Discovery of Harpidella McCoy, 1849 (Trilobita) in the Kralodvorian (Upper Ordovician) near Levin (Prague Basin, Czech Republic)

Nález rodu Harpidella McCoy, 1849 (Trilobita) v Kralodvoru (svrchní ordovik) u Levína (Pražská pánev, Čechy) (Czech summary)
(1 text-fig.)

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Abstract. The cut on south-eastern flank of Lucperk (hill near Levin) has yielded a richly diversified association of trilobites of Kralodvorian age below the clayey shales with numerous Chondrites. A complete list of trilobites has been compiled; Harpidella cf. kielanae (Petrunina) was found in the Králův Dvůr Formation for the first time.

Geological setting.
During construction the highway D-5 between Beroun and Zdice, an enormous cut was made on the south-eastern flanks of Lucperk (hill near Levin) after much of the Upper Ordovician and Lower Silurian rocks had been removed. This cut, up to 30 m high, exposed the Kralodvorian and Kosovian sequences, including the contact between the two units, two beds of diamictites in the lowest Kosovian with many dropstones, the richly fossiliferous clayey carbonate horizon in the upper Kralodvorian, and the richly fossiliferous grey-green claystones and silty shales below the layers with abundant Chondrites.

The exposures on the south-eastern side of Lucperk attracted attention of several geologists and fossil collectors, but a reliable measured section has never been made. The locality was briefly described by Mergl (1996) under the name Levin; according to Mergl (1996), the section has exposed the Králův Dvůr Formation consisting in its lower part of grey claystones and clayey shales, which are overlain with somewhat coarser siltstone layers containing minute shells of Foliomina, Kozlowskites, Dedzetina and other invertebrates. The siltstones and silty shales grade upwards into a sequence of grey-green claystones bearing shelly fauna and trilobites of conspicuously small size; this sequence has yielded common brachiopods Chonetoidea radiatula (Barr.), Cyclospira barrandei (Havl.) and a lingulate brachiopod Rafenoglossella. Significant trilobites are Microparia, Nankinolithus, Amphitryon, Dysplanus a.o. Some of them are excellently preserved in the carbonate nodules; graptolites are also present.

Judging from fairly frequent cyclopygid trilobites and minute size of brachiopod shells, Mergl (1996) supposed a rather deep-water environment.

The fossiliferous claystones are succeeded with a sequence about 2 metres thick, consisting of clayey shales with abundant Chondrites and other ichnofossils of Planolites type; body fossils, however, are absent from this sequence.

The uppermost Králův Dvůr Formation is distinguished by a horizon of clayey carbonate 0.2 metres thick, separated from the lowermost layer (lower diamictite bed) of the Kosov Formation by a bed of grey clayey shale. The clayey carbonate has yielded richly diversified association' consisting mostly of trilobites: Octilaeus hisingeri (Barr.), Alcestis latissima Hawle et Corda, Diacalymene asperula (Vaněk), Marekolithus kosoviensis (Marek), Mucronasipis grandis (Barr.), Duttonia morrisiana (Barr.), Actinopeltis insocailis (Barr.), Degemella gigantea (Barr.), Microparia speciosa Hawle et Corda, Symphysops armatus (Barr.), Dindymene fridericiaugusti Hawle et Corda, Dionide speciosa (Hawle et Corda), Eoleonaspis olivae (Troedsson), Raphiophorus fenellus (Barr.), and brachiopods of the genera Ravozeitina, Salopina, Botocium, Jezercia, Leptaena, Proboscisambon, Aegironetes, and Kozlowskites, further rather common cystoids, eocrinoids of the genus Mesilocystites, fragments of bryozoans, bivalves, gastropods, conulariids and very common ostracods. According to Mergl (1996), the fauna should be assigned to the deeper-water Proboscisambon Community. The clayey shales overlying the clayey carbonate horizon have yielded a less diversified assemblage of the Mucronaspis Community; besides the index species Mucronaspis grandis (Barr.). Mergl has mentioned only few bivalves, conulariids, and orthide brachiopods, all not yet determined.

The Králův Dvůr Formation is conformably overlain with the first bed of a coarse-grained diamictite (about 0.2 m thick) of the lowest Kosov Formation, which is separated from the „main“ diamictite bed up to 2 metres thick by an interlayer of grey, silty shale with sporadic remnants of fossils. Both diamictite beds as well as the overlying Kosovian sequence were thoroughly studied by Brenchley and Storch (1989); as the Kosov Formation is not the aim of our study, we do not deal with this part of the section on the south-eastern side of Lucperk.
Unfortunately, the complete Upper Ordovician sequence near Levin is no more accessible for a detailed study, because the cut, after recultivation, has been dressed with plants and shrubs.

Our study is devoted to the fauna of claystone, clayey and silty shales below the shale with numerous Chondrites. This beds are distinguished by a richly diversified trilobite association consisting of the following species: Birmanites kielanae (Pek et Prokop), Flexicalymene declinata (Hawle et Corda), Actinopeltis barrandei Kielan, A. carolaelexandri Hawle et Corda, Cyclopyge marginata Hawle et Corda, Microparia speciosa Hawle et Corda, Eudoliotics simaki Pirby et Vanek, Kloucekia pachypa Pirby et Vanek, Micronaspis granidis (Barr.), Dionide speciosa (Hawle et Corda), Dysplanus (Zeitlaenus) wahlenbergianus (Barr.), Lichidurum inc.gen., Primaspis (Meadowtownella) peregrina (Barr.), Selenopeltis vultoosa Pirby et Vanek, Harpidella cf. kielanae (Petrunina), Phillipinella (Ph.) parabola parabola (Barr.), Longchodomas portiockii (Barr.), Raphiopusus tenellus (Barr.), Amphitryon radians (Barr.), and Nankulinthus granulatus (Wahlenberg). The trilobites are associated with Scalarigraptus angustus (Perner), the association indicates the Nankulinthus granulatus Biozone.

The Kralodvorian sequence below the shales with abundant Chondrites has yielded not only the species well-known from other sites in the Prague Basin, but also some taxa which have been found for the first time in central Bohemia such as the brachiopod Christiania nissoni Sheehan, and the trilobites Harpidella cf. kielanae (Petrunina), and the ichids (undetermined), which present the immigrants from Baltic and Great Britain, respectively.

Systematic part
Aulacopleuridae Angelin, 1854
Otarioninae Richter et Richter, 1926
Harpidella McCoy, 1849

Type species. Harpes(?) megalops McCoy, 1846; Llandovery, Ireland.

Synonyms. Rhinotation Whittington et Campbell, 1967
Otarion (Maurotarion) Alberti, 1969
Otarion (Ticormotarion) Chatterton, 1971
Goodirsaspis Adrain et Chatterton, 1993

Remarks. Goodirsaspis was recently erected by Adrain and Chatterton (1993) as a genus of the Rorringtoniidae Owens (in Owens and Hammann, 1990), although it does not fit well the diagnosis of this family. Goodirsaspis exhibits many features of the Aulacopleuridae (resp. Otarioninae) and, consequently, it is not separable from them. Of the Bohemian species, Adrain and Chatterton (1993) attributed to Goodirsaspis with some doubt the Ludovician species Harpidella novella (Barr.) from the Kopanina Formation. In our concept, however, H. novella cannot be excluded from the generic rank of Harpidella. For a better understanding of the relations between Goodirsaspis and Harpidella, we present the following table showing the main features of the two genera to demonstrate that Goodirsaspis is a junior synonym of Harpidella McCoy.

Goodirsaspis Adrain et Chatterton, 1993

- Small median node on preglabellar field
- Very large L1
- Libigna lacking lobate eye socket and with broad, nontuberculate field
- Prominent bicomposite eye ridge
- Genal spine with broad, flattened base
- Transverse, subtrapezoidal rostral plate with connective sutures widely separate posteriorly
- Thorax of 14 segments, lacking axial spine
- Pygidium with width twice length, five or six axial rings and only first one or two interring
- Pleural and interpleural furrows well impressed

Harpidella (Harpidella) cf. kielanae (Petrunina, 1975)
(Text-fig. 1)

Remarks. Recently, one of us (V.V.) found in the Kralodvorian sequence several metres below the clayey carbonate horizon a craniidium of Harpidella, closely similar to that of H. (H.) kielanae, described by Petrunina (1975) from the Ashgill of Turkestan; moreover, Petrunina assigned to this species also
The specimens described by Kielan (1960) under the name „Otarion sp.b“ from the Ashgill of Poland. Our specimen is so closely similar to the Polish ones that we consider them as conspecific.

Text-fig. 1

Harpidella (H) cf. kielaniceps (Petrunina)
Incomplete cranium. Lucperk near Levin,
Krakov Dovar Formation. Coll. V. Volak.
WV - 4821 x 6.5

The cranium from the Prague Basin (Lucperk near Levin) is 3.5 mm long (sag.), moderately deformed in the claystone. Glabella is pyriform, with well-discernible L₁ and a convex occipital ring separated from the glabella with a deep occipital furrow. Preglabellar field is long (sag.), moderately sloping forward. Anterior margin of cranium defined by a raised, ridge-like rim. Surface of cranium set with scarcely disseminated, coarse granules.

References

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Vrch Lucperk u Levína je bohatou lokalitou v kralodvorském souvrství (Ordovik, Kralodvor). Jeden z nás (V.V.) zde nově nalezl kranidium, náležející rodu Harpidella McCoy, který až dosud nebyl z ordoviku Pražské pánve znám. Popisujeme ho jako Harpidella cf. kielaniceps (Petrunina, 1975) v anglické části práce.