

## A STUDY ON THE PLANT DIVERSITY IN WADI HAGUL, EASTREN DESERT, EGYPT

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### ABSTRACT

The present study on the plant diversity in Wadi Hagul comprises 82 species belonging to 71 genera from one Gymnospermae family and 25 Angiospermae families: Compositae is represented by 20 species, Leguminosae 9 species, Zygophyllaceae 7 species, and both of Chenopodiaceae and Gramineae are represented by 6 species. Asclepiadaceae and Polygonaceae are represented by 4 species each. Three species from Cruciferae are recorded. Each of Boraginaceae, Resedaceae, Scrophulariaceae, Solanaceae and Umbelliferae are represented by 2 species, while one species is recorded from each of Capparaceae, Cucurbitaceae, Ephedraceae, Euphorbiaceae, Geraniaceae, Labiatae, Malvaceae, Neuradaceae, Nitrariaceae, Plantaginaceae, Ranunculaceae, Tamaricaceae and Thymelaeaceae. The annual species in the studied area are 33 species; while the perennials are 28 species. Nineteen species are recorded as shrubs while the trees represent 2 species.

**Key words:** *Eastern desert, Egypt, plant diversity, wadi Hagul*

### 1. INTRODUCTION

Wadi Hagul is located in the northern part of the Eastern Desert of Egypt within Cairo-Suez district, delimited by latitudes 29°48'28"-29°57'43" N., and longitudes 32°09'32"-32°17'27" E. Wadi Hagul area is considered a morphotectonic depression falling between the southern scarps of Gebel Ataqa in the north and the northern scarp of El-Galala El-Bahariya Plateau in the south. Generally, the elevation rises gradually westwards until it merges into the great limestone plateau of Eocene age forming the center of the northern part of Eastern Desert. Several works were conducted on the Egyptian deserts and wadies. Abdallah *et al.* (1972) recorded one species of mosses and 307 species representing 194 genera and 54 families of phanerogames in Nubia, whereas Belal and Springuel (1996) recorded 127 species from Wadi Allaqi. A total of 110 species belonging to 35 families, were recorded in Wadi Allaqi (Ali *et al.*, 1997). The study of natural vegetation on El-Qantara area, North Sinai revealed 113 species from 45 families (Amer 2004). Mosallam (2007) recorded 124 species belonging to 108 genera and 42 families in Saint Katherine protectorate; while Soliman (2007) recorded 50 species in a survey of five wadies (Arbeien, Ithla, Sheraji, Talaa and

Tinya) in south Sinai. El Hadidi (1993) reviewed briefly the main features of the natural vegetation and the different habitat types in the Eastern Deserts. Hassan (1987) conducted a study for the flora of the area extending between Cairo-Suez road in the north and Idfu-Mersa Alam road in the south. His studies showed apparent diversity in the life forms ranging between woody perennial desert plants to herbaceous submerged water plants. A total of 433 species including 9 endemic were recorded from the study area. The present study aims to: 1- Study the plant diversity of the flora of the desert land in Wadi Hagul 2- Documentation the recorded species by herbarium specimens.

### 2. MATERIAL AND METHODS

The study was conducted in Wadi Hagul during the period from 2011 to 2013. Eight visits were performed to the area during this period. Seven sites (S1-S7) were selected to cover the species diversity in the area (Fig. 1). About 550 specimens were collected and prepared as herbarium sheets. These herbarium sheets were preserved in the herbarium of the Flora and Phytotaxonomy Researches Department (CIAM) and arranged according to Engler's system. The specimens were identified

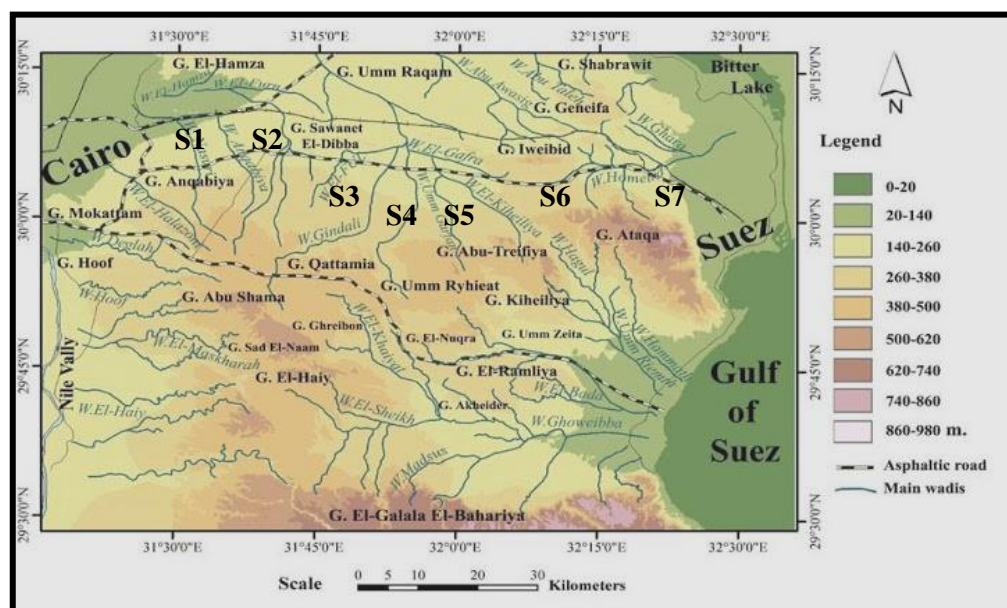


Fig. (1): A map showing the studied area in Wadi Hagul.

according to Täckholm (1974), Boulos, (1999, 2000, 2002 and 2005). The species recorded were arranged alphabetically within their families. For each species original publication, reference, habitat and life form, floristic category and local names were cited. A map for the studied area is shown Fig. (1).

### 3. RESULTS

The following are a detailed list of the 82 species mentioned in Table 1 together with their habitats, life forms, floristic categories and local names.

For floristic categories the following abbreviations are used: IR –Tur = Irano -

Table (1): Species recorded from Wadi Hagul with its families and habits according to Boulos (1999-2005).

Taxa	Family	Habitat
<i>Acacia tortilis</i> (Forssk.) Hayne subsp. <i>raddiana</i> (Savi) Brenan	Leguminosae	Tree
<i>Achillea fragrantissima</i> (Forssk.) Sch. Bip.	Compositae	Perennial
<i>Alhagi graecorum</i> Boiss.	Leguminosae	Perennial
<i>Anabasis articulata</i> (Forssk.) Moq.	Chenopodiaceae	Shrub
<i>Anabasis setifera</i> Moq.	Chenopodiaceae	Shrub
<i>Asteriscus hierochuntius</i> (Michon) Wiklund	Compositae	Annual
<i>Astragalus vogelii</i> (Webb) Bornm.	Leguminosae	Annual
<i>Bassia muricata</i> (L.) Asch.	Chenopodiaceae	Annual
<i>Brassica tournefortii</i> Gouan	Curciferae	Annual
<i>Calotropis procera</i> (Aiton) W. T. Aiton	Asclepiadaceae	Shrub
<i>Calligonum polygonoides</i> L. subsp. <i>comosum</i> (L' Her.) Soskov	Polygonaceae	Shrub
<i>Centaurea aegyptiaca</i> L.	Compositae	Annual
<i>Chenopodium murale</i> L.	Chenopodiaceae	Annual
<i>Citrullus colocynthis</i> (L.) Schrad.	Cucurbitaceae	Perennial
<i>Cleome droserifolia</i> (Forssk.) Delile	Capparaceae	Shrub
<i>Cotula cinerea</i> Delile	Compositae	Annual
<i>Cynanchum acutum</i> L. subsp. <i>acutum</i>	Asclepiadaceae	Perennial
<i>Deverra tortuosa</i> (Desf.) DC	Umbelleferae	Shrub
<i>Diplotaxis harra</i> (Forssk.) Boiss.	Cruciferae	Perennial
<i>Echinops spinosus</i> L.	Compositae	Perennial
<i>Emex spinosa</i> (L.) Campd.	Polygonaceae	Annual
<i>Ephedra alata</i> Decne.	Ephedraceae	Shrub
<i>Erodium laciniatum</i> (Cav.) Willd. subsp. <i>pulverulentum</i> (Boiss.) Batt. in Batt. & Trab.	Geraniaceae	Annual
<i>Euphorbia retusa</i> Forssk.	Euphorbaiaceae	Perennial
<i>Fagonia arabica</i> L.	Zygophyllaceae	Perennial

**Table (1): Cont.**

<i>Fagonia bruguieri</i> DC	Zygophyllaceae	Perennial
<i>Fagonia mollis</i> Delile	Zygophyllaceae	Perennial
<i>Filago desertorum</i> Pomel	Compositae	Annual
<i>Foeniculum vulgare</i> Mill.	Umbelliferae	Perennial
<i>Haloxylon salicornicum</i> (Moq.) Bunge ex Boiss.	Chenopodiaceae	Shrub
<i>Heliotropium arbainense</i> Fresen.	Boraginaceae	Perennial
<i>Hordeum murinum</i> L., subsp. <i>leporinum</i> (Link) Arcang.	Gramineae	Annual
<i>Hyoscyamus muticus</i> L.	Solanaceae	Perennial
<i>Ifloga spicata</i> (Forssk.) Sch. Bip.	Compositae	Annual
<i>Imperata cylindrica</i> (L.) Raeusch	Gramineae	Perennial
<i>Iphionia mucronata</i> (Forssk.) Ash. & Schweinf.	Compositae	Perennial
<i>Kickxia aegyptiaca</i> (L.) Nabelek subsp. <i>aegyptiaca</i>	Scrophulariaceae	Perennial
<i>Launaea capitata</i> (Spreng.) Dandy in F. W. Andrews	Compositae	Perennial
<i>Launaea mucronata</i> (Forssk.) Muschl. subsp. <i>cassiniana</i> (Jaub. & Spach) N. Kilian	Compositae	Annual
<i>Launaea nudicaulis</i> (L.) Hook. f.	Compositae	Perennial
<i>Launaea spinosa</i> (Forssk.) Sch. Bip. ex Kuntze	Compositae	Perennial
<i>Lavandula coronopifolia</i> Poir. in Lam.	Labiatae	Perennial
<i>Leptadenia pyrotechnica</i> (Forssk.) Decne.	Asclepiadaceae	Shrub
<i>Lotus glaber</i> Mill.	Leguminosae	Perennial
<i>Lycopersicum esculentum</i> Miller	Solanaceae	Annual
<i>Malva parviflora</i> L.	Malvaceae	Annual
<i>Medicago lupulina</i> L.	Leguminosae	Annual
<i>Medicago polymorpha</i> L.	Leguminosae	Annual
<i>Nauplius graveolens</i> (Forssk.) Wiklund	Compositae	Shrub
<i>Neurada procumbens</i> L.	Neuradaceae	Annual
<i>Nigella sativa</i> L.	Ranunculaceae	Annual
<i>Nitraria retusa</i> (Forssk.) Asch.	Nitrariaceae	Shrub
<i>Ochradenus baccatus</i> Delile	Resedaceae	Shrub
<i>Pennisetum divisum</i> (Forssk ex J. F. Gmel.) Henrard	Gramineae	Perennial
<i>Pergulaia tomentosa</i> L.	Asclepiadaceae	Perennial
<i>Phragmites australis</i> (Cav.) Trin. ex Steud.	Gramineae	Perennial
<i>Plantago ovata</i> Forssk.	Plantaginaceae	Annual
<i>Polygonum equisetiforme</i> Sm.	Polygonaceae	Perennial
<i>Pulicaria undulata</i> (L.) C.A.Mey.	Compositae	Shrub
<i>Reichardia tingitana</i> (L.) Roth	Compositae	Annual
<i>Reseda pruinoso</i> Delile	Resedaceae	Annual
<i>Retama raetam</i> (Forssk.) Webb & Berthel.	Leguminosae	Shrub
<i>Rumex vesicarius</i> L.	Polygonaceae	Annual
<i>Salsola imbricata</i> Forssk.	Chenopodiaceae	Perennial
<i>Schismus barbatus</i> (L.) Thell.	Gramineae	Annual
<i>Scrophularia xanthoglossa</i> Boiss.	Scrophulariaceae	Perennial
<i>Senecio glaucus</i> L. subsp. <i>coronopifolius</i> (Maire) C. Alexander	Compositae	Annual
<i>Seriphidium herba-album</i> (Asso) Soják	Compositae	Shrub
<i>Sonchus oleraceus</i> L.	Compositae	Annual
<i>Stipa canpensis</i> Thunb.	Gramineae	Annual
<i>Symphyotrichum squamatum</i> (Spreng.) Nesom	Compositae	Annual
<i>Tamarix nilotica</i> (Ehrenb.) Bunge	Tamaricaceae	Tree
<i>Thymelaea hirsuta</i> (L.) Endl.	Thymelaeaceae	Shrub
<i>Tribulus terrestris</i> L.	Zygophyllaceae	Annual
<i>Trichodesma africanum</i> (L.) R. Br.	Boraginaceae	Perennial
<i>Trigonella glabra</i> Thunb.	Leguminosae	Annual
<i>Trigonella stellata</i> Forssk.	Leguminosae	Annual
<i>Volutaria lippii</i> (L.) Cass. ex Maire	Compositae	Annual
<i>Zilla spinosa</i> (L.) Prantl	Cruciferae	Shrub
<i>Zygophyllum coccineum</i> L.	Zygophyllaceae	Shrub
<i>Zygophyllum decumbens</i> Delile	Zygophyllaceae	Shrub
<i>Zygophyllum simplex</i> L.	Zygophyllaceae	Annual

Turanian; Euro – Sib = Euro – Siberian; Med = Mediterranean; Sah - Sind = Saharo-Sindian; Sud – Zamb = Sudano - Zambebian.

\* Refer to the species recorded with a new distribution according to Täckholm 1974 and Boulos 2009.

### 1. Asclepiadaceae

**1.1. *Calotropis procera* (Aiton ) W. T. Aiton, *Horb. Kew.*, ed. 1,1: 305 (1789); Boulos 2000, p. 220.**

Habitat and life form: desertic plant. Nanophanerophyte.

Floristic category: Sah – Sind, IR – Tur and Sud – Zamb Regions.

Local names: 'Oshar, 'Oshaar, 'Oshr, 'Osher, Abat, Abbad, Beid el – 'Oshar ( fruit ).

**2.2. *Cynanchum acutum* L., *Sp. Pl.*, ed. 1, 212 (1753); subsp. *acutum*, Boulos 2000, p.222**

Habitat and life form: Waste moist ground, Nile and canal banks. Therophyte.

Floristic category: Med, IR-Tur and Sah-Sind Regions.

Local names: 'Ollaiq, 'Ollaiq, Modeid, Motteit, Libbein, Libbeina.

**3.3. *Leptadenia pyrotechnica* (Forssk.) Decne., *Ann. Sci. Nat. Bot.*, sêr. 2, 9: 270 (1838); Boulos 2000, p. 225.**

Habitat and life form: Sandy desert plains and wadis. Nanophanerophyte.

Floristic category: Sah-Sind, IR-Tur and Sud-Zamb Regions.

Local names: Markh, Agwaam, Seisabaan, Sesebaan.

**4.4. *Pergulaia tomentosa* L., *Syst. Nat.*, ed. 12, 2: 191 (1767); Boulos 2000, p. 223.**

Habitat and life form: desertic plant. Chamaephyte.

Floristic category: Sah-Sind and IR-Tur Regions.

Local names: Ghalqa, Gahlqay, Atma, Laban el-Homara, Omm. El-Laban, Dimish el- ghalq.

### 2. Boraginaceae

**5.5. *Heliotropium arbainense* Fresen., *Mus. Senckenb.* 1: 168 (1834); Boulos 2000, p.276.**

Habitat and life form: Sandy and stony desert wadis and plains, edges of cultivated ground.. Chamaephyte.

Floristic category: Sah – Sind and Sud – Zamb Regions.

Local names: Dafaara, Erhaba, 'Atana.

**6.6. *Trichodesma africanum* (L.) R. Br., *Prodr. Fl. Nov. Holl.* 1: 496 (1810); Boulos 2000, p. 286.**

Habitat and life form: Sandy and gravelly wadis, sandy desert plains, edges of cultivation. Chamaephyte.

Floristic category: Sah – Sind Sud-Zamb and IR – Tur Regions.

Local names: Hameem, Lisaan et-teir, Himhim, Horraaqa, Horreiq Shoak ed-dab'a, Khodaar, Tadatt, Shana, Losseiq, Lesseq, Lisseq, Lossaaq, Lessaaq.

### 3. Capparaceae

**7.7. *Cleome droserifolia* (Forssk.) Delile, *Descr. Egypte, Hist. Nat.* 250 (1814); Boulos 1999, p. 177.**

Habitat and life form: Stony and sandy wadis and plains. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: 'Afein, 'Afen, Mashta, Mishtar, Reeh el-bard.

### 4. Chenopodiaceae

**8.8. *Anabasis articulata* (Forssk.) Moq., in A. DC., *Pordr.* 13(2): 212 (1849); Boulos 1999, p. 126.**

Habitat and life form: Stony and sandy wadis. Chamaephyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Tarteer, Balbal, Belbal, 'Ageram, Hamd.

**8.9. *Anabasis setifera* Moq., *Chenop. Monogr. Enum.* 164 (1840); Boulos 1999, p. 125.**

Habitat and life form: Stony and sandy wadis. Chamaephyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Shabb, 'Agram, Hamd, Djell, Djill, Assal.

**9.10. *Bassia muricata* (L.) Asch. in Schweinf., *Beiter. Fl., Aethiop.*: 187 (1867); Boulos 1999, p. 106.**

Habitat and life form: Weed in new reclaimed lands with sandy soils. Therophyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Ghobbeira, Ghobbayra, Layya, Haythaam.

**10.11. *Chenopodium murale* L., *Sp. Pl.*, ed. 1, 219 (1753); Boulos 1999, p. 96.**

Habitat and life form: Weed. Therophyte.

Floristic category: Cosmopolitan.

Local names: Lissan el-teir ( el-thor ), Qehaniya, Qeihaniya, Abu 'efin ( 'efeina), Fiss el- kelb(kilaab) Sontaar, Fatteh, Shagaret el-motteina, Fisseih, Fosseish, Sakaraan, Sekraan.

**11.12. *Haloxylon salicornicum* (Moq.) Bunge ex Boiss., Fl. Orient. 4: 949 (1879); Boulos 1999, p. 124.**

Habitat and life form: Sandy and stony deserts and wadis. Nanophanerophyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Rimth, Remeh, Balbal, Belbel..

**12.13. *Salsola imbricata* Forssk., Fl. Aegypt.-Arab. CVII, CVIII. 57 (1775); Boulos 1999, p. 118.**

Habitat and life form: desertic plants. Chamaephyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Tarteer, Khreysy, Khreit, Haad, Shinaan, Molleih, Molleyh, Mellikh.

#### 5. Compositae

**13.14. *Achillea fragrantissima* (Forssk.) Sch. Bip., Flora (Regensburg) 38: 13 (1855); Boulos 2002, p. 249.**

Habitat and life form: Desert wadis and sandy plains. Nanophanerophyte.

Floristic category: Sah-Sind Region.

Local names: Gesoom, Gesoom gebeli, Alegiaan, Eileiaan, Baboonig, Baboonag, Qaysoom, Qasoom, Qesoom, Be'eithraan, Ba'ataran.

**14.15. *Asteriscus hierochuntius* (Michon) Wiklund, Nord. J. Bot. 5: 307 (1985); Boulos 2002, p. 225.**

Habitat and life form: Sandy and stony desert wadis and plains. Therophyte.

Floristic category: Sah-Sind Region.

Local names: Unknown.

**15.16. *Centaurea aegyptiaca* L., Mant. 118 (1767); Boulos 2002, p. 168.**

Habitat and life form: Desert wadis. Therophyte.

Floristic category: Sah-Sind Region.

Local names: Moraar, Shoak 'antar, Yamroor, Yamraar, Netesh.

**16.17. *Cotula cinerea* Delile, Descr. Egypte, Hist. Nat. 275, t. 47, f.4 (1814); Boulos 2002, p. 257.**

Habitat and life form: Winter weed. Therophyte.

Floristic category: Cosmopolitan.

Local names: Ribyaan, Erbeya, Arbeyanny, Sakaraan, Sekraan.

**17.18. *Echinops spinosus* L., Mant. 119 (1767); Boulos 2002, p. 146.**

Habitat and life form: desertic plant, Chamaephyte.

Floristic category: Med Region.

Local names: Khasheer, also Khharshoof, Khosheroof, Khoshroof, Khashroof (names for all thistles).

**18.19. *Filago desertorum* Pomel, Nouv. Mat. Fl. Atlant. 1: 46 (1874); Boulos 2002, p. 199.**

Habitat and life form: Desert wadis and plains. Therophyte.

Floristic category: Med, Sah-Sind and Ir-Tur Regions.

Local names: Kurbat.

**19.20. *Ifloga spicata* (Forssk.) Sch. Bip. in Webb & Berthel., Phyt. Canar. 2: 310 (1845); Boulos 2002, p. 197.**

Habitat and life form: Sandy wadis and desert plains. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Kreishit el-gadye, Shagaret el-ma'eeza, Kareish shedi, Kheishit es-sanheela, Gomborr.

**20.21. *Iphiona mucronata* (Forssk.) Ash. & Schweinf., Mém. Inst. Egypt. 2:86 (1887); Boulos 2002, p. 244.**

Habitat and life form: desertic plant. Chamaephyte.

Floristic category: Sah – Sind Region.

Local names: Dafeera, Dhafara, Dhafra, Dhofra, Dafra, Dafri.

**21.22. *Launaea capitata* (Spreng.) Dandy in F. W. Andrews, Fl. Pl. Sudan 3: 40 (1956); Boulos 2002, p. 294.**

Habitat and life form: Desert wadis, Sandy and alluvial plains, edges of cultivation, often a weed in reclaimed desert land. Chamaephyte.

Floristic category: Sah – Sind, Med and Sud-Zamb Regions.

Local names: 'Adeed, Hoadaan, Halawet el-ghozlaan, Hawthaan, El-anayaat, Shagaret el-libbeina, Howei kelaab, Halawaan.

**21.23. *Launaea mucronata* (Forssk.) Muschl., Man. Fl. Egypt 2: 1057 (1912) subsp. *cassiniana* (Jaub. & Spach) N. Kilian, Willdenowia 25: 277 (1995); Boulos 2002, p. 298.**

Habitat and life form: Sandy and stony deserts, alluvial plains, edges of cultivation. Therophyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local names: Amroor, Maroor, Yamroor, Morreira-entiya, 'Addeid, Haddieida.

**21.24. *Launaea nudicaulis* (L.) Hook. f., Fl. Brit. Ind. 3:416 (1881); Boulos 2002, p. 291.**

Habitat and life form: Sandy and alluvial soils,

desert plains and wadis, edges of cultivation. Chamaephyte.

Floristic category: Sah – Sind, Med and IR – Tur Regions.

Local names: Ribaay eilaab, Howa, Hawa, Howei, Moraar, Howthaan, Lesseq, Lessei,q, Lisseq, Lossaaq, Lessaaq.

**21.25. *Launaea spinosa* (Forssk.) Sch. Bip. ex Kuntze, Revis. Gen. Pl. 1: 350 (1891); Boulos 2002, p. 291.**

Habitat and life form: Rocky deserts and escarpments. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Kebaath, Kabath, Keddaad, Zaggwa.

**22.26. *Nauplius graveolens* (Forssk.) Wiklund, Nord. J. Bot. 7: 16 (1987); Boulos 2002, p. 226.**

Habitat and life form: Desert wadis and dry lands. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Rabd, Rabl, Rabool, Beheyma, Noqd, Noqod, Moqqeid.

**23.27. *Pulicaria undulata* (L.) C.A.Mey, Verz. Pfl. Casp. Meer. 79 (1831);**

Boulos 2002, p. 221.

Habitat and life form: desertic plant. Chamaephyte.

Floristic category: Sud – Zamb and Sah - Sind Regions.

Local names: Kootkaat, Rabool, Rabl, Rabd, Ghobbayra, Shaay gabali.

**24.28. *Reichardia tingitana* (L.) Roth, Bot. Abh. 35 (1787); Boulos 2002, p. 299.**

Habitat and life form: Desert wadis, sandy and alluvial plains, edges of cultivation. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Morrar, Hawwa.

**25.29. *Senecio glaucus* L., Sp. Pl., ed. 1, 868 (1753) subsp. *coronopifolius* (Maire) C. Alexander, Notes Roy. Bot. Gard. Edinb. 37: 412 (1979); Boulos 2002, p. 262.**

Habitat and life form: Winter weed especially in new reclaimed lands. Therophyte.

Floristic category: Sah – Sind, Med and IR – Tur Regions.

Local names: Moroor, Moreir, Moreyre, Meroor, Sofeera, Safeery, Sofra, Safra, Sofeir – attan.

Local names: Qorreis, Omm lonein, Omm loweinein.

**26.30. *Seriphidium herba-album* (Asso) Soják, Cas. Nár. Muz. (Prague) 152 (1): 22**

**(1983); Boulos 2002, p. 261.**

Habitat and life form: Sandy and stony deserts and calcareous ridges. Chamaephyte.

Floristic category: Med and Sah-Sind Regions.

Local name: Sheeh.

**27.31. *Sonchus oleraceus* L., Sp. Pl., ed. 1,749 (1753); Boulos 2002, p. 309.**

Habitat and life form: Common weed in cultivated lands, along. canal banks and roadsides. Therophyte.

Floristic and category: Cosmopolitan.

Local names: Go'odied, Goo'dei, Galawein, Galaaweel, Galaeel, Khass, Khaz, Hoa el- ganayin, Hawa, Howa, Howei, Kass Klab, Khass wez, Shekhasheikh, Shikschaakh.

**28.32. *Symphyotrichum squamatum* (Spreng.) Nesom, Phytologia 77:292 (1994), Boulos2002, p. 194.**

Habitat and life form: Common weed on Nile and canal banks and in waste places. Therophyte.

Floristic category: Pantropical.

Local names: Lossei, Lisseq, Lossaaq, Lesseq.

**29.33. *Volutaria lippii* (L.) Cass. ex Maire in Jahand. & Maire, Cat. Pl. Maroc 3: 817 (1934); Boulos 2002, p. 176.**

Habitat and life form: Desert wadis and waste ground. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Moraar, Moreir.

#### 6. Cruciferae

**30.34. *Brassica tournefortii* Gouan., III. Observ. Bot. 44, t. ZOA (1773); Boulos 1999, p. 211.**

Habitat and life form: Weed in winter crops. especially new reclaimed lands. Therophyte.

Floristic category: Med Region with extension to IR-Tur Region.

Local names: Shiltaam, Shirtaam.

**31.35. *Diploaxis harra* (Forssk.) Boiss., Fl. Orient. 1: 388 (1867). subsp. *harra*; Boulos 1999, p. 209.**

Habitat and life form: Sandy plains and stony wadis. Chamaephyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local name: Harra.

**32.36. *Zilla spinosa* (L.) Prantl, In Engl. & Prantl, Natürl. Pflanzemfam. III (2): 175 (1891); Boulos 1999, p. 218.**

Habitat and life form: Sandy plains. Chamaephyte.

Floristic category: Sah – Sind Region.

Local names: Zilla, Silla, Sillet, Besilla, Basilla, Shagaret el- hommoos, Ommo, Hammoos.

#### 7. Cucurbitaceae

**33.37.** *Citrullus colocynthis* (L.) Schrad., *Linnaea* 12: 414 (1838); Boulos 2000, p. 140.

Habitat and life form: Sandy plains, desert wadis, edges of cultivation in lands. Chamaephyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local names: Handal, Hanzal, Oorky, Tattoor.

#### 8. Ephedraceae

**34.38.** *Ephedra alata* Decne., *Ann. Sci. Nat. Bot., sér. 2, 2: 239* (1834); Boulos 1999, p. 11.

Habitat and life form: Desert sandy plains. Nanophanerophyte.

Floristic category: Sah-Sind Region.

Local names: 'Alde el-dabbagh, 'Alde el-gamal.

#### 9. Euphorbiaceae

**35.39.** *Euphorbia retusa* Forssk., *Fl. Aegypt.-Arab.* 93 (1775); Boulos 2000, p. 59.

Habitat and life form: Sandy plains and desert wadis. Chamaephyte.

Floristic category: Sah – Sind and Sud-Zamb Regions.

Local names: No'maniya, Melbeyn.

#### 10. Geraniaceae

**36.40.** *Erodium laciniatum* (Cav.) Willd., *Sp. Pl., ed. 4, 3: 633* (1800) subsp. *Pulverulentum* (Boiss.) Batt. In Batt. & Trab., *Fl. Algerie* 1: 126 (1888); Boulos 2000, p. 7.

Habitat and life form: Desert wadis, sandy and gravelly soils. Therophyte.

Floristic and category: Med and Sah-Sind Regions.

Local names: Abu mosfaah, Dahimiya, Dahmiyet ghozlaan, Abu 'oqeila, Bakhtery.

#### 11. Gramineae

**37.41.** *Hordeum murinum* L., *Sp. Pl., ed. 1, 85* (1753) subsp. *leporinum* (Link) Arcang., *Comp. Fl. Ital.* 805 (1882); Boulos 2005, p. 207.

Habitat and life form: Weed in fields and moist ground. Therophyte.

Floristic category: Med and IR-Tur Regions.

Local names: Sheer Barri, Sheera.

**38.42.** *Imperata cylindrica* (L.) Raesch., *Nom. Bot., ed. 3: 10* (1797); Boulos 2005, p. 327.

Habitat and life form: Canal banks, roadsides and waste ground. Chamaephyte.

Floristic category: Pantropical.

Local names: Halfa, Deil el-qott, Silla, Sill, Bodweya, Beniesh-shaam, Ambarta.

**39.43.** *Pennisetum divisum* (Forssk ex J. F. Gmel.) Henrard, *Blumea* 3: 162 (1938); Boulos 2005, p. 314.

Habitat and life form: Sandy deserts. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Thommaam, Themmaam, Dah, Ratam, Retam, Retem, Morraat-ghazal, Karaay, Theram, Hada.

**40.44.** *Phragmites australis* (Cav.) Trin. ex Steud., *Nomencl. Bot., ed. 2, 2: 324* (1841); Boulos 2005, p. 223.

Habitat and life form: Moist places and banks of the Nile and irrigation canals.

Helophyte.

Floristic category: Pantropical.

Local names: Hagna, Hagana, Ghaab, Ghaab reehi Boos, Boos khabba

Boos baw, Qasaba, Qasab, Qassaba, Qasab hegaazi, Qesba, Hoshanaat, Heesh, Heesh- maddaad, Taghaaneenet, Tighaaminee'n, Taneimme, Aghaaneem, Ighoonaam, Moddeid, Meddaad, Mottiet.

**41.45.** *Schismus barbatus* (L.) Thell., *Bull. Herb. Bossier, se'r. 2, 7: 391* (1756); Boulos 2005, p. 218.

Habitat and life form: Sandy and gravelly soils. Therophyte.

Floristic category: Euro-Sib, IR-Tur and Med Regions.

Local names: Bahma, Bohma, Abumaashi, Safsoof, Zaghab (Zera') el-faar, Abu hereiba (hareeba), Khafoor.

**42.46.** *Stipa canpensis* Thunb., *Prodr. Fl. Cap. 1: 19* (1794); Boulos 2005, p. 132.

Habitat and life form: Desertic plant. Therophyte.

Floristic category: Sah – Sind and Med Regions.

Local names: Sabat, Sabad, Sabt, Safsoof, Sabal (Sebl) abu el- Hossein, Abufakhoor, Tera, Dreira, Dreira.

#### 12. Labiatae

**43.47.** *Lavandula coronopifolia* Poir. in Lam., *Encycl. Suppl. 3: 308* (1813); Boulos 2002, p.11.

Habitat and life form: Calcareous ground, desert wadis. Chamaephyte.

Floristic category: Sah-Sind Sud-Zamb and Ir-Tur Regions.

Local names: Zeita, Zeiti, Balah, Diktae, Natash,

Netash, Netesh.

### 13. Leguminosae

- 44.48.** *Acacia tortilis* (Forssk.) Hayne, **Getreue Darstell. Gew. 10, t. 31 (1827).** subsp. *raddiana* (Savi) Brenan, **Kew Bull. 12: 87 (1927); Boulos 1999, p. 368.**

Habitat and life form: Sandy plains and desert wadis. Phanerophyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local names: Sayaal, Samoor, Saganeib, Towaay, Ollaaf, Samraa, Samrahl.

- 45.49.** *Alhagi graecorum* Boiss., **Diagn. Pl. Orient. 9: 114 (1849); Boulos 1999, p. 240.**

Habitat and life form: Moist waste ground and edges of cultivation. Hemi-cryptophyte

Floristic category: Palaeotropical.

Local names: 'Aqool, 'Agool, Shoak, Shoak el-gamal, Afisoor.

- 46.50.** *Astragalus vogelii* (Webb) Bornm., **Beih. Bot Centraalbl. 33 (2): 233 (1915); Boulos 1999, p. 329.**

Habitat and life form: Sandy and desert wadis. Therophyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local names: Qarn, Qarna, Qarni, Horboss, Taweel, Fag'ai.

- 47.51.** *Lotus glaber* Mill., **Gard. Dict., ed. 8, no. 3 (1768); Boulos 1999, p. 295.**

Habitat and life form: Moist and cultivated ground, canal banks, lawns. Chamaephyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Qarn el-ghazaal, Rigl el-asfoor, Zeita, Zeiti.

- \*48.52.** *Medicago lupulina* L., **Sp. Pl., ed. 1, 779 (1753); Boulos 1999, p. 269.**

Habitat and life form: Moist ground, edges of cultivation. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Nafal, Nafala, Nafla, Nefel.

- 48.53.** *Medicago polymorpha* L., **Sp. Pl., ed. 1, 779 (1753); Boulos 1999, p. 269.**

Habitat and life form: Cultivated, waste and moist ground. Therophyte.

Floristic category: Cosmopolitan.

Local names: 'Oqqeil, Nafal, Nafala, Nafla, Nefel.

- 49.54.** *Retama raetam* (Forssk.) Webb & Berthel., **Phyt. Canar. 3 (2, 2): 56 (1842) subsp. *raetam*; Boulos 1999, p. 258.**

Habitat and life form: Desert wadis. Nanophanerophyte.

Floristic category: Sah-Sind Region.

Local names: Ratam, Retam, Retem, Retem-behaan.

- 50.55.** *Trigonella glabra* Thunb. **Pl. Cap: 137 (1800); El - Hadidi & Fayed 1994, p.265.**

Habitat and life form: Sandy soils. Therophyte.

Floristic category: Sud – Zamb Med and Sah Sind Regions.

Local names: 'Eshb ( Oshb) el- malik, Daraqraq, Deraaq, Daraaq, Zeraqraq.

- 50.56.** *Trigonella stellata* Forssk., **Fl. Aegypt.-Arab. 140 (1775); Boulos 1999, p. 264.**

Habitat and life form: Sandy soils. Therophyte.

Floristic category: Med and Sah Sind Regions.

Local names: Gargas, Shetn el-khaadem, Atoor garm, Hesheita, Hisheita.

### 14. Malvaceae

- 51.57.** *Malva parviflora* L., **Sp. Pl., ed. 2, 926 (1763); Boulos 2000, p. 94.**

Habitat and life form: Winter weed in cultivated lands and along Nile and canal

banks. Therophyte.

Floristic category: Med, Euro – Sib, IR- Tur and Sah – Sind Regions.

Local names: Raqma, Raqmiya, Khobbeiza, Khobaaza.

### 15. Neuradaceae

- 52.58.** *Neurada procumbens* L., **Sp. Pl., ed. 1, 441 (1753); Boulos 1999, p. 249.**

Habitat and life form: Sandy plains and desert wadis. Therophyte.

Floristic category: Sah-Sind and Sud-Zamb Regions.

Local names: Losseiq, Lesseq, Lisseq, Lossaaq, Lessaaq, Doreis, Sa'daan, Shangareen.

### 16. Nitrariaceae

- 53.59.** *Nitraria retusa* (Forssk.) Asch., **Verh. Bot. Vereins. Prov. Brandenb. 18: 94 (1876); Boulos 2000, p. 31.**

Habitat and life form: Coastal and inland saline soils, edges of salt marshes. Nanophanerophyte.

Floristic category: Sah-Sind and Ir-Tur Regions.

Local names: Ghardaq, Gharqad, Gherdeq, Sahanoon, 'Agelgaam, 'Adjeldjaam, Timmeir, Tommeir, 'Anab ed-deeb.

### 17. Plantaginaceae

- 54.60.** *Plantago ovata* Forssk., **Fl. Aegypt.-Arab. 31 (1775); Boulos 2002, p. 120.**

Habitat and life form: Sandy wadis and depressions. Therophyte.

Floristic category: Cosmopolitan.



Local names: Geneima, Djeneima, Doqeis, Yanam, Yanama, Yenem, Loqmet en-na'ga.

#### 18. Polygonaceae

**55.61.** *Calligonum polygonoides* L., **Sp. Pl., ed. 1, 333 (1753) subsp. comosum (L' Her. ) Soskov, Nov. Sist. Vyss. Rast .12:153 (1975); Boulos 1999, p.24.**

Habitat and life form: desertic plant. Chamaephyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Arta, Teeb, Risoo, Rosah.

**56.62.** *Emex spinosa* (L.) Campd., **Monogr. Rumex 58, t. 1 (1819); Boulos 1999, p. 24.**

Habitat and life form: Winter weed on cultivations and canal banks. Therophyte.

Floristic category: Med and Sah – Sind Regions with extension to IR – Tur Region.

Local names: Drs el-āgooz, Rookbet el-agooz, Shagaret el-āgooz, Batbat, Tablaalast, Keikh, Kolleyly, Gazeesi, Hommeid, Shobeit, Hensaat, Hanzaab, Widna, Figl el-gabl, Losseiq, Lesseq, Lisseq, Lossaaq, Lessaaq.

**57.63.** *Polygonum equisetiforme* Sm., **Fl. Graec. Prodr. 1: 266 (1809); Boulos 1999, p. 30.**

Habitat and life form: Waste ground roadsides. field broders and canal banks.

Chamaephyte.

Floristic category: Med, Sah – Sind and IR – Tur Regions.

Local names: Qordaab, Batwa, Okreish, Afraag, Gorthaab.

**58.64.** *Rumex vesicarius* L., **Sp. Pl., ed. 1, 336 (1753); Boulos 1999, p. 34.**

Habitat and life form: Rocky and sandy desert wadis. Therophyte.

Floristic category: Med, Sah-Sind and IR - Tur Regions.

Local names: Hambeit, Hanbeit, Hamaad, Hammaad, Hammaad el 'eshb.

#### 19. Ranunculaceae

**\*59.65.** *Nigella sativa* L., **Sp. Pl., ed. 1, 534 (1753); Boulos 1999, p. 148.**

Habitat and life form: Escape from cultivation. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local name: Habet el-baraka.

#### 20. Resedaceae

**60.66.** *Ochradenus baccatus* Delile, **Deser. Egypt, Hist. Nat. 63 (1814); Boulos 1999, p. 231.**

Habitat and life form: Sandy plains and wadi beds. Nano phanerophyte.

Floristic category: Sah – Sind and IR - Tur Regions.

Local names: Qordi, Garthy, Thanabaan.

**61.67.** *Reseda pruinoso* Delile, **Descr. Egypte, Hist. Nat. 63 (1814); Boulos 1999, p. 236.**

Habitat and life form: Sandy and gravelly deserts and plains. Therophyte.

Floristic category: Sah – Sind Region.

Local names: Denaaba, Danabaan, Denebaan, Denabaan, Thanabaan, Khosaama.

#### 21. Scrophulariaceae

**62.68.** *Kickxia aegyptiaca* (L.) Nabelek, **Publ. Fac. Sci. Univ. Masaryk Brno 80: 30 (1926) subsp. aegyptiaca; Boulos 2002, p. 65.**

Habitat and life form: Desert wadis and sandy plains. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Thab el-faar, Ibswaa, 'Eshb ed-deeb, Reesha, Doreisha, Megeineena.

**63.69.** *Scrophularia xanthoglossa* Boiss., **Diagn. Pl. Orient., ser. 1, 12: 38 (1853); Boulos 2002, p. 72.**

Habitat and life form: Desert wadis. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Barwek, Qortom, Qartam.

#### 22. Solanaceae

**\*63.70.** *Lycopersicon esculentum* Miller, **Gard. Dict. ed. 8 (1768); Hepper 1998, p. 55. Habitat and life form: Cultivated vegetable crop Therophyte.**

Floristic category: Cultivated.

Local names: Tamatem, Qoutta.

**64.71.** *Hyoscyamus muticus* L., **Mant. 1: 45 (1767); Boulos 2002, p. 50.**

Habitat and life form: Desert wadis and plains. Chamaephyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Semm el-faar, Tatoora, Shagaret es-sakraan, Sakaraan.

#### 23. Tamaricaceae

**65.72.** *Tamarix nilotica* (Ehrenb.) Bunge, **Tent. Tamaric, 54 (1852); Boulos 2000, p. 127.**

Habitat and life form: Wide wadis with sandy silty ground. Nanophanerophyte.

Floristic category: Sah – Sind, Sud – Zamb and IR – Tur Regions.

Local names: Abal, Atl, Athal.

#### 24. Thymelaeaceae

**66.73.** *Thymelaea hirsuta* (L.) Endl., **Gen. Suppl. 4 (2): 65 (1848); Boulos 2000, p. 115.**

Habitat and life form: Sandy and stony plains. Nanophanerophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Mithnaan, Mitnaan.

**25. Umbelliferae**

**67.74. *Deverra tortuosa* (Desf.) DC., Prodr. 4: 143 (1830); Boulos 2000, p. 167.**

Habitat and life form: Desert wadis, sandy and stony plains. Chamaephyte.

Floristic category: Sah-Sind Region.

Local names: Shabat el-gabal, Qozzaah, Qazzaah, Qazoooh, Sekoo, Kerddwy, Zakook, Sakeeh, Qeseekh.

**\*68.75. *Foeniculum vulgare* Mill., Gard. Dict., ed. 8, no. 1 (1768); Boulos 2000, p. 174.**

Habitat and life form: Roadsides, canal banks, hillsides, escape from cultivation. Chamaephyte.

Floristic category: Med and Sah-Sind Regions, cultivated.

Local name: Shamar.

**26. Zygophyllaceae**

**69.76. *Fagonia arabica* L., Sp. Pl., ed. 1, 386 (1753); Boulos 2000, p. 14.**

Habitat and life form: Sandy plains and desert wadis. Chamaephyte.

Floristic category: Sah – Sind Region.

Local names: Gamd, Gamda, Gemda, Shibreeq, Shobrooq, 'Aqool el-ghazaal, Halwa, Helwa el-gemal, Haad, Shoakaan, Showeika.

**69.77. *Fagonia bruguieri* DC., Prodr. 1:704 (1824); Boulos 2000, p. 15.**

Habitat and life form: Sandy plains and desert wadis. Chamaephyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Khoshyaat, 'Agool, 'Aqool, 'Attan, 'Attani.

**69.78. *Fagonia mollis* Delile, Descr. Egypte, Hist. Nat. 76, t. 27, f. 2 (1814); Boulos 2000, p.18.**

Habitat and life form: Sandy and stony desert wadis and plains. Chamaephyte.

Floristic category: Sah – Sind Region.

Local names: Shoka'a, Halaawa, Halaawi.

**70.79. *Tribulus terrestris* L., Sp. Pl., ed. 1, 387 (1753); Boulos 2000, p. 28.**

Habitat and life form: Desert plains, waste ground, weed of cultivation. Therophyte.

Floristic category: Med and Sah-Sind Regions.

Local names: Shiqshiq, Dreiss, Kharshoom en-na'ga, Daqn esh-sheikh.

**71.80. *Zygophyllum coccineum* L., Sp. Pl., ed. 1, 386 (1753); Boulos 2000, p. 24.**

Habitat and life form: Sandy plains. Chamaephyte.

Floristic category: Sah – Sind, IR – Tur and Sud – Zamb Regions.

Local names: Ratrayt, Rotreyt, Balbal, Belbel, Bawaal, Bizz el-Kalba, Hamd.

**71.81. *Zygophyllum decumbens* Delile, Descr. Egypte, Hist. Nat. 221,t.27, f. 3 (1814); Boulos 2000, p.24.**

Habitat and life form: Stony wadis and desert plains. Chamaephyte.

Floristic category: Sah – Sind, and Sud – Zamb Regions.

Local names: Khreysy, Khreiza, Khoreize, Khriyet.

**71.82. *Zygophyllum simplex* L., Mant. 68 (1767), Boulos 2000, p. 23**

Habitat and life form: Sandy soils. Therophyte.

Floristic category: Sah – Sind and IR – Tur Regions.

Local names: Garmal, Qarmal, Goormeil.

**4. DISCUSSION**

The present study on the plant diversity in Wadi Hagul comprises 82 species belonging to 71 genera from one Gymnospermae family and 25 Angiospermae families: Compositae is represented by 20 species, Leguminosae 9 species, Zygophyllaceae 7 species, both of Chenopodiaceae and Gramineae are represented by 6 species. Asclepiadaceae and Polygonaceae are represented by 4 species each. Three species from Cruciferae are recorded. Each of Boraginaceae, Resedaceae, Scrophulariaceae, Solanaceae and Umbelliferae are represented by 2 species; while one species is recorded from each of Capparaceae, Cucurbitaceae, Ephedraceae, Euphorbiaceae, Geraniaceae, Labiatae, Malvaceae, Neuradaceae, Nitrariaceae, Plantaginaceae, Ranunculaceae, Tamaricaceae and Thymelaeaceae. The annual species in the studied area are 33 species; while the perennial ones are 28 species. Nineteen species are recorded as shrubs while the trees are 2 species. Four species recorded from the studied area are considered as a new distribution in the Desert Phytogeographical Region according to Tackholm 1974 and Boulos 2009, which are: *Medicago lupulina*, *Nigella sativa*, *Lycopersicum esculentum* and *Foeniculum vulgare*.

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## دراسة على التنوع النباتي بوادي حجل-الصحراء الشرقية- مصر

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### ملخص

تم في هذه الدراسة المقدمة للتنوع النباتي بوادي حجل تسجيل ٨٢ نوعا نباتيا تتبع ٧١ جنسا في ٢٥ فصيلة وقد سجلت الفصيلة المركبة أعلى نسبة في هذه الأنواع ٢٠ نوعا بينما سجلت الفصيلة القرنية ٩ أنواع والفصيلة الرطريطية ٧ أنواع والفصيلة النجيلية ٦ أنواع. وكل من الفصيلة العشارية والفصيلة الحمضية أربعة أنواع. وسجلت الفصيلة الصليبية ثلاثة أنواع. بينما مثلت كل من الفصائل الخيمية والباذنجانية والسكروفيولارية والرزيدية والبوراجينية بنوعين. وقد سجل نوع نباتي واحد في كل من بقية الفصائل (١٢ فصيلة). وقد بلغ عدد النباتات الحولية ٣٣ نوعا وعدد النباتات المعمرة ٢٨ نوعا وعدد الشجيرات ١٩ نوعا بينما تم تسجيل نوعين من الأشجار.

تم تسجيل توزيعات جغرافية جديدة لاربعة أنواع نباتية في منطقة الصحراء لم تسجل في مراجع الفلورة المصرية من قبل، وهذه الأنواع هي: ميديكاجو لوبيولينا، نيغلا ساتيفا، لاكوبسيسم اسكيولنتم، فونيكولم فولجير.

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