NINE SPECIES OF THE GENUS CICHLIDOGYRUS
PAPERNA, 1960 (MONOGENEAE: ANCYROCEPHALINAE)
FROM EGYPTIAN FISHES

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Abstract. The following species of the genus Cichlidogyrus Paperna, 1960 were recovered from
two species of fishes of the genus Tilapia collected from the River Nile in Cairo: C. arthracanthus
magnus Paperna et Thurston, 1969, C. tiberianus Paperna, 1960, C. tilapiae Paperna, 1960,
C. aegypticus sp. n., C. thurstonae sp. n. and Cichlidogyrus sp.

Helminthological examination of 15 specimens of Tilapia zilli and 3 specimens of T. nilotica originating from the River Nile from Cairo revealed, among others,
89 members of the genus Cichlidogyrus Paperna, 1960. The present paper deals with
their systematical evaluation.

MATERIAL AND METHODS

The fish were examined immediately after catching using the method described earlier
(Ergens and Lom 1970). The parasites were fixed in ammonium picrate — glycerine mixture
and mounted in Canada balsam. Measuring of individual hard parts of opisthaptor, copulatory
organ and vaginal armor was carried out after Gussev (in: Bykhovskaya—Pavlovskaya et al.
1962). Observations were made with a phase-contrast microscope and illustrations were prepared
with the aid of a camera lucida. All measurements are expressed in millimeters.

The anchors connected by a V- or U-shaped bar are designated as anchors of the first pair,
whereas the anchors the connecting bar of which is provided with two appendages are designated
anchors of the second pair. The order of individual pairs of marginal hooks was determined
according to Llewellyn (1963).

The material is deposited in the collection of the Institute of Parasitology, Czechoslovak
Academy of Sciences, Prague.

RESULTS

C. arthracanthus Paperna, 1960

Fig. 1

Host, location, locality: Tilapia zilli; gills; the River Nile in Cairo, 22 June 1971. Specimens
studied: 6.

Total length of anchors of first pair 0.039—0.042; their shaft 0.034—0.036, inner
root 0.008—0.012, outer root 0.004—0.008 and point 0.011—0.012 long. Connecting
bar 0.007—0.009 long and 0.080—0.088 wide. Total length of anchors of second pair
0.042—0.045; their shaft 0.025—0.029, inner root 0.018—0.022, outer root 0.005—0.008
and point 0.008—0.009 long. Connecting bar 0.007—0.009 long and 0.036—0.042
wide, with two 0.013—0.018 long appendages. Marginal hooks of first pair massive,
0.027—0.029 long. Marginal hooks of second pair of embryonal type, 0.011—0.012
long. Hook length of other pairs 0.030—0.032. Copulatory complex consisting of basic
Fig. 1. Hard parts of the opisthaptor and copulatory organ of *Cichlidogyrus arthracanthus* Paperna, 1960.

Fig. 2. Hard parts of the opisthaptor, copulatory organ and vaginal armor of *Cichlidogyrus cirratus* Paperna, 1964.
portion of irregular shape, 0.043–0.049 long membranous supporting portion and thin, spirally coiled copulatory tube.

This parasite was found for the first time on gills of T. zilli, Tristramella simonis and T. sacra in Izrael. Paperna (1969) reported it also from T. zilli from Ghana territory.

C. cirratus Paperna, 1964

Host, location, locality: Tilapia nilotica; gills; the River Nile in Cairo, 22 June 1971. Specimens studied: 4.

Total length of anchors of first pair 0.042–0.050; their shaft 0.039–0.042, inner root 0.010–0.015, outer root 0.002–0.003 and point 0.014–0.018 long. Connecting bar widely U-shaped, 0.006–0.008 long and 0.065–0.080 wide. Total length of anchors of second pair 0.041–0.046; their shaft 0.034–0.040, inner root 0.013–0.014, outer root 0.002 and point 0.011–0.013 long. Connecting bar 0.007–0.010 long and 0.037–0.050 wide, with two 0.014–0.023 long appendages. Marginal hooks of first and second pair 0.012–0.013 long, hooks of other pairs 0.022–0.025 long. Copulatory complex consisting of irregularly oval basic portion with a conspicuous finger-like process, branched, 0.042–0.055 long supporting portion and very long, thin copulatory tube. Vaginal armor in form of fine, long tube.

This parasite has been reported only from gills of T. galilaea from Israel (Lake Tiberias and Lake of Gallilee) (Paperna 1964).

Fig. 3. Hard parts of the opisthaptor, copulatory organ and vaginal armor of Cichlidogyrus longicornis longicornis Paperna et Thurston, 1969.
**C. longicornis longicornis** Paperna et Thurston, 1969

Host, location, locality: *Tilapia nilotica*; gills; the River Nile in Cairo, 22 June 1971. Specimens studied: 5.

Total length of anchors of first pair 0.033—0.039; their shaft 0.032—0.036, inner root 0.009—0.012, outer root 0.004—0.005 and point 0.012—0.013 long. Connecting bar arch-shaped, measuring 0.004 × 0.074—0.081. Oblong, distinctly longitudinally ribbed membranous structure situated in front of connecting bar and measuring 0.026—0.035 × 0.024—0.028. Total length of anchors of second pair 0.033—0.037; their shaft 0.024—0.030, inner root 0.008—0.013, outer root 0.006—0.008 and point 0.009—0.011 long. Connecting bar of this pair of anchors of characteristic shape (Fig. 3). Its middle portion 0.004—0.006 long and markedly widened margins 0.021—0.028 long. Bar 0.054—0.068 wide, appendages 0.037—0.050 long. Marginal hooks of first and second pair 0.012—0.018 long. Hooks of remaining pairs 0.032—0.034 long. Copulatory organ 0.046—0.051 in total length, consisting of oval basic portion, branched supporting portion and fine copulatory tube. Vaginal armor tube-shaped.

*C. longicornis longicornis* has been reported only from *T. nilotica* in Uganda (Paperna and Thurston 1969) and from *T. nilotica*, *T. galilaeae* and *T. zilli* in Ghana (Paperna 1968).

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**C. tubicirrus magnus** Paperna et Thurston, 1969

Host, location, locality: *Tilapia zilli*; gills; the River Nile in Cairo, 22 June 1971. Specimens studied: 3.

Total length of massive anchors of first pair 0.049—0.051; their shaft 0.044—0.045, inner root 0.016—0.018, outer root 0.003—0.005 and point 0.012—0.013 long. Connecting
bar measures 0.008—0.010 x 0.10—0.12. Total length of anchors of second pair 0.041—0.043; their shaft 0.031—0.033, inner root 0.016—0.018, outer root 0.004—0.006 and point about 0.010 long. Connecting bar of this pair of anchors massive, arch-shaped, 0.009—0.011 long and 0.055—0.056 wide. Appendages 0.009—0.013 long. Marginal hooks of first and second pair about 0.014 long. Hooks of remaining pairs 0.031—0.034 long. Copulatory complex 0.075—0.077 in total length, consisting of irregularly oval basic portion, simple supporting portion and relatively thick copulatory tube.

This parasite was found for the first time on gills of *T. nilotica*, *T. galilaeae* and *T. leucosticta* in Uganda. Paperna (1968, 1969) recorded it on gills of *T. galilaeae* in Ghana. *T. zilli* represents a new host.

![Fig. 5. Hard parts of the opisthaptor, copulatory organ and vaginal armor of *Cichlidogyrus tiberianus* Paperna, 1960.](image)

**C. tiberianus** Paperna, 1960

**Host, location, locality:** *Tilapia zilli*; gills; the River Nile in Cairo, 22 June and 25 July 1971. Specimens studied: 4.

Total length of anchors of first pair 0.036—0.040; their shaft 0.033—0.034, inner root 0.010—0.011, outer root 0.005—0.006 and point 0.009—0.010 long. Connecting bar widely U-shaped, measuring 0.004—0.006 x 0.005—0.057. Total length of anchors of second pair 0.024—0.026; their shaft 0.020—0.022, inner root 0.010—0.011, outer root 0.003—0.005 and point 0.005—0.007 long. Connecting bar about 0.004 long and 0.027—0.034 wide, its appendages 0.010—0.012 long. Marginal hooks of first and second pair 0.012—0.013 long. Hooks of remaining pairs 0.030—0.034 long. Copulatory complex consisting of irregularly oval basic portion, 0.034 long supporting portion and thin, arch-shaped copulatory tube. Vaginal armor 0.018—0.020 long.

The measurements of hard parts of opisthaptor and copulatory organ roughly correspond to the measurements given in the original description of the species, except the length of shaft of the second pair of anchors. It seems to be erroneous as it follows already from the fact that according to Paperna (1960) the total length of anchors of the second pair is smaller (0.022—0.035) than the length of their shaft (0.029—0.040).
C. tiberianus was recorded for the first time on gills of T. zilli from the Sea of Galilee (Paperna 1960) and later from other localities in Israel (Paperna 1964) and on another host species, T. galilaea, in Ghana (Paperna 1969). The records of C. tiberianus on T. nilotica and Haplochromis longirostris in Ghana (Paperna and Thurston 1969) can be considered incorrect, as in this case the parasites were determined wrongly (see C. thurstoniae sp.n.).

![Diagram](image)

**Fig. 6.** Hard parts of the opisthaptor and copulatory organ of Cichlidogyrus tilapiae Paperna, 1960.

C. tilapiae Paperna, 1960

**Host, location, locality:** Tilapia nilotica, T. zilli; gills; the River Nile in Cairo, 22 June 1971, Specimens studied: 5.

Total length of anchors of first pair 0.029—0.033; their shaft 0.025—0.026, inner root 0.010—0.013, outer root 0.003—0.006 and point 0.009—0.011 long. Connecting bar 0.006—0.007 long and 0.056—0.065 wide. Total length of anchors of second pair 0.037—0.041; their shaft 0.025—0.027, inner root 0.014—0.018, outer root 0.003—0.005 and point 0.008—0.010 long. Connecting bar measures 0.006—0.007 × 0.027—0.029, its appendages being 0.014—0.018 long. Marginal hooks of second pair 0.010—0.011 long, of embryonal type. Hooks of remaining pairs 0.017—0.019 long. Copulatory complex of relatively simple shape (see Fig. 6) and 0.030—0.033 long.

In the original description of this parasite, the following fish species from Israel were recorded as hosts: Tilapia nilotica, T. galilaea, Tristramella sacra and T. simonis. During the research of parasite fauna of fish in Ghana (Paperna 1968, 1969), Uganda (Paperna and Thurston 1969) and Columbia (Kritsky and Thather 1974) C. tilapiae was found also on gills of Pelmatohromis guentheri, Tilapia busumana, T. mossambica, T. zilli, Hemichromis fasciatus and Haplochromis macrognathus. Unfortunately, most of these published reports are not documented by any morphological or metrical data of the parasites.

210
C. aegypticus sp.n.

Host, location, locality: *Tilapia zilli*; gills; the River Nile in Cairo, 22 June and 25 July 1971. Specimens studied: 3. Holotype (measurements in parentheses) was obtained from a fish caught on July 25, 1971, No. Coll. 254.

Total length of anchors of first pair 0.029—0.031 (0.030); their shaft 0.025—0.026 (0.025), inner root 0.011—0.012 (0.011), outer root 0.004—0.006 (0.004), and point 0.010—0.012 (0.010) long. Connecting bar of this pair of anchors V-shaped, 0.004—0.005 (0.004) long and 0.055—0.064 (0.059) wide. Total length of anchors of second pair 0.024—0.025 (0.024); their shaft 0.020—0.021 (0.021), inner root 0.009—0.010 (0.010) outer root 0.004—0.005 (0.004) and point 0.007—0.009 (0.007) long. Connecting bar of this anchors arch-shaped, measuring 0.004—0.005 × 0.031—0.038 (0.004 × 0.038), its appendages measuring 0.015—0.018 (0.015). Marginal hooks of first and second pair about 0.012 long, hooks of remaining pairs 0.033—0.034 long. Copulatory complex 0.044—0.045 (0.044) in total length, consisting of basic portion, branched supporting portion and relatively narrow copulatory tube with wide basal funnel. Vaginal armor tubular, almost in the middle regularly widened, measuring 0.024—0.026 (0.026) in length.

*C. aegypticus* sp.n. is most closely related to *C. bifurcatus* Paperna 1960, *C. brevicirrus* Paperna et Thurston, 1969 and *C. sclerosus* Paperna et Thurston, 1969. It differs from *C. bifurcatus*, among others, in the shape of copulatory organ and presence of vaginal armor, from *C. brevicirrus* in the shape and smaller size of the first pair of marginal hooks and from *C. sclerosus* in larger marginal hooks of the 3rd—7th pair, smaller general length and shape of copulatory organ.

C. thurstonae sp.n.

Host, location, locality: *Tilapia nilotica*; gills; the River Nile in Cairo, 22 June 1971 Specimens studied: 2 — holotype (measurements in parentheses) and one paratype. No. Coll. 356.

Total length of anchors of first pair 0.033—0.034 (0.033); their shaft 0.024—0.027 (0.024), inner root 0.014. outer root 0.006—0.008 (0.008), and point 0.009—0.010.
(0.009). Connecting bar of these hooks 0.004—0.007 (0.004) long and 0.064 wide. Total length of anchors of second pair 0.030—0.032 (0.030); their shaft 0.020—0.022 (0.020), inner root 0.012, outer root 0.008—0.009 (0.008) and point 0.006—0.007 (0.006) long. Connecting bar of this pair of anchors measures 0.005—0.007 × 0.042—0.046 (0.005 × 0.046), its appendages being 0.014—0.015 long. Marginal hooks of first and second pair 0.012—0.014 long, hooks of other pairs 0.039—0.040 long. Copulatory complex 0.047—0.050 (0.047) in total length, consisting of oval basic portion, massive, branched supporting portion and slightly arch-shaped copulatory tube. Vaginal armor of irregular shape and 0.022—0.025 (0.022) long.

This parasite was found for the first time by Paperna and Thurston (1969) on gills of *Tilapia zilli*, *T. nilotica* and *Haplochromis longirostris* in Uganda, but it was erroneously determined as *C. tiberianus* Paperna, 1960. *C.thurstonae* sp.n., named in honour of Dr. J. P. Thurston, the author of first records of Monogenea on cichlid fishes in Uganda, differs markedly from *C. tiberianus* both in the shape of copulatory organ and vaginal armor and in the shape and size of anchors of the first pair.

*Cichlidogyrus* sp.

*Host, location, locality:* *Tilapia zilli*; gills; the River Nile in Cairo, 25 July 1971. Specimens studied: 3.

Total length of anchors of first pair 0.033—0.035; their shaft 0.026—0.028, inner root 0.011—0.012, outer root 0.005—0.007 and point 0.010—0.011 long. Connecting bar of this pair of anchors measures 0.004—0.005 × 0.063—0.064. Total length of anchors of second pair 0.026—0.029; their shaft 0.022—0.023, inner root 0.009—0.010, outer root 0.005—0.006 and point 0.008—0.010 long. Connecting bar 0.005—0.006 long and 0.033—0.043 wide, with two 0.014—0.017 long appendages. Marginal hooks of first and second pair 0.012—0.013 long, hooks of 3rd—7th pair 0.037—0.039 long. Copulatory complex 0.034—0.035 in total length, consisting of basic portion of irregular shape, membranous supporting portion and arch-shaped copulatory tube, the basic
Fig. 9. Hard parts of the opisthaptor, copulatory organ and vaginal armor of *Cichlidogyrus* sp. portion of which is funnel-shaped. Vaginal armor in form of horseshoe-shaped tube and 0.013—0.016 long.

*Cichlidogyrus* sp. is almost identical with *C. aegypticus* sp.n. in the shape and size of hard parts of opisthaptor and also its copulatory organ resembles in its structure and shape the underdeveloped copulatory organ of *C. aegypticus* sp.n. With regard to this fact and due to a lack of data on the morphogenesis of members of the genus *Cichlidogyrus* I determined this parasite tentatively as *Cichlidogyrus* sp.

ДЕВЯТЬ ВИДОВ РОДА CICHLIDOGYRUS PAPERNA, 1960 (MONOGENEA: ANCYROCEPHALINAE) ОТ ЕГИПЕТСКИХ РЫБ

Р. Эргенс


REFERENCES


—, Monogenetic trematodes collected from fresh

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L. V. Chesnova: Prejemstvennost' nauchnykh shkol v entomologii.
(Succession of scientific schools in entomology.)

The reader interested in personal lives and careers of prominent scientists and their intellectual heritage will be pleased to come across this interesting publication. In it creative activities of R. Leuckart, P. Manson, E. N. Pavlovsky and V. N. Beklemishev, the four leading parasitologists of world-wide repute and scientific schools founded by them are evaluated in four chapters. The author gives an account of important sections in the lives of these researchers, histories of their scientific discoveries and activities of their co-workers and disciples. Main results of their studies are pointed out and documented by numerous literature cited, particularly as regards the two Soviet parasitologists. Following a brief conclusion there is a list of names of the scientists mentioned in the text of the book.

Illustrations are modest, only Chapter 2 containing 10 figures which are not numbered and of which 6 are facsimile letters. At least the portraits of the main protagonists could have been included. The references are cited below the text in foot notes, sometimes with abbreviated title to save the space. Moreover, the pages indicated in the references are lacking unity: they are either omitted, or only one page is mentioned, rarely the first and last page are stated. On the other hand, the contents of the book, numerous facts and the general treatment of the subject should be positively evaluated. The book may be recommended to a wide range of readers, but it will mainly appeal to medical arachnentomologists.

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