

New record of *Carex* L. (Cyperaceae) for Libya

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Abstract

Carex L. Sect. Trachychlaenae, Subgenus *Carex* viz. *Carex hispida* Willd. ex Schkuhr is a native taxon of the Mediterranean basin, and this is the first time it has been found in Libyan territory. It grew in a small swamp about 50 km west of Derna city. The records date from March 2017 to March 2022. Collecting this taxon from this area in east Libya, expands the known geographical distribution of *Carex hispida* and underscores the importance of continued botanical exploration across all regions.

Keyword: Cyperaceae, *Carex*, Sedge, Libya, New Records, *Hispida*.

Introduction

The Cyperaceae is the third largest family among monocots (Lunkai *et al.* 2010), with a similar global distribution to the Poaceae (Simpson 2008), with 106 genera and *c.* 5400 species, especially the largest genus, *Carex* L. (Bruhl *et al.*, 2007), the sedge genus *Carex* L. (Cyperaceae), with nearly 2000 species it ranks among the three largest angiosperm genera in the world (POWO 2020, Govaerts *et al.* 2021), Remarkably, it has undergone few taxonomic rearrangements since its formal description by Linnaeus 1753. The morphological homogeneity of the diagnostic characteristics of *Carex* (unisexual flowers, with the pistillate ones enclosed in a bract-derived structure called the perigynium or utricle; (Kükenthal, 1909, Egorova, 1999, see also Jiménez-Mejías *et al.*, 2016), have historically been considered taxonomically difficult. This perception is a product of the great diversity, coupled

with the characteristics of reduced reproductive organs, lack of distinctive coloration and ability to hybridize (Bugg *et al.*, 2013), They also play an important role in conservation as dominant components of wetland ecosystems and are reliable indicators of habitat loss in such systems (Simpson *et al.*, 2003).

The main characters of this genus which distinguish it from the other genera in the Cyperaceae are flowers unisexual, the female ones contained within a prophyllar structure called a perigynium, which is referred to as a utricle when its margins are fused and closed (Dai *et al.* 2010; Jimenez-Mejias *et al.* 2016).

Perennial grass, long rhizomes, The stems are triangular in cross section, has a leaf-like (Welsh *et al.*, 2003), *Carex* leaves are long, alternate, and mostly arise near the base, usually within a closed sheathing base, parallel veined, and strap-shaped, The flowers of this family are bisexual or unisexual, and very minute (Judd *et al.*, 2000), They reproduce by rhizomes and seeds (Fox 2000).

The taxonomy of *Carex* was based on perigynium characteristics, the pattern of branching of the inflorescence (unispicate vs. multispicate), the distribution of the sexes in spikes (bisexual vs. unisexual), and the presence of a peduncle (sessile spike vs. pedunculate spike) (Kukenthal 1909; Chater 1980; Egorova 1999; Ball and Reznicek 2002).

Erteeb and Sherif (1985) in their treatment of Cyperaceae for Libya listed and described a total 6 species of *Carex* including one doubtful species that mentioned as unknown species (*Carex* sp.). The species, *Carex hispida* was not known to occur in Libya.

In the course of our studies of the genus in Libya, specimens of one species was observed from Ras Al Hilal, an east coast area of Libya. The floristic affinity between that of the east coast of Libya and south eastern coast of Europe has been well-known, discussed and it is not surprised at all to find this Mediterranean species in Libya (Sophia *et al.* 2022).

Carex Hispida

Willd. ex Schkuhr. Published in: Beschr. Riedgräs. 1: 63 (1801)

C. hispida is species of the genus *Carex*, subgenus *Carex* section *Trachychlaenae* Drejer. (Figures 1&2).

Synonyms

- = *Carex acutiformis* Brot.
- = *Carex echinata* Desf.
- = *Carex hispida* f. *marina* Heldr.
- = *Carex hispida* f. *marina* Heldr. ex Kük.
- = *Carex hispida* f. *soleirolii* (DC. & Duby) Asch.
- = *Carex hispida* subsp. *retusa* (Degl.) Arcang.
- = *Carex hispida* subsp. *soleirolii* (DC. & Duby) K.Richt.
- = *Carex hispida* var. *anacantha* Godr.
- = *Carex hispida* var. *genuina* Godr.
- = *Carex hispida* var. *soleirolii* (DC. & Duby) Nyman.
- = *Carex hispida* var. *soleirolii* (Duby) Asch. & Graebn.
- = *Carex lasiochlaena* Kunth.
- = *Carex longiaristata* Biv.
- = *Carex mediterranea* C.B.Clarke.
- = *Carex mediterranea* C.B.Clarke ex Post.
- = *Carex obtusangula* Salzm.
- = *Carex obtusangula* Salzm. ex Boott.
- = *Carex obtusangula* Salzm. ex Nyman.
- = *Carex phillippii* L.H.Bailey, 1886.
- = *Carex pratensis* Phil.
- = *Carex retusa* Degl.
- = *Carex soleirolii* DC. & Duby.

Description

Perennial, 57.5-113.5cm high, green herb with thick, indurate, brown-black underground Rhizome. Stem (culm) erect, stiff, trigonous, glabrous, leafy, 18.5-49cm. basal sheaths dissolves into fibres, blackish brown. Leaves as long as the stem or longer, 21.5-89 cm x 6-9mm (up to 100.5 cm long), caniculate, acute, scabrous towards the margins, the rest glabrous, flat, slightly stiff. Ligule short membranous, to blackish in color. Inflorescence spike like, androgynous (lower ones sometimes female), with 4-8 superior male spikelets with glumy bract and 1-6 inferior female spikelets with leafy bracts, the female spikes sometimes with few male flowers at apex, upper spikes sessile, lower spikes slightly long pedunculated, lower peduncles rather long, upper ones short. Bracts 1-69 cm long, lower involucral bracts longer than inflorescence, upper involucral bracts shorter than inflorescence, scabrous towards the margins. Male spikelets conspicuously overlapping with each other, female spikelets little spaced from each other. Male spikelets 2-9 cm × 2-8 mm, oblong- lanceolate, ±cylindrical, brown, lower spikes with short peduncle, upper spikes sessile. Rachis wingless, erect, glabrous, 2.5-6cm. Male glumes broad, ovate, rounded on back, brownish, mid-vein green, scarious on the margins, acute-obtuse or rounded, densely imbricate, not keeled, 4-7.2 mm × 2-2.5mm, nerves faint. Stamens 3, anthers linear, yellowish-brown, basifixed, 3-4.2mm long, filament white-yellowish, 2-7 mm long, longer than the anther. Female spikelets 1.3-7.5 cm × 4 mm-1.2 cm, oblong, cylindrical, dense, ± separated, with peduncle up to 1.5 cm long, smooth, exserted. Upper peduncles short and enclosed in involucral bract sheath but lower Peduncle slightly exserted. Rachis wingless, erect, glabrous. Female glumes (Figure 3) there are variation in female glumes in size, shape and color, narrow, in the lower spikelets lanceolate, apex acute-acuminate aristate, white and reddish-brown hyaline on margins, narrower than the female glumes in the upper female spikelets, the arista long, but in the upper female spikelets lanceolate, acute, reddish-

brown, mid-ven greenish, the arista short, 4.5-6mm \times 1-2mm (including awn), arista 1-1.5mm long, 1-nerved, the nerve tapered into very sharp point or mucro, glabrous, only minutely scabrous on the mucro. utricule nearly equaling the glumes or little shorter, 3-4 mm \times 1.5-2mm, 2-veined laterally or indistinctly veined abaxially, greenish or pale-yellow, smooth or with scattered brown glands or papillose, obtusely trigonous, ovate-oblong, contracted and rounded above to an elongated bifid beak, with two brownish toothed and scabrous at the beak in top, long of beak ca. 0.3-0.5 mm, base gradually narrowed and very shortly stipitate. ovary erect, trigonous, glabrous and smooth, 11.5mm long, brownish-green. Style slender, erect sometimes curved, c. scabrous, 1.5-2 mm long. Stigma 3, reddish-brown, exserted, 1.5-2 mm, hispidate.



Figure (1): Shape of *Carex hispida* in field trip (Photo by S. Alshareef)

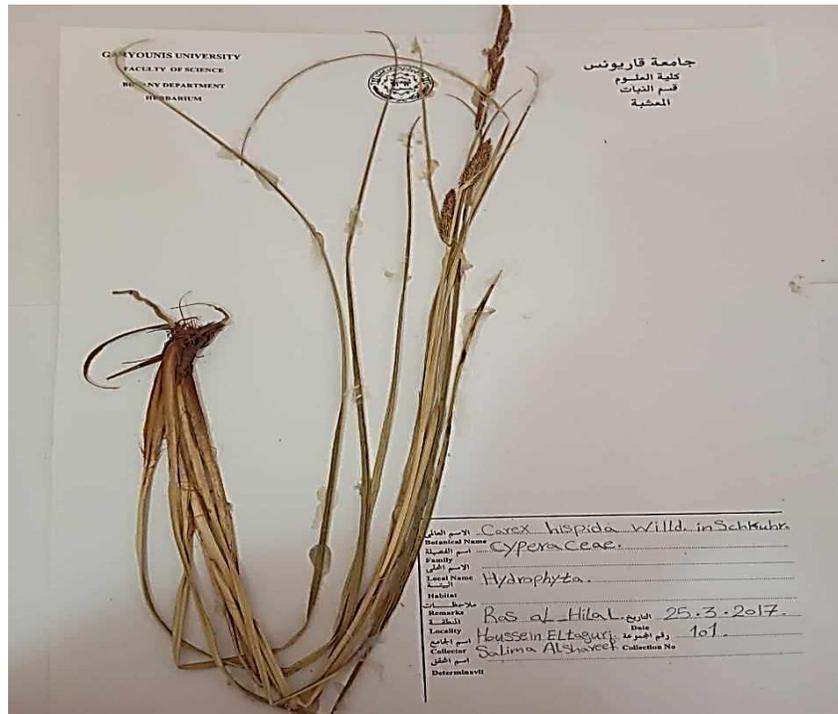


Figure (2): *Carex hispida* in Cyrenaica Herbarium Garyonis University (CHGU) Benghazi (Photo by S. Alshareef)

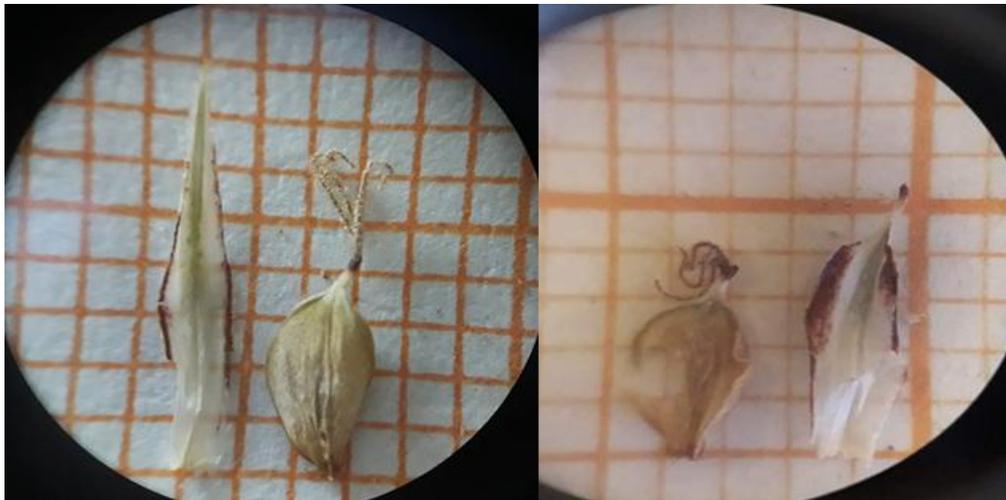


Figure (3): variation in female glume of *C. hispida* (Photo by S. Alshareef)

Distribution: according <https://www.gbif.org/species/2723098> (2024) this species recorded from most of south Europe, Morocco, Syria and Palestine. (Figure 3)



Figure (4): Distribution of *Carex hispida* from <https://www.gbif.org/species/2723098> (2024).

Ecology: It was discovered growing in a small swamp in the field among other mesophyte plants, located about 2.5 km south of the shoreline at Ras Al Hilal (340 m above sea level) and 50 km west of Derna city (Fig. 5). The climate in this area is primarily Mediterranean, characterised in by very dry summers (May-September) and relatively wet winters (October-April). The highest mean monthly rainfall does not exceed 54 mm, typically occurring in January. The mean annual rainfall over the last two decades is around 600 mm, although it is spatially erratic. The mean maximum monthly temperature reaches 30°C in August and decreases to 16°C in January. The lowest mean minimum monthly temperature is recorded in January at 12°C and decreases to 25°C in August (The Global Historical Weather and Climate Data)

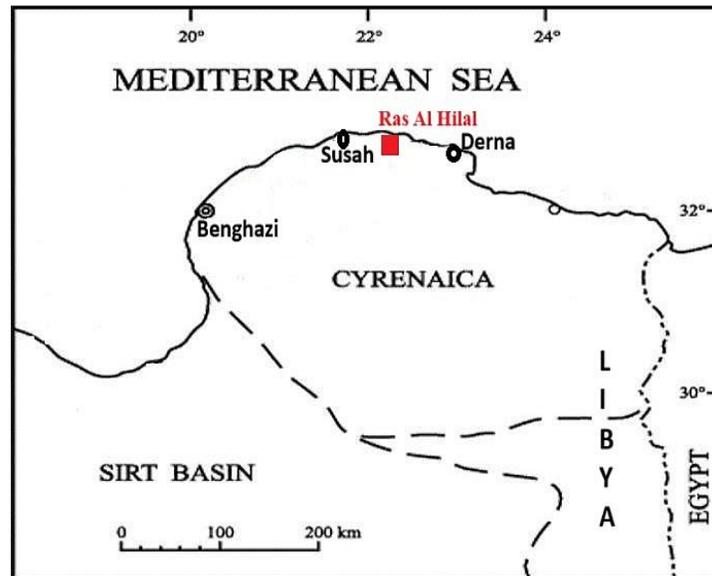


Figure (5): The location of the site (Ras Al Hilal) in the northeast of Libya

Specimens Examined: Albeida, Omar Almkhtar campus, M. Khalaf, 1501, 1.4.1998 (SHOU!); Ras Al Hilal, Wady Gartaples, Ali and Salah, 113, 28.5.1991 (CHGU!); Ras Al Hilal, Wady Gartaples, Houssein Eltguri and Salima Alshareef, 101, 25.3.2017 (CHGU!).

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