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Examination of samples of Neoproterozoic
rocks from Central Timans for microfossil
contents

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Title: Examination of samples of Neoproterozoic rocks from Central Timans for microfossil contents			
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Summary:			
<p>Thirteen samples of Neoproterozoic rocks cropping out in the Vymskaya ridge have been collected for biostratigraphic work. The sampled sections, reaching a thickness of c.3000 m each, are exposed along the Dimtemyol and Pokju rivers. The succession consists of dark-grey, mainly muddy and shaly rocks, accumulated in a quiet basinal environment.</p> <p>The samples were processed and examined at the Uppsala University in Sweden by Prof. Gonzalo Vidal. The samples contain only undeterminable organic detritus, probably because the rocks have suffered too high thermal alteration for microfossils to be preserved.</p> <p>A poor assemblage of microfossils has previously been found in the same rocks. It was interpreted as suggestive of Terminal Riphean (kudashian) and Early Vendian age for the succession. A reexamination of this only existing collection, although poor, would possibly shed some supplementary light on its stratigraphic importance.</p>			
Keywords: Late Proterozoic	Neoproterozoic	Sedimentary rock	
Stratigraphy	Microfossils		

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FIGURES

Fig. 1 Simplified map of the Timans and the Pechora Basin, pre-Palaeozoic reconstruction.

Fig. 2 Summary section of the profile exposed along the Dimtemyol river.

Fig. 3 Summary section of the profile exposed along the Pokju river.

1 INTRODUCTION AND SCOPE

During field work in the Central Timans in August 1995, under guidance of Drs. V.V. Olovyanishnikov and Dr. A.M. Pystin, two sections of Neoproterozoic rocks were examined: the Dimtemyol river and Pokju river sections. Both cross-cut the area of exposure called the Vymskaya ridge (Fig.1). Field observations and interpretations are summarized in an earlier report (Siedlecka & Roberts 1995). The present report is thus a supplement to the mentioned previous one and is focused on examination of samples for possible occurrence of microfossils. The objective of this examination was to establish more specifically the age and age range of the sampled succession of the Vymskaya ridge. This age is uncertain and, on the basis of various evidences including an earlier identification of microfossils, ages of Terminal Riphean and Early Vendian were suggested (Dedeev & Getsen 1987).

2 MATERIAL

The Dimtemyol River Section

The Lunvozhkaya and Kikvozhkaya Formations are present in this section with a total exposed thickness of c.3000 m; neither bottom nor top of the succession are exposed. There is evidence of an unconformity between these two formations but the duration of the erosional/depositional break is unknown. With exception of a thin, white sandstone unit above the unconformity, the two formations consist of dark-grey mudstones/muddy shales, siltstones and fine-grained sandstones which were interpreted as deposited from suspension and partly reworked by weak bottom currents in a quiet basinal environment (Siedlecka & Roberts 1995, see also Fig.2). Six samples have been collected from the Lunvozhkaya Formation for examination of microfossils: T-D2, T-D8, T-D9, T-D9A, T-D24, T-D24A. The numbers of samples refer to the numbers of localities of A.Siedlecka (AS) shown on Fig.2. No suitable samples were found in the Kikvozhskaya Formation.

The Pokju River Section

In this section the Paunskaya, Pokjukskaya and Lunvozhkaya Formations are exposed (Fig.3). The outcrop is poor and discontinuous, neither bottom nor top of the succession are visible. The summarized thickness is in excess of 3000 m. The succession consists of interbedded dark-grey sandstones, siltstones and mudstones which were interpreted by Siedlecka & Roberts (1995) as deposited from suspension and from distal turbidity currents in a quiet basinal environment. Turbidites are more common in the lower part of the succession. Seven samples for microfossils have been collected from the Pokju river section: T-P1A, T-P1B (Paunskaya Formation), T-P7, T-P13 (Pokjukskaya Formation) and T-P 19A and T-P20A

(Lunvozhkaya Formation). The numbers of samples refer to the localities of A.Siedlecka (AS) as shown on Fig. 3.

3 RESULTS

The samples have been sent to Prof. Gonzalo Vidal, Micropalaeontology Laboratory, Uppsala University for examination. The samples were processed and examined under a microscope. The reply from Prof. Vidal to my request is as follows: «*Except for T-D2, which is entirely barren, all the other samples yielded black carbonaceous detritus. This fits with the appearance of the rocks, that look to be strongly indurated and to have suffered thermal alteration sufficient to have obliterated acceptable organic preservation.*». Further on, Prof. Vidal assumes that the organics (i.e. the rocks - authors comment) suffered thermal alteration higher than 200° C.

4 DISCUSSION AND CONCLUSION

Acritarchs were previously reported by Dedeev & Getsen (1987) from the Vymskaya Ridge section (unspecified), from the Pokjukskaya, Lunvozhkaya and Kikvozhkaya Formations. The samples were processed and examined by N.S.Michailowa and, to my knowledge, the results are not published elsewhere. The 20 samples examined by N.S.Michailowa were collected by V.G.Getsen, the majority being taken from the Kikvozhkaya Formation (Getzen, personal comm.1995).

N.S.Michailova (as referred in Dedeev & Getsen 1987, p. 93) characterises the assemblage examined by her as poor. She has identified following forms:

Pokjukskaya Formation: Trachysphaeridium laminaritum Tim., Trematosphaeridium sp. and few, tubular algae.

Lunvozhkaya Formation: Protosphaeridium densum Tim., P.flexuosum Tim., P.tuberculiferum Tim., Stictosphaeridium tertulosum Tim., Trematosphaeridium holtedahlii Tim. and tubular algae.

Kikvozhskaya Formation: Protosphaeridium densum Tim., P.flexuosum Tim., P.torulolum Tim., P.tuberculiferum, Stictosphaeridium implexum Tim., S.sinaptiferum Tim., S.tortulosum Tim., Trematosphaeridium holtedahlii Tim., T.sp., Trachysphaeridium laminaritum Tim., Bavlinella(?), sp. Kildinella sinica Tim. (3 eks.), Symplassosphaeridium incrustatum Tim., organically-walled objects («badaibinya» in Russian), silhouettes of fossils, tubular algae and fragments of organic films.

On the basis of this assemblage an Early Vendian age has been suggested for the Lunvozhskaya and Kikvozhskaya Formations and Latest Rhiphaean (kudashian) age for the Pokjukuskaya Formation (Dedeev & Getzen, 1987). This conclusion may turn out to be controversial because the assemblage consists of long-range, non-diagnostic forms. However, since this is the only collection of microfossils existing so far, it would be worth a reexamination which could bring some new aspects to the Michailovas determinations and stratigraphic conclusions.

Poor material examined by Michailova, unsuitable for firm stratigraphic conclusions and the negative results of the recent examination of the new collection of samples indicate that biostratigraphy based on microfossils (acritarchs) is not a promising stratigraphic method for the studied succession. Unfortunately, there are no other direct stratigraphic methods which may be applied to the discussed section. Therefore, what methodologically remains are large-scale correlations which may give only an approximate to timing of regionally important events.

5 REFERENCES

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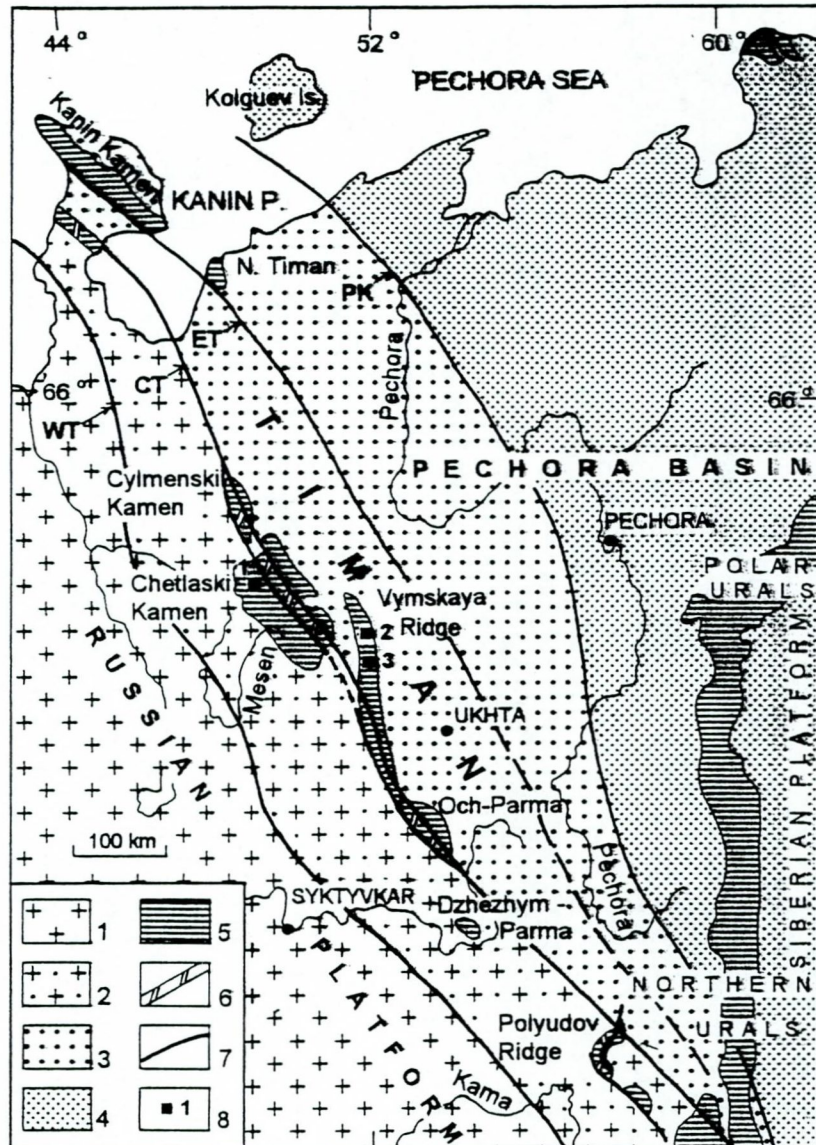


Fig.1. Simplified map of the Timans and the Pechora Basin, pre-Palaeozoic reconstruction (after Dedeev & Getsen 1987, Getsen 1987 and Olovyanishnikov 1995, with modifications). 1. Russian platform with Upper Proterozoic sedimentary cover. 2-4. Upper Proterozoic passive margin basin. 2. Pericratonic zone; 3. Passive margin to basin floor (miogeoclinal) zone; 4. Basin floor. 5. Area of outcrop of Upper Proterozoic rocks. 6. Upper Riphean stromatolitic dolomite. 7. Polyphase fault zones: WT - Western Timan, CT - Central Timan, ET - Eastern Timan, PK - Pechora-Kozhva. 8. Field camps: (1) Berezovaya-Mezen-Pyzhma river (planned, but not visited), (2) Pokyu river, (3) Dimtemyol river.

(From Siedlecka & Roberts 1995)

