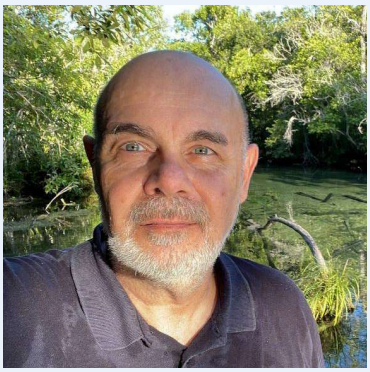
Interview

Conducted by ***Eliane Vicente****, August 2025*
Direct Science, Vol. 1, No. 1, 2025

In Conversation with Professor José Sabino, Ph.D.

Prof. Dr. José Sabino

José Sabino is a biologist and holds a PhD in Ecology from the State University of Campinas (Unicamp), with 35 years of experience in biodiversity conservation and the study of animal behavior. His career combines teaching, research, scientific management, and outreach. He was a professor at institutions such as PUC-SP, Uniderp, and UEMS, and is currently a Visiting Specialist Professor at the Gleb Wataghin Institute of Physics at Unicamp, where he teaches interdisciplinary courses focused on the environmental crisis and sustainability.



J. S. Bonito, MS. Self-portrait by José Sabino.

Within the editorial theme of this inaugural edition ("Science in the Digital Age"), we invited Professor José Sabino, Ph.D., a member of a select group of researchers whose career combines scientific rigor and a commitment to the dissemination of knowledge about biodiversity. His experiences and accumulated knowledge were generously shared in a interview that enriches critical reflection on the contemporary challenges of scientific research and knowledge communication. He contributed to the training of approximately 1,900 naturalist biologist-photographers and coordinated postgraduate courses in ecology, sustainable tourism, and scientific communication in the digital age. He served as a public manager, holding the position of Superintendent of Science and Technology for the State of Mato Grosso do Sul (2007–2008), and was a member of national scientific councils, such as BPBES and PPBio. He is the coordinator of the *Peixes de Bonito* Project, nationally recognized for integrating ecotourism, ecosystem services, and environmental conservation. Simultaneously, he established himself as a nature documentarian and photographer, amassing a collection of approximately 60,000 images of Brazilian fauna. Since 1992, he has been directing the production company

Natureza em Foco, specializing in environmental communication and biodiversity. He also worked as a science journalist at *Folha de S. Paulo* and as a consultant for productions by BBC, National Geographic, Discovery Channel, and Netflix. Resident in Mato Grosso do Sul since 2000, near the Pantanal and the Bonito region, he is dedicated to uniting science, art, and emotion to raise awareness in society about the value of Brazil's natural heritage.

Direct Science: The digital era has transformed the way we produce, share, and validate scientific knowledge. In your perception, what are the greatest advancements and challenges that this new scenario has brought to research in biology and environmental sciences?
José Sabino: The digital era has revolutionized biology in general and environmental sciences, specifically, on at least two levels. The first is methodological: global databases, remote sensing, bioinformatics, and next-generation genetic sequencing allow us to analyze ecological phenomena on previously unimaginable scales. The second is cultural: knowledge has ceased to be something restricted to laboratories and universities and has begun to circulate in open and collaborative networks. The great challenge is the same one we face in the very conservation of biodiversity: transforming abundance into quality. Having excessive data does not mean understanding it, and science increasingly needs rigor and solid methods to make sense of this ocean of information. The respected biologist Carlos Joly, Emeritus Professor at Unicamp and editor of the scientific journal *Biota Neotropica*, has a perfect phrase to describe this phenomenon: "We have an ocean of data, rivers of information, streams of knowledge, and drops of sustainability."

Scientific infrastructure in Brazil. CNPEM in Campinas (SP). Aerial photo taken with a drone by José Sabino.

DS: How do you assess the impact of open science on access to knowledge?
JS: Open science has democratized access to knowledge, allowing students from remote communities to access the same article as a researcher at Harvard. This is revolutionary. But it is important to emphasize that access does not indicate understanding. True progress only happens when we invest in transforming science into something intelligible, useful, and relevant to diverse audiences. It is precisely there that Biology and Environmental Sciences play a decisive role, because they deal with issues that permeate people's daily lives. We are talking about public health (from the development of vaccines to the universalization of sanitation), innovation (such as bioprospecting and the search for alternative sources of bioenergy), well-being (the science behind restorative contact with nature, which impacts mental health and quality of life), and even leisure (ecotourism, sport fishing, gardening). Translating science, in this context, means showing that it is not a distant discourse, but a concrete force that shapes the present and future of society.

DS: Artificial intelligence (AI) has been identified as a tool capable of accelerating analyses and scientific discoveries. What developments of AI do you see in Ecology, biodiversity, and conservation?
JS: Artificial intelligence can be a game changer for ecology and conservation. Imagine training algorithms to identify species in real time from sounds or images captured in the field: this is already happening and can multiply our monitoring capacity. Similarly, machine learning models can anticipate patterns of habitat loss or extinction risk based on historical data. But it is essential to remember that AI does not replace the human perspective. Ethical judgment, field intuition, and accumulated experience are irreplaceable. According to Bill Gates (first half of 2025), there are at least three professions that will probably not be fully replaced by AI: programmers, energy specialists, and biologists. Professions like these depend on creativity, intuition, and strategic thinking (elements that AI systems still cannot autonomously replicate). He explained that, although AI can assist with routine tasks or data analysis, it does not replace human judgment in formulating scientific hypotheses, managing energy infrastructure crises, or developing complex systems.

DS: As a researcher and photographer, you have a career marked by the dialogue between science and visual communication. In what ways has digital technology expanded the possibilities of documenting, analyzing, and disseminating information about biodiversity? What are the connections between science and visual communication in the digital age?
JS: I have always believed that photography, far beyond visual and historical recording, is a form of knowledge. Digital technology has exponentially expanded this: drones, high-resolution cameras, thermal cameras, and georeferenced image banks have transformed each click into scientific data. At the same time, the circulation of these images on social media creates a bridge between science and society. Showing an endemic fish in its natural habitat and its importance to ecosystems is not just aesthetic: it is science and it

is social mobilization for conservation.

Use of drones in environmental monitoring. Self-portrait by José Sabino.

DS: The photographic record combined with digital data can also be considered a form of citizen science. What is the role and contributions of Citizen Science to communities?
JS: Digital recording allows anyone, with a cell phone in hand, to become a contributor to science. Citizen science platforms have gathered millions of observations on birds, plants, and insects that would never have reached researchers before. For me, the great value is cultural: when a community records and shares its biodiversity, it not only generates data but also strengthens its identity with the territory and actively becomes a defender of the natural heritage. It's science giving prominence back to the people.

DS: What do you think are the most promising frontiers for integration between science, technology, and visual arts in the context of biodiversity research?
JS: I see a future where the boundaries are increasingly dissolving. Augmented reality, for example, can transform the way we communicate science: imagine a museum or public aquarium visitor pointing their phone at a display and receiving three-dimensional projections about ecology, threats, and species conservation. From a scientific perspective, the use of AI-processed images already allows us to detect

patterns invisible to the human eye. Visual art, in this context, is not just an aesthetic complement, but an epistemological tool: it helps us see what we did not yet know was before us.

Expo Biomas — Rio+20. Photo: José Sabino/*Natureza em Foco*.

ETHICS, ACCESS, AND THE FUTURE OF SCIENCE

DS: The speed of information circulation in the digital age also brings risks, such as the dissemination of unvalidated data. What is your opinion on reconciling scientific rigor with the speed of information in the digital age?
JS: The dilemma is clear: information circulates in seconds, but science needs time to validate. The risk of haste is enormous, especially when it comes to environmental issues, which stir up passions and economic interests. The answer, in my view, lies in the transparency of the processes: sharing not only the results but also the methodologies, the margins of error, and the uncertainties. This does not weaken science; on the contrary, it makes it more reliable. Qualified data and content combined with reliable sources and fact-checking are essential to combat misinformation.

DS: What role can scientific journals play in preserving academic integrity amid pressures for productivity and digital visibility?

JS: Journals have the responsibility to be guardians of academic integrity in a time of superficial metrics and pressures for productivity. This means valuing not only articles that "sell" positive results but also those that present negative data or replications. Scientific credibility is not built by the speed of publication, but by the rigor of peer review and ethical curation. In this sense, open journals like this one can be fundamental. I add that it is impossible to ignore the proliferation of predatory journals, which sell "scientific space" in exchange for fees, offering publications of very low reliability. They not only distort the scientific landscape but also threaten public trust in science. Addressing this problem requires a combination of critical education for researchers, transparency in editorial processes, and institutional support for journals committed to quality. Only in this way can scientific publishing fulfill its greater role: to be a legitimate space for the construction and validation of knowledge.

DS: What trends do you consider most relevant for the future of digital science and what would be the practical implications for young researchers in training?
JS: I see three trends that are consolidating. The first is the massive integration of data (ecological, genomic, and climatic big data) that will require new analytical skills. The second is transdisciplinarity, increasingly necessary to deal with complex problems. The third is socially engaged science, which not only describes reality but also participates in its transformation. For young researchers, this means that it is not enough to be good in a particular niche: they will need to learn to dialogue, collaborate, and communicate like a brave diplomat. Digital science is more open, but also more demanding.

DS: Today's science is marked by fierce competition for resources, visibility, and productivity. How do you see the importance of cultivating the humanistic component in this scenario, and what role can it play in shaping the future of science?
JS: I believe that the humanistic component is not an adornment of science; it is the pulsating heart of scientific practice. In an increasingly competitive environment, marked by productivity metrics and resource disputes, it is easy to forget that science is, above all, a collective and deeply human activity. Valuing the humanistic side means cultivating relationships of trust, respect, and collaboration, without which no discovery can be sustained in the long term. It is in this space that not only more solid academic partnerships are born, but also lasting friendships that cross institutional and cultural boundaries. If we want a science that is more than a race for results, we need to reclaim this axis of empathy and solidarity: it is they who transform knowledge into wisdom and discoveries into legacy.

We conclude this enlightening conversation with the esteemed researcher José Sabino reaffirming that science, by irreversibly entering the digital age, finds in open science a strategic axis to expand its reach, transparency, and social impact. His analysis highlights that the integration of technology, open access, and collaborative practices not only democratizes knowledge but also elevates the rigor and responsibility of researchers. By sharing his experience and reflection, Dr. Sabino reminds us that the future of scientific

research depends on accessible data, constant dialog, and institutions committed to building a more participatory, ethical, and global Science: a purpose that inspires and guides initiatives like the *Direct Science Open Journal*.