

## ***Sesbania bispinosa* (Jacq.) W. Wight and *Trifolium repens* L. (Fabales Fabaceae) two new legume records for natural flora of the United Arab Emirates**

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### **ABSTRACT**

In this report, we have recorded for the first time the presence of *Sesbania bispinosa* (Jacq.) W. Wight and *Trifolium repens* L. (Fabales Fabaceae) in natural flora of the United Arab Emirates (UAE). Based on extensive field surveys and literature review, it was apparent that these species have not been recorded before in the UAE flora. It might be important to mention that the two new records have great economic and agricultural importance. Both species are spontaneously occurring in the natural habitat and considered as good forage and can adapt to a wide range of environmental conditions. Specimens of both newly recorded species are deposited in the Sharjah Seed Bank and Herbarium (SSBH), UAE. Descriptions and photographs of these species are provided. The new records of vascular plants in UAE flora would help ecologists and conservation biologists in more potential scientific research and natural resources exploitations.

### **KEY WORDS**

Naturalized plants; new record; *Sesbania bispinosa*; *Trifolium repens*; United Arab Emirates.

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### **INTRODUCTION**

Fabaceae or Leguminosae is one of the most widespread flowering plants families with about 751 genera and over ca. 19,500 species (Lewis et al., 2005). Fabaceae species range from dominant tropical canopy trees to tiny alpine annual herbs (Doyle, 1994) and are distributed throughout the tropical, subtropical and temperate regions of the world. In United Arab Emirates (= UAE), the family Fabaceae is represented by approximately 73 species and this paper reports *Sesbania bispinosa* (Jacq.) W. Wight and *Trifolium repens* L. as an addition to the Fabaceae flora of the country.

The Fabaceae species represent a significant element of the UAE flora and contribute significantly to structure and functioning of desert ecosystems of

the country. It is interesting to note that despite of being first record in the country, *S. bispinosa* was found with more than hundred individuals growing in Wadi Al-Ain. Existence of this species in the natural habitats with high abundance shows its rapid naturalization. At present, globalization is facilitating and intensifying the intentional and unintentional introduction of plant species across the globe.

Accordingly, the data sets of biological records are likely to grow even faster, providing a wealth of research opportunities for ecologists and conservation biologists in understanding the main drivers of biodiversity loss. Knowledge of the spatial and temporal distribution of species is vital to many areas of biological research (Powney & Isaac, 2015). Biological recording has grown markedly in recent decades and the size and taxonomic breadth of

species distribution datasets are expected to rise (Dickinson et al., 2012; Miller-Rushing et al., 2012). In the past few years, many plant species were added as new records to the UAE flora (Böer & Chaudhary, 1999; Shahid & Rao, 2014a, 2014b; Gairola et al., 2015; Mahmoud et al., 2015).

As the UAE is experiencing a fast growth and development, mega sizes of commercial and agricultural exchange, there is a big possibility of spontaneous occurrence of new vascular plants to the country's flora. This paper reports the presence of two legume species, *S. bispinosa* and *T. repens* for the first time in the natural flora of the UAE.

## MATERIAL AND METHODS

During field explorations in 2013–2015, the Sharjah Seed Bank and Herbarium team collected the specimens of *S. bispinosa* and *T. repens* for the first time in the UAE. Along with plant samples, all relevant field data including geographic coordinates of the collection sites, associated species and habitat in which plants grow have been recorded. The specimens were studied in detail and identified using relevant flora and literatures. Drs. Ahmed El Banhawy and Samia Heneidak, expert taxonomists in the regional flora of the Middle East, also confirmed the identification of the two species. After identification, the specimens were processed and deposited in the herbarium of SSBH.

The review of literature further confirmed that these species have not been reported from the UAE (Jongbloed, 2003; Karim & Fawzy, 2007).

## RESULTS AND DISCUSSION

***Sesbania bispinosa*** (Jacq.) W. Wight  
= *Aeschynomene bispinosa* Jacq.  
= *Sesbania aculeata* (Willd.) Pers.

COMMON NAMES. Prickly sesban, Dnchifibre, and Dhaincha.

EXAMINED MATERIAL. In the UAE, we have recorded *S. bispinosa* in four wet sites in Wadi Al Ain, Al Ain city (N: 24.169242, E: 55.658084 Alt.: 236 m, N: 24.210189 E: 55.756487 Alt.: 276 m, N: 24.204791 E: 55.739821 Alt.: 262 m and N: 24.188811 E: 55.698345 Alt.: 249 m). More than 150 individuals of the species were recorded from

these sites. These included young, flowering, fruiting and senescent individuals.

REMARKS. *Sesbania bispinosa* is an annual or biennial, erect herb, sometimes suffrutescent, 1–3 m tall; stems semi-woody glabrous or sparsely pubescent when young, sparsely aculeate; leaves paripinnate; leaflets oblong, obtuse, mucronate, sparsely pilose on margins and midrib below; stipules 6–10 mm long; inflorescence raceme, 3–12-flowered; corolla pale yellow, violet flecked; fruit glabrous, somewhat curved; seeds pale brown, olive-green or greenish-black, ellipsoid; flowers and fruits were recorded in May (UAE). The associate species recorded with *S. bispinosa* were *Phragmites australis* (Cav.) Trin. ex Steud., *Juncus socotranus* (Buchenau) Snogerup, *Prosopis juliflora* (Sw.) DC., *Cynodon dactylon* (L.) Pers., *Ipomoea aquatica* Forssk., *Eclipta prostrata* (L.) L. and *Typha domingensis* Pers.

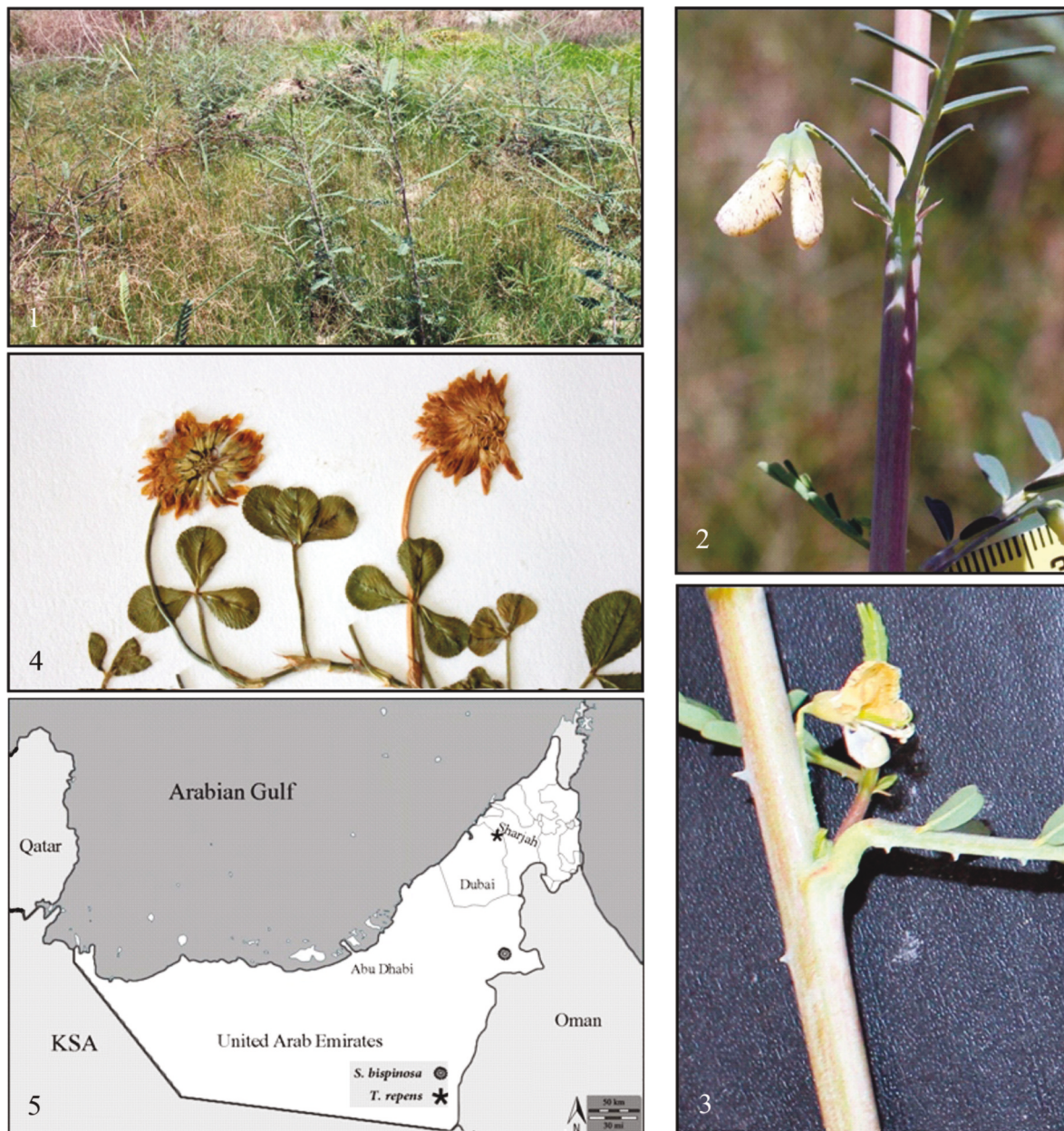
***Trifolium repens*** L.

= *Trifolium repens* var. *giganteum* Lagr.-Foss.

COMMON NAMES. White clover, Dutch clover, Ladino clover.

EXAMINED MATERIAL. In June 2013, we have recorded 5 individuals of *T. repens* from Emirate highway (N: 25.224, E: 55.559 and Alt.: 187), Dubai, UAE.

REMARKS. *Trifolium repens* is glabrous to glabrescent, prostrate, short-lived perennial or annual under moisture stressed conditions (Hutchinson et al., 1995). Stolon consists of a series of internodes separated by nodes. Each node bears a trifoliolate leaf. Leaflets 1–4 cm long, broadly obovate, rounded or retuse at the apex, if the node comes into contact with moist soil, adventitious roots may form from the root primordia closest to the ground (Thomas, 1987); petiole long; stipules broad at the base, sheathing, ending in a subulate apex; inflorescence globose raceme, 15–25 mm broad; flowers scented; calyx 2–6 mm, 10-nerved; teeth unequal; corolla white or pinkish; fruit linear, 3–4 seeded. Flowering and fruiting in May and June (United Arab Emirates). In the collection site, *T. repens* was growing in a sandy roadside habitat close to a wide sandy plain. This site generally receives some irrigation water from Dubai municipality to maintain the roadside landscape plants. The associate species of



Figures 1–3. *Sesbania bispinosa*. Fig. 1: habitat. Fig. 2: flowers. Fig. 3: stem with flower, spines and leaf base. Figure 4. *Trifolium repens*, herbarium specimen. Figure 5. The recording points of both the species.

*T. repens* were *Centropodia forsskalii* (Vahl) Cope, *Coelachyrum piercei* (Benth.) Bor., *Eragrostis barrelieri* Daveau, *Eremobium aegyptiacum* (Spreng.) Asch., *Gisekia pharnacioides* L., *Moltkiopsis ciliata* (Forssk.) I.M. Johnst., *Salvadora persica* Wall., *Spergularia marina* (L.) Griseb. and *Tragus racemosus* (L.) Haller.

In a study conducted by Mousa & Fawzi (2009), they did not record *S. bispinosa* in the same study

area. This indicates that this species has introduced after their survey and it rapidly adapted and naturalized to the local habitat of the study area as indicated by the presence of more than 150 individuals.

The fast naturalization of *S. bispinosa* under the environment of the UAE indicates that this species might have an invasive ability and threaten the unique indigenous flora of the country. In similar context, Wu et al. (2003) highlighted naturalization



as an important step of the primary phases of plant invasion and suggested comprehensive monitoring of naturalized species to collect important information about potential invaders. Consequently, careful monitoring for the distribution and abundance of rapidly naturalizing species such as *S. bispinosa* in the different habitats of United Arab Emirates should be taken into consideration.

## CONCLUSIONS

It is a well established fact that due to recent increase in international trade and travel, inflow of alien species tends to gradually increase worldwide. Both *S. bispinosa* and *T. repens* are newly recorded alien species to the natural flora of the UAE. The magnificent growth of *S. bispinosa* in the United Arab Emirates renders this species as a good candidate as economic crops under the natural conditions of the UAE.

However, the economic exploitation of this species necessitates careful records for its distribution and abundance in the different habitats of the country. Some of the previous new vascular plant records have made great contributions to our understanding of alien invasion plant within UAE. So, the mechanisms of arrival of newly recorded alien plants species in the country need to be determined. This will help in understanding the origins and pathways of arrival of invasive species and can help developing strategies for preventing future introduction and safeguarding native plant diversity.

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