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4. Data Report: Paleogene Planktonic Foraminifer Biostratigraphy, ODP Leg 198 Holes 1209A, 1210A, and 1211A (Shatsky Rise, Northwest Pacific Ocean)[1]

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INTRODUCTION

During Leg 198 of the Ocean Drilling Program (ODP), Paleogene sediments were recovered form 10 holes at four sites along a bathymetric transect from the Southern High of Shatsky Rise. In terms of age, the Paleogene successions span from the Cretaceous/Paleocene boundary to the early Oligocene. Sediments are mainly composed of tan nannofossil ooze with scattered darker layers richer in clay. This data report concerns planktonic foraminiferal biostratigraphy from three holes, specifically Hole 1209A (water depth = 2387 m), Hole 1210A (water depth = 2573 m), and Hole 1211A (water depth = 2907 m). The thickness of Paleogene sediments is 105.90 m in Hole 1209A, 95.05 m in Hole 1210A, and 56.11 m in the deepest Hole 1211A. Preliminary investigations conducted on board revealed that at Site 1209 the succession was mostly complete, whereas the succession was more condensed at Site 1211.

METHODS

A total of 360 samples from Holes 1209A, 1210A, and 1211A were investigated, two per section on average. Samples of 10 cm^3 were soaked in water and washed through a 40-µm sieve, and then were dried and

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split in three fractions: 40–150 µm, 150–250 µm, and >250 µm. Planktonic foraminifers were examined from the three sieve-size fractions. Core catcher samples were washed, dried, and examined on board and reexamined after the cruise.

Species identification was made by reference mainly to Blow (1979), Toumarkine (1983), Tourmakine and Luterbacher (1985), Berggren and Norris (1997), and Olsson et al. (1999).

Planktonic foraminiferal distributions are presented in Tables T1–T17. Individual species abundance are represented by the following abbreviations:

A = abundant (>30%).
C = common (10%–30%).
F = few (5%–10%).
R = rare (1%–5%).
VR = very rare (1–5 specimens).

The state of preservation is annotated as follows:

VG = very good (no evidence of breakage or dissolution).
G = good (>90% of specimens unbroken).
M = moderate (30%–90% of the specimens unbroken).
P = poor (strongly recrystallized or dominated by fragments and broken or corroded specimens).
VP = very poor (>90% of specimens broken).

Other microfossils are abbreviated as follows:

O = ostracodes.
Ech = echinoids.
Fish = fish remains.

Mineral components are abbreviated as follows:

ph = phillipsite.

Other abbreviations are as follows:

Rew Cr = Cretaceous taxa reworked.
Small res. = small residue.
Small fract. = small fraction 40–150 µm.
Large chilog. = large chiloguembelinids (>150 µm).
Mz = morozovellids.
Subb = subbotinids.

BIOSTRATIGRAPHIC SUMMARY

The biostratigraphic resolution obtained from the study of planktonic foraminifers from the Paleogene successions recovered at Shatsky Rise varies from good in the Paleocene–lower Eocene interval to moderately poor in the lower middle Eocene to very poor in the upper Eocene. Paleocene–lower Eocene assemblages are rich, diverse, and moderately preserved in the lowermost interval but are increasingly affected by dissolution toward the upper Eocene. Upper Eocene planktonic foraminiferal faunas are so highly fragmented that very few

species are recognizable. It is worth mentioning that the degree of faunal preservation is paralleled by low to high abundance of phillipsite in the residues. Also remarkable is the almost total absence of muricate forms beginning halfway through the middle Eocene, well before their extinction established level.

Nevertheless, we can state that the Paleocene–Eocene succession is almost complete in Holes 1209A and 1210A on the basis of faunal assemblages and some secondary events. Biostratigraphic reconstruction was more problematic for Hole 1211A, where some intervals are more condensed, even bounded by unconformities, compared to those of the other two holes.

When possible, we used the calibrated first occurrence (FO) and last occurrence (LO) of species given in Berggren et al. (1995, 2000) and updated by the Leg 198 Shipboard Scientific Party (see Bralower, Premoli Silva, Malone, et al., 2002). However, we note that the stratigraphic ranges for some Paleocene taxa differ from those of Olsson et al. (1999). For instance, we could not recognize some subzones, especially within Zone P4 of late Paleocene age. Planktonic foraminifer distributions for Hole 1209A are given in Tables **T1, T2, T3, T4, T5,** and **T6.** Planktonic foraminifer distributions for Hole 1210A are given in Tables **T7, T8, T9, T10, T11,** and **T12.** Planktonic foraminifer distributions for Hole 1211A are given in Tables **T13, T14, T15, T16,** and **T17.** Stratigraphic positions of the planktonic foraminiferal events recognized in the three holes are shown in Table **T18.**

On the basis of these events, we could recognize the following intervals, which conform to standard planktonic foraminiferal zones published in the literature (Blow, 1979; Tourmakine and Luterbacher, 1985; Premoli Silva and Boersma, 1988; Berggren et al., 1995; Olsson et al., 1999), from top to bottom.

Zone P18 (*Chiloguembelina cubensis–Pseudohastigerina* spp. Zone)

Top: LO *Pseudohastigerina micra*
Base: LO all hantkeninids

Hole 1209A: above Sample 198-1209A-14H-4, 91–92 cm
Hole 1210A: above Sample 198-1210A-14H-3, 131–132 cm
Hole 1211A: above Sample 198-1211A-9H-3, 128–130 cm

Remarks: The top of the zone was not investigated. This interval is assigned to Zone P18 because of the absence of hantkeninids. It is characterized by common large globigerinids (*"Globigerina" venezuelana* and *"G." euapertura*, *"G." tapuriensis,* and *"G." tripartita*) and common *Catapsydrax dissimilis* and *Catapsydrax unicavus*. Common pseudohastigerinids are recorded in the small-sized fractions. Preservation is moderate close to the base but improves higher in the interval.

Zone P16/P17 (*Turborotalia cerroazulensis* group–*Hantkenina* spp. Zone)

Top: LO all hantkeninids
Base: LO *Globigerinatheka semiinvoluta*

Hole 1209A: interval 198-1209A-14H-5, 36–37 cm, to 14H-CC
Hole 1210A: interval 198-1210A-14H-3, 147–148 cm, to 14H-CC

Hole 1211A: interval 198-1211A-9H-5, 27–29 cm, to 10H-1, 118–119 cm

Remarks: The top of the zone is placed at the LO of fragments of hantkeninids. In the absence of *G. semiinvoluta*, the base of the zone is placed at the FO of *Subbotina gortanii* in Holes 12109A and 1211A and at the FO of *Tenuitellinata angustiumbilicata* in Hole 1210A. According to the literature (Premoli Silva and Boersma, 1988) the latter taxon appears around the base of Zone P16. Fragments of *Cribrohantkenina inflata* are sporadically preserved throughout the interval. The faunal assemblage includes few *Turborotalia ampliapertura*, *Dentoglobigerina pseudovenezuelana*, *Subbotina angiporoides*, *T. angustiumbilicata*, common subbotinids, *C. unicavus,* and *C. dissimilis*. Preservation is very poor with specimens highly fragmented; residues are scarce with very abundant phillipsite.

Zone P15 (*Globigerinatheka semiinvoluta* Zone)

Top: LO *Globigerinatheka semiinvoluta*
Base: LO *Truncorotaloides rohri*

Hole 1209A: interval 198-1209A-15H-1, 27–29 cm, to 15H-3, 27–29 cm
Hole 1210A: interval 198-1210A-15H-1, 27–29 cm, to 15H-4, 27–29 cm
Hole 1211A: interval 198-1211A-10H-2, 27–29 cm, to 10H-5, 27–29 cm

Remarks: The index species *G. semiinvoluta* and *T. rohri*, delimiting the top and bottom of this zone respectively, are both absent in the holes investigated. Since only a few species could be identified in this interval because of strong fragmentation, the base of the zone is placed at the FO of *Globorotaloides permicrus*, according with Premoli Silva and Boersma (1988). Moreover, the presence of (1) "*G.*" *venezuelana*, *Globigerina officinalis*, *C. unicavus*, and *C. dissimilis*; (2) rare fragments of *Hantkenina alabamensis* and rare specimens of *Globigerinatheka luterbacheri* in all the holes; and (3) *T. ampliapertura* close to the base of the interval in Hole 1209A and *D. pseudovenezuelana* close to the top of the interval in Hole 1209A supports the assignment of this interval to Zone P15. If this is correct, then the specimens of *Subbotina senni*, *Subbotina crociapertura*, *Globigerinatheka subconglobata*, and *Globigerinatheka kugleri* recorded throughout this interval in the three holes, as well as rare small acarininids in Hole 1210A, must be reworked from older layers. Preservation is very poor and the assemblages are almost entirely fragmented; phillipsite is abundant.

Zone P14 (*Truncorotaloides rohri–Morozovella spinulosa* Zone)

Top: LO *Truncorotaloides rohri*
Base: LO *Orbulinoides beckmanni*

Hole 1209A: interval 198-1209A-15H-3, 127–129 cm, to 15H-7, 27–29 cm
Hole 1210A: interval 198-1210A-15H-4, 127–129 cm
Hole 1211A: interval 198-1211A-10H-5, 127–129 cm, to 10H-CC

T17. Planktonic foraminifers, Hole 1211A, Zones P14–P18, p. 53.

T18. Stratigraphic position of events, p. 55.

Remarks: The depauperate character of these assemblages plus the almost total absence of acarininids hindered biostratigraphy. Hence, the top of the zone is approximated by the FO of *G. permicrus* (see above). In Hole 1209A this interval is characterized by the occurrence of *Paragloborotalia nana*, *G. officinalis,* and *Globorotaloides suteri* close to the base, whereas *Subbotina praeturritilina* first occurs close to the top of the interval (Premoli Silva and Boersma, 1988) in Hole 1211A. The assemblages are dominated by *Globigerinatheka index*, *Globigerinatheka mexicana*, and subbotinids. Rare specimens of *Turborotalia pomeroli*, *T. cerroazulensis*, and *Globigerinatheka tropicalis* are also recorded. Only one sample with a comparable faunal assemblage was found in Hole 1210A. Throughout this interval in all three holes the assemblages contain reworked specimens of *Guembelitrioides nuttalli*, *G. subconglobata*, and *G. kugleri*. Preservation is very poor and the assemblage is dominated by dissolution-resistant species; phillipsite is abundant.

Zone P13 (*Orbulinoides beckmanni* Total Range Zone)

Total range of the nominal taxon

Hole 1209A: Section 198-1209A-15H-CC
Hole 1210A: interval 198-1210A-15H-4, 127–129 cm
Hole 1211A: absent

Remarks: The nominal taxon occurs in only one sample in both Holes 1209A and Hole 1209B. The assemblage is characterized by rare *Acarinina esnaensis*, *Acarinina spinuloinflata,* and few to common large globigerinathekids. The same assemblage, except for *O. beckmanni*, is found in one sample from Hole 1210A; it is assigned to Zone P13 based on the absence of taxa indicating either higher or lower stratigraphic zone. This interval is probably absent in Hole 1211A. Preservation is very poor, fragmentation is high, and phillipsite is common.

Zone P12 (*Morozovella lehneri* Zone)

Top: FO *Orbulinoides beckmanni*
Base: LO *Morozovella aragonensis*

Hole 1209A: interval 198-1209A-16H-2, 27–29 cm, to 16H-5, 27–29 cm
Hole 1210A: interval 198-1210A-15H-5, 27–29 cm, to 16H-1, 27–29 cm
Hole 1211A: interval 198-1211A-11H-1, 27–29 cm

Remarks: In Hole 1210A the top of the zone is placed at the LO of *Globigerinatheka curryi* (Toumarkine and Luterbacher, 1985). The base is defined by the LO of *M. aragonensis*. The assemblages throughout this interval are dominated by the globigerinathekids, mainly *G. index*, *G. koroktovi*, *G. mexicana,* and *G. kugleri*, with rare specimens of *G. curryi* and *G. euganea* present in Hole 1210A. Several species of acarininids (*A. bullbrooki*, *A. spinuloinflata*, *A. matthewsae*, and *A. esnaensis*), along with *Igorina broedermanni,* are present lower within this interval. These taxa gradually decrease in abundance, and most of them disappear before the top of the interval; notable exceptions are *A. spinuloinflata* and *A. esnaensis*. The first occurrence of *T. pomeroli* is recorded near the base of the zone in Hole 1209A but slightly above the zone base in Hole 1210A. Only one

sample from Hole 1211A can be assigned to Zone P12 owing to very poor preservation. Preservation is poor to moderate, fragmentation is high, and phillipsite is common.

Zone P11 (*Globigerinatheka subconglobata subconglobata* Zone)

Top: LO *Morozovella aragonensis*
Base: FO *Globigerinatheka mexicana*

Hole 1209A: interval 198-1209A-16H-5, 127–129 cm, to 17H-4, 27–29 cm
Hole 1210A: interval 198-1210A-16H-1, 127–129 cm, to 16H-CC
Hole 1211A: interval 198-1211A-11H-1, 127–129 cm, to 11H-7, 27–29 cm

Remarks: The top of the zone is well defined by the LO of *M. aragonensis* in Holes 1209A and 1211A, whereas in Hole 1210A the top of the zone is tentatively placed at the FO of *M. lehneri* (Toumarkine and Luterbacher, 1985; Premoli Silva and Boersma, 1988). Conversely, the lower boundary with Zone P10 is difficult to identify. The topmost assemblages of Zone P11 are characterized by common specimens of the nominal taxon, as well as *G. mexicana*, *G. kugleri*, *G. koroktovi*, *G. index*, *Subbotina cryptomphala*, and very rare fragments of *Hantkenina dumblei* and *Globigerinatheka barri* in Hole 1210A. Below these rich layers there is a short interval characterized by highly fragmented assemblages associated with common phillipsite, suggesting that a hiatus spanning the middle part of the interval is possibly present. The lower assemblages are characterized by common morozovellids and acarininids along with common *G. subconglobata* and the absence of *G. mexicana*. In the absence of *G. mexicana*, we use the FO of *G. subconglobata* to delimit the base of Zone P11. The other possibility is to place the base of Zone P11 at the LO of *Morozovella caucasica*, which disappears within Zone P10 according to the literature (Blow, 1979; Toumarkine and Luterbacher, 1985). However, we prefer to use a first occurrence event instead of a last occurrence of a taxon. Preservation is poor to moderate and fragmentation is generally high throughout.

Zone P10 (*Hantkenina nuttalli* Zone)

Top: FO of *Globigerinatheka mexicana*
Base: FO *Hantkenina nuttalli*

Hole 1209A: interval 198-1209A-17H-4, 124–126 cm, to 18H-2, 128–130 cm
Hole 1210A: interval 198-1210A-17H-1, 27–29 cm, to 18H-3, 28–30 cm
Hole 1211A: interval 198-1211A-11H-CC

Remarks: As reported above, the top of the zone is tentatively drawn at the FO of *G. subconglobata*. Since the hantkeninids are very rare and biostratigraphically unreliable, the base of Zone P10 is placed at the FO of *S. crociapertura* in Hole 1209A and at the FO of *I. broedermanni anapetes* in Holes 1210A and 1211A. Both taxa, according to the literature (Blow, 1979), appear close to the FO of the hantkeninids. *A. spinuloinflata* first appears close to the base of Zone P10 in Hole 1210A, whereas *Truncorotaloides topilensis* appears within the zone in Holes 1209A and 1210A.

The assemblages are dominated by small acarininids, *A. bullbrooki*, *A. cuneicamerata*, and *I. broedermanni*. There are also common specimens of *G. nuttalli* and *S. senni*. Morozovellids are represented by common to few *M. aragonensis* and *M. caucasica*, while *M. crassata* and *M. spinulosa* are rare. Subbotinids are large and abundant in the upper part of the zone. Rare fragments of hantkeninids are first recorded within this zone in Hole 1209A. Only one sample from Hole 1211A could be assigned to this zone. Preservation ranges from poor to moderate; fragmentation is generally high throughout the interval.

Zone P9 (*Planorotalites palmerae–Acarinina pentacamerata* Zone)

Top: FO *Hantkenina nuttalli*
Base: FO *Planorotalites palmerae*

Hole 1209A: interval 198-1209A-18H-3, 28–30 cm, to 19H-3, 127–129 cm
Hole 1210A: interval 198-1210A-18H-3, 131–133 cm, to 18H-4, 26–28 cm
Hole 1211A: interval 198-1211A-12H-1, 27–29 cm, to 12H-2, 127–129 cm

Remarks: The marker taxon *P. palmerae* is absent as well as are several of the secondary events usually used to identify both boundaries of this zone. As reported above, the top of the zone is drawn at the FO of *S. crociapertura* in Hole 1209A and *I. broedermanni anapetes* in Holes 1210A and 1211A. The base of the zone is tentatively placed at the FO of *G. nuttalli* (= *Guembelitrioides higginsi*, junior synonym), a taxon that appears close to the boundary between Zones P9 and P8 (Toumarkine and Luterbacher, 1985; Blow, 1979). These assemblages contain common subbotinids, such as *S. eocaenica* and large *S. inaequispira*, and *Turborotalia frontosa*. Acarininids are abundant, and morozovellids are mainly represented by *M. aragonensis* and *M. caucasica* with few *M. spinulosa*. The interval is more expanded in Hole 1209A than in the other holes. Preservation ranges from poor to moderate.

Zone P8 (*Morozovella aragonensis* Zone)

Top: FO *Planorotalites palmerae*
Base: LO *Morozovella formosa*

Hole 1209A: interval 198-1209A-19H-4, 27–29 cm, to 19H-CC
Hole 1210A: interval 198-1210A-18H-4, 131–133 cm, to 19H-1, 127–129 cm
Hole 1211A: interval 198-1211A-12H-3, 29–31 cm, to 12H-4, 127–129 cm

Remarks: The FO of *G. nuttalli* is used to mark the top of this zone, and the base was drawn at the LO of *M. formosa*. Several species appear in this interval including *A. pentacamerata* close to the base, followed by *M. spinulosa*, *M. caucasica,* and *Dentoglobigerina yeguaensis* slightly above all the aforementioned events. *Morozovella lensiformis* and *Acarinina soldadoensis* disappear in the upper half of the interval, whereas *Acarinina wilcoxensis* disappears at the top. *S. senni* increases in abundance through this interval. The assemblages are characterized by the common occurrence of small acarininids and medium-sized morozovellids. Preserva-

tion ranges from good to moderate in the lower part to poor in the upper part. At the top of the interval planktonic foraminifers are highly fragmented in Holes 1209A and 1210A, whereas this portion is may be missing in Hole 1211A.

Zone P7 (*Morozovella formosa formosa* Zone)

Top: LO *Morozovella formosa*
Base: FO *Morozovella aragonensis*

Hole 1209A: interval 198-1209A-21H-1, 27–29 cm, to 21H-3, 50–51 cm
Hole 1210A: interval 198-1210A-19H-2, 27–29 cm, to 20H-2, 127–129 cm
Hole 1211A: interval 198-1211A-12H-5, 27–29 cm, to 13H-1, 82 cm

Remarks: The zonal boundaries are well constrained by the nominal events. The assemblages in the large-sized fraction are dominated by large morozovellids such as *M. aragonensis* and *M. formosa*, and acarininids (*A. soldadoensis*, *A. coalingensis*, and *A. angulosa*). *Catapsydrax taroubaensis* appears at the base and *S. senni* close to the top of the zone. Subbotinids range in abundance from few to common in the small-sized fraction. The assemblage is also characterized by the presence of *I. broedermanni* and rare chiloguembelinids and globanomalinids. Preservation ranges from moderate to good.

Zone P6 (*Morozovella subbotinae* Zone)

Top: FO *Morozovella aragonensis*
Base: LO *Morozovella velascoensis*

Hole 1209A: interval 198-1209A-21H-3, 68–69 cm, to 21H-5, 49–50 cm
Hole 1210A: interval 198-1210A-20H-3, 27–29 cm, to 20H-4, 90–91 cm
Hole 1211A: interval 198-1211A-13H-1, 27–29 cm, to 13H-5, 86–87 cm

Remarks: The zonal boundaries are well constrained by the nominal events.

Subzone P6b (*Morozovella lensiformis* Subzone)

Top: FO *Morozovella aragonensis*
Base: FOs *Morozovella formosa* and *Morozovella lensiformis*

Hole 1209A: interval 198-1209A-21H-3, 68–69 cm
Hole 1210A: interval 198-1210A-20H-3, 27–29 cm, to 20H-3, 127–129 cm
Hole 1211A: interval 198-1211A-13H-1, 27–29 cm, to 13H-4, 128–130 cm

Remarks: The subzonal boundaries are well constrained by the nominal events. In Holes 1209A and 1210A this subzone is very thin, but it is remarkably more expanded in Hole 1211A. Faunal assemblages include abundant acarininids, *M. lensiformis*, *M. formosa*, common *Morozovella*

marginodentata, and few subbotinids. Chiloguembelinids and globanomalinids are common in the small-sized fraction. Preservation is good.

Subzone P6a (*Morozovella edgari* Subzone)

Top: FO *Morozovella formosa* and *Morozovella lensiformis*
Base: LO *Morozovella velascoensis*

Hole 1209A: interval 198-1209A-21H-4, 129–130 cm, to 21H-5, 49–50 cm
Hole 1210A: interval 198-1210A-20H-4, 27–29 cm, to 20H-4, 90–91 cm
Hole 1211A: interval 198-1211A-13H-5 28–29 cm, to 13H-5, 86–87 cm

Remarks: The subzonal boundaries are constrained by the nominal events. The base is also marked by the appearance of *M. marginodentata* and *Acarinina pseudotopilensis* and the disappearance of *Morozovella acuta*. *A. soldadoensis* and *A. coalingensis* dominate the assemblages, whereas morozovellids (*M. subbotinae*, *M. gracilis*, and *M. aequa*) are subordinate. Large-sized chiloguembelinids are few. Preservation is good.

Zone P5 (*Morozovella velascoensis* Zone)

Top: LO *Morozovella velascoensis*
Base: LO *Globanomalina pseudomenardii*

Hole 1209A: interval 198-1209A-21H-5, 129–130 cm, to 22H-1, 29–31 cm
Hole 1210A: interval 198-1210A-20H-5, 19–20 cm, to 21H-1, 127–129 cm
Hole 1211A: interval 198-1211A-13H-5, 128–129 cm, to 13H-7, 27–29 cm

Remarks: The zonal boundaries are well constrained by the nominal events, although the LO of *M. velascoensis* is very gradual at the top of the zone. The assemblages are characterized by common globanomalinids (mainly *G. australiformis*), *A. soldadoensis*, *M. subbotinae,* and *Morozovella occlusa*. Large chiloguembelinids commonly occur in Holes 1209A and 1210A in the uppermost part of the zone. *Acarinina subsphaerica* disappears just above the base. Rare specimens of *Morozovella africana* and *Morozovella allisonensis*, the so-called "excursion" taxa, are found in the small-sized fractions of Hole 1209A and 1211A demarcating the Paleocene/Eocene Thermal Maximum (PETM). Preservation is in general moderate with fragmented morozovellids and improves toward the top of the interval.

Zone P4 (*Globanomalina pseudomenardii* Zone)

Total Range of *Globanomalina pseudomenardii*

Hole 1209A: interval 198-1209A-22H-1, 131–133 cm, to 24H-2, 25–27 cm
Hole 1210A: interval 198-1210A-21H-2, 27–29 cm, to 23H-1, 128–130 cm
Hole 1211A: interval 198-1211A-13H-CC to 15H-1, 27–29 cm

Remarks: This zone is well constrained by the total range of the nominal taxon.

Subzone P4c (*Acarinina soldadoensis* Subzone)

Top: LO *Globanomalina pseudomenardii*
Base: FO *Acarinina soldadoensis*

Hole 1209A: interval 198-1209A-22H-1, 131–133 cm, to 23H-1, 127–129 cm
Hole 1210A: interval 198-1210A-21H-2, 27–29 cm, to 22H-2, 92–94 cm
Hole 1211A: interval 198-1211A-13H-CC to 14H-4, 27–29 cm

Remarks: The lower zonal boundary is well constrained by the nominal event. This subzone is characterized by the common occurrence of large acarininids such as *A. soldadoensis* and *A. mckannai* as well as *M. occlusa* and *M. velascoensis*. The faunal assemblages contain *A. coalingensis*, *A. decepta*, few to common *A. subsphaerica* throughout the interval, and *M. subbotinae* toward the top. *Igorina pusilla*, including high-spired morphotypes *Igorina albeari* and *Igorina tadjikistanensis* become extinct at the top along with *G. pseudomenardii*. Preservation is moderate on average, although several samples show high fragmentation.

Subzone P4b (*Acarinina subsphaerica–Acarinina soldadoensis* Subzone)

Top: FO *Acarinina soldadoensis*
Base: LO *Acarinina subsphaerica*

Hole 1209A: interval 198-1209A-23H-2, 26–28 cm, to 23H-5, 27–29 cm
Hole 1210A: interval 198-1210A-22H-2, 128–130 cm, to 22H-6, 27–29 cm
Hole 1211A: interval 198-1211A-14H-4, 128–130 cm, to 14H-5, 127–129 cm

Remarks: The LO of *A. subsphaerica* cannot be used to place the base of the subzone, as the nominal taxon extends up to the base of Zone P5. Therefore, the base of Subzone P4b is tentatively placed at the LO of *Morozovella conicotruncata*. The assemblages are dominated by igorinids (*I. pusilla*, *I. tadjikistanensis,* and *I. albeari*) and large acarinininids. In Hole 1210A *A. subsphaerica* is absent in the lower part of the subzone and becomes common near the top, whereas it is present in the lower part of the subzone in the other two holes. Subbotinids range from few to common in abundance. This subzone also includes a short, more clay rich interval characterized by small residues composed only by igorinids. Preservation is generally poor, with common fragments of morozovellids.

Subzone P4a (*Acarinina subsphaerica* Subzone)

Top: LO *Acarinina subsphaerica*
Base: FO *Globanomalina pseudomenardii*

Hole 1209A: interval 198-1209A-23H-5, 127–129 cm, to 24H-2, 25–27 cm
Hole 1210A: interval 198-1210A-22H-6, 127–129 cm, to 23H-1, 128–130 cm
Hole 1211A: interval 198-1211A-14H-6, 27–29 cm, to 15H-1, 27–29 cm

Remarks: As *A. subsphaerica* is found only in Hole 1211A close to the top of the interval, its LO cannot be used for placing the upper boundary of the subzone, which is drawn here at the LO of *M. conicotruncata*. The lower subzonal boundary is constrained by the FO of *G. pseudomenardii*. The large-sized fractions are dominated by *M. conicotruncata*, *M. velascoensis,* and *M. occlusa*. *Morozovella angulata* and *Morozovella abundocamerata* are common at the base of the subzone and become extinct close to the top. Rare *M. acuta* occurs throughout, whereas *M. aequa* and *Morozovella pasionensis* appear in the upper half of the interval. Characteristic elements of the assemblages in this subzone include *I. pusilla*, *I. tadjikistanensis*, *I. albeari*, *Subbotina triangularis,* and *S. velascoensis*. Preservation ranges from moderate to good in Holes 1210A and 1211A, whereas it is poor in the upper half of the subzone in Hole 1209A.

Zone P3 (*Igorina pusilla* Zone)

Top: FO *Globanomalina pseudomenardii*
Base: FO *Morozovella angulata*

Hole 1209A: interval 198-1209A-24H-2, 127–129 cm, to 24H-6, 26–28 cm
Hole 1210A: interval 198-1210A-23H-2, 27–29 cm, to 23H-4, 128–130 cm
Hole 1211A: interval 198-1211A-15H-1, 27–29 cm, to 15H-2, 127–129 cm

Remarks: The zonal boundaries are well constrained by the nominal events.

Subzone P3b (*Igorina albeari* Subzone)

Top: FO *Globanomalina pseudomenardii*
Base: FO *Igorina albeari*

Hole 1209A: interval 198-1209A-24H-2, 127–129 cm, to 24H-4, 127–129 cm
Hole 1210A: interval 198-1210A-23H-2, 27–29 cm, to 23H-3, 21–30 cm
Hole 1211A: interval 198-1211A-15H-1, 27–29 cm

Remarks: The subzonal boundaries are well constrained by the nominal events. The assemblage in the large-sized fraction (>250 µm) is dominated by *M. angulata* and *M. abundocamerata*. Within this subzone the FOs of *I. tadjikistanensis*, *M. velascoensis*, and *Morozovella apanthesma* are recorded, as well as that of *M. acuta,* near the top of the subzone where *Morozovella praeangulata* disappears. The small-sized fraction is characterized by the common occurrence of *Globanomalina imitata*. In Hole 1211A the interval is represented by only one sample. Preservation ranges from good in the lower part to poor in the upper part of Hole

1209A and is moderate in Holes 1210A and 1211A; in the latter hole the upper part of the subzone is possibly missing.

Subzone P3a (*Morozovella angulata* Subzone)

Top: FO *Igorina albeari*
Base: FO *Morozovella angulata*

Hole 1209A: interval 198-1209A-24H-5, 26–28 cm, to 24H-6, 26–28 cm
Hole 1210A: interval 198-1210A-23H-3, 108–110 cm, to 23H-4, 128–130 cm
Hole 1211A: interval 198-1211A-15H-2, 27–29 cm, to 15H-2, 127–129 cm

Remarks: The base of the subzone coincides with the FO of the nominal taxon. *Praemurica praecursoria*, *P. praecursoria carinata, Praemurica uncinata,* and *Praemurica inconstans* disappear at the top of the interval, whereas *I. pusilla*, *M. abundocamerata,* and *M. conicotruncata* first appear near the top. Globoanomalinids are common as well as subbotinids. Preservation is poor at the base, improving to good upsection in Holes 1210A and 1211A, whereas it is generally good in Hole 1209A.

Zone P2 (*Praemurica uncinata* Zone)

Top: FO *Morozovella angulata*
Base: FO *Praemurica uncinata*

Hole 1209A: interval 198-1209A-24H-6, 128–130 cm, to 25H-1, 127–129 cm
Hole 1210A: interval 198-1210A-23H-5, 27–29 cm, to 23H-6, 27–29 cm
Hole 1211A: interval 198-1211A-15H-3, 27–29 cm

Remarks: The zonal boundaries are well constrained by the nominal events. The FO of *P. uncinata* is followed by the FOs of *P. praecursoria* then *M. praeangulata* and *P. praecursoria carinata* in the upper part of the zone in Hole 1209A. Common specimens of *Praemurica trinidadensis* are confined to the base of the zone in Holes 1209A and 1210A. The assemblages in the small-sized fractions are dominated by globanomalinids (*G. imitata* and *G. ehrenbergi*) and chiloguembelinids (*C. subtriangularis* and *C. midwayensis*). This interval is thinner in Hole 1210A and represented by only one sample in Hole 1211A, indicating that the zone is condensed or incomplete. Preservation ranges from moderate to good.

Zone P1 (*Parasubbotina pseudobulloides* Zone)

Top: FO *Praemurica uncinata*
Base: LO of *Parvularugoglobigerina eugubina*

Hole 1209A: interval 198-1209A-25H-2, 127–129 cm, to 25H-6, 26–28 cm
Hole 1210A: interval 198-1210A- 23H-6, 128–130 cm, to 24H-3, 27–29 cm
Hole 1211A: interval 198-1211A-15H-3, 127–129 cm, to 15H-4, 45–46 cm

Remarks: The zonal boundaries are well constrained by the nominal events.

Subzone P1c (*Globanomalina compressa–Praemurica inconstans* Subzone)

Top: FO *Praemurica uncinata*
Base: FO *Globanomalina compressa* and/or *Praemurica inconstans*

Hole 1209A: interval 198-1209A-25H-2, 127–129 cm, to 25H-4, 26–28 cm
Hole 1210A: interval 198-1210A- 23H-6, 128–130 cm, to 24H-3, 27–29 cm
Hole 1211A: interval 198-1211A-15H-3, 127–129 cm, to 15H-4, 4–5 cm

Remarks: The base of the subzone is placed at the FO of *P. inconstans,* whereas *G. compressa* is found only in the upper part of the interval. *Subbotina cancellata* and *C. subtriangularis* appear near the top of Holes 1209A and 1210A. Faunal assemblages are mainly composed of praemuricates and subbotinids, and chiloguembelinids in the fine fraction. Preservation is poor in Holes 1209A and 1210A and moderate in Hole 1211A. Some reworking of upper Maastrichtian taxa is recorded throughout the interval in Holes 1209A and 1210A.

Subzone P1a–P1b

Top P1b: FO *Globanomalina compressa* and/or *Praemurica inconstans*
Base P1b: FO *Subbotina triloculinoides*

Top P1a: FO *Subbotina triloculinoides*
Base P1a: LO *Parvularugoglobigerina eugubina*

Hole 1209A: interval 198-1209A-25H-4, 127–129 cm, to 25H-6, 26–28 cm
Hole 1210A: absent
Hole 1211A: interval 198-1211A-15H-4, 45–46 cm

Remarks: Subzones P1a and P1b cannot be separated, as *S. triloculinoides*, the marker for the base of Subzone P1b, is first recorded at the same level as the FO of *P. inconstans*, the marker taxon of the overlying subzone. The interval is characterized by common chiloguembelinids and woodringinids that decrease in abundance in the upper part. This interval is absent in Hole 1210A and is represented by only one sample in Hole 1211A. Preservation is moderate.

Zone Pα (*Parvularugoglobigerina eugubina* Total Range Zone)

Total range of the nominal taxon.

Hole 1209A: below sample 198-1209A-26H-5, 93–94 cm
Hole 1210A: below sample 198-1210A-24H-3, 127–129 cm
Hole 1211A: below sample 198-1211A-15H-4, 88–89 cm

Remarks: Only the top of this zone is considered here, as Zone Pα was investigated in detail by **Premoli Silva et al.** (this volume). The upper-

most samples belonging to Zone Pα are characterized by abundant *P. eugubina* and common to abundant *Woodringina hornerstownensis* and *Chiloguembelina morsei* in Hole 1209A. In contrast, *P. eugubina* and chiloguembelinids are rare and woodringinids are common to abundant in Holes 1210A and 1211A. Preservation ranges from moderate to good.

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APPENDIX

Species List

Species are listed in alphabetical order.

Acarinina Subbotina, 1953

Acarinina acceleratoria Khalilov, 1967

Acarinina angulosa (Bolli) = *Globigerina soldadoensis angulosa* Bolli, 1957

Acarinina aquiensis (Loeblich and Tappan) = *Globigerina aquiensis* Loeblich and Tappan, 1957

Acarinina aspensis (Colom) = *Globigerina aspensis* Colom, 1954

Acarinina bullbrooki (Bolli) = *Globorotalia bullbrooki* Bolli, 1957

Acarinina camerata Khalilov, 1967

Acarinina coalingensis (Cushman and Hanna) = *Globigerina coalingensis* Cushman and Hanna, 1927

Acarinina collactea (Finlay) = *Globorotalia collactea* Finlay, 1939

Acarinina cuneicamerata (Blow) = *Globorotalia* (*Acarinina*) *cuneicamerata* Blow, 1979

Acarinina decepta (Martin) = *Globigerina decepta* Martin, 1943

Acarinina esnaensis (Le Roy) = *Globigerina esnaensis* Le Roy, 1953

Acarinina gravelli (Broennimann) = *Globigerina gravelli* Broennimann, 1952

Acarinina intermedia Subbotina, 1953

Acarinina matthewsae (Blow) = *Globorotalia* (*Acarinina*) *matthewsae* Blow, 1979

Acarinina mckannai (White) = *Globigerina mckannai* White, 1928

Acarinina nitida (Martin) = *Globigerina nitida* Martin, 1943

Acarinina pentacamerata (Subbotina) = *Globorotalia pentacamerata* Subbotina, 1947

Acarinina primitiva (Finlay) = *Globigerina primitiva* Finlay, 1947

Acarinina pseudotopilensis Subbotina, 1953

Acarinina rugosoaculeata Subbotina, 1953

Acarinina soldadoensis (Broennimann) = *Globigerina soldadoensis* Broennimann, 1952

Acarinina spinuloinflata (Bandy) = *Globigerina spinuloinflata* Bandy, 1949

Acarinina strabocella (Loeblich and Tappan) = *Globorotalia strabocella* Loeblich and Tappan, 1957

Acarinina subsphaerica (Subbotina) = *Globigerina subsphaerica* Subbotina, 1947

Acarinina triplex Subbotina, 1953

Acarinina wilcoxensis (Cuhsman and Ponton) = *Globorotalia wilcoxensis* Cushman and Ponton, 1932

Catapsydrax Bolli, Loeblich, and Tappan, 1957

Catapsydrax dissimilis (Cushman and Bermudez) = *Globigerina dissimilis* Cushman and Bermudez, 1937

Catapsydrax martini (Blow and Banner) = *Globigerinita martini* Blow and Banner, 1962

Catapsydrax unicavus Bolli, Loeblich and Tappan, 1957

Catapsydrax taroubaensis (Broennimann) = *Globigerina taroubaensis* Broennimann, 1952

Chiloguembelina Loeblich, and Tappan, 1956

Chiloguembelina midwayensis (Cushman) = *Guembelina midwayensis* Cushman, 1940

Chiloguembelina morsei (Kline) = *Guembelina morsei* Kline, 1943

Chiloguembelina subtriangularis Beckmann, 1957

Chiloguembelina trinitatensis (Cushman and Renz) = *Guembelina trinitatensis* Cushman and Renz, 1942

Chiloguembelina wilcoxensis (Cushman and Ponton) = *Guembelina wilcoxensis* Cushman and Ponton, 1932

Cribrohantkenina Thalmann, 1942

Cribrohantkenina inflata (Howe) = *Hantkenina inflata* Howe, 1928

Dentoglobigerina Blow, 1979

Dentoglobigerina yeguaensis (Weinzierl and Applin) = *Globigerina yeguaensis* Weinzierl and Applin, 1929

Dentoglobigerina pseudovenezuelana (Blow and Banner) = *Globigerina yeguaensis psedovenezuelana* Blow and Banner, 1962

Eoglobigerina Morozova, 1959

Eoglobigerina edita (Subbotina) = *Globigerina edita* Subbotina, 1953

Eoglobigerina eobulloides (Morozova) = *Globigerina* (*Eoglobigerina*) *eobulloides* Morozova, 1959

Eoglobigerina spiralis (Bolli) = *Globigerina spiralis* Bolli, 1957

Globanomalina Haque, 1956, emended

Globanomalina archeocompressa (Blow) = *Globorotalia* (*Turborotalia*) *archeocompressa* Blow, 1979

Globanomalina australiformis (Jenkins) = *Globorotalia australiformis* Jenkins, 1965

Globanomalina chapmani (Parr) = *Globorotalia chapmani* Parr, 1938

Globanomalina compressa (Plummer) = *Globigerina compressa* Plummer, 1926

Globanomalina ehrenbergi (Bolli) = *Globorotalia ehrenbergi* Bolli, 1957

Globanomalina imitata (Subbotina) = *Globorotalia imitata* Subbotina, 1953

Globanomalina planocompressa (Shutskaya) = *Globorotalia planocompressa planocompressa* Shutskaya, 1965

Globanomalina planoconica (Subbotina) = *Globorotalia planoconica* Subbotina, 1953

Globanomalina pseudomenardii (Bolli) = *Globorotalia pseudomenardii* Bolli, 1957

Globigerina d'Orbigny, 1826

Globigerina officinalis Subbotina, 1953

Globigerina praebulloides Blow, 1959

Large "*Globigerina*" d'Orbigny, 1826

"*Globigerina*" *euapertura* Jenkins, 1960

"*Globigerina*" *tapuriensis* Blow and Banner, 1962

"*Globigerina*" *tripartita* (Koch) = *Globigerina bulloides* (d'Orbigny) var. *tripartita* Koch, 1926

"*Globigerina*" *sellii* Borsetti, 1959

"Globigerina" venezuelana Hedberg, 1937

Globigerinatheka Broennimann, 1952

Globigerinatheka barri Broennimann, 1952

Globigerinatheka curryi Proto Decima and Bolli, 1970

Globigerinatheka euganea Proto Decima and Bolli, 1970

Globigerinatheka index (Finlay) = *Globigerinoides index* Finlay, 1939

Globigerinatheka kugleri (Bolli, Loeblich, and Tappan) = *Globigerapsis kugleri* Bolli, Loeblich and Tappan, 1957

Globigerinatheka luterbacheri Bolli = *Globigerinatheka subconglobata luterbacheri* Bolli, 1972

Globigerinatheka mexicana (Cushman) = *Globigerina mexicana* Cushman, 1925

Globigerinatheka "*micra*" (Shutskaya) = *Globigerinoides subconglobatus* var. *micra* Shutskaya, 1958

Globigerinatheka koroktovi (Keller) = *Globigerinoides koroktovi* Keller, 1946

Globigerinatheka semiinvoluta (Keijzer) = *Globigerinoides semiinvolutus* Keijzer, 1945

Globigerinatheka subconglobata (Shutskaya) = *Globigerinoides subconglobatus* var. *subconglobatus* Shutskaya, 1958

Globigerinatheka tropicalis (Blow and Banner) = *Globigerinoides tropicalis* Blow and Banner, 1962

Globoconusa Khalilov, 1956

Globoconusa daubjergensis (Broennimann) = *Globigerina daubjergensis* Broennimann, 1953

Globorotaloides Bolli, 1957

Globorotaloides carcoselleensis Toumarkine and Bolli, 1975

Globorotaloides suteri Bolli, 1957

Globorotaloides permicrus (Blow and Banner) = *Globorotalia* (*Turborotalia*) *permicra* Blow and Banner, 1962

Globoturborotalita Hofker, 1976

Globoturborotalita ouachitaensis (Howe and Wallace) = *Globigerina ouachitaensis* Howe and Wallace, 1932

Guembelitria Cushman, 1933

Guembelitria cretacea Cushman, 1933

Guembelitrioides El-Naggar, 1971

Guembelitrioides "lozanoi" (Colom) = *Globigerina lozanoi* Colom, 1954

Guembelitrioides nuttalli (= *higginsi*) (Hamilton) = *Globigerinoides nuttalli* Hamilton, 1953

Hantkenina Cushman, 1924

Hantkenina alabamensis Cushman, 1924

Hantkenina dumblei Weinzierl and Applin, 1929

Hantkenina liebusi Shokhina, 1937

Hantkenina mexicana Cushman, 1924

Igorina Davidzon, 1976

Igorina albeari (Cushman and Bermudez) = *Globorotalia albeari* Cushman and Bermudez, 1949

Igorina broedermanni (Cushman and Bermudez) = *Globorotalia broedermanni* Cushman and Bermudez, 1949

Igorina broedermanni anapetes (Blow) = *Globorotalia broedermanni anapetes* Blow, 1979

Igorina convexa (Subbotina) = *Globorotalia convexa* Subbotina, 1953

Igorina pusilla (Bolli) = *Globorotalia pusilla pusilla* Bolli, 1957

Igorina pusilla "high trochospire"

Remarks: This group includes the specimens of *I. pusilla* characterized by having a high trochospire. Similar morphotypes are illustrated by Olsson et al. (1999) from ODP Hole 761B (Wombat Plateau, Indian Ocean).

Igorina tadjikistanensis (Bykova) = *Globorotalia tadjikistanensis* Bykova, 1953

Morozovella McGowran in Luterbacher, 1964

Morozovella abundocamerata (Bolli) = *Globorotalia angulata abundocamerata* Bolli, 1957

Morozovella acuta (Toulmin) = *Globorotalia wilcoxensis* Cushman and Ponton var. *acuta* Toulmin, 1941

Morozovella acutispira (Bolli and Cita) = *Globorotalia acutispira* Bolli and Cita, 1960

Morozovella aequa (Cushman and Renz) = *Globorotalia crassata* var. *aequa* Cushman and Renz, 1942

Morozovella africana (El-Naggar) = *Globorotalia africana* El-Naggar, 1966

Morozovella allisonensis Kelly, Bralower, and Zachos, 1998

Morozovella angulata (White) = *Globigerina angulata* White, 1928

Morozovella apanthesma (Loeblich and Tappan) = *Globorotalia apanthesma* Loeblich and Tappan, 1957

Morozovella aragonensis (Nuttall) = *Globorotalia aragonensis* Nuttall, 1930

Morozovella caucasica (Glaessner) = *Globorotalia aragonensis* var. *caucasica* Glaessner, 1937

Morozovella conicotruncata (Subbotina) = *Globorotalia conicotruncata* Subbotina, 1947

Morozovella crassata (Cushman) = *Pulvinulina crassata* Cushman, 1925

Morozovella edgari (Premoli Silva and Bolli) = *Globorotalia edgari* Premoli Silva and Bolli, 1973

Morozovella formosa (Bolli) = *Globorotalia formosa formosa* Bolli, 1957

Morozovella gracilis (Bolli) = *Globorotalia formosa gracilis* Bolli, 1957

Morozovella lehneri (Cushman and Jarvis) = *Globorotalia lehneri* Cushman and Jarvis, 1929

Morozovella lensiformis (Subbotina) = *Globorotalia lensiformis* Subbotina, 1953

Morozovella marginodentata (Subbotina) = *Globorotalia marginodentata* Subbotina, 1953

Morozovella occlusa (Loeblich and Tappan) = *Globorotalia occlusa* Loeblich and Tappan, 1957

Morozovella pasionensis (Bermudez) = *Pseudogloborotalia pasionensis* Bermudez, 1961

Morozovella praeangulata (Blow) = *Globorotalia praeangulata* Blow, 1979

Morozovella quetra (Bolli) = *Globorotalia quetra* Bolli, 1957

Morozovella spinulosa (Cushman) = *Globorotalia spinulosa* Cushman, 1927

Morozovella subbotinae (Morozova) = *Globorotalia subbotinae* Morozova, 1939

Morozovella velascoensis (Cushman) = *Pulvinulina velascoensis* Cushman, 1925

Orbulinoides Cordey, 1968

Orbulinoides beckmanni (Saito) = *Porticulasphaera beckmanni* Saito, 1968

Paragloborotalia Cifelli, 1982

Paragloborotalia nana (Bolli) = *Globorotalia opima nana* Bolli, 1957

Parasubbotina Olsson, Hemleben, Berggren, and Liu, 1992

Parasubbotina pseudobulloides (Plummer) = *Globigerina pseudobulloides* Plummer, 1926

Parasubbotina varianta (Subbotina) = *Globigerina varianta* Subbotina, 1953

Parasubbotina variospira (Belford) = *Globorotalia* (*Turborotalia*) *variospira* Belford, 1984

Parvularugoglobigerina Hofker, 1978

Parvularugoglobigerina eugubina (Luterbacher and Premoli Silva) = *Globigerina eugubina* Luterbacher and Premoli Silva, 1964

Parvularugoglobigerina extensa (Blow) = *Eoglobigerina*? *extensa* Blow, 1979

Planorotalites Morozova, 1957

Planorotalites palmerae (Cushman and Bermudez) = *Globorotalia palmerae* Cushman and Bermudez, 1937

Planorotalites pseudoscitulus (Glaessner) = *Globorotalia pseudoscitula* Glaessner, 1937

Praemurica Olsson, Hemleben, Berggren, and Liu, 1992

Praemurica inconstans (Subbotina) = *Globigerina inconstans* Subbotina, 1953

Praemurica praecursoria (Morozova) = *Acarinina praecursoria* Morozova, 1957

Praemurica praecursoria carinata (El-Naggar) = *Globorotalia uncinata carinata* El-Naggar, 1966

Praemurica pseudoinconstans (Blow) = *Globorotalia* (*Turborotalia*) *pseudoinconstans* Blow, 1979

Praemurica taurica (Morozova) = *Globigerina* (*Eoglobigerina*) *taurica* Morozova, 1961

Praemurica trinidadensis (Bolli) = *Globorotalia trinidadensis* Bolli, 1957

Praemurica uncinata (Bolli) = *Globorotalia uncinata* Bolli, 1957

Pseudohastigerina Berggren and Olsson, 1959

Pseudohastigerina micra (Cole) = *Nonion micrus* Cole, 1927

Pseudohastigerina naguewichiensis (Myatliuk) = *Globigerinella naguewichiensis* Myatliuk, 1950

Pseudohastigerina wilcoxensis (Cushman and Ponton) = *Nonion wilcoxensis* Cushman and Ponton, 1932

Subbotina Brotzen and Pozaryska, 1961

Subbotina angiporoides (Hornibrook) = *Globigerina angiporoides* Hornibrook, 1965

Subbotina angiporoides minima (Jenkins) = *Globigerina angiporoides minima* Jenkins, 1966

Subbotina cancellata Blow, 1979

Subbotina cryptomphala (Glaessner) = *Globigerina bulloides* (d'Orbigny) var. *cryptomphala* Glaessner, 1937

Subbotina crociapertura Blow, 1979

Subbotina eocaena (Guembel) = *Globigerina eocaena* Guembel, 1868

Subbotina eocaenica (Terquem) = *Globigerina eocaenica* Terquem, 1882

Subbotina gortanii (Borsetti) = *Catapsydrax gortanii* Borsetti, 1959

Subbotina inaequispira (Subbotina) = *Globigerina inaequispira* Subbotina, 1953

Subbotina praeturritilina (Blow and Banner) = *Globigerina turritilina praeturritilina* Blow and Banner, 1962

Subbotina senni (Beckmann) = *Sphaeroidinella senni* Beckmann, 1953

Subbotina triangularis (White) = *Globigerina triangularis* White, 1928

Subbotina triloculinoides (Plummer) = *Globigerina triloculinoides* Plummer, 1926

Subbotina trivialis (Subbotina) = *Globigerina trivialis* Subbotina, 1953

Subbotina utilisindex (Jenkins and Orr) = *Globigerina utilisindex* Jenkins and Orr, 1972

Subbotina velascoensis (Cushman) = *Globigerina velascoensis* Cushman, 1928

Tenuitellinata Li, 1987

Tenuitellinata angustiumbilicata (Bolli) = *Globigerina ciperoensis angustiumbilicata* Bolli, 1957

Truncorotaloides Broennimann and Bermudez, 1953

Truncorotaloides libyaensis El Khoudary, 1977

Truncorotaloides rohri Broennimann and Bermudez, 1953

Truncorotaloides rohri mayoensis Broennimann and Bermudez, 1953

Truncorotaloides topilensis (Cushman) = *Globigerina topilensis* Cushman, 1925

Turborotalia Cushman and Bermudez, 1949

Turborotalia ampliapertura (Bolli) = *Globigerina ampliapertura* Bolli, 1957

Turborotalia boweri (Bolli) = *Globigerina boweri* Bolli, 1957

Turborotalia cerroazulensis (Cole) = *Globigerina cerro-azulensis* Cole, 1928

Turborotalia frontosa (Subbotina) = *Globigerina frontosa* Subbotina, 1953

Turborotalia increbescens (Bandy) = *Globigerina increbescens* Bandy, 1949

Turborotalia pomeroli (Toumarkine and Bolli) = *Globorotalia cerroazulensis pomeroli* Toumarkine and Bolli, 1970

Turborotalia prolata (Bolli) = *Globigerina prolata* Bolli, 1957

"*Turborotalia*" *griffinae* (Blow) = *Globorotalia* (*Turborotalia*) *griffinae* Blow, 1979

Woodringina Loeblich and Tappan, 1957

Woodringina claytonensis Loeblich and Tappan, 1957

Woodringina hornerstownensis Olsson, 1960

"*Globorotalia*" *reissi* Loeblich and Tappan, 1957

Table T1. Distribution of planktonic foraminifers, Hole 1209A, Zones Pα–P3b. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Parvularugoglobigerina eugubina*	*Woodringina hornerstownensis*	*Chiloguembelina morsei*	*Guembelitria cretacea*	*Parvularugoglobigerina extensa*	*Eoglobigerina eobulloides*	*Woodringina claytonensis*	*Subbotina trivialis*	*Praemurica taurica*	*Globanomalina archeocompressa*	*Globoconusa daubjergensis*	*Parasubbotina pseudobulloides*	*Chiloguembelina midwayensis*	*Praemurica pseudoinconstans*	*Eoglobigerina edita*	*Globanomalina planocompressa*	*Subbotina triloculinoides*	*Chiloguembelina subtriangularis*	*Praemurica inconstans*	*Parasubbotina varianta*	*Globanomalina compressa*	*Subbotina cancellata*	*Praemurica uncinata*	*Globanomalina imitata*	*Globanomalina ehrenbergi*	*Eoglobigerina spiralis*	Globanomalinids	*Praemurica trinidadensis*	*Morozovella praeangulata*	*Praemurica praecursoria*	Chiloguembelinids	*Praemurica praecursoria carinata*	*Globanomalina chapmani*	*Morozovella angulata*	*Morozovella abundocamerata*
198-1209A-																																						
24H-2, 127–129		219.97	P																							C									F		F/C
24H-3, 27–29		220.47	P																							F/C									F	C	F/C
24H-3, 127–129	P3b	221.47	M												F/C										F		F/C	F	VR			C			F/C	F/C	C
24H-4, 26–28		221.96	M												F/C										F		R/F			F		C			F/C	C	C
24H-4, 127–129		222.97	G												F/C								C		R/F		F/C	F	F			R/F			F	C	C
24H-5, 26–28		223.46	G												C						R/F	R	F		F	R/F	F/C	F	R/F			R/F	R/F		A	F	F/C	C
24H-5, 127–129	P3a	224.47	G																	F	R		F		F	C	R/F	R/F	C	C		F/C	C		C/A	C	F/C	R/F
24H-6, 26–28		224.96	G															F				C	F	F	F	C/A	C	R/F	F			F/C	C/A		C		F	
24H-6, 128–130		225.98	G												F							F	F	F	F	C			F	F		F/C	A	F	F	R		
24H-7, 22–24		226.42	P–M														C/A			F/C		C/A		F		F	R/F	R/F	C			C	C/A		F			
24H-CC	P2	227.90	M–G												F		F			F		C	R/F	C	F	C	R	F	F			R/F	C/A	F				
25H-1, 26–28		226.96	G												F	F	F			R/F	F	C/A	F	F		F	F/C	F	F	A	C/A	R/F	F/C	C				
25H-1, 127–129		227.97	G												F		F/C			F	F	C/A	F/C	F	F	F	F/C	R/F	F	A	R/F							
25H-2, 127–129		228.46	M–G												F	F	C/A	R/F		F/C	F	C	C	R	R													
25H-3, 26–28	P1c	229.47	P										F		C	F				F/C	F/C	F																
25H-3, 127–129		229.96	P–M			C/A							F		A			F/C		R	F		F															
25H-4, 26–28		231.46	G		A	A				F/C			F		F/C		C/A		R	F	F	F																
25H-4, 127–129		231.46	G		A	A				A		F	R		C	A	C/A	F/C																				
25H-5, 26–28	P1a/P1b	232.96	G		C/A	C/A	R/F		F/C	C	C/A	F	F	C	A		A	C		R																		
25H-5, 127–129		233.97	M–G		A	A	C		C	F/C	F	R	R	F/C	F	C/A	F	R/F																				
25H-6, 26–28		234.46	M–G		A	C/A	F/C		F	C	R/F		R/F	R	F	C/A	F																					
25H-6, 93–94	Pα	235.13	G	A	C/A	C/A	F	R	F	R/F	F	R	R																									

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Small res. = small residue, rew Cr = reworked Cretaceous taxa.

Table T1 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Igorina pusilla*	*Morozovella conicotruncata*	*Igorina albeari*	*Subbotina variospira*	*Igorina tadjikistanensis*	*Subbotina triangularis*	*Morozovella velascoensis*	*Morozovella apanthesma*	*Morozovella acuta*	Comments
198-1209A-													
24H-2, 127–129		219.97	P	R/F	C	R		R/F	F	C	R	R	Small res., fragmented
24H-3, 27–29		220.47	P	R/F	F/C	F/C	R		F				Small res., fragmented
24H-3, 127–129	P3b	221.47	M	F	F	F	F	R/F	R/F				Fragmented
24H-4, 26–28		221.96	M	F	R/F		F	R/F					Fragmented
24H-4, 127–129		222.97	G	F	R/F	R	F						
24H-5, 26–28		223.46	G	F	VR								
24H-5, 127–129	P3a	224.47	G										
24H-6, 26–28		224.96	G										
24H-6, 128–130		225.98	G										
24H-7, 22–24		226.42	P–M										Fragmented
24H-CC	P2	227.90	M–G										
25H-1, 26–28		226.96	G										
25H-1, 127–129		227.97	G										
25H-2, 127–129		228.46	M–G										Rew Cr
25H-3, 26–28	P1c	229.47	P										Fragmented, rew Cr
25H-3, 127–129		229.96	P–M										Fragmented
25H-4, 26–28		231.46	G										
25H-4, 127–129		231.46	G										
25H-5, 26–28	P1a/P1b	232.96	G										
25H-5, 127–129		233.97	M–G										
25H-6, 26–28		234.46	M–G										
25H-6, 93–94	Pα	235.13	G										

Table T2. Distribution of planktonic foraminifers, Hole 1209A, Zone P4. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Subbotina cancellata*	*Globanomalina imitata*	*Globanomalina ehrenbergi*	Chiloguembelinids	*Globanomalina chapmani*	*Morozovella angulata*	*Morozovella abundocamerata*	*Igorina pusilla*	*Morozovella conicotruncata*	*Igorina albeari*	*Subbotina variospira*	*Subbotina triangularis*	*Morozovella velascoensis*	*Morozovella apanthesma*	*Morozovella acuta*	*Subbotina velascoensis*	*Globanomalina pseudomenardii*	*Morozovella occlusa*	*Acarinina collactea*	*Subbotina inaequispira*	*Igorina tadjikistanensis*	*Morozovella acutispira*	Globanomalinids	*Morozovella aequa*	*Morozovella pasionensis*	*Igorina pusilla* high trochospire	*Acarinina nitida*	*Acarinina subsphaerica*	*Acarinina mckannai*	*Acarinina soldadoensis*
198-1209A-																																	
22H-1, 131–133		199.51	G		F						VR		R		F	C			F/C	VR	A			R		F	F	R/F		F		F	A
22H-2, 29–31		199.99	M–G		R/F											F			F		C/A					F	F	F				F	A
22H-2, 131–133		201.01	M–G		F										F	F	F		C	VR	C/A				R		C/A			F		F/C	C/A
22H-3, 28–30		201.48	M–G		F						F		R		F	F/C	F		F/C		C/A		F	F/C		F	C	R/F		F	F	C	C/A
22H-3, 131–132		202.51	M								F				F	F/C	R/F	R	F	R/F	C			R/F	F		F/C		R/F		R/F	F	F
22H-4, 28–29		202.98	M		C						C/A				C/A	R/F	F	F	C	R	C/A		R	F/C			C/A	R/F	F/C	F	F	F	F
22H-4, 129–131	P4c	203.99	M		F						C/A		F		F	R/F	F		F		F/C			F/C	VR			R		F		F/C	F
22H-5, 29–31		204.49	P		F/C						C/A		R		F/C	R/F		R	F/C	R	C		R	C/A			F		F	R/F	F	C	F
22H-5, 140–142		205.60	P		F						A		C		F	R/F	R/F		F	R	F			F			F	R	F/C	F	F	R/F	C/A
22H-6, 26–28		205.96	M		F						C/A		R/F		F	R/F	F	R	C	R	C/A			C/A			F		R	F	F/C	C/A	C
22H-7, 25–27		206.95	M		F						C		F/C		C	F	R/F	F	C	F/C	C/A			R/F			R/F	F/C	R	F	F	F	F/C
22H-CC		207.37	G								F		R/F		F/C	F	F	R/F	C	F	A			F/C					R	F	F	C/A	R
23H-1, 28–30		207.98	M		F						F		R/F		F	F/C		R/F	C	R	C			F/C	VR			F	R	R	C	F	R
23H-1, 127–129		208.97	M		F						C/A		C		F	F	F	F	F	R/F	C			F/C	R		R	F	F	F	R/F	F	R
23H-2, 26–28		209.46	M		R						F		F		C	C/A	F	R	C/A	C	F			F	R			F	R	R/F	C/A	F	
23H-2, 127–129		210.47	P–M		F						F		A		F	F/C	F	R	F	VR	R/F			R/F				F	R/F	F	C/A	R/F	
23H-3, 27–29	P4b	210.97	P		F						C/A		A		F	R/F	F	C	R	VR	R/F			C	F			R/F	C	F	C/A	F	
23H-4, 26–28		212.46	P		F		C				A		C/A		F	F/C			F		F/C			C		C	R			R	R/F		
23H-4, 127–129		213.47	P		F		C		R		C/A		A		F	F/C	F		F	R	F			F	R				C	VR	VR		
23H-5, 27–29		213.97	M								C		C/A		F	C/A	F	F	F	VR	F			F	F			F/C	F				
23H-5, 127–129		214.97	M		F/C					R/F	F/C	R/F	C		C	F/C	F/C		F	R	C			R/F	R			F	F				
23H-6, 27–29		215.47	P	F	R						F/C		A		F	F/C	F		F	VR	C			R/F		C	R						
23H-6, 127–129		216.47	P		R/F						F		F		C	R/F	R		C	R	F		F	R/F									
23H-7, 27–29	P4a	216.97	M	F	F/C				R	R/F	F	R/F	F		F	C	F/C	F	C	R/F	C			F									
23H-CC		217.55	G	F	F/C	F	F		F		R/F	F/C	R/F		C	F/C	C		F	F	C				R	F							
24H-1, 29–31		217.49	G	F	F/C					C	F	C/A	F	R	F	F/C	R/F	R	C	R/F	C		F	R/F	R	C							
24H-1, 128–130		218.48	M	F	C				C	F/C	C	A	F		F/C	F/C	F/C			R/F	R	F	F	R/F	F								
24H-2, 25–27		218.95	P–M	F	F/C	R/F	F	R	F	F/C	F	C/A	F	F	F/C	F/C	F/C	R	C	R/F	R	R/F	R										

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Small res. = small residue, rew Cr = reworked Cretaceous taxa, Mz = morozovellids.

Table T2 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Morozovella subbotinae*	*Subbotina eocaenica*	*Acarinina coalingensis*	*Chiloguembelina wilcoxensis*	*Acarinina aquiensis*	*Acarinina esnaensis*	*Acarinina decepta*	Comments
198-1209A-											
22H-1, 131–133		199.51	G	C	R/F	F	R/F	F			Fragmented
22H-2, 29–31		199.99	M–G	C	F	F/C		F	F	R	Fragmented
22H-2, 131–133		201.01	M–G	F/C				F/C			Fragmented
22H-3, 28–30		201.48	M–G			F/C		R	F	F	Fragmented
22H-3, 131–132		202.51	M	F				F			Fragmented
22H-4, 28–29		202.98	M			F	R		R/F	VR	Fragmented
22H-4, 129–131	P4c	203.99	M	F		F	VR	R			Small res., fragmented
22H-5, 29–31		204.49	P			R/F					Small res., fragmented
22H-5, 140–142		205.60	P	R							Fragmented
22H-6, 26–28		205.96	M			R/F					Fragmented
22H-7, 25–27		206.95	M								
22H-CC		207.37	G		R						Fragmented
23H-1, 28–30		207.98	M								Fragmented
23H-1, 127–129		208.97	M								Fragmented
23H-2, 26–28		209.46	M								Fragmented
23H-2, 127–129		210.47	P–M								Small res. fragmented
23H-3, 27–29	P4b	210.97	P								Small res., fragmented, rew Cr
23H-4, 26–28		212.46	P								Small res. fragmented
23H-4, 127–129		213.47	P								Fragmented
23H-5, 27–29		213.97	M								Fragmented
23H-5, 127–129		214.97	M								Mz, fragmented
23H-6, 27–29		215.47	P								Small res., fragmented
23H-6, 127–129		216.47	P								Fragmented
23H-7, 27–29	P4a	216.97	M								
23H-CC		217.55	G								
24H-1, 29–31		217.49	G								
24H-1, 128–130		218.48	M								
24H-2, 25–27		218.95	P–M								

Table T3. Distribution of planktonic foraminifers, Hole 1209A, Zones P5–P6b.

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Globanomalina imitata*	Globanomalinids	Chiloguembelinids	*Morozovella velascoensis*	*Subbotina velascoensis*	*Morozovella occlusa*	*Acarinina soldadoensis*	*Acarinina coalingensis*	*Chiloguembelina wilcoxensis*	*Igorina tadjikistanensis*	*Morozovella pasionensis*	*Acarinina nitida*	*Acarinina subsphaerica*	*Acarinina mckannai*	*Morozovella aequa*	*Morozovella subbotinae*	*Subbotina eocaenica*	*Subbotina triangularis*	*Morozovella acuta*	*Acarinina decepta*	*Acarinina aquiensis*	*Acarinina angulosa*	*Igorina convexa*	*Morozovella gracilis*	*Morozovella edgari*	*Acarinina collactea*	*Morozovella allisonensis*	*Morozovella africana*	Pseudohastigerinids	*Globanomalina australiformis*
198-1209A-																																	
21H-3, 68–69	P6b	192.38	G		C	C		C		C	F	C						R	F/C	C	F						C		R				F
21H-4, 129–130	P6a	194.49	G		C	C		F		C	R/F	C							C	C	F/C		R		F	F	F/C	R/F					
21H-5, 49–50		195.19	G		C	F		F		A	R/F	F			R/F			F	F	F/C	F	VR	R/F		C/A	F/C	F	F					
21H-5, 129–130		195.99	M–G		C	C	R/F	F	F	C/A	C	R/F		R/F	F		R/F	C	C/A		F		F			R/F	C	F	F				
21H-6, 109–110		197.29	M–G		C	C	VR	F	F	C	F	F		R	R/F			C	C/A	F	F			R		R/F	F	C					F
21H-7, 19–20	P5	197.89	G		F/C	F	C/A	F	F	C/A		F			R/F		R/F	C	C	R	F/C	F				F	F	R/F	F	R	R	R	
21H-CC		198.24	G	F	C	F	R/F	R	C	A	F			R	F/C	R/F	F/C	F	C	F	F	F	R	F	R								
22H-1, 29–31		198.49	P	C/A	F/C	A	VR	R	R/F	R	R	C	R																				

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Large chilog. = large chiloguembelinids (>150 µm), small res. = small residue.

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Igorina albeari*	*Subbotina eocaena*	*Acarinina intermedia*	*Subbotina inaequispira*	*Acarinina esnaensis*	*Morozovella marginodentata*	*Acarinina pseudotopilensis*	*Igorina broedermanni*	*Morozovella lensiformis*	*Acarinina wilcoxensis*	*Morozovella formosa*	*Morozovella aragonensis*	Comments
198-1209A-																
21H-3, 68–69	P6b	192.38	G		F	F			C/A	F	F	F	C	C		Large chilog.
21H-4, 129–130	P6a	194.49	G		F		C	R/F	A	F	R/F					Large chilog.
21H-5, 49–50		195.19	G			R	F	F	F/C	F	R/F					Large chilog.
21H-5, 129–130		195.99	M–G	VR	R	F										Large chilog.
21H-6, 109–110		197.29	M–G													Large chilog.
21H-7, 19–20	P5	197.89	G													
21H-CC		198.24	G													
22H-1, 29–31		198.49	P													Small res., fragmented

Table T4. Distribution of planktonic foraminifers, Hole 1209A, Zones P7–P8. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Chiloguembelina wilcoxensis*	Chiloguembelinids	*Morozovella formosa*	*Morozovella gracilis*	*Morozovella marginodentata*	*Acarinina aquiensis*	*Acarinina coalingensis*	*Acarinina decepta*	*Acarinina esnaensis*	*Acarinina gravelli*	*Acarinina intermedia*	*Acarinina primitiva*	*Acarinina pseudotopilensis*	*Acarinina angulosa*	*Acarinina soldadoensis*	*Acarinina subsphaerica* s.l.	*Acarinina wilcoxensis*	*Globanomalina* sp.	*Igorina broedermanni*	*Morozovella aequa*	*Morozovella aragonensis*	*Morozovella lensiformis*	*Morozovella subbotinae*	*Subbotina eocaenica*	*Subbotina inaequispira*	*Pseudohastigerina wilcoxensis*	*Catapsydrax taroubaensis*	*Morozovella quetra*	*Subbotina senni*	*Acarinina aspensis*	*Morozovella caucasica*	*Acarinina pentacamerata*	*Guembelitrioides lozanoi*	*Acarinina bullbrooki*	*Dentoglobigerina yeguaensis*
198-1209A-																																					
19H-4, 27–29		174.47	G						VR	F	F	F	F		F	F	F				R	F		A			F	F		R	R	R	F	C	F	F	C	
19H-4, 128–130		175.48	M		R					R	C	F	F		F	F	C					F		A			F	R	VR		VR	F	F	C	F	R	F	VR
19H-5, 27–29		175.97	M		VR					R	R	R	F		F	F	C	R		R		F		A	R		F	R			F	F	F	C	F	F	C	VR
19H-5, 128–130	P8	176.98	G–M		R				VR	VR	F	VR	F		F	F	A	F					VR	A	VR		F	VR		VR	F	R	F	C	F	R	C	R
19H-6, 28–30		177.48	M		VR					F	F	F	F		F	F	C	F		R		F	VR	A	R		F	F	VR	R	F	F	F	C	F	F		
19H-7, 28–30		178.48	M		VR				R	F	F	F	F	VR	F	F	F	54		F	R	F		A	F		F	F			F	F	F	F	F			
19H-CC		178.95	M		R				F		C	F	F	VR	C	F	F	A		F		F	VR	AA	F		F	F		VR	F	F	F					
20H-1, 27–29		179.47	M		R	R	R		F	F	C	F	F		C	F	F	A	VR	F	VR	F		AA	R	R	C	F	VR	R	F	F						
20H-1, 127–129		180.47	M		R	F	R		R	F	C	R	F		C	F	F	C	R	F		F	VR	AA	R	VR	F	R		R	F	R						
20H-2, 27–29		180.97	G		VR	VR	VR		VR	F	C	F	F	VR	C	F	F	A	R	R	VR	F	VR	AA	R	R	F	F	VR	R	F	F						
20H-2, 127–129		181.97	M		R	F	VR		R	F	F	F	F	VR	C	F	F	A	VR	F		R	VR	A	R	F	F	F		R	R	F						
20H-3, 27–29		182.47	G–M			F	F		R	F	F	F	F		C	F	F	A	F	F	VR	F	R	A	F	R	F	F		VR		R						
20H-3, 127–129		183.47	M		VR	F	R	R	F	C	F	F	F	VR		F	F	A	F	F		R	VR	A	F	R	C	F	R	VR	R	VR						
20H-4, 27–29	P7	183.97	G		R	F	VR	R	F	C	F	F	F	VR	C	F	C	A	F	F		F	VR	C	R	F	F	VR		R	R							
20H-4, 127–129		184.97	G		VR	F	F	F	R	F	C	F	C	VR	C	C	F	C	F	F	VR	F	VR	C	R	R	F	VR		R									
20H-5, 27–29		185.47	G		VR	F	F	F	F	F	F	C	F	VR	C	C	C	A	F	F		F	VR	F	F	F	F	VR		VR									
20H-5, 127–129		186.47	G			F	F	F	R	F	F	F	F	R	C		F	C	F	F		F	R	R		F	F	VR										
20H-6, 27–29		186.97	G			F	C	F	F	F	C	F	F	VR	F	F		C	F	F	R	F	R	R	F	F	F	F	VR										
20H-7, 27–29		188.47	G		VR	F	A	F	F	F	F	R	F	F	F	F	F	C	F	F		F	R	F	C	F	F	F										
20H-CC		188.97	G		R	F	A	C	R	F	F	F	F	R	F	F	F	A	F	F	VR	F	R	F	C	F	F	R	VR										
21H-3, 50–51		192.20	G	C	C	F/C	C	C	R	R	R	F	F	R	R	F	F	F	VR	C	F	R	F	C	C	F		F										

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Large chilog. = large chiloguembelinids (>150 µm), O = ostracodes, ech = echinoids.

Table T4 (continued).

Score, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Truncorotaloides rohri mayoensis*	*Truncorotaloides rohri*	*Morozovella spinulosa*	*Truncorotaloides libyaensis*	Comments
198-1209A-								
19H-4, 27–29		174.47	G	F	A	R	F	O
19H-4, 128–130		175.48	M	F	C	F	F	
19H-5, 27–29		175.97	M	F	C	VR		O
19H-5, 128–130	P8	176.98	G–M					O, fish
19H-6, 28–30		177.48	M					
19H-7, 28–30		178.48	M					O, ech
19H-CC		178.95	M					O, fish
20H-1, 27–29		179.47	M					O, ech
20H-1, 127–129		180.47	M					O, ech
20H-2, 27–29		180.97	G					O
20H-2, 127–129		181.97	M					O
20H-3, 27–29		182.47	G–M					O
20H-3, 127–129		183.47	M					O
20H-4, 27–29	P7	183.97	G					O, ech
20H-4, 127–129		184.97	G					O
20H-5, 27–29		185.47	G					O
20H-5, 127–129		186.47	G					O
20H-6, 27–29		186.97	G					Ech
20H-7, 27–29		188.47	G					O
20H-CC		188.97	G					O
21H-3, 50–51		192.20	G					Large chilog.

Table T5. Distribution of planktonic foraminifers, Hole 1209A, Zones P9–P11. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina aquiensis*	*Acarinina coalingensis*	*Acarinina decepta*	*Acarinina esnaensis*	*Acarinina gravelli*	*Acarinina primitiva*	*Acarinina pseudotopilensis*	*Acarinina angulosa*	Chiloguembelinids	*Igorina broedermanni*	*Morozovella aragonensis*	*Subbotina eocaenica*	*Subbotina inaequispira*	*Pseudohastigerina wilcoxensis*	*Catapsydrax taroubaensis*	*Morozovella quetra*	*Subbotina senni*	*Acarinina aspensis*	*Morozovella caucasica*	*Acarinina pentacamerata*	*Guembelitrioides lozanoi*	*Acarinina bullbrooki*	*Dentoglobigerina yeguaensis*	*Truncorotaloides rohri mayoensis*	*Truncorotaloides rohri*	*Morozovella spinulosa*	*Truncorotaloides libyaensis*	*Guembelitrioides lozanoi* tr. *nuttalli*	*Guembelitrioides nuttalli*	*Turborotalia frontosa*	*Globigerinatheka micra*	*Subbotina crociapertura*	*Hantkenina spines*	*Truncorotaloides* cf. *topilensis*	*Pseudohastigerina micra*
198-1209A-																																					
16H-5, 127–129		147.76	G	F			F		R				F	R	R					F				C	F			VR		VR		VR		VR		R	
16H-CC		149.87	G				R		F				R	R	VR					C				AA	C		F	R	VR			F		F		F	
17H-1, 28–30		150.98	M–P				R		F	F			F	R		R				C				AA			R	F	VR			F		F	R	VR	
17H-1, 128–130		151.98	VP				F	R	VR	R			R	R	VR	VR							VR	VR	C	R		VR			VR	R	x	R			
17H-2, 27–29	P11	152.47	M–P				F	R	C	F		VR	VR	F	F	F				F			R		A	F		F	VR			F	F	C	R		
17H-2, 126–128		153.46	M			R	C	R	F	F		VR	F	F	F	F	VR			F			R	F	A	F		F	F	VR			F	F	F	R	VR
17H-3, 30–32		154.00	M			R	F	VR	F	F		R	F	R	R	VR	VR			F		VR	R	R	AA	F		VR	F	R	VR		F	F	C	R	R	
17H-3, 124–126		154.94	M–P			R	F		F	F		F	F	F	F	F				R		F	R	R	AA	C		VR	F	VR		VR	F	F	F	F	VR	R
17H-4, 27–29		155.47	M–P	VR		F	F	F	F	F	F	F	R	F	F	R	VR			F		F		R	A	F		F	F				F	F	F		VR	VR
17H-4, 124–126		156.44	G–M	VR		F	C	F	R	VR	F	F		F	F	F				F		C	F	F	A	R		R	F	VR			F	F	C			VR
17H-5, 125–127		157.95	G			R	C	F	F	R	C	R	F	C	F	VR				VR		C	R		AA	F		F	VR	VR			F	F	F	VR	R	
17H-6, 27–29		158.47	P	VR		R	F	R	F	R	C	F	F	C	R	VR				F		C	R	R	A	F		F	F	R	VR	VR	F	F	F		VR	R
17H-6, 125–127		159.45	G–M	R		F	F	F	VR	R	F	F	F	C		R	VR			R		C	F		C	C		F	F	VR	VR		F	R	R		VR	
17H-7, 29–31	P10	159.99	M–P			F	F	F	F	F	F	F	F	C	F	F	VR			F		C	F	R	C	F		VR	F	VR	R		F	R	F	R	VR	VR
17H-CC		160.47	G	R		R	F	F	F	F	F	F	F	C	F	VR				F		A	F	R	AA	VR		F	F	VR		R	F	F	VR	F		
18H-1, 29–31		160.49	M–P	VR		R	F	F	R	F	F		C	C	F	R				F		C	F		A	R		F	F	R		VR	F	C	F			
18H-1, 128–130		161.48	M–G		R	C	C	F	F	R	F	R	C	C	F	R				R		A	C	VR	C	R		F	R			VR		F	F			
18H-2, 28–30		161.98	M–P	R	R	F		F	F	C	C	VR	F	F	F	F	VR			F		C	R	F	C		R	F	R	F	R	F	VR	R	F			
18H-2, 128–130		162.98	P	R	VR	F	F	F	F	F	C	F	C		F	VR				F		C	F	VR	C		R	F	R		VR	F	F	F			
18H-3, 28–30		163.48	M–P			F	R	F	F	F	C	VR	F	F	F	F		R		F		C	C	R	C		R	F	F	F			F				
18H-3, 127–129		164.47	P	VR		A	F	R	F	VR	C	VR	F	C	F			VR		R		C	F	R	A	R	R	F	R	R		F	F	F				
18H-4, 27–29		164.97	G	VR	F	C	F		F	C	F	R	R	C	F	F	VR	VR		F		C	F	R	C	R	R	F	F	F			F					
18H-4, 128–130		165.98	M	R	R	C	F	F	F	F	F		C	C	F	R	VR			F		C	C	VR	F	VR	R	C	R	F			R					
18H-6, 28–30		167.27	G–M	R	R	F	F	F	F	F	C	R		C	F	F				C		C	F	R	C	R	F	F	F	F								
18H-6, 127–129		168.26	P	VR	R	C	F	C	F	F	F	R	C	C	F	F		VR		F		C	C	VR	F	VR	F	F	VR	F	VR	VR						
18H-7, 28–30	P9	168.77	G	R	F		F	F	F	F	F	F	F	C	F	R	VR	R		F		C	C	F	C		F	F	F	F								
18H-CC		169.26	G		F	F	F	F	F	F	R	F	C	C	F	F		VR		C		C	A	F	F	VR	F	F	F	F	VR	VR						
19H-1, 27–29		169.97	M–P	R	F	F	F	F	F	C	F	VR	F	A	F	F		VR		F		A	F	R	F		R	C	F	F								
19H-1, 127–129		170.97	G	VR	F	F	R	F		F	F	R	F	A	F	R				R		C	F		F	VR	R	A	F	F								
19H-2, 27–29		171.47	M	R	F	F	F	F	F	VR	F	VR	F	C	F	F		VR		F		C	F	F	F	VR	R	C	F	C		VR						
19H-2, 128–130		172.48	G			F	F	F	F		F	R	C	A	F			VR		F		A	F		F	VR	F	A		C	R							
19H-3, 27–29		172.97	G	VR	VR	C	F	F	F	F	C	F	F	C	F	R		VR		F	R	A	F	VR	F	VR	F	C	VR	C								
19H-3, 127–129		173.97	M	VR	R	F	F	F	F	R	F	R	F	A	F	VR	VR	VR	R	F	F	A	F	VR	F	R	F	C	F	F	R	R						

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. O = ostracodes, fish = fish debris, ech = echinoids, ph = phillipsite.

Table T5 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Turborotalia griffinae*	*Turborotalia boweri*	*Globigerinatheka subconglobata*	*Subbotina eocaena*	*Globigerinatheka mexicana*	*Acarinina spinuloinflata*	*Globigerinatheka index*	*Hantkenina dumblei*	*Hantkenina liebusi*	*Globigerinatheka* sp.	Comments
198-1209A-														
16H-5, 127–129		147.76	G	VR	R	C	F	A	C	A	R		F	
16H-CC		149.87	G	R	R	C	F	F		F	R	F	F	O
17H-1, 28–30		150.98	M–P	F	F	C	F	F	C	F				Ph
17H-1, 128–130		151.98	VP	VR	VR	F	F	F	VR	R				
17H-2, 27–29	P11	152.47	M–P	F	F	A								Ph, fish
17H-2, 126–128		153.46	M	F	F	C								
17H-3, 30–32		154.00	M	C	F	F								
17H-3, 124–126		154.94	M–P	F	R	F								O
17H-4, 27–29		155.47	M–P	F	F	F								O, fish
17H-4, 124–126		156.44	G–M	F	VR									O
17H-5, 125–127		157.95	G	F	R									O
17H-6, 27–29		158.47	P	C	R									O, fish
17H-6, 125–127		159.45	G–M	F	VR									O, fish
17H-7, 29–31	P10	159.99	M–P											O, fish
17H-CC		160.47	G											O
18H-1, 29–31		160.49	M–P											O
18H-1, 128–130		161.48	M–G											O
18H-2, 28–30		161.98	M–P											O
18H-2, 128–130		162.98	P											Ech
18H-3, 28–30		163.48	M–P											O
18H-3, 127–129		164.47	P											O, ech
18H-4, 27–29		164.97	G											O
18H-4, 128–130		165.98	M											O, ech
18H-6, 28–30		167.27	G–M											O
18H-6, 127–129		168.26	P											Ech
18H-7, 28–30	P9	168.77	G											
18H-CC		169.26	G											O
19H-1, 27–29		169.97	M–P											O, ech
19H-1, 127–129		170.97	G											O
19H-2, 27–29		171.47	M											O
19H-2, 128–130		172.48	G											O, ech
19H-3, 27–29		172.97	G											O
19H-3, 127–129		173.97	M											O, fish

Table T6. Distribution of planktonic foraminifers, Hole 1209, Zones P13–P18. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina esnaensis*	*Acarinina primitiva*	*Igorina broedermanni*	*Subbotina senni*	*Acarinina bullbrooki*	*Dentoglobigerina yeguaensis*	*Truncorotaloides rohri*	*Morozovella spinulosa*	*Turborotalia frontosa*	*Subbotina crociapertura*	*Hantkenina* sp. spines	*Truncorotaloides* cf. *topilensis*	*Pseudohastigerina micra*	*Globigerinatheka subconglobata*	*Subbotina eocaena*	*Globigerinatheka mexicana*	*Acarinina spinuloinflata*	*Globigerinatheka index*	*Hantkenina dumblei*	*Hantkenina liebusi*	*Globigerinatheka* sp.	*Subbotina cryptomphala*	*Turborotalia pomeroli*	*Turborotalia cerroazulensis*	*Globigerinatheka barri*	*Hantkenina mexicana*	*Orbulinoides beckmanni*	*Subbotina utilisindex*	*Subbotina lineaperta* s.s.	*Paragloborotalia nana*	*Globigerina officinalis*	*Globigerina praebulloides*	*Globoroatoloides suteri*	*Subbotina praeturritilina*	*Catapsydrax unicavus*
198-1209A-																																					
13H-2, 27–29		114.47	VP						VR									VR						VR						VR		F	F	F	R	VR	F
13H-2, 128–130		115.48	P						R									VR														R	R		R	VR	F
13H-5, 28–30		118.98	M–P															F							VR						F		F	F	C	F	F	F
13H-5, 128–130	P18	119.98	M–P						R							VR		F							VR						VR		F	F	F	F	F	C
13H-CC		122.17	M						R									F							F						F		F	F	C	F	F	F
14H-3, 91–92		126.11	P																						VR								F		R		R	F
14H-4, 91–92		127.61	P													VR		VR													R	R	R	R	F	VR	R	R
14H-5, 36–37	P16/P17	128.56	P											R											VR							F	R	VR	R	F	F	R
14H-CC		131.22	P						VR									F			R				R						VR	R	R	VR	F	VR	R	R
15H-1, 27–29		131.97	VP											R				VR			VR										VR	VR		VR		VR		R
15H-1, 127–129		132.97	VP						VR					R				VR			VR				VR							R	VR			VR	VR	R
15H-2, 27–29	P15	133.47	VP																		VR			VR		VR	VR				VR	VR	VR			R	VR	VR
15H-2, 127–129		134.47	P						VR									VR			F			F			R	R			R	F	R	F	R	R	VR	F
15H-3, 27–29		134.97	P											F		R		VR	VR		R			R	VR	F	F				F	R	F	R	R	F		F
15H-3, 127–129		135.97	VP											R				VR	R		VR			VR	R	VR	VR				VR		R	VR	VR		VR	R
15H-4, 27–29		136.47	P															R	VR		F			F	VR	VR	R	VR				R	VR	VR	R	VR	VR	R
15H-4, 127–129		137.47	VP															VR	F		F			F	R	VR					R	F	VR	R	VR	VR		
15H-5, 27–29	P14	137.97	P						R					AA		VR		C	C		F			C	F	R	F				F	F	F	F	F			
15H-5, 127–129		138.97	P						VR					AA				C	C		A			C	F		F	R	VR		F	F	R	F	F			
15H-6, 27–29		139.47	P					R	VR		VR		VR	C		VR	VR	R	F		F			R	VR	R		VR			R	F	R	VR	VR			
15H-7, 27–29		140.47	P	R				C	R		VR	VR	F	AA			R		F	F	C	VR		F	F		R	VR			R	R	VR	VR	R			
15H-CC	P13	141.04	M–P	R				C	VR	VR		F	R	F	VR	R	F		C	F	A	VR		C	F	C	F	R		VR	R	F					
16H-2, 27–29		142.26	M–P	F				F	F		R	F	F	A	R	VR	C	F	C	F	A	VR	VR	F	VR	F	F	VR	R									
16H-3, 127–129	P12	144.76	G–M	R	VR	R	F	F	F	VR	F	VR	F	AA	VR		F	F	A	F	AA	VR	VR	C	R	F	R	VR									
16H-5, 27–29		146.76	P		R	VR		F		VR	R	R	F	A	R		F	F	C	F	AA	VR		C	F	R											

Notes: Preservation: G = good, M = moderate, P = poor, VP = very poor. Abundance: AA = very abundant, A = abundant, C = common, F = few, R = rare, VR = very rare. Ech = echinoids, fish = fish debris, O = ostracodes, ph = phillipsite.

Table T6 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Globigerina venezuelana*	*Turborotalia pseudoampliapertura* s.s.	*Globorotaloides permicrus*	*Dentoglobigerina pseudovenezuelana*	*Turborotalia ampliapertura* s.s.	*Globoturborotalita ouachitaensis*	*Catapsydrax dissimilis*	*Globigerina tripartita*	*Pseudohastigerina* sp.	*Tenuitellinata angustiumbilicata*	*Catapsydrax martini*	*Subbotina gortanii*	*Subbotina angiporoides*	*Globigerina tapuriensis*	*Pseudohastigerina naguewichiensis*	*Globigerina euapertura*	Comments
198-1209A-																				
13H-2, 27–29		114.47	VP	R	R	R	R	F	VR	F	R		R	VR		R	R		F	Ech, fish
13H-2, 128–130		115.48	P	R	F	F	F	F		R	VR		R	R	R		VR		F	Ph, fish
13H-5, 28–30		118.98	M–P	F	C	F	A	C	F	F	F	VR	F	F	VR	F	C		F	
13H-5, 128–130	P18	119.98	M–P	R	C	F	C	F	F		F		C	F	R	F	C	VR		Ph, O
13H-CC		122.17	M	F		F	C	C	F	F	F		F	F	VR	F	C	VR		O, fish
14H-3, 91–92		126.11	P	VR	F	R	F	F	R	R			F	VR	VR	R				Ph, fish
14H-4, 91–92		127.61	P	R		VR	F	F	VR	VR	R		R	R	VR	F	VR			Ph
14H-5, 36–37	P16/P17	128.56	P	VR	F	R	F	F	R	VR	VR	VR	R	VR		R	R			Ph, fish
14H-CC		131.22	P	R	R	VR	F		R	R	F	VR	F	VR	VR	R	R			Ph, fish
15H-1, 27–29		131.97	VP		VR	VR	VR		VR											Ph
15H-1, 127–129		132.97	VP	VR		VR		VR												Ph
15H-2, 27–29	P15	133.47	VP	VR		VR	VR	R												Ph
15H-2, 127–129		134.47	P	VR	F	F	F	F												Ph
15H-3, 27–29		134.97	P	R	VR	R														Ph
15H-3, 127–129		135.97	VP	R	VR															Ph
15H-4, 27–29		136.47	P																	Ph
15H-4, 127–129		137.47	VP																	Ph, fish
15H-5, 27–29	P14	137.97	P																	Ph, O
15H-5, 127–129		138.97	P																	Ph
15H-6, 27–29		139.47	P																	Ph
15H-7, 27–29		140.47	P																	Ph
15H-CC	P13	141.04	M–P																	Ph
16H-2, 27–29		142.26	M–P																	Ph
16H-3, 127–129	P12	144.76	G–M																	Fish
16H-5, 27–29		146.76	P																	Ph

Table T7. Distribution of planktonic foraminifers, Hole 1210A, Zones Pα–P3b. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Parvularugoglobigerina eugubina*	*Woodringina hornerstownensis*	*Chiloguembelina morsei*	*Guembelitria cretacea*	*Woodringina claytonensis*	*Subbotina trivialis*	*Globoconusa daubjergensis*	*Chiloguembelina midwayensis*	*Praemurica pseudoinconstans*	*Subbotina triloculinoides*	*Eoglobigerina edita*	*Praemurica inconstans*	*Praemurica taurica*	*Parasubbotina pseudobulloides*	*Chiloguembelina subtriangularis*	*Globanomalina compressa*	*Globanomalina imitata*	*Subbotina cancellata*	*Eoglobigerina spiralis*	*Praemurica trinidadensis*	*Parasubbotina varianta*	*Globanomalina planocompressa*	*Praemurica uncinata*	*Globanomalina ehrenbergi*	*Praemurica praecursoria*	*Subbotina variospira*	*Morozovella praeangulata*	*Acarinina strabocella*	*Morozovella angulata*	Globoanomalinids	*Praemurica praecursoria carinata*	*Globanomalina chapmani*	*Morozovella abundocamerata*	*Acarinina* cf. *subsphaerica*	*Igorina pusilla*
198-1210A-																																					
23H-2, 27–29		207.17	M																	F	F			F			F		F			C/A	C		F	F		C
23H-2, 128–130	P3b	208.18	M–G										F							F/C	F			R					C			F/C			R	F/C		C/A
23H-3, 21–23		208.61	G														F/C	R/F			F	R		F/C			F		C			C/A	C		R	F/C		C
23H-3, 108–110		209.48	G										F				F			R/F	F	R/F		F/C		R/F	R	C	C/A	F		F/C	C	C	F	F	F	F
23H-3, 128–130	P3a	209.68	G										R/F		R		F	R/F		F	F	R		F	R	C	F	C/A	F/C	F	R	C/A	C	F	F	C	F	
23H-4, 128–130		211.18	P–M									R/F			C/A			F	F	F	F	F		F		F/C	R/F	C	F/C	C	R	R		F				
23H-5, 27–29		211.67	M–G									F			C/A		F		R	F	F	F		C	F	R/F	R/F	F/C	C/A	R	R							
23H-5,128–130	P2	212.68	G							F		F/C	F		C/A		F/C		R	F	F	F		F	F	R	F	R	C/A									
23H-6, 27–29		213.17	G							VR		F	R		C		F/C		F	F/C	C	F	C	C	F	VR?	R	VR?	R									
23H-6, 128–130		214.18	M–G							VR		C			F/C		F/C	F		F	F	F/C	F/C		F													
23H-7, 27–29		214.67	M–G							R	F	C/A	F		C		F/C	F	R	R/F	F	F	C	F/C														
23H-CC		215.17				R/F					F	F/C			F			R/F	F	R																		
24H-1, 27–29	P1c	215.17				A					F	F		F	C/A		F/C																					
24H-1, 127–129		215.77				A					R/F	C	F		C/A		C																					
24H-2, 27–29		216.17				A					A			F	F																							
24H-2, 127–129		216.67				A					C/A	F		F	F/C																							
24H-3, 27–29		218.77		VR		A						F	R	F	F	F																						
24H-3, 127–129	Pα	219.17		R/F		A	R				C																											
24H-4, 2–3		219.42	G	R/F	A	F	F/C	C/A	F	F	R/F																											

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Rew Cr = reworked Cretaceous taxa.

Table T7 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Igorina tadjikistanensis*	*Subbotina triangularis*	*Morozovella velascoensis*	*Morozovella apanthesma*	*Morozovella acuta*	*Morozovella conicotruncata*	*Igorina albeari*	*Planorotalites pseudoscitulus*	*Globanomalina planoconica*	*Igorina pusilla* high trochospire	Comments
198-1210A-														
23H-2, 27–29		207.17	VP	R/F	F	R/F	F	R	R/F	R/F		F		
23H-2, 128–130	P3b	208.18	P	R	R				C	F			R/F	
23H-3, 21–23		208.61	M–P						F	R	F	F	R	
23H-3, 108–110		209.48	M–P						VR					
23H-3, 128–130	P3a	209.68	M											
23H-4, 128–130		211.18	P											Fragmented
23H-5, 27–29		211.67	P											
23H-5,128–130	P2	212.68	P											
23H-6, 27–29		213.17	P											
23H-6, 128–130		214.18	VP											Rew Cr
23H-7, 27–29		214.67	VP											Rew Cr
23H-CC		215.17	VP											Rew Cr
24H-1, 27–29	P1c	215.17	P											
24H-1, 127–129		215.77	P											
24H-2, 27–29		216.17	VP											
24H-2, 127–129		216.67	P											
24H-3, 27–29		218.77	VP											Rew Cr
24H-3, 127–129	Pα	219.17	P											
24H-4, 2–3		219.42	P											

Table T8. Distribution of planktonic foraminifers, Hole 1210A, Zone P4. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Subbotina triloculinoides*	*Parasubbotina varianta*	*Globanomalina imitata*	*Subbotina cancellata*	*Igorina pusilla*	*Morozovella conicotruncata*	*Igorina albeari*	Globanomalinids	*Morozovella angulata*	*Subbotina triangularis*	*Morozovella velascoensis*	*Morozovella apanthesma*	*Morozovella acuta*	*Subbotina velascoensis*	*Globanomalina pseudomenardii*	*Globanomalina chapmani*	*Morozovella occlusa*	*Igorina pusilla* high trochospire	*Globanomalina ehrenbergi*	*Morozovella abundocamerata*	*Morozovella pasionensis*	*Morozovella acutispira*	*Igorina tadjikistanensis*	*Acarinina nitida*	*Morozovella aequa*	*Acarinina subsphaerica*	*Subbotina variospira*	*Acarinina mckannai*	*Acarinina soldadoensis*	*Acarinina coalingensis*	Chiloguembelinids	*Subbotina inaequispira*	*Acarinina decepta*	*Subbotina eocaenica*	*Acarinina esnaensis*
198-1210A-																																					
21H-2, 27–29		188.17	M–G			F/C		F		R	F		F	F			C	R/F		C	R/F			C/A		C		F			F	A	F		F			R/F
21H-2, 127–129		189.17	M–G			F							R/F	F		R	F/C	R/F		C/A	F			F		F	F	F/C	R/F		F/C	F/C	R/F	C	F	R		
21H-3, 27–29		189.67	M					C						F			F	R/F		A	R/F			F		R/F	F	F/C	R/F		C	C/A	F		R/F		F/C	
21H-3, 127–129		190.67	G					C					F	F/C		R	F	F		C/A	R/F			R/F		F/C	C	F			C	F/C	F	F				
21H-4, 27–29		191.17	G				F	F			C		F	F/C		R/F	F	R/F		C/A	F			R		R		F			C	C		F	F		F	
21H-4, 127–129		192.17	G			C	F	F		VR			F/C	F/C		F	F			C	R/F			R/F		C	F	F	F		C	C/A	F		F		F	
21H-5, 27–29		192.67	M					F					F	R			R	R/F		C	R/F					R		F	F		F/C	C	F		F	F	R	F
21H-5, 127–129	P4c	193.67	M		F	F		F		VR			F	F/C		F	F			F/C	R/F					F	F	R	R/F		C	C/A	C		F	F	F	F
21H-6, 27–29		194.17	G			C	F/C	F			C		F	F/C		F/C	C	R/F		C/A				C		F			F		C	C/A	C		F	F		R/F
21H-6, 129–131		195.19	G			F	F	F/C					F	F/C		F	C	R/F		C/A	R/F			F/C		F	F	R	C/A		C/A	C	R/F			F/C	R	R
21H-7, 27–29		195.67	G			R/F	F	F		R/F	F		F	F/C	R		F	F		C	R/F			F/C		F	F		F		C	C	F		F	F	F	
21H-CC		195.88	M–G			F		F		F	F		F	F	R		F	VR		F	R			F		F	F		F		F	F						
22H-1, 26–28		196.16	G			F/C		F/C		F	C		F	F/C			C			C	R			F/C		F	F/C	F	A		C	F	R					
22H-2, 26–28		197.68	P			F		F/C		C/A				F	R			R		F/C				R		F	F		C/A		F	F/C		C				
22H-2, 92–94		198.32	M		R/F	F		F		A	C		F	F	R	R/F	F	R		F/C				R		F	C	R	C/A		F	F	VR					
22H-2, 128–130		198.68	P			F		C		F					R						F					C			C		F							
22H-2, 146–147		198.86	P					F/C		R			R		R						F					A			F		F							
22H-3, 26–27		199.16	P					C					R/F		R					R	F					A			C		R							
22H-3, 53–54		199.43	P					C		C/A	F		R/F			VR				R	F			R		C			F									
22H-3, 108–110	P4b	199.98	P		F			C/A		A			R/F		F	F	F/C			F	F				R	C	R			F/C									
22H-4, 26–28		200.66	P			F	F	C		F			R				F																					
22H-5, 26–28		202.16	P–M			F/C	F	C/A		C	C		C	F	F	F	C	F		F	R			R/F		F/C	F	R/F										
22H-5, 127–129		203.17	P–M			F	F	F		F			F/C	F		F	C	F		F				R			R	R	R									
22H-6, 27–29		203.67	P–M			F	F	F		F		R	C	F		F	F	R/F		F						R	R		R									
22H-6, 127–129		204.67	M			C	F	F	A	R	C	R	F/C	R/F		F	C	F		F				R	F	R	R	R										
22H-7, 27–29		205.17	G	F	R/F	F	R	F	A	R	C	R	F	F		F	F	R/F	R	C				R	R													
22H-CC	P4a	205.68	M–G	F	R		R	R	C				R	F	F	F	R/F		R	F		F	R															
23H-1, 27–29		205.67	M	F	R	R/F			C			C/A	F	F	F	F	R	R/F	R	F																		
23H-1, 128–130		206.68	M	R	C	R	F	C/A	F/C	F/C	A	C/A	F	F/C	F	C	R/F	R/F	R	C	R																	

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Rew Cr = reworked Cretaceous taxa.

Table T8 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Morozovella subbotinae*	*Chiloguembelina wilcoxensis*	*Acarinina collactea*	*Acarinina aquiensis*	Comments
198-1210A-								
21H-2, 27–29		188.17	M–G	F		R		Fragmented
21H-2, 127–129		189.17	M–G	F		R		Fragmented
21H-3, 27–29		189.67	M	F		F		Fragmented
21H-3, 127–129		190.67	G	F				
21H-4, 27–29		191.17	G	F		R	F	
21H-4, 127–129		192.17	G	F				
21H-5, 27–29		192.67	M	C	R			Fragmented
21H-5, 127–129	P4c	193.67	M					Fragmented
21H-6, 27–29		194.17	G	R/F				
21H-6, 129–131		195.19	G					
21H-7, 27–29		195.67	G					
21H-CC		195.88	M–G					
22H-1, 26–28		196.16	G					
22H-2, 26–28		197.68	P					Small, fragmented, rew Cr
22H-2, 92–94		198.32	M					Fragmented
22H-2, 128–130		198.68	P					Small, fragmented
22H-2, 146–147		198.86	P					Small, fragmented
22H-3, 26–27		199.16	P					Small, fragmented
22H-3, 53–54		199.43	P					Small, fragmented
22H-3, 108–110	P4b	199.98	P					Small, fragmented, rew Cr
22H-4, 26–28		200.66	P					Small, fragmented, rew Cr
22H-5, 26–28		202.16	P–M					Fragmented
22H-5, 127–129		203.17	P–M					Fragmented
22H-6, 27–29		203.67	P–M					Fragmented
22H-6, 127–129		204.67	M					
22H-7, 27–29		205.17	G					
22H-CC	P4a	205.68	M–G					
23H-1, 27–29		205.67	M					Rew Cr > 50%
23H-1, 128–130		206.68	M					

Table T9. Distribution of planktonic foraminifers, Hole 1210A, P5–P7. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Globanomalina imitata*	Globanomalinids	*Morozovella occlusa*	*Subbotina triangularis*	*Morozovella velascoensis*	*Acarinina nitida*	*Acarinina mckannai*	*Acarinina soldadoensis*	*Acarinina coalingensis*	*Acarinina decepta*	*Morozovella gracilis*	*Morozovella edgari*	*Acarinina collactea*	*Globanomalina australiformis*	*Acarinina subsphaerica*	*Acarinina esnaensis*	*Morozovella aequa*	*Morozovella subbotinae*	*Morozovella acuta*	*Morozovella pasionensis*	*Acarinina aquiensis*	*Igorina convexa*	Chiloguembelinids	*Acarinina angulosa*	*Subbotina eocaena*	*Acarinina pseudotopilensis*	*Acarinina intermedia*	*Subbotina inaequispira*	*Igorina broedermanni*	*Subbotina velascoensis*	*Morozovella marginodentata*	*Acarinina primitiva*	*Acarinina camerata*	*Turborotalia prolata*	*Globanomalina planoconica*
198-1210A-																																					
19H-2, 27–29		169.17	G								C	F												F/C	R/F		F/C	F	F	F	R			R/F			C
19H-2, 127–129		170.17	M–G								F/C	F							R/F		R			F	R/F		F	F	F		R	R		F			F/C
19H-3, 27–29		170.67	M–G				R/F				C	F					R/F		F	R	R/F			C	F/C		F	R/F	F/C			R		F			
19H-3, 127–129		171.67	G				F				F	R/F							F		R			F	F		F	F	F		R	F/C		F			C
19H-4, 27–29		172.17	M–G				R/F				F	R/F							R/F					F	F		R		F	F		F		F			F/C
19H-4, 125–127		173.15	M–G								F	F		R			R/F		F					F	F/C		F	F	C	R/F	R/F		F	F/C			F/C
19H-5, 27–29	P7	173.67	G				R				F	R/F		R			R/F		F/C					F/C	F/C	R/F	F	F	F	C	F		R/F	F/C			F/C
19H-5, 127–129		174.67	M–G				R				F	R/F					R/F		R/F					F/C	F/C	R/F	F/C		R	F	R/F	R	R/F	F			C
19H-6, 27–29		175.17	G						R		F/C	F/C							F		R			F	F	F	F			F	R/F	F	F/C				C
19H-6, 126–128		176.16	G						F		F/C	F		F					R/F	F/C	F			F	F/C	R/F	F	R/F	F/C	R/F		F	F/C	F/C	F		C
19H-7, 27–29		176.67	M–G						R		F	F/C		F			R		R/F	F/C	F/C			F/C	R/F	R/F	F	F		F	R/F	F	C				
19H-CC		177.17									C	F/C		F					R/F	F/C	F			F	F	F	C	F	F	R/F		F	F/C	F			
20H-1, 27–29		177.17	G				F				F/C	C		C						R	F						C						F		F/C		
20H-1, 127–129		178.17	M–G								C	F		F/C						R	F			F		F	F						C		F		
20H-2, 27–29		178.67	M–G								C	F		F					F	F	F/C					F	F		F		F	F	R/F				
20H-2, 127–129		179.67	G				F/C				F/C	F		F/C					F	F	F			C		C/A	F			C	F	C	C/A	R/F		F		F
20H-3, 27–29	P6b	180.17	G		F		F				C	R/F							F	F	C			F		C/A	F	F	F	C		F	F	C		F	R	
20H-3, 127–129		181.17	G				F				F/C	F							C	F	F/C			C	F	F	F	F	F		F	F	F	A	F			F
20H-4, 27–29	P6a	181.67	G		C		F				C	F	R	C/A					F	F	F/C			F	F	A	C	F	C		R/F	R	C/A	C	R	R?	R	R/F
20H-4, 90–91		182.30	M						R	F/C	C	C	F	C	R				F	R	C				F	A-g	F	F	F			F	R	F	R			
20H-5, 19–20		183.09	P–M			R		VR	F	F	C	C	R	C	R	R				C	F/C			R		A-g				F		F					
20H-5, 99–100		183.89	M			C		R		F	A	F	F	F	R	R/F			F	C	F			F		A-g				R/F	F						
20H-6, 6–7		184.46	M			C	F	R		C	C	R/F	F	F	R	F	F			F	F		F			C	C-g	F	R	VR?								
20H-CC	P5	186.59	M			C		F	F	C	C/A	C	F	F	R				F/C	F	F	VR	F	F	F												
21H-1, 27–29		186.67	P–M	C		F/C		F		C	A	C					F	R/F	F																		
21H-1, 127–129		187.67	M	F	F	C/A	F	F	R/F	F/C	A	F	F	VR	R	F	F																				

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant (A-g = abundant and large), C = common (C-g = common and large), F = few, R = rare, VR = very rare. Mz = morozovellids, O = ostracodes, small fract. = small fraction (40–150 µm).

Table T9 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina gravelli*	*Planorotalites pseudoscitulus*	*Morozovella formosa*	*Morozovella lensiformis*	*Morozovella aragonensis*	*Acarinina wilcoxensis*	*Morozovella aragonensis* small	*Acarinina rugosoaculeata*	*Globorotalia reissi*	*Catapsydrax* sp.	*Acarinina decepta*	*Morozovella quetra*	*Acarinina aspensis*	*Acarinina bullbrooki*	*Subbotina senni*	Subbotinids small	Comments
198-1210A-																				
19H-2, 27–29		169.17	G	F/C	F	R7F	C	C/A			C	F				F/C	R	R	F	
19H-2, 127–129		170.17	M–G			R/F	C	C/A			C	F			F/C	F/C	R	R	C	
19H-3, 27–29		170.67	M–G		R/F	R/F	C/A	F/C			C	F	R		F/C	F/C	R	R/F		
19H-3, 127–129		171.67	G	F/C	R/F	R/F	C	C/A			F	F	R/F		C	R/F	R	R		
19H-4, 27–29		172.17	M–G	F/C		F	F/C	F/C	R/F		F/C	F/C	R	F/C	F/C	R	R			
19H-4, 125–127		173.15	M–G	F/C		R/F	F/C	F/C	F		F	R	R							Small mz A
19H-5, 27–29	P7	173.67	G	F/C	R/F	F	F	R	R	F/C	F	F		F						
19H-5, 127–129		174.67	M–G	R/F	F/C	F	F	R	F	C	F	F		F						
19H-6, 27–29		175.17	G	F/C	R/F	F	F	R	F/C	C	F	F	R	F						Small fract. A
19H-6, 126–128		176.16	G	C	F	F	F	F/C	F/C	F/C	F	R		F						
19H-7, 27–29		176.67	M–G	F/C	R/F	C	F	F	C	F/C	F		R							O
19H-CC		177.17		R/F		C	F	F		C	C	R	R							
20H-1, 27–29		177.17	G	F/C		C	F/C	R	F											
20H-1, 127–129		178.17	M–G	F		C	C/A	R												
20H-2, 27–29		178.67	M–G	F		C	C	R	C											
20H-2, 127–129		179.67	G	C		C	C	R												
20H-3, 27–29	P6b	180.17	G	F		C	F/C													
20H-3, 127–129		181.17	G		R	F/C	F/C													
20H-4, 27–29	P6a	181.67	G	F	F															
20H-4, 90–91		182.30	M																	Fragmented
20H-5, 19–20		183.09	P–M																	Fragmented
20H-5, 99–100		183.89	M																	Fragmented
20H-6, 6–7		184.46	M																	Fragmented
20H-CC	P5	186.59	M																	Fragmented
21H-1, 27–29		186.67	P–M																	Fragmented
21H-1, 127–129		187.67	M																	Fragmented

Table T10. Distribution of planktonic foraminifers, Hole 1210A, Zones P8–P10. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	Benthic foraminifers	*Acarinina esnaensis*	*Subbotina eocaenica*	*Acarinina soldadoensis*	*Acarinina angulosa*	*Igorina convexa*	*Globanomalina planoconica*	*Globorotalia reissi*	*Acarinina primitiva*	*Subbotina triangularis*	*Morozovella subbotinae*	*Acarinina coalingensis*	*Acarinina collactea*	*Acarinina intermedia*	*Planorotalites pseudoscitulus*	*Morozovella lensiformis*	*Acarinina decepta*	*Morozovella aragonensis*	*Acarinina gravelli*	*Catapsydrax* sp.	*Acarinina pseudotopilensis*	*Subbotina eocaena*	*Acarinina bullbrooki*	*Subbotina senni*	*Acarinina aspensis*	Subbotinids small	*Acarinina aquiensis*	*Igorina broedermanni*	*Morozovella aequa*	*Acarinina pentacamerata*	*Subbotina inaequispira*
198-1210A-																																		
17H-1, 27–29		148.67	M															F?			R/F	F	F/C	C	F	F	F/C		C	F	C			F/C
17H-1, 131–133		149.71	P–M																		F	R	F/C	F/C	F	F	C				F			F
17H-2, 27–29		150.17	G																		F	F		F/C	C	R/F	C		C	F	F			F
17H-2, 131–133		151.21	G																		F			C	F/C	F	C		C	R	F/C			
17H-3, 27–29		151.67	M																		F		C	C	C	F	F/C		C		C			F
17H-3, 131–133		152.71	P–M																		F		F	F	F	F	C			R/F	F			R/F
17H-4, 27–29		153.17	P–M																		F	F	F/C	F	R		F	F			F			R/F
17H-4, 131–133		154.21	M–G																		F/C	F	F/C	R/F	R/F	F	C	R	F	R	F		VR	R/F
17H-5, 27–29	P10	154.67	M–G																		F/C	F	F	R/F	R		F	F	F/C	R	C			R/F
17H-5, 131–133		155.71	M																		F	F	F/C	R	F		F			R	C			
17H-6, 27–29		156.17	P–M																		F	F/C	F		R	F	F/C	F			F	F/C		
17H-6, 131–133		157.21	M																		F	R	F		R	F	C	R/F	F/C		F			
17H-7, 27–29		157.67	M																		F	C	F			C	C	F		R/F	C			
17H-CC		158.13	M–G																		F/C	F	C		R/F	F	F/C	F		F	F		R/F	R
18H-1, 28–30		158.18	M–G																	R	F	R/F	F				F	C	F		R	F/C			F
18H-1, 131–133		159.21	M–G																	R	F/C	R	F		F	F	R/F	R		R	C		R/F	F
18H-2, 26–28		159.66	P–M																	R	F/C	R	F/C			F/C	C				F/C			
18H-2, 130–132		160.70	P																		F		F	R	F	F	R	F		F	F/C		R/F	R
18H-3, 28–30		161.18	P–M																		F	R	C		F	F	F	F	C		F			
18H-3, 131–133	P9	162.21	G						F									F			F/C		F/C	F	F	C	C	F	C		R/F			F
18H-4, 26–28		162.66	M–G									R								F	C	F/C	C	R	F/C	C	C/A	F		R/F	F/C			
18H-4, 131–133		163.71	P						C											F	R	F	C	F	F	C	F	R			F/C		C	
18H-5, 27–29		164.17	P			R/F			F											R/F	C	F	F	R	F	F	F/C	F			F		F	
18H-5, 130–132		165.20	P–M						R/F			F								F	C/A	R/F	C	F	F	R	C	F	F	F	F		R/F	
18H-6, 27–29		165.67	P–M	F	R/F		R	R	F										R	F	F	R/F	C	F	F	F	C	C	F	F	F		R/F	
18H-6, 130–132	P8	166.70	P–M	F	R/F		F		R/F		F	F						F		R	F/C	C	F	R	F	F	C	F/C		R/F	F		R/F	
18H-7, 26–28		167.16	P–M	F		F	F		F			R/F				F		R/F	R/F	F	F/C	F/C	F	F	F	F	F	F/C		R/F	F		F	
18H-CC		167.44	M		R/F	R/F	C	F				F		F	R/F				R/F	F	C/A	F	F	F	F	R	F	F/C		R/F	R/F	R	F	R
19H-1, 27–29		167.67	M–G			F	F/C	F	R/F		R	F			F	C			F	R	F/C	F/C	F	F	F	R	R	F/C	C	R/F	R/F	R	F	
19H-1, 127–129		168.67	M–G		R/F	F	C	F/C	F	R	R	F	F	R	F	F	F	R/F	C	F	C/A	F/C	F	F/C	F	R/F	R	F/C	C					

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: AA = very abundant, A = abundant, C = common, F = few, R = rare, VR = very rare. Subb = subbotinids, small res. = small residue, mz = morozovellids.

Table T10 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Guembelitrioides lozanoi*	*Morozovella spinulosa*	Acarininids small	*Acarinina cuneicamerata*	*Acarinina appressocamerata*	*Morozovella crassata*	*Morozovella caucasica*	Morozovellids small	Tenuitellids	*Acarinina wilcoxensis*	*Morozovella quetra*	*Morozovella aragonensis* small	*Dentoglobigerina yeguaensis*	*Truncorotaloides rohri*	*Guembelitrioides nuttalli*	*Globigerinatheka micra*	*Turborotalia griffinae*	*Turborotalia frontosa*	*Subbotina crociapertura*	*Igorina broedermanni anapetes*	*Acarinina spinuloinflata*	*Acarinina acceleratoria*	*Pseudohastigerina* sp.	*Truncorotaloides topilensis*	*Truncorotaloides libyaensis*	*Catapsydrax unicavus*	Comments
198-1210A-																														
17H-1, 27–29		148.67	M	F/C	F	C	F/C	R/F		R/F							F/C	F	F/C			F	F	C					C	Fragments
17H-1, 131–133		149.71	P–M	F	F	F/C	F	R/F	F	F		F				F		F	F/C		R	F	R	C					F	Fragments A
17H-2, 27–29		150.17	G	F		C	F/C	F	F	F					C	F	R/F	F	F	R		C		F/C					F/C	Subb A
17H-2, 131–133		151.21	G	R	F	F/C	C	F	R	F						R/F		F	F		R	F/C	R/F	F					F	
17H-3, 27–29		151.67	M	C	F	C	F			F						F/C	F	F	F		R	F	F	F/C						Subb A
17H-3, 131–133		152.71	P–M	F	F	C	F/C	F	R/F	VR		C					R	F	C				C	F/C						Fragments A
17H-4, 27–29		153.17	P–M	F	R/F	F/C	F	F		R						F	R/F	C	F				F	F						Fragments A
17H-4, 131–133		154.21	M–G	R	R/F	C	C	R/F		R						F/C	F	F	C		F			F/C			F	F		
17H-5, 27–29	P10	154.67	M–G	F	R/F	C	C		R	R		F				R/F	F	F	F/C			R	R/F	F/C			F			
17H-5, 131–133		155.71	M	R		F/C	F	F	R	R		C				R	R	F	C				F	F/C			R			Fragments
17H-6, 27–29		156.17	P–M	F/C		F/C	F/C		R/F	VR		F					R/F	F	C				F	F/C			R			Fragments A
17H-6, 131–133		157.21	M	F/C	R/F	F/C	F/C	R/F	R	VR							F	F	C				R	F/C			R			Fragments
17H-7, 27–29		157.67	M	C		C	F	F		R							F/C	F	C				F	C			R			
17H-CC		158.13	M–G	F/C	F	C	F/C		R	F						R/F	F	R/F	F			R	F	R/F						
18H-1, 28–30		158.18	M–G	C	R/F		F			R		C				F	R/F		C		R		F	F/C						Fragments
18H-1, 131–133		159.21	M–G	F/C	R/F	C	F/C	F		F						F			R/F		R	F	F	R		F				Fragments
18H-2, 26–28		159.66	P–M	C	C	C	F/C	F	R	R						F		F	F			R	F	C						Fragments, mz, fish
18H-2, 130–132		160.70	P			C	A		R	R									R			F	F	F/C	R					Fragments AA
18H-3, 28–30		161.18	P–M	F/C	R/F		C		R/F	R						F	F	R	R	R	C	F	F							
18H-3, 131–133	P9	162.21	G	F/C	F		C		F	R				R?		F			F	R	F/C									
18H-4, 26–28		162.66	M–G	F/C	R/F	C	F	R/F	R/F	R		C		F/C		F	F	R	R	R	R									Subb large
18H-4, 131–133		163.71	P	F/C	F	F/C	C		F	R		F	R	F/C	F	R/F														Fragments AA
18H-5, 27–29		164.17	P	C		C	C/A	F	F	F				R?																Fragments AA
18H-5, 130–132		165.20	P–M	C		C	C	R/F	R	F	C		R/F	R?																Fragments mz
18H-6, 27–29		165.67	P–M	F/C		F/C	F	F	R	R	F	C	R?	R?																Fragments mz
18H-6, 130–132	P8	166.70	P–M	F/C		C	F	F	F	R	C																			Fragments mz
18H-7, 26–28		167.16	P–M	R	R/F		F	F	F	R																				Fragments mz
18H-CC		167.44	M	R	R/F	F/C																								
19H-1, 27–29		167.67	M–G																											Small res.
19H-1, 127–129		168.67	M–G																											

Table T11. Distribution of planktonic foraminifers, Hole 1210A, Zones P11–P11. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Catapsydrax* sp.	*Acarinina pseudotopilensis*	*Igorina broedermanni*	*Subbotina inaequispira*	*Planorotalites pseudoscitulus*	*Subbotina eocaena*	*Acarinina bullbrooki*	*Subbotina senni*	Subbotinids small	*Morozovella spinulosa*	Acarininids small	*Acarinina cuneicamerata*	*Acarinina appressocamerata*	*Morozovella crassata*	*Morozovella caucasica*	*Morozovella aragonensis*	*Dentoglobigerina yeguaensis*	*Subbotina crociapertura*	*Truncorotaloides rohri*	*Guembelitrioides nuttalli*	*Globigerinatheka micra*	*Turborotalia griffinae*	*Igorina broedermanni anapetes*	*Turborotalia frontosa*	*Acarinina spinuloinflata*	*Truncorotaloides topilensis*	*Globigerinatheka subconglobata*	*Guembelitrioides lozanoi*	*Acarinina gravelli*	*Acarinina aquiensis*
198-1210A-																																	
15H-4, 127–129	P13	135.17	P–M						F		F			F						R	R		F					R/F		F			
15H-5, 27–29		135.67	P						F		F		R/F	F						R	R		F					R/F		F			
15H-5, 127–129		136.67	P–M						C		F		F	F			R				F		F					F		C	R		
15H-6, 27–29		137.17	P–M								F			F			C			F	R/F							F		F	F		
15H-6, 128–130	P12	138.18	M						F		F		C	F			C			F	R							F		F/C	F		
15H-7, 27–29		138.97	G						F		C		R				F			R/F	R	VR					R	F		F	F		
15H-CC		139.17	M						F/C		F		F				F				F		F					R/F	F	F	R		
16H-1, 27–29		139.17	M					F		F	R		F				F				F	R	F	VR			F	F	F/C				
16H-1, 127–129		140.17	M					F	F	C	R/F		R						VR	R/F	F	F	F	R			F	C	F/C	F			
16H-2, 27–29		140.67	M					R/F		F	F		F				F		VR		R/F	F	F	R			F	C	F/C		R		
16H-2, 127–129		141.67	M–G		F	F	F		F	F	F	C					F		VR	F/C	F		F	F	R/F		F/C	C	R	F			
16H-3, 27–29		142.17	M		F/C	R/F	F		F				R/F				F			F		R	F	F	R	VR	R/F	C	R	C	F		
16H-3, 127–129		143.17	P–M	F		VR			F	F/C	F/C					R/F			F	F	R/F	R/F	F	F	R		R/F	C		R	F		
16H-4, 27–29		143.67	P–M	F/C	F				F		F	F			R/F	F			R	F	F		F	F/C				C		R			R
16H-4, 127–129	P11	144.67	M	C	F/C		F		F	F/C	F/C	F			R	R/f	R	R	R	F	R	F	F	R		R	F	C			F		
16H-5, 27–29		145.17	M		C		F/C		C	F	F	C	R/F					R	R	F		F/C	F	R			F	C	R/F		R		
16H-5, 127–129		146.17	P–M		F/C		F	R/F	C		F	F		F/C	F	R/F	R	R	R/F			F/C	F	F			F	C	R/F		F	R	F
16H-6, 27–29		146.61	M	C	F			F	F		C		F		F		F		R/F	F	F	F	F/C	C	F		F	F/C	R/F		F/C		
16H-6, 127–129		147.61	M	F	C	F		F	C	F			R/F	C	R/F		F		F	F	F	C	F	F			F/C	F	R/F	R	F		F
16H-7, 27–29		148.11	M		F	F			C	F	F	F/C	F	C	F/C			R/F	R/F	F	F	C	R	C			F	C		R	F	R	
16H-CC		148.57	M	F	F	F	F/C	F	C/A	F/C	F/C	C	R/F	F/C	F	F	F	R	F	F	F/C	F	F	F	R	R/F	F	F	F	R				

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Subb = subbotinids, ph = phillipsite.

Table T11 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Catapsydrax unicavus*	Tenuitellids	*Turborotalia boweri*	*Subbotina cryptomphala*	*Globigerinatheka koroktovi*	*Globigerinatheka index*	*Globigerinatheka kugleri*	*Globigerinatheka mexicana*	*Hantkenina* sp. spines	*Pseudohastigerinids*	*Acarinina pentacamerata*	*Acarinina matthewsae*	*Hantkenina dumblei*	*Globigerinatheka barri*	Chiloguembelinids	*Hantkenina liebusi*	*Morozovella lehneri*	*Catapsydrax dissimilis*	*Globigerinatheka euganea*	*Globigerinatheka curryi*	*Turborotalia pomeroli*	*Subbotina utilisindex*	*Hantkenina alabamensis*	*Globorotaloides carcoselleensis*	Comments
198-1210A-																												
15H-4, 127–129	P13	135.17	P–M	F	C		F	C	F	F	F	C					F											ph C, fragments
15H-5, 27–29		135.67	P	C	A		F	C	C	F	F	C					F				R		R				F	ph, fragments A
15H-5, 127–129		136.67	P–M				F	F	C	C	C	F			R	R	R								R	R?	F	ph
15H-6, 27–29		137.17	P–M	F	F		F	F	C	F/C	F	F					F						R					Fragments
15H-6, 128–130	P12	138.18	M	F	F/C		F	F	C	C	R/F	F				R	R						R	R/F				Fragments, ph
15H-7, 27–29		138.97	G	R/F	F		F	C	C	A	R/F	F			F		F			R			VR	F	R			
15H-CC		139.17	M				F	F/C	C	C		R					F			R		F						Small fragments
16H-1, 27–29		139.17	M			F/C	F	F/C	C	F/C	F/C				C		R			R	R	F						Fragments A
16H-1, 127–129		140.17	M	R/F		F	F	C	C	C	F/C		F		F/C				R									Fragments
16H-2, 27–29		140.67	M	F		F/C	F	F	F/C		F		F/C		F	R	R	F										Fragments C, ph C
16H-2, 127–129		141.67	M–G	F		F	F	F	F			R	F		VR													Fragments C
16H-3, 27–29		142.17	M	F	C		F	F	C	F	F	R	R	VR														Fragments A
16H-3, 127–129		143.17	P–M		C		R																					Fragments A, ph A
16H-4, 27–29		143.67	P–M		F	R																						Fragments A, ph A
16H-4, 127–129	P11	144.67	M		C																							Fragments A
16H-5, 27–29		145.17	M	C																								Fragments A
16H-5, 127–129		146.17	P–M	R/F																								Fragments A
16H-6, 27–29		146.61	M	F																								Fragments A
16H-6, 127–129		147.61	M																									Small sized A
16H-7, 27–29		148.11	M																									Small sized A
16H-CC		148.57	M																									Subb A

Table T12. Distribution of planktonic foraminifers, Hole 1210A, Zones P14–P18. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Subbotina eocaena*	*Subbotina senni*	*Morozovella spinulosa*	*Dentoglobigerina yeguaensis*	*Subbotina crociapertura*	*Guembelitrioides nuttalli*	*Globigerinatheka subconglobata*	*Catapsydrax unicavus*	Tenuitellids	*Subbotina cryptomphala*	*Globigerinatheka koroktovi*	*Globigerinatheka index*	*Subbotina praeturritilina*	*Globigerinatheka tropicalis*	*Globigerinatheka kugleri*	*Globigerinatheka mexicana*	*Hantkenina* sp. spines	*Globigerinatheka barri*	*Turborotalia pomeroli*	*Subbotina utilisindex*	Acarininids small	*Globoturborotalia carcoselleensis*	*Catapsydrax dissimilis*	*Hantkenina alabamensis*	*Globoturborotalia permicrus*	*Guembelitrioides lozanoi*	*Turborotalia frontosa*	*Globigerinatheka luterbacheri*	*Turborotalia cerroazulensis-cocoaensis*	*Globoturborotalia suteri*	*Subbotina angiporoides*	*Turborotalia ampliapertura*	*Tenuitellinata angustiumbilicata*	*Subbotina angiporoides minima*	*Globigerina venezuelana*
198-1210A-																																					
14H-3, 131–132	P18	124.21	P-s								F					F										F						F		R			F
14H-3, 147–148		124.37	P-s								F					F				F						R	R					F		R			
14H-4, 8–10		124.48	P-s													R				F												F	R/F	R			F
14H-5, 27–29		126.17	P-s									F				R/F																		R		F	
14H-6, 27–29	P16/P17	127.67	P-s								R					R																	R/F		F		
14H-6, 68–70		128.08	P-s								R	F								R													F/C				R
14H-7, 27–29		128.37	P-s								R															R	R						R/F	R	F/C	F	
14H-CC		129.44	P-s	F							F					R				VR			F			F							F/C	F/C	C		
15H-1, 27–29		129.67	P		R												VR														R	R					
15H-1, 127–129		130.67	P	C	F					R/F	C				C	R		C	C							R					R					
15H-2, 27–29	P15	131.17	P		C			R	F	F	R/F	F			R/F			F		VR	F					R		F									
15H-2, 127–129		132.17	P		R				VR	R	C				F		VR	F	R/F	VR	VR							F	R	VR							
15H-3, 27–29		132.67	P	F	F						C		F	R	F		VR	F	C		VR	R/F						F									
15H-3, 128–130		133.68	P	F	C		F			F	F	F		C	F/C		R			C	C		R	C	F	R	R	R									
15H-4, 27–29	P14	134.17	M	C	F/C	VR	F	R	R	F	F	F	F	F	C	F	R	C	F/C	F	F	VR	R	F	F													

Notes: Preservation: M = moderate, P = poor (P-s = poor and small). Abundance: AA = very abundant, A = abundant, C = common, F = few, R = rare, VR = very rare. Ph = phillipsite.

Table T12 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Paragloborotalia nana*	Subbotinids small	*Globigerina praebulloides*	*Pseudohastigerina micra*	*Globigerina officinalis*	*Cribrohantkenina inflata*	*Globigerina euapertura*	Comments
198-1210A-											
14H-3, 131–132	P18	124.21	P-s					F		F	Ph, fragments A
14H-3, 147–148		124.37	P-s						R		Ph, fragments A
14H-4, 8–10		124.48	P-s	R	F						Ph AA, fragments A
14H-5, 27–29		126.17	P-s			R	R	R			Ph AA, fragments A
14H-6, 27–29	P16/P17	127.67	P-s		F						Ph AA, fragments A
14H-6, 68–70		128.08	P-s	R							Ph AA, fragments A
14H-7, 27–29		128.37	P-s								Ph AA, fragments A
14H-CC		129.44	P-s								Ph AA, fragments A
15H-1, 27–29		129.67	P								Ph AA, fragments A
15H-1, 127–129		130.67	P								Ph, fragments A
15H-2, 27–29	P15	131.17	P								Ph AA, fragments A
15H-2, 127–129		132.17	P								Ph, fragments A
15H-3, 27–29		132.67	P								Ph, fragments A
15H-3, 128–130		133.68	P								Ph AA, fragments A
15H-4, 27–29	P14	134.17	M								Ph AA, fragments A

Table T13. Distribution of planktonic foraminifers, Hole 1211A, Zones Pα–P3b.

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Parvularugoglobigerina eugubina*	*Woodringina hornerstownensis*	*Woodringina claytonensis*	*Globoconusa daubjergensis*	*Chiloguembelina morsei*	*Praemurica pseudoinconstans*	*Chiloguembelina midwayensis*	*Subbotina trivialis*	*Parasubbotina pseudobulloides*	*Eoglobigerina edita*	*Guembelitria cretacea*	*Eoglobigerina eobulloides*	*Globanomalina archeocompressa*	*Praemurica taurica*	*Parasubbotina varianta*	*Praemurica inconstans*	*Globanomalina planocompressa*	*Subbotina triloculinoides*	*Eoglobigerina spiralis*	*Praemurica uncinata*	*Morozovella praeangulata*	*Globanomalina compressa*	*Chiloguembelina trinitatensis*	*Praemurica praecursoria*	*Morozovella angulata*	*Chiloguembelina subtriangularis*	*Praemurica praecursoria carinata*	Globanomalinids	Chiloguembelinids	*Globanomalina imitata*	*Morozovella abundocamerata*	*Subbotina cancellata*	*Praemurica trinidadensis*	*Igorina pusilla*	*Subbotina variospira*
198-1211A-																																					
15H-1, 127–129	P3b	127.57	G									F						F	C/A		F/C	F/C	F/C	F	F	C/A		C/A		F/C	C		F	F	F	F	F	
15H-2, 27–29	P3a	128.07	M–G		F							R/F						F	C		R/F	F	F	F	R/F	C	C	F/C		F		A	R/F	F	R	R	R	R
15H-2, 127–129		129.07	P–M						F			R						F	C			F/C	C/A	F	R/F	C	F	VR	F	VR	C	C	F					
15H-3, 27–29	P2	129.57	G					F/C	F	F/C								R	F/C		F/C	F	F	R	F													
15H-3, 127–129	P1c	130.57	G					AA	F	AA				F	F		F		F	R																	
15H-4, 4–5		130.84	G				R	A	C/A	C	F		F/C			F	F	F	R/F	R	R/F																
15H-4, 45–46	P1a/b	131.25	G		A	A	R/F	F/C	C	C	F	C/A		F	F	R																					
15H-4, 88–89	Pα	131.68	M–G	VR	A	A	F	C	F	F/C	F	F	R																								

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Small res. = small residue.

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina strabocella*	*Globanomalina ehrenbergi*	*Morozovella conicotruncata*	*Globanomalina chapmani*	*Subbotina triangularis*	*Igorina tadjikistanensis*	*Igorina albeari*	*Planorotalites pseudoscitulus*	Comments
198-1211A-												
15H-1, 127–129	P3b	127.57	G	F	F	R/F	R	R	R	R	F/C	
15H-2, 27–29	P3a	128.07	M–G	R	R	VR						
15H-2, 127–129		129.07	P–M									Fragmented
15H-3, 27–29	P2	129.57	G									
15H-3, 127–129	P1c	130.57	G									
15H-4, 4–5		130.84	G									
15H-4, 45–46	P1a/b	131.25	G									Small res.
15H-4, 88–89	Pα	131.68	M–G									Small res.

Table T14. Distribution of planktonic foraminifers, Hole 1211A, Zones P4a–P6a. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Parasubbotina pseudobulloides*	*Parasubbotina varianta*	*Subbotina triloculinoides*	*Eoglobigerina spiralis*	*Morozovella angulata*	*Globanomalina imitata*	*Morozovella abundocamerata*	*Subbotina cancellata*	*Chiloguembelina trinitatensis*	*Igorina pusilla*	*Subbotina variospira*	*Acarinina strabocella*	*Globanomalina ehrenbergi*	*Morozovella conicotruncata*	*Igorina tadjikistanensis*	*Morozovella velascoensis*	*Igorina albeari*	*Morozovella apanthesma*	*Morozovella acutispira*	*Globanomalina pseudomenardii*	*Morozovella acuta*	*Morozovella occlusa*	Globanomalinids	*Globanomalina chapmani*	*Morozovella aequa*	*Subbotina triangularis*	*Morozovella pasionensis*	*Subbotina velascoensis*	*Praemurica praecursoria carinata*	Chiloguembelinids
198-1211A-																																
13H-5, 28–29	P6a	113.58	G																									F/C				
13H-5, 86–87		116.16	M–G																					R				C				
13H-5, 128–129	P5	114.58	M																R									C				
13H-6, 7–8		114.72	G																C/A					F	F			F/C		C		
13H-6, 18–19		114.83	M						F										F/C						C/A	F		C	F	R/F			
13H-7, 27–29		116.42	P						C									R/F							F			R			F		
13H-CC	P4c	117.02	M–G						F				F					F	C				1		A			C	F	C	F		
14H-1, 27–29		117.07	G						F/C				F					R/F		R					A			C	R/F	F	F		
14H-1, 127–129		118.07	G						C				F/C					C/A	F					F	C/A			C	F	F	F		F
14H-2, 27–29		118.57	P						C				F/C					C/A							F						F		F
14H-2, 127–129		119.57	M						F				F					C	R/F				R/F		C/A			R/F	R/F	F	C		
14H-3, 27–29		120.07	P–M						F		R							R/f	F						C				F	R/F	F		
14H-3, 127–129		121.07	P–M						F/C				F					F	F	R				R/F	C				R/F	R/F	F		
14H-4, 27–29		121.57	P						F/C		R	F	F					C	F/C	R/F			F/C	F	C/A				R/F	F	F		
14H-4, 128–130	P4b	122.58	P–M						F				F/C					F	C	R	F		R/F	F/C	C			R/F	F		F/C		
14H-5, 27–29		123.07	P						C				C		F				F/C	F/C	F		R	R/F	C			R/F	R/F	F	C		
14H-5, 127–129		124.07	P						R/F				A					F	R/F	C	R				F/C			R	R/F				
14H-6, 27–29	P4a	124.57	P		F				C				F/C	R			F/C	F/C	R	F			R		F/C				F		F		
14H-6, 127–129		125.57	M–G				R	F/C	C		F		C	F			A	F	C	F/C	F		F	F	F			R	F/C	F/C	F/C	VR	R
14H-7, 27–29		126.07	M–G		R/F			R/F	F	F			F	F		R	C/A	F	F/C	F/C	F		R	R/F	R/F		R		C	F	F/C		
14H-CC		126.58	M	F	R			C	R/F	C			F	F			C/A	F	F	F	F				F	C		R					
15H-1, 27–29		126.57	G	C	C	F/C	R/F	C/A	F	C/A	F	F	C	F	R	F/C	C/A	F/C	VR	F	F	VR	R	R	VR	C	R						

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. Subb = subbotinids, mz = morozovellids.

Table T14 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina subsphaerica*	*Acarinina nitida*	*Acarinina mckannai*	*Igorina pusilla* high trochospire	*Acarinina soldadoensis*	*Acarinina aquiensis*	*Acarinina intermedia*	*Igorina convexa*	*Acarinina coalingensis*	*Subbotina inaequispira*	*Acarinina esnaensis*	*Acarinina triplex*	*Subbotina eocaenica*	*Acarinina decepta*	*Globanomalina planoconica*	*Morozovella subbotinae*	*Morozovella edgari*	*Acarinina wilcoxensis*	*Acarinina collactea*	*Morozovella africana*	*Morozovella allisonensis*	*Morozovella gracilis*	*Acarinina angulosa*	*Acarinina primitiva*	*Igorina broedermanni*	*Morozovella marginodentata*	Chiloguembelinids large	*Catapsydrax* sp.	*Acarinina gravelli*	*Acarinina pseudotopilensis*	Comments
198-1211A-																																		
13H-5, 28–29	P6a	113.58	G					C/A	F	R/F	R	C	F	F	F	F/C	F		F/C		F	R			C	C	C	F/C	F	C	F	F	F/C	F	
13H-5, 86–87		116.16	M–G		C/A	R/F		C/A	F			F	F						F/C		F	F			F/C	F	F	F	F	F	F	R	R	R	
13H-5, 128–129	P5	114.58	M					C/A	C			F					F		F						C	R	R	R/F						Fragmented
13H-6, 7–8		114.72	G					C/A	F	F	R/F			F		F	F		C	R		R	R	R	F									
13H-6, 18–19		114.83	M		F			C/A				F				F			A		R?													Fragmented
13H-7, 27–29		116.42	P	R				C/A				C			F																			Mz fragmented
13H-CC	P4c	117.02	M–G	F		F		C/A				F				F			C/A															
14H-1, 27–29		117.07	G	F		F/C		C/A	R/F			R/F			F	R/F			C	VR?														
14H-1, 127–129		118.07	G	F	F	F/C	F	C/A		R/F			F	F	R/F				C															
14H-2, 27–29		118.57	P	R/F	F	F/C		C/A																										Fragmented
14H-2, 127–129		119.57	M	R/F	F	F/C	R	A			F		R	F	F	F	R	R																Subb large, frag.
14H-3, 27–29		120.07	P–M	F	F	C/A		C/A		F		R	R	R/F																				Fragmented
14H-3, 127–129		121.07	P–M	F	F	F		F	R/F	F/C	R																							Fragmented
14H-4, 27–29		121.57	P	F/C	F/C	C/A	R	R/F																										Fragmented
14H-4, 128–130	P4b	122.58	P–M	C/A	C/A	C/A	F																											Fragmented
14H-5, 27–29		123.07	P	C/A	F/C	F	F																											Mz fragments
14H-5, 127–129		124.07	P	A		R/F	F																											Mz fragments
14H-6, 27–29	P4a	124.57	P	VR	R																													Mz fragments
14H-6, 127–129		125.57	M–G																															
14H-7, 27–29		126.07	M–G																															
14H-CC		126.58	M																															
15H-1, 27–29		126.57	G																															

Table T15. Distribution of planktonic foraminifers, Hole 1211A, Zones P6b–P8. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina aquiensis*	*Acarinina coalingensis*	*Acarinina decepta*	*Acarinina esnaensis*	*Acarinina gravelli*	*Acarinina intermedia*	*Acarinina primitiva*	*Acarinina pseudotopilensis*	*Acarinina angulosa*	*Acarinina soldadoensis*	*Acarinina wilcoxensis*	*Chiloguembelina* sp.	*Igorina broedermanni*	*Morozovella formosa*	*Morozovella gracilis*	*Morozovella lensiformis*	*Morozovella marginodentata*	*Subbotina eocaenica*	*Subbotina triangularis*	*Subbotina velascoensis*	*Morozovella subbotinae*	*Acarinina subsphaerica* s.l.	*Subbotina inaequispira*	*Morozovella aequa*	*Pseudohastigerina wilcoxensis*	*Subbotina lineaperta* s.l.	*Globanomalina* sp.	*Morozovella aragonensis*	*Morozovella quetra*	*Catapsydrax taroubaensis*	*Acarinina pentacamerata*
198-1211A-																																	
12H-3, 29–31		101.10	M		F	F	F	F		F	F	C			R	C					C					VR				A	R	VR	C
12H-3, 127–129	P8	102.10	M	R	F	C	F	F	R	C	F	C	R	R	VR	F			R		C					F		VR	F		A		VR	F
12H-4, 28–30		102.60	M	R	C	C	F	F		C	F	F	R		VR	F			F		F					F			F		A	F	R	C
12H-4, 127–129		103.60	G–M	F	F	C	F	F	R	C	F	C	F	VR		F			R		F					F	VR	VR	F	VR	A	R	F	F
12H-5, 27–29		104.10	G–M	VR	C	F	F	F		C	C	F	A			F	R	F	F		C				F	R			F		A	R	VR	R
12H-5, 127–130		105.10	G–M	R	F	F		F	VR	C	F	F	A	VR	VR	F	A	F	R		C					R			VR	VR	C	VR	R	
12H-6, 27–29		105.60	G–M	R	F	C	F	R		C		F	AA	VR		F	C	F	VR	R	F				F	VR	VR		R		C		R	
12H-6, 128–130	P7	106.60	G–M	R	F	F	F	F		C	F	F	A			F	A	F		VR	F			VR	R	F		R			C			
12H-7, 27–29		107.10	G–M		F	F	VR	F	VR	C	F	F	AA	VR	VR	F	A	F	F	F	F				F	F	R	VR	F		C	VR	VR	
12H-CC		107.39	G		F	F	F	C		F	F	C	A	R		F	A	F			F			R	R	F	VR	VR	R		C	VR	R	
13H-1, 27–29		107.60	G–M	VR	C	F	F	F		F	F	F	C	F	R	F	A	F	F	R	C			F	F	VR	VR		F	F	F			
13H-1, 82–83		108.12	M	R	A	C	C	F	VR	F	F	F	C	F		F	C	F	R	R	F			F	R	R		VR	F	VR	R			
13H-1, 96–97		108.26	M–P	F	C	F	F	F	VR	F	C	F	A		F	F	C	F	F	F	C			F	R		R	VR	F					
13H-1, 128–130		108.60	M	F	F	C	F	C	R	F	C	F	F	F		C	F	F	F	F	F					F	R		F					
13H-2, 27–29		109.10	G–M	R	C	F	C	F	R	F	F	F	C		R	A	F	F	F	C	F			F	F	F	R							
13H-2, 128–130	P6b	110.10	M	R	F	F	F	F	VR	F	C	F	F	F		C	C	C	F	A	F	VR		C	VR		VR	R						
13H-3, 27–29		110.60	G	F	F	F	F	F		F	C	F	F			F	C	F	C	A	F	R	VR	F	R	F	R							
13H-3, 128–130		111.60	G–M	F	F	F	F	F	R	F	F	F	F	F	R	F	C	F	C	A	F	F	VR	C		F	R	VR						
13H-4, 27–29		112.10	G		F	F	F	F	F	F	F	F	F	F	R	F	F	F	C	AA	F	F	F	F		R								
13H-4, 128–130		113.10	G–M	F	F	F	F	F	R	F	F	F	C	F	F	F	F	F	F	A	F	F	F	C	R	VR	R							

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: AA = very abundant, A = abundant, C = common, F = few, R = rare, VR = very rare. O = ostracodes, ech = echinoids.

Table T15 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina aspensis*	*Subbotina senni*	*Guembelitrioides lozanoi*	*Morozovella caucasica*	*Acarinina bullbrooki*	*Truncorotaloides rohri*	Comments
198-1211A-										
12H-3, 29–31		101.10	M	F		F	F	A	R	
12H-3, 127–129	P8	102.10	M	F	VR	F	F	F		FIsh
12H-4, 28–30		102.60	M	R	F					
12H-4, 127–129		103.60	G–M	R	F					Fish
12H-5, 27–29		104.10	G–M							
12H-5, 127–130		105.10	G–M							FIsh
12H-6, 27–29		105.60	G–M							Fish
12H-6, 128–130	P7	106.60	G–M							O
12H-7, 27–29		107.10	G–M							O
12H-CC		107.39	G							O
13H-1, 27–29		107.60	G–M							O, fish
13H-1, 82–83		108.12	M							
13H-1, 96–97		108.26	M/P							
13H-1, 128–130		108.60	M							
13H-2, 27–29		109.10	G–M							O
13H-2, 128–130	P6b	110.10	M							
13H-3, 27–29		110.60	G							O, ech
13H-3, 128–130		111.60	G–M							O
13H-4, 27–29		112.10	G							O
13H-4, 128–130		113.10	G–M							O

Table T16. Distribution of planktonic foraminifers, Hole 1211A, Zones P9–P12. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina aquiensis*	*Acarinina decepta*	*Acarinina esnaensis*	*Acarinina gravelli*	*Acarinina primitiva*	*Acarinina pseudotopilensis*	*Acarinina angulosa*	*Acarinina wilcoxensis*	*Igorina broedermanni*	*Subbotina eocaenica*	*Subbotina inaequispira*	*Pseudohastigerina wilcoxensis*	*Subbotina lineaperta* s.l.	*Globanomalina* sp.	*Morozovella quetra*	*Morozovella aragonensis*	*Catapsydrax taroubaensis*	*Acarinina pentacamerata*	*Acarinina aspensis*	*Subbotina senni*	*Guembelitrioides lozanoi*	*Morozovella caucasica*	*Acarinina bullbrooki*	*Truncorotaloides rohri*	*Guembelitrioides nuttalli*	*Morozovella spinulosa*	*Dentoglobigerina yeguaensis*	*Turborotalia frontosa*	*Turborotalia griffinae*	*Subbotina crociapertura*	*Igorina broedermanni anapetes*	*Globigerinatheka micra*	*Truncorotaloides libyaensis*	*Turborotalia boweri*	*Globigerinatheka subconglobata*
198-1211A-																																					
11H-1, 27–29	P12	88.57	VP			R						x											F						R								
11H-1, 127–129		89.57	M–P			F	F	F	F			F	F	x		F			F		C		F	F		A	R	VR	F	F	F	F	F			R	C
11H-2, 27–29		90.07	P			F	R	F	F			F	C	x		F			C		C		F	R		AA	F		F	F	F	F	F		F	VR	C
11H-2, 127–129		91.07	M		F	F	R	F	F			F	F	x		F			F		F		F	F		A	F	VR	F	F	F	F	F		F		C
11H-3, 27–29		91.57	M–P		F	F	F	F	VR			F	C	R		F			F		F		F	R		A	F	R	F	F	C	F	C		F	F	VR	F
11H-3, 127–129		92.57	M		F	F	F		R			F	F	R		F			C		F		F	F		C	F		F	F	F	F	F		F	F		F
11H-4, 27–29	P11	93.07	P		F	F	F	F	F			F	F		VR	F	VR		F		C		C			A	F		F	R	R		R		F	F	R	F
11H-4, 127–129		94.07	P		F	F	F	F	F			C	F	R		F			F		A	R	F			C	F		F	R	VR	R	R		C	F	F	F
11H-5, 27–29		94.57	P		F	F	R	F	F	VR		C	F	VR	VR	VR			C		A	R	F	VR	R	A	F	VR		F	R	VR	R	R	C	R	R	C
11H-5, 127–129		95.57	M–P			F	F	F	F	F		F	F						C		C	F	F	F	R	A	F		F	VR	R		R	R	A	VR	R	C
11H-6, 27–29		96.07	M–P		F	F	R	F	F	F		F	F	R		R	VR		F		C	F	C	F	F	A	C		VR	VR		R	F	R	C	R	F	C
11H-6, 127–129		97.07	P		F	F	R	F	VR	F		F	F	R		F			C	VR	C	F	F	R	A	C	C	VR	F	R	R	VR	R	F	F	R	R	F
11H-7, 27–29		97.57	P–M		F	F	F	F	R	F		C	F	F	VR	R	VR		F	VR	A	R	F	VR	A	C	C	VR	VR	VR		VR	F	F	F		VR	F
11H-CC	P10	97.93	G–M	VR	F	F	F	F	F	F		F	F	F		VR			C		A	R	F		A	C	F		VR	VR	VR	VR	F	R?				
12H-1, 27–29		98.07	M	VR	F	F	R	F	F			F	C	F		F			C	VR	C	R	F	F	A	A	C		VR	R	F	VR						
12H-1, 129–131	P9	99.09	M	VR	F	F	F	F	F	F		F	F	F		F	VR		A		C	R	VR	R	A	C	C		F		R	R						
12H-2, 27–29		99.57	M	VR	F	F	R	C	F	F		F	F	R	VR	F			C	VR	C	R	R	F	C	A	F	R	R									
12H-2, 127–129		100.60	M–P	VR	C	C		C	F	F	VR	C	F	F		F	R	VR	A	VR	C	R	R	F	F	C	R	VR	VR	VR									

Notes: Preservation: G = good, M = moderate, P = poor, VP = very poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare, x = present. O = ostracodes, ph = phillipsite.

Table T16 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Pseudohastigerina micra*	*Truncorotaloides* cf. *topilensis*	*Subbotina eocaena*	*Tenuitella* sp.	*Globigerinatheka index*	*Globigerinatheka mexicana*	*Globigerinatheka kugleri*	*Subbotina utilisindex*	*Subbotina cryptomphala*	*Hantkenina* sp. spines	*Globorotaloides suteri*	*Planorotalites pseudoscitulus*	*Catapsydrax unicavus*	Comments
198-1211A-																	
11H-1, 27–29	P12	88.57	VP		R	VR	R	F	F		R	VR	R	R	R	VR	Fish, ph
11H-1, 127–129		89.57	M–P	VR	F	VR	R	R	F	R							Fish, ph
11H-2, 27–29		90.07	P		F												
11H-2, 127–129		91.07	M	VR	R												O, fish
11H-3, 27–29		91.57	M–P	VR	R												
11H-3, 127–129		92.57	M		VR												O
11H-4, 27–29	P11	93.07	P	VR													Fish, ph
11H-4, 127–129		94.07	P														Fish, ph
11H-5, 27–29		94.57	P	VR													Fish, ph
11H-5, 127–129		95.57	M–P														O, fish
11H-6, 27–29		96.07	M–P														O, fish
11H-6, 127–129		97.07	P														Fish, ph
11H-7, 27–29		97.57	P–M														O
11H-CC	P10	97.93	G–M														O
12H-1, 27–29	P9	98.07	M														
12H-1, 129–131		99.09	M														
12H-2, 27–29		99.57	M														
12H-2, 127–129		100.60	M–P														O

Table T17. Distribution of planktonic foraminifers, Hole 1211A, Zones P14–P18. (Continued on next page.)

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Acarinina esnaensis*	*Subbotina senni*	*Dentoglobigerina yeguaensis*	*Pseudohastigerina micra*	*Subbotina eocaena*	*Tenuitella* sp.	*Globigerinatheka index*	*Globigerinatheka mexicana*	*Subbotina utilisindex*	*Subbotina cryptomphala*	*Hantkenina* sp. spines	*Globorotaloides suteri*	*Planorotalites pseudoscitulus*	*Catapsydrax unicavus*	*Turborotalia pomeroli/Turborotalia cerroazulensis*	*Globigerinatheka* sp.	*Hantkenina liebusi*	*Globigerinatheka barri*	*Globigerinatheka koroktovi*	*Globigerinatheka tropicalis*	*Hantkenina alabamensis*	*Subbotina linaperta* s.s.	*Subbotina praeturritilina*	*Globigerina officinalis*	*Globigerina praebulloides*	*Paragloborotalia nana*	*Globorotaloides permicrus*	*Globigerina venezuelana*	*Turborotalia pseudoampliapertura* s.s.	*Globigerinatheka luterbacheri*	*Catapsydrax dissimilis*	*Dentoglobigerina pseudovenezuelana*	*Turborotalia ampliapertura* s.s.	*Catapsydrax martini*	*Subbotina gortanii*
198-1211A-																																						
8H-CC		69.36	M–P			F	VR	C					F		F		F								C	VR	C	F	F	C	F		F	C	F	F	R
9H-2, 27–29	P18	71.07	M–P			F	VR	A					F		F		F								F	F	F	F	F	C	F		F	C	R	F	F
9H-3, 128–130		73.58	G–M			F		C				VR	F		F		C								F	F		F	R	C	F		F	C	F	F	F
9H-5, 27–29	P16/P17	75.57	M			F	R	F					F		F		F								F	F	F	F	F	F	F		F	A	C	F	
9H-6, 118–119		77.98	VP				VR	R					VR	F	F		VR							R					R	R	VR	F			R	VR	VR	VR
9H-6, 128–130		78.08	G–M			R	VR	C				F	F	VR	F		F							VR		F	F	F	F	F	F	F			C	C	F	F
9H-6, 135–136		78.04	P				VR	F					VR	F	VR		F							R			VR	F	R	VR	VR	F		F		F	VR	
9H-CC		78.66	M			VR		C				R	F	VR	F		C							VR		C	F	F	F	F	F	C		F	F	C	F	R
10H-1, 44–45		79.24	VP			VR		F				VR	R	F	F		F						R	R		R	VR	F			R			R	R	R	R	VR
10H-1, 89–90		79.96	VP					R					R		R									R		VR	R		R	R	VR	VR		VR	R	VR	R	VR
10H-1, 118–119		79.98	P				VR						VR	R			R							R		R			R	R	F	F		R			VR	VR
10H-2, 27–29	P15	80.57	VP			VR		F				VR	R		R			VR							VR	VR		R		R	R	R	F		R				
10H-2, 128–130		81.58	VP			VR		R		VR		VR	R		R		R	VR							R	R	VR	R	R	R	R	R		VR	R			
10H-3, 28–30		82.08	VP				VR	VR		VR		R	VR		VR	VR	F	VR	R						VR	R	R	VR	R	VR	R	VR		R	VR			
10H-3, 127–129		83.07	VP			VR		VR		VR		R	R		VR		F	VR	VR				VR		VR		R	VR	F	R	R			VR				
10H-4, 27–29		83.57	VP					VR		R	VR	VR	R		R		R	R	R						R	R	R	VR	VR	VR	R	VR		VR				
10H-4, 127–129		84.57	VP			R	R			F	R	R	F				R	R	F				VR		R	F	R	R	R	F		VR						
10H-5, 27–29		85.07	VP					F		F	VR	R	F			R	F		F		R	R	VR	R	F	F	F	R	VR		R	R	R					
10H-5, 127–129	P14	86.07	VP		VR	VR	VR	R		F	F	R	VR		R	VR	R	VR	R			F	VR	R	R	VR												
10H-6, 27–29		86.57	VP		F			R		A	F		F	VR	R	R	R	VR	F		VR	C		R														
10H-7, 27–29		87.57	VP	VR	R	R	VR	F		C	F	F	R	F	F	VR	R	R	F			R	VR	R														
10H-CC		88.03	M–P	F	F		VR	F	R	C	A	C	F	A	F	R	F	C	C	R		F	F	R														

Notes: Preservation: G = good, M = moderate, P = poor. Abundance: A = abundant, C = common, F = few, R = rare, VR = very rare. O = ostracodes, ph = phillipsite.

Table T17 (continued).

Core, section, interval (cm)	Zone/ Subzone	Depth (mbsf)	Preservation	*Globoturborotalita ouachitaensis*	*Subbotina angiporoides*	*Tenuitellinata angustiumbilicata*	*Globigerina tripartita*	*Pseudohastigerina* sp.	*Pseudohastigerina naguewichiensis*	*Cribrohantkenina inflata*	*Globigerina tapuriensis*	*Globigerina sellii*	Comments
198-1211A-													
8H-CC		69.36	M–P	F	C	F	F	R	R		R	F	O, fish, ph
9H-2, 27–29	P18	71.07	M–P	VR	F	F	F		VR				O, fish, ph
9H-3, 128–130		73.58	G–M	F	C	F	F		R		R		O
9H-5, 27–29		75.57	M	F	C	F	F	F	R		VR		O
9H-6, 118–119		77.98	VP	VR		R			VR				O
9H-6, 128–130		78.08	G–M	F	C	F	F		VR				O
9H-6, 135–136	P16/P17	78.04	P				VR			R			O, fish, ph
9H-CC		78.66	M	F	F	F	R	R	VR				O, fish, ph
10H-1, 44–45		79.24	VP	R		R	VR						
10H-1, 89–90		79.96	VP	VR									
10H-1, 118–119		79.98	P										O
10H-2, 27–29		80.57	VP										Ph
10H-2, 128–130		81.58	VP										O, fish, ph
10H-3, 28–30		82.08	VP										O, fish, ph
10H-3, 127–129	P15	83.07	VP										O, fish, ph
10H-4, 27–29		83.57	VP										Fish, ph
10H-4, 127–129		84.57	VP										Fish, ph
10H-5, 27–29		85.07	VP										Fish, ph
10H-5, 127–129		86.07	VP										Fish, ph
10H-6, 27–29	P14	86.57	VP										O, fish, ph
10H-7, 27–29		87.57	VP										Fish, ph
10H-CC		88.03	M–P										O, fish, ph

Table T18. Stratigraphic position of the planktonic foraminiferal events, Holes 1209A, 1210A, and 1211A. (Continued on next page.)

Planktonic foraminifer event	Zone/ Subzone base	Core, section, interval (cm)		Depth (mbsf)			Core, section, interval (cm)		Depth (mbsf)		
		Upper	Lower	Upper	Lower	Mean	Upper	Lower	Upper	Lower	Mean
		198-1209A-	198-1209A-				198-1210A-	198-1210A-			
LO *Hantkenina* spp.	P18	14H-4, 91–92	14H-5, 36–37	127.61	128.56	128.09	14H-3, 131–132	14H-3, 147–148	124.21	124.37	124.29
FO *Subbotina gortanii–Tenuitellinata angustiumbilicata*	P16/P17	14H-CC	15H-1, 27–29	131.22	131.97	131.60	14H-CC	15H-1, 27–29	129.44	129.67	129.56
FO *Globorotaloides permicrus*	P15	15H-3, 27–29	15H-3, 127–129	134.97	135.97	135.47	15H-3, 128–130	15H-4, 27–29	133.68	134.17	133.93
LO *Orbulinoides beckmanni*	P14	15H-7, 27–29	15H-CC	140.47	141.04	140.76	15H-4, 27–29	15H-4, 127–129	134.17	135.17	134.67
FO *Orbulinoides beckmanni*	P13	15H-CC	16H-2, 27–29	141.04	142.26	141.65	15H-4, 127–129	15H-5, 27–29	135.17	135.67	135.42
FO *Morozovella lehneri*							16H-1, 27–29	16H-1, 127–129	139.17	140.17	139.67
LO *Morozovella aragonensis*	P12	16H-5, 27–29	16H-5, 127–129	146.76	147.76	147.26	16H-1, 27–29	16H-1, 127–129	139.17	140.17	139.67
FO *Globigerinatheka subconglobata*	P11	17H-4, 27–29	17H-4, 124–126	155.47	156.44	155.96	16H-CC	17H-1, 27–29	148.57	148.67	148.62
FO *Subbotina crociapertura–Igorina broedermanni anapetes*	P10	18H-2, 128–130	18H-3, 28–30	162.98	163.48	163.23	18H-3, 28–30	18H-3, 131–133	161.18	162.21	161.70
FO *Guembelitrioides nuttalli*	P9	19H-3, 127–129	19H-4, 27–29	173.97	174.47	174.22	18H-4, 26–28	18H-4, 131–133	162.66	163.71	163.19
LO *Morozovella formosa*	P8	19H-CC	20H-1, 27–29	178.95	179.47	179.21	19H-1, 127–129	19H-2, 27–29	168.67	169.17	168.92
FO *Morozovella aragonensis*	P7	21H-3, 50–51	21H-3, 68–69	192.20	192.38	192.29	20H-2, 127–129	20H-3, 27–29	179.67	180.17	179.92
FO *Morozovella formosa*	P6b	21H-3, 68–69	21H-4, 129–130	192.38	194.49	193.44	20H-3, 127–129	20H-4, 27–29	181.17	181.67	181.42
LO *Morozovella velascoensis*	P6a	21H-5, 49–50	21H-5, 129–130	195.19	195.99	195.59	20H-4, 90–91	20H-5, 19–20	182.30	183.09	182.70
FO *Morozovella gracilis*		21H-7, 19–20	21H-CC	197.89	198.24	198.07	20H-CC	21H-1, 27–29	186.59	186.67	186.63
LO *Globanomalina pseudomenardii*	P5	22H-1, 29–31	22H-1, 131–133	198.49	199.51	199.00	21H-1, 127–129	21H-2, 27–29	187.67	188.17	187.92
LO *Igorina albeari*		22H-1, 29–31	22H-1, 131–133	198.49	199.51	199.00	21H-1, 127–129	21H-2, 27–29	187.67	188.17	187.92
FO *Acarinina soldadoensis*	P4c	23H-1, 127–129	23H-2, 26–28	208.97	209.46	209.22	22H-2, 92–94	22H-2, 128–130	198.32	198.68	198.50
FO *Acarinina mckannai*		23H-3, 27–29	23H-4, 26–28	210.97	212.46	211.72	22H-3, 26–27	22H-3, 53–54	199.16	199.43	199.30
LO *Morozovella angulata*		23H-4, 26–28	23H-4, 127–129	212.46	213.47	212.97	22H-6, 27–29	22H-6, 127–129	203.67	204.67	204.17
LO *Morozovella conicotruncata*	P4b	23H-5, 27–29	23H-5, 127–129	213.97	214.97	214.47	22H-6, 27–29	22H-6, 127–129	203.67	204.67	204.17
FO *Globanomalina pseudomenardii*	P4a	24H-2, 25–27	24H-2, 127–129	218.95	219.97	219.46	23H-1, 128–130	23H-2, 27–29	206.68	207.17	206.93
FO *Igorina tadjikistanensis*		24H-4, 26–28	24H-4, 127–129	221.96	222.97	222.47	23H-2, 128–130	23H-3, 21–23	208.18	208.61	208.40
FO *Igorina albeari*	P3b	24H-4, 127–129	24H-5, 26–28	222.97	223.46	223.22	23H-3, 21–23	23H-3, 108–110	208.61	209.48	209.05
FO *Igorina pusilla–Morozovella conicotruncata*		24H-5, 26–28	24H-5, 127–129	223.46	224.47	223.97	23H-3, 108–110	23H-3, 128–130	209.48	209.68	209.58
FO *Morozovella angulata*	P3a	24H-6, 26–28	24H-6, 128–130	224.96	225.98	225.47	23H-4, 128–130	23H-5, 27–29	211.18	211.67	211.43
FO *Praemurica uncinata*	P2	25H-1, 127–129	25H-2, 127–129	227.97	228.46	228.22	23H-6, 27–29	23H-6, 128–130	213.17	214.18	213.68
FO *Praemurica inconstans*	P1c	25H-4, 26–28	25H-4, 127–129	232.96	231.46	232.21	24H-3, 27–29	24H-3, 127–129	218.17	219.17	218.67
FO *Subbotina triloculinoides*	P1b	25H-4, 26–29	25H-4, 127–130	232.96	231.46	232.21	24H-3, 27–30	24H-3, 127–130	218.17	219.17	218.67
LO *Parvularugo–globigerina eugubina*	P1α	25H-6, 26–28	25H-6, 93–94	234.46	235.13	234.80	24H-3, 27–31	24H-3, 127–131	218.17	219.17	218.67

Notes: LO = last occurrence, FO = first occurrence. * = Berggren et al. (1995), † = Berggren et al. (2000).

Table T18 (continued).

Planktonic foraminifer event	Zone/ Subzone base	Core, section, interval (cm)		Depth (mbsf)			Age (Ma)
		Upper	Lower	Upper	Lower	Mean	
		198-1211A-	198-1211A-				
LO *Hantkenina* spp.	P18	9H-3, 128–130	9H-5, 27–29	73.58	75.57	74.58	33.7*
FO *Subbotina gortanii–Tenuitellinata angustiumbilicata*	P16/P17	10H-1, 118–119	10H-2, 27–29	79.98	80.57	80.28	~35.2*
FO *Globorotaloides permicrus*	P15	10H-5, 27–29	10H-5, 127–129	85.07	86.07	85.57	~38.4*
LO *Orbulinoides beckmanni*	P14	10H-CC	11H-1, 27–29	88.03	88.57	88.30	40.1*
FO *Orbulinoides beckmanni*	P13						40.5*
FO *Morozovella lehneri*							43.5*
LO *Morozovella aragonensis*	P12	11H-1, 27–29	11H-1, 127–129	88.57	89.57	89.07	43.6*
FO *Globigerinatheka subconglobata*	P11	11H-7, 27–29	11H-CC	97.57	97.93	97.75	~45.8
FO *Subbotina crociapertura–Igorina broedermanni anapetes*	P10	11H-CC	12H-1, 27–29	97.93	98.07	98.00	~49
FO *Guembelitrioides nuttalli*	P9	12H-2, 127–129	12H-3, 29–31	100.60	101.10	100.85	~50.4
LO *Morozovella formosa*	P8	12H-4, 127–129	12H-5, 27–29	103.60	104.10	103.85	50.8*
FO *Morozovella aragonensis*	P7	13H-1, 82–83	13H-1, 96–97	108.12	108.26	108.19	52.3*
FO *Morozovella formosa*	P6b	13H-4, 128–130	13H-5, 28–29	113.10	113.58	113.34	54.0*
LO *Morozovella velascoensis*	P6a	13H-5, 86–87	13H-5, 128–129	114.16	114.58	114.37	54.7*
FO Morozovella gracilis		13H-6, 7–8	13H-6, 18–19	114.83	116.42	115.63	54.7*
LO *Globanomalina pseudomenardii*	P5	13H-7, 27–29	13H-CC	116.42	117.02	116.72	55.9*
LO *Igorina albeari*		13H-CC	14H-1, 27–29	117.02	117.07	117.05	56.3†
FO *Acarinina soldadoensis*	P4c	14H-4, 27–29	14H-4, 128–130	121.57	122.58	122.08	56.5*
FO *Acarinina mckannai*		14H-5, 127–129	14H-6, 27–29	124.07	124.57	124.32	59.1*
LO *Morozovella angulata*		14H-5, 127–129	14H-6, 27–29	124.07	124.57	124.32	59.1†
LO *Morozovella conicotruncata*	P4b	14H-5, 127–129	14H-6, 27–29	124.07	124.57	124.32	58.8†
FO *Globanomalina pseudomenardii*	P4a	15H-1, 27–29	15H-1, 127–129	126.57	127.57	127.07	59.4†
FO *Igorina tadjikistanensis*		15H-1, 127–129	15H-2, 27–29	127.57	128.07	127.82	60.5†
FO *Igorina albeari*	P3b	15H-1, 127–129	15H-2, 27–29	127.57	128.07	127.82	60.0*
FO *Igorina pusilla–Morozovella conicotruncata*		15H-2, 27–29	15H-2, 127–129	128.07	129.07	128.57	61.0–60.9*
FO *Morozovella angulata*	P3a	15H-2, 127–129	15H-3, 27–29	129.07	129.07	129.07	61.0*
FO *Praemurica uncinata*	P2	15H-3, 27–29	15H-3, 127–129	129.57	130.57	130.07	61.2*
FO *Praemurica inconstans*	P1c	15H-4, 4–5	15H-4, 45–46	130.84	131.25	131.05	63.0*
FO *Subbotina triloculinoides*	P1b	15H-4, 4–6	15H-4, 45–47	130.84	131.25	131.05	64.3*
LO *Parvularugo–globigerina eugubina*	P1α	15H-4, 45–46	15H-4, 88–89	131.25	131.68	131.47	64.7*