THREE NEW SPECIES OF *GYRODACTYLUS* (MONOGENOIDEA) FROM *VARICORHINUS CAPOETA GRACILIS* (KEYSERLING) FROM THE RIVER LENKORANKA

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Abstract. Three new species of *Gyrodactylus* Nordmann, 1832 are described from *Varicorhinus capoeta gracilis* (Keyserling) from the River Lenkoranka (Azerbaijan SSR) as follows: *G. varicorhini* sp. n., *G. capoeta* sp. n. and *G. mikailovi* sp. n.

Examination of *Varicorhinus capoeta gracilis* from the River Lenkoranka (25 km from the estuary in the Caspian Sea), Azerbaijan SSR during the spring of 1974 revealed the presence of three previously undescribed species of the genus *Gyrodactylus* Nordmann, 1832.

The host fishes used in this study were collected with nets. The parasites were fixed in 4% formalin and mounted as permanent preparations in glycerin-gelatine. Methods concerning observation, measurement and illustration of species described herein, were employed as given by Gussev (1955), Malmborg (1957) and Ergens and Lom (1970). All measurements are in millimeters (the measurements of the holotypes are given in parentheses).

*Gyrodactylus varicorhini* sp. n.

**Fig. 1**

Location on host: Oral cavity, fins, gills. Specimens studied: Twenty.

The holotype is represented by a specimen collected in the oral cavity of the host caught on April 7, 1974. It is deposited, together with two paratypes, in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague (Coll. No. 376). Other paratypes are deposited in the collection of the Institute of Zoology, Academy of Sciences of Azerbaijan SSR, Baku.

Description: Total length of anchors 0.064—0.072 (0.069), shaft 0.047—0.053 (0.052), point 0.030—0.035 (0.032), root 0.019—0.021 (0.021). Ventral connecting bar with well-developed lateral processes and a membranous extension measuring 0.014 to 0.019 (0.018). Length of bar 0.006—0.008 (0.007), width 0.027—0.033 (0.032). Dorsal connecting bar measures 0.002—0.003 × 0.015—0.022 (0.003 × 0.022). Total length of marginal hooks 0.027—0.030 (0.030), hook proper measures 0.006—0.007.

This species is very similar to the species *G. barbi* Ergens, 1976, but differs from it in the shape of the hook proper of the marginal hooks.
Fig. 1. Hard parts of the opisthaptor of *Gyrodactylus variicornis* sp. n.

- a — holotype; b, c, d, e — paratypes.

Fig. 2. Hard parts of the opisthaptor of *Gyrodactylus capostai* sp. n.

- a — holotype; b — paratype.
**Gyrodactylus capoetai** sp. n.

Location on host: Fins, skin. Specimens studied: Four.

The holotype is represented by a specimen collected on the skin of the host caught on April 16, 1974. It is deposited, together with one paratype, in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague (Coll. No. 375). The other two paratypes are deposited in the collection of the Institute of Zoology, Academy of Sciences of the Azerbaijan SSR, Baku.

**Description**: Total length of anchors 0.047—0.052 (0.049), shaft 0.037—0.041 (0.038), point 0.022—0.026 (0.025), root 0.012—0.014 (0.014). Measurements of ventral connecting bar with the developed lateral processes and a 0.011—0.012 (0.011) long membranous extension are 0.005×0.018—0.022 (0.005×0.020). Dorsal connecting bar measures 0.001—0.002×0.015—0.016 (0.002×0.016). Total length of marginal hooks 0.023—0.024 (0.024), hook proper measures 0.005—0.006.

*G. capoetai* sp. n. is most closely related to *G. markeevskii* Kulakovskaya, 1951, but differs from it in the shape of the hook proper of marginal hooks and in the measurements of the complex of anchors.

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**Gyrodactylus mikailovi** sp. n.

The single specimen examined, representing a holotype, was obtained from the gills of host captured on April 18, 1974. It is deposited in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences, Prague (Coll. No. 378).

**Description**: Total length of anchors 0.085, length of shaft 0.059, point 0.038, root 0.029. Measurements of ventral connecting bar with well-developed lateral processes and a 0.022 long membranous extension, are 0.009×0.036. Measurements of dorsal connecting bar are 0.004×0.026. Total length of marginal hooks 0.031—0.032, hook proper measures 0.008.

*G. mikailovi* sp. n., named in honour of the Azerbaijan ichthyoparasitologist Dr. T. K. Mikailov, most closely resembles in the shape and also in measurements of the anchors the *G. macronychus* Malmberg, 1957, from which it differs in the shape of hook proper of marginal hooks.

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ТРИ НОВЫХ ВИДА РОДА *GYRODAC'TYLYUS* (MONOGENOIDEA) OT *VARICORHINUS CAPOETA GRACILIS* (KEYSERLING) ИЗ РЕКИ ЛЕНКОРАНКИ

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Резюме. Дано описание трех новых видов рода *Gyrodactylus* Nordmann, 1832 от *Varicorhinus capoeta gracilis* (Keyserling) из реки Ленкоранки (Азербайджанская ССР): *G. varicorhinus* sp. n., *G. capoeta* sp. n. и *G. mikailovi* sp. n.
SELECTIVE STAINING OF OPISTHAPTOR SCLERITES OF SOME MONOGENEAES

The shape of monogenean opisthaptor sclerites (called "hard parts" in systematic papers) has been studied mostly by means of phase-contrast microscopy. For this purpose, either fresh or fixed material has been used. A mixture of ammonium picrocarmine or glyceraldehyde-gelatin has recently been used for fixation and embedding (Ergens R., Folia parasit. (Praha) 16: 320, 1969; Ergens R., Lom J., Puvodec parasitarnich nemocí ryb. Publ. House Academia, Praha, 1970), but the contrast of opisthaptor sclerites is gradually reduced in these media.

Our method using paraformaldehyde fuchsin provides intensive staining of monogenean opisthaptor sclerites. The material embedded in Canada balsam is persistent and the intensity of staining does not change. We have verified this method on the whole mounts of some species of the genus Gyrodactylus (G. macronychus Malmberg, 1957 and G. aphygine Malmberg, 1957) and on the sections from the species of the genus Tetraonchus while studying the histochemistry of their sclerites (Żdárska Z., Folia parasit. (Praha) 21: 345—347, 1974).

The material was obtained by the courtesy of Dr. Ergens to whom my thanks are due. The monogeneans of the genus Gyrodactylus were collected from the skin of fishes and placed in a Petri dish with water. A large number of specimens were transferred by a pipette to a slide with a drop of water. A cover slip was placed over the drop and the excess water was sucked off with filter paper and replaced by Baker's fixative (Pearse A. G. E., Histochemistry: theoretical and applied. Vol. 1. J. and A. Churchill Ltd., London, 1968). After 10 min the cover slip was removed and the specimens sticking to the slide were further fixed for 24 h in Baker's fixative (may be fixed for a longer time) and then washed in water for 2 hours.

Staining procedure
1. Treat with paraformaldehyde prepared according to Pearse (1968) for 5 minutes (longer treatment with paraformaldehyde may damage the sclerites).
2. Wash in water for 2—5 minutes.
3. Stain with aldehyde fuchsin prepared according to Pearse (1968) for 30 minutes.
4. Wash in water for 10 minutes.
5. Dehydrate in alcohol, clear in xylol and mount in Canada balsam. The sclerites stain deep purple.

The entire marginal hooks of Gyrodactylus macronychus (Plate I, Figs. 1, 2; Plate II, Fig. 1) and G. aphygine (Plate II, Fig. 2) stain intensely. In the shaft of the anchors only the outer layer is stained, whereas the inner one remains unstained (Plate I, Fig. 2; Plate II, Figs. 1, 2). The connecting bars also remain unstained (Plate I, Fig. 1; Plate II, Figs. 1, 2).

The method using PAA aldehyde fuchsin is one of the methods applied for the detection of proteins with SS groups, which were demonstrated by Lyons (Parasitology 56: 63—100, 1966) in opisthaptor sclerites of different genera of Monogenea and by Żdárska (1974) in the sclerites of the members of the genus Tetraonchus. We assume therefore that this method may be applied for permanent slides of these parasites serving as document material.

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