1964

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GLOUCESTER POINT, VIRGINIA

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TRANSLATION SERIES NO. 8

December 1964

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TRANSLATION SERIES NO. 8

VIRGINIA INSTITUTE OF MARINE SCIENCE
Gloucester Point, Virginia
1964

1948 Raboty Morskoi Biologicheskoi Stantsii Karelo-Finskogo Universiteta,
No. 1, p. 140-144

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In an address before a special meeting celebrating the 40th p140
anniversary of his scientific activity, V. A. Dogiel, indicated that, "in works dealing with the problem of the species, data from parasitic animals open wide perspectives and yield new methods leading to the establishment of subordinate systematic units." Later he stated that the researcher "is astonished by the unusual wealth and variety of factors leading to divergency of species among parasites."

Among the materials on monogenetic trematodes which are at our disposal, the data on Monogenea parasitizing representatives of the genus Eleginus G. Fischer represent a good illustration of the above-mentioned considerations of V. A. Dogiel. This genus of fishes consists of two species /both called Navaga/: E. navaga (Pallas) distributed near the northern shores of Europe and western Siberia, and E. gracilis (Tilesius) in the far eastern seas.

In his work on geographic distribution of gadoids A. N. Svetovidov (in press) indicates that this family is almost unique among fishes in its singular distribution. Whereas the great majority of the families of fishes is considerably richer in the number of species and genera in the northern part of the Pacific Ocean than in the northern part of the Atlantic, the gadoids have opposite relations. It must also be pointed out that evolutionarily Pacific gadoids are derivatives from Atlantic ones. According to the opinion of A. N. Svetovidov the Navaga penetrated the Pacific Ocean between or after the glacial epochs. Since that time the divergence between the two isolated groups of Navaga has become so great that at the present time we have two species which differ sharply morphologically.

In connection with this, examination of the composition of the fauna of monogenetic trematodes of the two species of Navaga is of considerable interest because the knowledge of the ways of evolution of the hosts should assist in the elucidation of the nature and the tempos of the evolution of the parasites.

Among the parasitic worms monogenetic trematodes are most convenient for clarification of above-mentioned questions, because they develop without intermediate hosts and have very brief free-swimming larval stages. Representatives of the genus Gyrodactylus Nordmann even lack this /free-swimming stage/ (contact infection).

Preface to Translation[1]

Translation of this paper was undertaken as part of a long-term research project on the systematics, host-specificity and zoogeography of monogenetic trematodes.[2] Translation and editing were accomplished in the following manner:

1. Oustinoff[3] read translation on tape.
2. Mrs. Morales transcribed translation from tape to first typescript.
3. Hargis edited typescript.
4. Typescript retyped by Mrs. Morales.
5. Hargis again edited typescript for final corrections.

A conscious effort has been made to keep this translation as near the original as possible. It is probably inevitable, however, that some of the nuances of meaning in the original have been distorted or lost. For this we apologize to the author and the reader.

Certain passages were difficult to translate. Where a different English phrase seems to fit the author's meaning better or serves to clarify the text, it has been inserted in brackets. Certain obvious errors or misspellings in the original text were changed, less obvious ones are noted with (sic).

For convenience in referring to the Russian text the original pagination is given in the margin of the translation opposite the place where the new page begins. Occasionally figures or tables are somewhat displaced from their original page location; however, since they, themselves, are numbered sequentially, no confusion should result.

The citation of numbers for measurements and numbered structures are generally given in the translation as they were in the author's paper. This should further facilitate checking with the Russian. Unless otherwise noted, all measurements are in millimeters.

This translation is intended as a service to researchers, Though effort has been made to make it comprehensible, accurate and useful, it is likely that improvements can be made. Should literary improvements or verification appear desirable it is suggested that the researcher make his own translation. Pagination is arranged to facilitate such activity. We will appreciate constructive suggestions for improvements in this and future translations.

Thanks are due to Mrs. Patricia C. Morales of the Virginia Institute of Marine Science who transcribed, typed and assembled the manuscript, and to Miss Evelyn Wells who assisted with final editing.

William J. Hargis, Jr.

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[1]Virginia Institute of Marine Science Translation Series, No. 8.

[2]Translation and editing supported by funds from Grant No. E-2389 of the National Institutes of Health.

[3]Chairman, Department of Modern Languages, College of William and Mary Williamsburg.

We examined both species of Navaga--Eleginus navaga (Pallas) p141
from White Sea, and E. gracilis (Tilesius) from the Sea of Okhotsk. Monogenetic trematodes of the genus Gyrodactylus Ndm. were found in both places, and they turned out to be new /species/.[1]

Gyrodactylus gerdi Bychowsky nov. sp.

Worms (fixed) are of average size. Their length is 0.25 - 0.38 mm and largest width is 0.07 - 0.10 mm. The attaching disc /posthaptor/ is almost round, being of a somewhat smaller diameter than the body width. Its dimensions are 0.07 - 0.09 x 0.07 - 0.08. The middle hooks /anchors/ are considerably elongated having a rather long interior outgrowth /superficial or ventral root/ with a weakly developed but clearly expressed exterior outgrowth /deep or dorsal root/ and a relatively short point. The dimensions of the anchors are: overall length 0.082 - 0.086; width of the basal part 0.057 - 0.059; length of the ventral root 0.030 - 0.037; length of the point 0.021 - 0.026. The connecting plate of the exterior outgrowths /dorsal bar/ is rather long, more or less of the same length, and almost straight. Its length is approximately 0.026 - 0.028. Its place of attachment to the middle hooks /anchors/ subdivides the latter in the ratio of 1:1.6 to 2.0. The basal connecting plate /ventral bar/ has rounded lateral ends and a long membranous extension. The latter is rather coarse; its free lower edge is irregularly rounded. The length of the ventral bar is approximately 0.030 - 0.033, its width is 0.008 - 0.010, and the length of the membrane-shaped extension is 0.025 - 0.028. The lateral hooks are of the usual type up to 0.035 in length.

Host: Navaga--Eleginus navaga (Pallas). p142

Habitat: Gills (on gill filaments).

Place of discovery ?Locality/: White Sea (Kolezhma, Soroka).

(Type and paratypes are in the collection of the Zoological Institute of the Academy of Sciences USSR.)

The species described above differs from the earlier known ones mainly by the powerfully developed superficial roots, whereas the points of the anchors are relatively weakly developed. It is especially characteristic that the ventral roots are of almost equal width throughout their lengths, in contrast to the majority of other species of Gyrodactylus in which the basal portions of the roots are more massive than their ends. The general configuration of the anchors resembles that of Dactylogyrus anchoratus (Duj.).

This species is named in honor of Professor S. V. Gerd.

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[1] In the descriptions of the new species, terminology has been clarified. Terms in brackets after the literal translation follow the useage of W. J. Hargis, Jr., (1955). A revised, annotated list of morphological terms useful for morphological studies of monogenetic trematodes. Gloucester Point, Va. Va. Fish. Laboratory /Va. Institute of Marine Science/ Mimeograph, 12 p.)

Gyrodactylus gerdi subsp. orientalis nov. subsp.

Worms (examined live and fixed) are from 0.28 - 0.35 in length and 0.08 - 0.14 in width. The posthaptor is 0.07 - 0.10 long and 0.07 - 0.10 wide. The anchors are 0.072 - 0.080 long; their basal part is from 0.050 to 0.058 long; the length of the superficial root is 0.024 - 0.032; the length is 0.020 - 0.023. The connecting plate of the exterior outgrowth /dorsal bar/ is of the same shape as in the typical G. gerdi, and is 0.020 - 0.027 long. Its place of junction with the anchors subdivides them in the ratio of 1 to 1.7 - 2.2. The ventral bar is shorter than in the typical G. gerdi. Its length is 0.026 - 0.028, its width is approximately 0.008, and the length of the membranous extension is 0.020 - 0.026. The lateral hooks are 0.032 - 0.034 long.

Host: Far Eastern Navaga--Eleginus gracilis (Tilesius).

Habitat: Gills (on gill filaments).

Place of discovery /Locality/: Gulf of Anive (Bosse Bay or "Lake" Tobuti).

(Type and paratypes are in the collections of Zoological Institutes of Academy of Sciences, USSR)

This subspecies differs from the typical G. gerdi mainly in its dimensions while retaining the characteristic form for the species. Generally, the smaller dimensions for all parts of the attaching armature and also relatively shorter ventral roots of the anchors are typical.

Gyrodactylus arcuatus subsp. elegini n. subsp. p143

Worms (fixed) are 0.16 - 0.28 in length and 0.06 - 0.09 in width. The posthaptor is rounded, its diameter varies from 0.06 - 0.08. The anchors are of the usual form with roots and relatively long, powerful points. The dimensions of the anchors are: overall length 0.030 - 0.038; length of the basal part 0.027 - 0.033; the length of the superficial roots 0.004 - 0.008; length of the points 0.018 - 0.021. The connecting plate of the exterior outgrowth /dorsal bar/ is straight, rather thin, 0.014 - 0.017 in length. The basal connecting plate /ventral bar/ has rounded ends with long extensions extending forward and lying along the ventral roots of the anchors and having a weakly developed membranous extension. The length of the dorsal bar is approximately 0.018 - 0.022. The lateral hooks are of the usual form having up to 0.031 in length.

Host: Navaga--Eleginus navaga (Pallas).

Habitat: Gills (on gill rakers and on archs).

Place of discovery /Locality/: White Sea (Kolezhma, Soroka).

(Type and paratypes are in the collection of the Zoological Institute.)

In 1933 the author described Gyrodactylus arcuatus from the gills and fins of the sticklebacks, Gasterosteus aculeatus and Pygosteus pungitius, from the Karelian lakes near Petrozavodsk (lakes Pertozero and Konchzero near the village of Konchzero). The form described here resembles the typical G. arcuatus closely and /therefore/ can hardly be considered as an independent species. However, it differs from G. arcuatus in the dimensions of certain parts, specifically in the larger lateral hooks, the larger haptoral bars and the somewhat shorter ventral roots of the anchors. In comparing the preparations of the worms from sticklebacks and from Navaga it can be seen that the latter /the parasites of Navaga/ are somewhat larger on the average and have more massive attaching formations.

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Let us now try to analyze the data which were obtained. First, we see that the subspecies are formed in two different ways. In the case of Gyrodactylus gerdi we deal with geographic isolation which brings with it parallel development of morphological changes both of the parasite and the host. At the same time the tempo of divergency of the parasites is slower than that of the host, for during the same historical period the host evolved to the degree of a well separated species, whereas the parasite attained only subspecific level, differing mainly in its dimensions. In the case of Gyrodactylus arcuatus the morphological changes of the parasite arise in connection with the transfer of part of the population of the species to a new host in the same geographical region. One must also note that the transfer to a new host which is somewhat removed from the initial host systematically apparently plays a role here because Gyrodactylus arcuatus does not show any noticeable morphological differences in the two species of sticklebacks. It is possible that the change toward living in marine conditions also plays a role in this instance, although we also have data which contraindicate this supposition, because the same species of monogenetic trematodes, which do not differ morphologically, are encountered on the same /species of/ sticklebacks p144 both in marine and freshwater conditions.

The question also arises as to how justifiable it is to designate by the same taxonomic term intraspecific groupings which are formed differently. Without entering into a detailed discussion of this question, we wish to state that in our opinion this is quite permissible because the same degree of changes which are morphically consolidated can be acquired as a result of different, most diversified factors. And to designate the same morphological changes by different taxonomic names seems to us unsuitable to say the least. Furthermore, in our opinion the geographical factor is over-estimated in the contemporary zoological systematics to the detriment of the ecological factor which undoubtedly has an enormous significance in the process of speciation.

Regarding the time of the formation of the subspecies orientalis of Gyrodactylus gerdi, we may say that, on the basis of the above-mentioned data of A. N. Svetovidov (in press) concerning the period of divergency of the host and also of the data of K. M. Deriugin (1928) and on the history of the origin of the fauna of the White Sea, it is more likely that it was formed in the post-glacial period. Approximately the same period of formation can be considered for Gyrodactylus arcuatus elegini although it is possible that this subspecies is even younger.

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FIG. 1. Gyrodactylus gerdi Bychowsky n. sp. Attaching armature of the specimen from Eleginus navaga (Pall.). White Sea. The scale of this and the following drawings equals 0.03 mm.

FIG. 2. Gyrodactylus gerdi subsp. orientalis Bychowsky n. subsp. Attaching armature of the specimen from Eleginus gracilis (Til.). Sea of Okhotsk.

FIG. 3. Gyrodactylus arcuatus subsp. elegini Bychowsky n. subsp. Attaching armature of specimen from Eleginus navaga (Pal.). White Sea.

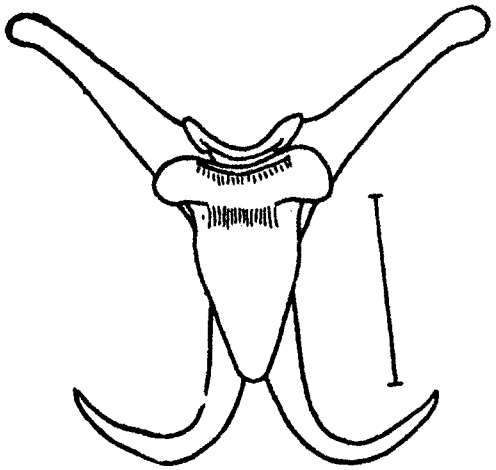

FIG. 1

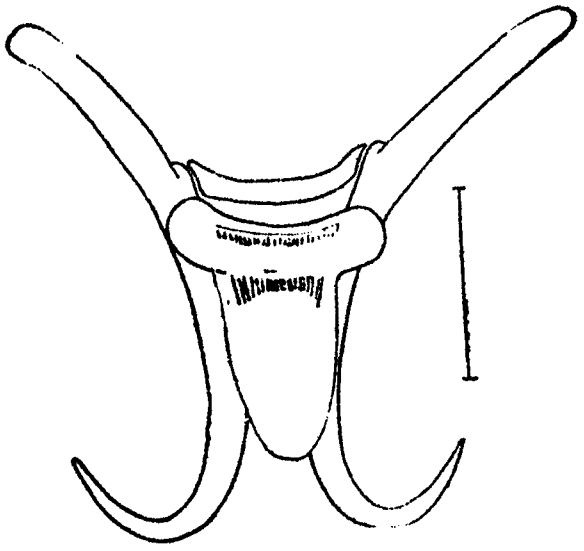

FIG. 2

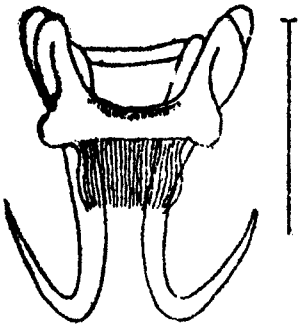

FIG. 3