Age refinement of ostracods from the Ordovician section in the Neblyinaya River, northeastern Novaya Zemlya

Upřesnění stáří ostrakod v ordoviku údolí řeky Neblinaja, Novaja Zamlja

(2 figs)

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The age of ostracods collected together with Llanvirn and Caradoc graptolites in the Neblyinaya River (north-eastern Novaya Zemlya) in the 1986 by the author has been specified.

Key words: Ordovician; Graptolites; Ostracods; Neblyinaya River; Novaya Zemlya; Russia

In 1986 the author, together with several colleagues, carried out a study of the Palaeozoic, including Ordovician deposits, in the Neblyinaya River Basin (Figs 1, 2) on the northeastern Severny Island, Novaya Zemlya (Sobolevskaya et al. 1989). Ostracods were collected along with abundant Llanvirn and Caradoc graptolites. Both graptolites and ostracods were described and illustrated in Atlas (1997). Somewhat later, a paper by Schallreuter et al. (2001) presented description of ostracods. Alltogether, these authors described 31 ostracod species assigned to 28 genera, from which eight genera are new. However, no detailed information was presented on location of the individual ostracod specimens and no information provided on their association with graptolites. Consequently, the ostracods were assigned only in a general way to the Ordovician.

We believe that it is important to fill the gap and to briefly describe lithology of the section from which graptolites and ostracods were collected and to specify the age of the latter.

The stratigraphic section from which ostracods were collected is located in the Neblyinaya River, in the northeastern part of Severny Island, Novaya Zemlya (Figs 1 and 2). Ostracods were found at five levels in the Middle Ordovician Murmantsev Formation (Fig. 2). The Murmantsev Formation contains inequigranular sandstones (up to gritstones), siltstones, mudstones, less common conglomerates and limestones. The formation is devided into informal units called traditionally members. The lower member, 520 m thick, is composed of alternating sandstones, siltstones, mudstones and limestones. The sandstones are marked by current ripples. Graptolites of the bifidus Zone: *Tetragraptus quadribrachiatus* (J. Hall), *Phyllograptus angustifolius* (J. Hall), *Ph. anna anna* Rued., *Ph. typus* J. Hall, *Pseudotrigonograptus ensiformis* (J. Hall), *Tylograptus* sp., *Eoglyptograptus dentatus* (Brongn.), *Undulograptus austrodentatus americanus* (Bulm.), *Un. cumbrensis* (Bulm.), *Bergstroemograptus crawfordi* (Harr.), *Glossograptus acanthus* E. et W., *Gl.* aff. *holmi* Bulm., (samples 416-1/4; 2/3; 4/3; 5/2; 6/4; 6/6) have been reported from the lower half of the member (265 m). Sample 416-5/2 contains graptolites and ostracods *Telegraphia novasemljaensis* (Fig. 2).

Graptolites *Glyptograptus graciosus* Sob., *Glossograptus fimbriatus* (Hopk.) occur in the upper half of the lower member (255 m), which belongs to the murchisoni Zone. *Eoglyptograptus dentatus* (Brongn.), *Undulograptus austrodentatus americanus* (Bulm.), *Un.*

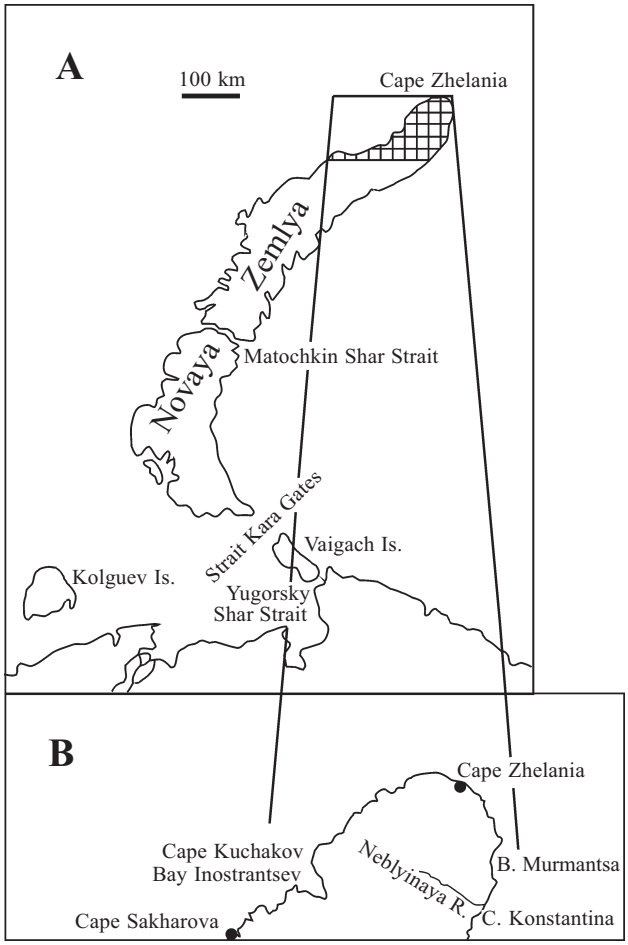


Fig. 1. A – Schematic map of Novaya Zemlya, showing location of the study area (hatched); B – Detail from A with location of the Neblyinaya River section.

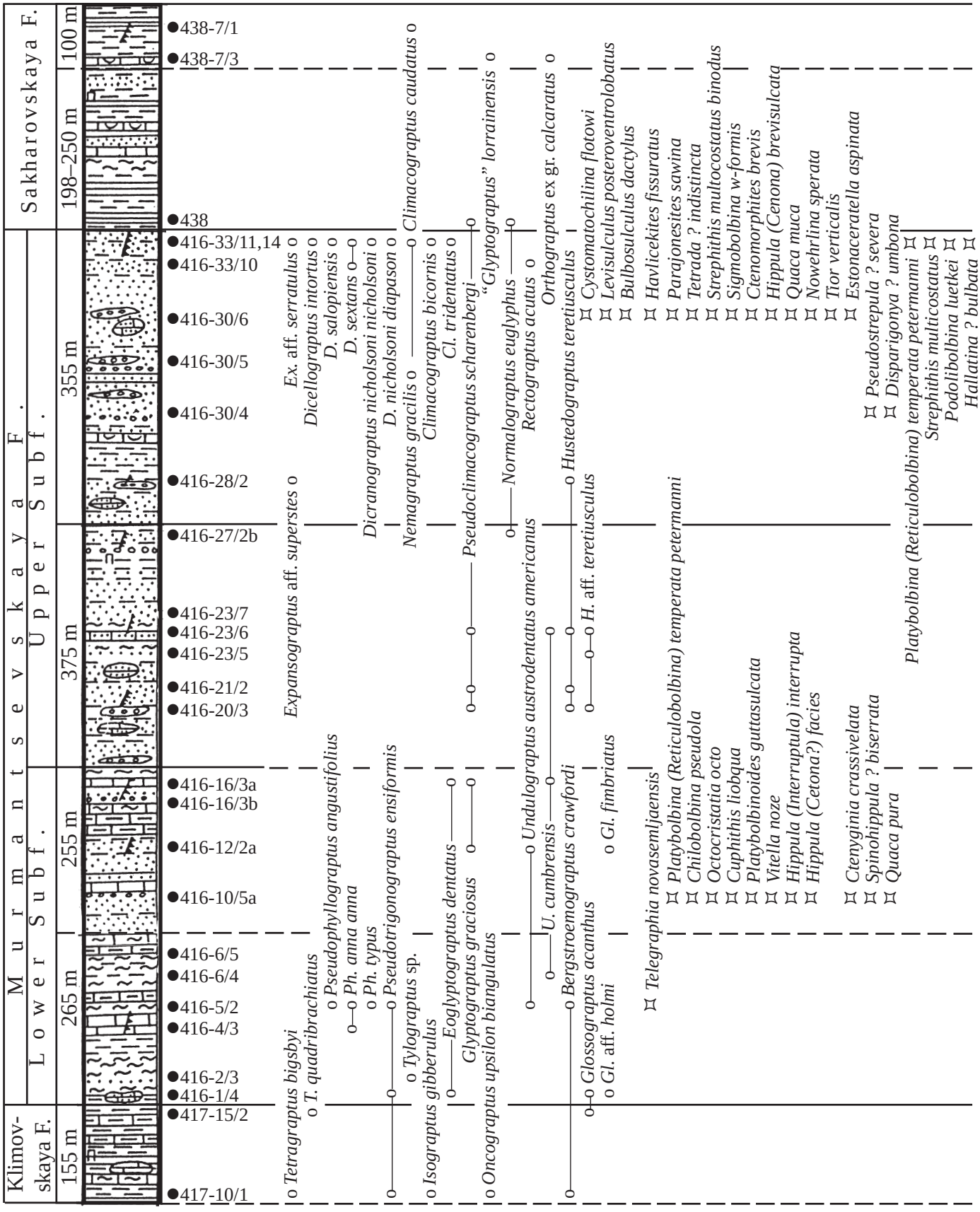
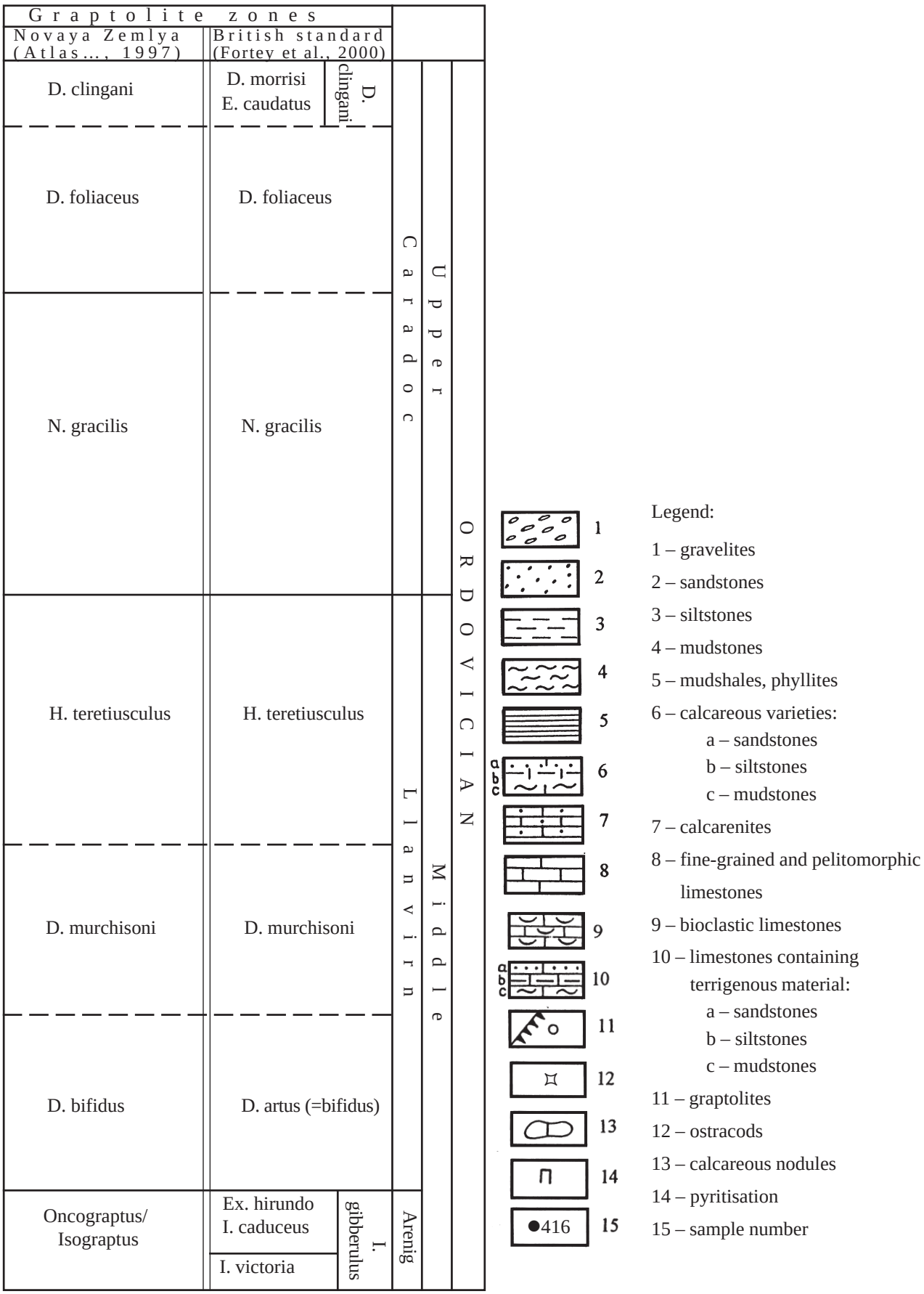


Fig. 2. Stratigraphic section at the Neblyinaya River and distribution of ostracods and graptolites in the Murmantsevskaya Formation.


Graptolite zones
Novaya Zemlya (Atlas..., 1997)
British standard (Fortey et al., 2000)
D. clingani
D. morrisi
E. caudatus
D. clingani
D. foliaceus
D. foliaceus
N. gracilis
N. gracilis
H. teretiusculus
H. teretiusculus
D. murchisoni
D. murchisoni
D. bifidus
D. artus (=bifidus)
Oncograptus/ Isograptus
Ex. hirundo
I. caduceus
I. victoria
I. gibberulus
Arenig
Llanvirn
Caradoc
Upper
Middle
ORDOVICIAN
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
416
Legend:
1 – gravelites
2 – sandstones
3 – siltstones
4 – mudstones
5 – mudshales, phyllites
6 – calcareous varieties:
a – sandstones
b – siltstones
c – mudstones
7 – calcarenites
8 – fine-grained and pelitomorphic limestones
9 – bioclastic limestones
10 – limestones containing terrigenous material:
a – sandstones
b – siltstones
c – mudstones
11 – graptolites
12 – ostracods
13 – calcareous nodules
14 – pyritisation
15 – sample number

cumbrensis (Bulm.) (samples 416-12/2a; 16/3a; 16/3b) continue higher-up in the section from the bifidus Zone. The following ostracods have been recorded about 120 m from the base of the zone: *Platybolbina* (*Reticulobolbina*) *temperate petermanni*, *Chilobolbina pseudola*, *Octocristatia octo*, *Cuphithis liobqua*, *Platybolbinoides guttasulcata*, *Vitella noze*, *Hippula* (*Interruptula*) *interrupta*, *H.* (*Cetona*?) *facies*, *Ctenyginia crassivelata*, *Spinohippula*? *biserrata*, *Quaca pura* (sample 416-10/5a).

The upper member of the Murmantsev Formation, 730 m thick, consists mainly of quartz and feldspar-quartz sandstones alternating with silty limestones, in turn with dark siltstones with graptolites of the teretiusculus and gracilis zones. In the lower part (375 m) of the upper member, along with a zonal species, the following fossils are present: *Pseudoclimacograptus scharenbergi* (Lapw.), *Undulograptus cumbrensis* (Bulm.), *Hustedograptus* aff. *teretiusculus* (His.), *Normalograptus euglyphus* Lapw. (samples 416-20/3; 21/2; 23/5; 23/6; 23/7; 27/26).

Expansograptus aff. *superstes* (Lapw.), *Hustedograptus* aff. *teretiusculus* (His.), (sample 416-28/2) were determined from the lower gracilis Zone (355 m). Ostracods *Pseudostrepula*? *severa* and *Disparigonia umbona* (sample 416-30/4) occur up the section. 100 m up the section we determined the zonal species – *Nematograptus gracilis* (J. Hall) (sample 416-30/5) and a rich ostracod assemblage (14 species) occurs some 100 m above the *Nematograptus gracilis* (J. Hall). These species are: *Cystomatochilina flotowi*, *Levisulculus posteroventrolobatus*, *Bulbosulculus dactylus*, *Havlicekites fissuratus*, *Parajonesites sawina*, *Tetrada*? *indistincta*, *Strephithis multocostatus binodus*, *Sigmobolbina w-formis*, *Ctenomorphites brevis*, *Hippula* (*Cenona*) *brevisulcata*, *Quaca muca*, *Nowehrlina sperata*, *Tior verticalis*, *Estonaceratella aspinata* (sample 416-30/6).

Abundant graptolite assemblage was found near the top of the Murmantsev Formation, corresponding to the top of the gracilis Zone. Along with the index species, the following graptolites are present: *Expansograptus* aff. *serratulus* (J. Hall), *Dicellograptus intortus* Lapw., *D. salopiensis* E. et W., *D. sextans* (J. Hall), *Dicranograptus nicholsoni nicholsoni* Hopk., *D. nicholsoni diapason* Gurley, *Climacograptus bicornis* (J. Hall), *Cl. tridentatus* Lapw., *Pseudoclimacograptus scharenbergi* (Lapw.), *Normalograptus euglyphus* (Lapw.), *Rectograptus acutus* (Lapw.) (samples 416-33/10; 33/11). The following ostracods were determined three meters above the locality of the sample 416-33/11: *Platybolbina* (*Reticulobolbina*) *temperata petermanni*, *Strephithis multicostatus*, *Podolibolbina luetkei*, *Hallatina*? *bulbata* (sample 416-33/14).

The Sakharov Formation overlies the Murmantsev Fm. It is composed of dark-grey to black siltstones with mudstones and quartz sandstones. In addition, there are a few beds of dark-grey biomorphic limestones. Only graptolites from the clingani Zone: *Climacograptus caudatus* Lapw., "*Glyptograptus" lorrainensis* (Rued.) and *Rectograptus calcaratus* (Lapw.) (samples 438-7/1 and 438-7/3) have been reported from the Sakharov Formation at the Neblyinaya River. At the Cape Sakharov (Fig. 2), the foliaceus Zone contains the following graptolites: *Dicellograptus forchammeri* Gein., *D. intortus* Lapw., *D.* aff. *moffatensis* Carr., *Dicranograptus rectus* Hopk., *Climacograptus peltifer* Lapw., *Diplograptus foliaceus* (Murch.) and others (Fig. 2).

In conclusion, it should be noted that from the above listed ostracods only one form – *Platybolbina* (*Reticulobolbina*) *temperate petermanni* was found at two levels, i.e., in the murchisoni Zone (sample 416-10/5a) and in the gracilis Zone (sample 416-33/14). The remaining species (they are all new) occur in the Murmantsev Formation and have not been reported from other parts of the section (Fig. 2).

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Upřesnění stáří ostrakod v ordoviku údolí řeky Neblinaja, Novaja Zamlja

Článek upřesňuje stáří ostrakod popsaných v článku Schallreutera et al. (2001), publikovaném v Journal of the Czech Geological Society. Stáří četných nových rodů a druhů ostrakod je specifikované na základě hojných graptolitů stáří llanvirn a caradoc.

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