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## A new contribution on the Gzhelian trilobites in the western Karavanke Mountains

### Nov prispevek o gželijskih trilobitih v zahodnih Karavankah

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#### Abstract

In the new very rich finding place called Na visokih, western Karavanke Mountains, containing the Upper Carboniferous fossils, six taxons of trilobites have been found; three of them: *Pseudophillipsia (Carniphillipsia) semicircularis* Hahn & Hahn, 1977, *Ps. (C.) liparoides* Hahn & Hahn, 1977, and *Paladin (Kaskia) sp.* give new morphological information to the descriptions given in Hahn, Hahn & Ramovš, 1977 and Hahn, Hahn & Ramovš, 1981. They are additionally described in the present study.



Project 5

#### Kratka vsebina

V zelo bogatem zgornjekarbonskem najdišču fosilov Na visokih je bilo najdenih tudi šest trilobitnih taksonov; med njimi so trije — *Pseudophillipsia (Carniphillipsia) semicircularis* Hahn & Hahn, 1977, *Ps. (C.) liparoides* Hahn & Hahn, 1977 in *Paladin (Kaskia) sp.* — ki dajejo nove morfološke informacije k prejšnjim opisom v delih Hahn, Hahn & Ramovš, 1977 in Hahn, Hahn & Ramovš, 1981. Ti taksoni so dodatno opisani v tem delu.

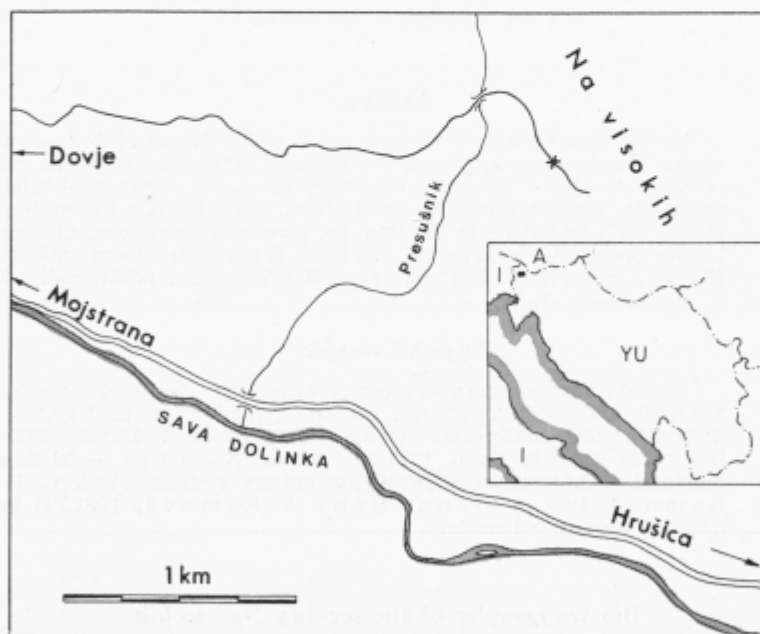
#### Biostratigraphy of the locality Na visokih

Jože Bedič, from the town of Jesenice, has discovered a new very rich finding place containing the Upper Carboniferous fossils (Gzhelian stage, fig. 1). The finding place was uncovered by the new forest road which leads from the village Dovje northeastwards to the place called Na visokih. The fossils occur in a stratum of clayey marl about two metres thick which lies within

gray quartz sandstones that contain poorly preserved plant remains. In spite of the fact that this is the richest finding place of Gzhelian fossils in the area of the western Karavanke Mountains, we can find the trilobites only rarely among them, in fact, as regards the trilobite remains, this is one of their most meagre finding places. Nevertheless six taxons have been found here: three among them give new morphological information on the interesting trilobite fauna of the western Karavanke Mountains; for this reason they are additionally described in the present study.

The fossiliferous clayey marl consists of thicker or thinner sheets; when fresh, it is of darkly gray colour, when mouldered, it is brownish. The fossils are sparser in the more sandy parts of the marl. In the middle of these sheets, which are about 12 cm thick, we can frequently find a very hard bluish gray limestone.

Among the fossils brachiopods are predominant; most numerous are Spiriferidae and Martiniidae; very frequent are Marginiferinae, especially *Kozlowskia* and *Karavankinae* (*Karavankina praepermica*). Furthermore, there are many samples of Meekellidae, while the large samples of the genera *Enteletes* and *Orthothetes expansum* can only very rarely be found. As a characteristics of the brachiopod fauna from this finding place we may point out the complete



x Finding place - Nahajališče

Fig. 1. Location sketch map of the finding place Na visokih containing very rich Gzhelian fossils

Sl. 1. Položajna skica najdišča Na visokih s številnimi gželijskimi fosili

absence of Chonetidae which, however, are rather frequent in several other finding places. Further, it is typical that the genera *Echinoconchus* and *Echinaria* are not present among this brachiopod fauna.

In the finding place Na visokih the lamellibranchs are comparatively rare; still they are here an important faunal element with some very characteristic forms. One can also find here gastropods and cephalopods.

A special characteristics of this finding place are the large solitary corals which can reach a length of even more than 10 cm. In some strata corals only can be found. They stand close one to the other, in the position as they had lived, and represent thin coral biostromes. In some other sheets the numerous corals are accompanied by individual brachiopods and branching bryozoa. So far this is the only finding place with coral biostromes; in all other finding places the solitary corals occur only singly. A little more numerous they are only in the finding place Črni vrh 2.

An other important characteristics of this finding place are algal biostromes that can be found in individual strata of marly limestone that are about 12 cm thick. The alga *Anthracooporella* is rock building, besides it there are very few other fossil remains.

A further characteristic of this place is the fact that the crinoids are here very rare, while in the majority of other Upper Carboniferous finding places from the western part of the Karavanke Mountains they are very frequent. Besides individual large non-segmented sponges we can find also small segmented sponges of various forms. Finally we may mention as a characteristics of this finding place the absence of the fusulinid *Rugofusulina alpina antiqua*, a typical microfossil in the Gzhelian strata of the western Karavanke Mountains.

All this fossil material from the new finding place corresponds in age to other Gzhelian finding places in the western Karavanke Mountains; it shows the most favourable biological conditions in the shallow marine environment. Only here favourable conditions existed for the growth of coral and algal biostromes.

### Systematic Palaeontology

The new outcrop Na visokih has brought to light remains of 6 trilobite taxa: *Paladin (Kaskia) bedici* Hahn & Hahn, 1977, *Pseudophillipsia (Carniphillipsia) semicircularis savensis* Hahn & Hahn, 1977, *Ps. (C.) rakoveci* Gauri, 1965, *Ps. (C.) liparoides* Hahn & Hahn, 1977, *Ps. (C.)* sp. Hahn & Hahn, 1977 and *Paladin (Kaskia)* sp. With the exception of the last named taxon, none of the remaining species and subspecies is new; they all are known from Spodnja počivala 1 and 3, Savske jame 2 or Planina pod Golico 2. With that, by help of trilobites, the Gzhelian age of Na visokih outcrop is proved. The cephalopod faunas of all these outcrops in the region of Jesenice are described in Kullmann & Ramovš, 1980.

Only the new remains of *Ps. (C.) semicircularis savensis*, *Ps. (C.) liparoides* and *Paladin (Kaskia)* sp. add new morphological information to the descriptions given in Hahn, Hahn & Ramovš, 1977 and Hahn, Hahn & Ramovš, 1981. Therefore, only these taxa are treated in the following section.

Family Phillipsiidae (Oehlert, 1886) Hahn, Hahn & Brauckmann, 1980  
 Subfamily Ditomopyginae Hupé, 1953

*Pseudophillipsia* Gemmelaro, 1892

*Pseudophillipsia* (*Carniphillipsia*) G. Hahn & Brauckmann, 1975

*Pseudophillipsia* (*Carniphillipsia*) *semicircularis* Gauri, 1965

*Pseudophillipsia* (*Carniphillipsia*) *semicircularis savensis* Hahn & Hahn, 1977

Pl. 1, fig. 4

\*1977 *Pseudophillipsia* (*Carniphillipsia*) *semicircularis savensis* Hahn & Hahn  
 in Hahn, Hahn & Ramovš, Tril. Ober-Karbon Slowenien: 147 bis  
 148, pl. 2, figs. 15 a—b, text-figs. 3 d, 5 a—b.

1981 *Pseudophillipsia* (*Carniphillipsia*) *semicircularis savensis*. — Hahn,  
 Hahn & Ramovš, Neue Trilobitenfunde: Tab. 1.

1982 *Pseudophillipsia* (*Carniphillipsia*) *semicircularis savensis*. — Hahn,  
 Hahn & Brauckmann, Cat. Foss. Austriae: 63.

Hitherto, from this subspecies only the holotype, a cranidium from Spodnja počivala 1, was known. Now a nearly complete, slightly distorted specimen, no. 827, from Na visokih is present. It allows to give the description of thorax and pygidium. Its systematic position is proved by the unique shape of the glabella (very broad between  $\beta$ - $\beta$ , quickly narrowed posteriorly), which is distinguishing *Ps.* (*C.*) *semicircularis savensis*.

In no. 827, the left free cheek is missing, the right free cheek is distorted. The proximal portion of the right genal spine is preserved. It is very broad in that region, and therefore the complete spine was probably rather long, perhaps reaching to the end of the thorax. The thorax is composed of 9 segments, as usually seen in the Phillipsiidae. The pygidium, somewhat distorted, is slightly broader than long. Its rhachis is composed of about 20 rings, the last rings being vestigial. Each ring is decorated with 2 nodes, quite similar as in *Ph.* (*C.*) *rakoveci* (see Hahn, Hahn & Ramovš 1977: pl. 2, fig. 19). The pleural field has 9—10 ribs; only the anterior 5—6 ribs are well pronounced. The border is broad, as far as visible, a border furrow is present. The specimen is about 30 mm long. Cephalon, thorax and pygidium are about equal in length.

By the characters of the pygidium, *Ps.* (*C.*) *semicircularis savensis* is very similar to *Ps.* (*C.*) *rakoveci*. These similarities refer to the shape of the pygidium, number of rings and ribs, and especially to the nodes being present on the rings. If our conjecture can be proved in future, that also the genal spines of *savensis* are nearly as long as in *rakoveci*, then *savensis* should be grouped (on subspecific level) better with *Ps.* (*C.*) *rakoveci* than with *Ps.* (*C.*) *semicircularis*. Then, the main difference between the true *rakoveci* and *savensis* is the breadth of the glabella in its anterior portion.

*Pseudophillipsia* (*Carniphillipsia*) *liparoides* Hahn & Hahn, 1977

Pl. 1, figs. 1—3

\*1977 *Pseudophillipsia* (*Carniphillipsia*) *liparoides* Hahn & Hahn in Hahn,  
 Hahn & Ramovš, Tril. Ober-Karbon Slowenien: 149—152, pl. 1, figs.  
 4—6, text-fig. 7, tab. 1—2.

- 1981 *Pseudophillipsia* (*Carniphillipsia*) *liparoides*. — Hahn, Hahn & Ramovš, Neue Trilobitenfunde: tab. 1.
- 1982 *Pseudophillipsia* (*Carniphillipsia*) *liparoides*. — Hahn, Hahn & Brauckmann, Cat. Foss. Austriae: 59—60.

Hitherto, from this species 1 cranidium and 3 isolated pygidia were known, found in Savske jame 2. Now, from Na visokih 4 new specimens can be added: no. 826 a, a complete carapax (pl. 1, fig. 3); no 826 b, a thorax with pygidium; no. 828, the posterior part of the thorax with pygidium (pl. 1, fig. 2) and no. 817, a cranidium (pl. 1, fig. 1). It is proved by these new specimens that the 3 pygidia grouped in 1977 with the holotype cranidium are in fact parts of the same species, *liparoides*. Moreover, the morphology of the free cheeks can be added, and also the thorax is known. The most important taxonomic features of *liparoides* — the sloping anterior border of the cranidium, the shape of the palpebral lobes, the structure of the pygidium, and the very slender shape of all parts of the carapax — are fully expressed in the new specimens.

In one feature both the new cranidia differ from the holotype: the lateral praeoccipital lobes as well as the medial praeoccipital lobe are much better pronounced. Apparently, the holotype cranidium has become somewhat distorted in that region post mortem. In no. 826 a and in no. 817 the medial praeoccipital lobe is node-like in shape, nearly as long as broad, and as high as the glabella in its posterior region. The furrow between the medial praeoccipital lobe and the glabella is well incised; even better incised are the lateral furrows on each side against the lateral praeoccipital lobe (L1). These are longer than broad, anteriorly pointed, posteriorly somewhat broadened. The occipital furrow is deeply incised, straight medially, but somewhat curved back laterally on each side behind L1.

The free cheeks are long and slender, the same as the whole animal. The eyes are relatively long — as in *Paladin* (*Kaskia*) *bedici*: see Hahn, Hahn & Ramovš 1977: text-fig. 2 —, a broad eye-furrow is present. From the region of the eye, the cheek bends steeply downwards to the broad border which is oriented almost horizontally and separated by a well incised border furrow. Anteriorly, the border region is covered by the glabella which is expanded to the anterior rim of the cephalon. The genal spine is medium in length and pointed; it extends to the sixth segment of the thorax.

The thorax is composed of 9 segments. It is long and slender, the outer parts of the pleurae are steeply bent downwards. The new pygidia have 18 rings and (as far as visible) 9—10 ribs on each pleural field. Their quotient breadth: length is 0,8—0,9. In these respects they fit very well with the pygidia described in 1977. The complete specimen no. 826 a is 29 mm in length, the pygidium no. 828 is 12,5 mm in length, and the cranidium no. 817 is 13 mm in length. The cephalon and the pygidium of *liparoides* are of about the same length, the thorax is somewhat shorter.

The relationships of *Ps.* (*C.*) *liparoides*, as discussed by us in 1977:151—152, are not altered by knowledge of the new specimens.

*Paladin (Kaskia) sp.*

Pl. 1, fig. 5

One pygidium, no. 829, is very short and broad, differing in this respect from most of the other Ditomopyginae known from the south Eastern Alps. Its length is 11 mm, its breadth is 17 mm, its quotient breadth: length is 1,55. Only *Pseudophillipsia (Carniphillipsia) sp.* Hahn, Hahn & Ramovš, 1977: pl. 1, fig. 10 shows a similar shape. The new pygidium has 15—16 rings (the posterior rings are only shadowy visible) and 9—10 ribs on each pleural field. The border region is broken and not preserved. In number of rings and ribs and also in their structure this pygidium resembles those of *P. (K.) bedici* as seen in Hahn, Hahn & Ramovš 1977: pl. 2, figs. 11—13. The rhachis is rounded in cross-section. The rings have no nodes, and the anterior and posterior branches of the ribs sprawl against the border. But, also if broadening by post mortem compression is taken into consideration, no. 829 differs too much in shape from that of *bedici* to be grouped with this species. Therefore, it is named here in open nomenclature as »*Paladin (Kaskia) sp.*«.

## References

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## Plate 1 — Tabla 1

Trilobites from the Upper Carboniferous (Gselian) of the locality Na visokih, NW Slovenia

Zgornjekarbonski (gželij) trilobiti iz nahajališča Na visokih, severozahodna Slovenija

Figs. 1—3 — Sl. 1—3

*Pseudophillipsia (Carniphillipsia) liparoides* Hahn & Hahn, × 2,7

1 Cranidium, no. 817

Kranidij, št. vzorca 817

2 Posterior part of thorax and pygidium, no. 828

Zadnji del oprsja in zadek, št. vzorca 828

3 Complete specimen, no. 826 a

Popolni trilobitov skelet, št. vzorca 826 a

Fig. 4 — Sl. 4

*Pseudophillipsia (Carniphillipsia) semicircularis savensis* Hahn & Hahn, × 2,7

Nearly complete specimen, no. 827

Nepopolno ohranjeni primerek, št. vzorca 827

Fig. 5 — Sl. 5

*Paladin (Kaskia) sp.*, × 3,3

Pygidium, no. 829

Zadek, št. vzorca 829

*Aspiduriscus* *Aspiduriscus* *Aspiduriscus*  
and *Perko* in the western Karavanke

