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23 2004 .

**RADIOLARIAN ECOLOGY AND BIOGEOGRAPHY: NEW VISION OF THE PROBLEM.  
PART 2. ABIOTIC FACTORS, RADIOLARIAN PALEOBIOGEOGRAPHY,  
MARINE PALEOLANDSCAPE ENVIRONMENTS IN GEOLOGICAL PAST**

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*\*Paleontological Institute RAS*

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The new data on distribution radiolarians of Late Devonian, Carboniferous, Early Permian, and Late Cretaceous ages in paleobasins of Urals and adjacent territories of Russian and Western-Siberian platforms are analyzed. It is established, that in the geological past the paleobasins with maximal density of populations and high taxonomic diversity of radiolarians were located near to a continental land, or in zones of aulacogen and active tectonic faults. It is shown, that radiolarian bioefficiency is controlled by leading abiotic factors: currents, upwelling, the El Nino effects, hydrosulphuric pest, rift zones and deep faults, supply silica and other minerals in sea water.

Key words: *radiolarians, conditions of inhabitation, settling, paleobiogeography, Middle and Late Paleozoic, Late Mesozoic, marine paleolandscapes.*

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1981, 1984; [ , , 1966, 1981, 1986].

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[ , 2003].

[Boltovskoy, 1998].

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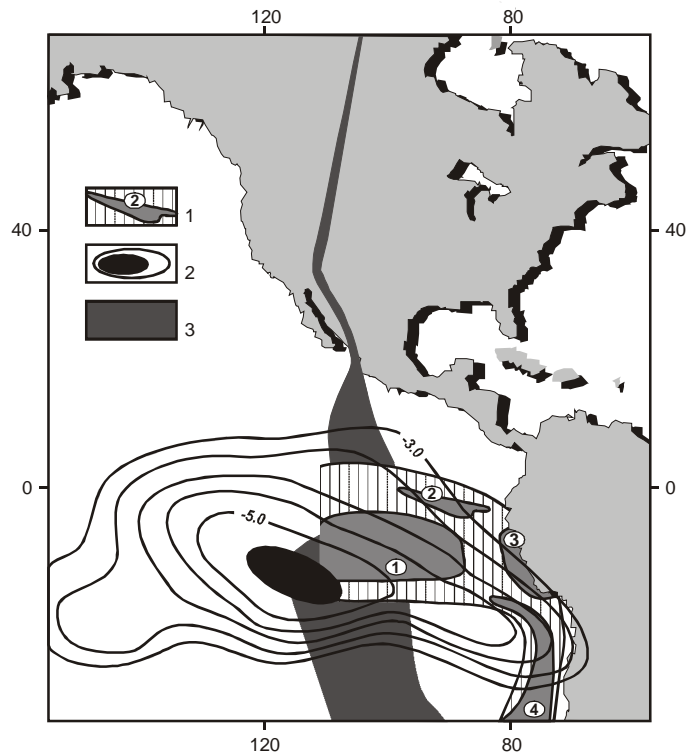
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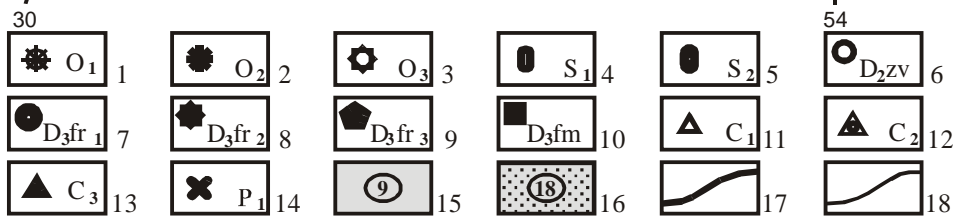
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 », [Molina-Cruz, 1977]; 2 –  
 ( [ , 1998]); 3 –  
 ( [ , 1994).



200-600 ,  
 160000  
 [Anderson et al., 1990; Venec-Peyre et al., 1995; Vernaud-Grazzini, Caulet, 1995; Boltovskoy, 1998, 1999].  
 [Handoh et al., 2003],  
 ( , ),  
 [Riegraf, 1995]  
 [ , 1994, 1998; 2000; , 2004; Anderson et al., 1990].

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 [ , 1926, 1983, 1987]. -  
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 1995; [ , 1995; , -  
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 10<sup>2</sup> [Aldredge, Gotschalk, 1990; , - :  
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 $\text{SiO}_2$ ,  
 ( .1).  
 $\text{SiO}_2$   
 ( 20-40 ),  
 (65-70 %)  
 [Klevtsova, Afanasieva, 1998; , 2000] ( .2).  
 $\text{SiO}_2$   
 [ , 2000].  
 [ , 1994]. [ , 1975; Klevtsova, Afanasieva, 1998; , 2000].



. 2.  
 1-14 - : 1-3 - : 1 - , 2 - , 3 - -  
 ; 4, 5 - : 4 - , 5 - ; 6 - , 7-10 - : 7 -  
 , 8 - , 9 - , 10 -  
 ; 11-13 - : 11 - , 12 - , 13 - ; 14 - ; 15 - (1-  
 17): (1) - , (2) - , (3) - , (4) - , (5) -  
 - , (6) - - , (7) - , (8) - - , (9) - -  
 , (10) - - , (11) - - , (12) - , (13) - ,  
 (14) - - , (15) - - , (16) - - , (17) - -  
 - ; 16 - (18-20): (18) - , (19) - , (20) - -  
 ; 17 - ; 18 - ( . . . [1978] . . . [2000]).

(Na, Ca, Mg, K, Al, Si, Fe), [ , 1987],  
 Na, Ca, Mg,  
 Al, Si, K, Ti, 1. (  $4,27 \times 10^{14}$  / );  
 Si 2.

Si  
 [ ..., 2002]. 20 %;

3. ;  
 4. ;  
 5. ;  
 48 %  
 – 50-68 %, 6. (

Si  
 46 %  
 – 35-82 %.  
 SiO<sub>2</sub> ; , 7. )

(  $n \times 10^{-4}$  / ): Ca – 4,88;  
 SiO<sub>2</sub> – 4,26; – 3,2; Na<sup>+</sup> – 2,07; Mg<sup>2+</sup> – 1,33;  
 K<sup>+</sup> – 0,74; Fe<sup>2+</sup> – 0,223; Al – 0,003.

SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>,  
 Fe<sub>2</sub>O<sub>3</sub> – MgO, CaO, Na<sub>2</sub>O  
 [ ..., 2002].

[ , 1987]:  
 1. 40-75

2.

92 %  
 7-8 %  
 [ ..., 2002].

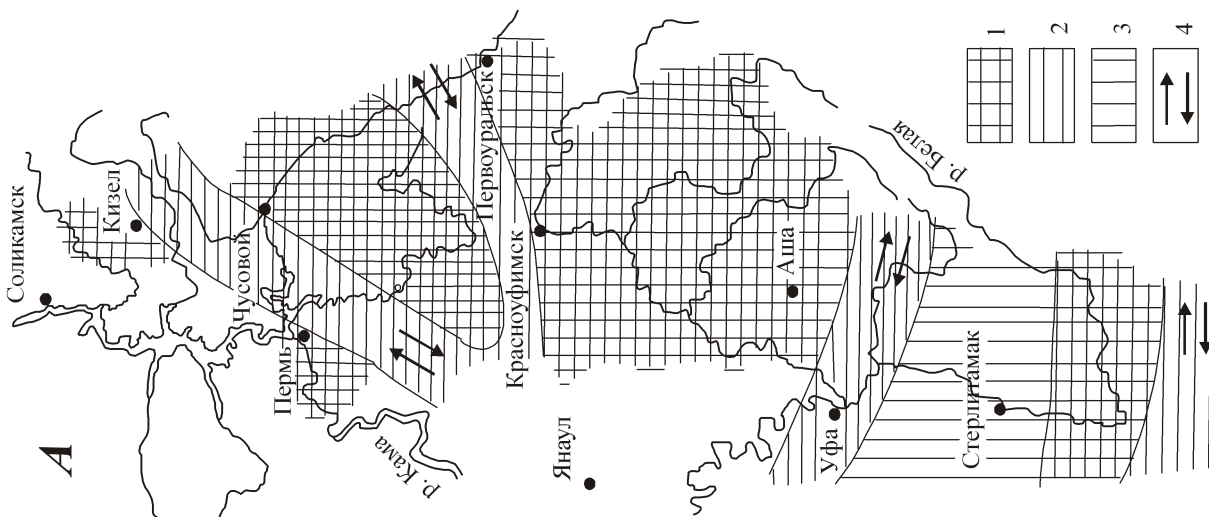
3. 95 %

SiO<sub>2</sub>

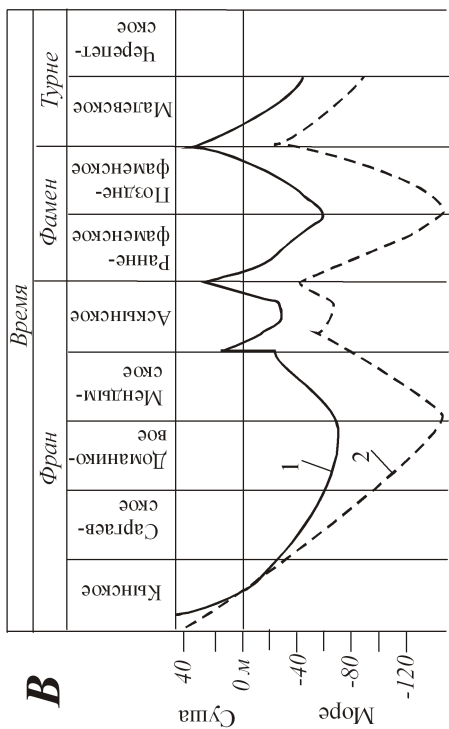








4.



A.

: 1 - ; 2 -

3 -  
4 -

(1) C.  
(2) : I -

(1 - *Archaeosphaera*; 2, 3 - *Parathurammina*; 4 - *Cribrosphæroides*; 5 - *Irregulariina*; 6 - *Archæaelagena*; 7 - *Nanicella*); II -

(8 - *Girvanella*; 9 - *Pycnostroma*; 10 - *Siphonites*; 11 - *Nodosinella*; 12 - *Spongiostroma*); III - (13 -

; 14 -

; 15 -

; 16 -

; 17 -

; 18 -

; 19-21 -

; 22 - ; 23 -

; 24 -

; 25 - ; 26 -

; 27 - *Lingula*; 28 -

*Buchiola*; 29 -

*Leiorhynchus*; 30 -

; 31 - ; 32 -

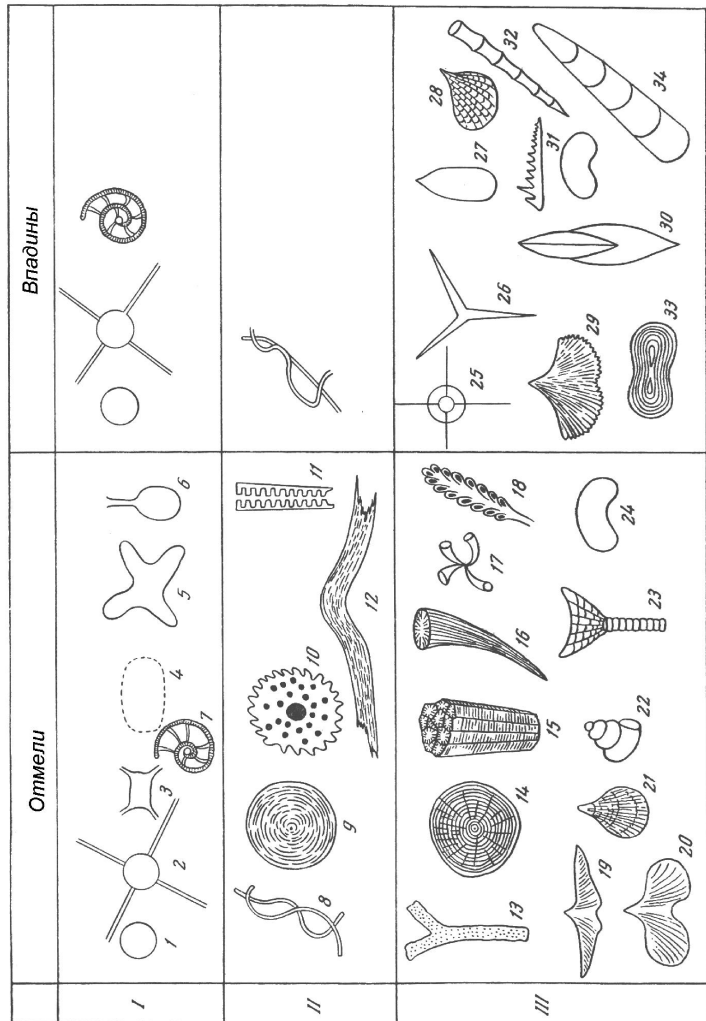
; 33 -

*Entomozoe*; 34 -

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[1968],

C







100

SiO<sub>2</sub>,

[ , 2002].

( , )

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[ , 2000].

( , ) [ , 2002].

( 18,69 %),

: 1)

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, 1998;

[ , 2000].



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[Menner et al., 1996].

20°

[ , 1994, 1998]

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[ , 2000].

SiO<sub>2</sub>

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(Acritarcha Tasmanacea)

( . 2), ( . 6)

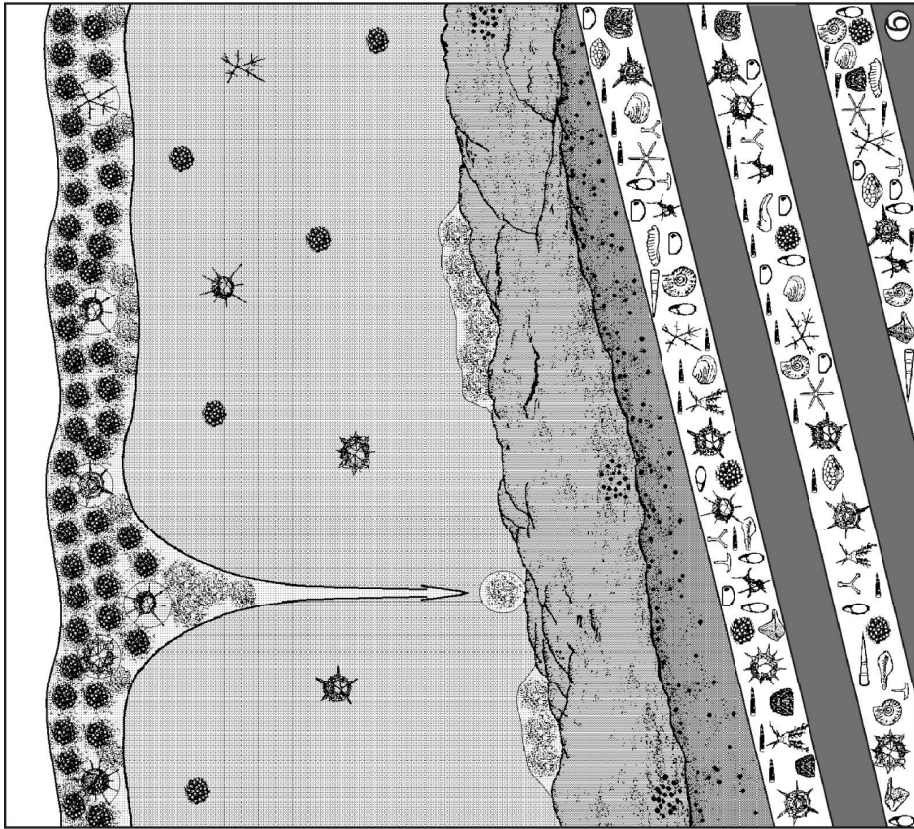
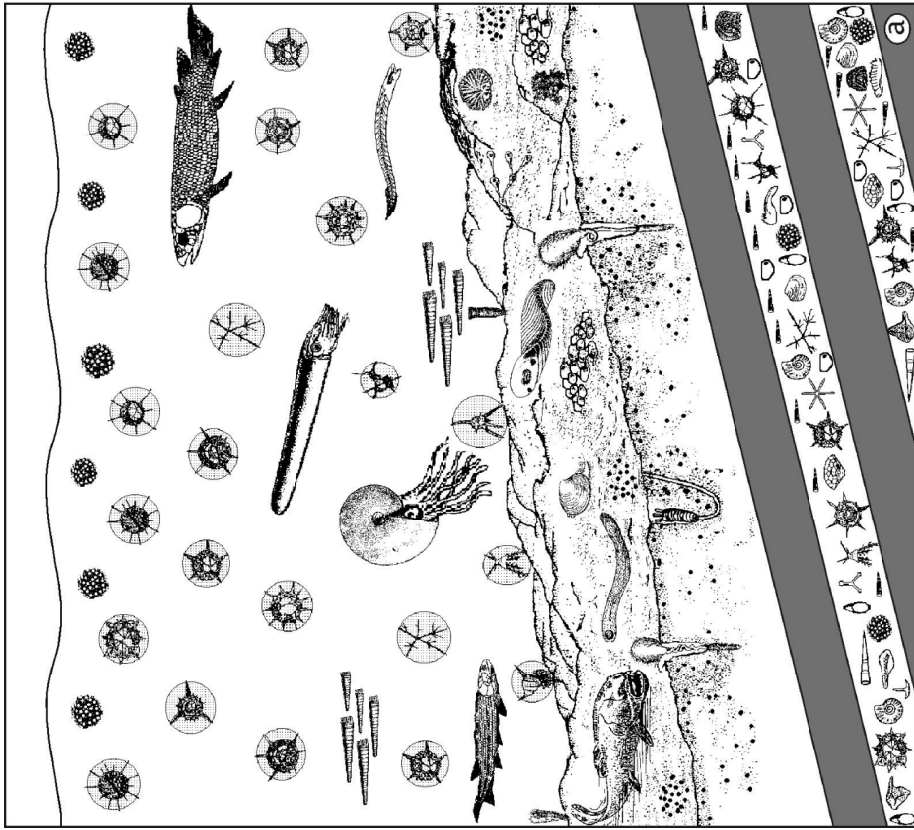
[ , 1998; , 2000].

[ , 2000].

100-

200 .

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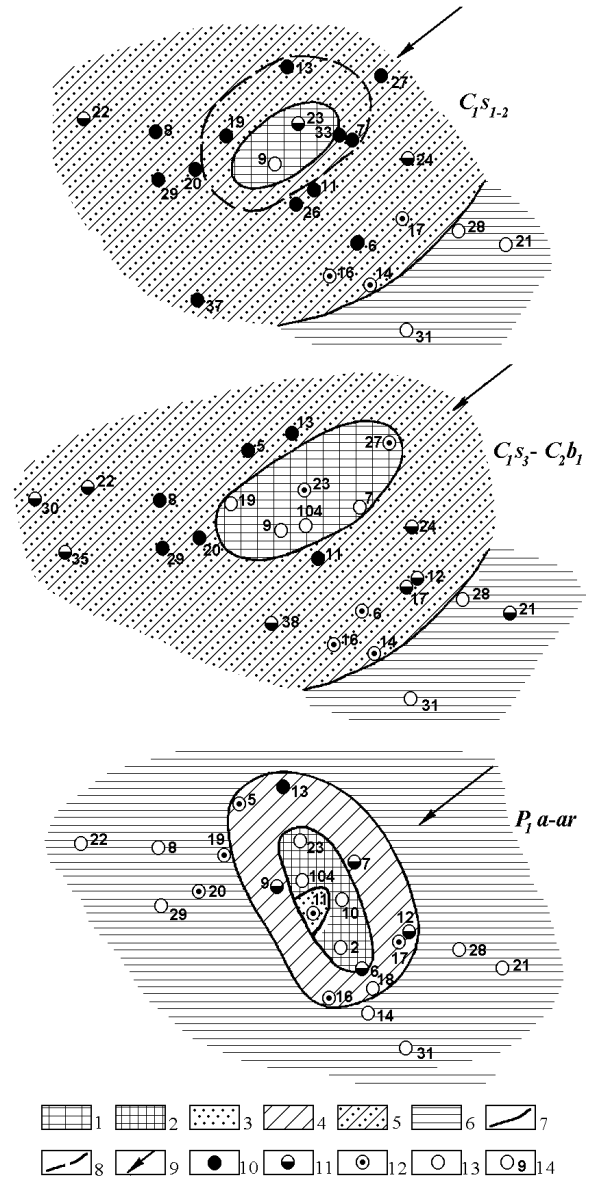
. 6. ( [ , 2000] ).

- ; 2- ; 3- ; 4- ; 5- ; 6- ; 7- ; 8- « » ; 9- ; 10- ; 1- , ) ; 7- .



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. 7.

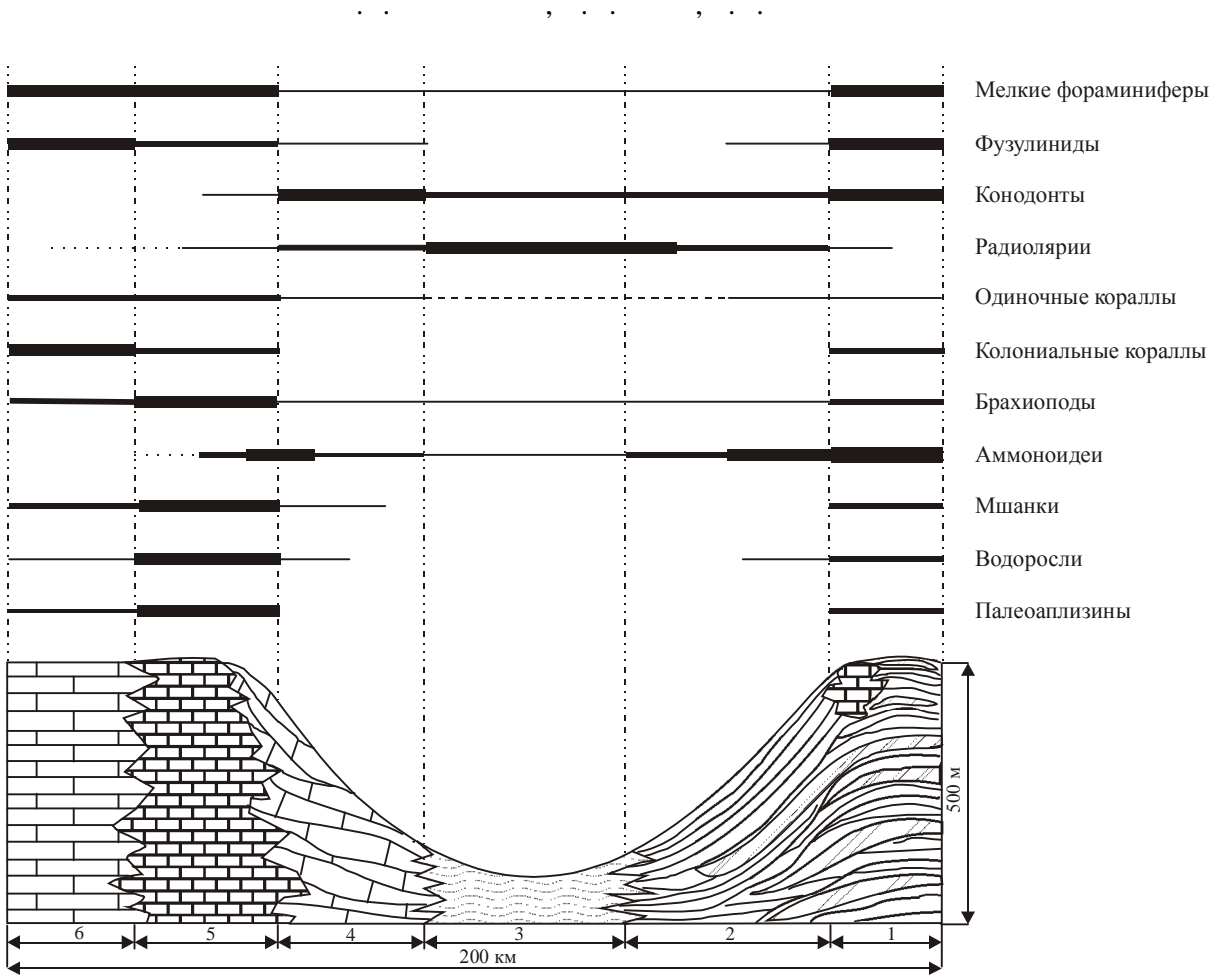
( [ , 1987, 2000]).

[ , 1986, 2002; , 1987, 2000] ( . 7).

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 1-6 - : 1 - , 2 - ;  
 3 - , 4 - ;  
 5 - , 6 - ; 7 - ;  
 8 - ; 9 - - ;  
 ; 10-13 - :  
 10 - , 11 - , 12 - , 13 - - ;  
 ; 14 - .



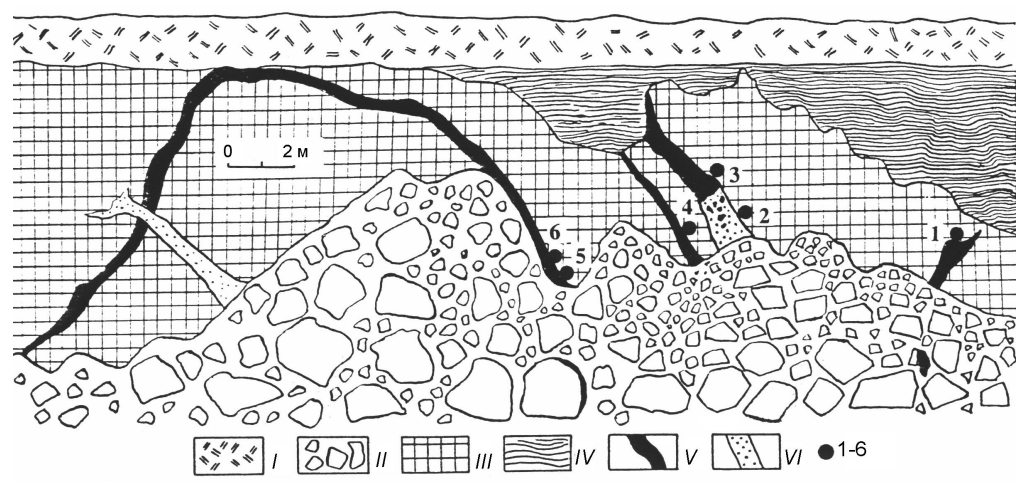
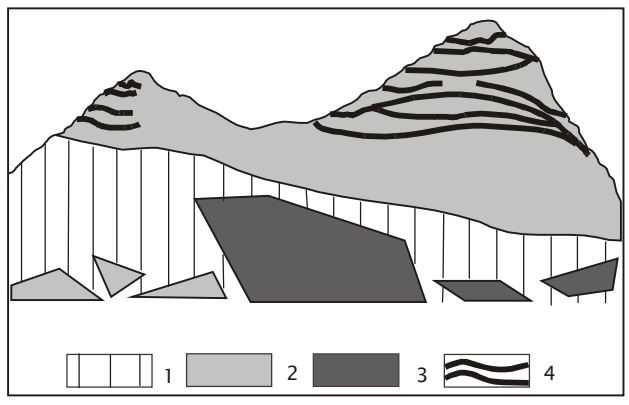
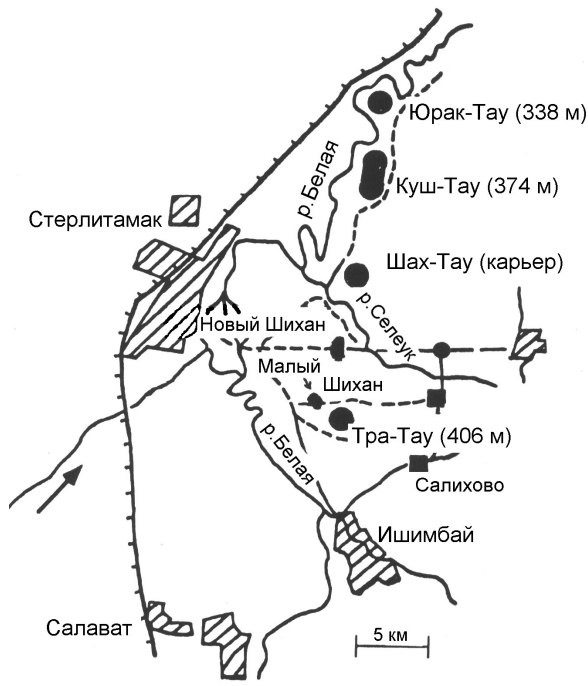




. 8.

[ (, 1999)].

1 – ; 2 – ; 3 – ; 4 – ; 5 – ; 6 –



9. ( . 1 - ; 2 - ; 3 - ; 4 - ( [ ., 1999]).  
 ; I - ; II - ; III - ; IV - ; V - ; VI - ; 1-6 - ( [ ., 1996]).

*Entactinosphaera, Astroentactinia, Copicyntra.*

vashov, 1983].

[Chu-

[Chuvashov, Crasquin-Soleau, 2000].

*Copicyntra* [ , 2000].

( . 8).

[ , 1999].

[1956]

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2002; [ , 2003 ], [ , 2001, , 2003 ], [ , 1999], (5-15 ) ( .9) [ , 1996]. [ , 1996].

SiO<sub>2</sub> ( , ), [ , 1990]. [ , 1988; 1999]. [ , 2004].

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[ , 2001].

[ , 2002; , 2003 , ].

[ , 1967].

15-20 ,

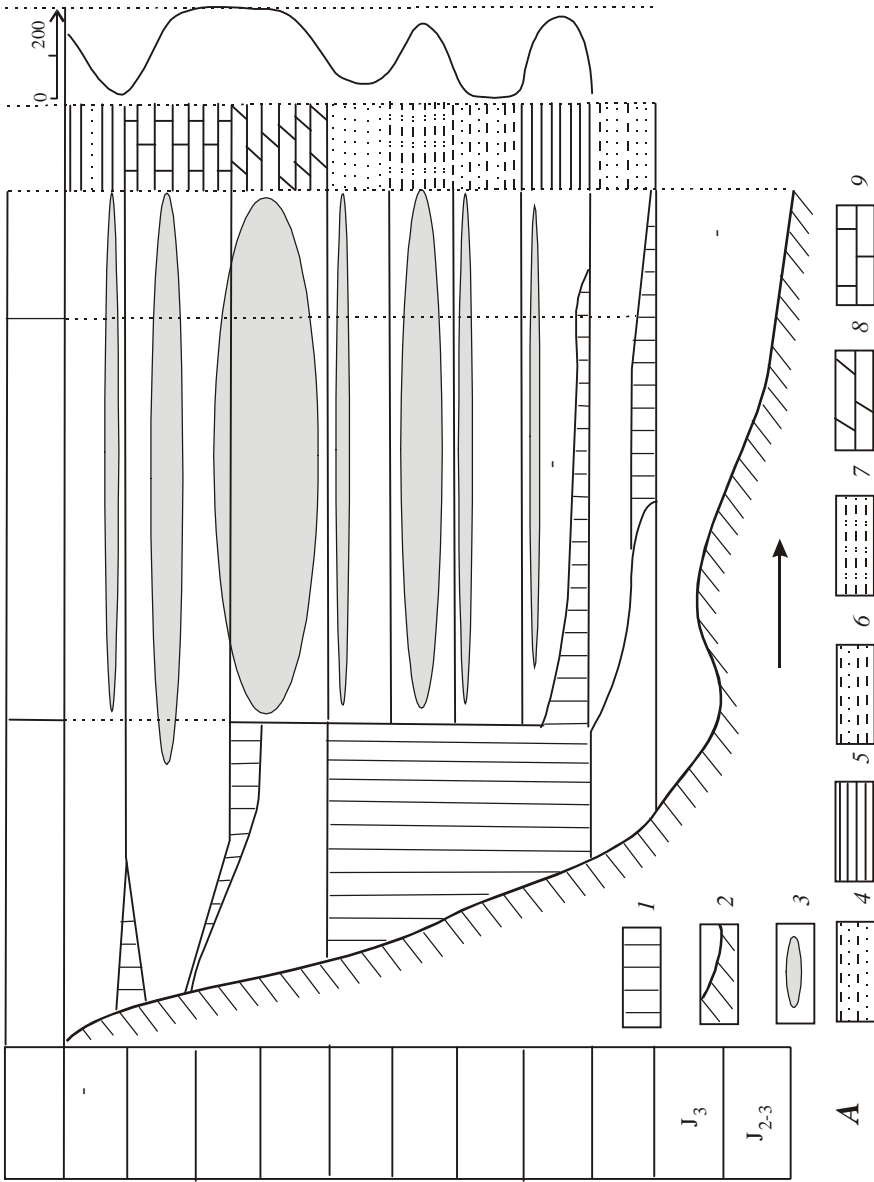
100-200 [ . 2002].

200,

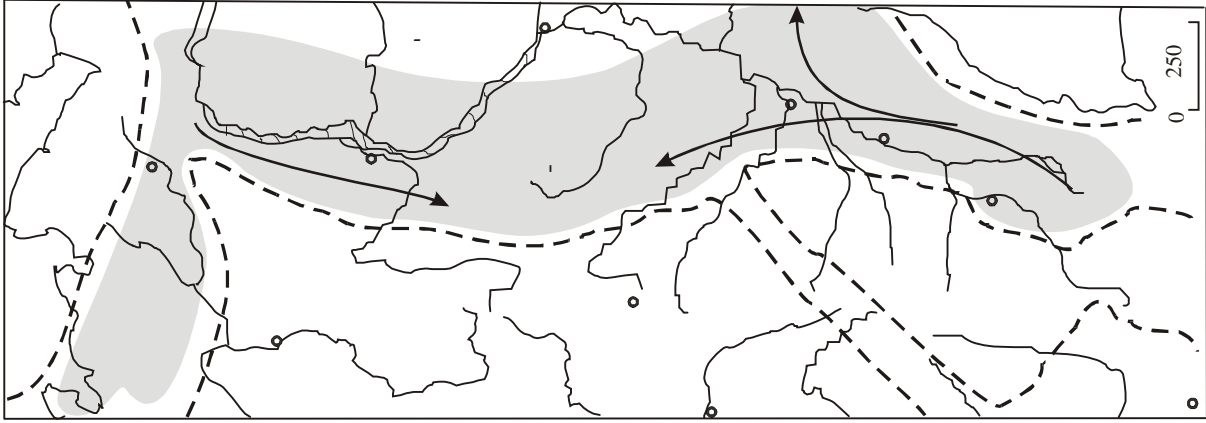
- 500 ,

[ , 2000, 2001].

2003 , ].



.10.  
 (A) ( ) ; 2- ; 3- ; 4- ; 5- ; 6- ; 7- ; 8- ; 9- ;





SiO<sub>2</sub>

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Prunobrachium //

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1987. .26-46. // . . . . // . . . . : -

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2003. : // ,2004. .3-10. . . . . -

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1. // . . . . . -

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,1987. .78-85. . . . . // -

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1. .12-21. . . . . // -

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. . . . .7. . . . . // -

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1987. 340 . . . . . : -

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,2002. 461 . . . . . -

. . . . . : ,1984. // .2003. 4. .43-64. -

120 . . . . ,1988. 231 . . . . : -

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1966. . 219-45. // ( )// -1995. : sellaria . . . , 1981. 406 . , 1996. . 25-34. . . , 1986. 200 . « » - // -2000. - 1979. 260 . : , 2001. . 18-24. . . 2. . . , 1956. 265 . // . . 2. . . , 1959. 557 . : , 2002. . . . 68-101. , 1994. 68 . . . , 1998. 57 . , 1983. 83 . // . . . 1984. 7. . 10-34. // 1966. 2. . 87-98. // . 2003. 6. . 33-40. . . 3.: - Afanasieva M.S., Zamilatskaya T.K. The Paleobiogeography of the North-East Pricaspian in Artinskian Time based on Radiolaria and Foraminifera // Micropaleontology. 1993. 6. Spec. publ. . 61-66. . . 1995. 352 . Alldredge A.L., Gotschalk C.C. The relative contribution of marine snow of different origin to biological processes in coastal waters // Continental shelf Res. 1990. V. 10. P. 41-58. 1961. 352 . . . : 1931. 48 . - Anderson R.Y., Linsley B.K., Gardner J.V. Expression of seasonal and ENSO forcing in climatic variability at lower than ENSO frequencies: evidences from Pleistocene marine valves of California // Paleogeogr. Paleoclimatol. Paleoecol. 1990. V. 78. 3-4. P. 287-300. . . , 1968. 132 . - Boltovskoy D. Classification and distribution of South Atlantic recent Polycystine radiolaria // Palaeontol. Electronica. 1998. V. 1. Is. 2. 116 p. 3. . 22-37. - Boltovskoy D. Radiolaria Polycystina // South Atlantic Zooplankton / D. Boltovskoy (ed.). Leiden: Backhuys, 1999. P. 149-212. . . : , 2003 . . 3-65. - Chuvashov B.I. Permian reefs of the Urals // Facies. 1983. V. 8. P. 191-212. . . ( ) - Chuvashov B.I., Crasquin-Soleau S. Palaeogeography and palaeotectonic of the jointing area between the Eastern European Basin and the Tethys basin during Late carboniferous (Moscovian) and Early Permian (Asselian and Artinskian) // Memouris. Mus. nat. hist. 2000. V. 182. P. 203-238. // - Gursky H.-Ju. Gefuge, Zusammensetzung und Genese der Radiolarite im ophiolitischen Nicoya-Komplex (Costa Rica) // Munster. Forsch. Geol. Palaeont. 1988. V. 68. 189 p. . 1999. . 7. 6. . 41-55. // Diester-Haass L. Middle Eocene to early Oli-

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