

SARS-CoV-2 in Captive Nonhuman Primates, Spain, 2020–2023

Appendix

Appendix Table. Distribution of individual and pooled fecal samples collected from captive NHPs in Spain during February–May 2022*

NHP family and species	No. positive/ total†	Zoos and rescue centers‡																
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Aotidae																		
<i>Aotus azarae</i>	0/1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<i>Aotus nancymae</i>	0/1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0/2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Atelidae																		
<i>Ateles geoffroyi</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Subtotal	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Callitrichidae																		
<i>Callimico goeldii</i>	0/5	0	2	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0
<i>Callithrix geoffroyi</i>	0/8	0	1	0	0	3	0	0	0	1	0	0	0	0	1	0	1	1
<i>Callithrix jacchus</i>	0/5	0	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	1
<i>Cebuella pygmaea</i>	0/2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
<i>Leontopithecus chrysomelas</i>	0/3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
<i>Leontopithecus rosalia</i>	0/2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<i>Mico argentatus</i>	0/2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Saguinus bicolor</i>	0/1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Saguinus imperator</i>	0/2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
<i>Saguinus labiatus</i>	0/2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Saguinus midas</i>	0/2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
<i>Saguinus oedipus</i>	0/7	0	1	0	0	2	0	0	0	0	1	1	0	0	0	0	1	1
Subtotal	0/41	0	11	0	0	7	3	0	0	2	4	2	0	0	3	0	3	6
Cebidae																		
<i>Cebus olivaceus</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Saimiri boliviensis</i>	0/1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
<i>Saimiri sciureus</i>	0/5	0	1	0	0	1	1	0	0	1	0	0	0	0	0	1	0	0
<i>Sapajus apella</i>	0/8	1	0	0	2	2	1	0	0	0	1	0	0	0	0	0	0	1
Subtotal	0/15	1	1	0	2	3	2	0	0	1	2	0	0	0	0	1	1	1
Cercopithecoidea																		
<i>Cercocebus atys lunulatus</i>	0/3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0
<i>Cercocebus chrysogaster</i>	0/1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<i>Cercopithecus mona</i>	0/1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<i>Cercopithecus neglectus</i>	0/4	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0
<i>Chlorocebus aethiops</i>	0/2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
<i>Colobus guereza</i>	0/5	0	1	0	1	0	0	0	0	0	0	0	1	0	2	0	0	0
<i>Erythrocebus patas</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<i>Lophocebus aterrimus</i>	0/4	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
<i>Macaca fascicularis</i>	0/2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Macaca silenus</i>	0/1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Macaca sylvanus</i>	0/9	0	0	0	0	1	0	3	0	0	0	0	0	0	3	1	1	0
<i>Macaca tonkeana</i>	0/1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<i>Mandrillus leucophaeus</i>	0/2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
<i>Mandrillus sphinx</i>	0/2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
<i>Miopithecus ogouensis</i>	0/7	0	0	0	0	2	0	0	2	0	0	0	0	2	0	1	0	0
<i>Papio cynocephalus</i>	0/4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Papio hamadryas</i>	0/1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Papio papio</i>	0/1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0/51	2	3	2	6	6	0	3	4	0	0	5	2	2	6	5	4	1
Galagidae																		

NHP family and species	No. positive/ total†	Zoos and rescue centers‡																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
<i>Galago moholi</i>	0/3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	
Subtotal	0/3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	
Hominidae																			
<i>Gorilla gorilla gorilla</i>	0/4	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	0	
<i>Pan troglodytes</i>	0/11	0	1	0	1	3	0	1	1	0	0	3	0	0	0	0	1	0	
<i>Pan troglodytes ellioti</i>	0/2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
<i>Pan troglodytes troglodytes</i>	0/4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	
<i>Pan troglodytes verus</i>	0/3	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	
<i>Pan troglodytes verus/troglodytes</i>	0/4	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	
<i>Pongo abelii</i>	0/2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Pongo pygmaeus</i>	0/4	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	
Subtotal	0/34	0	3	1	3	4	0	13	2	0	0	4	0	3	0	0	1	0	
Hylobatidae																			
<i>Hylobates agilis</i>	0/1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Hylobates lar</i>	0/5	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	0	
<i>Hylobates muelleri</i>	0/1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Hylobates syndactylus</i>	0/1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
<i>Nomascus gabriellae</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
<i>Nomascus leucogenys</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
<i>Nomascus siki</i>	0/1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
Subtotal	0/11	0	0	0	2	3	0	0	0	0	2	1	0	1	1	1	1	0	
Lemuridae																			
<i>Eulemur albifrons</i>	0/1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Eulemur fulvus</i>	0/2	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	
<i>Eulemur macaco</i>	0/3	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
<i>Eulemur mongoz</i>	0/1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
<i>Eulemur rubriventer</i>	0/1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
<i>Eulemur rufifrons</i>	0/1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
<i>Lemur catta</i>	0/10	0	1	0	1	1	0	0	1	1	0	1	1	1	0	0	1	1	
<i>Varecia rubra</i>	0/1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
<i>Varecia variegata</i>	0/6	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	1	0	
Subtotal	0/26	1	3	0	3	2	0	0	4	2	0	2	2	4	0	0	2	1	
Lorisidae																			
<i>Nycticebus pygmaeus</i>	0/1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Subtotal	0/1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Pitheciidae																			
<i>Pithecia pithecia</i>	0/1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Subtotal	0/1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand total	0/186	4	22	3	16	26	10	16	10	5	8	14	4	10	10	7	11	10	

*Numbers indicate the number of NHP species tested for SARS-CoV-2 at each zoo or rescue center. NHP, nonhuman primate.

†Number of SARS-CoV-2–positive animals per the total number of animals tested at each zoo or rescue center.

‡Fecal samples were obtained from zoos or rescue centers represented by letters A–Q. Locations of the zoos and rescue centers are shown in Figure 1, main text.

Appendix References

- Wu Y, Wu N, Jia X, Wu Y, Zhang X, Liu Y, et al. Long-term immune response to Omicron-specific mRNA vaccination in mice, hamsters, and nonhuman primates. *MedComm* (2020). 2023;4:e460. [PubMed https://doi.org/10.1002/mco2.460](https://doi.org/10.1002/mco2.460)
- Honda-Okubo Y, Li L, André G, Leong KH, Howerth EW, Bebin-Blackwell AG, et al. An Advax-CpG55.2™ adjuvanted recombinant spike protein vaccine protects cynomolgus macaques from a homologous SARS-CoV-2 virus challenge. *Vaccine*. 2023;41:4710–8. [PubMed https://doi.org/10.1016/j.vaccine.2023.06.063](https://doi.org/10.1016/j.vaccine.2023.06.063)