



First Record of the Aquatic Insect *Notonecta glauca* (Linnaeus, 1758) (Hemiptera: Notonectidae) from Basrah Governorate, Southern Iraq

Haider Shaker Darweesh Aljnaany^{1*}, Iman Mussa Omran², and Huda Kadhim Ahmed¹

¹Department of Marine Biology, Marine Science Center, University of Basrah, Iraq.

²Department of Plant Protection, College of Agriculture, University of Basrah, Iraq.

*Corresponding Author: haider.darweesh@uobasrah.edu.iq

ARTICLE INFO

Article History:

Received: Feb. 20, 2026

Accepted: May 15, 2026

Online: June 9, 2026

Keywords:

Aquatic insect,
Basrah,
Hemiptera,
Iraq,
First record,
Notonecta glauca

ABSTRACT

The aquatic insects of genus *Notonecta* (Linnaeus, 1758) include approximately 65 recorded species worldwide. Although this genus is widespread in Iraq's neighboring countries, Iran and Turkey, it was recorded in Iraq only by one species *Notonecta maculata* (Fabricius, 1794). In this study, the backswimmer *Notonecta glauca* (Fabricius, 1758) was recorded for the first time, when only one specimen was collected in March 2024, from the campus of Basrah University (30°33'48.9 N, 47°44'33.8 E) in Basrah, South of Iraq, and deposited in the museum of Marine Science Center (MSC/ Basrah University), with collection voucher numbers (135). The species was identified using dissecting and compound microscopes depending on morphological characters, and it represented a significant addition to the insect fauna belonging to Notonectidae in Iraq.

INTRODUCTION

The Hemiptera are considered the largest and most important order of Exopterygote insects and include two suborders: Heteroptera (true bugs) and Homoptera (sucking bugs). (Choate, 2010). The Heteroptera, also called the true water bugs, are divided into two groups: Gerromorpha (semi-aquatic bugs) and Nepomorpha (true aquatic bugs) (Grandova, 2013). The true water bug group comprises about thirteen families, including the Notonectidae family, also known as back swimmers. This family is cosmopolitan widespread across large parts of Europe and North Africa, and eastward through Asia to Siberia and China (Berchi, 2013; Mohammed *et al.*, 2025). It ranks the second in species richness after the water boatmen family among aquatic insects, containing about 400 species and 11 genera (Polhemus & Polhemus, 2008; Yaseen *et al.*, 2024). The *Notonecta glauca* (Linnaeus 1758) is a representative species. This species is widespread globally; in India, only four species were recorded of this genus, *N. viridis* Delcourt, 1909, *N. montandoni* Kirkaldy, 1897, *N. glauca* Linnaeus, 1758, and *N. violacea* Kirkaldy, 1897 (Khanra & Dash, 2025). In addition, Iran recorded four species of *N.*

maculata Fabricius (1794), *N. viridis* Delcourt (1909), *N. glauca* Linnaeus (1758), and *N. obliqua* Thunberg (1787) (**Ghahari et al., 2013**). The same Iranian species were recorded in Turkey, in addition to *N. meridionalis* Passion (1924) (**Banbl & Fent, 2020**).

The back-swimming family (Notonectidae) represents the major predators in aquatic ecosystems, and its members are abundant in many freshwater environments (**Nowińska & Brożek, 2019**). Depending on unusual morphological specializations, such as mouthparts for piercing and sucking, long hind legs, and large, complex eyes, they could successfully adapt to new habitats (**Khila et al., 2014**). The species *Notonecta glauca* (Linnaeus 1758) measures approximately 13–16 mm in length; females are larger than males (**Balmert et al., 2011**). The common back swimmer prefers environments with dense vegetation for hiding. When aquatic plants are present, this animal settles on the plant's edge, usually in the middle, a preference unaffected by prey selection. This position allows it to more easily observe its surroundings and capture passing prey. Due to its preference for plants and low inclination toward surface areas, this animal thrives in complex environments where avoiding the surface and the presence of abundant vegetation provide cover from predators. The common dorsal swimmer feeds on a variety of aquatic organisms, such as daphnia (water fleas) (**Reynaldi et al., 2011; Jabir et al., 2025**). These insects feed mostly on other insect species, but they have been observed preying on fish eggs, fry, and tadpoles, moreover they have been observed preying on *Culex pipiens* larvae (**Reynaldi et al., 2011**). The insect *Notonecta glauca* relies on its front, middle and rear legs to anchor itself underwater, it uses its hind legs as oars. These legs are fringed with hairs, and when at rest, they extend laterally like a pair of oars in a boat, the common back-swimming insect hunts its prey using its predatory forelegs or midleg (**Immoene et al., 2014; Khorsheed et al., 2026**). These legs have gripping surfaces that make it difficult for prey to escape. It is an ambush predator, waiting for the right opportunity to pounce on its unsuspecting prey, and when the weather is warm, usually in the late of summer and autumn, *Notonecta* flies among ponds, whereas they prefer reproduction in the spring (**Griffith & Gilett-Kaufman, 2021**).

The aim of this study is to document the biodiversity of predator aquatic insect in Basrah, southern Iraq.

MATERIALS AND METHODS

One specimen of *Notonecta glauca* (**Fabricius, 1758**) was collected during March 2024 from a water channel inside the campus of Basrah University, Basrah, Iraq, at the coordinates 48.9'33°30 N, 47°44'33.8 E (Fig. 1) by using a hand net D- frame for catching insects with 250μ mish size. The water depth was approximately 90cm, 250m length and 1.5m width. Reeds, grasses, willows, and *Conocarpus* trees grow along its banks. The aquatic insect includes mosquito larvae, dragonfly nymphs, and water beetles. The water's physical factors were: temperature 24°C, pH 7.3, dissolved oxygen 7.32 mg/L, and salinity 1.97 mg/L. The specimen was transferred to the laboratory to take the

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body measurements by electronic Vernia and the species were identified morphologically according to the information and keys in **Savage (1989)**, **Griffith and Gilett-Kaufman (2021)** and **Nelson (2022)**. Then, it was preserved in 70% ethanol and deposited in the Marine Science Center (MSC) Basrah University, Iraq, with collection voucher numbers (135).

Photographs were taken by using Sony a7riv camera with Canon MP-e 65mm f 2.8 macro lens, the image stacking was conducted using Helicon focus 8.1.0; brightness, sharpness, and color correction by Adobe Photoshop CC 2024.

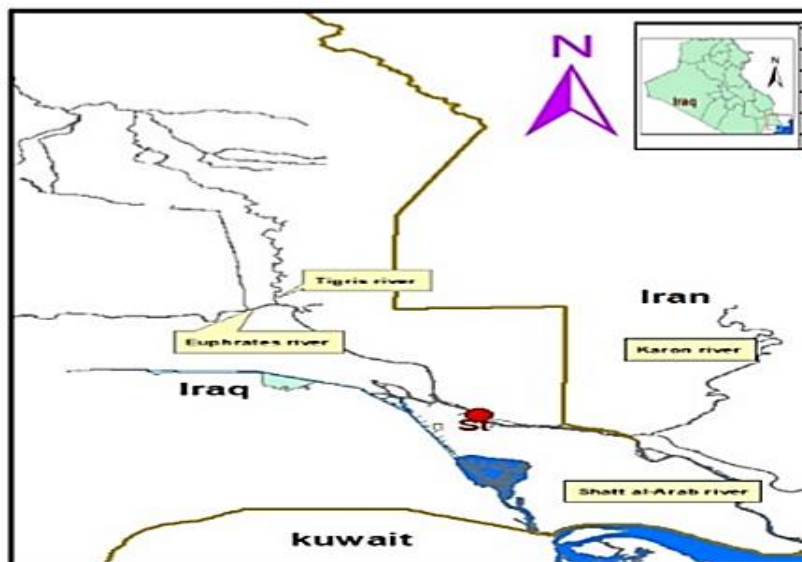


Fig. 1. Map of sample collection sit.

RESULTS

The Scientific Taxonomy:

Kingdom: Animalia

Phylum: Arthropoda

Class: Insect

Order: Hemiptera

Sub Order: Heteroptera

Family: Notonectidae

Genus: *Notonecta*

Species: *N. glauca* (Linnaeus, 1758)

Material Studied

Basrah Governorate, 1 female specimen (♀), collected on 18 March 2024 from water.

Body Measurements

Body length 14 mm, width about 3 mm; scutellum length of 5mm, width 3mm; hind leg length of 13 mm, front leg 6 mm, middle leg 7mm; abdomen length 9 mm and width 4mm and length front wing 8 mm.

General Distribution

The species is distributed in most of European countries, Morocco, Tunisia, Egypt, and Asia from Cyprus and Anatolia to West Siberia, north-western China, and Tajikistan (Linnavuori & Hosseini, 2000; Fent et al., 2011; Ghahari et al., 2013; Banbl & Fent, 2020). Due to the loss of the *N. maculata* specimen from the Natural History Museum of the University of Baghdad during the events of 2003, the comparison between these two species provided by Nelson (2022) was used. *Notonecta maculata* is a dark orange species with extensive dark speckling on the elytra. The metanotum, located on the dorsal side of the thorax beneath the wings, has an orange spot, which is the diagnostic character separating *N. maculata* from *N. glauca*. In *N. glauca*, the metanotum is completely black. The speckling in *N. maculata* is extensive and covers the entire elytra, whereas in *N. glauca* it is absent from the inner part of the corium. However, it is not advisable to rely solely on this character; therefore, the metanotum of heavily speckled specimens should be examined to confirm the identification (Nelson, 2022). The most similar species recorded in Iraq, specifically in Basra, is *Anisops sardea* (Fig. 2b). However, the main distinguishing difference of this species is its length, since it reaches a maximum length of 8-9 mm, while the species *N. glauca* reaches a length ranging between 14-17 mm in some species. The second difference is in the color of the body and wings. The body color of the species *N. glauca* is brown to pale gray in some species. The wings are also light brown with scattered black spots that resemble dots covering the wing, while the body color of *A. sardea* is pale yellow and the wings are dark brown. The last and clear difference is in the eyes. They are closer together in the species *A. sardea* in all directions, while in the species, they are close together only from the dorsal view of the head, whereas from the frontal view of the head, the eyes are more far apart.

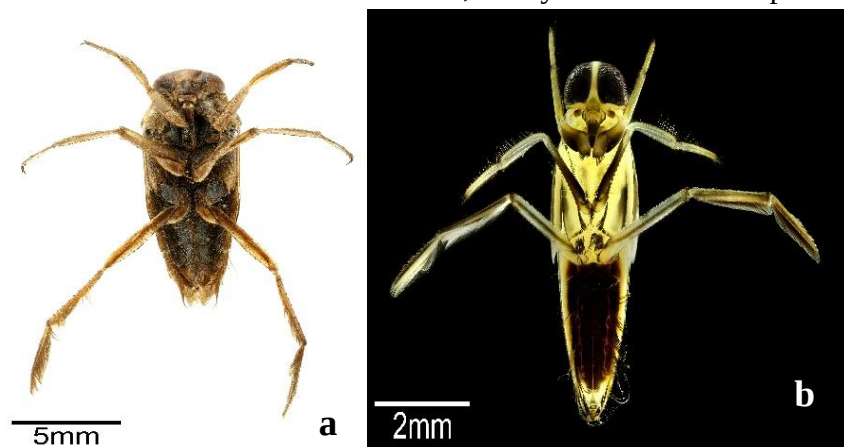


Fig. 2. (a) *Notonecta glauca* ventral view female; (b) *Anisops sardea* ventral view female.

Description

This species of back-swimmer is characterized by an elongated body, convex body shape, and the length is similar to the letter V from the dorsal side. Its length ranges from about 14 mm, and its color is brown or sometimes pale gray (Fig. a3). The head is strong and wide, bearing two large, prominent eyes that cover most of the head area. The distance between the eyes varies from one species to another since it is important in distinguishing the species. The snout or beak is prominent and consists of four pieces, and the short antennae, consisting of only three to four parts, are hidden under the head and are almost hidden under the eyes (Fig. c3). Back insects, like other members of the order Hemiptera, have piercing-sucking mouthparts.

The thorax is trapezoidal, transverse, and strongly convex. The anterior margin is slightly central, the lateral margins are obliquely straight, the posterior lateral angles are slightly less prominent, and the shield is large and very triangular. They have two pairs of wings. The first pair, the forewing, is hemipterous, consisting of two parts: the anterior part is sheathed, and the terminal part is membranous. The abdomen is covered with dense hairs resembling cilia, which are used to balance the insect while swimming on its back. The forelegs and middle legs end in sharp claws used to grasp prey, and the hindlegs are long and covered, with dense hairs to aid swimming, and do not have claws (Fig. 3b).

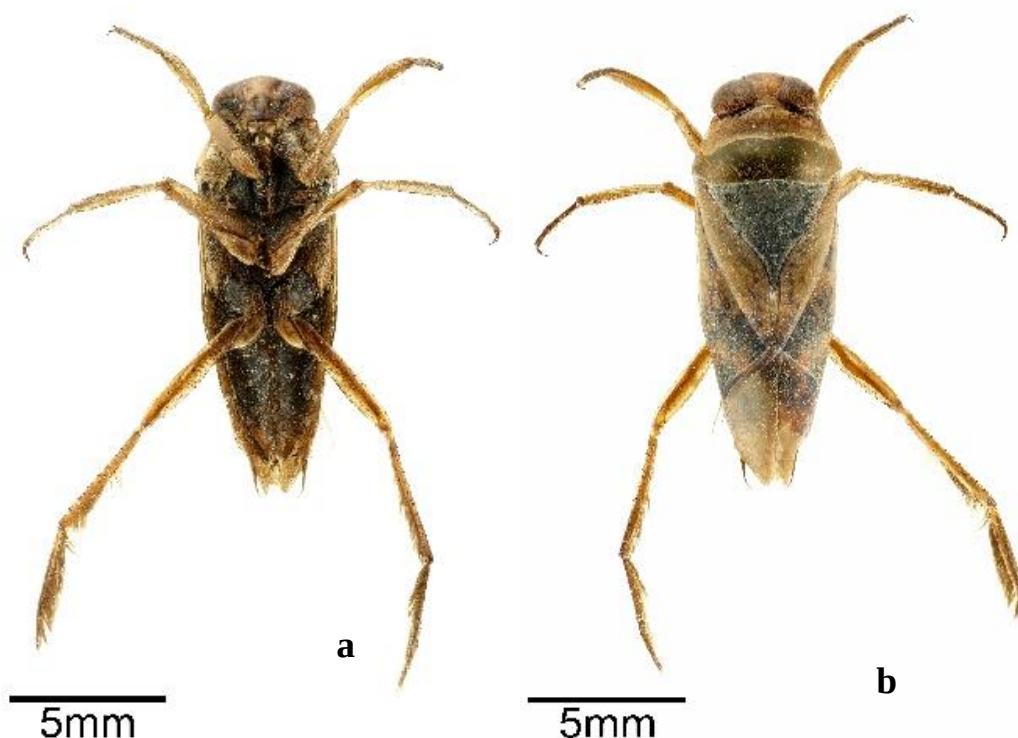




Fig. 3. *Notonecta glauca* (Linnaeus, 1758) female: (a) Dorsal view; (b) Ventral view; (c) Frontal view of the head.

DISCUSSION

The true aquatic bugs that occur in Iraq are poorly known. The data for many groups are sparse and no comprehensive account or checklist exists for the country. The first study concerning the family Notonectidae dates back to **Abdul-Hussein's (1987)** study when he recorded in his book on aquatic insects in Iraq that the family includes three genera and four species, the genus *Notonecta* Linnaeus (1758), which includes the species *N. maculate* (Fabricius, 1794); the genus *Anisops* (Spinola, 1837), which includes two species, *Anisops varia* and *A. sardea*; and the genus *Buenoa* Kirkaldy (1904). However, the most recent studies in this field are those by **Abdul-Hassan et al. (2009)** and **Al-Saffar et al. (2021)**, which confirmed the presence of the genus *Buenoa* Kirkaldy (1904) in the marshes of southern Iraq, and the study by **Al-Eidani and Karim (2015)**, which confirmed the presence of two species, *A. varia* and *A. sardea*. Therefore, in this study, a species belonging to the genus *Notonecta* was recorded in Basrah Governorate, southern Iraq, bringing the number of recorded species for this genus to two.

Regional and widespread species in the countries neighborhood Iraq include four species in Iran belonging to this genus: *N. glauca* Linnaeus (1758), *N. obliqua* Thunberg (1787), *N. maculata* Fabricius (1794), and *N. viridis* Delcourt (1909). The same species was recorded in Turkey, along with *N. meridionalis* Passion (1924), which has also been documented. Due to the scarcity of recent studies in Iraq on the suborder Heteroptera, little has been recorded about this suborder and this genus in particular. Therefore, recording this species in Iraq is a significant addition to the species belonging to the genus *Notonecta*. Therefore, we encourage researchers to conduct more in-depth studies of this family, since it exhibits significant faculties of diversity in Iraq's neighboring countries, especially given the shared water resources of these three nations.

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