

# New Record of *Leptadenia arborea* (Forssk.) Schweinf. in the Flora of Libya

**Sh-Hoob M. El-Ahamir**, Botany Department, Faculty of Science, Gharyan University, Gharyan, Libya, and **Khaleefah S. Imohammed**, Botany Department, Faculty of Science, Sabha University, Sabha, Libya

<https://dx.doi.org/10.4314/tjpp.v19i2.1>

(Libya)

## ABSTRACT

**El-Ahamir, S.M. and Imohammed, K.S. 2024.** New record of *Leptadenia arborea* (Forssk.) Schweinf. in the flora of Libya. *Tunisian Journal of Plant Protection* 19 (2): 63-68.

A new record for *Leptadenia arborea* (Forssk.) Schweinf. is reported for the first time in the flora of Libya. This species was collected from Ariggiba region (110 km southwest Sabha city). A full description and habitat information on the plant are provided. A brief discussion about the most important traits of this species is presented.

*Keywords:* *Leptadenia arborea*, Libya, Sabha, tree of life

*Leptadenia arborea* (Forssk.) Schweinf. commonly known as the tree of life, is a climbing shrub from the Apocynaceae family. Its distribution extends across diverse habitats in these regions, demonstrating its adaptability to various environmental conditions. This fact can be attributed to several factors: (i) a remarkable ability to adapt to harsh climatic conditions and (ii) seeds are likely dispersed by wind and water (Batanouny and El-Sheikh 2003).

In North Africa, the introduction of *L. arborea* may have occurred through human activities. The plant is valued for its

medicinal properties and its role in traditional practices (treat syphilis, migraine, and mental illnesses), which could have led to its intentional cultivation in gardens and agricultural systems (Sharma et al. 2012). Additionally, the expansion of trade routes and agricultural practices may have facilitated its unintentional spread.

In Libya, only *Leptadenia pyrotechnica* (Forsk.) Decne was reported from Wadi Tafilamin, Ghat, Ghadames and Marzuk (Ali and Jafri 1977, Jafri and El-Gadi 1989) belonging to Asclepiadaceae family. This study reports a new record of *L. arborea* (Forssk.) Schweinf. in Libya.

## MATERIALS AND METHODS

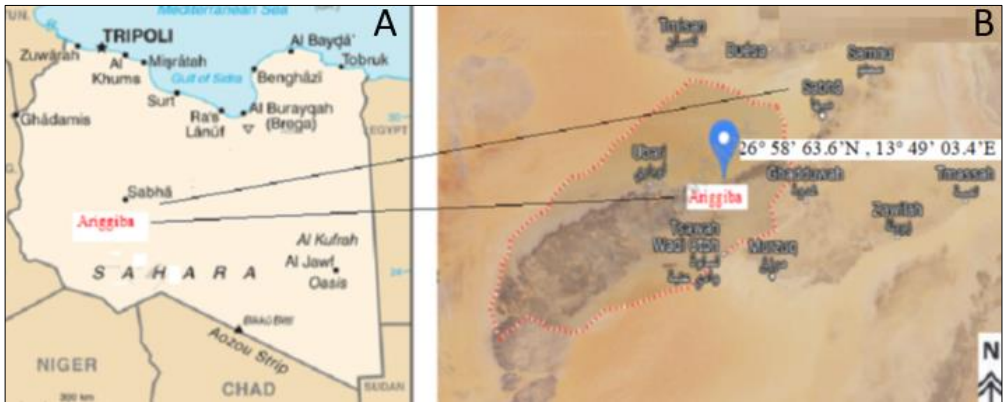
Specimens of *L. arborea* were found, photographed, collected and identified as a result of field surveys (2023-2024), from several localities of Sabha and from Ariggiba Region, 110 km

Corresponding author: Sh-Hoob M. El-Ahamir  
Email: Shhoob.Elhamir@gu.edu.ly

Accepted for publication 07 December 2024

southwest Sabha city about 1000 km south of Tripoli, (26° 58' 63.6" N , 13° 49' 03.4" E ) (Fig.1). Plants were identified as *L. arborea*, the voucher specimens were deposited in the herbarium of Botany Department, Faculty of Science, University of Sabha using the data from several references (Ahmed et al. 2009, Boulos 2000, Darbyshire et al. 2015, Davis

1970, El-Sheikh et al. 2014, Hedberg et al. 2003, Thulin 2006). The plant species was given voucher number (02912N). The Voucher specimens were deposited in the same herbarium, with a duplicate sent to the herbarium of the Botany Department, Gharyan University, Gharyan, Libya (Fig.2).



**Fig 1.** Map of Libya (A) and detailed map of the Sabha district (B) showing the locality where *Leptadenia arborea* was collected.

## RESULTS AND DISCUSSION

**Accepted name:** *Leptadenia arborea* (Forssk.) Schweinf.

**Homotypic synonyms:** *Cynanchum arboretum* Forssk.

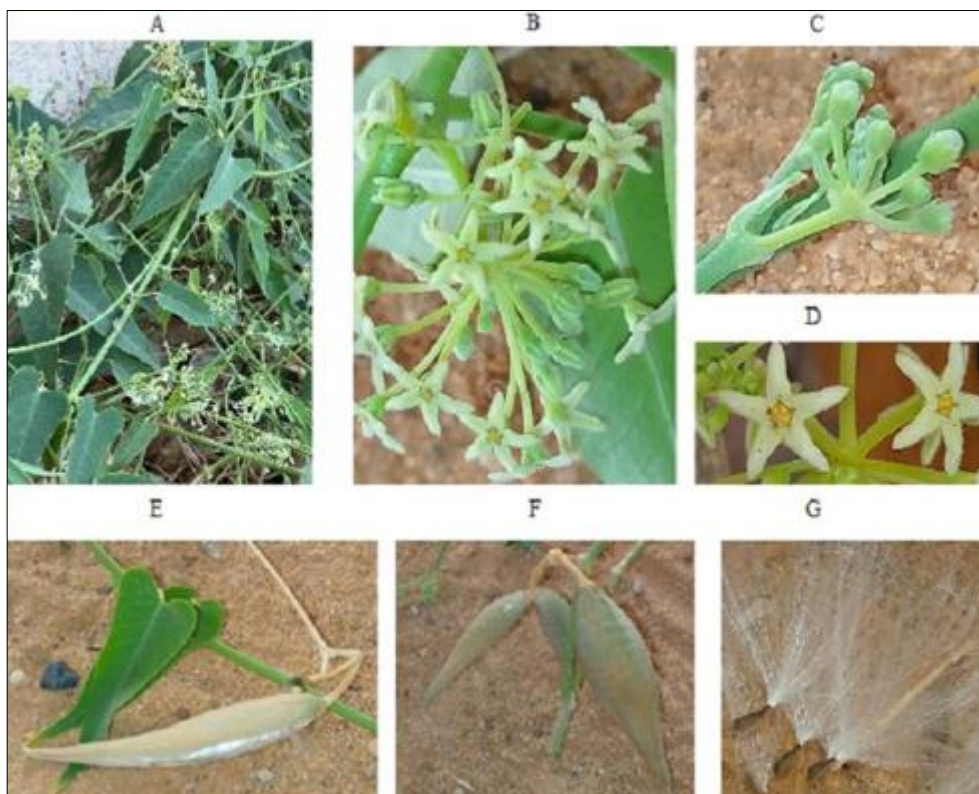
**Heterotypic synonyms:** *Leptadenia abyssinica* Decne, *Leptadenia clavipes* S. Moore, *Leptadenia delilei* Decne, *Leptadenia forskalii* G. Don, *Leptadenia jazanica* Masrahi.

**English common name:** Tree of life.

### Plant description.

*Leptadenia arborea* typically grows up to 3 m tall. Its biological features are slender, erect stems with a smooth or slightly rough texture. The leaves are arranged oppositely, generally linear to

lanceolate, measuring 5-15 cm in length and 1-3 cm in width. They are green, with a glabrous surface that helps reduce water loss (Batanouny and El-Sheikh 2003). The flowers are small, tubular, and usually white to yellow, with a pleasant fragrance (Fig. 2). They are borne in clusters, attracting various pollinators. The fruit is a slender, elongated follicle that contains several seeds, which are dispersed by wind or water (Abdel-Hamid et al. 2016). Its chromosome number is reported to be  $2n = 22$ . This diploid number is consistent with various studies on the genetic characteristics of the species (Batanouny and El-Sheikh 2003, El-Sheikh and Batanouny 2007).



**Fig 2.** *Leptadenia arborea*. A: Habit, B: Inflorescence, C: Flower buds, D: flowers, E: leaves, F: follicle, G: seeds.

### Distribution.

According to “African Plant Database”, “efloramaghreb”, “Plants of the World Online”, “World Flora Online”, *L. arborea* is found in Algeria, Burkina, Cameroon, Central African Republic, Chad, Djibouti, Egypt, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Somalia, Sudan, and Yemen.

### Habitat.

*L. arborea* thrives in a variety of habitats, predominantly dry, sandy, and rocky soils. It is commonly found in open woodlands, scrublands, and along riverbanks, where it can access moisture during the rainy season (El-Sheikh et al.

2014). It is well-adapted to withstand drought conditions. Its deep root system allows it to access groundwater, enabling it to survive in challenging environments (Abdel-Hamid et al. 2016).

*L. arborea* is a perennial shrub or small tree native to the arid regions of Africa and the Arabian Peninsula, particularly found in countries such as Sudan and Egypt. Its adaptability allows it to thrive in diverse habitats, including open woodlands and scrublands. In Libya, the genus *Leptadenia* is represented by only one species, as documented in the flora of Libya (Ali and Jafri 1977, Keith 1965, Jafri and El-Gadi 1989). This study marks the first record of *L. arborea* in the

Sabah and Ariggiba regions of Libya, increasing the number of *Leptadenia* species in the country to two.

Overall, the successful introduction and establishment of *L. arborea* in Libya highlight its adaptability to local ecological conditions, making it a significant addition to the region's flora. Continued research is essential to further understand its ecological role and potential conservation implications within North African ecosystems.

### Distribution in Libya.

Plants of *L. arborea* were found near dried water bodies and wastelands of

Ariggiba region (26° 58' 63.6" N, 13° 49' 03.4" E) located approximately 110 km Southwest of Sabha region of Libya, about 1000 km south of Tripoli. In addition, plants have been detected in several regions of Sabha (26° 41' 37.3" N 13° 48' 55.2" E to 27° 04' 00.46" N, 14° 43' 35.61" E) (Fig. 3).

This finding is significant as of *L. arborea* was not previously documented in the flora of Libya compiled by Jafri and El-Gad (1989) and Keith (1965), indicating that this represents a new addition to the plant species diversity of the country.



**Fig 3.** Herbarium specimen of *Leptadenia arborea* (Forssk.) Schweinf. collected from Ariggiba region, Sabha, Libya.

## Key to the genus *Leptadenia* in the flora of Libya.

Since the key of the genus *Leptadenia* mentioned in the flora of Libya includes only one species, this study provides a classification key that includes *L. pyrotechnica* and *L. arborea*.

- 1.(a) Leaves opposite, stipulate, asymmetrical at base. Plants small, prostrate ..... **2(a)**  
(b) Often a shrub or small tree, reaching heights of up to 3 m ..... **2(b)**  
2.(a) Slender, upright stems and narrow leaves. Small and fragrant flowers, white or yellow..... ***L. pyrotechnica***  
(b) Broader leaves compared to *L. pyrotechnica*, often with a more robust appearance. Flowers clustered, with a similar color range..... ***L. arborea***

The classification of *L. arborea* has evolved significantly, driven by advancements in phylogenetic studies and a deeper understanding of plant relationships. Initially classified within the Asclepiadaceae family, it was later reclassified into the Apocynaceae family based on genetic and morphological evidence. Molecular studies utilizing DNA sequencing demonstrated that many genera once categorized under Asclepiadaceae are more closely related to those in Apocynaceae, prompting a reevaluation of family boundaries (Endress and Igersheim 2000).

Moreover, both families share certain morphological traits, particularly in the structure of their flowers and fruits. However, specific characteristics of *L. arborea* align more closely with those of the Apocynaceae family, leading taxonomists to reassess its classification.

The integration of molecular data into taxonomic frameworks has resulted in significant reclassifications, with many species, including *L. arborea*, being reassigned to Apocynaceae in light of their phylogenetic relationships (APG III 2009).

## CONCLUSION

This study highlights the expanding global distribution of *L. arborea*, a species native in the Sahara, Sahel, and Arabian Peninsula. The findings show its ability to naturalize and establish populations outside its native range, including its first recorded presence in Libya's flora. The spread of *L. arborea* in Libya and other parts of North Africa can be attributed to unintentional dispersal, intentional introduction, and its adaptability to regional environmental conditions.

---

## RESUME

**El-Ahamir S.M. et Imohammed K.S. 2024. Nouvelle observation de *Leptadenia arborea* (Forssk.) Schweinf. dans la flore de la Libye. Tunisian Journal of Plant Protection 19 (2): 63-68.**

Une nouvelle observation de *Leptadenia arborea* (Forssk.) Schweinf. est enregistrée pour la première fois dans la flore de la Libye. Cette espèce a été collectée dans la région d'Ariggiba (110 km au sud-ouest de la ville de Sabha). Une description complète et des informations sur l'habitat sont fournies. Une brève discussion sur les traits les plus importants de cette espèce est présentée.

*Keywords:* arbre de la vie, *Leptadenia arborea*, Sabha

---

تم تسجيل نوع نبات جديد هو *Leptadenia arborea* (Forssk.) Schweinf. لأول مرة في فلورة ليبيا. تم جمع هذا النبات البري المنتشر في منطقة الرجيبا (110 كم جنوب غرب مدينة سبها). تم تشخيص ووصف النبات وتقديم معلومات وبيانات حول توزيعه وانتشاره. وتمت تقديم مناقشة موجزة حول أهم السمات التي يتسم هذا النوع النباتي.

كلمات مفتاحية: سبها، شجرة الحياة، *Leptadenia arborea*

#### LITERATURE CITED

- Abdel-Hamid, A.A., El-Sheikh, M.A., and Batanouny, K.H. 2016. Ecophysiological Adaptations of *Leptadenia arborea* in the Desert Environment. *Journal of Arid Environments*, 134: 73-79. doi: 16445319274519868116
- Ahmed, Z.U., Hassan, M.A., Begum, Z.N.T., Khondker, M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A.K.A., and Haque, E.U. 2009. *Apocynaceae*. Vol. 12, Pages 6-11. In: *Flora and Fauna of Bangladesh*. Dhaka, Bangladesh. doi: 10.3329/bjz.v48i1.47872
- Ali, S.I. and Jafri, S.M.H. 1977. *Asclepiadaceae*. Vol. 9, Pages 1-16. In: *Flora of Libya*. Department of Botany, Al-Fateh University, Tripoli, Libya.
- Angiosperm Phylogeny Group. 2009. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society*, 161 (2): 105-121. doi:10.1111/boj.12385
- Batanouny, K.H., and El-Sheikh, M.A. 2003. *Apocynaceae*. Vol.4, Pages 1-20. In: *Flora of Egypt*. Cairo University Press, Cairo, Egypt.
- Boulos, L. 2000. *Flora of Egypt*, Vol. 2. Al-Hadara Publishing, Cairo, Egypt, 352 pp.
- Derbyshire, I., Kordofani, M., Farag, I., Candiga, R. and Pickering, H. 2015. *The Plants of Sudan and South Sudan: An Annotated Checklist*. Royal Botanic Gardens, Kew, UK, 400 pp.
- Davis, P. H. 1984. *Flora of Turkey*. Vol. 3. Edinburgh University Press, Edinburgh, Scotland, UK, 628 pp.
- El-Sheikh, M.A., and Batanouny, K.H. 2007. Cytogenetic studies of selected species of the family *Apocynaceae*. *Journal of Biological Sciences*, 7 (4): 659-661.
- El-Sheikh, M.A., Abou El-Soud, A.M., and El-Sayed, A. 2014. Distribution and ethnobotanical uses of *Leptadenia arborea* in Egypt. *International Journal of Medicinal Plants*, 6 (2): 123-130.
- Endress, P.K., and Igersheim, A. 2000. The significance of the floral structure in the evolution of the *Apocynaceae*. *Plant Systematics and Evolution*, 222 (1-4): 1-21.
- Hedberg, I., Edwards, S. and Nemomissa, S. 2003. *Flora of Ethiopia and Eritrea*, Vol. 4. The National Herbarium, Addis Ababa, Ethiopia, 352 pp.
- Jafri, S.M.H., and El-Gadi, A. 1989. *Apocynaceae*. Vol. 98, Pages 1-13. *Flora of Libya*. Department of Botany Al-Fateh University, Tripoli, Libya.
- Keith, H.G. 1965. A preliminary check list to Libya flora Ministry of agriculture. Libyan Ministry of Agriculture, Libya, 1047 pp.
- Sharma, R., Shukla, S., and Kachroo, P. 2012. Medicinal Properties of *Leptadenia arborea*: An Overview. *Asian Journal of Pharmaceutical and Clinical Research*, 5 (3): 56-59.
- Thulin, M. 2006. *Flora of Somalia*. The Royal Botanic Gardens, Kew, UK, 626 pp.
- <https://africanplantdatabase.ch>. [Accessed: 19 Nov 2024]
- <https://www.worldfloraonline.org>. [Accessed: 19 Nov 2024]
- <https://efloramaghreb.org/specie/72417> [Accessed: 19 Nov 2024]
- <http://www.worldfloraonline.org> [Accessed: 19 Nov 2024]
- <https://powo.science.kew.org/taxon> [Accessed: 19 Nov 2024]