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A NEW RECORD OF *TOLYPELLA GLOMERATA* (DESV.) LEONH. (CHARACEAE) FROM IRAQ

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Abstract

Tolypella glomerata (Desv.) Leonh. 1863 is recorded from Iraq for the first time. This species has been found in one locality in Al-Hartha, Basrah southern Iraq in shallow water. The locality was dried throughout Summer reason and fooled in autumn and winter seasons. but the heavily encrusted specimens suggest freshwater or slightly saline water. This species grows in pond rich in calcium and alkaline pH = 8.2 on 0-35 cm depth. It forms small patches in shallow places together with *Chara vulgaris* and *Nitella tenuissima* (Desvaux) Kützing.

Key words: Characeae, *Tolypella*, new record, Basrah, Iraq

Introduction

The family Characeae (Charophyceae, Charophyta) is the largest and most structurally complex of the green algae, known as stonewort (Moore, 1986; Feist and Feist 1997; Krause, 1997; Cirujano *et al*., 2013). Most Characeae are found in fresh water, but *Kapraun, (2007)* reported it was grow in freshwater and brackish (maritime) environments. Charophyceae covered with calcium carbonate and found in low - medium nutrient-rich water. According of the morphology, the order Charales contains one family with six genera divided into two tribes Chareae including *Chara* L., *Lamprothamnium* J. Groves, *Nitellopsis* Hy, *Lychnothamnus* (Rupr.) Leonhardi and Nitelleae including *Nitella* Agardh and *Tolypella* (A. Braun) Leonhardi (Wood and imahori, 1965). 63 species of Charophytes found in Europe (BlaženÈiæ *et al*., 2006). Because of the morphology, molecular analyses and chromosome studies, the members of the tribe Chareae form monophyletic group, *Nitella* and *Tolypella* do not correspond to the monophyletic tribe Nitelleae. *Tolypella* is a distinct genus (Mc Court *et al*., (1995).

Tolypella (Desv.) Leonh. is the largest genus in the family Chareaeceae. There are 400 species worldwide, with 5 species in Iberian peninsula, 21 species in Britain and Ireland (Stewart and Church 1992; Cirujano *et al*., 2008; Bracamonte *et al*., 2013). As well as recorded as a new species in Iceland (Hrafnsdottir *et al*., 2019). *Tolypella* contains two species and ten infraspecific taxa, it was characteristic absent of the cortex, stipuloides, spine cells and bract cells. the rays of *Tolypella* are always multicellular.

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Materials and methods

Site description

T. glomerata is a new species found in the Iraq. this species collected in one site in southern of Iraq and identification (Fig. 1 and 2).

The specimen of *T. glomerata* was collected during November to February 2017/2018 from one place of Al-Hartha region. *T. glomerata* small temporary pond with slightly brackish water, located in silty clay soil texture. This pond remains flooded during autumn and winter namely a period enough to complete life cycle of the Characeae, from seed to fructification and production of oospores, the pond dries in Summer reasons. The specimens were examined and identified.

Al – Hartha is a city located in the north-eastern part of Basrah Governorate on the east bank of the river Euphrates. The sampling site can describe as very shallow pond (0-35 cm) with clear water. slightly brackish and alkaline water, which become dry at the end of March or first week of April, generally with bare silty-clay substrate, *T. glomerata* found with *Chara vulgaris, Nitella tenuissima* and near *Phragmites australis*. *T. glomerata*

was found richly fertile in early February. In late March, it disappears and replaced by *Chara vulgaris*.

Fig. 1: Map of *T. glomerata* study area in Al-Hartha, Basrah.

Fig. 2: *T. glomerata* in the field photograph.

Results and Discussion

T. glomerata is monoecious species, very small plants. The stem of *T. glomerata* was 7-22 cm high, slender, with green to grayish green, Internodes 1-2 times the length of the branchlets forming dense heads at the top of the plant, fertile and sterile in a whorl. in heads incurved; once divided with nodes bearing 3-5 lateral abaxial and adaxial rays. End segment (3-4 cells), last cell rounded and obtuse. Lateral rays elongate (3-5 cells) with the end cell cylindrical, obtuse. Heads 3-10 per shoot.

Gametangia present adjoined on fertile branchlet nodes or aggregate at base of branchlets. Oogonia whitish in color, elliptical, 1–3 at a node, 300–550 µm long, 250-445 µm wide. Mature oospores light brown to dark brown colour with marked stripes and granulated or smooth (Fig. 3). Antheridia 1-3 solitary and small, 300–400 µm in diameter (Fig. 3).

Habitat

Our study reported that *T. glomerata* grown in a freshwater marsh near Shatt al-Arab, found in ephemeral vernal pools, the aquatic ecosystem was freshwater marsh to slightly saline waters during early autumn to winter which agree with (Cirujano, *et al*., 2013; Zeneli and Kashta, 2016). Winter *et al*., (1996) observed that salinity is a limiting factor for fertility in and *T. glomerata*.

Fig. 3: *Tolypella glomerata,* A: whole plant; B- ends of branching and head; C, D- oogonia and antheridia.

As well as inhibition the formation of mature oospores.

T. glomerata is found in Basrah/Al-Hartha from a one locality southern Iraq in shallow water, freshwater lakes, late autumn. This species grows in pond rich in calcium and alkaline pH = 8.2 on 0-35 cm depth. It forms small patches in shallow places together with *Chara vulgaris* and *Nitella tenuissima*.

T. glomerata known in Iraq from single site, in pond Al-Hartha. It grows in water rich in calcium. Because of a very small number of *T. glomerata* sites in Basrah.

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