



Current status of some plants distribution in specific phytogeographical regions of Egypt

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Abstract

There are some issues with the Egyptian flora still need to be resolved. Therefore, it requires further intensive collections from all regions, accurate taxonomical studies, geographical distributions updating for some species because of many factors affected the plants existence in many areas as: climate, new constructions, and reclamation of many lands and introduction of invasive species. This research highlights of some species that weren't gathered from particular phytogeographical regions and the existence of some of them hadn't been authenticated in Egypt. Thus, the presence of these species in specific phytogeographical areas of Egypt is confirmed in this study. It was based on herbarium records and some previous studies. The mentioned species in this research include nine species belonging to three families: *Atractylis boulosii*, *Reichardia picroides*, *Juncus littoralis*, *Lolium rigidum*, *Lolium perenne*, *Lolium multillorum*, *Rostraria hispida*, *Lygeum spartum* and *Aegilops longissima*. The current study also verified the existence of *Rostraria hispida*, which wasn't confirmed in Egypt.

Key Words: distribution; Egypt; flora; Sinai

Introduction

The plants in the Egyptian Flora are threatened by a combination of factors including unsustainable agriculture methods, overgrazing, pollution, urbanization, climate change, habitat modification and deforestation, overexploitation, and the introduction of invasive alien species (Shaltout and Eid, 2016).

Therefore, if any of these factors change, it may have an impact on whether certain plants appear or disappear in a certain location. The geographical distribution of species can be highly affected by climate which is the main environmental factor that affect the plant growth, development, distribution, and relative abundance (Amer

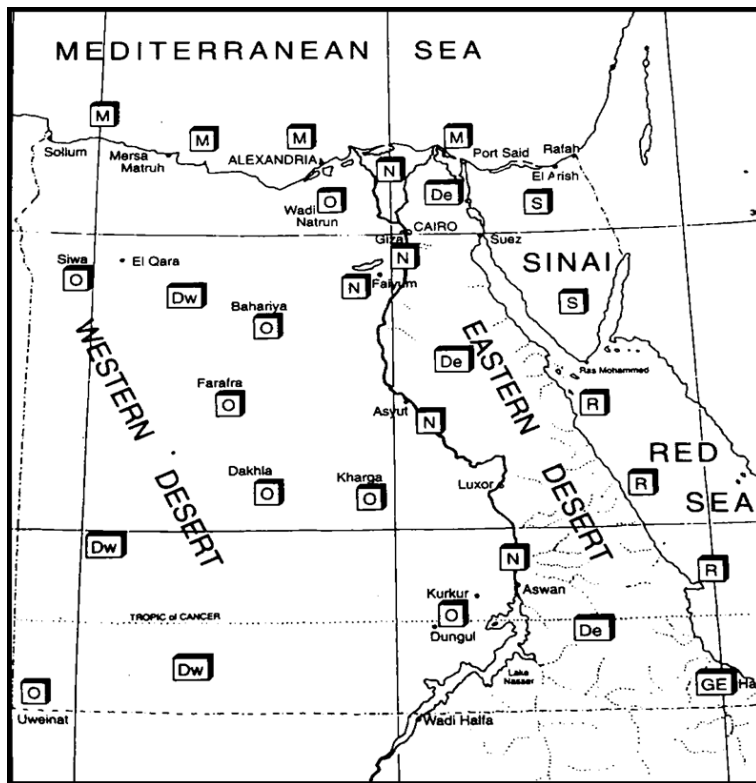
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etal., 2021). In addition, human activities as construction, recreation, global trade and transportation that promoted both the intentional and accidental spread of species across their natural dispersal barriers (Kolar and Lodge, 2001).

Our recent Egyptian flora of Boulos (1999, 2000, 2002, 2005, and 2009) deals and fills the gaps of more than 25 years since the publication of Täckholm's Students' Flora of Egypt in 1974. However, there were many question marks that needed to answer e.g. the presence of some species was unconfirmed in Egypt. Moreover, not all species were collected from the documented phytogeographical regions that they belonged to. Finally, nowadays the geographical distribution of these species greatly differs from that of the past and needs to be updated. So, this study aims to confirm the presence of some species that weren't reported or unconfirmed by Boulos (2009) from specific geographical regions.

Materials and Methods

The recorded species in this study were gathered from Boulos (2009) whose collections are missing in some phytogeographical regions. The following investigation is based on the collections of some previous studies namely, Shaltout *et al.* (2004), Kamel *et al.* (2008), Abd El-Ghani *et al.* (2014), Hatim *et al.* (2016), Abd El-Hamid (2017) and Hassanen *et al.*, (2022). Moreover, it depended on herbarium specimens from the following herbaria: Cairo University (CAI), Suez Canal University (SCUI) and Agricultural Research Center (CAIM). The geographical distribution of the species is given according to Boulos (2009). The most recent names of the species are given according to international databases (IPNI, POWO). Map 1 shows the phytogeographical regions suggested in this investigation according to Boulos (2009).



Map. 1. Phytogeographical regions given by Boulos (2009). N: The Nile region, comprising the valley, Faiyum and the delta, O: The Western Desert's oasis includes Wadi Natrun, Kharga, Dakhla, Siwa, Farafra, Bahariya, Kurkur, Dungul and Uweinat, M: The stretch of the Mediterranean coast between the Libyan border near Sollum to Port Said, D: All of Egypt's deserts, excluding Sinai, De: Desert east of the Nile with the exception of Sinai, Dw: Desert west of the Nile, R: The coastline of the Red Sea, GE: Gebel Elba, the mountainous area surrounding it, S: The entire Sinai Peninsula, includes the El-Tih Desert and the Mediterranean coastline east of the Suez Canal.

Results

Seven species were cited as doubtful by Boulos (2009) from Sinai Peninsula, Deserts and Mediterranean, among them: *Atractylis boulosii*, *Reichardia picroides*, *Juncus littoralis* and *Aegilops longissima*. This study proved their presence of these species from North and mountainous Sinai. *Lolium rigidum*, *Lolium perenne* and *Lolium multillorum* weren't gathered from Deserts but this study and others confirmed their collection from Eastern and Isthmic Deserts. In addition, *Rostraria hispida* wasn't collected from the Mediterranean region but this study proved their collection from Mariut and Burg El Arab.

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1. Asteraceae

1.1. *Atractylis boulosii* Taeckh.

Collected by Kamel *et al.* (2008) from North Sinai.

1.2. *Reichardia picroides* (L.) Roth.

Collected by Shaltout *et al.* (2004) from St. Katherine's Protectorate.

2. Juncaceae

2.1. *Juncus littoralis* C.A. Mey.

Collected by Hatim *et al.* (2016) from Sinai.

3. Poaceae

3.1. *Aegilops longissima* Schweinf. & Muschl.

Collected by kamel *et al.* (2008) from North Sinai.

3.2. *Lolium multillorum* Lam.

Collected by Abd El-Ghani *et al.* (2014) from Eastren Desert, Abd El-Hamid (2017) from Suez and Hassanen *et al.* (2022) from Ismailia-Suez Highway-Abu Khalifa (El Ballah).

Specimens seen Ismailia, 17/ 4/ 1982 Alaa M.Amer s.n. (CAI).

3.3. *Lolium perenne* L.

Collected by Hatim *et al.* (2016) from Sinai; Abd El-Ghani *et al.* (2014) from Eastren Desert and Hassanen *et al.* (2022) from Ismailia, Suez highway Road and Ismailia city.

3.4. *Lolium rigidum* L.

Collected by Shaltout *et al.* (2004) from St. Katherine's Protectorate; Abd El-Ghani *et al.* (2014) from Eastren Desert; Hatim *et al.* (2016) from Sinai; Hassanen *et al.* (2022) from Ismailia, Suez highway Road and Ismailia city.

3.5. *Lygeum spartum* L.

Collected by Hatim *et al.* (2016) from Sinai.

3.6. *Rostraria hispida* (Savi) Doğan

Specimens seen: Wadi Um Feshtan, Maryut, 15/ 4/ 1970, A. Abbas & A. Kahattah 131A (CAIM); Mariut, 11/ 8/ 1992, H. Helmy & K. Abdel Rahem s.n. (CAIM); Burg El Arab, 25/ 9/ 2012, A. Khattab 130 (CAIM).

Discussion

Boulos (2009) didn't list these nine species from certain phytogeographical regions. The result in this study may reflect the drastic change in the climatic conditions to which Egypt has faced over the past 13 years. In addition, human activities such as agricultural practices, reconstruction and trade had played significant role in this regard. Other species that have not been collected from specific regions since 2009 may be due to the lack of conditions necessary for their growth.

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