Rapid Communication

The lark daisy *Centratherum punctatum* Cass, an emerging invader in South Africa

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Abstract

Centratherum punctatum Cass, a melittophilous shrub endemic to tropical America and Australia, has spread extensively in warm climate countries and has become an invasive species. This paper presents the first official documentation of this species naturalized outside of cultivation in South Africa. Six populations were recorded along roadsides in two provinces, primarily in Limpopo province and Kwa Zulu Natal. One of these populations was identified by a citizen scientist in South Africa. To prevent the spread of this invasive species, efforts are underway to assess the populations for possible early detection and rapid response programs to eradicate them.

Key words: Invasive alien plant, garden escapee, weeds, ornamental plants, Limpopo province, invasive plants

Introduction

Invasive alien species (IAS) are species introduced intentionally or unintentionally by human activities, capable of establishing self-sustaining populations that can spread widely over long distances and produce large numbers of reproductive offspring (Richardson et al. 2000). Invasive species are recognized as major drivers of global biodiversity loss and ecosystem degradation, posing significant ecological, economic, and social challenges worldwide (Sala et al. 2009). Understanding the ecology of invasive species is crucial for effective management, as they often possess specific traits that contribute to their success in colonizing and establishing populations in new environments (Chen et al. 2024). These traits may include high reproductive rates, rapid growth, broad environmental tolerance, lack of natural enemies, and high dispersal ability (Rojas-Botero et al. 2022; Su et al. 2023; Young et al. 2017). The ecological processes that facilitate invasions, such as propagule pressure, biotic resistance, and community dynamics, are important factors that determine the success or failure of invasive species in a new environment (Rojas-Botero et al. 2022; Vedder et al. 2020; Young et al. 2017).

Management of invasive species requires a multi-faceted approach that includes prevention, early detection, rapid response, and long-term control efforts (Chen et al. 2024). Early detection and rapid response efforts aim to identify and address new invasive species populations before they become established and spread (Reaser et al. 2020; Westbrooks 2004). *Centratherum punctatum*, commonly known as "Purple Fleabane" or "Spreading *Centratherum*", is a flowering plant that belongs to the family Asteraceae. Native to tropical regions of tropical America and Australia (Dargas et al. 2016), *C. punctatum* is known for its attractive purple flowers and medicinal properties. It has been observed to thrive well in disturbed sites such as roadsides in its native region (Dargas et al. 2016), which may contribute to its success as an invader in regions where it has been introduced, such as Taiwan where it has already naturalized and exhibits invasive tendencies (Chen and Wu 1999). In South Africa, the earliest known records of the species were from KwaZulu Natal at Meise botanic garden where it is now fairly widespread (Alison Young *personal communication*), and it is currently spreading rapidly in Limpopo province, South Africa. Initiating a rapid response and implementing effective eradication strategies are vital for curbing the spread and associated impacts of this imminent invaders (Ahmad et al. 2019a, b; Clements et al. 2004). In this study, we report on the emerging plant invader *C. punctatum*, document its flower visitors, and provide recommendations for curbing its proliferation in South Africa.

Materials and methods

Opportunistic C. punctatum *sightings*

This report is based on the results of annual early detection and rapid response surveys commissioned by the Directorate on Biodiversity Evidence of the South African National Biodiversity Institute (SANBI), similar to previous surveys reported. These surveys were conducted in the Limpopo province between 2022–2023, and the species was identified based on its morphological features. The existence of the species in the Thohoyandou National Botanical Garden and Thate Vondo forest was first reported by citizen scientist Mr. Rofhiwa Netshituni. Herbarium specimens were deposited at the Larry Leach Herbarium of the University of Limpopo (UNIN 1220096) and Pretoria (PRE) National herbarium. A search of the Southern African Plant Invaders Atlas (SAPIA) database did not yield any record of the species.

Results and discussion

Occurrence records

The recent discovery of *C. punctatum* in Limpopo (Figure 1), several kilometers away from its known populations, has raised significant concern due to its reported invasive tendencies in other parts of the world. Specifically,



Figure 1. The inflorescence of *Centratherum punctatum* recorded in Limpopo province.

in particularly in Limpopo province and Durban, KwaZulu Natal, where it has already exhibited invasive behaviour after escaping cultivation (Alison Young *personal communication*). Moreover, reports from citizen scientists highlight the valuable role they can play in early detection of invasive species and emerging invaders. In total this study reports on seven population recorded to date (Supplementary material Table S1). Citizen scientists have been shown to provide crucial information on the distribution and abundance of invasive species, aiding in the identification of new populations and tracking their spread, as demonstrated in previous studies (Anderson et al. 2017; Sarat et al. 2017; Thomas et al. 2017; Varray and Hudin 2017).

Invasive plant species such as *C. punctatum* can exert significant indirect effects on native plant communities by altering pollinator dynamics. As a melittophilous species with year-round flowering, *C. punctatum* attracts a diverse assemblage of arthropods, such as bees, butterflies, beetles, flies, ants, mantises, spiders, and others (Figure 2). This kind of aggregation of floral visitors and predators can disrupt native pollination networks, similar to impacts observed with *Leucanthemum vulgare* in California and South Africa (Moshobane et al. 2022a; Suttle 2003). Comparable interactions have also been documented in its native range (Dargas et al. 2016). These findings highlight the need for focused studies on pollinator assemblages and the ecological consequences of *C. punctatum* in invaded ecosystems.

Potential pathway of introduction and proliferation

Botanical gardens play a dual role in plant invasions, acting both as pathways for introducing non-native species through ornamental and medicinal cultivation, and as monitoring sites for early detection (Culley et al. 2022).



Figure 2. Plate of insects recorded visiting the flower of *C. punctatum* in Thathe vondo forest, Limpopo province (arthropods visiting flowers of *C. punctatum* : a) ant, b) prey mantis, c) beetles and fly, d) spider, e) spider and moth).

Climate change may further accelerate naturalisation risks (Dullinger et al. 2017; Van der Veken et al. 2008). *Centratherum punctatum*, widely grown for ornamental and medicinal use, contains numerous bioactive compounds (Gbolade et al. 2009) and has demonstrated therapeutic potential (Bieski et al. 2012; Pawar and Arumugam 2011). However, related species such as *C. brachylepis* Sch. have shown toxicity (Medeiros et al. 2009). Therefore, early identification, local authority reporting, and public awareness through educational materials are essential for managing potential invasions effectively.

In the present study *C. punctatum* has been observed to occur predominantly along roadways, including both disturbed and paved roads. This distribution pattern is consistent with previous studies demonstrating that roads can act as conduits for the spread of invasive plant species by providing linear corridors that facilitate dispersal and colonization, often leading to significant ecological alterations (Moshobane et al. 2022b; Son et al. 2024). The role of roads as vectors for invasive plant expansion is well-documented, with numerous studies underscoring their importance in promoting establishment and spread, particularly in disturbed habitats (Adhikari et al. 2024; Lemke et al. 2019; Rahlao et al. 2010; Son et al. 2024).

Conclusions

In conclusion, the study underscores the critical importance of understanding the ecological dynamics of invasive alien species (IAS) for effective management strategies. IAS, introduced by human activities, have emerged as drivers of global biodiversity loss and ecosystem degradation, necessitating

comprehensive actions. The success of invasions is attributed to specific traits, such as high reproductive rates and rapid growth, that enable these species to establish and proliferate in new environments. *Centratherum punctatum*, an invasive shrub recently documented in South Africa, exemplifies these trends. Its expansion raises concerns, particularly in Limpopo and KwaZulu Natal, where it has displayed invasive behavior post-cultivation.

This study sheds light on the important role of citizen scientists in detecting and tracking invasive species. The interactions between *C. punctatum* and diverse arthropod visitors highlight its potential impact on local ecosystems. Notably, the observed predation on pollinators by spiders underscores the complex ecological implications of this invasion. These findings, paralleling those from its native region, underline the significance of such phenomena and emphasize the importance of vigilant monitoring and management efforts. Ultimately, this research contributes to the broader understanding of invasive species dynamics and informs strategies to mitigate their adverse effects on ecosystems and biodiversity.

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Disclaimer

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Supplementary material

The following supplementary material is available for this article:

Table S1. Occurrence records of *Centratherum punctatum*.

This material is available as part of online article from:
http://www.reabic.net/journals/bir/2026/Supplements/BIR_2026_Moshobane_etal_SupplementaryMaterial.xlsx