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TAXONOMIC STUDY OF *GLOSSOSTEMON BRUGUIERI* DESF. (MALVACEAE) IN IRAQ

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Abstract

Glossostemon burguieri Desf. is a monotypic native plant in Iraq, reclassified to Malvaceae family, the plant contains important chemicals used in traditional medicine and because it has not been seen through 37 years and recollected in 2016, it was interested to re-examined it. There were noticeable morphological variations particularly in leaf lamina, margin and apex; measurements were less in all examined parts (shorter and smaller) due to environmental changes. The study found that all specimens were collected from the same district; there is no extension for this genus in Iraq, may be its threatened. The study examined the pollen grain for the first time; it was prolate- spheroidal with 3- zonocolporate and coarse reticulate sculpture.

Keywords : *Glossostemon*, Malvaceae, Sterculiaceae, Iraq, Taxonomic.

Introduction

Glossostemon submitted as a wild plant in Iraq, monotypic within the family Sterculiaceae (Townsend *et al*., 1980). Ali Al- Rawi, 1964 mentioned that the plant distributed in Persian foothill district in Iraq (FPF). The families: Bombacaceae, Sterculiaceae, Tiliaceae and Malvaceae into merged a more widely circumscribed Malvaceae, so all taxa under Sterculiaceae are treated as taxa under Malvaceae (APGII, 2003; Kare & Chase, 2009). Townsend *et al*., 1980 mention *Dombeya arabica* Barker as a synonym; it was confirmed by the World Checklist of Selected Plant Families organization (WCSP) and reported *Glossostemon bruguieri* as an accepted name in (Plantlist org. 2012). *Glossostemon* named referring after its staminodes (*glossa*: tongue; *stemon*: stamen), it is native in Iraq and the local names are ARAB QÕZI or MUGĀTH, (Townsend *et al*., 1980). While in Egypt it is known as MOGHAT. The dried peels roots are used in traditional medicine (Gamel *et al.,* 2010). The plant has been focus of attention for many scientific researchers, Meselhy, 2003 confirmed that *Glossostemon* contains biflavnoes, methoxylated, flavones, anthraquinones and lignans in addition to mucilage, oestrone and phytosterol; while N. Ibrahim. *et al.* 1997 in a chemical study suggested that the roots should be investigated as potential medical and nutritive food, another medical study for Gareeb *et al.* (2014) considered the *Glossostemon* as potent safe- juvenile osteopenic (JO) - reversal extracts and El-Sayed *et al.* 2003 also study the effect on urine volume of *Glossostemon* constituents. However there are much more medical and chemical studies of this plant which are not the field of this study. *Glossostemon* was collected from east district in Iraq in 1932- 1947- 1977, 1979 and 2016, samples were kept in National Herbarium of Iraq/ Ministry of Agriculture-Baghdad (BAG); the study aim to re- examine the plant for the first time after 37 years, were it recollected again by a team of scientific researchers work in (BAG), furthermore we aim to study the morphology of its pollen grain also for the first time in Iraq.

Material and Methods

The plant was collected by a team of scientific researchers of (BAG), it collected from Al- Hashima 14 km. of Al-Fateha police station, road between Badra to Mandali in 2016, this aria located east Baghdad (FPF); it was examined by dissecting microscope, identified, compared with reference herbarium specimens of (BAG) and specimens of GBIF organization gallery- on line, were specimens kept since 1910 (GBIF gallery, 2020), the study also review the genus in Flora of Iraq (Townsend *et al*. 1980). Acceptance of its binomial scientific name checked with the plant list organization (plantlist.org. 2012). Morphology of pollen grains studied by light microscope following (Al-Dobaissi, 2008) method.

Results and Discussions

The plant grows in an open area and the red shiny color of the flowers gave the plant a very attractive view, it grows at side road or side hill (Fig. 1). The study found some variations comparing with data of flora of Iraq and with on-line specimens of Iraq in GBIF galary; the measurements of studied plants are less (smaller and shorter), for example the height submitted in the flora 45- 65 cm to 1.5 m. while it was 13- 30 cm., maybe due to environmental changes. The morphological variations noticed particularly in leaf lamina, margin and apex (Table 1, app. 1). Tawsend *et al.* 1980 in flora of Iraq mentioned that the plant grow in sandy soil; while the collected plants were growing in a clay soil. Furthermore it was mentioned in the flora that the genus distributed in steppe region of Iraq, the FUG, FNG, FNI, FKI and FPF districts; while the examination of the specimens referred that the plants collected during the years 1910- 1932- 1947- 1977 and 1979 till 2016 were collected from the same district, the (FPF) altitude ±50- 250m and the frequency was rare; there is no extension for this genus in Iraq, may be its threatened.


(a) The plant


(b) The flowers

Fig. 1: The plant in nature

Table 1: Some variations in morphological characteristics of leaves

Morphological characteristics			Currently studied specimens	Data from flora of Iraq	On-line GBIF specimens
Leaf	Morphology	Lamina	wide reniform	Broad as length	Deltoid
		Margin	irregular undulate with some serrate teeth mostly trilobite	Irregular teeth with obtuse sinuses between	Irregular serrate
		Apex	Rounded	Acute	Acute
		Base	Curved inward	truncate or cordate	Almost truncate

Morphology of pollen grain was prolate-spheroidal, the apertures was colpi are fusiform- oblong, 3- zonocolporate and the exine sculpture was coarse reticulate (Fig. 2). The Equatorial diameter (E) was 33.758 µm. and Polar axis (P) was 40.448 µm. these reading are agreed with Hamdy. & Shamso, 2010 study.

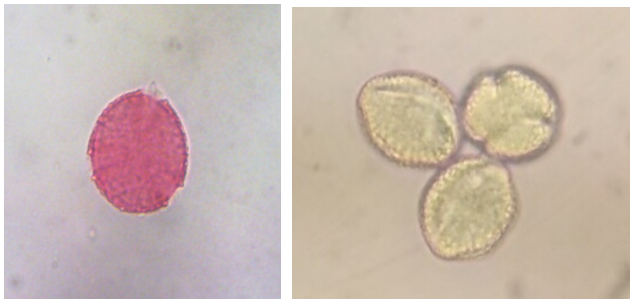
(a) Stained with sufranine. (b) without stain

Fig. 2 : Pollen grains (L.M.)

Taxonomic treatment:

Glossostemon bruguieri Desf., Mem. Mus. Hist. nat. Par. 3: 239(1817) (Fig. 3)

Perennial green herb. Stem erect- ascending, woody, 13- 27- 30 cm. x 8- 22 cm. brunched at the lower nods. Stellate yellow tomentose trichomes covered all vegetative parts. Stipules and bracts are almost similar, lanceolate-linear, sessile, margin entire, apex attenuate, 1.6- 3.6 cm. x 0.2- 0.5 cm. and 2.5-3.0 cm. x ≤ 0.1 cm. respectively. Leaves simple, wide reniform, 6-26 cm. x 5- 26 cm., apex rounded, base ~ concaved, margin irregular undulate with some serrate teeth, mostly trilobite, 5- 7 primary veined from base; petiol, 4-16 cm. x 0.3-0.6 cm. Inflorescences dense, axillary simple corymb, verticillasters 20- 25 flowers, actinomorphic, flowering peduncle 1.2-4.5 cm., fruiting peduncle 6.2- 9.0 cm., pedicel 1.9- 4- 5.5 cm. Calyx green, 5 united sepals at base, ovate- wide lanceolate, margin entire, acute apex, 0.6-1.4- 2.2 cm. x 0.3-0.6 cm., three primary veins, dense stellate yellow tomentose on the outer surface (dorsally), calyx remain with fruit. Corolla red-maroon, 5 petals alternate with sepals, linear lanceolate, margin entire, incurved at the lower part (concave), apex attenuate, 2.1- 2.4 cm. x 0.4- 0.6 cm., 5 veins, glabrous. Androceum red-maroon, consisted of 5 groups alternate with petals, these groups fused at the most lower part (make a ring around the pistle); the innermost of each group modified as a leaf like structure, lanceolate, has three veins, 4- 5 mm. x ≤ 1mm. prominently it is petaloid staminod; the fertile stamens are of two groups, each consist four stamens branched at each side of the petaloid staminod, ± 2 mm. length, the stamens are dark red with shiny yellow anthers, dehiscing via longitudinal slits, total number 40 stamen in one flower. Gynoecium syncarpous, 5 carpelled, isomerous with the perianth parts, superior ovary, 3- 3.5 mm., apical glabrous style, 1 mm. length, end with 5 short oblong stigma; the ovary with 5 angles, fleshy scale- like processes, covered with dense stellate yellow tomentose trichomes, 5 locules, axile placentation. Fruit green become gray at repin, capsule, elongated spherical- elongated ovate, 6.5 cm. x 3 cm. the ovarian scale like processes grow to cone-like, 20- 25 mm., end with spines. Seed trigonous, tapering to one end, 2 faces plane and the third curved outward (convex), 8- 9 mm. x 5- 6 mm., light whitish yellow (sandy color), there are some nods lined along the seed give the appearance of necklace- like. Pollen grain prolate-spheroidal, 3-zonocolporate, exine sculpture coarse reticulate.

Specimen seen (BAG). Iraq: Al- Hashima 14 km. of Al-Fateha police station, road between Badra to Mandali, east of Baghdad (FPF). Alt. 91m. 26/ 4/ 2016, Al- Kaisi, A.Haloob and Riyadh. 58889. (fig. 4).

Habitat: clay soil in an open area, side road or side hills, frequency rare and rarely grow in cultivated field of wheat, common plants grow nearby is Alhagi, alt. 90m.- 180m.

Distribution: (FPF) Persian foothill district of Iraq; northern east- east of Baghdad.

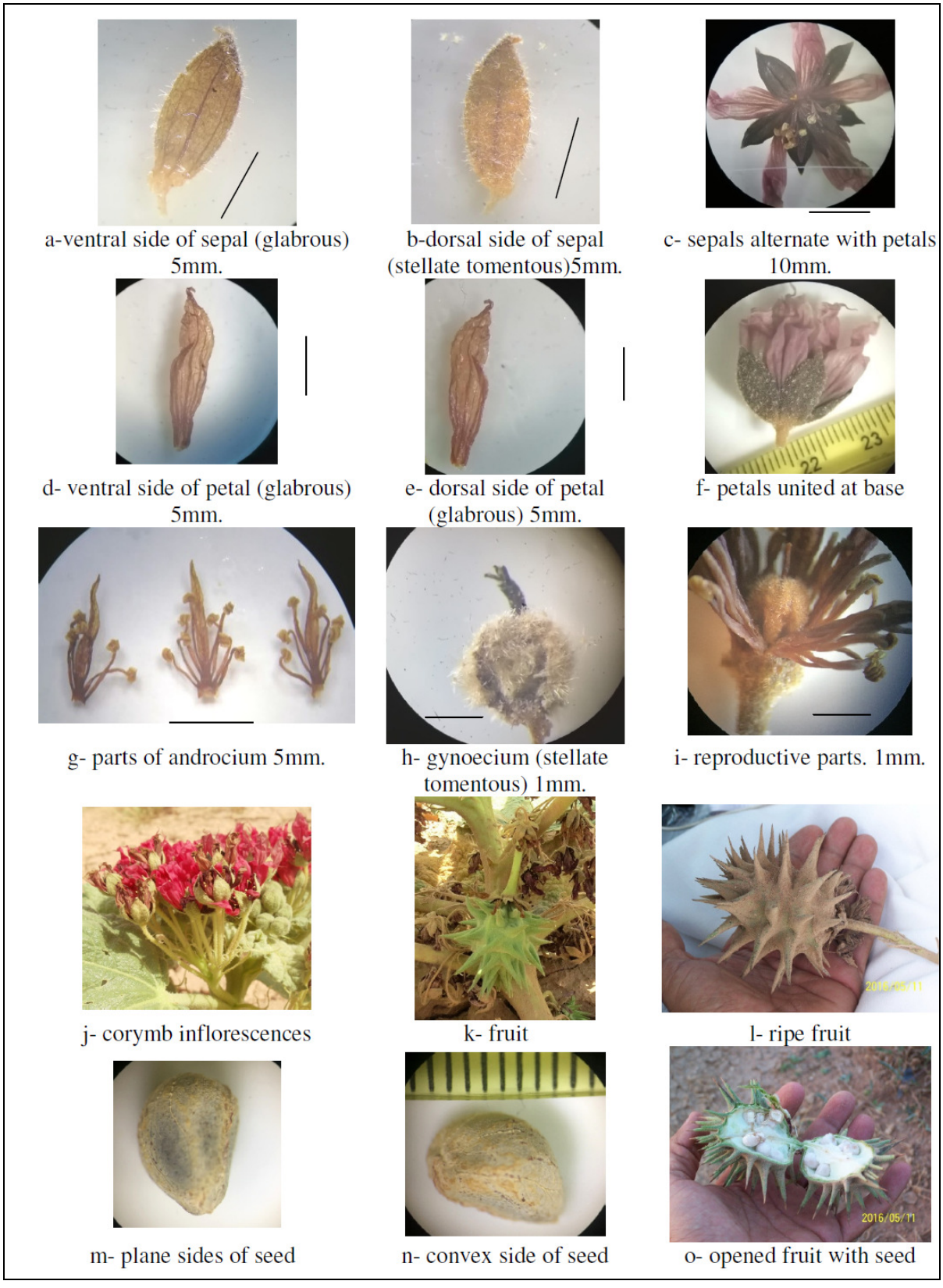

Fig. 3 : Vegetative and reproductive parts of *Glossostemon*

Figure 4: BAG Specimen no. 58889

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