

# The Roblín Event and its ichnological record (Srbsko Formation, Middle Devonian, Bohemia)

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**ABSTRACT.** The Roblín Event has been newly assigned to the boundary between the Kačák and Roblín stratigraphical members (early/middle Givetian). This event, from viewpoint of the ichnofossil assemblages, is similar to late Ordovician event which occurred at the base of the Kosov Formation and have been interpreted as a glacioeustatic regressive event. The ichnoassemblages developed from Chondrites-dominated types by increased amount of mixed elements from the Arenicolites, Cruziana and Nereites Ichnofacies. The typical ichnoassemblage of the Roblín Member consists of the following ichnogenera: Arenicolites, Planolites, ?Chondrites, Gordia, Helminthopsis, Treptichnus, ?Urohelminthoidea, Bifungites, and Zoophycos.

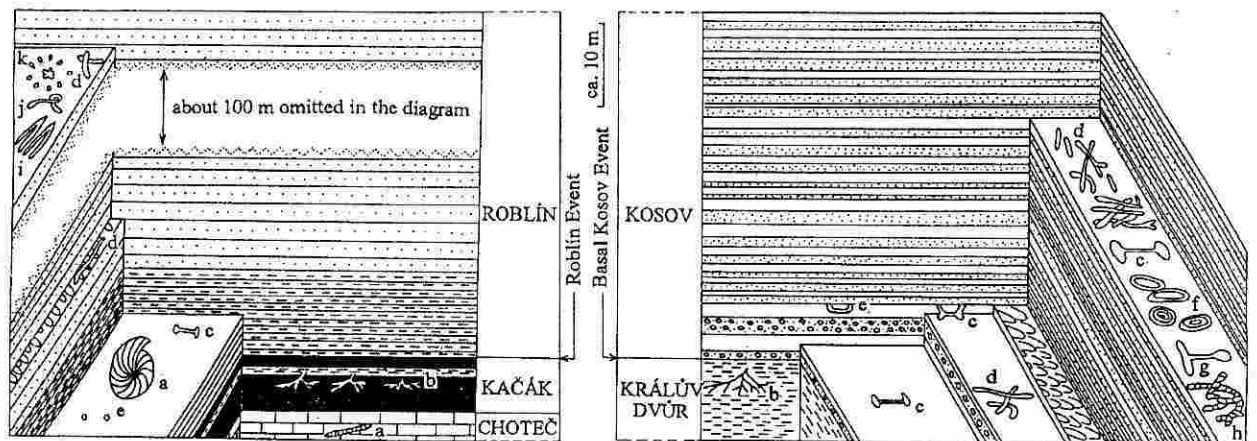
**KEYWORDS:** ichnoassemblages, Roblín Event, Givetian, Devonian, Barrandian area.

The Roblín Beds, the upper of two members of the Srbsko Formation (uppermost Eifelian – Givetian), occupy an exceptional position in the Barrandian area: they represent the uppermost known member of the Prague Basin, showing a continuous sedimentation from the Tremadocian up to the Middle Devonian. The Roblín Member differs from all the older Devonian formations by its flysch-like character. It comprises grey and greyish-green siltstones alternating rhythmically with intercalations and laminae of clay shales, and with beds of subgreywackes of thickness in centimetres and decimetres. Graded and cross bedding of the subgreywackes are characteristic. The presence of flute marks on lower bedding planes is common. Rarely, trace fossils are also present (e.g., Kukul and Jäger 1988, Chlupáč 1992).

The beginning of the Srbsko Formation is synchronous with an important global transgressive event (the Kačák Event after Chlupáč and Kukul 1988). The post-event dysoxic sedimentation (the Kačák Member showing dense accumulations of *Chondrites* ichnosp. in certain beds representing probably the "piped zones" after Savrda

and Bottjer (1989) and reflecting short oxygen level fluctuations) continued for a short time only. The so-called Roblín Event, of regional extent (Chlupáč and Kukul 1986), started the flysch-like sedimentation of the Roblín Member. In the past several years, I collected ichnofossils at the following localities of the Roblín Beds: Hlubočepy – railway cutting, Hlubočepy – railway station, Barrandov – new housing quarters, and Bubovice – airport. The ichnofossils will be systematically described by a joint paper with I. Pek (Palacký University, Olomouc).

The trace fossil assemblage of the Roblín Beds show a low diversity and is composed of a mixture of elements of the Arenicolites Ichnofacies (*Arenicolites*), Cruziana Ichnofacies (*Treptichnus*, *Bifungites*) and Nereites Ichnofacies (?*Sublorenzina*, *Helminthopsis* and ?*Urohelminthoidea*), however, the facies-crossing ichnotaxa prevail (*Planolites*, *Gordia*, ?*Chondrites*). The presumed distal turbidite character of sedimentation (Chlupáč 1992), probably with relatively short intervals between individual turbidite events, contrasts with the preceding character of sedimentation (carbonates of the Choteč Limestone



**Figure 1.** – Schematic comparison of the ichnological record of the Roblín Event (Middle Devonian; left side) and the Basal Kosov Event (Late Ordovician; right side) in the Prague Basin.

Králov Dvůr: greyish-green clay shales of the upper part of the Králov Dvůr Formation; Kosov: rhythmic alternation of fine-grained sandstones, siltstones and shales of the lower part of the Kosov Formation, showing two layers of diamictite at the base; Choteč: biotretic or micritic limestones of the Choteč Formation; Kačák: grey to black calcareous shales of the Kačák Beds, showing a pale intercalation; Roblín: rhythmic alternation of subgreywackes, siltstones and shales (at the base with pale grey, greyish-green or greyish-brown siltstones and shales) of the Roblín Beds. Ichnofossils: a/ *Zoophycos*; b/ *Chondrites*; c/ *Bifungites*; d/ *Planolites*; e/ *Arenicolites*; f/ *Laevicyclus*; g/ *Monofungites*; h/ *Torrowangea*; i/ *Urohelminthoidea*; j/ *Gordia*; k/ ?*Sublorenzina*. The left side was made after data from localities mentioned in the text, and after profiles published by Chlupáč (1992). The right side after Mikuláš (1992), who used also data by Štorch and Mergl (1989).

and dark shales of the Kačák Member). This, coupled with a probably increasing isolation of the extirpating Prague Basin, enabled a development of only r-strategic forms of filter and sediment feeders (= tracemakers of *Arenicolites*, *Planolites*, ?*Chondrites*, *Gordia*, *Helminthopsis*, *Bifungites*, *Zoophycos*). Also, the density of this assemblage was rather low except for local fluctuations.

In the Prague Basin, a very similar ichnoassemblage is present in the Kosov Formation (Uppermost Ordovician), namely in its lower part above diamictite layers of a glacial origin. *Arenicolites*, *Planolites*, *Gordia*, *Helminthopsis*, *Treptichnus* and *Bifungites* are the common elements of these assemblages (see Mikuláš 1992). Similar mixed trace fossil assemblages occur in numerous flysch sequences. The similarity reflects similar lithofacial, hydrodynamic and perhaps also hydrochemical parameters of these settings. The presence of *Chondrites* and *Zoophycos* may reflect dysoxia in the Roblín Member, persisting from the underlying Kačák Member.

Comparison of the Late Ordovician "r-strategic assemblage" with its Devonian equivalent from the Roblín Beds (see the figure) shows a certain "improvement" of living strategies in the given geological period ("modern" ichnogenera *Urohelminthoida* and ?*Sublorenzina*). It documents a re-distribution of benthic activities in the ocean during the Palaeozoic rather than "evolution of traces" (cf. Mikuláš 1993).

## References

- CHLUPÁČ I. 1992. Devon. In Chlupáč I. et al.: *Paleozoikum Barrandienu*, 148–198. Český geologický ústav, Praha.
- CHLUPÁČ I. and KUKAL Z. 1986. Reflection of possible global Devonian events in the Barrandian area, Č.S.S.R. *Lecture Notes in Earth Sciences*, 8, *Global Bio-Events*, 171–179. Springer, Berlin.
- CHLUPÁČ I. and KUKAL Z. 1988. Possible global events and the stratigraphy of the Barrandian Paleozoic (Cambrian – Devonian, Czechoslovakia). *Sborník geologických věd, Geologie*, 43, 83–146.
- KUKAL Z. and JÄGER O. 1988. Siliciclastic signal of the Variscian orogenesis: the Devonian Srbsko Formation of Central Bohemia. *Věstník Ústředního ústavu geologického*, 63 (2), 65–80.
- MIKULÁŠ R. 1992. Trace fossils from the Kosov Formation of the Bohemian Upper Ordovician. *Sborník geologických věd, Paleontologie*, 32, 9–54.
- MIKULÁŠ R. 1993. Ichnologie – jiný pohled na živý svět. *Vesmír*, 72 (10), 563–565. Praha.
- SAVRDA C.E. and BOTTJER D.J. 1989. Anatomy and implications of bioturbated beds in "black shale" sequences: examples from the Jurassic Posidonienschiefer (Southern Germany). *Palaios*, 4, 330–342.
- ŠTORCH P. and MERGL M. 1989. Kralodvor-Kosov boundary and the late Ordovician environmental changes in the Prague Basin (Barrandian area, Bohemia). *Sborník geologických věd, Geologie*, 44, 117–153.