

## ***Clinopodium serpyllifolium* subsp. *barbatum* (Lamiaceae) and *Datura ferox* (Solanaceae): New Records For The Flora of Egypt**

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**C**LINOPODIUM *serpyllifolium* subsp. *barbatum* (Lamiaceae) and *Datura ferox* (Solanaceae) have been recorded for the first time from Egypt. Both taxa were found in the mountainous region of Saint Katherine Protected Area, South Sinai. Morphological description and photos were given. Herbarium voucher was kept at related Herbaria.

**Keywords:** *Clinopodium serpyllifolium*, *Datura ferox*, Egypt, New record, Morphology, Saint Katherine Protectorate.

### **Introduction**

Saint Katherine Protectorate (SKP) extends over virtually the entire mountain massif of southern Sinai, with an area of about 4350km<sup>2</sup>, and lies between 33° 55' to 34° 30'E and 28° 30' to 28° 35'N with an elevation range of 1300–2641 m above sea level (asl) (Moustafa & Klopatek, 1995).

The genus *Clinopodium* L. is mostly distributed in the New World (both temperate and tropical) and temperate Eurasia, but a few in Africa, tropical Asia and Indo-Malaysia (Harley et al., 2004). Species number in *Clinopodium* recently increased to about 100 by inclusion of numerous taxa from other genera (Harley & Granda, 2000 and Bräuchler et al., 2005). *Micromeria* Benth., a member of family Lamiaceae, is a taxonomically difficult and complex genus (Bräuchler et al., 2008). Taxonomists have split this complex into many genera as *Satureja* L., *Clinopodium* L., *Calamintha* Mill., *Acinos* Mill. and *Micromeria* (Arabaci et al., 2010) and sometimes agglomerate all together in *Satureja* (Briquet, 1895-97 and Greuter et al., 1986) or *Clinopodium* (Kuntze, 1891). However, the genera *Acinos*, *Calamintha* and *Micromeria pro parte* were transferred to the genus *Clinopodium* and several new combinations were validated (Iamonico & Bogdanović, 2010) on the other hand

Bräuchler et al. (2006, 2010) transferred *Micromeria* sect. *Pseudomelissa* to *Clinopodium* based on molecular phylogenetic and morphologic

structure. According to Boulos (2002, 2009 and Täckholm, 1974), the genus *Micromeria* is represented by 5 species viz.: *M. serbaliana* Danin & Hedge; *M. sinaica* Benth.; *M. imbricata* (Forssk.) C.Chr.; *M. nervosa* (Desf.) Benth.; *M. myrtifolia* Boiss. & Hohen. They didn't include in their account the presence of genus *Clinopodium*, which is reported here for the first time from Egypt (Sinai).

*Datura* L. is a small genus of about ten species (Shaw, 2000); it belongs to family Solanaceae which comprises 100 genera and 2,700 species (Olmstead & Bohs, 2007). *Datura* species are native in the southern United States and Mexico. Several species are widely cultivated as ornamentals or have become notorious agricultural or environmental weeds (Shaw, 2000). Bernhardt (1833) divided the genus *Datura* into 4 sections namely *Brugmansia*, *Stramonium*, *Dutra* and *Ceratocaulis*. Economically *Datura* species are important source of alkaloids as atropine, hyoscyamine, scopolamine, meteloidine, apohyoscyne, apotropine and tropine (Demeyer & Cordier, 1993).

Täckholm (1974) reported five species of *Datura* from Egypt viz. *D. stramonium* L., *D. tatula* L., *D. innoxia* Mill., *D. metel* L. and *D. fastuosa* L. While Hepper (1998) and Boulos (2002, 2009) reported only three species: *D. stramonium*, *D. innoxia*, *D. metel*; he treated *D. tatula* and *D. fastuosa* as synonyms of *D. stramonium* and *D. metel*, respectively.

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## Materials and Methods

Plant materials were collected from Wadi El Raha and El Shikh Awad, in the mountainous region of Saint Katherine Protectorate (Fig. 1), South Sinai, Egypt during field survey carried out in 2017-2018. The specimens were first checked in Täckholm (1974); Boulos (2002, 2009) for their presence in Egypt. The specimens were identified using regional literature (Haegi, 1976; Feinbrun, 1977 and Arabaci et al., 2010) in addition to different websites then compared with specimens housed in different Egyptian Herbaria (Cairo University, CAI, Damietta University Herbarium and Saint Katherine Herbarium, SKPH). Accepted name as well as synonyms was verified using International Plant Names Index (IPNI), Global Biodiversity Information Facility (GBIF) and The World Checklist of Selected Plant Families (WCSP). The distribution map was drawn using ArcGIS 10.2. Voucher specimens were kept at Department of Botany and Microbiology, Faculty of Science, Damietta University Herbarium, and in Saint Katherine Protectorate Herbarium (SKPH).

## Results and Discussion

In this study, we reported new genus: *Clinopodium serpyllifolium* subsp. *barbatum* (P.H. Davis) Bräuchler (Lamiaceae) and new species: *Datura ferox* L. (Solanaceae) to the flora of Egypt from Sinai.

### Lamiaceae

*Clinopodium serpyllifolium* (M. Bieb.) Kuntze subsp. *barbatum* (P.H. Davis) Bräuchler, Taxon 55: 980. (2006).

*Basionym*: *Micromeria fruticosa* (L.) Druce subsp. *barbata* P.H. Davis in Kew Bull. 6: 77(1951)

*Type*: [Lebanon] Iter Syriacum in Libano ad Dschene et circa Cedretum. In jugi inferioribus regionibus Danie, 5500 ped., 28. Jul. 1855. *Th. Kotschy* 342 (holotype: G)

*Syn.*: *Micromeria barbata* Boiss. & Kotschy in Boiss., Diagn. Ser. 2, 4: 14 (1859), nom. Illeg. non CA. Mey. in Fisch. & Mey., Ind. Sem. Hort. Petrop. 8: 67 (1842).

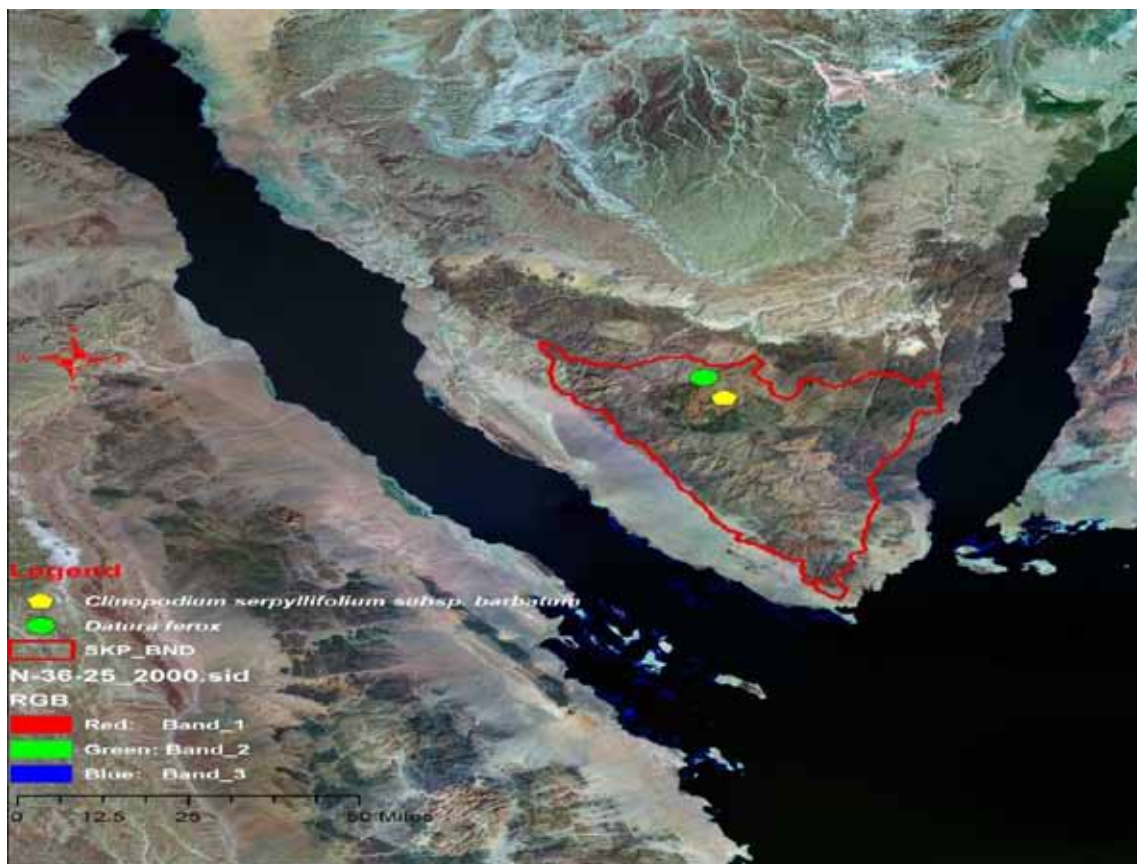


Fig. 1. Study area and new record of *Clinopodium serpyllifolium* and *Datura ferox* distribution shown in yellow and green colors, respectively.

Fragrant sub-shrub, up to 80cm, stem many, glabrous, quadrangular, erect or ascending, internode length 3.8cm. Leaves petiolate, opposite, simple, ovate, 0.4-1.5x 0.2-1cm; margin crenate-dentate, with obtuse apex, rounded at the base; petiole 2-5mm long. Flowers in cymose inflorescence; pedunculate. Calyx violet, tubular, hairy, nerved, 0.3-0.4mm long, calyx teeth subulate to triangular. Corolla white with violet edge on upper site, lower limb longer than upper one, claw 4mm in length, limb 3mm. Bracts ovate- subulate, 1mm long. Seeds brown. (Figs. 2, 3). Flowering and fruiting: April to October (-December).

*Habitat:* Weed in gardens

*Specimen seen:* South Sinai, Saint Katherine Protected area, Wadi el Raha, 13-12-2017; El Gamal, s.n. (SKPH; Damietta University, Herbarium)

*Global Distribution:* Lebanon, Syria, Western Asia, Palestine; in Egypt, only known from southern Sinai, Saint Katherine protected area.

The calyx shape is the most important character for the separation of *Clinopodium* from *Micromeria*, being 13-nerved, bilabiate calyx in the former and 13-nerved, subequally 5 dentate calyx in *Micromeria*.

*Clinopodium serpyllifolium* subsp. *barbatum* characterized by crenate leaf margin, no marginal vein, height up to 80cm. or more and hairy calyx.

#### Solanaceae

Key to the *Datura* species in Egypt including the newly recorded one.

1- Leaf margin sinuate- dentate to coarsely dentate .....2

+ Leaf margin entire or undulated .....3

2- Corolla c. 3cm long; petals broad triangular. Capsule ellipsoid to broadly-ellipsoid (2-5x 1.2-3cm) with c.30 stout, broad based, conical, sharp spines (2-4cm length) .....*D. ferox*

+ Corolla 6-10cm long, rounded. Capsule narrow-ovoid to ovoid (5-7x 3-5cm) with numerous sharp, narrow spines .....*D. stramonium*.

3- Leaves hairy-pubescent. Corolla 12-20 cm long. Capsule globose (4.5-5.5cm) with numerous slender, sharp spines .....*D. innoxia*

+ Leaves Glabrous. Corolla up to 17cm long, terminated by acuminate apex, distinct and separated by short sinuses. Capsule globose (4-5cm) with numerous, conical tubercles spines ....  
.....*D. metal*.

*Datura ferox* L., Amoen. Acad. 3: 403.1756

*Lectotype:* “*Stramonium ferox*” in Boccone, *Icon. Descr. Rar. Pl. Siciliae*, 50, t. 26, f. c, e, 51, 1674

Annual, stem green, glabrous, erect, Leaves alternate, glabrous, broad-ovate, 1.2-3x 1-1.3cm, margin coarsely doubly lobed; petiole about 2.5cm long. Flowers erect, solitary, pedicel c. 1.8cm. Calyx c. 2cm long. Corolla c. 3cm long, white. Capsule ovoid- ellipsoid, 4-valved, 2-5x 1.2-3cm, prickly with unequal spines, spine length 2-4cm, with thick conical bases, slightly acuminate when ripe. Seeds black, reniform rounded towards the upper outer margin, tapered towards the base, 4mm long (Figs. 4 and 5). Flowering and fruiting July to December.

*Specimen seen:* South Sinai, Saint Katherine Protected area, El Sheikh awad, 10-12-2017, El Gamal, s.n. (SKPH; Damietta University Herbarium)

*Habitat:* Weed in gardens

*Global distribution:* Widely wide distribution “Eastward country boarded to Egypt as well as Europe countries”. In Egypt only known from South Sinai, Saint Katherine protected area.

The newly recorded taxa were found in natural wild vegetation, which represent the natural extension of its global distribution. Only one individual of *Clinopodium serpyllifolium* subsp. *barbatum* was recorded at Wadi El Raha at the mountainous region of Saint Katherine protected area. *Datura ferox* L. survived as one population only at one site of Wadi El Shikh Awad in the mountainous region of Saint Katherine protected area.



Fig. 2. *C. serpyllifolium* subsp. *barbatum*; a= Leaves, b= Inflorescences and c= Fruit.

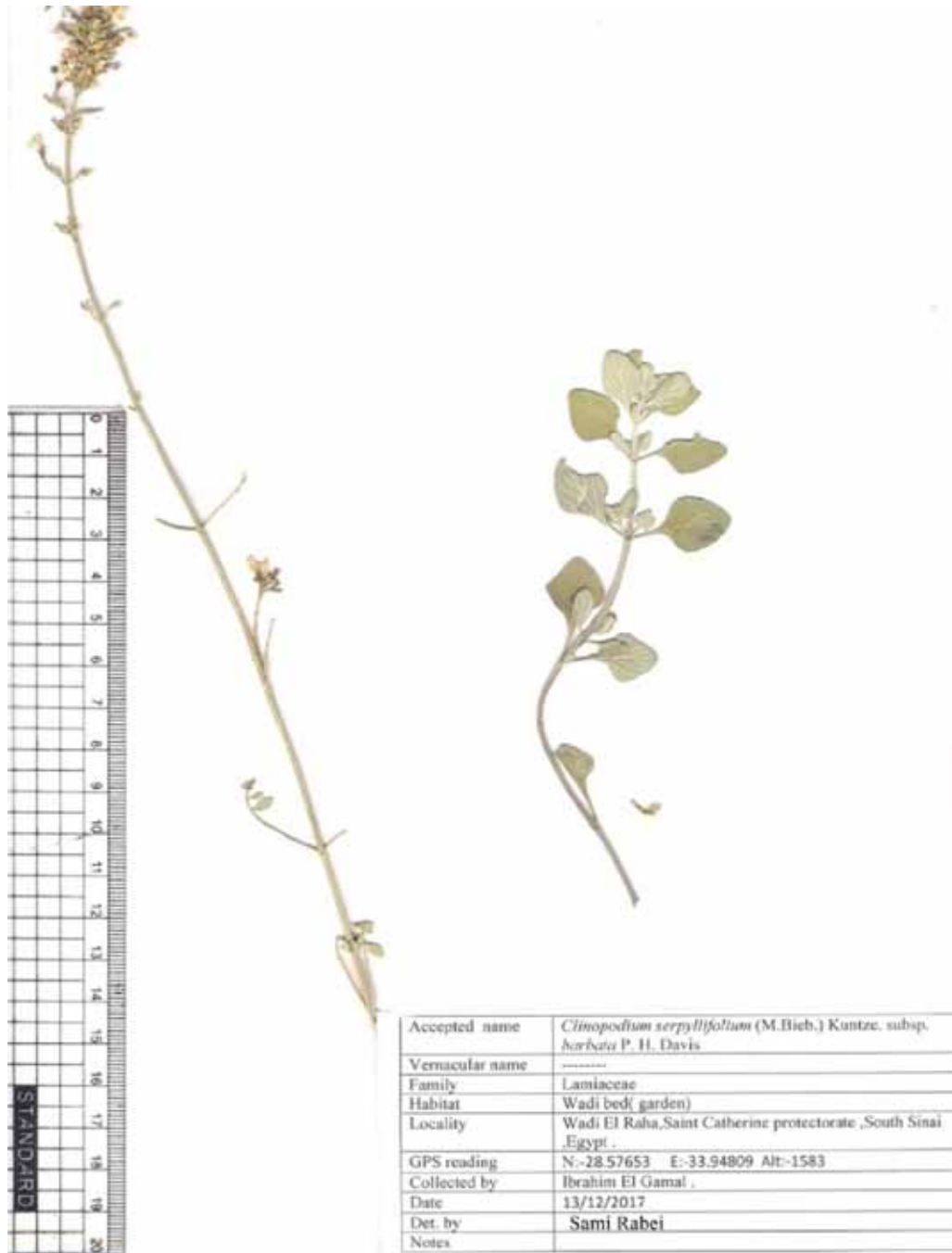


Fig. 3. *C. serpyllifolium* subsp. *barbatum* herbarium specimen.



Fig. 4. *Datura ferox* herbarium specimen.



Fig. 5. a= *Datura ferox* whole plant, b= Flower and c= Fruit.

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### نبات عشب الشاي (الفصيلة الشفوية) ونبات الداتورة طويلة الأشواك (الفصيلة الباذنجانية) كأنواع جديدة على الفلورا المصرية

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خلال المسح النباتى بمحمية سانت كاترين بجنوب سيناء بمصر. تم رصد كل من الأنواع (عشب الماء أو الزعيطان) *Clinopodium serpyllifolium* subsp. *barbatum* (الفصيلة الشفوية) ونبات الداتورة طويلة الأشواك (الفصيلة الباذنجانية) كأنواع جديدة لم تسجل من قبل فى الفلورا المصرية. تم وصف الأنواع النباتية من حيث الشكل الخارجى مدعوماً ببعض الصور.