Supplementary Table 1: Tree stump cast measurements

Tree Stump Cast	Diameter	Notes
1	133.8 cm	
2	32 cm	
3	29.5 cm	
4	64 cm	
5	59 cm	
6	62.5 cm	
7	60.2 cm	
8	18 cm	
9	60.5 cm	
10	129 cm	
11	160 cm	
12	40 cm	
13	30 cm	
14	58cm	
15	106 cm	
16	72.6 cm	
17	68 cm	
18	30 cm	
19	92 cm	
20	120 cm	
21	75 cm	
22	98 cm	
23	89 cm	
24	120 cm	
25		no measurement
26	69.2 cm	
27	50 cm	
28	70 cm	
29		no measurement

Supplementary Table 2: Classification and leaf physiognomic characters for fossil leaves from R3

Morphotype	Classification[¥]	Margin *	Leaf area (cm^2)	Leaf area (e^x, $cm^{2)}$	Petiole width (cm)	(Petiole width)^2/area	Leaf mass/area (g m-2)	Leaf mass/area, + error	Leaf mass/area, - error
	Site mean	88.89	25.04	7.83	0.19	3.27E-03	124.97	238.95	67.05
1	Dicot	E	11.87	6.85	0.15	2.84E-03	125.20	160.50	97.66
2	Monocot	-							
3	Dicot	E							
4	Dicot	E	14.34	7.18	0.18	2.29E-03	115.19	160.82	82.50
5	Dicot	E	45.82	8.43	0.22	1.09E-03	86.94	195.94	38.58
6	Dicot	E	70.98	8.87	0.27	1.06E-03	85.87	193.53	38.10
7	Dicot	T	11.13	7.02	0.18	2.78E-03	124.15	279.93	55.06
8	Dicot	E	7.14		0.06	6.27E-04	70.25	124.86	39.53
9	Dicot	E	6.45	6.45	0.15	2.78E-03	124.19	220.85	69.84
10	Dicot	E	7.25	6.59	0.14	2.71E-03	122.84	218.44	69.08
11	Dicot	E	32.63	8.01	0.21	2.22E-03	113.93	202.55	64.08
12	Dicot	E	25.31	7.84					
13	Dicot	?	46.93	8.45					
15	Dicot	T	4.03	6.00					
16	Dicot	E	20.05	7.50	0.12	1.08E-03	86.47	138.34	54.05
17	Dicot	E							
18	Dicot	E	15.84	7.37					
19	Dicot	E	26.22	7.87					
20	Dicot	E	25.98	7.50					
21	Dicot	E	34.23	8.14	0.27	2.16E-03	112.74	254.14	50.01
22	Dicot	E	11.02	6.94	0.20	9.17E-03	195.82	274.59	139.64
23	Dicot	E	84.88	9.05	0.30	6.10E-03	167.56	378.16	74.24
24	Dicot	T	17.42	7.46					

25	Dicot	E	44.39	8.40	0.32	7.01E-03	176.68	398.83	78.27
26	Dicot	E	4.64	6.14	0.09	1.66E-03	101.96	229.81	45.24
27	Dicot	E	26.79	7.89	0.21	6.69E-03	173.60	391.84	76.91
28	Dicot	E	5.64	6.34					
29	Dicot	E							
30	Monocot	-							
¥Dicot = dicotyledonous angiosperm, Monocot = monoctyledonous angiosperm. *E = entire, T = toothed, ? = unknown, - = monocot. Blank cell indicate character not measured due to incomplete preservation.									

Supplementary Table 3: Paleobotanical and paleosol paleoclimate estimates from R3 time-slice.

Leaf physiognomy model	Mean annual temperature (MAT, °C)	Mean annual precipitation (MAP, mm)	Wet month precipitation (mm)
Wilf[45]	28.3 (±2.0)		
Miller et al.[46]	27.1 (±1.9)		
Kowalski and Dilcher[47]	34.5 (±2.4)		
Peppe et al.[22]	22.8 (±4.9)	1710 (+1430, -780)	
Wilf et al.[48]		1660 (+1330, -730)	
Gregory-Wodzicki[47]		2620 (+1570, -980)	
Jacobs and Herendeen[50] Model 1		1460 (± 390)	
Jacobs and Herendeen[50] Model 2		1390 (± 320)	
Jacobs and Herendeen[50] Wet ppn			1400 (± 380)

Supplementary Table 4: Vertebrate faunal list for R3 site (historical and our collections). Taxon list follows Pickford[24] and Drake *et al.*[63] with additional revisions and systematic works from several authors see [23,64-67] and our personal observations.

Faunal List	**New collections**		**Historical collections**
	2007-2013 entire site	**2011-2013** "forest paleosol"	after Pickford (1986)
Primates			
Dendropithecus macinnesi		**x**[1]	**x**
Limnopithecus legetet			**x**
Nyanzapithecus vancouveringorum			**x**
Proconsul nyanzae			**x**
Proconsul heseloni	**x**	**x**	
Komba minor			**x**
Komba robustus			**x**
Progalago songhorensis			**x**
Mioeuoticus shipmani			**x**
Chiroptera			**x**
Propotto leakeyi			**x**
Lagomorpha			
Kenyalagomys rusingae	**x**		**x**
Kenyalagomys minor			**x**
Rodentia			
Lavocatomys aequatorialis	**x**	**x**	
Paraphiomys pigotti	**x**	**x**	**x**
Paraphiomys stromeri			**x**
Paraphiomys sp.	**x**	**x**	
Diamantomys luederitzi	**x**	**x**	**x**
Kenyamys mariae	**x**	**x**	
Simonimys sp.	**x**		
Paranomalurus soniae	**x**		
Megapedetes pentadactylus	**x**	**x**	**x**
Vulcanisciurus africanus	**x**	**x**	**x**
Macroscelidea			
Myohyrax oswaldi			**x**
Macroscelididae indet.	**x**	**x**	
Tenrecidae			

Parageogale aletris			**x**
Proboscidea			
Prodeinotherium hobleyi	**x**		**x**
cf. *Archaeobelodon sp.*	**x**		**x**
Hyracoidea			
Afrohyrax championi	**x**	**x**	**x**
Tubulidentata			
Myorycteropus africanus	**x**	**x**	**x**
Erinaceidae			
Gymnurechinus leakeyi			**x**
Amphechinus rusingensis	**x**	**x**	**x**
Creodonta			
Anasinopa leakeyi			**x**
Metapterodon sp.			**x**
Leakeytherium hiwegi			**x**
Hyainailouros nyanzae			**x**
Isohyaenodon andrewsi			**x**
Creodonta indet.	**x**	**x**	
Carnivora			
Cynelos euryodon			**x**
Kichechia zamanae			**x**
Afrosmilus sp.	**x**		
Carnivora indet.	**x**	**x**	
Rhinocerotidae			
Turkanatherium acutirostratum			**x**
Rhinocerotidae indet.	**x**		
Chalicotheriidae			
Butleria rusingense	**x**	**x**	**x**
Anthracotheriidae			
Sivameryx africanus			**x**
Brachyodus aequatorialis			**x**
Anthracotheriidae indet.	**x**	**x**	
Suidae			
Kubanochoerus anchidens			**x**
Kenyasus rusingensis	**x**	**x**	**x**
Nguruwe kijivium			**x**
Sanitheriidae			

Diamantohyus africanus			**x**
Ruminantia			
Dorcatherium chappuisi	**x**		**x**
Dorcatherium pigotti	**x**	**x**	**x**
Dorcatherium parvum	**x**	**x**	**x**
Dorcatherium sp.	**x**	**x**	
Propalaeoryx nyanzae			**x**
Canthumeryx sirtensis			**x**
Walangania africanus			**x**
Crocodilia			
Crocodilia indet.	**x**	**x**	
Squamata			
Varanus sp.	**x**		
Gerrhosaurus sp.			**x**
Serpentes indet.	**x**	**x**	
Testudines			
Testudinidae indet.	**x**	**x**	
Aves			
Aves indet.	**x**	**x**	

[1] Although the *Dendropithecus* skeletons are from historical collections, the location of that discovery enabled us to tie them stratigraphically to the forest paleosol during the 2011 season.