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**Ultra-high resolution pollen record from the northern Andes reveals rapid shifts in montane climates within the last two glacial cycles**

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**Supplementary Table 1. Core sections (depth in cm) of Fúquene-9 and Fúquene-10**

Fúquene-9	Fúquene-10		Fúquene-9	Fúquene-10
	6799-6702			3259-3161
	6644-6546		3199-3101	
	6499-6402			3140-3041
	6379-6282		3079-2981	
	6259-6162			3019-2921
6199-6100			2959-2861	
	6139-6043			2899-2802
6079-5981			2838-2742	
	6019-5922			2779-2681
5960-5861			2719-2620	
	5899-5801			2649-2556
5839-5741			2599-2501	
	5778-5681			2539-2441
5719-5621			2479-2381	
	5659-5561			2419-2321
5599-5501			2359-2261	
	5538-5441			2299-2201
5479-5380			2239-2146	
	5415-5321			2179-2083
5350-5261			2119-2021	
	5299-5202			2059-1965
5239-5163			1999-1901	
	5179-5082			1939-1841
5119-5020			1879-1781	
	5059-4962			1819-1721
4999-4901			1759-1661	
	4939-4842			1698-1601
4878-4781			1639-1541	
	4819-4721			1579-1480
4758-4660			1519-1421	
	4699-4600			1459-1361
4639-4541			1399-1301	
	4579-4481			1339-1241
4521-4422			1279-1181	
	4459-4360			1219-1121
4399-4301			1159-1061	
	4339-4241			1099-1001
4279-4181			1039-941	
	4216-4122			970-880
4159-4061			919-821	
	4099-4001			859-760
4038-3941			799-701	
	3949-3879			739-641
3919-3820			679-580	
	3859-3761			619-521
3798-3701			559-460	
	3738-3641			499-401
3679-3582			439-341	

	3619-3521			379-280
3559-3461			318-220	
	3499-3400			259-160
3439-3341			199-167	
	3378-3281			140-100
3319-3220				

**Supplementary Table 2. Tie points between Fúquene-9 and Fúquene-10**

Fq-10 depth (cm)	Fq-9 depth (cm)	Offset (cm)
169	108	61
257	196	61
378	318	60
499	437	62
737	669	68
858	793	65
969	899	70
1338	1255	83
1458	1368	90
1578	1475	103
1698	1587	111
1818	1742	76
2297	2212	85
2370	2279	91
2418	2367	51
2537	2522	15
2648	2695	-47
2778	2803	-25
2898	2915	-17
3018	3065	-47
3139	3170	-31
3257	3286	-29
3377	3418	-41
3498	3543	-45
3618	3649	-31
3738	3768	-30
3858	3895	-37
3948	3992	-44
4097	4145	-48
4213	4260	-47
4338	4374	-36
4457	4492	-35
4578	4614	-36
4697	4742	-45
4817	4871	-54
4938	4970	-32
5057	5092	-35
5297	5327	-30
5324	5369	-45

**Supplementary Table 3. Selected intervals used to construct the Fúquene-9 composite record**

Fq-9 Depth (cm)	Fq-10 Depth (cm)	<i>Fq-10 drilling depth</i>	Fq-9 Depth (cm)	Fq-10 Depth (cm)	<i>Fq-10 drilling depth</i>
6000-5982			2719-2620		
5959-5866			2599-2516		
5839-5824				2515-2480	2530-2495
	5823-5736	5778-5691	2479-2381		
5719-5622			2359-2269		
5599-5584				2268-2240	2359-2331
	5583-5489	5538-5444	2239-2146		
5479-5461			2119-2090		
	5460-5370	5415-5325	2083-2021		
5350-5329			1999-1901		
	5328-5235	5298-5205	1879-1819		
	5208-5114	5178-5084		1816-1795	1901-1880
	5094-5001	5059-4966	1794-1781		
	4971-4878	4939-4846	1758-1695		
	4873-4780	4819-4726		1694-1645	1770-1721
4758-4744			1639-1571		
	4743-4645	4698-4600		1570-1490	1681-1601
4639-4615			1489-1470		
	4614-4521	4578-4485		1469-1389	1572-1492
4520-4426			1388-1369		
	4425-4400	4390-4365		1368-1280	1458-1370
4399-4312			1278-1257		
4278-4245				1256-1160	1339-1243
	4244-4170	4197-4123	1158-1062		
4158-4065				1061-1039	1144-1122
	4064-4049	4016-4001	1038-941		
4037-3994				899-810	969-880
	3993-3923	3949-3879	799-739		
3919-3896				738-695	803-760
	3895-3799	3858-3762	679-580		
	3768-3679	3738-3649	558-460		
3678-3596				437-339	499-401
	3595-3564	3564-3533		319-227	379-287
3558-3499			199-167		
	3498-3450	3453-3405			
3438-3342					
3318-3260					
	3259-3199	3230-3170			
3198-3104					
3077-2981					
2958-2861					
	2860-2838	2843-2821			
2837-2742					

Core depth of Fúquene-9 are according to the original depth intervals. Core depth of Fúquene-10 are shown as their original depth intervals and the new depth intervals after correlating the cores.