

# **New Record of *Cichlidogyrus tiberianus* Paperna, 1960 (Monogenea, Ancyrocephalidae) from Gills of Redbelly Tilapia *Coptodon zillii* (Gervais, 1848) in Iraq**

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**Abstract:** The monogenean *Cichlidogyrus tiberianus* is described from gills of the redbelly tilapia *Coptodon zillii* from Al-Graiat location on the Tigris river at Baghdad city for the first time in Iraq. *C. tiberianus* is considered now as the third species of the genus *Cichlidogyrus* to be detected from fishes of Iraq. This parasite is distinguished by the shape and size of the sclerotized parts of its haptor and its male copulatory organ. The description and measurements of this parasite as well as its illustrations are given.

Keywords: Monogenea, *Cichlidogyrus tiberianus*, *Coptodon zillii*, Iraq.

## **INTRODUCTION**

The group of Monogenea represents one of the most species-rich groups of parasitic flatworms worldwide, with many species described only recently, which is particularly true for African monogeneans. *Cichlidogyrus*, a genus mostly occurring on African cichlids, comprises more than 100 nominal species (Kmentová et al., 2016). *Cichlidogyrus* communities on respective hosts display variable species richness, which ranges from 1 to 20 species per host species (Řehulková et al., 2013). However, monogeneans are known to depict a considerable biological diversity and they usually show high host specificity, parasitizing a single or few closely related host species (Vanhove et al., 2011). Although monogeneans are generally highly host-specific, there is a range of levels of host specificity within this group (Roux & Avenant-Oldewage, 2010). According to Řehulková et al. (2013), the host specificity of *Cichlidogyrus* parasites is variable, with 48 species are considered as oioxenous (i.e. infesting only a single host species) and 35 are considered as stenoxenous (i.e. infesting closely-related host species).

Species of *Cichlidogyrus* are distributed among a wide range of cichlid fishes; more than 40 species within 11 genera (Mendlová et al., 2012).

In Iraq, the cichlid fish redbelly tilapia *Coptodon zillii* (Gervais, 1848), which is also known by its synonymous name *Tilapia zillii* (Gervais, 1848), is an exotic fish which was introduced in the neighboring countries and found its way to inland waters of Iraq (Al-Faisal et al., 2014).

No research has been undertaken on *Cichlidogyrus* in Iraq except for the recent record of two species namely *C. sclerosus* Paperna & Thurston, 1969 and *C. tilapiae* Paperna, 1960 on gills of two species of cichlid fishes from Al-Graiat location on the Tigris river at Baghdad city (Abdul-Ameer & Atwan, 2016). So, the present paper documents the first record in Iraq of *C. tiberianus* from gills of *C. zillii*.

## **MATERIALS AND METHODS**

During the period from July to December 2015, a total of 38 specimens of the redbelly tilapia *C. zillii* were collected from Al-Graiat location on the Tigris river at Baghdad city. Fishes were transported to the laboratory for parasitological examination. Gills were removed and examined with Meiji MT4200L microscope. Detected monogeneans were flattened and stained with aqueous neutral red. Permanent slides were prepared with glycerin. Drawings of the sclerotized pieces of the haptor and of the copulatory organ were made by using a camera Lucida. The morphological terminology followed Pariselle & Euzet (1998). Voucher specimen of *C. tiberianus* was deposited in the Iraq Natural History Research Center and Museum, University of Baghdad.

The values of all measurements (in  $\mu\text{m}$ ) employed in this paper (Fig. 1) are used in the parasite description as in the following order: minimum-maximum (mean) values. Parasite identification was mainly made according to Ergens (1981) and Pariselle & Euzet (2009). These monogeneans are distinguished by their morphological data (measurements of the sclerotized parts of the haptor and reproductive organs). The host fish (the redbelly tilapia) was identified according to Mutlak & Al-Faisal (2009) and its scientific name was used according to Catalog of Fishes by Eschmeyer (2016). The information on the previous records of parasites was checked by using the index-catalogue of parasites and disease agents of fishes of Iraq by Mhaisen (2016).

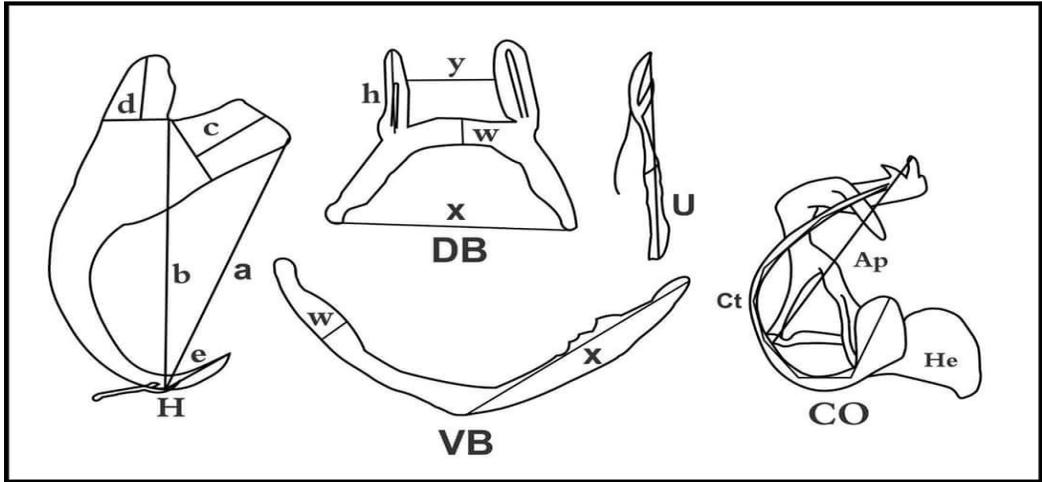


Figure 1: Measurements used in the description of *C. tiberianus* of the present study.

DB, Dorsal transverse bar: h- length of auricle, w- maximum width, x- total length, y- distance between auricles; H, Hamulus (gripus): a- total length, b- blade length, c- root length, d- shaft length, e- point length; CO, Copulatory organ: Ap- Accessory piece length, Ct- Copulatory tube (penis) total length, He- Heel; U, Uncinulus (hooklet); VB, Ventral transverse bar: w- maximum width, x- length of one branch.

## RESULTS

*Cichlidogyrus tiberianus* is found on gills of the redbelly tilapia *Coptodon zillii*. Ten out of 38 *C. zillii* were infected. The prevalence of infection was 26.3% and the mean intensity was 1.6. The measurements were based on three specimens of parasites. The following is a brief description and measurements (in micrometer) of this parasite as shown in Fig. (2):

Body length 308-334 (321), width 72-84 (78). The opisthaptor has two pairs of anchors of different size and shape with the presence of hamulus filament. Ventral hamuli are larger with broad base and inner root, total length 33-40 (37), blade 31-35 (33), point 9-11 (10), inner root 9-11 (10), shaft broad 5-7 (6). Ventral bar U-shaped with an indented membrane and rounded ends, length of one branch 28-29 (27), maximum width 4-6 (5). Total length of dorsal hamulus 24-26 (25), blade 19-21 (20), inner root point 9-11 (10) and shaft 3-5 (4). Total length of dorsal bar 27-33 (30), maximum width 3-5 (4), pyriform auricles with rounded ends, 10-12 (11) long with a distance of 10-12 (11) between auricles. Uncinulus (hooklet) length 11-13 (12), 10-12 (11), 28-32 (30), 30-34 (32), 28-32 (30), 29-31(30) and 29-31 (30), respectively for 1-7. Copulatory organ consists of two parts: copulatory tube and accessory piece, the thin, arch-shaped

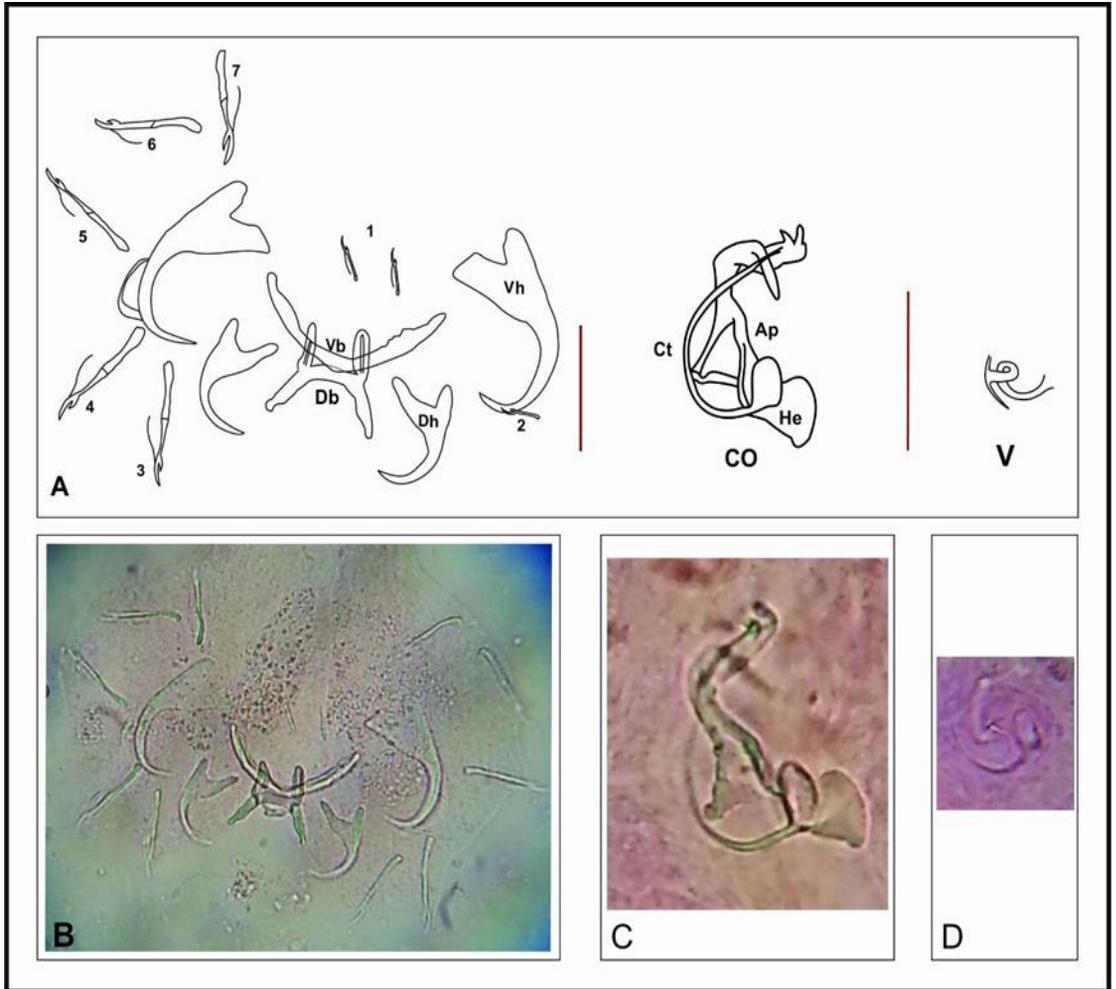


Figure 2: *Cichlidogyrus tiberianus* from *Coptodon zillii*.

A: Camera Lucida drawing of the haptor. (Scale bar, 28  $\mu$ m), CO: Copulatory organ, V: Vaginal armor (Scale bar, 35  $\mu$ m).

B: Photomicrograph of the haptor (100x).

C: Photomicrograph of the copulatory organ (400x).

D: Photomicrograph of the vaginal armor (400x).

Ap- Accessory piece, Ct- Copulatory tube, Db- Dorsal bar, Dh- Dorsal hamulus, He- Heel, Vb- Ventral bar, Vh- Ventral hamulus, 1 to 7 = uncinuli (hooklets).

copulatory tube, 64-71 (67.5) long, with tapered end and an accessory piece of 35-37 (36) long. Vaginal armor 18-22 (20) long.

Voucher specimen of *C. tiberianus* was deposited in the Iraq Natural History Research Center and Museum, University of Baghdad (serial number INHM-M1).

## DISCUSSION

In Iraq, surveys of fish parasites of *C. zillii* from different water bodies, so far, revealed the presence of two species belonging to the genus *Cichlidogyrus* viz *C. sclerosus* Paperna & Thurston, 1969 and *C. tilapiae* Paperna, 1960 as recently reported by Abdul-Ameer & Atwan (2016) as well as some species of monogeneans belonging to the genus *Dactylogyrus* and the genus *Gyrodactylus* (Al-Azebawe, 2010; Hamadi et al., 2011). Al-Sa'adi et al. (2012) through their introduction on the first parasitological report on *C. zillii* (reported as *T. zillii*) demonstrated all the literature on parasitic and fungal infections of cichlid fishes of Iraq. With the wide distribution of *C. zillii* after the first report on its occurrence in Iraq (Al-Sa'adi, 2007), it is expected to record more monogeneans in general and *Cichlidogyrus* species in particular.

The measurements of the present *C. tiberianus* are in agreement with those reported by Ergens (1981) from Egyptian fish *C. zillii* (reported as *Tilapia zillii*) from the River Nile at Cairo. *C. tiberianus* so far has been reported from various cichlid fishes in several countries: Southern Ghana, Uganda, Egypt and Benin on *C. zillii* (reported as *T. zillii*); Uganda and Zimbabwe on *T. rendalli*; Senegal, Guinea, Cote d'Ivoire and Congo on *T. guineensis*, *T. coffea*, *T. dageti*, *T. walteri* and *T. zillii* (Pariselle & Euzet, 2009; Roux & Avenant-Oldewage, 2010).

According to the index-catalogue of parasites and disease agents of fishes of Iraq (Mhaisen, 2016), the present report of *C. tiberianus* represents its first record in Iraq as no previous record was given for this parasite from fishes of Iraq. So, *C. tiberianus* is now considered as the third species of the genus *Cichlidogyrus* to be detected from fishes of Iraq. The result also confirms the host-specificity of the monogenean *C. tiberianus* to infect fishes of the family Cichlidae.

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