

# A newly-reported *Salicornia europaea* population under threat

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## Abstract

A previously unreported population of *Salicornia europaea* has been found on the edges of a small tidal inlet in the emirate of Umm al-Qaiwain. It appears to be different from two ecotypes of the species found in other parts of the United Arab Emirates (UAE). The location has large numbers of an introduced halophytic plant species, *Sesuvium portulacastrum*, which serve to inhibit the growing of local species. The number of plants of the local *S. europaea* ecotype is low and the species may disappear. The eradication of the alien species of *S. portulacastrum* from the area is necessary to protect the *S. europaea* ecotype and other local flora in the area.

## Introduction

*Salicornia europaea* L., a member of the Amaranthaceae family, is an annual halophytic herbaceous plant with multi-branched, fleshy stems, growing up to 45 cm in height. Flowers are tiny, off-white to yellow, hermaphrodite. Flowering occurs in November, while seeds mature in December. The species is found in coastal areas of North America, Europe, Africa and Asia. In the Arabian Peninsula, it is native to Kuwait (Omar 2001), Qatar (Norton *et al.* 2009), Saudi Arabia (Chaudhary 1999) and the UAE (Brown & Sakkir 2004). The plant, popularly known as sapphire or glasswort, is edible and can be eaten either raw or cooked. It can also be used as a fodder while its seed is rich in high quality oil, making it suitable for cultivation as an oilseed crop.

*Sesuvium portulacastrum* L. (L.), a member of the Aizoaceae family, is a facultative halophyte plant species.

Commonly called sea purslane, it is found in tropical and subtropical regions around the world. It is perennial, prostrate or semi-erect, succulent, growing up to 1 m in length and 30 cm in height. It flowers and produces seed all year round. It is considered to be an aggressive and spreading plant having no serious pest problem. These traits make it a successful invasive species in different areas of the world. In the UAE, it was introduced as an ornamental and ground cover plant in different parts of the country and, due to its tenacity, has become established. In some farms, it has become a weed and competes with the cultivated crops. The species has been identified in several areas, especially close to saline water bodies, where it competes with local flora, including *S. europaea* (Shahid 2018). It has been recorded as an invasive species in the UAE (Soorae *et al.* 2015) and five other countries



Figure 1. Red arrow indicates location of the *Salicornia europaea* population.



Figure 2. A few indigenous *Salicornia europaea* plants (upper right) growing among invasive *Sesuvium portulacastrum* at Khor al-Madfaq.



Figure 3. The dominant species at the study area in Khor al-Madfaq is *Sesuvium portulacastrum*.



Figure 4. *Salicornia europaea* plants surrounded by *Sesuvium portulacastrum* at Khor al Madfaq.



Figure 5. A thickly-growing population of *Salicornia europaea* at Rams, Ra's al-Khaimah.



Figure 6. *Avicennia marina* seedlings growing among *Sesuvium portulacastrum* plants at Khor al Madfaq.



Figure 7. Flowering *Salicornia europaea* at Khor al-Madfaq (all photos by Mohammad Shahid).

(GBIF Secretariat 2017). In Saudi Arabia, it has been found on the eastern coast as an invasive plant that affects the growth of other floral species (Thomas *et al.* 2014) including *Ipomoea pes-caprae* (L.) R. Br. (Convolvulaceae) and *Malephora crocea* (Jacq.) Schwant. (Aizoaceae).

## Materials and Methods

In 2018, during a botanical expedition to the coastal areas of the emirate of Umm al-Qaiwain, a population of *Salicornia europaea* was found on the edge of the tidal inlet of Khor al-Madfaq (N 25°38.393, E 55°44.035, (Figure 1), where it was present in a very small area (Figure 2). The place is about 25 km from a previously reported *S. europaea* population in Khor al-Beida, Umm al-Qaiwain (given the name UAQ in Shahid, 2017) and around 40 km from the second ecotype found at Rams (given the name RAK in Shahid [2017]), in a location between these two ecotypes. Apart from *S. europaea*, another local plant species, the mangrove, *Avicennia marina*, was also present, with a population of differing ages, but primarily at seedling stage. The most visible plant species in the area was *Sesuvium portulacastrum* (Figure 3), which covered a larger area than the other species.

## Results

In contrast to the two other previously reported *Salicornia europaea* populations in the UAE (Shahid 2018), the number of plants of the species at Khor al-Madfaq in the area is very small, with only a few dozen plants of what appears to be a unique ecotype present, all being surrounded by the aggressive *Sesuvium portulacastrum* plants (Figure 4). In other areas, plant density of *S. europaea* is very high. At Rams, (RAK), where *S. portulacastrum* is also present, it is growing on a patch of land that extends over 1 km along the coast (Figure 5). At Khor al-Madfaq, it is sparsely found among thickly growing *S. portulacastrum*. It is suggested that this alien species may be responsible for the poor growth of *S. europaea* in the area.

At Rams (RAK) and the other Umm al-Qaiwain site in Khor al-Beida (UAQ), the number of *S. europaea* plants ecotypes is very high and spread over larger areas, suggesting that the two populations are relatively safe. In case of Khor al-Madfaq, the very small population of *S. europaea* is highly vulnerable due to the lower number of plants and presence of invasive alien plants.

Many of the mangrove (*Avicennia marina*) seedlings at Khor al-Madfaq were also surrounded by *S. portulacastrum* (Figure 6), which may also affect their growth.

Observation indicates that the *S. europaea* ecotype at Khor al-Madfaq starts flowering in the 2<sup>nd</sup> week of

November (Figure 7), the same period as the Rams (RAK) population. The other population in Umm al-Qaiwain, (UAQ), begins flowering in the 1<sup>st</sup> week of November.

## Conclusion

To save the *Salicornia europaea* population at Khor al-Madfaq, consideration should be given to the eradication of *Sesuvium portulacastrum*, collection and preservation of the seed of the unique population of *S. europaea* and subsequent reintroduction of the *S. europaea* ecotype in the area through sowing of seed and transplanting of seedlings.

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