

Sonia Gallina influences on the study of other ungulates in México: honoring a professor and a dear friend

Sonia Gallina-Tessaro, a distinguished Mexican professor residing in Central México, has been a foundational pillar at the Instituto de Ecología, A. C. for over 47 years (Figure 1). A trailblazer in the study of deer not only in México but possibly across Latin America, Sonia's pioneering contributions have prompted many of us to continue doing research with deer and other ungulates. The following recompilation of contribution on ungulates is a small tribute to her work by presenting this special issue of THERYA, the scientific journal of the Mexican Society of Mammalogist (AMMAC by its Spanish initials), with a set of selected new articles about ungulates with special emphasis on deer.

Sonia is the clear example of enthusiasm and vitality that can be transmits to the students and to all of us who have



Figure 1. Dr. Sonia Gallina in Xalapa, Veracruz (2005; Photo Alberto González).



Figure 2. Dr. Gallina is pregnant of her second son Alejandro, almost due to give birth and still working in her office at the Instituto de Ecología, A. C. The institute was inside of the Museo de Historia Natural de la Ciudad de México, in section II of Chapultepec (1984; Photo Alberto González).

ever crossed her path (Figure 2). Her long and illustrious carrier in the mammalogy have motivated many persons in the study of different aspect of the mammalogy, having the ability to reproduce that energy and spare among many of us. In opinion of many of the colleagues with whom we interact to carry out this issue, they mentioned that the most important aspect of Sonia is her cheerful personality and ability to tackle many challenges. Sonia has been described as a person with a deep passion to study and conserve mammals, but also a person able to transmit that passion to her students, a person that encourages young people to follow their academic dreams, a person that transmits trust. She uses her strong and powerful voice to convey clear and direct messages to her students and general persons, even in classrooms a floor away.

Sonia began its “passionate relationship” with deer since she was as student at the Universidad Nacional Autónoma de México when she began with her bachelor thesis in 1978 and continues to its PhD. Over the years, Sonia has mentored more than 65 students who conducted their research under her guidance in México. Many of these students have since become esteemed professors in various Mexican universities and institutes, specializing in deer studies across different regions of the country and in other countries as well.

With an impressive academic output that includes 10 books, 72 book chapters, over 90 papers, and 104 lectures, Sonia is also a member of the National System of Researchers of CONAHCYT (by its Spanish initials), holding the distinction of Level II. In the Asociación Mexicana de Mastozoología A. C. she is a very active member, the most outstanding contribution of her was to be president from 2008 to 2010 and her support to the creation of *Therya*, which now is a consolidated journal and is already a publishing house with three journals, including one of popular sciences. Sonia also organized the X Congreso Nacional Mastozoología and the I Congreso Latinoamericano de Mastozoología (2010). In 2019 she was awarded the Ticul Álvarez Solórzano award in addition to U.S. Fish and Wildlife Service (Figure 3).

Ungulates are mammals with hooves and the group is composed by two orders of mammals, the Perissodactyla order containing rhinos, equine and tapirs, and Artiodac-



Figure 3. Receiving the Ticul Álvarez Solórzano award during the XV Congreso Nacional de mastozoología in Chihuahua City, October 19, 2022. In the photo from left to right Dr. Enrique Martínez Meyer president of the AMMAC, Dra. Cristina Mac Swiney González vicepresident of the AMMAC, Dr. Sonia Gallina awarded, and Dr. Gerardo Sánchez Rojas who presented her as the one recognized with the 2020 award (Photo Fernando González).

tyla, an order that contains all bovids, ovid, deer, suids and peccaries of the world among others. Some ungulates are among the best studied mammals of the world (white-tailed deer, red deer, wild boar, etc.), but some have been neglected by science in several ways. For example, in a study about forest ungulates of Neotropical forest [Taber et al. \(2017\)](#) found that of 22 species of forest ungulates in Neotropical forest, 60 % of them were in some degree of risk of extinction in 2008, according to the red list of the IUCN (<https://www.iucnredlist.org/>), considerably larger than the 21 % of world mammals at risk of that time. In addition, there were 279 papers published about these 22 species from 2000 to 2009 with a rate of 1.3 papers per species per year ([Taber et al. 2017](#)), a contrasting figure with almost 20 papers per year about jaguar and pumas (charismatic carnivores of the Neotropical forests also). There were even 11 species of forest ungulates with no formal publication at all in all these years ([Taber et al. 2017](#)).

Ungulates are very important in the world because they are among the largest (and sometimes the numerous) species of the ecosystem, they are among the largest prey for native predators and for humans that still practice subsistence hunting, they remove large amount of plants, they disperse seeds, they remove soils and plan some seeds while destroy other seedlings, ungulates perform some of the largest and impressive migrations on the world (caribous in the Artic circle and Wildebeest and Zebras in Eastern Africa; Figure 4).

At the same time, ungulates are among the mammals that have suffered population reduction in large amounts. [Ripple et al. \(2015\)](#) in an influential paper, argues that 60 % of the world’s largest herbivores (most of them ungulates) are at risk of extinction. The main reasons for the extinction of these groups of animals are the fact that are some of the largest preys for human hunters, and most of them (due to the large size) need large amount of habitat to maintain a viable population. Humans have hunted animals in all the natural ecosystems and forests are being fragmented and lost at alarming pace every day, the largest animals are the



Figure 4. Dr. Gallina on an island in Lake Victoria, Tanzania, Africa during a safari in July 2019 where she visited several sites in Tanzania and Kenya to witness the great migration of ungulates between the plains of the Masai Mara to the Serengeti National Park and Ngorongoro crater (Photo Fernando González).

one that are being impacted in a great way due to the ecological requirements.

In this context, Sonia Gallina's work on ungulates has been of extreme importance. Sonia began studying deer in the late 1970's and coauthored a book in early 1980's. Her primary focus species have been the white-tailed deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), red brocket deer (*Mazama temama*) and bighorn sheep (*Ovis canadensis*), although her work is much more extensive and she has worked with many more species of mammals, either at the level of populations or communities, throughout all of México, in temperate forests, dry forest, jungles, and deserts.

Her work marks the beginning in México of the research on game wildlife and its management. Sonia began her research by studying the diet of deer in La Michilia, Durango. Later in her career, she expanded her expertise to the dry, arid regions of Sonora, Baja California, and Chihuahua. Her pioneering studies emerged during a time when wildlife in México was largely understudied. At that time, large mammals like the white-tailed deer were primarily assessed using indirect methods, such as feces or track counts. Direct counts were not yet common practice, and emerging technologies, such as telemetry radio-collars, were still in their early stages. She incorporated a long-awaited sustainability that we considered as a great tool to conserve biodiversity. For the data interpretation, Sonia and some of its colleagues developed some mathematical models for the



Figure 5. After the 1970 women's world cup. In 1971 the biology students had a friendly game against the chemistry students, on the islands in Ciudad Universitaria, UNAM in Mexico City. The photo shows Sonia Gallina and Cecilia de la Torre (Photo unknown).

estimation of density and relative size composition to its long-term studies that covered up to two decades of data.

Sonia's research was groundbreaking, not only because it filled critical knowledge gaps but also because it signaled a significant milestone: a Mexican researcher was dedicating herself to understanding and conserving local wildlife populations. Many recognized and were inspired by the fact that Sonia, a Mexican scientist, was taking the lead in this important work. Moreover, Sonia exemplifies the resilience and determination of a female scientist. She navigated not only the scientific challenges of her field but also personal challenges. For instance, she continued her research while pregnant with her first child and even traveled to reserves in the then (now extinct), Soviet Union. She broke barriers in a male-dominated field, succeeding against the odds (Gallina 2012; Figure 5).

This special issue of *Therya* is a living tribute to a person who has dedicated her life to studying one of the largest mammals of México, a person that has dedicated uncountable hours of her life to form students, who has spent days, weeks, and month in the field enduring hard conditions to collect ecological information of a wildlife species, even up to today she teaches a fieldwork course of one month. She is passionate about it, but overall, she is a person who is a good friend and who can transmit trust and confidence to students that want to continue with research on ungulates. Sonia is a great friend, and we hope that she enjoys this issue and that continues working and inspiring many of us about studying the amazing group of ungulates, a group that she chose first! (Figure 6).

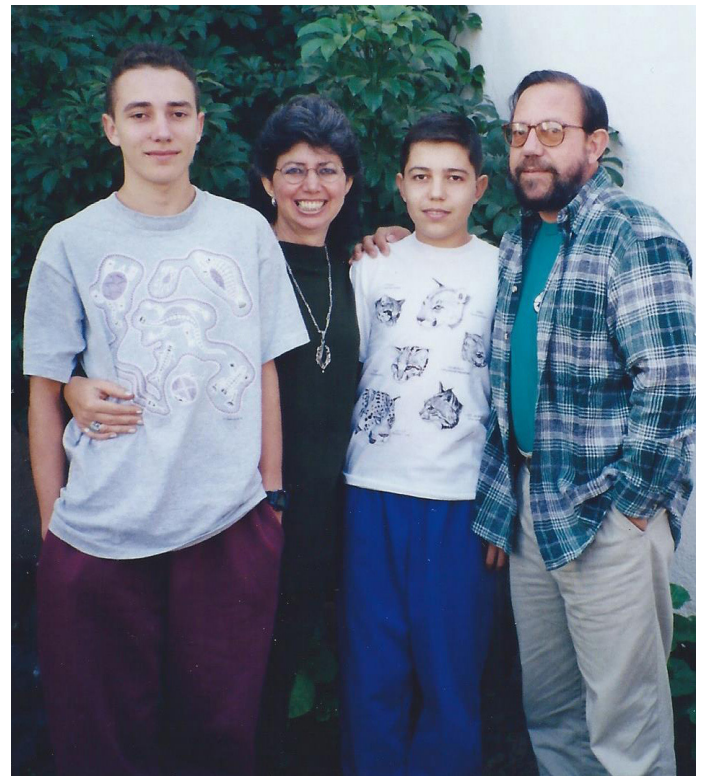


Figure 6. For Dr. Gallina, family has always been very important. In this photo taken in 1998, she appears with her two sons, Alberto Jr. on her right and Alejandro on her left. At the end her husband Dr. Alberto González (Photo Pia Gallina).

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