

The Domestication of Guinea Pigs (*Cavia porcellus*)



Guinea Pig (豚鼠、天竺鼠)

I have something to say:

- I am NOT from Guinea!
- I am NOT a pig!

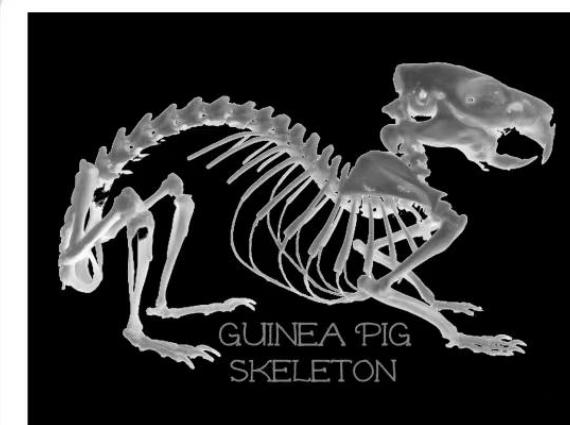
But I am used for V-section...



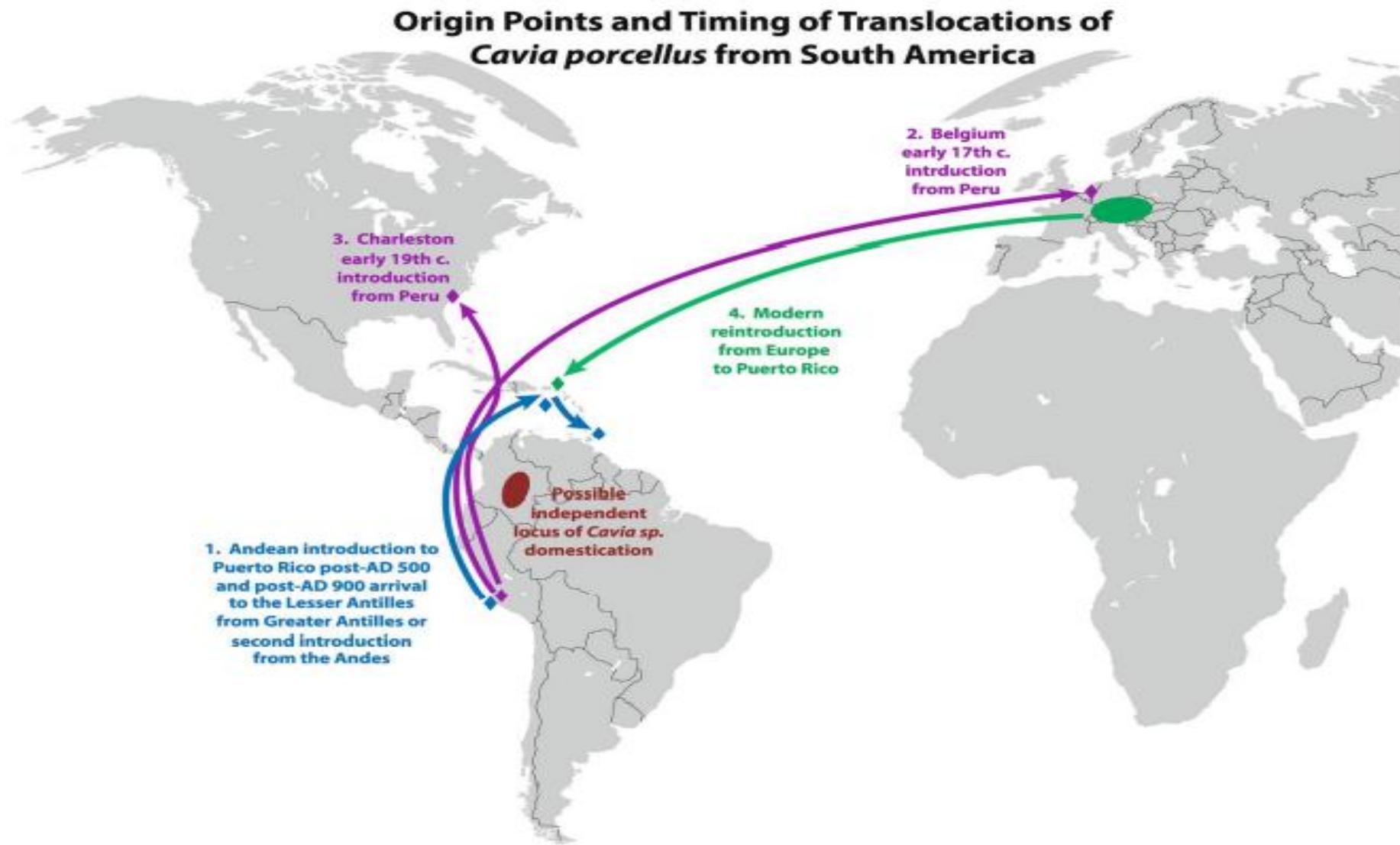
TAT
Poor me.. RIP..



Illustration 1. Distribution of the guinea pig in the Andean countries, circa 1990



Before Becoming a Pet



ID Card of Guinea pigs

English Name	Guinea Pig (Rodent family)
Latin Name	<i>Cavia porcellus</i>
Nickname	Cuy
Food	Barley and kitchen scraps of vegetables, and the residue from making chicha (maize) beer
Life Span	6-8 years
Earliest Remains	Burned bones and bones with cut marks from midden deposits in highland sites that date to ca. 7000 BC
Domestication Location	Andes Mountains, South America
Domestication Date	Experimentation with domestication may have begun as early as 5000 BC, with domestication evident by 2500 BC from highland sites in the region of Ayacucho, Peru (Wing 1986).
Wild Ancestor	Wild cavy (most likely <i>Cavia tschudii</i> , although some scholars suggest <i>Cavia aperea</i>), found today in the western (<i>C. tschudii</i>) or central (<i>C. aperea</i>) Andes.



Domestication Intention

(1) Food

The chemical composition of guinea pig meat, as a weight-based proportion of the edible meat, is 70.6% water, 20.3% protein, 7.8% fat, and 0.8% minerals (Bolton, 1979, p. 240). This is not a high fat value but it could have been crucial as an additional source to that of camelids, particularly during certain times of the year and especially to the most needy segments of the human population (infants, pregnant, and nursing women) .



(2) Medical Device

An illness is diagnosed by rubbing the guinea pig over the body of the patient and examining the internal organs of the animal after having sacrificed it. It is believed that the part of the body of the guinea pig which corresponds to the sick organ of the patient will show signs of sickness, for example, discoloration. After having done this operation, the [folk healer] can recommend an appropriate treatment.



FIGURE 5 Guinea pig without adornment from Structure 1E U91 of Tambo Viejo [Colour figure can be viewed at wileyonlinelibrary.com]

(3) Ritual/ Religion

Among nine indigenous Quechua myths, guinea pigs are among the sacrifice to god. It was very common to use these little animals to see the outcome of future events by slicing them open.



FIGURE 3 Adorned guinea pig from Structure 1W U9 of Tambo Viejo [Colour figure can be viewed at wileyonlinelibrary.com]

Domestication Process

The guinea pig may have become domesticated through a voluntary scavenger association with man; that is, it may have sought the garbage found in human occupation sites. After man discovered the wild cavy to be a desirable source of meat, he may have enticed the animals closer into his settlement area with choice scraps. Eventually, he took them into his dwelling and replaced those used as food with additional wild ones. Reproduction probably did not occur until the animals had become thoroughly accustomed to the hut and to the food supplied them.



Illustration 2. Many Andean families share house space with their cuys to keep them safe from weasels, opossums, and foxes. This Ecuadorian household keeps its cuys under a platform bed. (Photo by Edmundo Morales)



Illustration 3. This vendor in Huaraz, Peru, buys cuys raised in traditional kitchens and then sells them in the marketplace. (Photo by Edmundo Morales)

Domestication Features

	Wild	Domesticated
Selfies		
Hair color	Naturally gray	Multicolored or white hair
Body size	Smaller (less than 8 inches)	Larger (8-11 inches long)
Temper	Aggressive and pay more attention to their local environment	Mild
Tolerance to other males	Wild male cuys do not tolerate each other and live in harems with one male and several females	More tolerant of multi-male groups, and exhibit increased levels of social grooming of one another and increased courtship behavior

Domestication Features (Zooarchaeology)

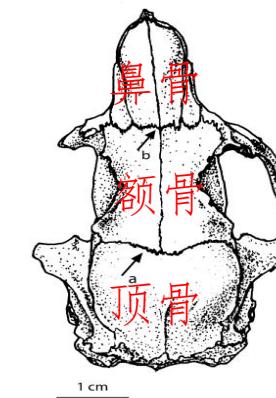


Fig. 3. Dorsal view of the skull of the guinea pig from Mons showing the curved fronto-parietal suture (a) and the straight naso-frontal suture (b).



1. Cranial and external characteristic

Table 2

Skull characteristics of the guinea pig from Mons compared to those of the domestic and wild taxa listed by Wing (1977).

	Naso-frontal suture		Fronto-parietal suture		Palatal spine	
	% straight	% M-shaped	% curved	% straight	% absent	% present
Domestic (<i>n</i> = 9)	73	27	100	0	73	27
<i>Cavia tschudii</i> (<i>n</i> = 40)	36	64	26	74	68	32
<i>Cavia porcellus anolaimae</i> (<i>n</i> = 15)	7	93	23	77	0	100
<i>Cavia aperea</i> (<i>n</i> = 9)	0	100	12	88	33	67
Mons	X		X		X	

2. Bone size and variation

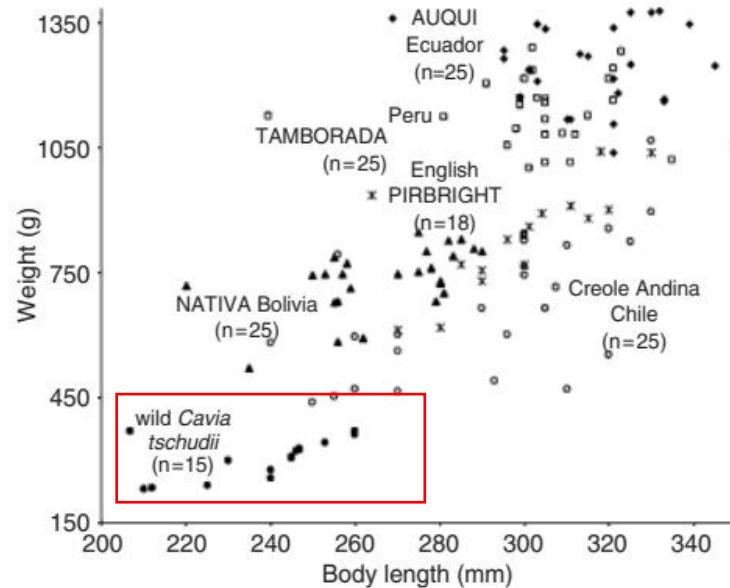


Figure 1 Body weight and total body length of 118 domestic adult guinea pigs from different breeds (symbols used placed before each name) and 15 wild cavy *Cavia tschudii*. Sample sizes (*n*) below each name.

Table 3. Summary of measurements and other characteristic found in *Cavia*, both modern and archaeological

	MANDIBLE					Height of jaw at diastema					SKULL			Fronto-parietal suture	Palatal spine	
	Lower alveolar length					Number Range Mean Standard deviation Coefficient of variation			Number Range Mean Standard deviation Coefficient of variation		Naso-frontal suture	M-shaped %	Curved %	Straight %	Absent %	Present %
<i>Cavia porcellus</i> domestic	9	14.0–16.7	15.47	0.913	5.90	9	6.1–7.5	6.74	0.537	7.97	73	27	100	0	73	27
<i>Cavia tschudii</i>	40	11.2–14.5	12.93	0.934	7.22	40	4.2–6.5	5.30	0.561	10.58	36	64	26	74	68	32
<i>Cavia porcellus</i> <i>anolaimae</i>	15	13.0–16.2	14.75	0.792	5.37	15	4.7–6.2	5.41	0.494	9.13	7	93	23	77	0	100
<i>Cavia aperea</i>	9	12.4–15.4	13.94	0.997	7.15	9	5.0–6.9	5.94	0.576	9.70	0	100	12	88	33	67
Chilca A.D. 1000–1400	6	11.3–15.4	13.17	1.595	11.68	8	4.4–7.1	5.51	0.958	17.38	4	0	5	0	2	0
Huánuco Kotosh 1800–2600 B.P.	12	10.4–14.6	13.27	1.287	9.70	16	3.8–6.9	5.61	0.857	15.27	4	0	4	2	1	0
Ayacucho Ac 158 Puente Piki-Jaywa 7000–8000 B.P.	21	12.4–15.1	13.74	0.767	5.58	253	3.6–6.5	5.20	0.485	9.33	3	3	7	5	2	0
Ac 117 Rosamachay 2400 B.P.	2	14.9–15	14.95	–	–	2	5.9–6.5	6.20	–	–	2	0	2	0	0	2
A.D. 800–1200 Eb4 Wari	5	11.6–18.8	15.52	2.941	18.95	7	4.8–7.8	6.01	1.256	20.88	0	1	0	1	1	0
Cuzco PC ₂ Minaspatata 3000 B.P.–A.D. 1500	47	11.8–18.6	13.58	1.091	8.03	54	4.4–7.9	5.40	0.704	13.03	1	1	4	3	2	0
Pikicallepata 2200–3400 B.P.	13	11.9–14.8	13.34	0.799	5.99	15	4.9–6.2	5.61	0.457	8.15	1	0	7	3	1	0

- Height of jaw taken from the middle of the diastema
 - (1) The most recent samples available are the most variable;
 - (2) Ayacucho and Cuzco — the mean of the diastemal measurement of the recent samples shows a large and significant increase in size over the older samples

3. Pelvis:

Notch of ischium is deeply hollowed for domesticated one.



Reference

1. E. Lord et al. Ancient DNA of Guinea Pigs (*Cavia* spp.) Indicates a Probable New Center of Domestication and Pathways of Global Distribution. *Scientific Reports* (2020) , <https://doi.org/10.1038/s41598-020-65784-6>
2. Wing, E. S. Animal domestication in the Andes. in *Advances in Andean archaeology* (ed. Browman, D. L.) 167–188 (Mouton Publishers, 1978).
3. Sandweiss, D. H. & Wing, E. S. Ritual Rodents: Te Guinea Pigs of Chincha, Peru. *J. F. Archaeol.* 24, 47 (1997).
4. Correal, G. & der Hammen, T. *Investigaciones arqueológicas en los abrigos rocosos del Tequendama: 11.000 años de prehistoria en la Sabana de Bogotá*. Bogotá (Biblioteca Banco Popular, 1977)
5. Stahl, P. W. Animal Domestication in South America. in *The Handbook of South American Archaeology* (eds. Silverman, H. & Isbell, W. H.) 121–130 (Springer New York, 2008), https://doi.org/10.1007/978-0-387-74907-5_8.
6. Hesse, B. Archaic exploitation of small mammals and birds in Northern Chile. *Estud. Atacameños* 51, 37–51 (1984).
7. Jzereef, G. Faunal remains from the El Abra rock shelters (Colombia). *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 25, 163–177 (1978).
8. Dunnum, J. L. & Salazar-Bravo, J. Molecular systematics, taxonomy and biogeography of the genus *Cavia* (Rodentia: Caviidae). *J. Zool. Syst. Evol. Res.* 48, 376–388 (2010).
9. Spotorno, A. E. et al. Ancient and modern steps during the domestication of guinea pigs (*Cavia porcellus* L.). *J. Zool.* 270, 57–62 (2006).
10. Pinto, M., Zúñiga, H. & Torres, O. *Estudio Sistemático Del Género Cavia Pallas, 1766 (Rodentia:Caviidae) En Colombia*. (Academia de Ciencias Exactas, Físicas y Naturales, 2002).
11. Delgado, M. E. Stable isotope evidence for dietary and cultural change over the Holocene at the Sabana de Bogotá region, Northern South America. *Archaeol. Anthropol. Sci.* 10, 817–832 (2018).
12. Delgado, M. E. Holocene population history of the Sabana de Bogotá region, Northern South America: An assessment of the craniofacial shape variation. *Am. J. Phys. Anthropol.* 162, 350–369 (2017).