

# ***Caudanthera edulis* (Edgew.) Meve & Liede (Apocynaceae): a new record for the flora of the United Arab Emirates**

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## **ABSTRACT**

*Caudanthera edulis* (Edgew.) Meve & Liede, a perennial succulent herb, belonging to the family Apocynaceae, has been documented as a new record for the flora of the United Arab Emirates (UAE). A description of the species, distribution and habitat ecology, and its importance is provided. This new record highlights the importance of continued botanical exploration in the region to document and understand the plant diversity.

## **KEY WORDS**

*Caudanthera edulis*; *Caralluma edulis*; UAE flora; new record.

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## **INTRODUCTION**

The genus *Caudanthera* Plowes belongs to the subfamily Asclepiadoideae within the family Apocynaceae, which includes succulent plants adapted to arid environments (Endress & Bruyns, 2000; Sharawy et al., 2015). These plants have unique morphological features, medicinal properties, and ecological importance (Mahmood et al., 2010), all of which contribute to their value in both natural ecosystems and human applications. The genus *Caudanthera* includes four accepted species namely *C. baradi* (Lavranos & L.E.Newton) Plowes, *C. edulis* (Edgew.) Meve & Liede, *C. mireillae* (Lavranos) Plowes and *C. sinaica* (Decne.) Plowes (POWO, 2025). Based on the available literature, no species of the genus *Caudanthera* had been recorded in the flora of UAE.

During botanical field surveys carried out between 2020 and 2024 to collect wild plant material for conservation and research at the Sharjah Seed

Bank and Herbarium (SSBH), the authors discovered an unfamiliar, succulent plant growing hidden beneath dense shrubs, and the understory of large shrubs and trees. The same plant was later encountered again in some local gardens. Some residents, particularly those living in valley areas, confirmed their familiarity with the plant, calling it *Daghabees*, noting that they traditionally use it as both a food source and for its medicinal properties (TM personal communications).

The collected plant specimens were thoroughly examined and compared with existing literature on regional flora, including key references such as Jongbloed et al. (2003), Ghazanfar (2006), Karim & Fawzy (2007), and Allen et al. (2021). Subsequently, based on morphological traits including succulent stems, small scaly leaves, star-shaped flowers, and long follicles, we confirmed the identification of these specimens as *Caudanthera edulis* (Family Asclepiadaceae; synonymised names: *Caralluma edulis*) (Figs. 1–3). To the best of our knowl-

edge, there is no prior record of *C. edulis* in UAE flora. Therefore, this is the first report of its occurrence in the country, with the genus *Caudanthera* also being recorded for the first time in the UAE. Herbarium voucher specimens of *C. edulis* were deposited in the SSBH for future reference. New records for the flora of the UAE, including our recent contributions, help enhance understanding of the region's biodiversity (Mahmoud & Gairola, 2024).

### CAUDANTHERA EDULIS FROM UNITED ARAB EMIRATES

**DESCRIPTION.** *Caudanthera edulis* is a perennial succulent herb with a fleshy, erect to decumbent stems (1–2 cm diameter), forming a cluster that grows up to 30 cm height. The stems are greenish gray with prominent tubercles arranged along the stem angles. Leaves are rudimentary, appearing as small scales at the nodes. Flowers are star-shaped, typically maroon or purple, with intricate patterns on the corolla lobes. The fruit is a follicle containing numerous seeds embedded in silky hairs, aiding wind dispersal. Its succulence is an adaptation to water scarcity, allowing it to thrive in hyper-arid conditions (Eggli & Nyffeler, 2009; Kumar et al., 2021).

**HABITAT AND DISTRIBUTION.** *Caudanthera edulis* was recorded in gravel plains from Al Mudam, Al Bridi, Zubaidah areas in Sharjah and wadis in Mudhayrah area, Ajman. Globally, *C. edulis* is native to Northeast Africa (Eritrea, Sudan, Somalia), the Arabian Peninsula (Oman, Saudi Arabia, Yemen), Western Asia (Afghanistan, Iran) and Northwest India (Gilbert, 1990; Albers & Meve, 2002; Patzelt et al., 2014; POWO, 2025). The distribution of *C. edulis* in UAE, showing SSBH records and the species range based on the field knowledge of local residents, is presented in Fig. 4. The plants were found growing in mountainous, stony sides of wadis, and gravel plains habitats, always nestled within the intricate, and sparse vegetation. Due to this habit of growing within shrubs, *C. edulis* can be easily overlooked in the field. We found *C. edulis* growing within the shrubs *Plocama aucheri*, *Lycium shawii*, *Haloxylon salicornicum*, *Rhazya stricta*, *Tetraena qaterense*, and in the understory of *Vachellia tortilis* trees. Based on the interactions

with some local residents, they mentioned that they had collected it from the gravel plains habitat in the emirate of Umm Al Quwain and propagated it through cuttings.

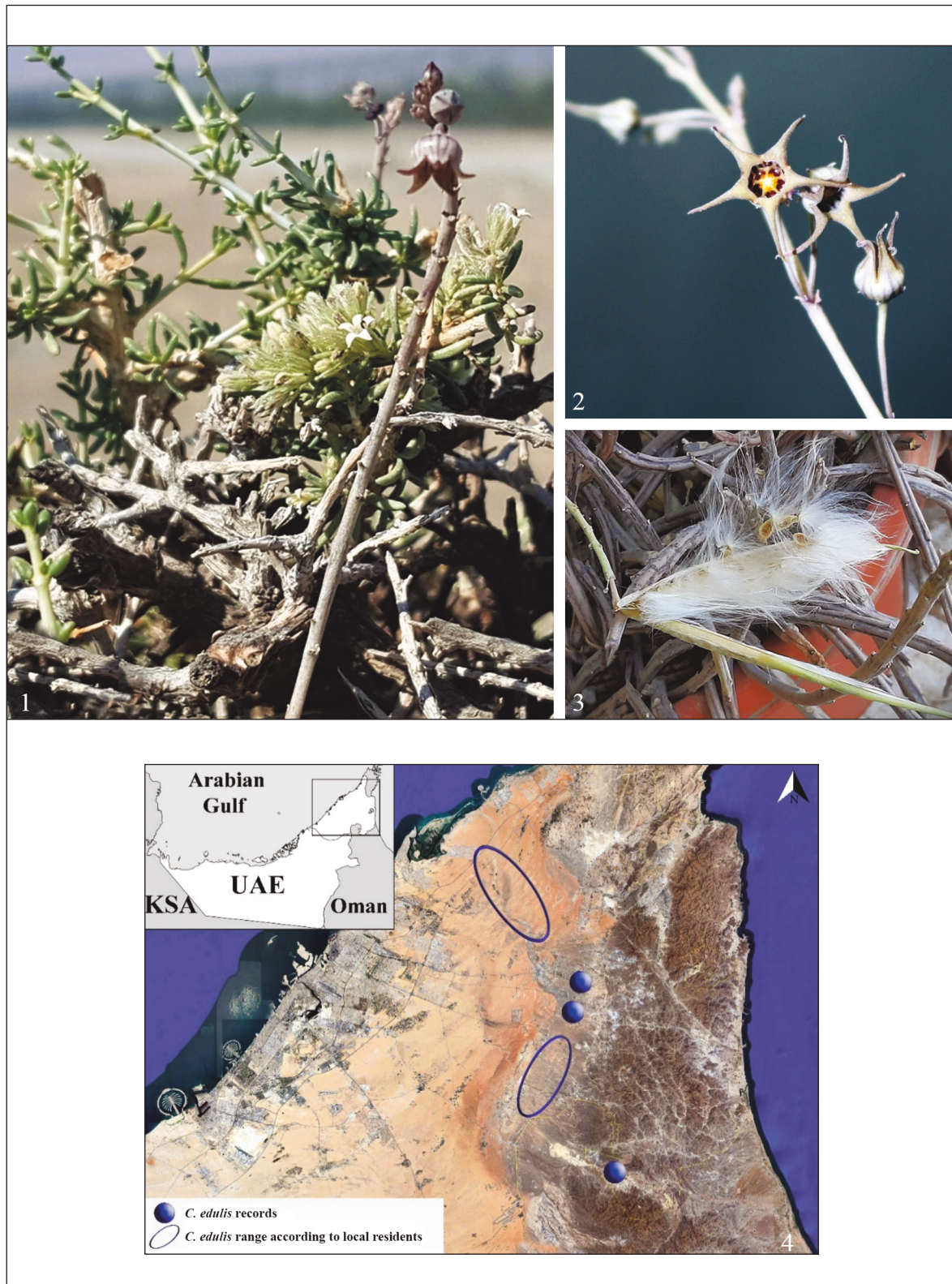
**FLOWERING AND FRUITING.** The wild recorded and the planted individuals of *C. edulis* showed flowering and fruiting throughout the year.

**REMARKS.** Existing literature highlights the multipurpose significance of *C. edulis*, which has a well-documented history of traditional use as a food source, as well as for medicinal and nutraceutical applications (Dutt et al., 2012; Patel et al., 2013; Khan et al., 2022). In the Thar Desert, India, the young succulent stems of *C. edulis* are commonly consumed raw as greens or cooked as a vegetable (Singh et al., 2016). Importantly, the plant is used in the management of diabetes and has anti-inflammatory properties, analgesic effects and anti-obesity potential (Khan et al., 2016; Qayyum et al., 2018; Al Hinai et al., 2020; Khan et al., 2022). In UAE, according to local people, *C. edulis* has been used for its medicinal properties, particularly for diabetes management, in addition to consuming the plant either fresh green or traditional cooked dishes.

### CONCLUSIONS

We have recorded the occurrence of *C. edulis* for the first time in the flora of UAE. The rarity of *C. edulis* in the wild, and its habit of growing hidden within shrubs or as understory vegetation, has likely made it difficult for field researchers to spot. Due to this growth habit of *C. edulis*, it may be easily overlooked in the field; however, it may have more wide distribution than our current records. Therefore, in addition to our field explorations, we establish communication with local people to document more localities of this species and understand its distributions in the wild. Such information will help in understanding the threat status and aid in the conservation and sustainable utilization of this plant. Given the rarity of *C. edulis* and its ecological, medicinal, and potential economic value, it deserves more attention from both scientific research and conservation perspectives. As a new record for the country's flora, future studies could focus on documenting the medicinal and edible uses of *C.*





Figures 1–3. Photographs of *Caudanthera edulis* in United Arab Emirates. Fig. 1: plant growing within the shrub *Plocama aucheri*. Fig. 2: flowering twig and close-up of flower. Fig. 3: opened follicles. Figure 4. Distribution map of *Caudanthera edulis* in United Arab Emirates.

*edulis*, as well as exploring its population dynamics, genetic diversity, and nutraceutical and ethnobotanical properties.

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## REFERENCES

- Al Hinai A., Lupton D.A. & Al Issai G., 2020. Indigenous knowledge and folk use of medicinal plants in the Eastern Hajar Mountains, Oman. *Journal of Medicinal Plants Studies*, 8: 104–110.
- Albers F. & Meve U. (Eds.), 2002. *Illustrated Handbook of Succulent Plants: Asclepiadaceae*. Springer, 378 pp.
- Allen D.J., Westrip, J.R.S., Puttick, A., Harding, K.A., Hilton-Taylor, C. & Ali, H., 2021. UAE National Red List of Vascular Plants. Technical Report. Ministry of Climate Change and Environment, United Arab Emirates, Dubai.
- Dutt H.C., Singh S., Avula B., Khan I.A. & Bedi Y.S., 2012. Pharmacological review of *Caralluma* R. Br. with special reference to appetite suppression and anti-obesity. *Journal of Medicinal Food*, 15: 108–119.
- Eggle U. & Nyffeler R., 2009. Living under temporarily arid conditions - succulence as an adaptive strategy. *Bradleya*, 27: 13–36.  
<https://doi.org/10.25223/brad.n27.2009.a10>
- Endress M.E. & Bruyns P.V., 2000. A revised classification of the Apocynaceae s.l. *The Botanical Review*, 66: 1–56.
- Ghazanfar S.A., 2006. *Flora of the Arabian Peninsula and Socotra*. Edinburgh University Press, 408 pp.
- Gilbert M.G., 1990. A review of *Caralluma* R. Br. and its segregates. *Bradleya*, 8: 1–32.
- Jongbloed M.V.D., Feulner G.R., Böer B. & Western A.R., 2003. *The Comprehensive Guide to the Wild Flowers of the United Arab Emirates*. Environmental Research and Wildlife Development Agency, Abu Dhabi, UAE, 576 pp.
- Karim F. & Fawzy N., 2007. *Flora of the United Arab Emirates*. UAE University Publication, Al-Ain, UAE, 2 vols., 946 pp.
- Khan M., Khan R.A., Ahmed M. & Gul S., 2016. Anti-inflammatory effect of *Caralluma edulis* against acute and chronic inflammation. *The Journal of Animal and Plant Sciences*, 26: 336–342.
- Khan M., Manzoor Z., Rafiq M., Munawar S.H., Waqas M.Y., Majeed H., Ali Shah S.Z., Hussain R., Hussain H.I., Tahir T., Kotwica-Mojzych K. & Mojzych M., 2022. Phytochemical Screening, Anti-Inflammatory, and Antidiabetic Activities of Different Extracts from *Caralluma edulis* Plant. *Molecules*, 27: 5346.  
<https://doi.org/10.3390/molecules27165346>
- Kumar R., Singh V. & Sharma P., 2021. Taxonomic revision of the genus *Caralluma* (Apocynaceae) in India. *Phytotaxa*, 490: 123–145.
- Mahmood T., Muhammad S. & Shinwari Z.K., 2010. Molecular and morphological characterization of *Caralluma* species. *Pakistan Journal of Botany*, 42: 1163–1171.
- Mahmoud T. & Gairola S., 2024. Three new records to the flora of United Arab Emirates: *Dactyloctenium australe* Steud. (Poaceae) and two varieties of *Neurada procumbens* L. (Neuradaceae). *Biodiversity Journal*, 15: 479–483.  
<https://doi.org/10.31396/Biodiv.Jour.2024.15.3.479.483>
- Patel A.K., Phulwaria M., Rai M.K., Gupta A.K., Shekhawat S. & Shekhawat N.S., 2014. In-vitro propagation and ex-vitro rooting of *Caralluma edulis* (Edgew.) Benth. & Hook. f.: an endemic and endangered edible plant species of the Thar Desert. *Scientia Horticulturae*, 165: 175–180.  
<https://doi.org/10.1016/j.scienta.2013.10.039>
- Patzelt A., Harrison T., Knees S.G. & Al Harthy L., 2014. Studies in the Flora of Arabia: XXXI. New Records from the Sultanate of Oman. *Edinburgh Journal of Botany*, 71: 161–180.
- POWO, 2025. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <https://powo.science.kew.org/> Retrieved 27 March 2025.
- Qayyum N., Rani H., Mir K.B. & Khan A.Q., 2018. *Caralluma* Pharmacological Attributes. *Journal of Food, Nutrition and Population Health*, 2: 2–13.
- Sharawy S.M., Kamel E.A., Karakish E.A.K. & Loutfy M.H.A., 2015. A systematic revision on *Caralluma* species of Saudi Arabia based on karyological and molecular data. *Pakistan Journal of Botany*, 47: 937–950.
- Singh J.P., Kumar S., Venkatesan K. & Kulloli R. N., 2016. Conservation status and utilization of *Caralluma edulis*: an important threatened medicinal plant species of the Thar Desert, India. *Genetic Resources and Crop Evolution*, 63: 721–732.  
<https://doi.org/10.1007/s10722-016-0366-3>