



## IMPORTANCE OF SCIENTIFIC COLLECTIONS: CHALLENGES, RESILIENCE, AND FUTURE EXPECTATIONS

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### Abstract

This manuscript proposes to demonstrate the importance of scientific collections as an effective means of sharing biological/taxonomic information. The organisms from this collection were sampled by Dimitri de Araújo Costa, creator of the Zoological Collection Aquário Paraíba (João Pessoa, Brazil). The elaboration and maintenance of this type of materials, even without public investment, is essential to safeguard the heritage of a people, which will serve as a basis for future studies and improve connectivity with society, due to its strong link with environmental education.

**Keywords:** World heritage. Zoological Collection Aquário Paraíba. Curatorial activities. Brazil.

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# 1 Scientific collections and their importance

The importance of scientific collections is fundamental for sharing biological and taxonomic data, opening a 'window of opportunity' on the great environmental biodiversity. The Aquário Paraíba, located in João Pessoa municipality, State of Paraíba, Northeast Brazilian, is an institution that portrays the importance of species, diversities of living aquatic organisms, valuing new knowledge, carrying out new works directed to research projects (AQUÁRIO PARAÍBA, 2022). Promoting knowledge, environmental education, and sustainability, it becomes an attractive tourist place, which receives animals for rehabilitation and carries out tourism and education work in schools and universities.

The present study describes the importance of scientific collections, made by a private initiative. The activity of collecting is linked to many decades of evolutionary history that arouses people's curiosity, extolling new areas of knowledge both in the artificial and natural collection, for a collection to coexist outside the natural environment is in the stages of storage in its preservation outside the natural environment. The formation of a collection, no matter how small, regardless of the amount of species collected will always have a direction for further studies.

Therefore, for the protocols of a collection, qualified professionals with extreme responsibility are essential to guarantee the heritage safekeeping of the collected samples, from the monitoring and loan of material to the entire policy that involves the biological collection in the stages of organization, identification, reliability, and functions performed in the collection, in order to demonstrate the diversity of the species collected.

The structure process of a scientific collection goes through many challenges, mainly in terms of the lack of support from public decision-makers due to decreasing financial resources, causing staff discouragement, the inadequacy of location for storage and preservation, and lack of planning/disorganization, among others. According to Zaher and Young (2003):

“...the majority of Brazilian zoological collections were built through the isolated effort of one or a few researchers and institutions, driven by the need to create essential sources of consultation and information” (translated from ZAHER; YOUNG, 2003, p. 26).

All the functions of a collection in caring for evaluation are through a curatorial team responsible for the documentary installation, materials, physical space, donations as well as the conditions for possible loans whether through the post or transported, it will need to be documented for the purposes of legal proof and mainly from the internal control of the collection. In this framework, in 'Zoological Collection Aquário Paraíba' ("Coleção Zoológica Aquário Paraíba-CZAP") it is mandatory, to follow national and international laws, regulations, agreements, conventions, e.g. the Nagoya protocol and the Convention on Biological Diversity (CBD, 2022): the loan material will be sent in the container that the individual is stored, been closed and sealed, keeping the labels with tipping and information of all data, duly signed by the curators with two copies one in the collection and another with the person responsible for the loan. The tipping is the initial record of the zoological collection and is essentially the same as all collections, containing sequential numbers of the species, arranged by taxonomical groups.

The procedural steps of a collection represent the documentary facts in accordance with the norms established by the responsible curators. We can express that the zoological collection is not a 'one-way street'; it emerges from a contextual complexity in all rights in the exercise of its activities for the well-being in favor of 'harmonious' development with society (COSTA et al., 2021).

The first stage consists of the dynamics of identification, and organization of the didactic and scientific category, which can be organized in a written (log book/accessions register book) and/or digitized spreadsheet of the collected data, with sequential numbers for the tipping.

The second phase is established in the physical dynamics of conservation of the collection, keeping all species in their respective environments, such as (for wet material) in a glass container, preferably conserved in alcohol (70% to 99%), later it will be properly labeled with information about species name, authority, regions (date, location, geographic coordinates one or more responsible for the collection). Providing educational practices for all levels of studies from primary schools to university, both public and private institutions, serving as a didactic and scientific model, the role of each species of individual brings to the environment. According to article 216 of the 1988 Brazilian Federal Constitution defines that what must be preserved are the goods of a tangible and intangible nature, taken individually or together, bearers of reference to the identity, action, and memory of the different groups that form the Brazilian society, with the collaboration of the community, and shall promote and protect the Brazilian cultural heritage, through inventories, registers, surveillance, toppling and

expropriation, and other forms of safeguarding and preservation (BRASIL, 1988).

The collection is a partner of scientific research, whatever its purpose, it elevates to other visions the growth in knowledge and development and also the act of collecting, providing curiosity and new challenges of encouragement, about the importance of scientific research. A scientific collection does not represent a 'bunch of objects', but a grouping of individuals collected in different locations, it is a historical heritage enabling knowledge and development about the evolution of species interacting and supporting new research and scientific work.

## 2 Starting point and future outcomes

The specimens that originated this collection were sampled between the years 2015 to 2018 by Dimíttri Costa, Geuba Silva and other researchers/students, on the beaches of Seixas (municipality of João Pessoa), Miramar (Cabedelo), Maceió (Pitimbu), coastal region of the state of Paraíba, Northeast Brazil.

The entire collection will be quantified, digitalized and afterwards available on the Aquário Paraíba institutional website, as well as in international datasets, such as the Global Biodiversity Information Facility (GBIF, 2022).

## 3 Conclusion

Individual efforts/societal actions, even without public support, can be efficient for the elaboration and development of scientific collections. The need for scientific collections becomes essential as a world heritage. Consequently, this scientific collection of Aquário Paraíba may serve as a basis for future studies, as well as for environmental education, encouraging young scientists to environmental preservation, and improve their interaction with non-academics.

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## CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

The author declares that he has been solely responsible for every phase of this research.

## DECLARATION OF INTEREST

The author discloses that he has no known competing financial interests or personal relationships that could have appeared to influence the study reported in this manuscript.

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