

RECORDING OF TWO SPECIES OF THE GENUS *DIPARTIELLA*  
(RAABE, 1959) STEIN, 1961 (CLIOPHORA: TRICHODINIDAE) FOR  
THE FIRST TIME IN IRAQ FROM GILLS OF THE COMMON CARP  
*CYPRINUS CARPIO*

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ABSTRACT

The examination of gills of the common carp *Cyprinus carpio* revealed the presence of two species of the family Trichodinidae belonging to the genus *Dipartiella* (Raabe, 1959) Stein, 1961 namely *D. indiana* Saha and Bandyopadhyay, 2017 and *D. kazubski* Mitra and Bandyopadhyay, 2009 for the first time in Iraq from Al-Graiat location on the Tigris River at Baghdad city. This also represents the first record of the genus *Dipartiella* from fishes of Iraq. The descriptions and measurements of these two parasite species as well as their illustrations were given.

Key words: *Dipartiella*, *Dipartiella kazubski*, *Dipartiella indiana*, Trichodinids, Tigris River, Iraq.

INTRODUCTION

*Trichodinid ciliophorans* are among the greatest common and mostly spread groups of symbionts as parasites of aquatic invertebrate and vertebrate hosts (Van As and Basson, 1989). The ciliates of Trichodinidae are characterized by proteinaceous cytoskeleton of the adhesive disc which consists of a ring of hollow conical elements, known as denticles, which although solid, consist of three distinct regions: a distal blade, a central part and a proximal ray. The denticles are inserted into each other subtended by a ring of fine skeletal rods, called radial pins. The disc is encircled by a moveable border membrane, reinforced by fine skeletal rays appearing as fine striations. The locomotory organelle consists of a compound wreath of oblique ciliary rows (Basson and Van As, 2006; El-Tantawy and El-Sherbiny, 2010). The morphology of the denticles in the adhesive disc has been widely used in species identification of trichodinids (Van As and Basson 1989, 1992). More than 300 trichodinid ciliophoran species, representing 11 genera have been reported from the gills, skin, fins, urinary bladder as well as reproductive system of different fish species in the world (Asmat, 2014; Özer *et al.*, 2015). Among the genera of Trichodinidae the genus *Dipartiella* (Raabe, 1959) Stein, 1961. Species of this genus are described by denticle ring composed of tightly packed denticles, consisting only of blades and weakly developed central parts which do not extend into conical protrusions (Basson and Van As, 1989). According to the characteristic values of the denticles, *Dipartiella* was confirmed to be the most primitive genus in the existing genera of Trichodinidae (Gong *et al.*, 2005). Only four species of this genus have

### Recording of two species of the genus *Dipartiella*

been described throughout the world (Raabe, 1959; Mitra and Bandyopadhyay, 2009; Saha and Bandyopadhyay, 2017).

As no previous record was given for any species of the genus *Dipartiella* from fishes of Iraq (Mhaisen, 2018), the present study is concerned with the first record of this genus in Iraq, as it is found to be represented with two species (*D. indiana* and *D. kazubski*) parasitizing gills of *Cyprinus carpio* from Al-Graiat location in the Tigris river at Baghdad city.

### MATERIALS AND METHODS

Fishes were collected weekly from Tigris river in Baghdad city near Al-Graiat location (33° 24' N, 44° 20' E), between July 2015 and March 2016. A total of 42 specimens of *C. carpio* were examined. Skin and abstracted gills from fresh fishes were examined under a dissecting microscope. Fresh skin and gill smears, which made from the hosts, were microscopically examined for the presence of trichodinids. Smears with trichodinids were air-dried, fixed with absolute methanol and stained with Giemsa stain in accordance with the method proposed by Shuaib and Osman (2015).

The systematic descriptions used in the present study were based on the observations of living as well as Giemsa stained specimens; method of measurements and the terminology were mainly made according to Basson and Van As (1989). Drawings were done by using a camera Lucida. All measurements used in the description are presented in micrometers in the following order; minimum-maximum (mean) values. By contact on the email, the information on the previous account records of trichodinids of fishes of Iraq were checked with the index-catalogue of parasites and disease agents of fishes of Iraq (Mhaisen, 2018).

### RESULTS AND DISCUSSION

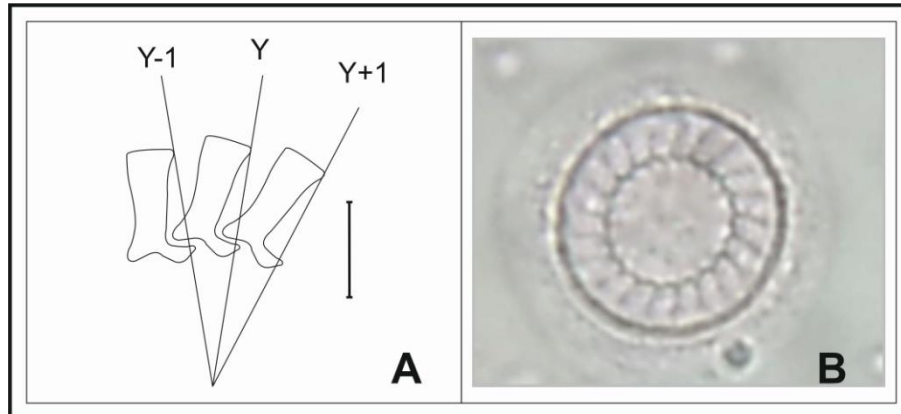
Two species of the genus *Dipartiella* namely *D. indiana* and *D. kazubski* were found on the gills of the common carp *C. carpio* from Al-Graiat location on the Tigris river at Baghdad city. The following is a brief account on their description and measurements.

#### ***Dipartiella indiana* Saha and Bandyopadhyay, 2017**

This parasite was obtained from gills of *C. carpio* with a prevalence of 2.4 % and a mean intensity of 3. The following is an account on the description and measurements (in  $\mu\text{m}$ , based on five specimens) of this parasite as shown in plate (1).

Small trichodinid, measures 29.6-31.2 (30.4) in diameter. Adhesive disc usually rounded 22.6-23.8 (23.2) in diameter which is encircled by finely striated border membrane 1.6-2.2 (1.9) wide. Number of radial pins per denticle 3-4. Diameter of denticle ring: 10.4-11.8 (11.1). Number of denticles 21. Span of denticle 3.4-4.2 (3.8). Macronucleus U-shaped, external diameter 22.6-24.2 (23.4), length of area between ends of macronucleus 3.5-3.9 (3.7). Micronucleus could not be noticed in any of the studied specimens.

Adhesive disc appeared uniformly blade elongated, anterior and posterior margins parallel, slightly curved towards y+1 axis, occupying most area between y-axes, distal margin extremely flat and truncated, runs parallel to the wide border membrane; tangent point blunt with rectangular end; central part reduced, ray absent.



**Plate 1:** *Dipartiella indiana*. Diagrammatic drawing. (Scale bar= 3.2  $\mu\text{m}$ ),  
B- Photomicrograph (1000x).

The description and measurements of the present *D. indiana* is in agreement with those reported by Saha and Bandyopadhyay (2017) from gills of *Carassius auratus* from fish farms of West Bengal, India.

***Dipartiella kazubski* Mitra and Bandyopadhyay, 2009**

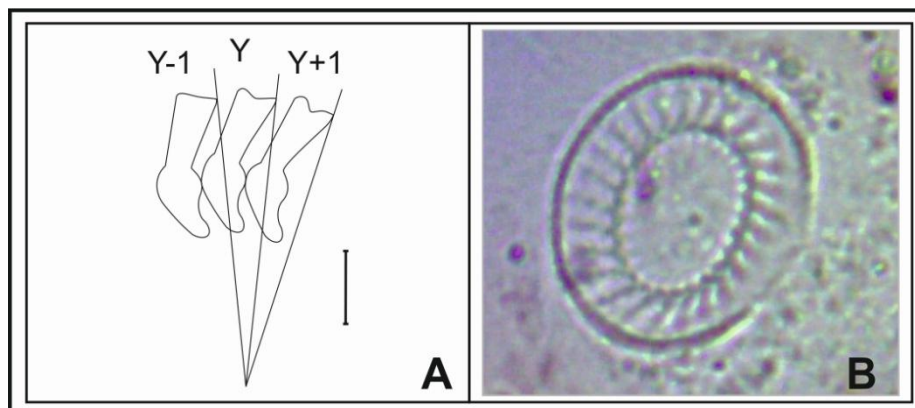
This parasite was obtained from gills of *C. carpio* with a prevalence of 7.1 % and a mean intensity 2. The following is an account on the description and measurements (in  $\mu\text{m}$ , based on five specimens) of this parasite as shown in plate (2).

Small trichodinid, 18.2-19.8 (19.0) in diameter; adhesive disc usually rounded 14.2-15.2 (14.7) in diameter which is encircled by finely striated border membrane 1.0-1.6 (1.3) wide; number of radial pins per denticle 4. Diameter of denticle ring: 9.6-10.0 (9.8); number of denticles 33, span length of denticle: 3.2-3.8 (3.5).

Macronucleus C-shaped, external diameter 13.4-13.8 (13.6), length of area between ends of macronucleus 2.0-2.4 (2.2). Micronucleus could not be noticed in any of the studied specimens.

Adhesive disc mostly appeared oblong. Blade broad, rectangular, anterior and posterior straight and parallel, slightly curved towards Y+1 axis, occupies most area between y-axis, distal margin of blade truncated, remains in close proximity to border membrane and runs parallel with it. Tangent point commonly like a point. Anterior blade margin do not touches or extends beyond Y+1 axis. Posterior margin of blade almost straight. Central part reduced, ray absent.

#### Recording of two species of the genus *Dipartiella*



**Plate 2:** *Dipartiella kazubski*. A-Diagrammatic drawing. (Scale bar= 1.2  $\mu$ m),  
B- Photomicrograph (1000x).

The descriptions and measurements of the present *D. kazubski* are in agreement with those reported by Mitra and Bandyopadhyay (2009) from gills of both *Batasio batasio* and *Wallago attu* of the river Tista and the river Churni, respectively, of West Bengal, India.

According to Mhaisen (2018), the occurrence of the two parasites of the present study, *Dipartiella indiana* and *D. kazubski* represents their first record in fishes of Iraq as no previous record was given for these parasites from fishes of Iraq.

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Recording of two species of the genus *Dipartiella*

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تسجيل نوعين من الجنس *Dipartiella* (Raabe, 1959) Stein, 1961 (شعبة حاملات الأهداب: عائلة ترايكودينيدي) لأول مرة في العراق من غلاصم سمكة الكارب الإعتيادي *Cyprinus carpio*

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الخلاصة

أظهر فحص غلاصم سمكة الكارب الإعتيادي *Cyprinus Carpio* وجود نوعين من عائلة Trichodinidae يعودان لجنس *Dipartiella* (Raabe, 1959) Stein, 1961 وهما *D. kazubski* و *D. indiana* لأول مرة في العراق من منطقة الكريعات على نهر دجلة في مدينة بغداد. وهذا يمثل أيضا أول تسجيل للجنس *Dipartiella* من الأسماك العراقية. تم إعطاء مواصفات وقياسات كلا الطفيليين فضلا عن الرسوم التوضيحية لهما.