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ORIGINAL ARTICLE

First records of *Ambiphrya* and *Vorticella* spp. (Protozoa, Ciliophora) in cultured Nile tilapia (*Oreochromis niloticus*) in the central region of Saudi Arabia

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KEYWORDS

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Abstract The present study was carried out as part of an ongoing general survey seeking to uncover protozoan parasites infecting cultured tilapia in the central region of Saudi Arabia. In the sample of 400 specimens of tilapia (*Oreochromis niloticus*) 30 were infested with *Ambiphrya ameiuri* simultaneously with *Vorticella* sp. Morphometric criteria were used to describe and identify these species and this study presents the first records of these species among cultured fish in Saudi Arabia.

1. Introduction

Aquaculture is now the fastest growing food-producing sector worldwide but suffers significant economic losses due to the effects of parasitic infections of fish (Munoz et al., 2000). Saudi Arabian aquaculture has intensified on tilapia development, and the fish has been enthusiastically acknowledged by Saudis and expatriates living in the nation (FAO, 2012). Protozoan parasites undoubtedly comprise one of the most important groups of pathogens negatively influencing the wellbeing of both cultured and feral fish. They have not received much attention, because of the technical difficulties inherent in their study in comparison to the much larger helminthic parasites (Lom and Dykova, 1992). Enhanced knowledge of protozoans that parasitise fish would, therefore, fill a long neglected gap in scholarship whilst also being a prerequisite for the rapid and correct diagnosis of the infection agency of epizootics. Parasitic ciliates are among the most pathogenic protozoa that infect fishes (Van As and Basson, 1988). Whilst usually not considered to be a problem in the wild, many species cause extensive losses under conditions of intensive aquaculture (Dickerson and Clark, 1996). Infections by sessile peritrichs such as *Ambiphrya* and *Vorticella* are common in many cultured fishes (Basson and Van As, 2006) but, thus far, have

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not been reported from cultured tilapia in Saudi Arabia. The aim of this study, therefore, was to survey the presence of *Ambiphrya* and *Vorticella* in cultured tilapia in the central region of Saudi Arabia.

2. Materials and methods

Specimens of the Nile tilapia (*Oreochromis niloticus*) were collected randomly from a number of different farms in Riyadh, Saudi Arabia (24° 38′ 26″ N/46° 46′ 22″ E). The fish were transported immediately, alive, to our laboratory in the Zoology Department, College of Science, King Saud University, where they were maintained alive in well aerated glass aquaria.

Wet smears were taken from the skin, fins and gills and carefully examined for any ciliated ectoparasitic protozoan. Positive smears were air dried, fixed in methanol for 10 min, and then stained with 5% Giemsa's solution in phosphate buffer (pH 7.3) for 30 min. Smears were then examined, measured and photographed using an Olympus microscope fitted with an oil immersion lens. All measurements are in micrometres (μm) and data is expressed as mean (range).

3. Results

Of the 400 examined fish, only 30 (7.5%) were discovered infested with *Ambiphrya* simultaneously with *Vorticella*. The noted parasites are identified as follows:

3.1. Ambiphrya ameiuri Thompson, Kirkegaard and Jahn, 1974

Solitary sessilian peritrichs with a barrel-shaped body are shown in Figs. 1 and 2. The body measurements were 68 (60–80) μm in length and 43 (40–48) μm in width. The body was divided into oral and basal regions by an equatorial ciliary girdle (Fig. 2), with the oral region measuring 40 (35–45) μm and the basal region measuring 24 (20–32) μm. The peristomial disc was mostly convex and was surrounded by a conspicuous peristomial lip (Figs. 1 and 2). Infundibulum was conspicuous, slightly oblique and never exceeded the equatorial girdle (Figs. 1 and 2). The macronucleus measured approximately 40 μm and was typically ribbon-shaped, folding back on itself throughout the body cell and extended beyond the equatorial girdle (Figs. 1 and 2). A large number of different sized food vacuoles as well as one contractile vacuole were observed in the oral region (Fig. 1). The scopula, whilst it never exceeded the overall breadth of the body (Figs. 1 and 2), was in the form of a very wide (about 37–42 μm) undulated disc located at the base, with adhesive fibres for attachment.

3.2. Vorticella sp.

This sessile peritrich was characterised by its inverted bell-shaped body which was composed of two parts; zooid and scopula (Figs. 3 and 4). The zooid was a spherical shape, about 55 (50–65) μm in diameter and occurred solitarily on a retractile stalk (Figs. 3 and 4). The peristomial disc was flat convex with a circular ring of feeding cilia on the upper margin (Fig. 4). The peristomial disc and feeding cilia were surrounded by the peristomial lip (Fig. 4). The macronucleus was ribbon-shaped and extended throughout the zooid (Fig. 3). A large

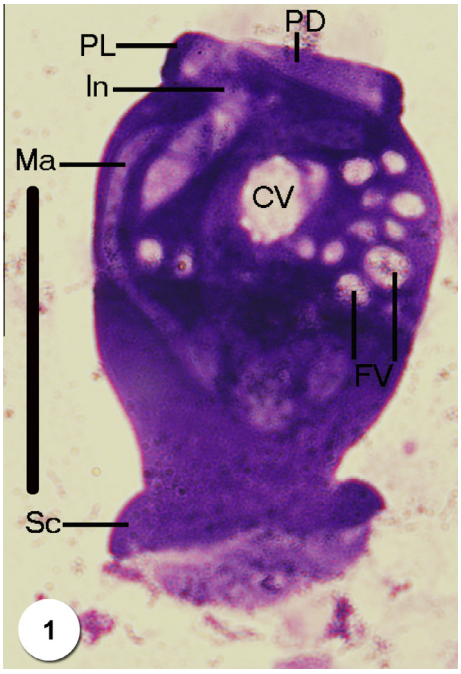

Figure 1 Photomicrographs of Giemsa stained *Ambiphrya ameiuri* showing: (CV) Contractile vacuole; (FV) Food vacuole; (In) Infundibulum; (Ma) Macronucleus; (PD) Peristomial disc; (PL) Peristomial lip; (SC) Scapula. Scale-bar = 50 μm.

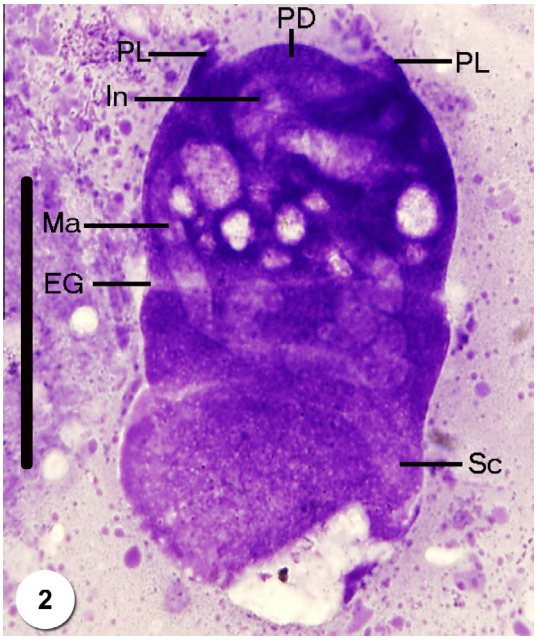

Figure 2 Photomicrographs of Giemsa stained *Ambiphrya ameiuri* showing: (EG) Equatorial ciliary girdle; (In) Infundibulum; (Ma) Macronucleus; (PD) Peristomial disc; (PL) Peristomial lip; (SC) Scapula. Scale-bar = 50 μm.

number of different sized food vacuoles were observed in the central part of the zooid (Fig. 3). The scopula, meanwhile, secreted a contractile stalk with an inner element, called the