Skvortsovia: 10(1): 1–13 (2024)

Skvortsovia
http://skvortsovia.uran.ru/
ISSN 2309-6497 (Print)
ISSN 2309-6500 (Online)

Article

DOI:10.51776/2309-6500_2024_10_1_1_13

A first documented record of naturalized *Asclepias curassavica* L. (Apocynaceae) in the Emirate of Abu-Dhabi, UAE

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Received: 14 June 2024| Accepted by: Alexander Sukhorukov 13 August 2024 | Published online: 26 August 2024
Edited by: Keith Chamberlain

Abstract

A brief report is presented of the discovery in Abu Dhabi Emirate, on the first recorded case of naturalization of a species of Apocynaceae, *Asclepias curassavica* L., which is an alien species in the United Arab Emirates (UAE). This species is occasionally cultivated in the UAE as an ornamental plant and sometimes runs wild and grows as a weed around gardens (Byalt and Korshunov, 2021a). A small, naturalized population of this species was discovered in November 2011 in Wadi Tarabat on Jebel Hafeet, a mountain just south of Al Ain. Jebel Hafeet (1,140 m) is a limestone anticline, which is 17 km long and 4 km wide and is isolated from the Hajar range of mountains located 20 km to the east. *Asclepias* is pollinated here by local butterflies and wasps and produces many seeds with pappus that are easily distributed by wind. In one place, in Abu Dhabi Emirate, it is truly naturalized, blooming and bearing fruit constantly, and should therefore be recommended for inclusion in the list of invasive species in the UAE.

Keywords: Abu Dhabi, *Asclepias*, naturalization, new records, United Arab Emirates

Introduction

On 21st November 2011 we visited Jebel Hafeet, a mountain just south of Al Ain, Abu Dhabi, in the United Arab Emirates (UAE). Jebel Hafeet (1,140 m) is a limestone anticline, which is 17 km long and 4 km wide and is isolated from the Hajar mountain range located 20 km to the east. It straddles UAE in the north and Oman in the south and represents a stark contrast to the flat plain that surrounds the mountain on all sides. One new naturalized alien species for Abu Dhabi Emirate, *Asclepias curassavica* L. (Apocynaceae), was found in the environs of Al-Ain in the north-eastern part of the emirate, in the upper part of Wadi Tarabat [24°4'39.5"N 55°46'40.11"E] (Figs. 1–3).

Figure 1. Map of Jebel Hafeet in the environs of Al Ain (based on Google Maps)

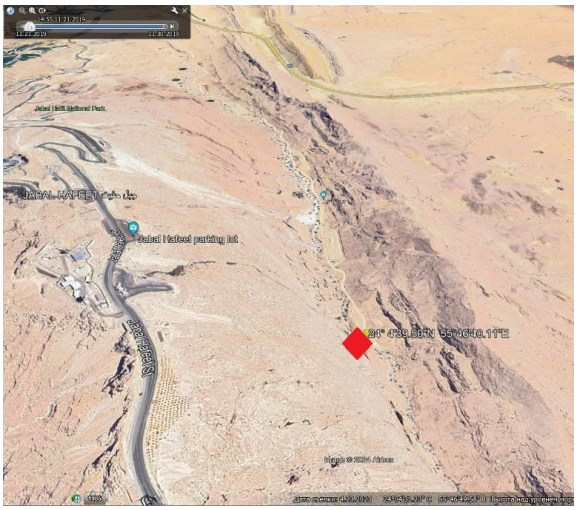

Figure 2. Map of Wadi Tarabat. Red rhombus indicates the site of discovery of naturalised *Asclepias curassavica* L. (based on Google Maps)

Figure 3. Limestone rocks with crack formed by flowing water

This plant was subsequently found growing in large numbers on rock ledges and the stony banks of a spring, in cracks below wet rocks and on boulders, at an altitude of about 500 m (Figs. 3, 4–6). The source of water in the stream is the drainage water from air conditioning systems and sewage discharge from the villas and two hotels located above on the cliff.

Figure 4. Wet and shady rocks with ferns (*Adiantum*) and mosses

Asclepias curassavica was not previously included in the Abu Dhabi emirate flora list (see Böer, 1998; Böer and Al Ansari, 1999; Böer and Chaudhary, 1999; Jongbloed *et al*., 2000, 2003; Brown and Sakkir, 2004 a, b; Karim and Fawzi, 2007). There is a mention of this species in the article by Sakkir and Brown (2013), although it was not included in their 2004 list of species recorded as new for Jebel Hafeet (Brown and Sakkir, 2004a). The quotation from the 2013 publication reads: "Apart from the native species listed in this paper, some exotics have also gained a foothold on the mountain and are thriving, including the striking perennial

Figure 5. Typical vegetation on spring banks

Figure 6. Naturalised *Asclepias curassavica* L. on wet limestone ledge

Asclepias curassavica." It is not clear from this text whether it is in the same place that we discovered it or whether *Asclepias curassavica* is found in different places in the wadi where sewage and drainage waters are discharged from buildings above. In any case, we consider it necessary to pay attention to the invasive potential of *Asclepias curassavica*. Clearly, this plant

can naturalize quite easily if there is a source of moisture, such as in some wadis, and its periodical monitoring is required, in Wadi Tarabat, especially, since this is the territory of the National Park of Jebel Hafeet.

Material and methods

The plants in photographs and collected specimens were identified using the available descriptions in floras (Linneaus, 1753; Ali and Nasir, 1983; Li *et al*., 1995; Fishbein *et al*., 2023) and the online resources, *Global Biodiversity Information Facility* (GBIF, 2024) and *Global Plants JSTOR* (2022). Herbarium specimens were placed at LE and FSH (herbarium acronyms are given as in Thiers, 2020). The names of the taxa, authors' abbreviations and places of publication were checked against those in the *International Plant Names Index* (IPNI, 2024). The names of taxa, that are accepted by the authors of the current paper are in bold. The taxonomic decisions were made by analysing the literature and the available taxonomic databases, *Catalogue of Life* (CoL, 2024), *Plants of the World Online* (POWO, 2024) and *Tropicos* (2024). Distribution is given as recommended in the *World Geographical Scheme for Recording Plant Distribution* (Brummitt, 1992). All photographs in the article were taken by Vladimir and Mikhail Korshunov.

Results and Discussion

Asclepias curassavica L. in Sp. Pl.: 215 (1753) ≡ *Asclepias bicolor* Moench, Methodus: 717 (1794), nom. superfl. ≡ *Asclepias aurantiaca* Salisb. in Prodr. Stirp. Chap. Allerton: 150 (1796), nom. superfl. ≡ *Asclepias nivea* L. var. *curassavica* (L.) Kuntze, Revis. Gen. Pl. 2: 418 (1891). = *Asclepias margaritacea* Hoffmanns. ex Schult., Syst. Veg. (J.J.Roemer & J.A.Schultes), ed. 15[bis], 6: 86 (1820) = *Asclepias cubensis* Wender., Bot. Zeitung (Berlin) 1: 830 (1843).

Common names: tropical milkweed, bloodflower, cotton bush, cockroach herb, Mexican butterfly weed, redhead, scarlet milkweed, wild ipecacuanha.

An American species by origin, widely cultivated and naturalized is, in fact, currently considered to be a pantropical weed.

Asclepias curassavica differs from other closely related species by flowers with bright red corolla, orange or yellow corona with a prominent tooth arising from the cavity and arching over the stylar head. Related species have white, yellow, green or brownish corolla with variously coloured corona, corona tooth missing or inconspicuous and included within the

Figure 7. Blooming and fruiting *Asclepias curassavica* L.

Figure 8. Herbarium specimen of *Asclepias curassavica* L., kept at LE (LE01195403)

cavity of the lobe. It is an annual or short-lived perennial with fibrous, non-tuberous rootstock (Goyder, 2009) (Figs. 7 and 8).

The species name is accepted in the taxonomic databases, *Catalogue of Life* (CoL, 2024), *Global Biodiversity Information Facility* (GBIF, 2024) and *Plants of the World Online* (POWO, 2024). Its native distribution range is reported to be Mexico to Tropical South America. It is a subshrub and grows primarily in the seasonally dry tropical biome (POWO, 2024). On the Arabian Peninsula, *Asclepias curassavica* is found in Saudi Arabia (Checklist of Flora Saudi Arabia, 2011), where it escaped from cultivation. One site is recorded from Oman according to the *Global Biodiversity Information Facility* (GBIF, 2024). For UAE generally, this species has not been reported before 2013 (Western, 1989; Jongbloed *et al*., 2003; Sakkir, 2004 a, b; Karim and Fawzi, 2007), when it was recorded for Jebel Hafeet without specific data on its habitat there (Sakkir and Brown, 2013).

For the first time, we have found and photographed this species in Abu-Dhabi Emirate in November 2011, (Fig. 7, 8) in the mountains at about 500 m a.s.l. in the environs of Al-Ain, although herbarium specimens were not collected at that time. Subsequently, it was found by us in 2020 in Fujairah Emirate, in Al Bidiya, Al Qalamoon Nursery, 0.3 km E of Eid Prayer Ground Bidya (25°25′24.7″ N, 56°20′18.77″ E) (Byalt and Korshunov, 2021a).

Our plants match the herbarium specimens of *Asclepias curassavica* at JSTOR (LINN-HL310-18!, BM001046268!, BR0000005202591!, BR0000005198498; K001125046!, LE01194403; M0175024; MA660615!, RSA0024068!), the specimens of *A. curassavica* at GBIF (https://www.gbif.org/species/3170241) and also the original description of *A.*

curassavica given by Linnaeus (1753), as well as descriptions given in *Flora of Pakistan* (Ali and Nasir, 1983), *Flora of China* (Li *et al*., 1995) and *Flora of North America* (Fishbein *et al*., 2023).

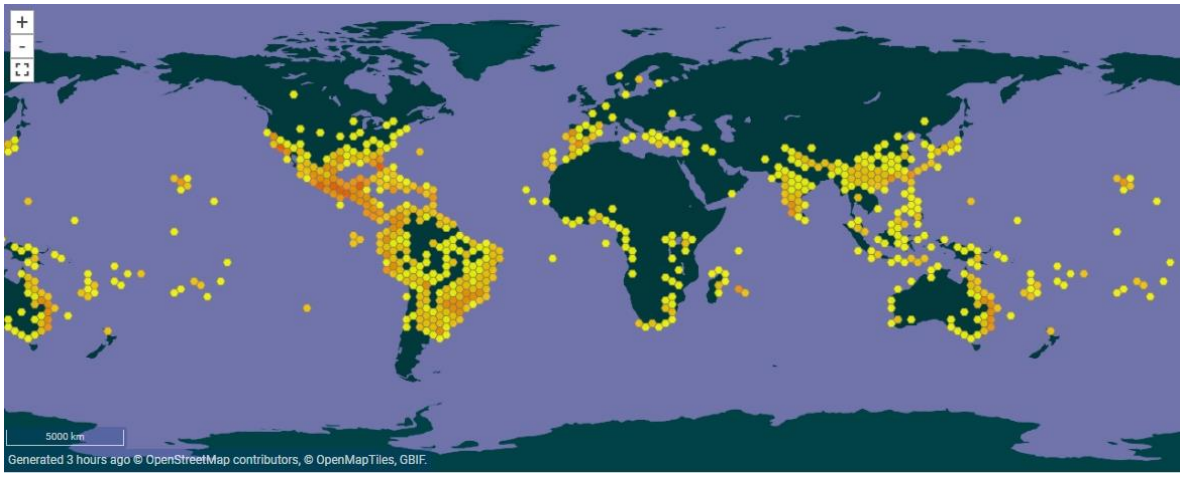

Figure 9. Map of distribution of *Asclepias curassavica* L. (from the website GBIF.org)

Distribution worldwide: *Asclepias curassavica* has a native range from Mexico to tropical South America. According to POWO (2024) it is native to: Bahamas, Belize, Bolivia, Brazil, Cayman Islands, Chile (Galápagos Islands), Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, French Guiana, Guatemala, Guyana, Haiti, Honduras, Jamaica, Leeward Islands, Mexico, Dutch Antilles, Nicaragua, Panamá, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Turks-Caicos Islands, Venezuela, and Society Islands (Windward Islands). It is widely cultivated, escapes into the wild and is naturalized in tropical countries throughout the World as shown on the map (Fig. 9). It is recorded as introduced in 61 countries and widely naturalized in tropical Asia (India, Bhutan, Indonesia, Philippines, Singapore, Sri Lanka, Papua New Guinea, China, Taiwan, Thailand), Africa (Botswana, Egypt, Ghana, Lesotho, Namibia, RSA, Sudan, Eswatini, Zimbabwe), and Australia (GBIF, 2024; POWO, 2024).

Distribution in UAE: Fujairah Emirate: Al Bidiya, Al Qalamoon Nursery, 0.3 km E of Eid Prayer Ground Bidyah, 25°25′24.70″ N, 56°20′18.77″ E, elevation 22 m: weed in and between plastic pots with cultivated plants, 15.V.2020, fl., fr., *V.V.Byalt & M.V.Korshunov 2959*, Abu Dhabi Emirate (LE, FSH), (Figs. 10–16).

So far, there are at least two places where *Asclepias curassavica* has been found as an alien species in UAE. In one place it is truly naturalized, blooming and bearing fruit constantly, and should therefore be recommended for inclusion in the list of invasive species. *Asclepias* is

pollinated here by local butterflies and wasps (Figs. 10 and 11) and produces many seeds with pappus that are easily distributed by wind (i.e. it is an anemochorous plant) (Fig. 12).


Figures 10 and 11. Butterflies and wasps are pollinators of *Asclepias curassavica* L. in Wadi Tarabat

Figure 12. Seeds of *Asclepias curassavica* L. are easily dispersed by wind


Figures 13 and 14. Naturalised *Asclepias curassavica* L. on rocks

Figure 15. Naturalised *Asclepias curassavica* L. between stones

Figure 16. Naturalised *Asclepias curassavica* L. in Wadi Tarabat

Along with *Asclepias curassavica* and other common mountain plants, some rather rare plants grow in Wadi Tarabat, including *Acridocarpus orientalis* A.Juss. (Malpighiaceae) (Fig. 17), *Iphiona aucheri (*Boiss.) Anderb. (Asteraceae) (Fig. 18), *Withania somnifera* (L.) Dunal (Solanaceae) (Fig. 19), *Senecio breviflorus* (Kadereit) Greuter (Asteraceae) (Fig. 20), *Typha domingensis* Pers. (Typhaceae) (Fig. 21), *Euphorbia indica* Lam. (Euphorbiaceae) (Fig. 22).

Figure 17. Flowers of rare shrub *Acridocarpus orientalis* A.Juss. in Wadi Tarabat

Figure 18. Rare species *Iphiona aucheri* (Boiss.) Anderb. on rock ledges

Figure 19. *Withania somnifera* (L.) Dunal (Solanaceae) grows on rocky bank of a spring

Figure 20. *Senecio breviflorus* (Kadereit) Greuter on rocks

Figure 21. Young *Typha domingensis* Pers. between rocks in stream water

Figure 22. *Euphorbia indica* Lam., a common weed plant of irrigated ground also grows together with *Asclepias curassavica* L. in Wadi Tarabat

Conclusions.

Asclepias curassavica is an introduced species in the UAE and it is quite widely cultivated in plant nurseries, near private villas and hotels, where it sometimes escapes from cultivation. However, the fact that we observed a large, naturalized population of this plant in the reserve may indicate that it has further potential to spread in the UAE in suitable wet habitats. It currently has a low degree of naturalization in UAE. So far, there are at least two documented places where *Asclepias curassavica* has been found as an alien species in the Emirates. In one place it is truly naturalized, blooming and bearing fruit constantly, and should therefore be recommended for inclusion in the list of invasive species.

Acknowledgements

The authors of this paper thank the reviewers and editors of the journal for valuable corrections and suggestions. The article constitutes a contribution toward completion of the State Assignment to the V. L. Komarov Botanical Institute of the Russian Academy of Sciences, within the BIN RAS project, "Vascular plants of Eurasia: taxonomy, floristic research, plant resources", No AAAA-A 19-119031290052-1 and with financial support from the Ministry of Education and Science of Russia under Agreement No. 075-15-2021-1056 dated September 28, 2021. The authors also express their gratitude to His Excellency Salem Al Zahmi (Director of His Highness Crown-Prince Office) and Dr. Fouad Lamghari Ridouane, Director of Research and Innovation of Fujairah Research Centre for their assistance in conducting field work and for their great contribution to the implementation of this study. We thank reviewers and editors of the journal for their comments, suggestions and necessary corrections.

Authors' contributions

Vyacheslav V. Byalt (VB) initiated the project: together with MK collected, preserved, identified and labeled plants, analysed material prepared by MK, wrote the manuscript, participated in discussion and revision of the manuscript, and coordinated the project.

Mikhail V. Korshunov (MK) together with VB collected, took part in field investigations, made photos of plants, preserved and identified plants, participated in the discussion of the manuscript.

Vladimir M. Korshunov (VK) initiated the project with VB, took part in field investigations, made photos of plants, participated in the discussion of the manuscript.

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