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Conference Abstract

Should we pay more attention to *Gazania rigens* in Europe?

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Abstract

Gazania rigens (L.) Gaertn., commonly known as gazania or treasure flower, is a member of the Asteraceae family native to southern Africa. Introduced to Europe in the 18th century as an ornamental plant due to its vibrant yellow inflorescences, the species behaves as a perennial in warmer climates and an annual in colder regions. Its perennial nature facilitates naturalization, occasionally leading to invasiveness in regions such as parts of Europe and Australia. Using available GBIF data (as of April 2026), we analyzed the distribution of *G. rigens* in Europe to assess its potential for further expansion. Of the roughly 3,000 recorded gazania localities, only 166 (5%) predate the year 2000. An additional 304 localities were reported over the following decade, primarily concentrated in European coastal areas. Post-2010, records surged exponentially, with a substantial number emerging in inland parts of the continent.

To determine the environmental preferences of the species, we calculated descriptive statistics using BioClim climate data (worldclim.org) and SoilGrids data (soilgrids.org) for soil chemical properties (nitrogen, organic carbon, and pH) at a depth of 0–5 cm. To match the spatial resolution of SoilGrids, we filtered the data to retain only localities with a reported spatial accuracy of ≤ 250 m, yielding a subset of 1,594 localities (53%). Spatial overlap comparison between the full dataset and the filtered 250-m dataset—projected onto a 10-km ETRS grid—revealed that 67% of the grid cells remained identical. Furthermore, these cells were evenly distributed across the species' range, ensuring the representativeness of the 250-m subset.

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Our findings indicate that *G. rigens* prefers slightly acidic to slightly alkaline soils; 50% of the localities (interquartile range) exhibited pH values between 6.2 and 7.3, while 80% (10^{th} to 90^{th} percentiles) fell between 5.9 and 7.6. Nitrogen concentrations ranged from 2.6 g/kg (10^{th} percentile) to 7.2 g/kg (90^{th} percentile). Although the minimum annual precipitation (BIO12) was 130 mm, the 10^{th}-to-90^{th} percentile range spanned 487–984 mm, characteristic of a continental climate. However, precipitation during the driest month (BIO14) was 39 mm at the 75^{th} percentile and 48 mm at the 90^{th} percentile, signaling a strong tolerance to drought. Conversely, the species is sensitive to cold conditions. The minimum temperature of the coldest month (BIO6) was 0.7 °C at the 10^{th} percentile, whereas the maximum temperature of the warmest month (BIO5) ranged from 22.3 °C (10^{th} percentile) to 30.6 °C (90^{th} percentile).

Currently, the majority of European gazania records are concentrated in France, Portugal, Spain, and the United Kingdom, with sporadic or localized clusters elsewhere (e.g., Sardinia and Sicily in Italy, Corfu and Crete in Greece). Habitat suitability modeling via MaxEnt indicates a high potential for eastward expansion. Favorable climatic conditions could facilitate its spread across Italy, the coastal regions of Croatia, Albania, and Greece, and along the southern coast of the Black Sea. Additionally, suitable soil characteristics support potential inland establishment stretching from Italy to Turkey. Given the documented negative impacts of *G. rigens* on native flora and habitats in regions like Spain, targeted monitoring and potential commercial trade bans are strongly recommended.

Keywords

invasive plant; Mediterranean basin; ecological niches; spatial analyses

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Conflicts of interest

The authors have declared that no competing interests exist.