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KOTLARCZYKIA BATHYBIA GEN. N., SP. N. (TELEOSTEI) FROM THE  
OLIGOCENE OF THE CARPATHIANS.

*Abstract* — A description of a new genus from Gonostomatidae family, closely related to two living genera *Bonapartia* and *Margrethia*, on the basis of the palaeontologic data the evolutionary trends in one of the natural groups of this family are being presented.

INTRODUCTION

In 1972, during a research work in the Menilitic Beds in the Polish Carpathians I have collected some fishes, representatives of a new genus in Gonostomatidae family. The fishes are from the lowest part of the upper bathypelagic horizon of the Menilitic Beds, which are exposed at the slope of the Przemyśl — Bircza road, on the Kępak mount near the village Korzeniec. The description of this exposure, as well as the detailed stratigraphic data and the full list of the found ichthyofaunal assemblage are given by Jerzmańska & Kotlarczyk (in press). The described specimens are in the collection of the Palaeozoological Department of the Wrocław University for which the abbreviation Z. PAL Wr. is used.

Order **Clupeiformes**

Suborder **Stomiatoidei**

Family **Gonostomatidae** Goode & Bean, 1895

Only the bathypelagic fishes belong to this family. They are represented by 22 recent genera (Grey, 1960; 1961). The oldest records of Gonostomatidae (*Paravinciguerrria* Aramb. and *Idrissia* Aramb.) are already known in the Cretaceous (Arambourg, 1954). The well marked development of this family however can not be observed till the Oligocene and the Mioce-

ne, because the extinct genera (*Idrissia* Aramb., *Scopeloides* Wett., *Prae-woodsia* Aramb., *Ohuus* Sato) are noticeable together with the recent genera (*Cyclothone* Goode & Bean, *Gonostoma* Rafin., *Vinciguerria* Gode & Bean, *Phothichthys* Hutton, *Mauroliticus* Cocco). The paleogeographic ranges of the fossil Gonostomatidae, except the genus *Ohuus* are discussed by Jerzmańska (1968). This last genus described by Sato (1962) from the Miocene of Japan is closely related to *Cyclothone*, already known from the Miocene of California (David, 1943).

According to Grey (1960) among the recent representatives of this family, four genera (*Gonostoma*, *Cyclothone*, *Bonapartia* and *Margrethia*) form a natural group that is distinguished from the others by the absence of photophores on the isthmus, the small amount of photophores in the VAV<sup>1)</sup>, the short premaxilla and relatively short distance between the pelvic bases and the anal origin. This two (or even three when well preserved) last features, easily noticeable in fossil material allow the extinct genera *Scopeloides*, *Ohuus* and *Kotlarczykia* n.gen. to be included to this group. Besides, *Scopeloides* is closely related to *Gonostoma* (Arambourg, 1967), *Ohuus* to *Cyclothone* (Sato, 1962) and *Kotlarczykia* to two living genera *Bonapartia* Goode & Bean, and *Margrethia* Jespersen & Taning.

It should be underlined, that *Kotlarczykia* does not appear in the Carpathian Mountains till the upper part of the Menilitic Beds (the upper bathypelagic horizon). On the other hand *Scopeloides* occurs in the older ichthyofaunal assemblages, which have the similar ecological relationships (the lower bathypelagic horizon) (Jerzmańska, 1968; Jerzmańska & Kotlarczyk, 1968). The similar differences of the fish genera composition between the two horizons are visible in the other families as well (Jerzmańska, Kotlarczyk & Krawczyk, 1973).

The next appearance of the following genera in that line in the Miocene, allows to arrange evolutionary trends within the natural group of Gonostomatidae (Text-fig. 1). According to the fossil records hitherto existing it is possible to state, that the process of the differentiation of the four recent genera of Gonostomatidae already began in the Oligocene.

#### Genus *Kotlarczykia* gen.n.

*Type species: Kotlarczykia bathybia* sp.n.

*Derivatio nominis:* named after Prof. Janusz Kotlarczyk, the meritorious research worker of the Carpathian Mountains.

*Diagnosis.* — Head long. The snout with a short premaxilla and a long curved maxilla. The upper jaw and the mandible with big conical teeth

<sup>1)</sup> The photophores of the ventral series found between the pelvic bases and the anal origin.

and with minute teeth in the interspaces. The lower jaw prominent. There are 34 vertebrae, including 19 caudal. The short dorsal fin opposite to the beginning of the long anal. The pectoral fins lie low on the side of the abdomen. Origin of short pelvic fins near the anal fin. The trunk short. The distance from the basis of the pectoral fins to the beginning of the anal shorter than the length of the head. The caudal fin forked. A single series of large photophores.

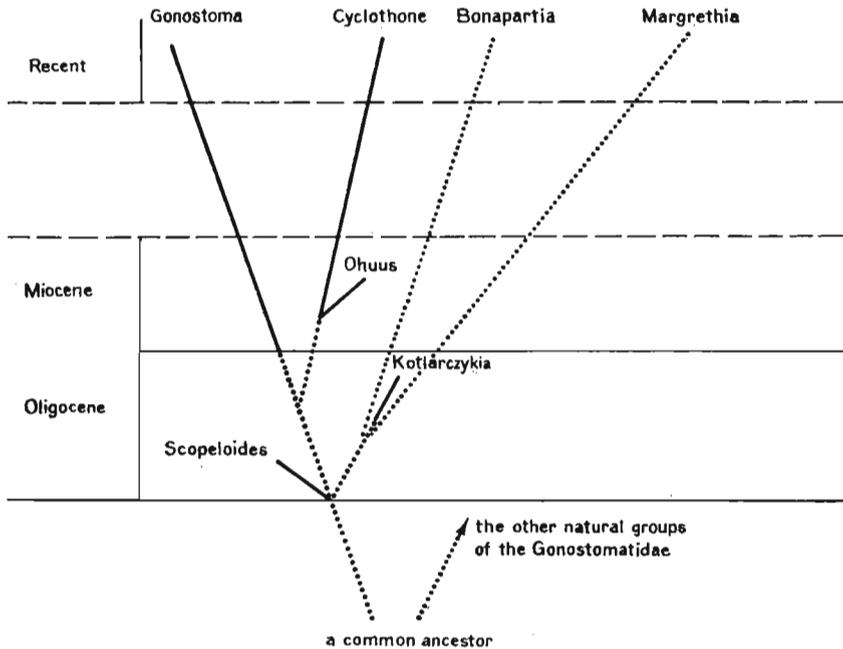


Fig. 1. — The evolutionary trends in one of the natural groups of the family Gonostomatidae.

The genus is monotypic.

*Discussion.* — Because of: 1) the short premaxilla, 2) teeth not uniform in size, 3) a short trunk, 4) the pelvic fins situated near the anal fin, 5) the position of a short dorsal fin and a long anal fin, 6) a single series of photophores on each side of abdomen, described fishes resemble two recent (close related) genera *Bonapartia* and *Margrethia*. Similar to *Margrethia* the Carpathian specimens possess 34 vertebrae and 17 photophores in the AO series. But the long anal fin and the lack of the adipose fin are the visible features of *Bonapartia* (Table I).

*Kotlarczykia* takes the intermediate position between these genera. This is pointed out by the presence of the 7 rays in the pelvic fin, 14 rays in the pectoral fin, 17 rays in the dorsal fin and the amount of procurrent rays

in both lobes of the caudal fin (Table I). The same may be said about such features as the position of the anal fin in relation to the beginning of the dorsal fin. The latter in *Kotlarczykia* begins above the first ray of the anal fin, when in *Bonapartia* the beginning of the dorsal fin is situated before and in *Margrethia* behind the origin of the anal fin.

Table I

Genus	Vertebrae	P	V	D	A	C	Photophores of the AO series	Adipose fin
<i>Margrethia</i> <sup>1)</sup>	34	13-14	8	15-16	21-26	7,X-IX,9	17	present
<i>Kotlarczykia</i>	34	14	7	17	31	9,X-IX,7	17	absent
<i>Bonapartia</i> <sup>1)</sup>	37	14-16	7-8	17-20	29-31	8,X-IX,4	18-20	absent
<i>Scopeloides</i> <sup>2)</sup>	37-39	12	9	14	25	5-6,X-IX,5-6	16	absent

<sup>1)</sup> After: Jespersen & Taning (1919); Norman (1930); Grey (1960).

<sup>2)</sup> After: Arambourg (1967).

Unfortunately in the zoological literature there is a lack of the osteological descriptions and particularly of the description of the skeleton supporting the caudal fin in the two living genera. It makes it impossible to compare it with the described fossil material in a detailed way. But the mentioned below (p. 286) specialization of the structure of hypurals, as being the important feature in judging the relationship, makes it impossible to think of the representatives of *Kotlarczykia* as of the direct ancestor of the discussed here recent genera. It is quite possible that they derive from the same stock in the Oligocene simultaneously with *Kotlarczykia*.

The differences between the representatives of *Kotlarczykia* and of *Scopeloides* known from the Carpathians are easy to notice even in the worse preserved specimens. As it has already been mentioned, *Scopeloides* occurs only in the older sediments of the lower bathypelagic horizon. The morphological differences between the two genera (Table I) lie in the existence in *Scopeloides*: 1) the greater amount of vertebrae, 2) the longer abdomen, 3) the dorsal and anal fin shorter, 4) the different position of the median fins, 5) numerous accessory radials in front of the dorsal fin, 6) two series of photophores on each side of abdomen.

Stratigraphic range as for the type species.

*Kotlarczykia bathybia* sp.n.  
(Pl. XXIII-XXIV; Text-fig. 2)

*Type specimen*: Pl. XXIII, Z. PAL. Wr. A/1998 — the almost complete skeleton.

*Stratum typicum*: Oligocene, the lowest part of the upper bathypelagic horizon of the Menilitic Beds.

*Locus typicus*: the Krępak mount, near the village Korzeniec, the Carpathians, Poland.

*Derivatio nominis*: *bathybia*, named after the assemblages of the deepwater fishes among which it was found.

*Diagnosis*. — As for the genus.

Formula:

Vert. 34 (15+19); D — 17; A — 31; P — 14; V — 7; C — 9, X — IX, 7.

*Material*. — 6 specimens (Z. PAL. Wr. A/1998-2003).

*Description*. — Narrow, long fishes. The length of the body without the caudal fin 30-80 mm. The maximum body depth fits 4 times into the body length without the caudal fin. The dorsal and anal fin originates more or less in the middle of the body length without the caudal fin. The large photophores are seen as the dark spots. In the AO series there were 17 photophores (14+3). The photophores were situated on the abdomen in a single series.

Dimensions (in mm)

	Z. PAL. Wr A/:	1998	2000
Length of body without caudal fin	about	80.0	about 35.0
Maximum depth of body		17.5	8.6
Length of head	about	22.0	about 9.5
Distance from base of pectoral fin to beginning of anal fin		17.5	7.0
Length of base of dorsal fin		13.5	6.5
Length of base of anal fin		28.5	13.5
Length of pectoral fin		13.0	—
Length of pelvic fin		7.5	—

*Skull*. The long head fits 3.5 times into the length of the body without the caudal fin. The small orbit, the diameter bigger than the preorbital area, fits ca. 4 times, into the head length. The bones of the neurocranium are poorly preserved. The short but a stout premaxilla forms about  $\frac{1}{3}$  of the margin of the upper jaw. The narrow maxilla reaches the point much behind the orbit. The lower jaw is long and relatively low. The dentary as well as both bones of the upper jaw has on its all length the series of acute teeth. Their bases are ornamented in a delicate way by the numerous longitudinal ridges. In the interspace between this big teeth there are minute teeth, 7 in every of them.

*Vertebral column*. There are 34 vertebrae, 19 caudal and 15 abdominal. The abdominal part short, fits almost 2 times into the caudal part of the vertebral column. There are 12 pairs of ribs. The first pair is short and

delicate, the following long, stout reaching the ventral edge of the abdomen. The neural spinous processes of the abdominal vertebrae remain unfused and in the caudal vertebrae are fused to form a single median spine. The centra are well ossified. The last two caudal vertebrae are lightly upturned. Epineurals occur on the all abdominal and 9 caudal vertebrae. On the latter the epipleurals are seen as well. The caudal skeleton consists of 6 hypurals supporting 19 principal caudal fin rays. On the ventral side occur two fused hypurals (the first and the second) and 9 principal rays. On the dorsal side the fusion of two hypurals (the third and the fourth) into the one bone took place. It seems that only one epural occurred. The last centrum of the vertebral column consisted probably of the first preural centrum and at least the first ural centrum (the names of the centra after the Nybelin's (1964) terminology). On the basis of the one specimen in which I was able to observe the structure of the caudal skeleton it is difficult of a state the presence or absence of the boundaries between the ural centra. In the supporting of the caudal fin, apart from the hypural bones, the modified haemal spines of the two last but one

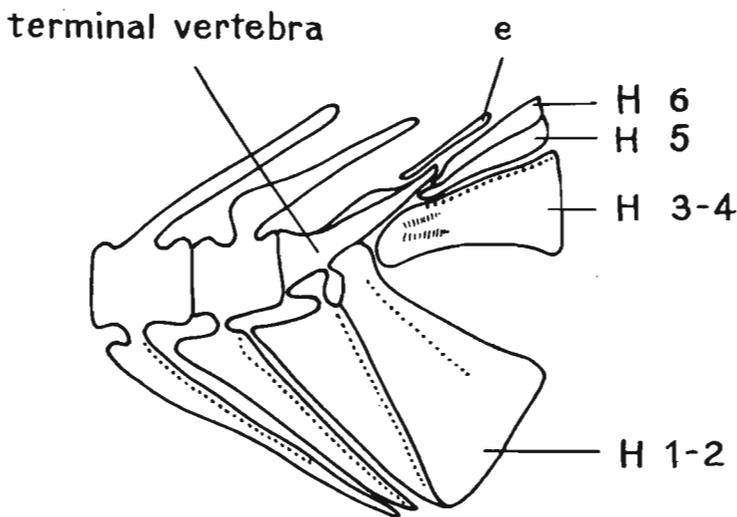


Fig. 2. — *Kotlarczykia bathybia* sp. n. — Caudal skeleton of the specimen Z. PAL. Wr. A/2000, ca,  $\times 20$ . e — epural; H. — hypural.

vertebra took part. The described above skeleton of the caudal fin shows a certain specialization, visible among others in the fusion of the hypural bones.

Pectoral fins, situated low, almost one the edge of the vent. Composed of the 14 long rays reaching the base of the pelvic fins. Cleithrum long, narrow, curved with a short ventral part. Supracleithrum long, narrow. Posttemporal stout, forked.

Pelvic fins, situated under the twenty second vertebrae counted from the end. Consist of the 7 rays. Short, not reaching the beginning of the anal fin.

Dorsal fin. The beginning lies about equidistant from base of caudal and end of snout. It originates above the 18th and ends above the 12th vertebra (counted from the end). Contains 17 rays. The first three gradually longer, unbranched. All the following rays are branched. The longest is the fourth ray. The lengths of the remaining rays are growing short very quickly. In effect, it gives the characteristic shape of this fin (Pl. XXIII. XXIV). The first pterygiophores are stout expanded in their distal part, similar to living Gonostomatidae. Preceding the dorsal fin there are no accessory radials.

Anal fin, originates below the beginning of the dorsal fin. The base stretches on the distance of 18th to 4th vertebra counted from the end. It contains 31 rays, in this the first short and unbranched, then eight long, the remaining 22 rays shorter and shorter. It gives the similar shape as with the dorsal fin. The first four pterygiophores long and narrow, the remaining shorter, expanded in their upper part as with the typical Gonostomatidae.

Caudal fin, is rather deeply forked. Contains 19 principal rays, 9 of them in the lower lobe and 10 in the upper lobe. Preceding the lower lobe there are seven procurrent rays, preceding the upper — nine rays.

The body was covered by quite big, thin cycloid scales.

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KOTLARCZYKIA BATHYBIA GEN. N., SP. N. (TELEOSTEI) Z OLIGOCENU  
KARPAT

*Streszczenie*

Przedstawiono opis nowego rodzaju i gatunku ryby *Kotlarczykia bathybia* z najniższego ogniwa górnego poziomu batypelagicznego warstw menilitowych Karpat. Ryby te należą do rodziny Gonostomatidae obejmującej wyłącznie formy batypelagiczne. Najstarsi przedstawiciele tej rodziny znani są już z kredy (Arambourg, 1954). Wśród dzisiejszych 22 rodzajów Gonostomatidae najbliższymi spokrewnionymi z *Kotlarczykia* są rodzaje *Bonapartia* Goode & Bean oraz *Margrethia* Jespersen & Taning nieznane w stanie kopalnym.

Na podstawie dotychczasowych danych paleontologicznych przedstawiono kierunki rozwojowe w obrębie jednej z naturalnych grup tej rodziny. Proces zróżnicowania się czterech współczesnych rodzajów (*Gonostoma*, *Cyclothone*, *Bonapartia* i *Margrethia*) rozpoczął się przypuszczalnie już w oligocenie (Text-fig. 1).

АННА ЕЖМАНЬСКА

KOTLARCZYKIA BATHYBIA GEN. N., SP. N. (TELEOSTEI)  
ИЗ ОЛИГОЦЕНА КАРПАТ

## Резюме

В работе дано описание нового рода и вида рыбы *Kotlarczykia bathybia* из низов верхнего батипелагического горизонта менилитовых слоев в Карпатах. Эти рыбы относятся к семейству Gonostomatidae, включающему исключительно батипелагические формы. Древнейшие представители этого семейства известны с мела (Арамбур, 1954). Среди 22 современных родов Gonostomatidae наибольшее сходство с *Kotlarczykia* проявляют роды *Bonapartia* Goode & Bean и *Margrethia* Jespersen & Taning, которые не встречались в ископаемом виде.

На основании анализа палеонтологических данных рассматриваются направления эволюции одной из природных групп этого семейства. Процесс обособления четырех современных родов (*Gonostoma*, *Cyclothone*, *Bonapartia* и *Margrethia*) начался, вероятно уже в олигоцене (Text-fig. 2).

## EXPLANATION OF PLATES

## Plate XXIII

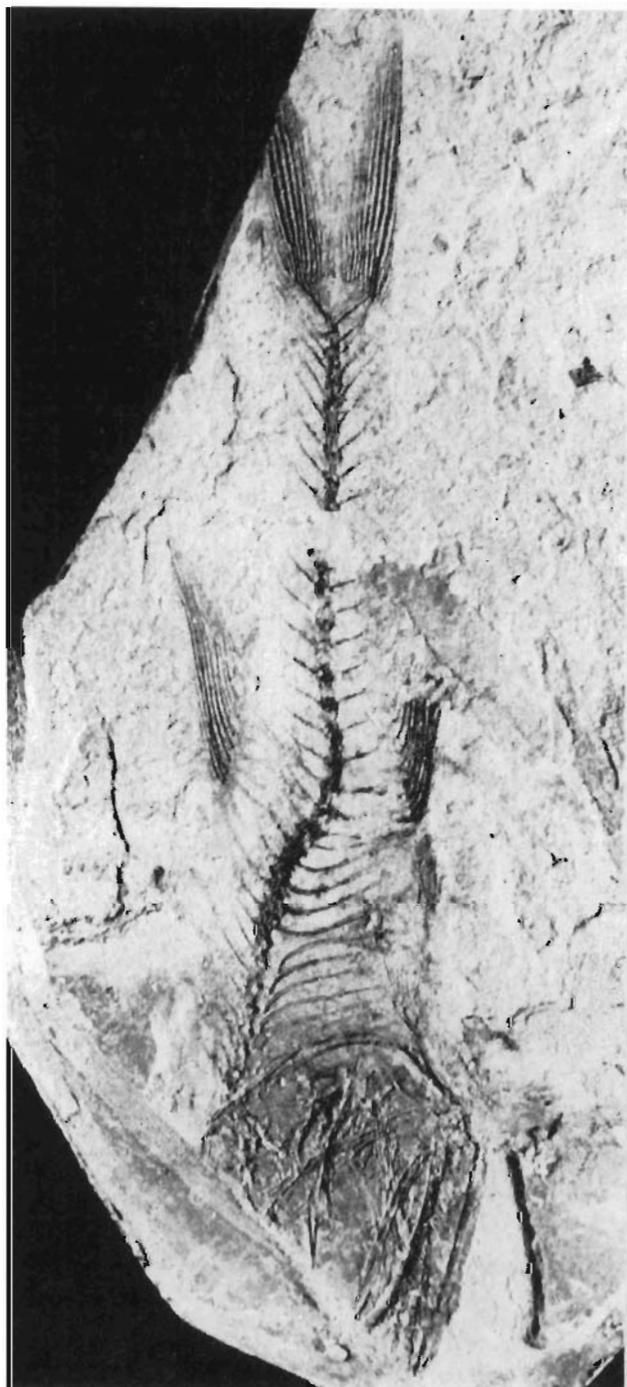
*Kotlarczykia bathybia* sp. n. — holotype (Z. PAL. Wr. A/1998).  
ca,  $\times 2,5$

## Plate XXIV

*Kotlarczykia bathybia* sp. n. — paratype (Z. PAL. Wr. A/2000).  
ca,  $\times 4$



*Phot. M. Czarnocka*



Phot. M. Czarnocka