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Incorporation of the Jorge Vaz Collection into the Museu de Zoologia da Universidade de São Paulo

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ABSTRACT

The mollusk specimens belonging to the former physician and researcher Jorge Faria Vaz's private collection were incorporated into the institutional assemblage of the Museu de Zoologia da Universidade de São Paulo from 2005 to 2013. A brief account on his life and career, as well as a statistical report of the assemblage are herein provided. The whole collection comprises 2,673 lots, from which, 2,285 contain Brazilian specimens, 367 are from other regions of the globe and 21 have unknown locality data. It includes 1,854 gastropod lots, 800 bivalve lots, tusk-shells (12 lots), cephalopods (6 lots) and a single polyplacophoran lot. Most specimens belong to terrestrial and freshwater groups (52%). In total, 184 molluscan families are present, the most abundant are: Hyriidae (Bivalvia), Bulimulidae (Gastropoda), Dentaliidae (Scaphopoda), Spirulidae (Cephalopoda) and Ischnochitonidae (Polyplacophora). The most noteworthy specimens are types and examined material from recently described and revised species, as well as several vouchers from Dr. Vaz's papers, now made available to the scientific community.

Keywords: Curatorial methods, natural history collection, private collection, SUCEN, vouchers.

INTRODUCTION

The late public health physician and malacologist Jorge Faria Vaz (Fig. 1A) was a prolific researcher in the field of medical malacology, well known among Brazilian scientific and amateur communities (see biography below). He published many papers on medically important molluscan taxa (*e.g.*, Vaz *et al.* 1986a; Teles & Vaz 1987; Vaz 1989; Vaz & Teles 1992; Teles *et al.* 1997), and co-founded the *Sociedade Brasileira de Malacologia* (Brazilian Malacologial Society), of which he was a very active member (Fig. 1B). He was also the owner of an extensive private shell collection, especially rich in neotropical freshwater and terrestrial specimens. Many such specimens were sold to private collectors worldwide soon after Dr. Vaz's passing, but a significant part of this important assemblage was kindly donated to the Mollusca Collection of the Museu de Zoologia da Universidade de São Paulo (MZSP), Brazil.

Figure 1: Personal photographs and documents of Dr. Jorge F. Vaz. **A:** Dr. Vaz in his early 50s. **B:** Dr. Jorge's badge from the first Encontro Brasileiro de Malacologia (Brazilian Malacological Meeting), 1969. **C:** Dr. Vaz in his 70s and his daughter Maria Elisa, at a department store in São Paulo, SP. (Photo belongs to family archive.)

Since the cataloging of the first lots in 2005, the Jorge Vaz Collection greatly helped in taxonomic revisions (*e.g.*, *Leiostracus subtuszonatus*, Salvador & Cavallari 2013a; Figs. 3B–C) and species descriptions (*e.g.*, *Oxychona maculata* Salvador & Cavallari, 2013b; Fig. 3A). It may yet reveal several taxonomic discoveries, for a considerable amount of specimens are unidentified and require further study. We provide herein a brief report on Dr. Vaz's professional life and scientific contributions, and present a statistical overview of the Jorge Vaz Collection lots incorporated into the Mollusca Collection of Museu de Zoologia da Universidade de São Paulo (MZSP).

BIOGRAPHY

Jorge Faria Vaz was born in Barbacena, a small municipality in the southeastern Brazilian state of Minas Gerais, on 6 September 1917. His demeanor was so discreet and introverted that even close relatives have some difficulty in accurately providing information on his earlier days. Because of that, details on his younger years and primary education are unfortunately missing.

Dr. Vaz began his professional life as a physician, graduated from the Faculty of Medicine of the Federal University of Rio de Janeiro on December 1940. He specialized in orthopedics and traumatology, working in the Brazilian Army during World War II and reaching the ranks of Medical Lieutenant and Captain. While still in the Army, he would work in the Itaipu Military Fortress, in Santos, São Paulo state, from 1946 to 1947. Dr. Vaz worked in the Cambuci Military Hospital until 1956, and became director of orthopedics. After leaving the army due to health issues, he also worked at several local hospitals and clinics in the São Paulo Metropolitan Area, such as the Tatuapé Municipal Emergency Hospital, Vergueiro Municipal Emergency Hospital, Matarazzo Hospital,

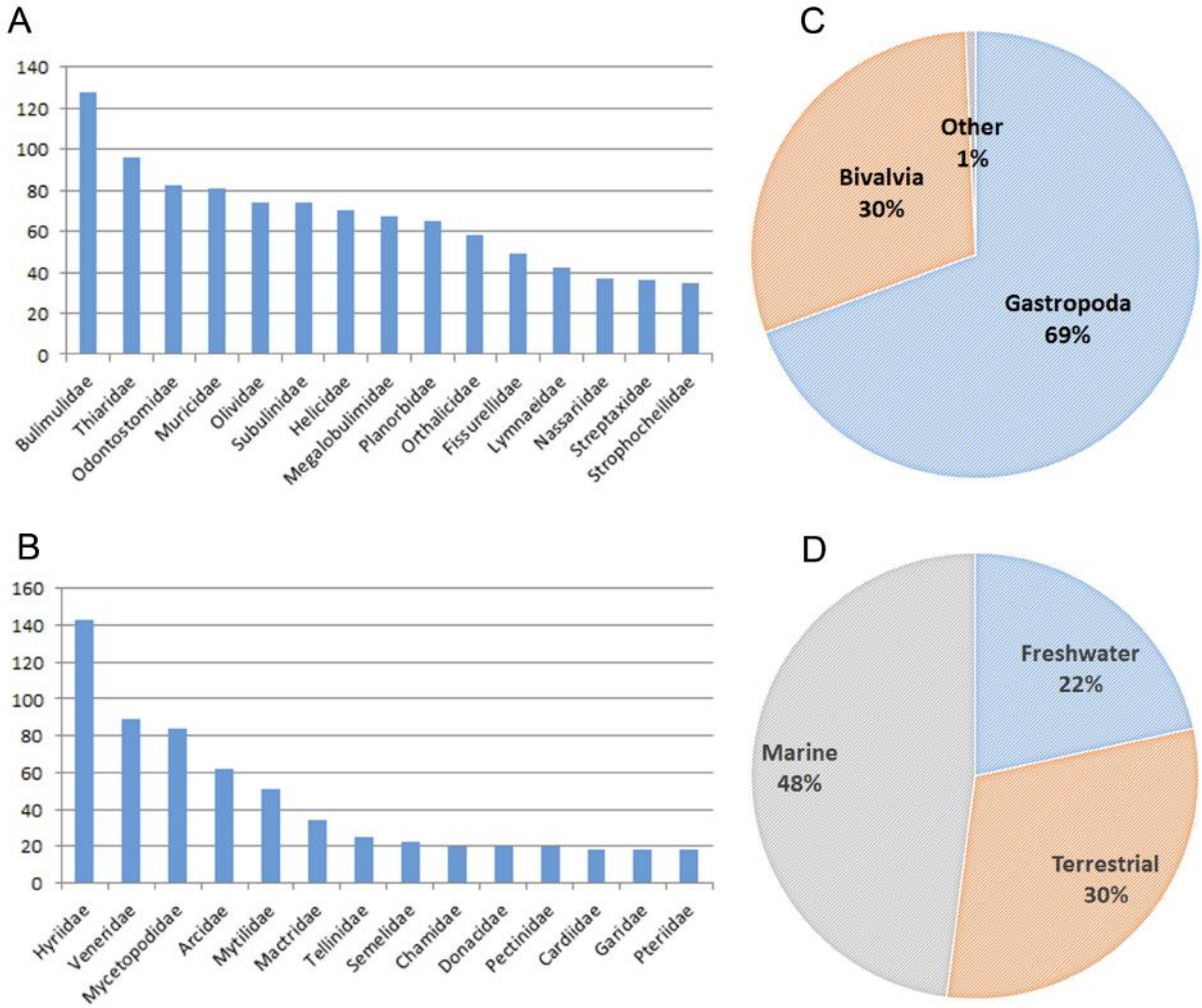

Figure 2: Statistical overview of the Jorge F. Vaz Collection. **A:** Most abundant gastropod families by number of lots. **B:** Most abundant bivalve families by number of lots. **C:** Percentage of lots of main mollusk classes. **D:** Percentage of specimens from different environments.

IAPETEC, Beneficência Portuguesa Hospital, Cruz Azul Hospital, and Nossa Senhora da Pompéia Hospital.

Dr. Vaz's activities in the field of orthopedics ended when he began working at SUCEN – Superintendência para o Controle de Endemias (Superintendence of Endemic Diseases Control) of the São Paulo State's Secretariat of Health, in the early 1970s. At that time, he was a member of the Campanha de Combate à Esquistossomose (CASESQ), a public campaign devoted to the control of schistosomiasis (a disease in which the intermediary hosts are freshwater snails). Dr. Vaz was in charge of analyzing snail samples collected in the field, looking for possible *Schistossoma* infestation foci in different places of São Paulo. He became a renowned specialist in taxonomy and anatomy of freshwater snails, mainly regarding planorbids (*e.g.*, Vaz 1979a, 1979b; Vaz *et al.* 1986; Vaz 1991; Elmor *et al.* 1992).

With the aid of his team, Dr. Vaz was in charge of the planorbidic mapping of São Paulo during the 1980s, and collected samples of freshwater mollusks throughout the state (Vaz *et al.* 1986b, 1987, 1992). This allowed for the assembling of an excellent collection that mainly included basommatophorans, but also other regional mollusks specimens such as freshwater bivalves and

prosobranchs. This collection was particularly important as it preceded the introduction of several invasive species now widespread in regional drainages, such as *Corbicula fluminea* (Müller, 1774), *Lymnoperna fortunei* (Dunker, 1857), and *Melanoides tuberculatus* (Müller, 1774) (Avelar *et al.* 2004; Simone 2006; Paschoal *et al.* 2015).

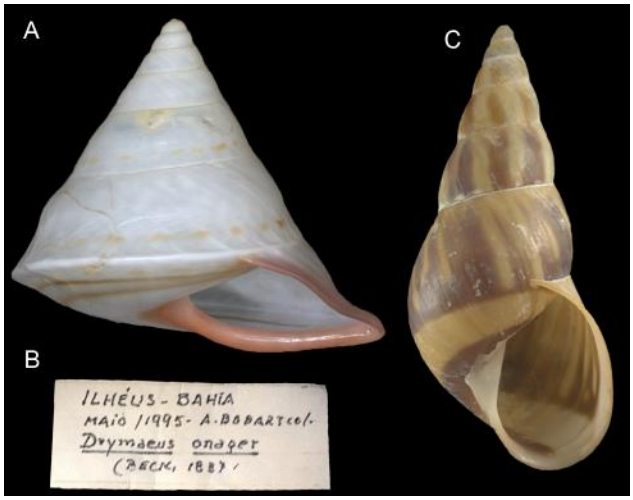

Figure 3: Notorious specimens from the Jorge Vaz Collection. **A:** Apertural view of the lolotype of *Oxychona maculata* Salvador & Cavallari, 2013, MZSP 108005 (height = 17.9 mm). **B:** Original label of the neotype of *Leiostracus subtuszonatus* (Pilsbry, 1899), with Dr. Vaz's handwriting. **C:** Apertural view of the Neotype *of L. subtuszonatus*, MZSP 108040 (height = 28.5 mm).

Jorge Vaz began his shell collecting activities in the early 1960s. Despite his obvious preference for freshwater mollusks, he also collected marine and terrestrial specimens. He exchanged samples with collectors worldwide, and used to be proud to have exchanged shells with Japanese Emperor Akihito. Unfortunately, no specimen securely coming from the Emperor was found in the portion of Dr. Vaz's collection donated to the MZSP. During the last decades of his life, his enormous collection was held in a famous São Paulo street, Alameda Lorena. His living room was full of mollusk wonders of interest to any malacology enthusiasts. Dr. Vaz was a naturalist beyond his love for malacology, and used to collect butterflies and orchids. He was also an amateur astronomer and mineralogist, among several other things.

After a life dedicated to medical and malacological studies, Dr. Jorge Faria Vaz passed away on 8 June 2004. He was married to Maria Apparecida Alves Vaz and left three daughters, Helena, Maria (Fig. 1C) and Rita, five grandchildren and three greatgrandchildren. Different traders acquired a significant part of his collection afterwards, including most of the marine specimens. His family kindly donated the more scientifically organized part of it and most of the partially damaged shells

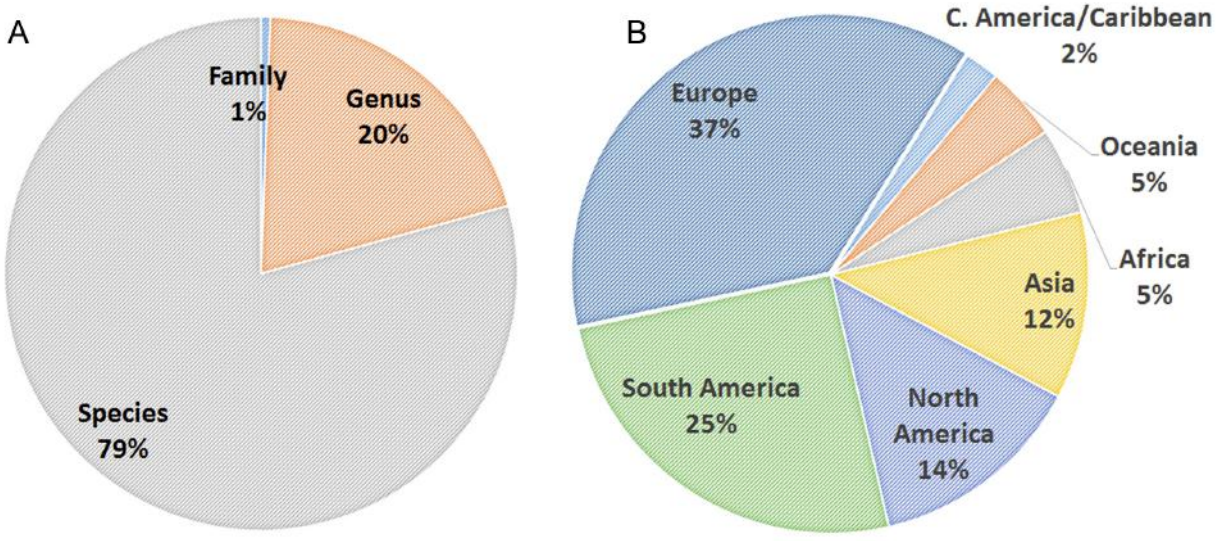

Figure 4: Statistical overview of the Jorge Vaz Collection, part II. **A:** Percentage of identified lots by taxonomic level. **B:** Percentage of non-Brazilian lots by continent.

collected during Dr. Vaz's travels to the MZSP. The scientific relevance of this assemblage is unquestionable, for it contains vouchers and unstudied specimens coming from a time when Brazilian natural environments were much less degraded.

MATERIAL & METHODS

Lots were processed, cataloged and digitalized from 2005 to 2013 by the MZSP personnel. Specimens from the Jorge Vaz Collection incorporated into the MZSP mostly consisted of dry empty shells. Several individuals with soft parts preserved in ethanol, Bouin, Railliet-Henry and creosote solutions were present, and maintained in their original storage media whenever possible. Processed specimens or lots received new MZSP catalog numbers. New MZSP standard labels were added to the originals (when present), and both contain information regarding the original Jorge Vaz Collection catalog number and annotations. Most of the original labels contain Dr. Vaz's handwriting (Fig. 3B). The collection's original catalog book, which was also kindly donated by the Vaz family, contains handwritten information on most of the collection lots and is now kept at the MZSP library.

RESULTS

The whole Jorge Vaz Collection comprises 2,673 lots encompassing 24,597 specimens now incorporated into the MZSP. Most of the items (90.1%) are exclusively preserved dry, consisting of empty shells and (rarely) fossilized material. The remaining lots are preserved in wet media, mostly 70% ethanol (7.7%), dry shells with corresponding wet-preserved soft parts (~1%), and very few lots in Bouin, Railliet-Henry and creosote solutions (~1%).

From the donated lots, 2,289 (85.6%) contain Brazilian specimens, 367 (13.7%) come from other regions of the globe and 17 (0.6%) have unknown or unclear locality data (Fig. 4B). The collection is mostly composed of Neotropical taxa, with few exceptions. Most of the lots contain terrestrial and freshwater specimens (52%; Fig. 2D). Five mollusk classes are represented in the assemblage (Fig. 2C), namely Gastropoda (1,854 lots), Bivalvia (800 lots), Scaphopoda, Cephalopoda and Polyplacophora (respectively 12, 6 and a single lot). Representatives pertain to 129 gastropod families, 49 bivalve, 3 cephalopod, 2 scaphopod and a single polyplacophoran family (Ischnochitonidae). Most of the items are identified at species level (2,132 lots), 542 at genus level, 16 at family level, and only three gastropod lots are unidentified (Fig. 4A).

In number of lots, the most abundant bivalve family in the collection is Hyriidae (143 lots; Fig. 2A). Within it, the most well represented genus is *Diplodon* Spix, 1827 (105 lots, 856 specimens). Among the gastropods, Bulimulidae has the highest number of lots (128; Fig. 2B). Its most abundant genus is *Drymaeus* Albers, 1850 (49 lots, 157 specimens). Spirulidae is the most abundant cephalopod family (three lots, 12 specimens), while Dentaliidae (10 lots, 266 specimens) is the most numerous scaphopod one.

We were able to identify 14 voucher lots from four papers authored by Dr. Vaz and colleagues among the catalogued items. Despite Dr. Vaz's handwriting, the original labels do not bear any voucher annotation. Even so, we were able to verify their status through collection data (catalog book, locality, dates and collector names) and measurements, which were exactly as described in the original papers. These lots received additional labels and MZSP catalog numbers (see Table 1).

Table 1: Voucher lots of Dr. Vaz's studies found in the assemblage.

Reference	Species	Voucher lots (MZSP)
Vaz, 1979	Stenophysa marmorata	111921, 114146
Vaz, 1979	Physella cubensis	112498, 112511, 112520
Vaz, 1979	Lymnaea columella	112505
Vaz, 1979	Helisoma duryi	112501
Vaz, 1979	Biomphalaria pfeifferi	114260
Vaz, 1979	Bulinus truncatus	114258
Vaz, 1979	Biomphalaria tenagophila	117315
Vaz, 1979b	Marisa cornuarietis	105315, 111028
Vaz & Ishiata, 1981	Drymaeus papyraceus	113631
Vaz, 1991	Lilloiconcha pleurophora	114242

DISCUSSION

Jorge Faria Vaz's contributions to malacology and medical sciences are numerous and solid, which is demonstrated by his long and prolific career and many published papers. It is most fortunate that a considerable part of his collection is now adequately kept in a traditional institution like the MZSP. Voucher specimens from Dr. Vaz's studies have now been made available to the scientific community, and a rich and diverse assemblage of poorly known marine and freshwater taxa can now be used in future studies. This collection is an undeniable legacy of his work, and may now remain well preserved for future generations of researchers.

As recent revisions and descriptions have demonstrated (*e.g.*, Salvador & Cavallari 2013a, 2013b), the Vaz Collection may yet harbor significant discoveries. There are several lots containing unidentified species, which may represent new occurrences or even new species when properly studied. This is in fact commonplace for natural history collections in general, and a testimony of their importance (Allmon 1994). Moreover, several of the Vaz Collection's terrestrial and freshwater specimens were collected in a different period, when Brazilian natural environments were much less degraded. In view of the fragile state of several molluscan groups, especially the terrestrial taxa (Lydeard *et al.* 2004; Régnier *et al.* 2009), it would not come as a surprise if many such specimens came from places where they are now endangered or even extinct. To facilitate these important discoveries as well as to ensure proper preservation of relevant specimens, the incorporation of personal assemblages into traditional institutions should always be encouraged.

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