Samples	Thickness	Conodont zones	*Me. guanwushanensis* Tian, 1988	*Me. costalliformis* Ji, 1986	*Me. asymmetrica* Bischoff and Ziegler, 1957	*Ad. rotundiloba* *Bryant, 1921*	*Ad. rugosa* Branson and Mehl, 1934	*Ad. triangulata* Kralick, 1994	*Ad. gigas* Youngquist et al., 1947	*Ad. hamata* Ulrich and Bassler, 1926	*Ad. ioides* Ziegler, 1958	*Ad. curvata* Branson and Mehl, 1934	*Ancy. primus* Ji, 1986	*Ancy. triangularis* Youngquist, 1945	*Ic. al. alternatus* Branson and Mehl, 1934	*Ic. al. laliensis* n. subsp.	*Ic. symmetricus* Branson and Mehl, 1934	*Po. alata* Huddle, 1934	*Po. evidens* Klapper and Lane, 1985	*Po. elegantulus* Klapper and Lane, 1985	*Po. decorosus* Stauffer, 1938	*Po. aequalis* Klapper and Lane, 1985	*Po. webbi* Stauffer,1938	*Po. webbi* Stauffer,1938 M1	*Po. maximovae* Ovnatanova and Kononova, 1996	*Po. reitlingerae* Ovnatanova and Kononova, 2008	*Po. elegantulus* Klapper & Lane, 1985	*Po. morgani* Klapper & Lane, 1985
LYF-31	-2	UN ZONE																										
LL-0	0	FZ 1-2				P												X					X					
LL-1	1	FZ 1-2	P			X											X		X				X					
LL-2.5	2.5	FZ 3	P	P	P	P	X	P									X	X				P	X					
LL-4	4	FZ 4	X		X			X											X			P	X					
LL-5.3	5.3	FZ 5								X							X		P			X	P	X				
LL-6	6	FZ 5															X	P	X				P	X	X	?		
LL-7	7	FZ 6-7											X				P		P			P	X	X				
LL-8	8	FZ 8								X							P		X			X	P	X	P	X		
LL-9	9	FZ 8								X							X		X				X		X			
LL-10	10	FZ 8								X							X		X			X	X	X				
LL-10.7	10.7	FZ 8								X							X		X									
LL-13	13	FZ 8								X							X		X									
LL-14	14	FZ 9-10								X				?			X		X									
LL-15	15	FZ 9-10								X							X		X				X		P			
LL-16.8	16.8	FZ 9-10								P				P			X		P									
LL-18.1	18.1	FZ 11							P	X							X		X							X		
LL-19	19	FZ 11								X		P							X									
LL-20.8	20.8	FZ 11												P					X									
LL-24.5	24.5	FZ 11								X									X		X							
LL-26.4	26.4	FZ 12								X	X								P		X							
LL-30	30	FZ 12								X	X								X		X							
LL-32.7	32.7	FZ 12									X			X					X		?							
LL-33.5	33.5	FZ 12																										
LL-34.3	34.3	FZ 12																										
LL-35	35	FZ 12 ?																										
LL-35.4	35.4	FZ 12 ?																										
LL-36	36	FZ 12 ?									X			P					X							X		
LL-37	37	FZ 12 ?									X			X					X									
LL-38.5	38.5	FZ 12 ?									X								X		P							
LL-39.4	39.4	FZ 13A								X	X								X		X							
LL-40.7	40.7	FZ 13A								X	X										X							
LL-41.5	41.5	FZ 13A								X	X										X							
LL-42.8	42.8	FZ 13A									X										X							
LL-43.7	43.7	FZ 13A									X										X							
LL-44.3	44.3	FZ 13A									X										X							
LL-45	45	FZ 13B								X	X										X							
P1	46	FZ 13B								X	X										P		X					
P0X	47	FZ 13B								P	X										X		P			P		
P0X+0.5r	47.5	FZ 13C																										
P1X	48	*superlobata*													X	X				X								
NP2	49	*trangularis*													P	P											P	P

						transitans-stock							*hassi*-stock							*ljaschenkoae*-stock				*yizhouensis*-stock			
Samples	*Pa. transitans* Muller, 1956	*Pa. aristovi* Bardashev and Bardasheva, 2012	*Pa. aristovi* Bardashev and Bardasheva, 2012 M1	*Pa. martenbergensis* Muller, 1956	*Pa. pragigas* Ziegler and Sandberg, 1990	*Pa. punctata* Hinde, 1879	*Pa. housei* Klapper, 2007a	*Pa. plana* Ziegler and Sandberg, 1990	*Pa. bohemica* Klapper and Foster, 1993	*Pa. luscarensis* Klapper and Foster, 1993	*Pa. spinata* Ovnatanova and Kuzmin, 1991	*Pa. rotundilobata* Kuzmin, 1998	*Pa. hassi* Muller and Muller, 1957	*Pa. mucronata* Klapper et al., 1996	*Pa. amplificata* Klapper et al., 1996	*Pa. anzhelae* Khruscheva and Kuzmin, 1996	*Pa. semichatovae* Ovnatanova, 1976	*Pa. kireevae* Ovnatanova, 1976	*Pa. hanae* Bai et al., 1994	*Pa.* cf. *ljaschenkoae* Ovnatanova, 1976	*Pa. coronata* Muller, 1956	*Pa. proversa* Ziegler, 1958	*Pa. proversa* Ziegler, 1958 M1	*Pa. yizhouensis* n. sp.	*Pa. ederi* Ziegler and Sandberg, 1990	*Pa. eureka* Ziegler and Sandberg, 1990	*Pa. linguiformis* Muller, 1956
LYF-31																											
LL-0																											
LL-1																											
LL-2.5																											
LL-4	P																										
LL-5.3	X	P	P	X		P			X	X	P																
LL-6	P	P		X	X	P		?	P	X	P									?							
LL-7	X		X	X	?	P		?	X	X		X	P							P							
LL-8	P		P	X	P	P	P	P	P	X		P	P							X							
LL-9				X	X	X		X				X	X							X							
LL-10					?	X	P	X				X	X	P	X												
LL-10.7				X		X	P	X				X	X	?	P					X							
LL-13						X		X				X	X	X	X							tr					
LL-14				X		X		X				X	X	P	X			X		P		X	P	P			
LL-15				X		P		X				P	P	P	P			X		X	X	P	X	X			
LL-16.8						P		P					X	P	X			X		X	P	P	X	X		?	
LL-18.1								P					X	X	P	P	X	X		P	X	P	P	P	X	P	
LL-19								?					X	X	P	P	P	X		P		X	X	X	X	X	
LL-20.8								X						p	X						?	X	X			X	
LL-24.5															X					X							
LL-26.4														?											P		
LL-30																											
LL-32.7																											
LL-33.5																										X	
LL-34.3																											
LL-35																											
LL-35.4																											
LL-36																											
LL-37																										X	
LL-38.5																											
LL-39.4																									P	P	
LL-40.7																										P	
LL-41.5																											
LL-42.8																			X								
LL-43.7																			X								
LL-44.3																			X								
LL-45																			X								X
P1																			X								X
P0X																											X
P0X+0.5r																											
P1X																											
NP2																											

			feisti-stock												*nasuta*-stock										
Samples	*Pa. feisti* Klapper, 2007a	*Pa. jamieae* Ziegler and Sandberg, 1990	*Pa. jamieae* Ziegler and Sandberg, 1990 M1	*Pa. gyrata* Kuzmin and Melnikova, 1991	*Pa.* cf. *prominens* Muller, 1956	*Pa. juntianensis* Han, 1987	*Pa. foliacea* Youngquist, 1945	*Pa. nasuta* Muller, 1956	*Pa. marki* Savage, 2013	*Pa. muelleri* Klapper and Foster, 1993	*Pa. nicolli* Klapper, 2007a	*Pa. winchelli* (Stauffer, 1938)	*Pa. winchelli* (Stauffer, 1938) M1	*Pa. extansa* Ziegler and Sandberg, 1990	*Pa. bogartensis* (Stauffer, 1938)	*Pa.* cf. *bogartensis* (Stauffer, 1938)	*Pa. berkeri* Klapper, 2007	*Pa. boogaardi* Klapper and Foster, 1993	*Pa. rh. salibaevi* Bardashev, 2009	*Pa. rh. rhenana* *Bischoff, 1956* M1	*Pa. rh. rhenana* *Bischoff, 1956*	*Pa. triangularis* Sannemann, 1955	*Pa. ultima* Ziegler, 1958
LYF-31																							
LL-0																							
LL-1																							
LL-2.5																							
LL-4																							
LL-5.3																							
LL-6																							
LL-7																							
LL-8	P																						
LL-9	X																						
LL-10																							
LL-10.7										?													
LL-13								tr															
LL-14								tr															
LL-15								X															
LL-16.8								P		X													
LL-18.1								X		P													
LL-19	P							P															
LL-20.8								X															
LL-24.5	X	P		X				X		?													
LL-26.4	X	P	P	P				X				P											
LL-30		X	P					P				?											
LL-32.7		P	P					X				X											
LL-33.5		P	P					X				X											
LL-34.3								?															
LL-35		X	X					?															
LL-35.4		X	X					X															
LL-36		X	X		X			X				X	X			P			P				
LL-37	P	X	X		X		X	P				X	X			P			X		X		
LL-38.5		X	X		X			X				X							X				
LL-39.4			X			P	X	X			X	X	X		?				X		X		
LL-40.7						P	X	X				P			X				X	P	X		
LL-41.5						X	P	P				P	X	P	P			P	P		X		
LL-42.8						X	P	?			X	P			X		P	P	X	P			
LL-43.7						X	X	X				X	X	X	X		P	P	X	P	X		
LL-44.3						X		X			X	X		X	X			X	P				
LL-45						X		X			X	X	X		X			X	X		X		
P1						X		X			X	X	X	X	P			P	X		X		P
P0X						X		P	P		X	P	X	P	X			X	P		X		
P0X+0.5r																							
P1X																							P
NP2																						P	

Table. 2