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VERTEBRATE MICROREMAINS FROM THE PRAGIAN, EMSIAN AND EIFELIAN OF THE PRAGUE BASIN (CZECH REPUBLIC)

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Abstract: *The vertebrate faunas in limestone samples of the Early and Middle Devonian ages (Pragian, early Emsian, late Emsian, and latest Eifelian) which were collected from five localities in the Barrandian area, Bohemia, include scales, tesserae, bones, and teeth of acanthodians, placoderms, chondrichthyans, and sarcopterygians. Although the vertebrate remains are not abundant the assemblages are significant in being dominated by particular taxa. Apart from undetermined microremains the genera* Cheiracanthoides, Laliacanthus, Nostolepis, *and* Tassiliodus *were determined*.

Key words: Vertebrate microremains, Acanthodii, Placodermi, Chondrichthyes, Sarcopterygii, Devonian, Kačák Event, Prague Basin, Gondwana, Czech Republic

INTRODUCTION

Devonian vertebrate remains are rare in the Prague Basin (Barrandian area, Czech Republic). Barrande (1872) was the first to describe several fish remains. He determined them as *Asterolepis, Coccosteus, Ctenacanthus*, and *Gompholepis*, all being represented by incomplete dermal plates or fin spines (Barrande, 1872; pl. 28–30). Cross-sections of fin spines and fine superficial structures of preserved dermal plates, scales, or fin spines were figured by Barrande 1872; pls 28, 30. His determinations were revised since (Eastman, 1897; Bayer, 1905) and later new vertebrate remains from the Barrandian area were described or reviewed (von Koenen, 1895; Růžička, 1929; Gross, 1950, 1958, 1959, 1973; Vaškaninová & Kraft, 2014a, 2014b, 2016; Vaškaninová & Ahlberg, 2017).

No record of vertebrate microremains from the Devonian of the Prague Basin was published except for the acetic acid isolated scales of *Machaeracanthus bohemicus* Barrande, 1872 from the Lochkov Formation of Kosoř described and illustrated by Gross (1973) and acanthodian scales by Märss (1997) and Burrow *et al.* (2010b). However, the presence of vertebrate microremains in the Prague Basin was noted in the Chýnice Limestone (Mergl & Ferrová, 2009), Suchomasty Limestone (Mergl & Jiménez, 2015), and Acanthopyge Limestone (Hladil *et al.,* 1992; Mergl 2008) but without any additional data. They were picked from residues as a by-product of phosphatic brachiopod and conodont sampling. Despite their rarity, the vertebrate microremains, mostly scales, dermal bones and fin spines constitute a few distinct assemblages, which are described here. This contribution is a preliminary report about vertebrate microremains in the Prague Basin, Czech Republic.

METHODS AND MATERIAL

All vertebrate microremains were hand-picked from residues of limestone dissolved in 10% acetic-acid solution. The histology of scales was not studied due to the rarity of the specimens. The morphological terminology of scales is adopted from Burrow & Murphy (2016). Material descriptions are arranged stratigraphicaly.

All figured vertebrate microremains (except of a few specimens destroyed during SEM investigation) are housed in the palaeontological collections of the Centre of Biology, Earth and Environmental Sciences at the Faculty of Education of the University of West Bohemia in Plzeň (PCZCU).

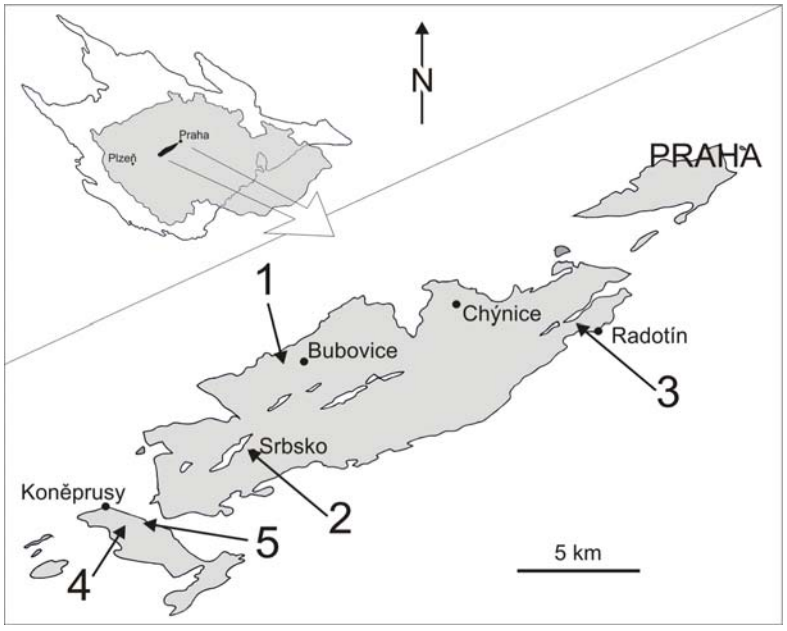

Figure 1. *Outline of the Bohemian Massif, Czech Republic, and Devonian of the Barrandian area (top), and outcropping Devonian rocks of the Prague Basin (below), with marked localities which yielded vertebrate microremains: 1 – Sv. Jan, Solway's Quarries, 2 – Srbsko, 3 – Radotín, Hvížďalka Quarry. 4 – Koněprusy, Na Voskopě (neptunic dykes), 5 – Koněprusy, Jirásek's Quarry.*

GEOLOGICAL SETTING OF SAMPLING LOCALITIES

The stratigraphy of the Devonian of the Barrandian area is well known. Authors refer to the summary of Chlupáč (1998a), with additional data about special sections and localities commented by Hladil *et al.* (1992), Budil (1995), Chlupáč (1996, 1998b), Ferrová *et al.* (2012), and Vodrážková *et al.* (2013). A short review of four stratigraphic horizons and localities with vertebrate microremains is presented (Fig. 1).

1ST HORIZON: PRAGIAN, PRAHA FORMATION, DVORCE-PROKOP LIMESTONE

Vertebrate microremains are represented by chondrichthyan scales (Plate I, fig. 1–3) and an acanthodian tooth whorl (Plate I, fig. 4).

Locality: (1) Sv. Jan, Solway's Quarries, dark-grey limestone bed adjoining to the shale intercalation with *Monograptus atopus* Bouček, *M.* cf. *yukonensis* Jackson and *M. aequabilis notoaequabilis* Jaeger. Remains are associated with impoverished fauna (Chlupáč, 1998a) of acrotretid (*Havlicekion, Opsiconidion*), siphonotretid (*Orbaspina*) and discinoid brachiopods (*Praeoehlertella*) (Mergl, 2001), a chonetid *Hemichonetes elegans* Havlíček & Racheboeuf, 1979, and small smooth-shelled rhynchonelliform brachiopods.

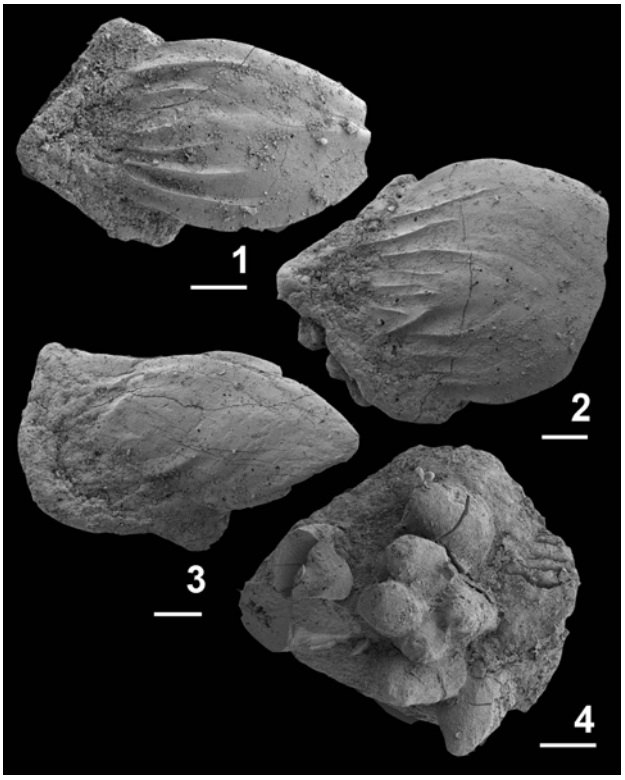

Plate I, 1–3 Chondrichthyes gen. et sp. indet., Pragian, Praha Formation, Dvorce–Prokop Limestone, locality Sv. Jan, Solway's Quarries; Scale bars 100 μm; 1 – scale in crown view, PCZCU 2101; 2 – scale in crown view, PCZCU 2102; 3 – scale in crown view, PCZCU 2103; 4 – Acanthodii gen. et sp. indet., Pragian, Praha Formation, Dvorce–Prokop Limestone, locality Sv. Jan, Solway's Quarries; Scale bar 100 μm; tooth whorl in top view, PCZCU 2104.

Plate II

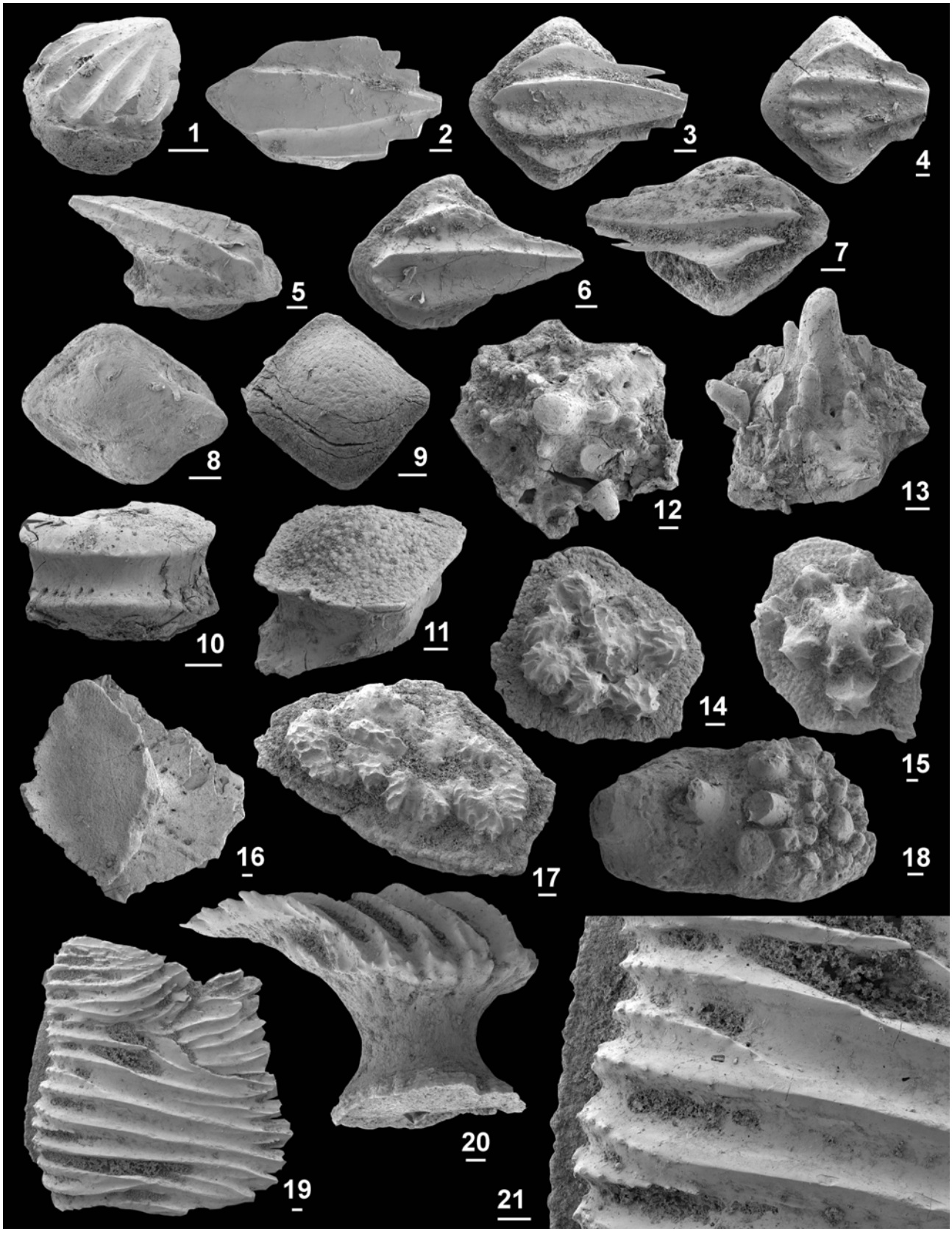

Plate II, 1 – *Nostolepis* sp., Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek?s Quarry locality; Scale bar 100 μm; scale in oblique view, destroyed.
2–7, 9, 11, 18 – *Laliacanthus* cf. *singularis* Karatajute-Talimaa, 1968, Lower Emsian, Zlíchov Formation, Chapel Coral Horizon; Radotín, Hvížďalka Quarry locality; Scale bars 100 μm; 2 – scale in crown view, PCZCU 2107; 3, 7 – scale in crown and latero-crown views, PCZCU 2109; 4 – scale in crown view, PCZCU 2108; 5, 6 – scale in oblique and crown views (destroyed); 9 – scale in base view, PCZCU 2105; 11 – scale in base-oblique view (destroyed); 18 – tooth whorl in top view, PCZCU 2010.
8 – Acanthodii gen. et sp. indet., Lower Emsian, Zlíchov Formation, Chapel Coral Horizon; Radotín, Hvížďalka Quarry locality; Scale bar 100 μm; scale in crown view, PCZCU 2106.
10 – *Cheiracanthoides* sp., Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bar 100 μm; scale in anterior view, destroyed.
12, 13, 15 – Acanthothoraci gen. et sp. indet., Lower Emsian, Zlíchov Formation, Chapel Coral Horizon; Radotín, Hvížďalka Quarry locality; Scale bars 100 μm; 12, 13 – tessera in crown and oblique view (destroyed); 15 – tessera, PCZCU 2111.
14, 17 – Chondrichthyes gen. et sp. indet., Lower Emsian, Zlíchov Formation, Chapel Coral Horizon; Radotín, Hvížďalka Quarry locality; Scale bars 100 μm; 14 – dermal plate in crown view (destroyed); 17 – dermal plate in crown view, PCZCU 2112.
16, 19–21 – *Tassiliodus* (?) sp., Lower Emsian, Zlíchov Formation, Chapel Coral Horizon; Radotín, Hvížďalka Quarry locality; Scale bars 100 μm; 16 – scale in base view, PCZCU 2113; 19, 21 – scale in crown view and detail of the crown ridges, PCZCU 2115; 20 – scale in side view, PCZCU 2114.

Class Acanthodii Owen, 1846

Acanthodii gen. et sp. indet.
Plate I, fig. 4

Description: The tooth whorl consists of 10 cusps in a chevron-like arrangement followed posteriorly by two cusps (Plate I, fig. 4). The base of the whorl is broadly rhomboidal.

Remarks: This type of whorl is common through the Lower Devonian, but cannot be assigned to any particular acanthodian.

Occurrence: Locality 1.

Class Chondrichthyes Huxley, 1880

Chondrichthyes gen. et sp. indet.
Plate I, figs 1–3

Description: The scales are 0.7–0.8 mm long, with square to rhomboidal flat base and elongate rhomboidal posteriorly displaced crown. The crown is low, extending behind the base by a flat rounded point. The margins of the crown are smooth. The surface of the crown bears up to eight low acute ridges with converging posterior ends. The ridges disappear at about midlenght of the crown. The posterior half of the crown is striated in the area paralleling the edges of the crown.

Remarks: The scales differ from other scales from the Prague Basin by weakly developed crown ridges and a low neck, and are similar to some chondrichthyan scales from the Middle Devonian of Australia (Pomeroy, 1994).

Occurrence: Locality 1.

2ND HORIZON: LOWER EMSIAN, ZLÍCHOV FORMATION, CHAPEL CORAL HORIZON

Vertebrate microremains are represented by acanthodian scales (Plate II, figs 2–9, 11) acanthodian tooth whorls (Plate II, fig. 18), acanthothoracid placoderm tesserae (Plate II, figs 12, 13, 15), and chondrichthyan scales (Plate II, figs 14, 16, 17, 19–21).

Localities: (2) Srbsko, natural outcrop of the Zlíchov Limestone in the slope above the road from Srbsko to Karlštejn, and (3) Radotín, Hvížďalka Quarry, limestone boulders in the quarry scree. Vertebrate remains are associated with a very rich and taxonomically diverse fauna of corals, stromatoporoids, fenestrate bryozoans, rhynchonelliform brachiopods, trilobites, conulariids, rostroconchs, and other benthic fauna of reef origin (Havlíček, 1998) in both sampling sites. Beds rich in fossils represent recurrent accumulations of the biodetritic material in the talus of the early Emsian reef (Chlupáč, 1998a).

Class Acanthodii Owen, 1846
Family Climatiidae Berg, 1940

Genus *Laliacanthus* Karatajūtė-Talimaa, 1968

Laliacanthus cf. *singularis* Karatajūtė-Talimaa, 1968
Plate II, figs 2–7, 9, 11, 18

Description: The scales are up to 0.8 mm long, with highly convex subquadrate base. Moderately elevated strongly rhombic crown is ornamented

with four ridges, in some scales with additional two short ridges near the anterior edge of the crown. The surface between the ridges is gently sulcate. The posterior part of the crown is sharply pointed. The posterolateral edges of the crown extend into small sharply pointed flat spines.

Remarks: The specimens are referred to *Laliacanthus singularis* Karatajūtė-Talimaa, 1968 due to the elongate crown and spiny posterior crown. However, our scales are more elongate and spines at the posterior crown are shorter.
The scales are also similar to the scales of *Nostolepis costata* (Goujet, 1976). This species in known from the upper Lochkovian to the lower Pragian of Spain (Wang, 1993) as well as Saudi Arabia (Burrow *et al.,* 2006) and Nevada (Burrow & Murphy, 2016). A discussion about similarly shaped scales from other areas has been given by Burrow & Murphy (2016). They indicate that *N. costata* is a widespread species along the Gondwanan shore of the Rheic and Palaeotethys oceans, but also illustrate intricate taxonomy of similarly shaped scales. All scales from the Zlíchov Formation differ from the specimens figured by Burrow & Murphy (2016) by the spiny posterolateral edges but despite this difference and different age, the new formal name is not introduced. The Bohemian scales are rather similar to scales from the Jawf Formation of Saudi Arabia (Burrow *et al.,* 2006), especially by the uneven posterolateral edges of the crown, which resemble the spiny edges of the Bohemian scales.

A single tooth whorl (Plate II, fig. 18) that could be referred to an acanthodian bears a cluster of cusps of uneven size on elongate base. Three large cusps form a row followed by similarly sized isolate cusps.

Occurrence: Localities 2 and 3.

Acanthodii gen. et sp. indet.
Plate II, fig. 8

Remarks: There is another scale difficult to determine due to extensive abrasion of the crown. Although it differs from the associated *Laliacanthus* cf. *singularis* Karatajūtė-Talimaa, 1968 by the crown being smaller than the base, it might originate from the anterior parts of the body, the rostral or cephalic squamation.

Occurrence: Locality 3.

Class Placodermi M'Coy, 1848
Order Acanthothoraci Stensiö, 1944

Acanthothoraci gen. et sp. indet.
Plate II, figs 12, 13, 15

Description: The tesserae (Plate II, figs 12, 13) are circular and bear a highly conical central cusp at the centre of plate. The central cusp is surrounded by six radiating ridges, which bear three to four smaller nodes. The third tessera (Plate II, fig. 15) is subcircular and has a central larger tubercle surrounded by six smaller tubercles. The flat margin of the tessera is covered by small nodes.

Remarks: The tesserae can be tentatively referred to acanthothoracids. Similarly shaped tesserae were described from the Emsian of North Queensland, Australia by Pomeroy (1996; fig. 6J).

Class Chondrichthyes Huxley, 1880
Order *incertae sedis*

Genus *Tassiliodus* Derycke et Goujet, 2011

Tassiliodus (?) sp.
Plate II, figs 16, 19–21

Description: The scales are up to 2 mm long, variable in outline, with highly elevated crown on a rather thin neck (Plate II, fig. 20). The base is gently displaced anteriorly, generally rhombic but varying in outline, with acute margins and gently concave finely pitted surface. The crown is flat, much larger than the base, subquadrate to irregularly rhombic with the posterior corner extending far behind the base. The posterior and lateral edges of the crown are spinose. The surface of the crown bears 15 to 20 ridges in a streamlined arrangement, separated by weakly sulcate furrows. Some ridges may divide or fuse, or a new short ridge originates at the bottom of the furrow, but the majority of ridges originate at the anterior edge of the crown and extend into a short spine at the posterior edge. The crest of each ridge bears a single row of short spines in regular spacing, but the spines are present only in the anterior part of the crown. The neck of the crown bears some nick pores of variable size and arrangement (Plate II, fig. 16).

Remarks: The scales are rather similar to the scales of *Tassiliodus lessardi* Derycke & Goujet (2011; fig. 6 D) from the Emsian of Algeria, but surely belong to different species. The spinose crests of the ridges, a flat to weakly concave base, thin neck, and variation in the outline of scales

resemble scales of putative chondrichthyan *Polymerolepis whitei* Karatajute-Talimaa, 1968 (Hanke *et al.,* 2013).

The scales are also similar to the acanthodian *Milesacanthus*, but our *T.* sp. differs by a flat to gently concave base, spiny crest of the crown ridge and by several pores at the crown neck. *Milesacanthus antarctica* Young & Burrow, 2004 from the Aztec Siltstone of Antarctica shows a different arrangement of crown ridges, which are smooth (Young & Burrow, 2004).

Occurrence: Localities 2 and 3.

Chondrichthyes gen. et sp. indet.
Plate II, figs 14, 17

Description: Three tesserae have a gently convex base and no discrete neck. The ornament consists of a central area of low closely packed serrated tubercles tapering to a rounded point. The tubercles have up to twelve radiating ridges lacking nodes. The larger tesserae have a more elongate outline and bear tubercles of uniform size, which are surrounded by a finely nodose depressed margin.

Remarks: Similar scales referred to chondrichthyes were described by Otto (1999; fig. 2, A1, A2) from the Middle Devonian of the Rheinisches Schiefergebirge, Germany.

Occurrence: Locality 3.

3RD HORIZON: UPPER EMSIAN, DALEJE-TŘEBOTOV FORMATION, SUCHOMASTY LIMESTONE

The vertebrate microremains of the Suchomasty Limestone are dominated by fragmental dermal bones of placoderms (Plate III, figs 1–7), accompanied by fewer tooth-like microremains with high apical cusp surrounded by six radiating ridges (Plate III, figs 8–10) that may belong to a chondrichthyan. No acanthodiid scales were detected. All remains come from the infillings of neptunian dykes penetrating the reef forming the Koněprusy Limestone of Pragian age.

Locality: (4) Koněprusy, E part of the "Na Voskopě" hill, a neptunian "Main Dyke" filled by rose and reddish biosparitic limestone in E wall of the quarry, the sites 25 and 26 described and illustrated by

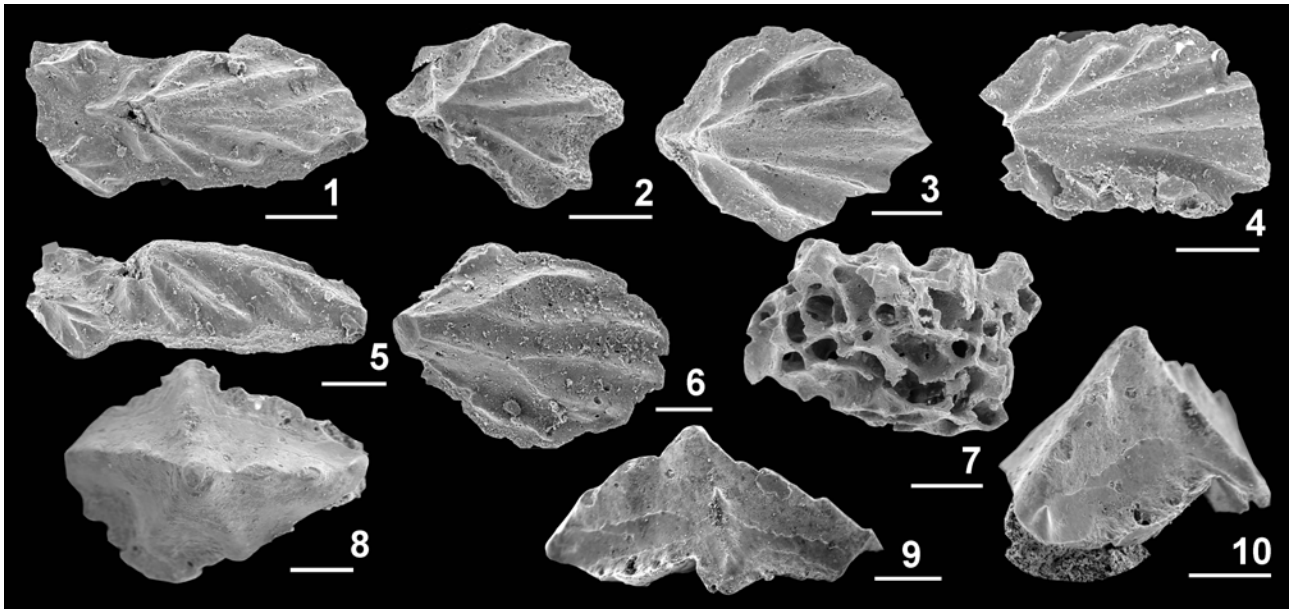

Plate III, 1–7 – Acanthothoraci gen. et sp. indet., Upper Emsian, Daleje–Třebotov Formation, Suchomasty Limestone; Koněprusy, Na Voskopě locality; Scale bars 100 μm; 1, 5 – dermal plate fragment with three tubercles in crown and latero-crown views, PCSCU 2116; 2 – dermal plate fragment in crown view, PCZCU 2117; 3 – dermal plate fragment in crown view, PCZCU 2118; 4 – dermal plate fragment in crown view, PCZCU 2119; 6 – dermal plate fragment in crown view, PCZCU 2120; 7 – dermal bone in lateral view, PCZCU 2121.
8–10 Chondrichthyes gen. et sp. indet., Upper Emsian, Daleje–Třebotov Formation, Suchomasty Limestone; Koněprusy, Na Voskopě locality; Scale bars 100 μm; 8–10 – tooth-like plate in crown, lateral and oblique views, PCZCU 2122.

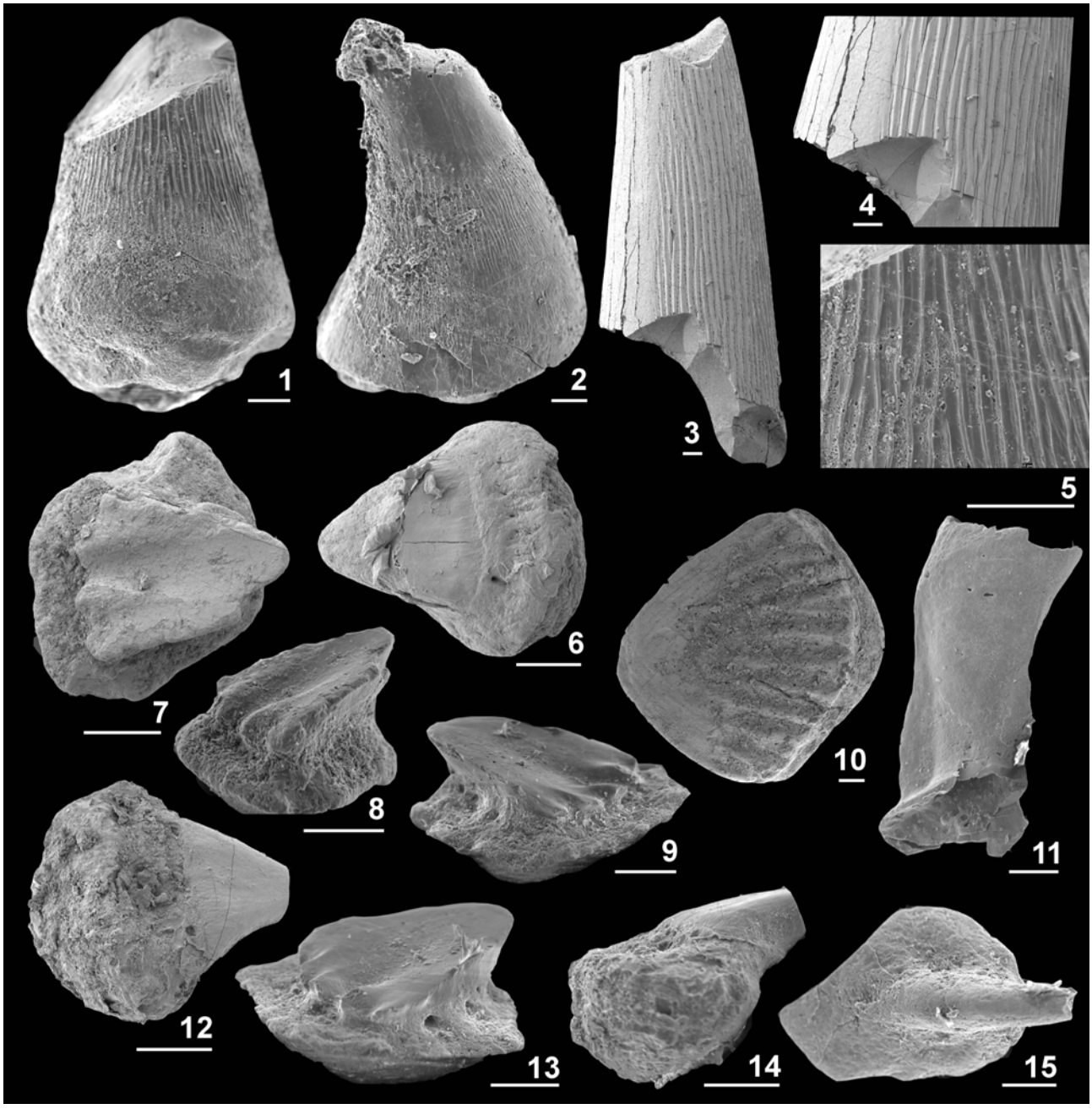

Plate IV, 1–5 – Sacropterigii gen. et sp. indet., Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bars 100 μm; 1, 5 – incomplete tooth in lateral view and detail of surface, PCZCU 2123; 2 – incomplete tooth in lateral view, PCZCU 2124; 3, 4 – incomplete tooth in lateral view, and detail of surface PCZCU 2100. 6, 12, 14 – Chondrichthyes gen. et sp. indet., tooth-like elements, Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bars 100 μm; 6 – tooth-like element in crown view, PCZCU 2129; 12, 14 – tooth-like elements in crown and side views, PCZCU 2128. 7–9, 13 – *Nostolepis* sp., Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bars 100 μm; 7, 8 – scale in crown and antero–crown views, PCZCU 2125; 9, 13 – scale in two latero–crown views, PCZCU 2126. 10 – *Cheiracanthoides* sp., Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bar 100 μm; 10 – scale in crown view, PCZCU 2127. 11, 15 – Uncertain vertebrate remains, Eifelian/Givetian transition, Srbsko Formation, Kačák Member, "dark interval" above the *Acanthopyge* Limestone, Koněprusy, Jirásek's Quarry locality; Scale bar 100 μm; 11 – onychodont (?) branchial, PCZCU 2130; 15 – palaeoniscoid (?) bone, PCZCU 2131.

Chlupáč (1996), also reported as the locality 13 of Havlíček & Kukal (1990). The vertebrate remains come from limestone with fossils of the *Orbitoproetus–Scabriscutellum* Community. Associated conodonts indicate the lower part of the *P. serotinus* Zone. Other phosphatic microfossils are represented by conodonts (for list see Mergl & Jiménez, 2015), caudal spines of phyllocarid crustaceans, sclerites of *Eurytholia*, conulariids (Mergl *et al.,* 2016) and diverse organophosphatic brachiopods (Mergl & Jiménez, 2015). The non-phosphatic fauna is represented by highly diversified rhynchonelliform brachiopods, trilobites, cephalopods, and crinoids, with less abundant gastropods (Havlíček & Kukal, 1990).

Class Placodermi M'Coy, 1848
Order ? Acanthothoraci Stensiö, 1944

Acanthothoraci gen. et sp. indet.
Plate III, figs 1–7

Description: The dermal bone plate fragments (Plate III, figs 1–6) bear a distinct ornament of several asymmetric elongated acute tubercles of uneven size. Some attain only one-third of the size of a large tubercle. The larger tubercles are 0.5 mm long, elongate, and with tips directed posterolaterally. The tubercle is covered by 7 to 10 radiating ridges. Irregular fragments of dermal bones associate the ornamented dermal plate fragments (Plate III, fig. 7).

Remarks: The plates with serrate ridges are similar to the ?palaeacanthaspid plates described by Burrow (2003; fig. 6G, H) from the Lochkovian of central New South Wales, Australia and to the plates of an unnamed placoderm by Burrow (1996; pl. 1, fig. D) from the same area. Similarly shaped plates were referred to *Xiejiawanaspis pinus* Burrow, Turner & Wang, 2000 from the Emsian of Uzbekistan (Burrow *et al.,* 2010a).

Occurrence: Locality 4.

4RD HORIZON: EIFELIAN-GIVETIAN TRANSITION, SRBSKO FORMATION, KAČÁK MEMBER, "DARK INTERVAL"

Vertebrate micro-remains are fairly common and diverse in the upper half of the "dark interval" which has been correlated with the Kačák Member of the Srbsko Formation (Hladil *et al.,* 1992; Hladil, 1993; Budil, 1995). Besides some irregular dermal bone fragments, some scales, fragments of bones with teeth cusps, and fragments of fin spines were identified. Isolated scales could be attributed to *Nostolepis* and *Cheiracanthoides* (Plate II, figs 1, 10; Plate IV, figs 7–9, 10, 13). Isolated (?) sarcopterygian teeth, bones and other scales of likely onychodont (Plate IV, fig. 11) and palaeoniscoid (Plate IV, fig. 15) affinity, and chondrichthyan teeth (Plate IV, figs 6, 12, 14) are present.

Locality (5). Eifelian-Givetian, Kačák Member, dark interval above the crinoidal Acanthopyge Limestone, Koněprusy, NE wall of the Jirásek Quarry. The gnathostome remains are associated with fragments of vascular plants (*Rellimia*), conodonts of the *Polygnathus eiflius* Zone, sclerites of *Eurytholia* and diverse organophosphatic brachiopods represented by obolids (*Lingulipora, Paterula*), acrotretids (*Havlicekion, Opsiconidion*), discinoids (*Acrosaccus, Opatrilkiella, Orbiculoidea, Schizocrania*), and siphonotretids (*Orbaspina*). Rhynchonelliform brachiopods are rare, with strophomenids, chonetids, productids, orthotetids, protorthids and atrypids determined. Proetid trilobites and ostracods are very rare. The abundant dacryoconarids include *Nowakia otomari* and styliolinids. The faunal association has a distinct deep water aspect in the Koněprusy area and is reflecting the Kačák Event (Hladil *et al.* 1992; Budil, 1995).

Class Acanthodii Owen, 1846
Family Climatiidae Berg, 1940

Genus *Nostolepis* Pander, 1856

Nostolepis sp.
Plate IV, figs 7–9, 13

Description: Small (0.3–0.5 mm) scale with a low and slightly convex rhombic base, which is larger than a low clearly anteriorly inclined triangular crown. The crown inclination is quite prominent, and it bears 4 to 5 ridges near the anterior margin. The posterior gently concave and rounded end of the crown is slightly extended over the base. The crown sides are smooth.

Remarks: The short crown of the scales resembles some species of *Nostolepis* described by Valiukevičius (1994) from the Lower Devonian of Taimyr. Among them *N. curta* Valiukevičius, 1994

is the most similar. The crown of *Nostovicina laticristata* (Valiukevičius, 1994) figured in Valiukevičius (1994) on pl. 19, fig. 1 is also rather similar, but its base is more convex. Definite determination requires histological sectioning which is out of scope of this preliminary report.

Occurrence: Locality 5.

Genus *Cheiracanthoides* Wells, 1944

Cheiracanthoides sp.
Plate II, fig. 10; Plate IV, fig. 10

Description: The scale is rhombic in outline with a flat base and low neck. The crown is gently convex, with 12 or more low ridges, prominent in the anterior part of the crown. The posterior part is nearly smooth. The sides of the crown are smooth, the posterior end is rounded. Numerous pores are present along the anterior face of the neck.

Remarks: The scale is very similar to body scales of *Cheiracanthoides comptus* Wells, 1944. The scale also resembles an unnamed scale described by Burrow & Murphy (2016) from Nevada and even more the scales referred to *C. comptus* from the Eifelian to Givetian of North Queensland (Pomeroy 1996) but the type species differs by a more elongate crown.

Occurrence: Locality 5.

Class Sarcopterygii Romer, 1955
Order *incertae sedis*

Sarcopterygii gen. et sp. indet.
Plate IV, figs 1–5

Description: The entire teeth-like remains are 2–3 mm long, narrowly conical, straight or gently curved, with a rounded and gently but irregularly convex base. Fine, gently wavy ridges fade towards the cusp creating a finely striated surface of the teeth. The ridges never merge but arise or fade in concave interspaces, which are about twice as wide as the ridges. A narrow pulp canal is present.

Remarks: The remains likely represent sarcopterygian teeth, because there is a narrow pulp cavity visible in cross section (Plate IV, fig. 1) and an excavate base. It is similar to teeth referred by Pomeroy (1996; fig. 5 B) as an Onychodontid indet.

Occurrence: Locality 5.

CONCLUSIONS

The rare vertebrate microremains from four stratigraphical horizons of the Prague Basin (Pragian, Lower Emsian, Upper Emsian, and Eifelian/Givetian transition) indicate a moderate diversity and distinctive associations in particular horizons. There are scales, dermal bones and teeth of acanthodians, placoderms, chondrichthyans, and likely onychodontids. The highest diversity and abundance of microremains observed comes from the "dark interval" above the light coloured limestone sequence of the *Acanthopyge* Limestone in the Koněprusy area. This interval indicates a deepening related to the Kačák event (Hladil *et al.,* 1992; Budil, 1995; Chlupáč, 1998a) and represents the Eifelian/Givetian boundary interval (dacryoconarid *Nowakia otomari* Zone; ? conodont *Polygnathus eiflius* Zone; Chlupáč, 1998a; Kalvoda, 1992).

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