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POLYZYGIA GÜRICH, AN OSTRACOD GENUS
FROM THE GIVETIAN OF THE HOLY CROSS MOUNTAINS

Abstract. — On evidence of abundant specimens of the ostracod species: *Polyzygia symmetrica* Gür. and *P. trigonata* Gür. from the Givetian of the Holy Cross Mts. certain stages of their ontogeny have been studied and their synonymics revised.

INTRODUCTION

In the present paper the writer reports results of his research work on the ostracod genus *Polyzygia* Gürich. His studies were carried out on ample material collected in 1954 at Skały, a locality in the Holy Cross Mts., from the so-called brachiopod shales of the Givetian stage¹.

These ostracods have already been previously dealt with by G. Gürich (1896), D. Sobolev (1909) and recently by A. Přibyl (1953).

In order to recover the carapaces the writer subjected the samples of marly rock to treatment with Glauber's salt and then to washing. About 450 fossil remains of genus *Polyzygia* were thus obtained and supplied adequate material not only for morphological study of the carapace in adults, but also for analysing some stages of its ontogeny as yet not described.

As disclosed by recent research genus *Polyzygia* also occurs in the Middle Devonian of the Central Devonian Field in the U. S. S. R., as well as in that of the Eifel Mts. in Germany.

Data, supplied by investigation of the abundant material collected from the same locality and stratigraphic horizon as those which yielded the specimens described by Gürich, enabled the writer to make a revision of the synonymy of representatives of *Polyzygia* thus far described. He also shows that the species established by Polenova (1952) and those described by Krömmelbein (1953) are to be considered as synonyms of *P. symmetrica* Gürich.

¹ Closer stratigraphic data were published by Z. Kielan (1954).

The present paper has been prepared under the guidance of prof. R. Kozłowski to whom the author is greatly indebted for his valuable comments and suggestions.

DESCRIPTIONS

Superfamily **Beyrichiacea** Ulrich & Bassler, 1923

Family **Drepanellidae** Swartz, 1936

Subfamily **Bassleratinae** Schmidt, 1941

Genus *Polyzygia* Gürich, 1896

A new diagnosis is given for *Polyzygia* by Krömmelbein (1953), which, however, does not include all the forms now referred to this genus. The writer thinks it useful to enlarge the meaning of genus *Polyzygia*, at the same time taking note of its specific individual variations.

Diagnosis. — Carapace of moderate size with approximately rectangular outline. Left valve somewhat larger, slightly overlapping the right valve. A frill usually occurring anteriorly. Ornamentation details of the carapace surface consist of an outer ridge running pretty nearly parallel to the outline of carapace and an inner ridge encircling one or two nodes. Carapace surface frequently spinose.

Discussion. — The present writer calls „posterior“ the widest part of the carapace. With this orientation the frill is situated anteriorly while the outer ridge distinctly widens posteriorly.

After Krömmelbein (1953, p. 54) genus *Polyzygia* displays certain resemblances to genera *Bollia*, *Bonnemaia*, *Zygosella* and *Zygodolba*; also to *Ulrichia*, as mentioned by Schmidt (1941, p. 51). Krömmelbein, however, does not report in detail on these resemblances, merely stating that they derive from the appurtenance of that genus to the family of Drepanellidae. Bassler & Kellett (1934, p. 25) make references to the resemblance of *Polyzygia* with *Drepanellina*, from which they make it differ by the free outer ridge and the presence of the inner ridge only.

Swartz (1936, p. 553) supposes that genus *Polyzygia* may be derived from *Bollia* on the presence of the second ridge, so called inner ridge. This opinion does not seem correct, since the inner ridge develops independently from nodes. As seen in drawings of species of *Bollia*, the nodes are there most commonly united in the ventral part so as to form a kind of ridge. Schmidt (1941, p. 50-51) states that genus *Polyzygia* shows some relationship with *Ulrichia*, from which it differs by the presence of the inner ridge. The relationship seems, however, to be very vague, because the two genera diverge already in the early stages of ontogeny².

² The ontogeny of *Ulrichia* (*Kozłowskiella*) *kozłowskii* Prib. has been studied by the writer but is not dealt with in this paper.

PL. I

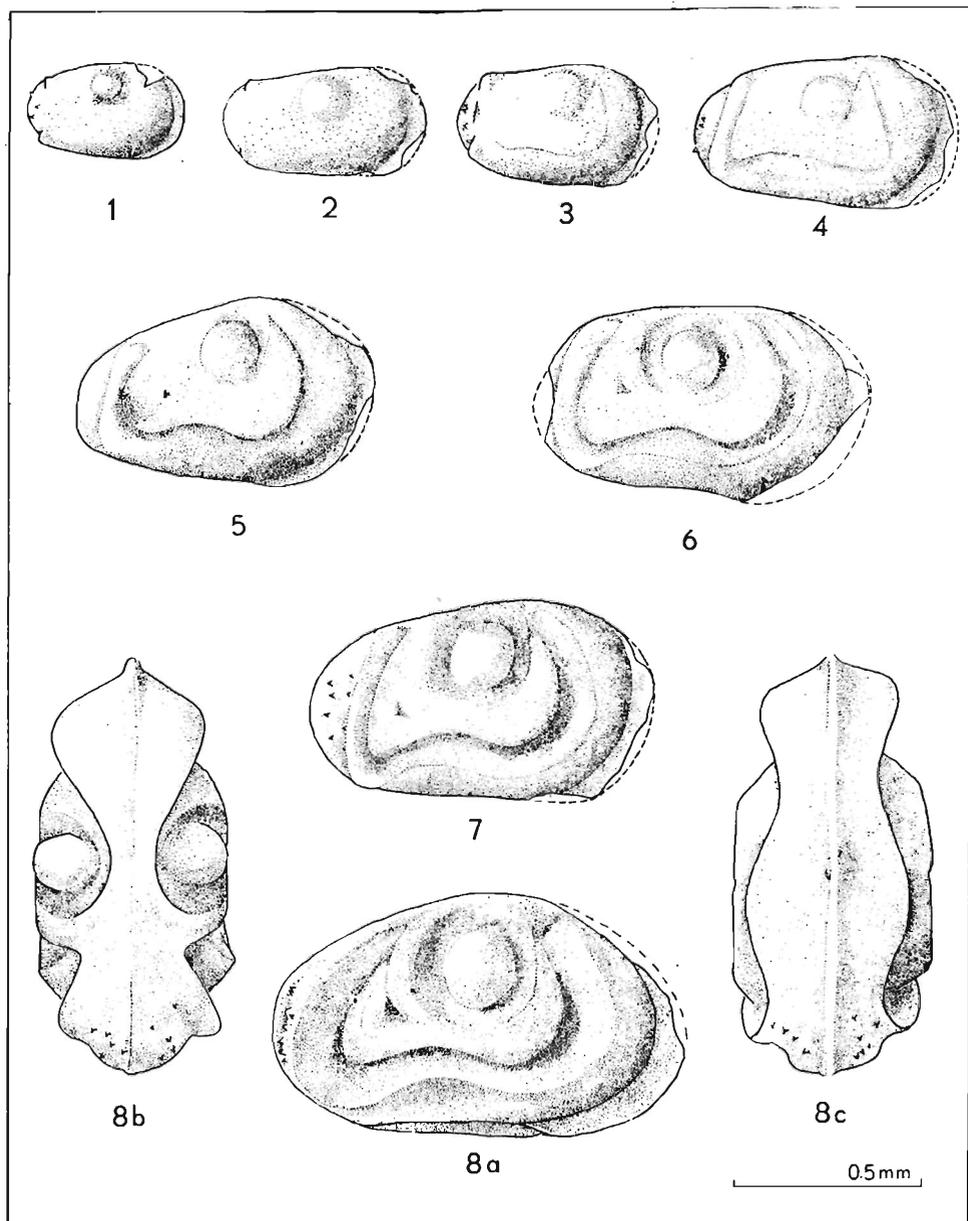


Fig. 1-7. *Polyzygia trigonata* Gür.; seven young stages.

Fig. 8. *Polyzygia trigonata* Gür., neotype; a right valve, b dorsal view, c ventral view.

Polyzygia trigonata Gürich
(pl. I, fig. 8 a-c)

1900. *Beyrichia* (?) *trigonata* Gür.; G. Gürich, Nachtr. z. Palaeoz. im Poln. Mittelgeb., p. 366, pl. 15, fig. 12 a-c.
1909. *Beyrichia* (?) *trigonata* Gür.; D. Sobolev, Sred. dev. Kelec. — Sand. kriaža, p. 394.
1934. *Beyrichia* (? *Octonaria*) *trigonata* Gür.; Bassler & Kellett, Bibliographic Index of Paleozoic Ostracoda, p. 208.
1953. *Polyzygia trigonata* Gür.; A. Příbyl, Skořep. pol. střed. dew. z profilu Grzeg.-Skály v hořách Svatokř., p. 246-248, pl. 2, fig. 1; pl. 3, fig. 1-15.

Material. — About 150 carapaces and isolated valves with distinct ornamentation. All specimens were separated from the rock matrix.

Dimensions of three specimens (in mm):

	1	2	3
length	1.000	1.100	1.175
height	0.650	0.670	0.720
width	0.520	0.550	0.600

Description. — Carapace oval in shape, left valve somewhat larger and overlapping the right valve. Dorsal border rectilinear. On lateral surface are two ridges, the inner and the outer, separated by a sulcus. Ventrally, the outer ridge slightly curves back to the centre of carapace and then arching sharply extends to the dorsal area. Inner ridge, separated by a sulcus from the outer ridge, is U-shaped. In the posteroventral area it widens out triangularly and shows a pit, sometimes elongated so as to form a sulcus, in the posterodorsal area the inner ridge unites with the outer ridge. A distinct isolated circular node occurs near the centre of the carapace.

Dorsal surface of carapace is in the shape of a bi-concave lens, while the ventral surface in that of a broad list widening out medially and at both ends. The carapace is frilled anteriorly and finely spinose posteriorly. Interior view of left valve shows a hinge-groove into which the right valve list fits when the carapace closes.

Discussion. — The ornamental details of the carapace, i. e. the frill, outer ridge and anterior part of inner ridge are similar to those in *Polyzygia symmetrica*. The writer has unfortunately been unable to detect in his specimens the ornamental differences of the left and right valves, as referred to by Gürich (1900). The carapace orientation has been by him reversed from that assigned by Gürich on the base of such characters as the frill, width and ontogeny.

From the available material a neotype has been selected (pl. I, fig. 8), inasmuch as Gürich's holotype kept at Wrocław was lost during the last war.

Variations. — The outline of carapace shows fairly distinct variations. Some specimens are oval, rectangular, more or less elongate. The node is sometimes united with the inner ridge. Přebyl (1953) judges the more slender forms to be the males, and supposes that females are more inflated. On evidence of his own material the writer has ascertained that the number of slender specimens with a high index (2.7 - 3.0) is strikingly small. This leads him to associate slenderness of carapace with male specimens (fig. 1), since it is known that female specimens usually predominate.

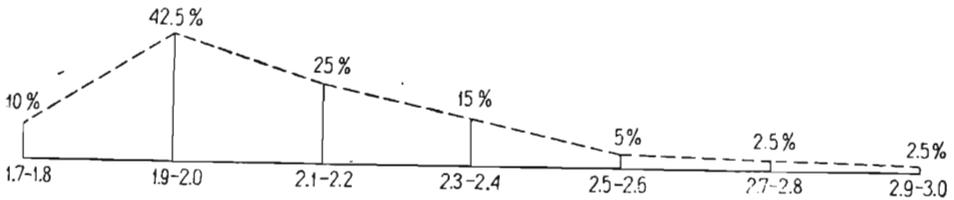


Fig. 1. — Variation diagram for *Polyzygia trigonata* Gür. Abscissa — length to width ratio.

Ontogenic stages. — For practical aims the description of the several ontogenic stages has been given in numerical order, though this does not correspond to the directly consecutive moultings. The young stages are extremely rare in washing residue and frequently badly preserved. The proportion of adult specimens to young is as 15:1. The various ontogenic stages have been studied on the right valve.

Pl. I, fig. 1. Dimensions: length 0.400 mm, height 0.260 mm.

The carapace is oval with an approximately central node encircled by shallow sulcus; on the ventral side of the node the sulcus does not close. A frill occurs anteriorly. Posteriorly two short appendages are present and minute spines are discernible.

Pl. I, fig. 2. Dimensions: length 0.480 mm, height 0.280 mm.

Appendages in posterior part of carapace shaped as triangular tablets, the other characters do not show any changes.

Pl. I, fig. 3. Dimensions: length 0.500 mm, height 0.320 mm.

The node is already fairly well developed. In this stage of ontogeny the sulcus is discretely outlined and parts of the inner and the outer ridge make their appearance. Appendages in posterior part of carapace are enlarged and tend to be fused.

Pl. I, fig. 4. Dimensions: length 0.660 mm, height 0.380 mm.

Appendages of the posterior part of carapace are fused and form a part of the outer ridge with sharp margin.

Pl. I, fig. 5. Dimensions: length 0.760 mm, height 0.460 mm.

Outer ridge has developed over the entire length. A small pit appears in the posteroventral area of the inner ridge.

Pl. I, fig. 6. Dimensions: length 0.800 mm, height 0.500 mm.

The ornamental details are far more distinct in this stage of ontogeny, though they continue to be gently rounded and without sharp surface edges.

Pl. I, fig. 7. Dimensions: length 0.840 mm, height 0.500 mm.

Ornamental structures definitely developed. This is obviously the penultimate of the ontogenic stages.

In summing up the above description of ontogenic development, the following conclusions may be drawn:

a. The only node occurring in *Polyzygia trigonata* makes its appearance already in the early stages of ontogeny;

b. It is to be supposed that together with the node two appendages develop to form the posterior end of the outer ridge;

c. Minute spines appear on the surface of the carapace during relatively early stages of ontogeny;

d. Both the inner and outer ridges make their appearance simultaneously.

Polyzygia symmetrica Gürich

(pl. II, figs. 1-8)

1896. *Polyzygia symmetrica* Gür.; G. Gürich, Das Palaeozoicum im Poln. Mittelgebirge, p. 387-388, pl. 14, figs. 8-9.

1909. *Polyzygia symmetrica* Gür.; D. Sobolev, Srednij Devon, p. 394.

1934. *Polyzygia symmetrica* Gür.; R. S. Bassler & B. Kellett, Bibliographic Index of Paleozoic Ostracoda, p. 435, pl. 10, fig. 8.

1952. *Polyzygia gürichi* Pol.; E. N. Polenova, Mikrofauna SSSR, p. 77-78, pl. 2, fig. 5.

1953. *Polyzygia symmetrica* Gür.; A. Přibyl, Skořepatci polského střed. devonu (givevu) z profilu Grzegorzowice-Skały v horách Svatokřížských, p. 245-246, pl. 2, figs. 2-11.

1953. *Polyzygia gürichi* Krömm.; K. Krömmelbein, Nachweis der polnischen Gattungen *Polyzygia* und *Poloniella* im Mittel-Devon der Eifel, p. 54-55, pl. 3, fig. 1a-d.

1953. *Polyzygia geesensis* Krömm.; K. Krömmelbein, *ibidem*, p. 56, pl. 3, fig. 2a-d.

Material. — About 200 carapaces and isolated valves, mostly well preserved, showing distinct ornamentation. All the specimens were completely removed from the matrix.

Dimensions of three specimens (in mm):

	1	2	3
length	0.925	1.000	1.150
height	0.525	0.550	0.625
width	0.475	0.500	0.525

Description. — The carapace is sub-rectangular in shape, with an anterior frill. The outer ridge is separated by a sulcus from the inner ridge, and it gently declines centrally. Dorsal border rectilinear. Inner ridge is W-shaped and encircles two oval-shaped nodes, of which the anterior is usually isolated. Anteriorly it is united with the outer ridge. The posterior area of the inner ridge is crescent-shaped and has no contact with the border structures. The posterior node is commonly united with the dorsal ridge. The dorsal surface and particularly so the ventral have an appearance similar to that of *P. trigonata*. On the inner side of the left valve is a hinge groove and a hinge selvage on that of the right valve.

Discussion. — Gürich (1896) established the genus *Polyzygia* on the base of some Beyrichian-shaped carapaces. He has ascertained that these forms are more closely related to genus *Bollia* than to *Beyrichia* proper. Actually certain *Bollia* species resemble *Polyzygia*.

Thus far five species of that genus have been described, namely:

Polyzygia symmetrica Gürich, 1896

Polyzygia trigonata Gürich, 1900

Polyzygia gürichi Polenova, 1952

Polyzygia gürichi Krömmelbein, 1953

Polyzygia geesensis Krömmelbein, 1953.

The abundant material available to the writer has been collected from the same locality (Skały) and the same horizon (brachiopod shale — „Calceola Mergel” after Gürich) as those that yielded the fossils on which Gürich established his genus *Polyzygia*. After that author (1896, p. 387, pl. 14, fig. 9) *Polyzygia symmetrica* has a symmetric carapace, i. e. with almost equal posterior and anterior parts. The ostracod materials which the present writer had the opportunity to inspect (about 1.000 specimens belonging to various species) seem numerous enough not to allow overlooking of a form such as represented in the drawing by Gürich, and yet no carapace has been discovered in the material under consideration identical with that illustrated by Gürich. From the above one may conclude that the drawing and description of *P. symmetrica* given by Gürich are not quite exact. Přibyl (1953), to whom the material from Skały was also accessible, referred forms from that locality, showing two nodes and an outer and inner ridge, to species established by Gürich, without closer scrutiny of the differences existing between his specimens and these shown in Gürich's drawing. Přibyl also cites the species *Polyzygia gürichi* of Polenova with a comment that it differs from *P. symmetrica* by dimensions and the regular arrangement of the two ridges only. After

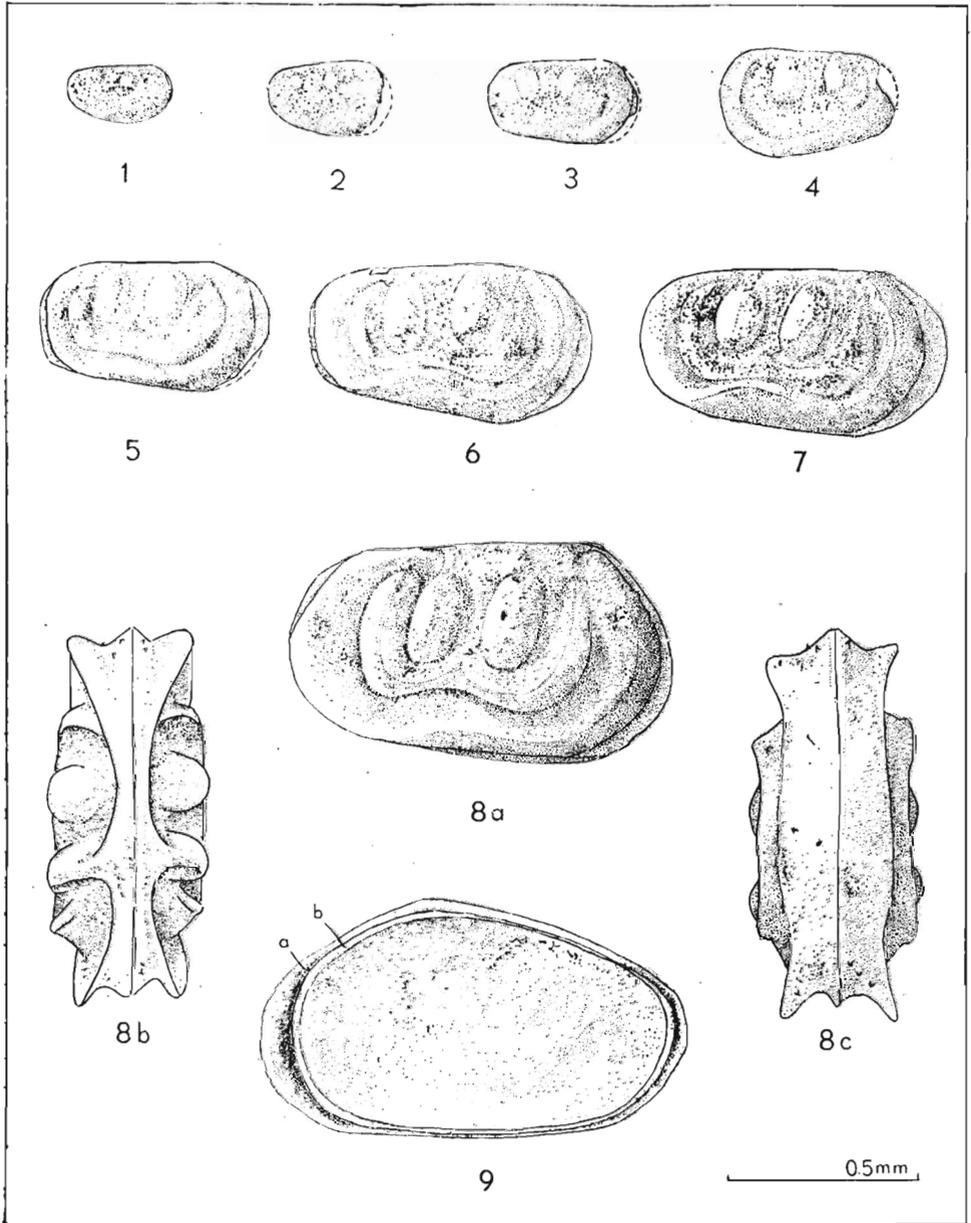


Fig. 1-7. *Polyzygia symmetrica* Gür.; seven young stages.

Fig. 8. *Polyzygia symmetrica* Gür., neotype; a right valve, b dorsal view, c ventral view.

Fig. 9. *Polyzygia trigonata* Gür. Internal view of right valve; a frill, b list.

Příbyl (1953, p. 246), *P. symmetrica* is closely related to *P. gürichi* Pol. This species of Polenova actually shows the same details of ornamentation as the form here considered. Polenova (1952, p. 77), when comparing the form described by herself with that shown in Gürich's drawing mentions the following differences: junction of the inner with the outer ridge in the anterior part of the carapace, lack of symmetry referred to Gürich's form and the presence of the dorsal ridge. These differences are correct, as mentioned above, in relation to the drawing of the author of the species, but they could not be confirmed by material here studied which undoubtedly represents the same species. *Polyzygia gürichi* Pol. differs from *Polyzygia symmetrica* described by Gürich by dimensions only, whereas the other characters may be assigned to individual variations exhibited by forms collected from Skały and here described as *P. symmetrica*.

Krömmelbein (1953), probably not being acquainted with the paper by Polenova, has described two new *Polyzygia* species from Middle Devonian marls of the Eifel Mts., likewise giving to one of them the name of *P. gürichi*. The species *P. gürichi* (1953) described by Krömmelbein differs from *P. gürichi* of Polenova (1952) solely by dimensions and a greater surface of the posterior part of the inner ridge. It is also more slender. Krömmelbein's other species, the *P. geesensis*, is almost identical with the form described by Polenova in respect to ornamentation and the outline of carapace, the difference being that of dimensions only. Since, as shown here below, these characters vary greatly in *P. symmetrica*, the writer supposes that: *Polyzygia gürichi* Polenova, 1952, *Polyzygia gürichi* Krömmelbein, 1953, and *Polyzygia geesensis* Krömmelbein, 1953 — are synonyms of *Polyzygia symmetrica* Gürich.

Since the loss of the holotype specimen of *P. symmetrica*, kept in the Wrocław University, a neotype has been selected from the material at the writer's disposal (pl. I, fig. 8).

Variations. — The outline of the carapace is subject to distinct oscillations. The posterior part of the inner ridge also varies strongly. The shape of nodes and of inner ridge is mostly constant. On evidence of several specimens selected to exemplify details of variations it is possible to determine that there occurs an increase in the surface of the inner ridge (left valve), corresponding to a decrease in height and increase in length of carapace. Figs. 1-4 in pl. III illustrate the gradual growth of length of carapace. These forms, do not yet, however, display any cardinal differences with respect to the shape of the posterior part of the inner ridge. Figs. 5-7 in pl. III depict these gradual changes. The carapaces elongate, but an increase of the posterior surface of the inner ridge does not always accompany the elongation. These characters do not correlate.

PL. III

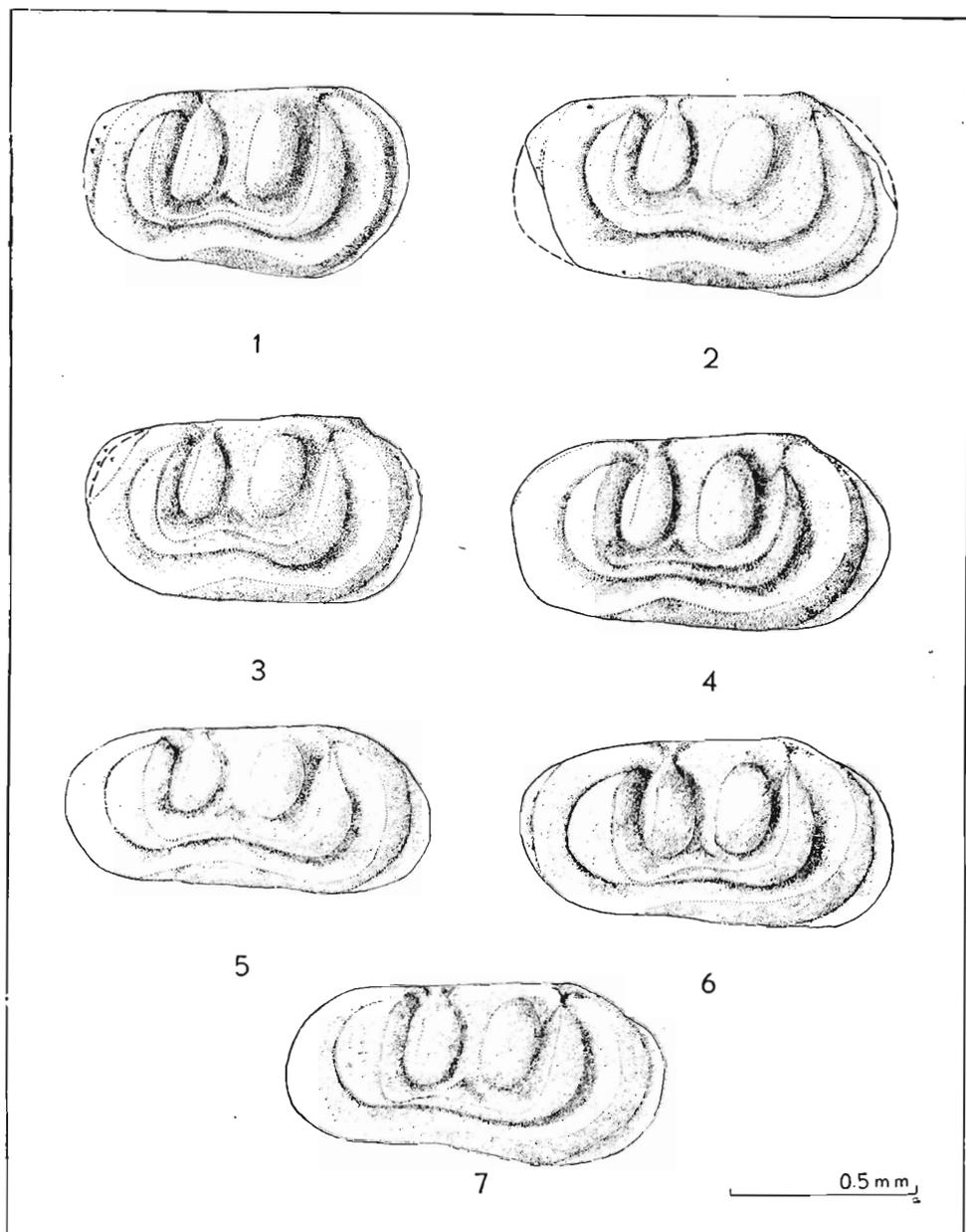


Fig. 1-7. *Polyzygia symmetrica* Gür. Seven specimens of right valve showing variations of outline and of inner ridge.

The problem of dimorphism in *Polyzygia symmetrica* is similar to that in *P. trigonata*.

Ontogeny. — Young specimens of *Polyzygia symmetrica* have been collected from the same layers as adult forms. The former are, however, markedly rare and in a worse state of preservation.

Pl. II, fig. 1. Dimensions: length 0.260 mm, height 0.140 mm.

Two carapaces showing a sub-oval shape. Dorsal border rectilinear. Almost in the centre of the carapace a node has developed in a gentle depression. Two rounded tubercles have developed posteriorly and scarce minute spines make their appearance. The greatest width of the carapace is associated with the postero-central area.

Pl. II, fig. 2. Dimensions: length 0.300 mm, height 0.200 mm.

Carapace with oval outline and rectilinear dorsal border. The outline of a fragment of the outer ridge becomes discernible in the anterior part of carapace. The anterior node is larger and separated by a sulcus from the anterior part of the outer ridge and the upper posterior tubercle. The lower tubercle has shifted to the anterior part.

Pl. II, fig. 3. Dimensions: length 0.380 mm, height 0.240 mm.

Right valve. Outline sub-rectangular, the outer ridge developed in the anterior part of the valve. Posterior node more elongate than the anterior and extending to dorsal border. Lower tubercle without changes.

Pl. II, fig. 4. Dimensions: length 0.460 mm, height 0.280 mm.

Left valve. Outline of valve as well as arrangement of nodes without changes. Posterior part of outer ridge, with a sharp edge, shows some progress in its development. Lower tubercle disappears.

Pl. II, fig. 5. Dimensions: length 0.580 mm, height 340 μ m.

Right valve. The inner sulcus well developed nearly on its complete length. A fairly distinct inner ridge extends in the anterior part. Posterior part of valve without essential changes.

Pl. II, fig. 6. Dimensions: length 0.740 mm, height 0.420 mm.

Right valve. Outer ridge developed along its entire length. The nodes take on a decidedly oval shape. The inner ridge also developed in its entire length and separated by a delicate sulcus from the node in the posterior part of the valve.

Pl. II, fig. 7. Dimensions: length 0.800 mm, height 0.440 mm.

Carapace showing more distinct details of ornamentation. The sulcus has deepened. This stage undoubtedly is the predecessor of the adult stage.

Essential stages of development may be presented as follows:

a. The anterior node and tubercles are the earliest ontogenic characters.

b. It may be supposed, that minute spines appear together with the last elements.

c. The outer ridge is the next detail of ornamentation to appear after the nodes.

d. The posterior node derives from the posterior upper tubercle, while the lower one disappears.

e. When the outer ridge is outlined the inner makes its appearance.

This is undoubtedly a character acquired at a later stage than nodes and tubercles.

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Warszawa, October 1955*

REFERENCES

- BASSLER R. S. & KELLETT B. 1934. Bibliographic Index of Paleozoic Ostracoda. *Geol. Soc. Amer., Spec. Pap.* 1, 1-500. New York.
- GÜRICH G. 1896. Das Palaeozoicum im Polnischen Mittelgebirge. *Verhandl. Russ. Kais. Min. Ges.*, 32, 1-539. St. Petersburg.
- 1900. Nachträge zur Palaeozoicum des Polnischen Mittelgebirge. *N. Jb. Min., Geol. etc.*, Bl.-B. 13, 331-388. Stuttgart.
- KESLING R. V. 1951. Terminology of Ostracod Carapaces. *Contr. Mus. Paleont. Univ. Michigan*, 9, No. 4, 93-171. Ann Arbor.
- KIELAN Z. 1954. Les Trilobites mésodévoniens des Monts de Sainte-Croix (Trylobity środkowo-dewońskie z Gór Świętokrzyskich). *Palaeont. Pol.*, 6, I-VI + 1-50. Warszawa.
- KRÖMMELBEIN K. 1953. Ostracoden-Studien im Devon der Eifel. 3. Nachweis der polnischen Gattungen *Polyzygia* u. *Poloniella* im Mittel-Devon der Eifel. *Senckenberg.*, 34, No. 1-3, 53-59. Frankfurt a/M.
- POLENOVA E. N. 1952. Ostrakody verchnej časti živetskogo jarusa Russkoj platformy. *Mikrofauna SSSR*, 5, 65-156. Leningrad-Moskva.
- PŘIBYL A. 1953. Skořepatci polského středního devonu (givetu) z profilu Grzegorzowice-Skały v horách Svatokřížských. *Sborn. Ústřed. Úst. Geol.*, 20, odd. paleont. 1-112. Praha.
- SCHMIDT E. A. 1941. Ostracoden aus den Bohdalec-Schichten und über die Taxonomie des Beyrichiacea. *Abhandl. Senckenberg. Naturf. Ges.*, 454, 1-96. Frankfurt a/M.
- SOBOLEV D. 1909. Srednij devon Kelecko-Sandomirskogo krjaža (Mitteldevon des Kielce-Sandomir Gebirges). *Mat. Geol. Rossii (Mat. Geol. Russlands)*, 24, 44-536. St. Petersburg.
- SWARTZ F. M. 1936. Revision of the Primitiidae and Beyrichiidae, with new Ostracoda from the Lower Devonian of Pennsylvania. *Journ. Paleont.*, 10, No. 7, 541-586. Menasha, Wisc.

FRANCISZEK ADAMCZAK

RODZAJ *POLYZYGIA* GÜRICH (OSTRACODA) Z ŻYWETU SKAŁ
W GÓRACH ŚWIĘTOKRZYSKICH

Streszczenie

Obfity materiał małżoraczków, zebrany przez autora w żywocie serii skal-
skiej miejscowości Skały w Górach Świętokrzyskich, pozwolił na szczegółowe zba-
danie dwu przedstawicieli rodzaju *Polyzygia* Gürich, mianowicie *P. trigonata* Gür.
i *P. symmetrica* Gür. Prócz skorupki osobników dorosłych zebrano okazy młodociane, co pozwoliło prześledzić główne stadia rozwoju ontogenetycznego skorupki
wymienionych gatunków, dotychczas nie opisywane. Została ustanowiona kolejność
pojawiania się poszczególnych elementów morfologicznych i scharakteryzowano
przeobrażenia, jakim podlegają one w czasie wylinek. Opierając się na bogatym
materiale dotyczącym *P. symmetrica* Gür. autor dowodzi, że opisany przez Polenow-
wą (1952) z Centralnego pola dewońskiego ZSRR gatunek *P. gürichi* Pol. nie różni
się w rzeczywistości od *P. symmetrica*, jeżeli się uwzględni wykazany przez autora
zasięg zmienności rzeźby tego gatunku. Podobnie przedstawia się sprawa z formami
opisanymi przez Krömmelbeina (1953) z dewonu środkowego Gór Eiflu w Niemczech
pod nazwą *P. gürichi* Krömm. i *P. geesensis* Krömm. Ich cechy mieszczą się dobrze
w granicach zmienności gatunku *P. symmetrica* i wprowadzone przez autora nie-
mieckiego nazwy należy uznać za synonimy gatunku Güricha.

OBJASNIENIA DO ILUSTRACJI

PL. I (p. 37)

Fig. 1-7. *Polyzygia trigonata* Gür. — stadia młodociane.

Fig. 8a-c. *Polyzygia trigonata* Gür. — neotyp; a skorupka prawa, b strona dorsalna,
c strona wentralna.

PL. II (p. 42)

Fig. 1-7. *Polyzygia symmetrica* Gür. — stadia młodociane.

Fig. 8a-c. *Polyzygia symmetrica* Gür. — neotyp; a skorupka prawa, b strona dorsalna,
c strona wentralna.

Fig. 9. *Polyzygia trigonata* Gür. — skorupka prawa od strony wewnętrznej: a ob-
wódka, b listewka.

PL. III (p. 44)

Fig. 1-7. *Polyzygia symmetrica* Gür. — 7 okazów skorupki prawej, ilustrujących
zmienność zarysu i wałka wewnętrznego.

Fig. 1 (p. 39)

Wykres zmienności dla *Polyzygia trigonata* Gür.; oś odciętych — stosunek długości
do grubości.

ФРАНЦИШЕК АДАМЧАК

РОД *POLYZYGIA* GÜRICH (OSTRACODA) ИЗ ЖИВЕТА СКАЛ
В СВЕНТОКРЖИСКИХ ГОРАХ

Резюме

Богатый материал остракод, собранный автором в живете скальской серии в местности Скалы (Свентокржиские Горы), дал возможность детального изучения двух представителей рода *Polyzygia* Gürich, а именно *P. trigonata* Gür. и *P. symmetrica* Gür. Кроме раковин взрослых особей были собраны молодые экземпляры, что позволило проследить главные стадии онтогенетического развития раковин названных видов, чего до сих пор никто не описывал.

Автором установлена последовательность появления отдельных морфологических элементов раковины и охарактеризованы преобразования, каким она подвергается во время вылинок.

На основании богатого материала относительно *P. symmetrica* Gür. автор доказывает, что вид *P. gürichi* Pol., описанный Поленовой (1952) из Центрального Поля девона СССР, не отличается ничем от *P. symmetrica*, если принять во внимание изменчивость скульптуры раковины этого вида, констатированную автором. Подобным образом обстоит дело с формами описанными Крёммельбеином (1953) из среднего девона Гор Эйфель в Германии под названиями *P. gürichi* Krömm. и *P. geesensis* Krömm. Их видовые признаки хорошо помещаются в границах изменчивости вида *P. symmetrica*, так что введенные немецким автором названия следует считать синонимами вида установленного Гюрихом.
