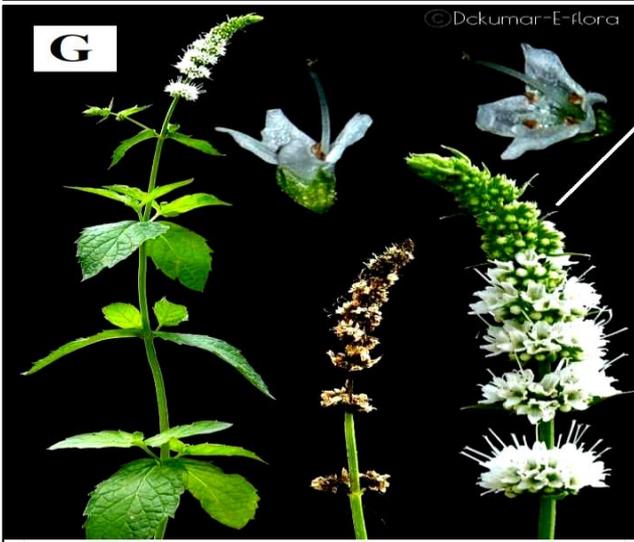


**M. arvensis**



**Mentha alba** Zinia & B.Uddin





PEPPERMINT & SPEARMINT:  
*What's the difference?*



Culinary uses

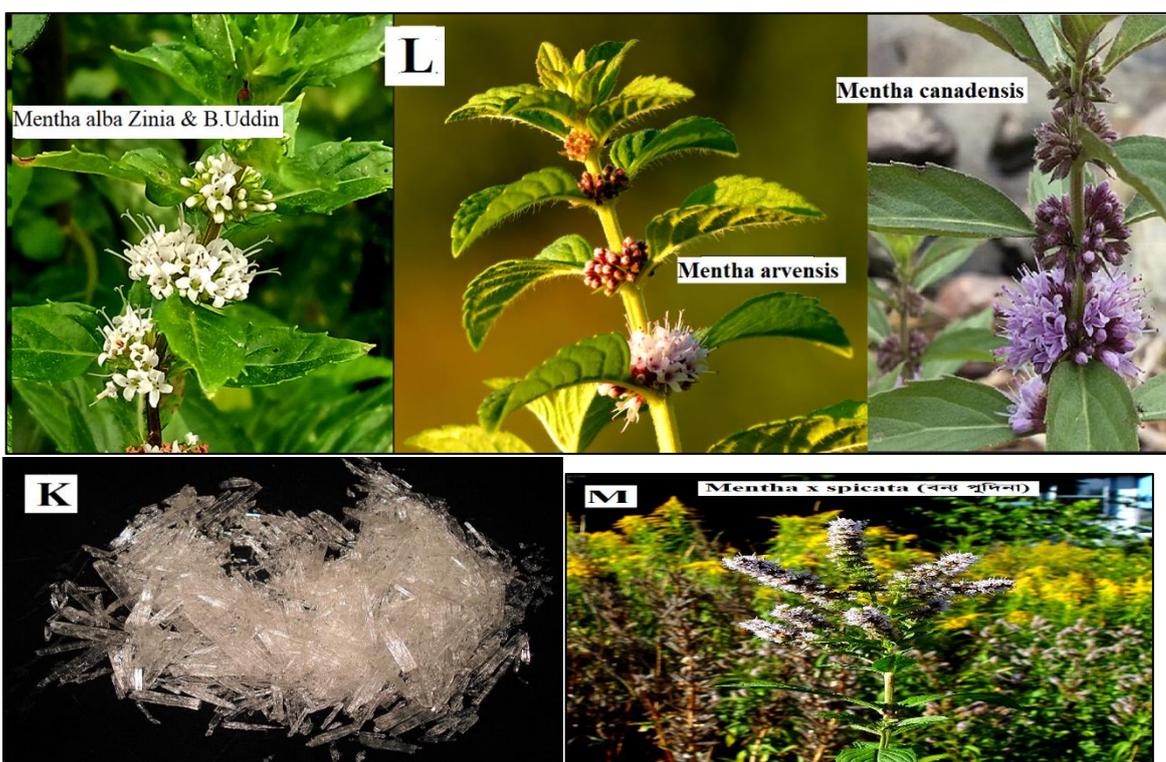
A jar of mint jelly, a traditional condiment served with lamb dishes



Limonana (mint lemonade) served in Damascus, Syria the leaf, fresh or dried, is the culinary source of mint. Fresh mint is usually preferred over dried mint when storage of the mint is not a problem. The leaves have a warm, fresh, aromatic, sweet flavor with a cool aftertaste, and are used in teas, beverages, jellies, syrups, candies, and ice creams. In Middle Eastern cuisine, mint is used in lamb dishes, while in British cuisine and American cuisine, mint sauce and mint jelly are used, respectively. Mint (pudina) is a staple in Indian cuisine, used for flavoring curries and other dishes.

**Menthol**

Menthol is an organic compound, more specifically a monoterpenoid, made synthetically or obtained from the oils of corn mint, peppermint, or other mints. It is a waxy, clear or white crystalline substance, which is solid at room temperature and melts slightly above.



## Medicinal uses

In traditional Iranian medicine, it is reported that *Mentha* species have cooling sensation properties, strengthen the stomach and are effective to relieve digestive symptoms, respiratory tract problems and hemorrhoids. Leaf Decoction against stomach disorders. Leaf, stem Infusion Headache, tiredness. Leaf, stem Infusion and decoction Diabetes. Leaf, flower Infusion and decoction Asthma, bronchitis, chest pain, lungs disorder, kidney problems, diuretic Leaf Infusion Cold and flu, toothache. Aerial parts Infusion, roat affection. Leaf Powder Skin diseases. Whole plant Infusion Aphrodisiac, cold, flatulence, headache, tonic, toothache. Leaf, stem Decoction against the ailments of intestine.

## Etymology

The word "mint" descends from the Latin word *mentha* or *menta*, which is rooted in the Greek words μίνθα *mintha*, μίνθη *minthē* or μίντη *mintē* meaning "spearmint". The plant was personified in Greek mythology as Minthe, a nymph who was beloved by Hades and was transformed into a mint plant by either Persephone or Demeter. The word 'Alba' for white flowers and green stem. Zinia for author Zinia Nasrin Snumon and B.Uddin for Dr. Sheikh Bakhtear Uddin.

## Common name and Bengali name

Zinnia's mint in English. জিনিয়ার পুদিনা in Bengali.

## Habitat

In wild besides vegetable garden.

## Key identifying characters

1. The long-pointed leaves,
2. White flowers,
3. Stamens are long.
4. Toothed leaves but teeth are few numbers.
5. Stems are green in young and reddish in mature.

## Specimen examined

At RDA campus. Bogura, Bangladesh. Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42. (Fig-5)

Herbarium sheet number - ZNS 504 (AAHBAU)

## Distribution

The genus distributed in It grows wild in Europe while it is cultivated in Japan, England, France, Italy, the USA, Bulgaria, Russia, India and Bangladesh.

Its species can be found in many environments, but most grow best in wet environments and moist soils.

## Economic uses/values/harmful aspects

*Mentha* is an Indian and Bangladeshi native medicinal plant used to treat many diseases. *Mentha* plants have superabundant ingredients of phenolic compounds distinctly phenols, flavonoids, terpenes, quinines, and polysaccharides. These phytochemicals paved the way for significant utilization in the production of pharmaceuticals food and beverage industry. Numerous species of *Mentha* are used as spices and for herbal teas. Generally, every part, for instance, the leaves, stems, and roots of *Mentha*, have been used in tribal and traditional medicines. Economically, highly important species are *Mentha aquatica* L., *Mentha longifolia* L. (*M. longifolia*), *Mentha × piperita* L. (*M. × piperita*), *Mentha spicata* L. (*M. spicata*), and *Mentha arvensis* L. (*M.*

*arvensis*). All these species possess potential phytochemicals, such as iso-menthol, iso-menthone, cineol, limonine, piperitone, carvacrol, dipentene, linalool, thujone, piperitenone oxide, and phellandrene, which play an important role in pharmacy, food, flavor, ointment, and associated industries.

### Ethical approval

Sample collected from live tree at RDA campus, Bogura. Illustration made using the photos and related species illustration. Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east.

### Author's contribution

Zinia Nasrin Shumon completed the manuscript and prepared the images. Final editing by Dr. Dr. Shaikh Bokhtear Uddin.

### Conflicts of interests

The author declares that there are no conflicts of interest.

### Funding

The study has not received any external funding

### Data and materials availability

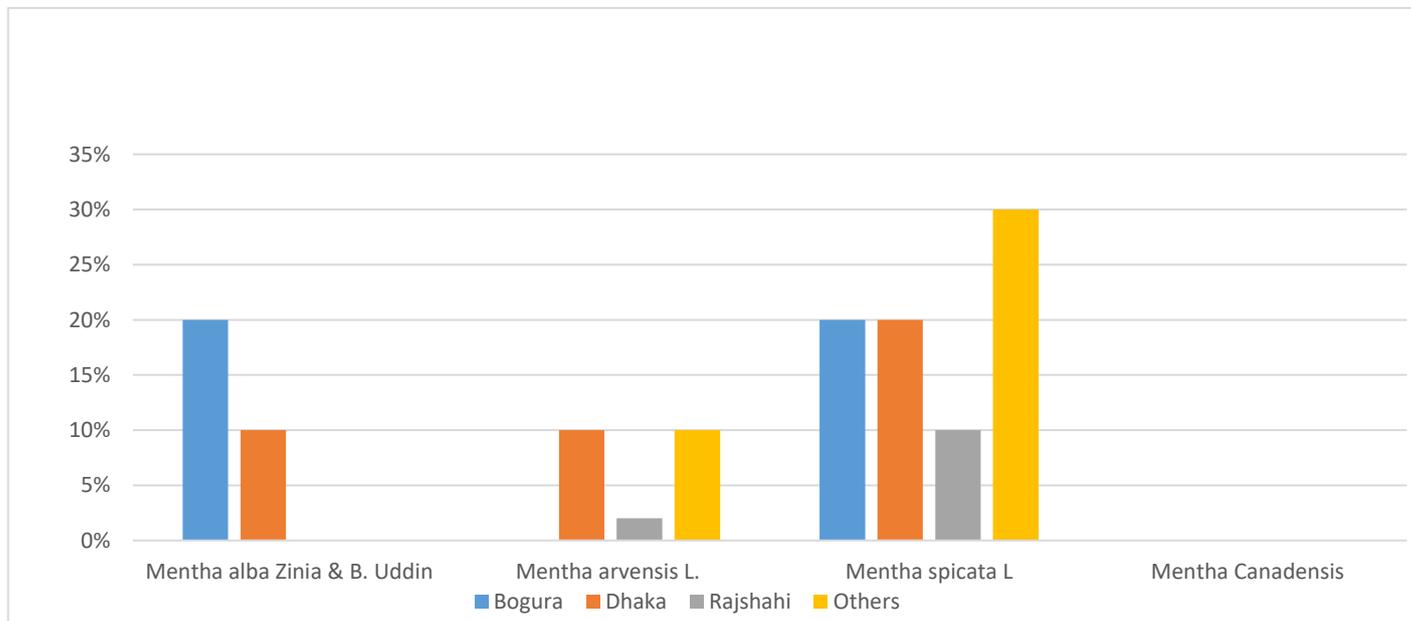
All data associated with this study are present in the paper.

### Acknowledgements

At first thanks to Sir Dr. Md Ashrafuzzaman for writing technique of new species.

We thanks to Mr. Miraz for collecting all of the herbarium materials for getting the full description. He made herbarium sheet. Botanical Illustration also done by him. Thanks to Md. Salah Uddin for his contribution.

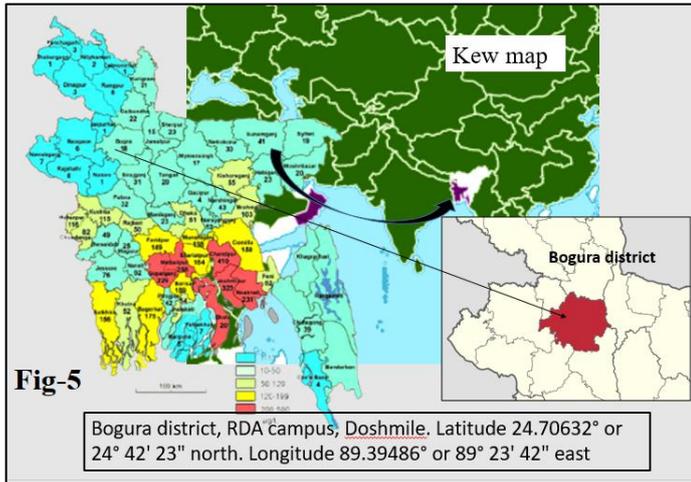
Fig-4



## CONCLUSION

After all the discussion, it is sure that *Mentha alba* Zinia & B. Uddin is new to taxon. We illustrated and described a new species of mentha genus, Family – Lamiaceae, in Bogura district, Bangladesh. There're showing

differences with *M. arvensis*, *M. canadensis*, *M. spicata*, and *Mentha × piperita*. Prepared identification keys also for proper description.



## Map

Bogura district, RDA campus, Doshmile. Latitude 24.70632° or 24° 42' 23" north. Longitude 89.39486° or 89° 23' 42" east.

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