

Invasive alien plants of horticultural origin growing in Zimbabwe: Analysis of control mechanisms and management.

Alfred Maroyi

Department of Biotechnology and Biological Sciences, University of Fort Hare, Private Bag X1314, Alice 5700, South Africa.

Page | 1

Abstract

Alien ornamental plants which escape from cultivation usually establish themselves and invade other habitats with far-reaching ecological and economic consequences. The current study, conducted in Zimbabwe, assessed the diversity of invasive alien ornamental plants in the country, the life forms of the species, their continents of origin, preferred invasion habitats, management and spread of the species. This study therefore focused on alien ornamental plant species which reproduce or spread without continued human help. An extensive literature review resulted in the identification of 41 invasive alien plant species used as ornamentals in Zimbabwe. Documented species belong to gymnosperms (4.9%), ferns (7.3%), monocots (9.8%) and eudicots (78%). More than half of the ornamental species (65.9%) are members of the Solanaceae family with six species, followed by Asteraceae and Fabaceae (five species each), Euphorbiaceae (three species), Cactaceae, Meliaceae, Pinaceae and Salvinaceae (two species each). About three-quarters of invasive alien species used as ornamentals in Zimbabwe (70.7%) are native to America, followed by Asia contributing six species (14.6%), Africa and Oceania with four species each (9.8%). Results of this study showed that degraded areas, roadsides, riparian habitats, woodland and forest formations are the preferred invasion habitats of invasive alien species used as ornamentals in Zimbabwe. Results of this study are important for monitoring existing alien plant species in the country, new introductions, and managing biological invasions. A better understanding of their establishment, spread, social and economic impacts, and distributional changes over time is vital for making informed decisions about alien plant species.

Keywords: Alien species, floristic diversity, ornamental plants, plant invasion, taxonomy

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Corresponding Author: Alfred Maroyi

Email: amaroyi@ufh.ac.za

Department of Biotechnology and Biological Sciences, University of Fort Hare, Private Bag X1314, Alice 5700, South Africa.

Introduction

Invasive alien plants (IAPs) are non-native plant species that have been introduced to a new geographical area, and such species can “sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable distances from the parent and/or site of introduction and have the potential to spread over long distances” (Richardson et al., 2011). The use of exotic ornamental plants has often led to the introduction of aggressive invaders (Li et al., 2004). Ornamental plants are variable in terms of their life forms and cultivation needs, and they form an important component of the human environment as these species are valuable components of the domestic home and commercial gardens, cemeteries, street trees, floriculture plantations and specialist garden collections (Pergl et al., 2016). Literature studies show that ornamental horticulture is one of the major pathways for introducing and spreading alien plant species into natural landscapes globally (Hulme et al., 2018; Raicu et al., 2025).

Many ornamental plant species, initially cultivated for their aesthetic and functional value in home and commercial gardens and recreational spaces, have demonstrated invasive potential by their capacity to escape from cultivation and establish populations in riparian habitats (Raicu et al., 2024). Richardson et al. (2007) argued that urban and peri-urban riverbanks act as transitional zones between aquatic and terrestrial habitats, as these ecosystems are important pathways for the introduction of alien plant species. Alien plant species that have escaped from cultivation are divided into three categories, that is, casual, naturalized, and invasive aliens. According to Pyšek et al. (2004), casual aliens reproduce occasionally outside cultivation, do not form self-sustaining populations, and rely on repeated introductions for their persistence. Similarly, naturalized species are defined as aliens that reproduce consistently without direct human intervention by recruitment from seed or ramets and are capable of independent growth (Pyšek et al., 2004). Invasive alien plants (IAPs) are defined as naturalized species which produce reproductive offspring,

often in very large numbers, at considerable distances from the parent plants, and thus have the potential to spread over a large area (Pyšek et al., 2004). Therefore, once naturalized in a new region or area, many ornamental plants and other IAPs are known to cause some ecosystem modifications, resource competition, decrease native species diversity and ecosystem productivity, alter fire regimes, the rate of nutrient cycling and hence impact upon ecosystem functioning, affecting human well-being and their socio-economic conditions through various mechanisms (Holmes et al., 2020; Kachena and Shackleton, 2024; Potgieter et al., 2021; Rai and Singh, 2020).

The horticultural introduction pathway is characterized by individuals who collect bulbs, seeds, tubers, and roots of plant species for cultivation and trade (Van Kleunen et al., 2018). Alien ornamental plants that have escaped from cultivation can be used to underscore biological invasion as a staged process, where successful IAPs are expected to cross a series of spatial, environmental, and biological barriers (Clout and Williams, 2009), which include transport, establishment, and spread. Other researchers such as Semenya and Maroyi (2020) and Mengistu et al. (2025) outlined different attributes of IAPs which confer success in terms of transport, establishment, and spread of these species depending on their adaptability to the environment. Ornamental plants which escape from cultivation usually establish sustainable populations and often spread into other habitats with far-reaching ecological and economic consequences (Kowarik, 2005). The underlying reason that many exotic ornamental plants are invasive is that they possess positive traits that are highly desirable to landscapers, gardeners, and nursery managers, as these species reproduce easily, establish rapidly, and grow quickly even under stressful environmental conditions (Li et al., 2004).

Ornamental plants are characterized by a high and long-term propagule pressure, reduced risk of failure due to protection from unsuitable environmental conditions, and usually have sufficient time to adapt to local environmental conditions;

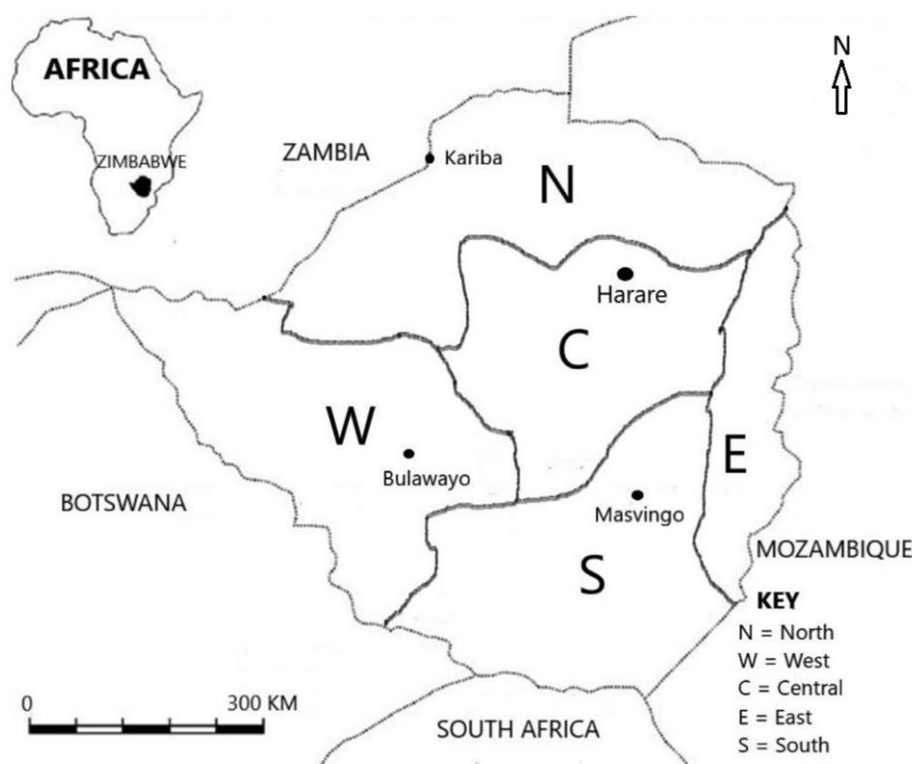
following escape, there is an abundance of suitable habitats that can serve as entry points for their establishment (Pergl et al., 2016). This study aimed to provide detailed information on the diversity of invasive alien ornamental plants in Zimbabwe, their life forms, continents of origin, preferred invasion habitats, management, and information on how these species are spreading in the country. To interpret the current plant invasion trends and predict the likely future impacts of invasive alien ornamental plants in the country, empirical data such as identities of the species, their diversity, growth forms, continent or country of origin, and preferred invasion habitats of the species are required. Such information will serve as a guide in the control and management of ornamental plant invasions in Zimbabwe.

Materials and methods

Study area.

Zimbabwe is a landlocked country, lying between latitudes 15° to 23°S and longitudes 25° to 34°E (Figure 1). The topography in Zimbabwe varies from an altitude of about 250 m above sea level in the southern part of the country to about 2600 m in the eastern part of the country (Mupfiga et al., 2022, 2025). The minimum temperatures have been recorded from around June to July, while maximum temperatures have been experienced in October, ranging from 6°C to 35°C (Mupangwa et al., 2023; Underwood et al., 2024). Annual sum of precipitation ranges from below 400 mm in the western and southern parts of Zimbabwe to above 1500 mm in the eastern part of the country (Gwitira et al., 2014; Mupfiga et al., 2022; Shekede et al., 2019; Underwood et al., 2024). The native flora of Zimbabwe is estimated to be about 6000 species of vascular plants (Mapaura and Timberlake, 2004) recorded in diversified vegetation types and habitats which include dry and moist forests, dry and moist woodlands, rocky habitats, wetlands, disturbed habitats and grasslands (Mapaura and Timberlake, 2004).

Figure 1: Map showing the study area (modified from Maroyi, 2026).



Data sources

The botanical and ecological literature studies (Biegel, 1977, 1980; Drummond, 1972, 1975; Hyde et al., 2026; Mapaura and Timberlake, 2004; Maroyi, 2006, 2009, 2012a,b, 2013, 2015, 2017, 2022, 2026; Maroyi et al., 2019; Mullin, 2000; Palgrave, 2002; Timberlake et al., 1999; Wild et al., 1972) were used as the main sources of data for all the analyses in this paper, see Table 1. The scientific publications consulted were published in English, which spanned between 1972 to 2026, a period of 54 years, a long period to capture information on invasive alien plants growing in Zimbabwe. Literature sources excluded from this review are those articles that are partially accessed, that is, accessed as abstracts only, and also published articles lacking information on invasive alien ornamental plants in Zimbabwe. The nomenclature of the species is based on the Plant of the World Online (POWO, 2026), and that of the families follows APG IV (2016) and Christenhusz and Byng (2016). The invasive alien ornamental plants in Zimbabwe

were characterized in terms of number of species, growth forms, occurrence at regional level, geographical origins and types of habitats colonized. The growth form categorization of species follows Rowe and Speck (2005) and Zeil-Rolfe et al. (2024), that is, climbers, grasses, herbs, shrubs and trees. The geographical origin of the IAPs was assessed in the following categories: Europe, the Mediterranean region, Africa, America, Asia and Oceania based on information obtained from literature studies (Biegel, 1977, 1980; Drummond, 1972, 1975; Hyde et al., 2026; Mapaura and Timberlake, 2004; Maroyi, 2006, 2009, 2012a,b, 2013, 2015, 2017, 2022, 2026; Maroyi et al., 2019; Mullin, 2000; Palgrave, 2002; Timberlake et al., 1999; Wild et al., 1972). The distribution of taxa in Zimbabwe follows Pope and Pope (1998): Northern, Western, Central, Eastern and Southern (see Figure 1). Habitat categorization of species follows Hejda et al. (2015), that is, forests, grasslands, sandy, rocky, riparian, wetland, aquatic, ruderal, roadsides and agricultural habitats.

Table 1: Overview of literature sources documenting invasive alien ornamental plants in Zimbabwe.

Author(s) and year of publication	Region	Focus of the study	No. species	No. families
Wild et al., 1972	NWCES	Common plants including invasive alien ornamental plants	5	4
Drummond, 1972	NWCES	Indigenous and naturalised taxa (invasive alien ornamental plants) belonging to the Fabaceae family	2	1
Drummond, 1975	NWCES	Woody trees, shrubs and climbers including invasive alien ornamental plants	8	7
Biegel, 1977	NWCES	Exotic plants including invasive alien ornamental plants	9	7
Biegel, 1980	NWCES	Exotic plants including invasive alien ornamental plants	11	9
Timberlake et al., 1999	NWCES	Indigenous and naturalised <i>Acacia</i> species (including alien ornamental plants)	2	1
Mullin, 2000	NWCES	Exotic conifers including invasive alien ornamental plants	2	1
Palgrave, 2002	NWCES	Indigenous and naturalised taxa (invasive alien ornamental plants)	10	9
Mapaura and Timberlake, 2004	NWCES	Indigenous and exotic vascular plants (invasive alien ornamental plants)	25	17
Maroyi, 2006	NWCES	Indigenous and exotic plants (invasive alien ornamental plants)	31	27
Maroyi, 2009	NWCES	Indigenous and exotic plants managed in home gardens (invasive alien ornamental plants)	9	7
Maroyi, 2012a	NWCES	Indigenous and exotic plants (invasive alien ornamental plants)	13	10
Maroyi, 2012b	NWCES	Indigenous and exotic plants (invasive alien ornamental plants)	22	18
Maroyi, 2013	C	Indigenous and exotic plant species managed in home gardens (invasive alien ornamental plants)	4	2
Maroyi, 2015	NWCES	Indigenous and exotic <i>Acacia</i> species (invasive alien ornamental plants)	2	1
Maroyi, 2017	NWCES	Exotic plants (invasive alien ornamental plants)	32	28
Maroyi, 2022	NWCES	Exotic plants (invasive alien ornamental plants)	34	29
Maroyi, 2026	NWCES	Exotic plants (invasive alien ornamental plants)	36	20
Maroyi et al., 2019	NWCES	Exotic plants (invasive alien ornamental plants)	29	26
Hyde et al., 2026	NWCES	Indigenous and exotic plants (invasive alien ornamental plants)	33	29

Results and discussion

Taxonomic diversity

Forty-one invasive alien plant species are used as ornamentals in Zimbabwe (Table 2), and about a quarter of these species have other applications which include being used as sources of edible fruits, fodder, oil, shade, tanbark, timber and windbreak (Table 3). Previous research conducted in Brazil (Silva et al., 2024), the Caribbean (Rojas-Sandoval and Ackerman, 2021), Romania (Urziceanu et al., 2020) and South Africa (Mokotjomela et al., 2023) showed that ornamental horticulture is a major contributor to plant invasions. The recorded ornamental species belong to gymnosperms (two species = 4.9%), ferns

(three species = 7.3%), monocots (four species = 9.8%), and eudicots (32 species = 78%). More than half of the ornamental species (27 species = 65.9%) are members of the Solanaceae family with six species, followed by Asteraceae and Fabaceae (five species each), Euphorbiaceae (three species), Cactaceae, Meliaceae, Pinaceae and Salvinaceae (two species each) (Figure 2). Previous studies in Romania (Urziceanu et al., 2020) and South Africa (Mokotjomela et al., 2023), which focused on the contribution of ornamental horticulture to plant invasions, highlighted the importance of plant families such as Asteraceae, Cactaceae, Fabaceae and Solanaceae. Moreover, families like Asteraceae, Cactaceae, Fabaceae and Solanaceae are also among the

largest plant families in the world, characterized by at least 1750 species each (Christenhusz and Byng 2016). Invasive alien plant species used as ornamentals in Zimbabwe are represented by thirty-three genera, and these include *Datura*

with four species, followed by *Senna* with three species, *Acacia*, *Euphorbia* and *Pinus* with two species each (Table 2).

Table 2: Checklist of invasive alien plant species used as ornamentals in Zimbabwe

Species and family	Common name	Growth form	Distribution
<i>Acacia mearnsii</i> De Wild.; Fabaceae	Black wattle	Tree	E
<i>A. melanoxylon</i> R.Br.; Fabaceae	Australian blackwood	Tree	CE
<i>Ageratina adenophora</i> (Spreng.) R.M.King & H.Rob.; Asteraceae	Crofton weed	Herb	NCE
<i>Ageratum conyzoides</i> L.; Asteraceae	Chick weed	Herb	NWCES
<i>Arundo donax</i> L.; Poaceae	Giant reed	Grass	NC
<i>Azolla filiculoides</i> Lam.; Salviniaceae	Water fern	Fern	NCE
<i>Browallia americana</i> L.; Solanaceae	Jamaican forget-me-not	Herb	NCE
<i>Calotropis procera</i> (Aiton) W.T.Aiton; Apocynaceae	Rubber bush	Tree	NWCES
<i>Coreopsis lanceolata</i> L.; Asteraceae	Tick-seed	Herb	CES
<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth; Cactaceae	Jumping cholla	Shrub	WS
<i>Datura ferox</i> L.; Solanaceae	Large thorn apple	Herb	WCES
<i>D. inoxia</i> P.Mill.; Solanaceae	Downy thorn-apple	Herb	NWES
<i>D. quercifolia</i> Kunth; Solanaceae	Chinese thorn-apple	Herb	C
<i>D. stramonium</i> L.; Solanaceae	Thorn apple	Herb	NWCES
<i>Erigeron karvinskianus</i> DC.; Asteraceae	Mexican fleabane	Herb	NCE
<i>Euphorbia cyathophora</i> Murray; Euphorbiaceae	Painted spurge	Herb	NWCES
<i>E. tirucalli</i> L.; Euphorbiaceae	Pencil cactus	Tree	NWCES
<i>Furcraea foetida</i> (L.) Haw.; Asparagaceae	Green-aloe	Shrub	CE
<i>Grevillea robusta</i> A.Cunn. ex R.Br.; Proteaceae	Silver oak	Tree	E
<i>Ipomoea purpurea</i> (L.) Roth; Convolvulaceae	Common morning glory	Climber	NWC
<i>Jacaranda mimosifolia</i> D.Don; Bignoniaceae	Jacaranda	Tree	NWCES
<i>Lantana camara</i> L.; Verbenaceae	Lantana	Shrub	NWCES
<i>Melia azedarach</i> L.; Meliaceae	Syringa	Tree	NWCES
<i>Myriophyllum aquaticum</i> (Vell.) Verdc.; Haloragaceae	Parrot's feather	Herb	NWCES
<i>Nicandra physaloides</i> (L.) Gaertn.; Solanaceae	Apple-of-Peru	Herb	NWCES
<i>Oenothera rosea</i> L'Hér. ex Aiton; Onagraceae	Rose evening primrose	Herb	NWCE
<i>Opuntia ficus-indica</i> (L.) Mill.; Cactaceae	Sweet prickly-pear	Shrub	WCES
<i>Persicaria capitata</i> (Buch.-Ham. ex D.Don) H.Gross; Polygonaceae	Pink-head knotweed	Climber	ES
<i>Pinus patula</i> Schiede ex Schltdl. & Cham.; Pinaceae	Patula pine	Tree	CE
<i>P. roxburghii</i> Sarg.; Pinaceae	Chir pine	Tree	CE
<i>Pistia stratiotes</i> L.; Araceae	Water lettuce	Herb	NWCES
<i>Pontederia crassipes</i> Mart.; Pontederiaceae	Water hyacinth	Herb	NWCES
<i>Prunus cerasoides</i> Buch.-Ham. ex D.Don; Rosaceae	Himalayan flowering cherry	Tree	CE

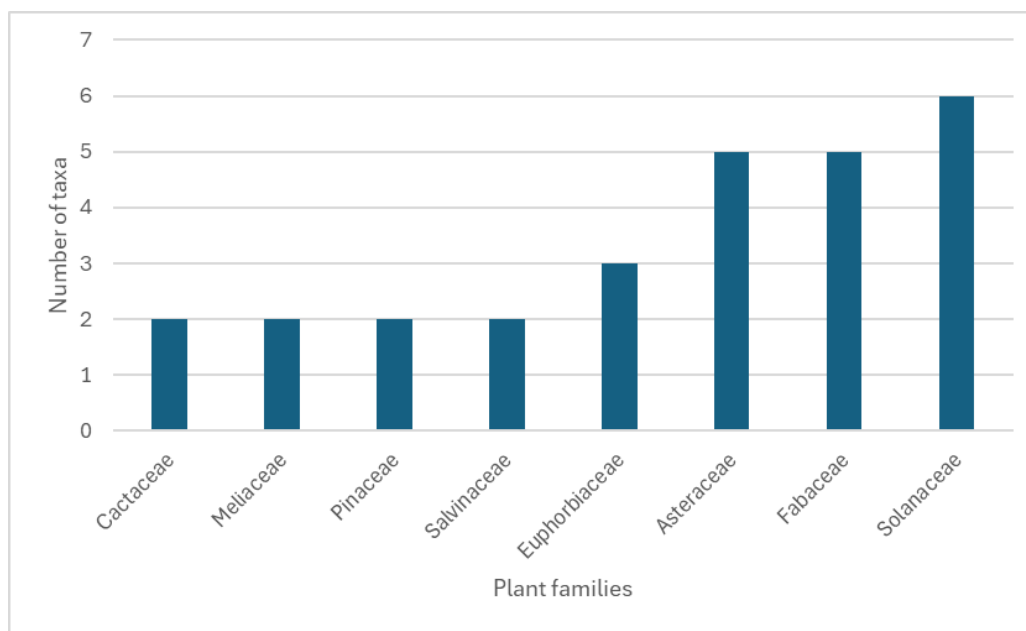
<i>Psidium guajava</i> L.; Myrtaceae	Guava	Tree	NWCES
<i>Ricinus communis</i> L.; Euphorbiaceae	Castor-oil plant	Shrub	NWCES
<i>Salvinia molesta</i> D.S.Mitch.; Salviniaceae	Kariba weed	Fern	NWCE
<i>Senna didymobotrya</i> (Fresen.) H.S.Irwin & Barneby; Fabaceae	Peanut butter cassia	Shrub	NWCES
<i>S. occidentalis</i> (L.) Link; Fabaceae	Coffee senna	Herb	NWCES
<i>S. pendula</i> (Humb. & Bonpl. ex Willd.) H.S.Irwin & Barney; Fabaceae	Easter senna	Shrub	NCE
<i>Tithonia rotundifolia</i> (Mill.) S.F.Blake; Asteraceae	Red sunflower	Herb	NWCES
<i>Toona ciliata</i> M.Roem.; Meliaceae	Red cedar	Tree	NC

Table 3: Geographical origins, introduction pathways and other uses of documented species

Species	Native range	Other uses	Habitat
<i>A. mearnsii</i>	Oceania	Tanbark and timber	Forest margins, grassland and ruderal
<i>A. melanoxylon</i>	Oceania	Timber	Forest, forest margins and grassland
	America	-	Agricultural, forest, riparian, roadsides and woodland
<i>A. adenophora</i>	America	-	Agricultural, forest, riparian, ruderal and woodland
<i>A. conyzoides</i>			
<i>A. donax</i>	America	-	Riparian and wetland
<i>A. filiculoides</i>	America	-	Aquatic
<i>B. americana</i>	America	-	Agricultural, roadsides and ruderal
<i>C. procera</i>	Africa and Asia	-	Rocky, roadsides and ruderal
<i>C. lanceolata</i>	America	-	Roadside and ruderal
<i>C. fulgida</i>	America	-	Rocky and ruderal
<i>D. ferox</i>	America	-	Agricultural, riparian and ruderal
<i>D. inoxia</i>	America	-	Agricultural, riparian and ruderal
<i>D. quercifolia</i>	America	-	Ruderal
<i>D. stramonium</i>	America	-	Agricultural, roadsides, ruderal and woodland
<i>E. karvinskianus</i>	America	-	Forest and ruderal
<i>E. cyathophora</i>	America	-	Agricultural and ruderal
<i>E. tirucalli</i>	Africa	-	Agricultural and woodland
<i>F. foetida</i>	America	-	Secondary vegetation and woodland
	Oceania	Shade, wind break and timber	Forest and riparian
<i>G. robusta</i>			
<i>I. purpurea</i>	America	-	Agricultural, roadsides and ruderal
<i>J. mimosifolia</i>	America	-	Forest, grassland and woodland
<i>L. camara</i>	America	-	Agricultural, ruderal and woodland
	Asia	and -	Agricultural, riparian and woodland
<i>M. azedarach</i>	Oceania		
<i>M. aquaticum</i>	America	-	Aquatic
<i>N. physaloides</i>	America	-	Agricultural, roadsides, ruderal and woodland
<i>O. rosea</i>	America	-	Agricultural and ruderal
<i>O. ficus-indica</i>	America	Edible fruits and fodder	Agricultural, rocky, ruderal and woodland

<i>P. capitata</i>	Asia	-	Agricultural, roadsides and ruderal
<i>P. patula</i>	America	Timber	Forest, grassland and scrub
<i>P. roxburghii</i>	Asia	Timber	Forest and grassland
<i>P. stratiotes</i>	America	-	Aquatic
<i>P. crassipes</i>	America	-	Aquatic
<i>P. cerasoides</i>	Asia	-	Riparian and woodland
<i>P. guajava</i>	America	Edible fruits	Forest, riparian and roadsides
<i>R. communis</i>	Africa	Oil	Agricultural, forest, riparian and ruderal
<i>S. molesta</i>	America	-	Aquatic
<i>S. didymobotrya</i>	Africa	-	Roadsides and ruderal
<i>S. occidentalis</i>	America	-	Roadsides and ruderal
<i>S. pendula</i>	America	-	Riparian, roadsides and ruderal
<i>T. rotundifolia</i>	America	-	Agricultural, roadsides and ruderal
<i>T. ciliata</i>	Asia	Timber	Riparian, ruderal and wetland

Figure 2: Families with Two or More Invasive Alien Species. Source: Author



Growth forms, geographical origins and introduction pathways

The floristic region with the highest number of horticultural ornamental species in Zimbabwe is Central with 36 species (87.8%), followed by the Eastern region (35 species = 85.4%), Northern (27 species = 65.9%), Western (24 species = 58.5%) and Southern with 23 species (56.14%) (Figure 3). According to Maroyi (2006), small-scale plantings of IAPs in Zimbabwe, particularly ornamental plants is linked to the

country's colonial history and the settlement of the colonists in the country in the 1890s and early 20th century. This is the period when botanical gardens flourished in the British colonies, and ornamental plants and other associated uses such as hedges, shade, and wind breaks were transported from one continent to another (Maroyi, 2006, 2012b). Plant species that are used as ornamentals in Zimbabwe that have been recorded in all five floristic regions include *Ageratum conyzoides* L., *Calotropis procera* (Aiton) W.T.Aiton,

Datura stramonium L., *Euphorbia cyathophora* Murray, *E. tirucalli* L., *Jacaranda mimosifolia* D.Don, *Lantana camara* L., *Melia azedarach* L., *Myriophyllum aquaticum* (Vell.) Verdc., *Nicandra physaloides* (L.) Gaertn., *Pontederia crassipes* Mart., *Psidium guajava* L., *Ricinus communis* L., *Senna didymobotrya* (Fresen.) H.S.Irwin & Barneby, *S. occidentalis* (L.) Link and *Tithonia rotundifolia* (Mill.) S.F.Blake (Table 2). Some of these species are important in the horticulture industry, partly because such species are known to have desirable characteristics such as easy propagation, production of beautiful flowers, rapid growth, and establishment rate (Seboko et al., 2024).

Close to half of invasive alien species used as ornamental plants in Zimbabwe (42%) are herbs, followed by trees (29%) and shrubs (17%), see Figure 4. The prevalence of herbaceous plants is to some extent correlated with the dominant plant families, that is, Asteraceae, Fabaceae and Solanaceae, which have a significant proportion of herbaceous plants (Hasanuzzaman et al., 2020; Samuels, 2015; Zhang and Elomaa, 2024). About three-quarters of invasive alien species used as ornamentals in Zimbabwe (29 = 70.7%) are native to America, followed by Asia

contributing six species (14.6%), Africa and Oceania with four species each (9.8%) (Figure 5). Invasive alien plants used as ornamentals in Zimbabwe occupy a wide range of habitats in the country, with more than half of the species (56.1%) having been recorded as ruderals, followed by species recorded as agricultural weeds (41.5%) (Figure 6). Other habitats where invasive alien plant species used as ornamentals in Zimbabwe have been recorded in the following habitats (in descending order of importance): roadsides, riparian, woodland, forest, grassland, aquatic, rocky areas, forest margins, wetland, scrub and secondary vegetation (Figure 6). Previous research showed that herbaceous alien plants are the predominant growth forms in disturbed habitats, such as abandoned agricultural fields, ruderal areas, wastelands, cultivated areas and roadsides (Meddour et al., 2020). Similarly, other studies in different regions of the world showed that herbaceous alien plant species often thrive in pioneer, disturbed habitats and ruderal areas due to their ability to grow rapidly and their resilience to environmental stress (Dubyna et al., 2022; Gazoulis et al., 2022; Omer et al., 2021; Sohrabi et al., 2023).

Figure 3: Distribution of invasive alien species used as ornamentals in Zimbabwe.

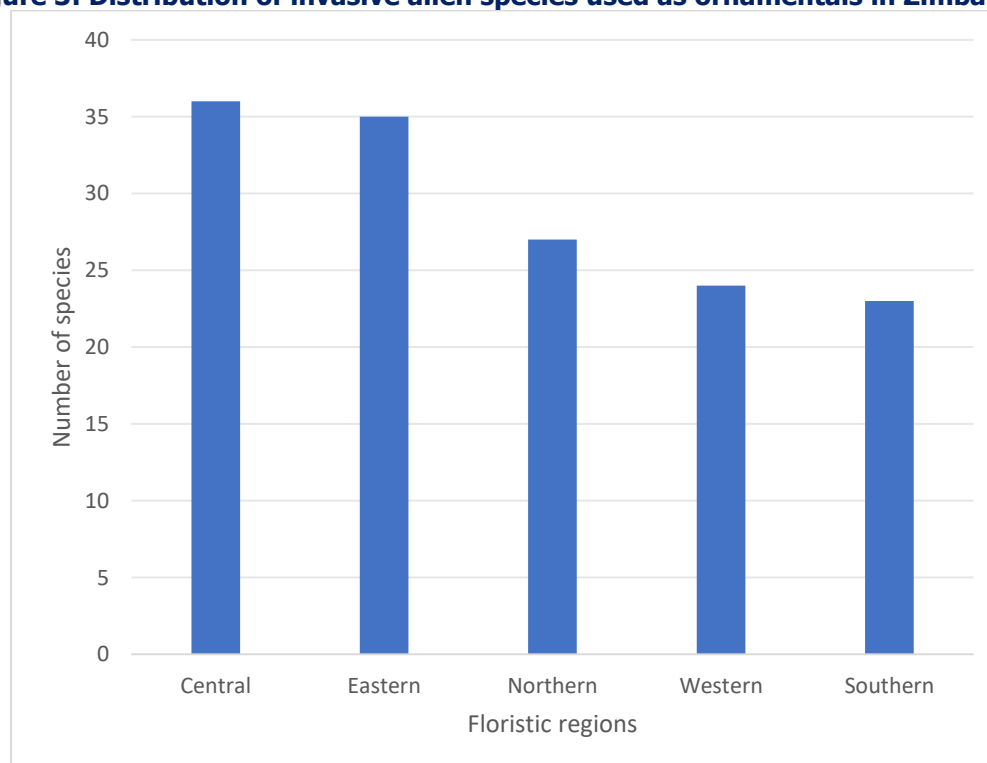


Figure 4: The growth forms of invasive alien species used as ornamentals in Zimbabwe.

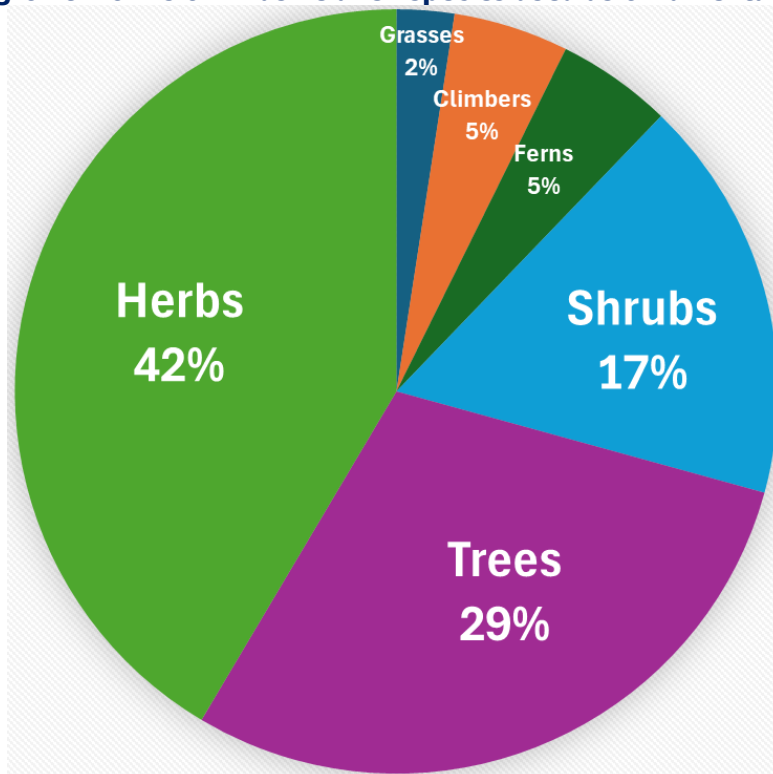


Figure 5: Geographical origin of invasive alien plants used as ornamentals in Zimbabwe.

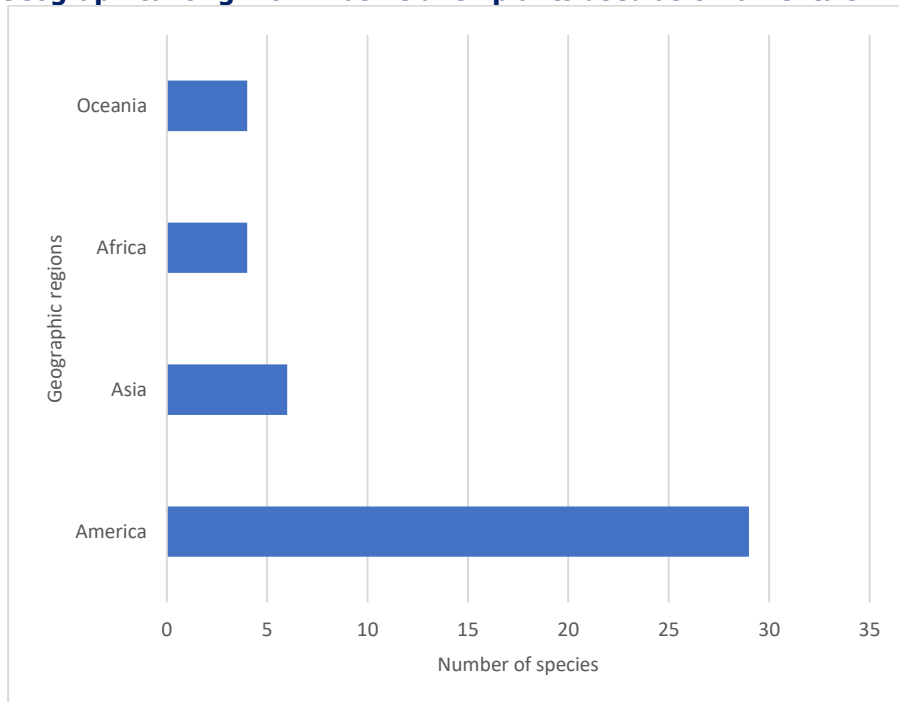
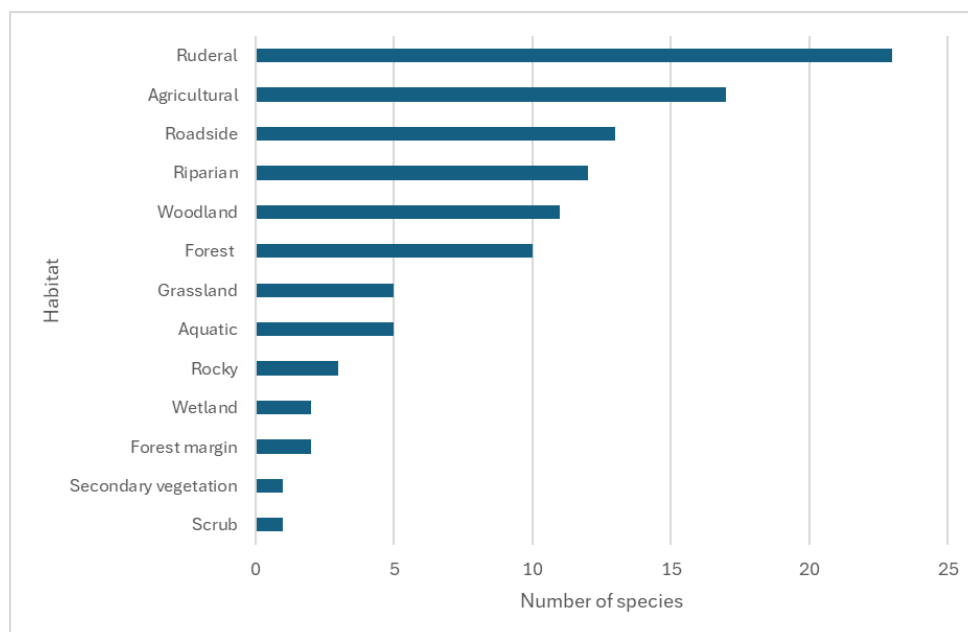


Figure 6: Habitats in which invasive alien species used as ornamentals are found in Zimbabwe. Source: Author



Conclusions

The research findings of the current study highlight the importance of ornamental plants as valuable components of domestic and public gardens, cemeteries, street trees, floriculture plantations and specialist garden collections. However, invasive ornamental plants may escape from cultivation and invade natural habitats, where they colonize, establish themselves, and in some cases become aggressive invaders. Understanding the diversity of invasive alien ornamental plants is essential for interpreting current trends predict ecological and socio-economic impacts. There is therefore a need for proper assessment, management, and control measures for IAPs used as ornamental plants in Zimbabwe if negative impacts associated with IAPs are to be minimized. The IAPs are an important feature of the Zimbabwean landscape and ecosystems; therefore, there is a need for a database of such species and associated information about their undesirable properties. The best long-term solution for containing the spread of well-known invasive ornamental plants is to put specific management and control measures in place to ensure that their numbers are kept in check.

Limitations of the study

Research focusing on exotic plants and/or IAPs is often associated with several limitations, including deficiencies in taxonomic information such as exotic species, countries of origin, and reasons for their introductions. In addition to this, some exotic plants and/or IAP categories, such as lower plants, that is, bryophytes, ferns, fern allies, and gymnosperms, are under-represented in the literature. Therefore, this probably resulted in publication bias, as it caused subjectivity in the interpretation and synthesis of the research findings.

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Author contributions

I am solely responsible for the conception and design of the research work, data collection, analysis, interpretation of the data, and writing of the manuscript.

Registration and protocol

The review was not registered, and a protocol was not prepared.

Competing interests

The author declares that there is no conflict of interest associated with this research.

List of abbreviations

APG IV - Angiosperm Phylogeny Group IV

C - Central

E - Eastern

IAPs - Invasive alien plants

N - Northern

POWO - Plant of the World Online

S - Southern

W - Western

Availability of data, code, and other materials

All data generated or analyzed during this study are included in this article.

Author biography

Alfred Maroyi is a Professor of Botany in the Department of Biotechnology and Biological Sciences, University of Fort Hare

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