

The following are the Supplementary data to this article:

Table S1 The environment variable.

Type	Code	Description	Unit
Climate factors	bio1	Annual mean temperature	°C
	bio2	Mean diurnal range (Mean of monthly (max.temp.-min.temp.))	°C
	bio3	Isothermality (bio2 / bio7) ($\times 100$)	
	bio4	Temperature seasonality (standard deviation*100)	
	bio5	Max temperature of the warmest month	°C
	bio6	Min temperature of the coldest month	°C
	bio7	Temperature annual range (bio5- bio6)	°C
	bio8	Mean temperature of the wettest quarter	°C
	bio9	Mean temperature of the driest quarter	°C
	bio10	Mean temperature of the warmest quarter	°C
	bio11	Mean temperature of the coldest quarter	°C
	bio12	Annual precipitation	mm
	bio13	Precipitation of the wettest month	mm
	bio14	Precipitation of the driest month	mm
	bio15	Precipitation seasonality (Coefficient of variation)	
	bio16	Precipitation of the wettest quarter	mm
	bio17	Precipitation of the driest quarter	mm
	bio18	Precipitation of the warmest quarter	mm
	bio19	Precipitation of coldest quarter	mm
Terrain factors	alt	Altitude	m
	slope	—	°
	aspect	—	rad
UVB factors	Uvb1	Annual mean UV-B	
	Uvb2	UV-B seasonality	
	Uvb3	Mean UV-B of highest Month	
	Uvb4	Mean UV-B of lowest Month	
	Uvb5	Sum of monthly mean UV-B during highest quarter	
	Uvb6	Sum of monthly mean UV-B during lowest quarter	
Soil factors	T-cf	Topsoil coarse fragments	%volume
	T-oc	Topsoil organic carbon	% weight
	T-ph	Topsoil pH (H2O)	-log(H ⁺)
	T-sand	Topsoil sand fraction	% weight
	T-silt	Topsoil silt fraction	% weight

Table S2 The potential suitable distribution areas of *A. yangbiense* and *C. chago* under climate change

Species	Climate scenarios	Period	Low suitability		Medium suitability		High suitability		Total suitability	
			area		area		area		area	
			Area (×10 ⁴ km ²)	Change (%)	Area (×10 ⁴ km ²)	Change (%)	Area (×10 ⁴ km ²)	Change (%)	Area (×10 ⁴ km ²)	Change (%)
<i>A. yangbiens</i>		LGM	28.0946	63.76%	12.0013	77.34%	2.2046	-57.05%	42.3005	45.58%
		MH	6.8430	-60.11%	1.1758	-82.62%	0.5417	-89.45%	8.5605	-70.54%
		Current	17.1564	—	6.7674	—	5.1333	—	29.0571	—
	SSP126	2030S	8.9754	-47.68%	3.5303	-47.83%	4.4383	-13.54%	16.9440	-41.69%
		2050S	9.3645	-45.42%	3.3381	-50.67%	5.0628	-1.37%	17.7654	-38.86%
		2070S	8.4331	-50.85%	3.1810	-52.99%	2.2158	-56.83%	13.8299	-52.40%
		2090S	10.9799	-36.00%	3.9611	-41.47%	4.5344	-11.67%	19.4754	-32.98%
	SSP585	2030S	7.4048	-56.84%	2.7777	-58.95%	2.0439	-60.18%	12.2264	-57.92%
		2050S	7.8128	-54.46%	3.3288	-50.81%	3.3477	-34.78%	14.4894	-50.13%
		2070S	9.5864	-44.12%	4.1401	-38.82%	2.7180	-47.05%	16.4445	-43.41%
		2090S	6.6435	-61.28%	2.2262	-67.10%	1.3039	-74.60%	10.1736	-64.99%
<i>C. chago</i>		LGM	22.4487	215.83%	11.2197	212.01%	1.4488	-44.76%	35.1172	163.51%
		MH	3.2027	-54.94%	0.1872	-94.80%	0.0677	-97.42%	3.4576	-74.06%
		Current	7.1019	—	3.5959	—	2.6228	—	13.3266	—
	SSP126	2030S	2.1058	-70.37%	1.1612	-67.71%	0.4350	-83.41%	3.7021	-72.22%
		2050S	2.5393	-64.28%	1.6240	-54.84%	0.7030	-73.20%	4.8663	-63.48%
		2070S	1.5531	-78.15%	0.2765	-92.31%	0.0022	-99.91%	1.8319	-86.25%
		2090S	2.2634	-68.16%	0.8500	-76.36%	0.0563	-97.85%	3.1697	-76.22%
	SSP585	2030S	2.1923	-69.16%	0.9623	-73.24%	0.0583	-97.78%	3.2129	-75.89%
		2050S	1.4896	-79.04%	0.6123	-82.97%	0.1129	-95.70%	2.2148	-83.38%
		2070S	0.6804	-90.43%	0.0236	-99.34%	0	-100%	0.7041	-94.72%
		2090S	0.0682	-99.04%	0	-100%	0	-100%	0.0682	-99.49%