Botanica
ISSN 2538-8657
https://doi.org/10.35513/Botlit.2026.3.3
2026, 32(3): 155–159

Communication

First record of *Clerodendrum chinense* (Lamiaceae) in Algeria

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Received: 5 January 2026. Accepted: 25 September 2026. Published online: 28 October 2026

Abstract

Boulemtafes A., Saadi A., 2026: First record of *Clerodendrum chinense* (Lamiaceae) in Algeria. – Botanica, 32(3): 155–159. https://doi.org/10.35513/Botlit.2026.3.3

Biological invasions significantly drive global biodiversity change, and early detection of newly established alien plant species is crucial for evaluating invasion risks. Here, we report the first documented natural establishment of *Clerodendrum chinense* (Osbeck) Mabb. in Algeria. This ornamental species, native to tropical and subtropical Asia, was first recorded in 2022 as having escaped cultivation in two locations in the Annaba region. *Clerodendrum chinense* has high invasive potential because it reproduces vegetatively through root suckers, tolerates a wide range of conditions, and can establish in disturbed habitats. These traits suggest potential local spread and therefore warrant monitoring of its populations in north-eastern Algeria.

Keywords: biodiversity, invasive alien species, Mediterranean region, naturalisation, ornamental plants.

INTRODUCTION

The introduction of invasive alien species is recognised as a major driver of global biodiversity loss. This issue is particularly pronounced in biodiversity hotspots, such as the Mediterranean region (Myers, 2003; Vilà et al., 2011). Algeria has a rich native flora comprising more than 3000 vascular species, with a high endemism rate of 6.3% – the territory is home to 248 strictly endemic taxa (Dobignard & Chatelain, 2010; Yahi et al., 2012). Therefore, introducing alien species poses an even greater threat to Algeria's native flora (Meddour et al., 2020).

Vilà et al. (1999) have estimated the number of naturalised non-native species in Algeria at 143. However, recent studies have recorded 211 non-native vascular species (Meddour et al., 2020), of which 108 are naturalised. Sakhraoui et al. (2024) have since updated the list. This reflects the diverse pathways through which these species were introduced, including for agricultural and experimental purposes (Richardson & Pyšek, 2006). During the colonial era (1830–1962), Algeria saw intensive introductions of non-native plants for agricultural or experimental purposes (Carra & Gueit, 1952), leading to a steady increase in introduced species.

Clerodendrum chinense (Osbeck) Mabb. (Lamiaceae), is an evergreen ornamental shrub native to tropical and subtropical Asia. Ornamental horticulturists particularly value it for its attractive foliage and spectacular, fragrant flowers. In Algerian coastal cities, people widely cultivate it in public and private gardens (Bellili et al., 2022; iNaturalist, 2025a, b). It is native to the Indo-Malayan region, extending from the eastern Himalayas and southern China to the Malay Peninsula, the Philippines and the Indonesian archipelago (POWO, 2025).

It has been naturalised in Central and South America and several Pacific islands for approximately 150 years, forming dense stands and being recognised as an invasive weed (PIER, 2011). According to international databases and the literature consulted (Meddour et al., 2020; Sakhraoui et al., 2024; POWO, 2025), no previous reports document spontaneous or naturalised populations of *Clerodendrum chinense* in Algeria. Therefore, this record represents the first documented occurrence of the species established outside cultivation in Algeria.

MATERIALS AND METHODS

We conducted systematic observation campaigns over four consecutive years (2022–2025) at Badji Mokhtar University (Sidi Amar commune) and in the Boudebza Med Salah district of Annaba (north-eastern Algeria). We recorded geographic coordinates using a GPS device and characterised the habitat by dominant vegetation cover, substrate type, degree of anthropogenic disturbance (ruderal versus seminatural) and light exposure.

We confirmed species identification by comparing morphological descriptions with those of Li & Hedge (1994), Smith (1991) and Wearn & Mabberley (2011). We thoroughly reviewed Algerian botanical literature, particularly Maire (1987) and Quézel & Santa (1963), to verify whether this species had previously been recorded in Algeria. We also verified its taxonomy by consulting digital specimens in international herbaria, such as the Royal Botanic Gardens, Kew and the Missouri Botanical Garden, via the GBIF, Kew Data Portal, and Tropicos platforms. Voucher specimens of *Clerodendrum chinense* collected during this study were deposited at the Department of Biology of the Badji Mokhtar-Annaba University.

In the absence of an official framework defining the native status of flora in Algeria, we adopted the criteria proposed by Richardson et al. (2000) to evaluate the biogeographic status of the species. We also relied on data from the African Plant Database (APD, 2025) and the Euro+Med PlantBase (2025).

RESULTS

Clerodendrum chinense was observed at two sites in the city of Annaba in eastern Algeria: on the Sidi Amar University campus (36.90000° N, 7.75000° E, altitude 15 m) and in the Boudebza Med Salah district (36.90645° N, 7.73376° E, altitude 30 m). Repeated observations between 2022 and 2025 documented several flowering and fruiting individuals actively proliferating, demonstrating effective reproductive establishment and confirming naturalisation according to the applied criteria. These observations are the first documented records of naturalised populations of this species in Algeria, distinct from the ornamental plantations observed in other coastal cities in the country. Based on these findings, we consider the species a non-native ornamental that escaped cultivation.

The observed individuals correspond to the double-flowered form of *Clerodendrum chinense*. This species is characterised by densely pubescent, quadrangular branches and opposite, broadly ovate leaves measuring 6–25 cm in length and 5–25 cm in width. The leaves are cordate with coarsely and irregularly crenate margins. The leaves have at least eight clearly visible primary veins and are pubescent on the upper surface and glabrous below.

The terminal, cymose inflorescences are dense and composed of many highly fragrant, white to pinkish-white flowers. The flowers form dense glomeruli measuring 8–15 cm in diameter. Most of the flowers are double, with numerous petals and staminodes, and a few simple, fertile flowers are also present. The fleshy, globular fruits are 6–8 mm in diameter and change from green to blackish purple at maturity (Fig. 1).

The observed populations colonise anthropogenic areas on the University campus, such as building edges and surrounding ruderal areas. The species was particularly abundant around an abandoned educational greenhouse, suggesting that human activities facilitate its dispersal. The species thrives in sunny to semi-shaded areas with fertile, moist soil and can reach heights of up to 2.5 metres.

Vegetative reproduction by root suckers was evident, with new shoots emerging at variable distances (0.5–2 m) from the primary plant, resulting in high density and the formation of dense clonal colonies, particularly around the educational greenhouse. Sexual reproduction appears to be limited due to the dominance of sterile double flowers. However, occasional fruiting was observed, originating from



Fig. 1. Flowering *Clerodendrum chinense* in north-eastern Algeria. Photograph by A. Boulemtafes.

the few simple fertile flowers present in the inflorescences.

DISCUSSION

This is the first recorded instance of *Clerodendrum chinense* in Algeria, and the first in the Mediterranean region. It encourages further research into other potential locations. This finding aligns with the broader trend of introducing tropical ornamental species to the Mediterranean region (Brunel et al., 2010) and is consistent with recent findings in Skikda province, located west of Annaba (Sakhraoui et al., 2019; Sakhraoui, 2024). These observations differ significantly from ornamental plants previously documented in other Algerian coastal cities (Bellili et al., 2022).

Analysis of *Clerodendrum chinense* behaviour in areas where it has been introduced revealed its invasive potential, raising serious concerns. In the southwestern Pacific, particularly in Western Samoa and American Samoa, the species has already become a significant weed, outcompeting and smothering underlying vegetation in rich, humid soils (Space & Flynn, 2002). In Niue and Fiji, it rapidly forms dense, monospecific stands that reduce native plant diversity and hinder forest regeneration (Space & Flynn, 2002). Naturalised in Hawaii since 1917, *Clerodendrum chinense* actively colonises roadsides, disturbed areas, taro fields, and stream beds (Motooka et al., 2003), thereby altering plant community structure. In Florida, seven non-native *Clerodendrum* species have escaped cultivation, demonstrating the genus's high invasive potential (Wunderlin & Hansen, 2011). The species occasionally colonises disturbed sites along the central and southern Florida peninsula, demonstrating its ability to adapt to subtropical conditions. This ecological plasticity suggests the species could establish successfully in a wider range of Algerian coastal ecosystems.

Clerodendrum chinense reproduces mainly through vegetative propagation via root suckers, enabling it to colonise favourable habitats rapidly. This asexual reproduction provides a significant competitive advantage in disturbed ecosystems, where sexual reproduction may be limited. In the Pacific, generalist polyphagous insects cause only minor damage. Natural enemies specific to its native range, notably the chrysomelid *beetle Phyllocharis undulata* (Linnaeus 1763), which causes significant damage in southern China and northern Vietnam, are absent from areas of introduction (Julien & White, 1997). This release from natural enemy pressure facilitates the species' establishment and expansion.

Algeria is particularly vulnerable to biological invasions. Its coastal regions concentrate 248 endemic taxa, which *Clerodendrum chinense* (Yahi et al., 2012) prefers. Although recorded populations are currently confined to human-altered ruderal sites, the documented capacity of the species for rapid clonal spread and its ability to adapt to different habitats suggests that it could eventually encroach on adjacent seminatural habitats where these endemics occur. Urbanisation and anthropogenic disturbances have already weakened Algerian coastal ecosystems (Medjahdi, 2010), creating favourable conditions for the spread of invasive species. Furthermore, the absence of an official naturalised status in databases (Euro+Med PlantBase, 2025) hinders prompt assessment of its spread, which could delay management measures.

Repeated observations of *Clerodendrum chinense*

in Annaba over several years meet the naturalisation criteria by Richardson et al. (2000). However, given the limited extent and duration of the current record, longer-term monitoring is required to confirm whether the species has become fully established or still occurs only occasionally. Unlike in Florida and the Pacific Islands, where the species thrives in humid tropical conditions, Algeria's Mediterranean climate is drier and at a higher latitude, making its long-term persistence uncertain. Nevertheless, climate change favours tropical species in the Mediterranean (Walther et al., 2009), and *Clerodendrum chinense* has been observed to grow in both sun and partial shade around greenhouses. This ecological plasticity may support its persistence locally.

Author contributions. A.B. and A.S. conceived and designed the study. A.B. conducted the field surveys and collected the data. A.S. performed the botanical analyses and verified the species identification. A.B. wrote the original manuscript draft, and A.S. critically revised. Both authors read and approved the final version of the manuscript.

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