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## THE RESEARCH ON INVERTEBRATE FAUNA AT THE NATURAL HISTORY MUSEUM, FLORENCE UNIVERSITY

**Abstract** - Natural History Museums, born in the XVIII century, have evolved with the emergence of new technologies and with the evolution of new social-scientific issues. Research activity has been carried on several aspects, from the classic faunistic studies or the systematics and taxonomy of various groups of invertebrates to the research that arises from the national and international legislation and the new challenges posed by climate change and globalization.

**Key words** - Collections - Research - Invertebrates - Natural History Museum.

**Riassunto** - *La ricerca sulla fauna invertebrata al Museo di Storia Naturale, Università di Firenze* - I Musei di Storia Naturale, nati nel XVIII secolo, si sono, nel corso del tempo, evoluti adeguandosi al nascere di nuove tecnologie ed all'emergere di nuove problematiche socio-scientifiche. L'attività scientifica degli esperti del Museo di Storia Naturale dell'Università Firenze è quindi svolta su diversi fronti, da quello classico dello studio faunistico e della sistematica e tassonomia di vari gruppi di invertebrati, a quello della ricerca in risposta alle nuove legislazioni nazionali ed internazionali ed alle problematiche scaturite dai cambiamenti climatici e dalla globalizzazione.

**Parole chiave** - Collezioni - Ricerca - Invertebrati - Museo di Storia Naturale.

### INTRODUCTION

Natural history collections were born in Europe in the XVIII century and they were initially created by individuals often of high rank, with large financial resources in order to bring the beauty and curiosity of nature that could be shown to a small circle of educated and selected guests.

The preparations were placed in environments called «cabinet of wonders» or «Wunderkammer» that were nothing more than the first simple and unconscious attempts to give life to a real museum of natural history. In fact, what we call at present «biodiversity» was already, albeit naive, admired by those who felt to bring together all the strange and wonderful specimens that were not a human creation, but that derived from the «divine creativity».

The beauty of nature, even before being assembled and shown in its entirety and physically in appropriate places, was always reproduced by men in all forms of art. In prehistoric caves, drawings or engravings were already representing animals or plants that were closely related to human life. In mosaics, sculptures, paintings, tapestries, architectural friezes nature subjects

are often represented, including animals - most frequently vertebrates but also invertebrates. Among the invertebrates, molluscs, crustaceans and the insects were, for their beauty of form and colour, often represented with great precision into works of art. In the nineteenth century had also come to use the practice to teach young noblewomen to collect specimens of particular beauty, such as the shells that were often imported from the so-called «new lands».

The birth of the Natural History Museums goes hand in hand with the great scientific expeditions of the late eighteenth and beginning of the nineteenth centuries. The purpose was to gather, collect and study everything that was still unknown and that came from exotic countries still unexplored and unknown. With the zoological collections the need to place the specimens was born, classifying them with a unique name, therefore the binomial classification of Linnaeus was eventually chosen as the best worldwide.

In the nineteenth century scientific names to a huge number of living beings were then given and a priority became the need of preserving them in museums where scholars could view them for their research and also the people could finally be aware of the wonders of nature. In Tuscany, the first natural history collections were made from the most powerful noble families in Florence and the Medici family collected a lot of objects which, in the late eighteenth century, merged in «La Specola», presently the Natural History Museum of the University of Florence.

The Imperial Royal Museum of Natural History in Florence was among the first to open its doors to all (it was inaugurated in 1775), but it diversified the visiting hours between the common people and the aristocracy. The Natural History Museums, with their first and essential functions, the research and educational work were therefore born and since then their growth and transformation by adapting to the socio-cultural and scientific changes have been continuous.

### DISCUSSION

Contrary to popular opinion, Natural History Museums are not static institutions; their research and con-

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servation are constantly evolving and changing with the use of new technologies in response to new questions posed by the scientific and socio-cultural development. In «La Specola» Museum, as it is commonly called the Zoological Section of the Museum of Natural History, University of Florence, the collections of invertebrates, among the most important in Italy, are derived largely from the research that was carried out from the time of its foundation until today.

Research issues have changed and evolved over the years, what once was almost exclusively pure research today is sometimes applied, meeting the multiple needs of public administrations and adaptation to national and international guidelines.

For this reason, researches conducted on invertebrates are not limited to the classical taxonomy, systematics, expansion and enrichment of the collections (helminthological, malacological, carcinological, entomological, etc.) by means of research and collection campaigns in Italy and abroad, but are also realized with the implementation of projects commissioned by various government agencies.

The latest regional, national and international laws and regulations often require the implementation of directives to which the public authorities, at different levels, must meet, and this fact poses the Museum, with its researchers, as their natural referent.

Modern research frontiers are therefore opened with the use of new technologies, such as genetic analysis and electron microscopy. Climate change and human activities due to globalization force researchers to face new issues, such as biological invasions of non-native species. The scientific research is consequently carried out towards new issues, while maintaining the original features of a Natural History Museum, is also increasingly linked to practical aspects of daily life.

#### THE RESEARCHES ON THE ZOOLOGICAL GROUPS

##### *Malacological researches*

###### *History*

The malacological collections start practically from the foundation of the Museum, with specimens from the Medici collections, where there were among them works of art, still subject of expert studies on fine arts as the carved *Nautilus* shells (Scalini, 1993).

The Targioni Tozzetti family members were linked to the Natural History Museum of Florence (AA.VV., 2006); Giovanni Targioni Tozzetti (1755-1829) was the main responsible for the collection of one of the oldest collections of continental molluscs. Then Adolfo Targioni Tozzetti (1823-1902) continued the collection and study of marine and continental molluscs with the publication of several works such one on

Cephalopods (Targioni Tozzetti, 1869; Borri *et al.*, 1988) and the description of new species of terrestrial gastropods from Tuscany such as *Vitrina bonellii* (Targioni Tozzetti, 1873).

The ability of the directors and curators to convey and encourage «amateur» experts permitted to have the expertise for the reorganization of the stored material, moreover the acquisition of important collections in the second half of the nineteenth century, were created by eminent malacologists: Vittorio Pecchioli (1790-1870) with the purchase in 1874 of the collection of land and freshwater molluscs; Vittorio Uzielli with the donation in 1894 of continental and marine molluscs; Giovanni Caramagna (1830-1895) with land- and seashells, including the shell types from Assab, Red Sea (Caramagna, 1888) which was donated to the Museum in 1897, and in particular the collection of Marianna Paulucci Panciatichi-Ximenes (1835-1919) with malacological material that, with regard to the land-shells, is considered the most important of Italy and which is still a reference point for malacological researches. The Paulucci collection was donated in 1898 (Barbagli & Borri, 2002) and is presently fully deposited in the Museum of Natural History in Florence, with 161 types of taxa described by Paulucci available to the scientific community (Cianfanelli & Manganelli, 2002). These collections are still entirely preserved in the Museum of Natural History of Florence and all the scientists that contributed to forming this collection, together with the then director Adolfo Targioni Tozzetti, supplied to the research and the definition of the national malacofauna that, in those years when the unification of Italy was defined, was considered as one of the milestone in science, for the creation of a national identity (Manganelli *et al.*, 2002). For some of these scientists exhibitions and conferences were organized to remember their role in the growth of the natural sciences in our country and to revive the historical memory of «La Specola» in Florence (AA.VV., 2006; Manganelli & Cianfanelli, 2002; Manganelli *et al.*, 2009). In the twentieth century we can remember other scholars and directors of the museum that dedicated themselves to research and enrichment of the malacological collections. Giuseppe Colosi (1892-1975) studied some Italian land shells, such as Testacellidae, Limacidae and Arionidae, and the study was not only limited to morphology but also to their anatomy (Colosi, 1919a; 1920a). The research carried out by another director, Benedetto Lanza, in the Horn of Africa led to the discovery of new species for Somalia and the acquisition of a reference collection for that poorly known area especially for the invertebrate fauna (Connolly, 1928; Forcart, 1961).

###### *Current research*

The commitment of the museum experts has allowed the study and the subsequent acquisition of the collec-

tion Soderi-Annovazzi, one of the most comprehensive collections of marine molluscs of Somalia (Borri *et al.*, 2002). With numerous research campaigns and collection carried out in Kenya, the last of them in 1999 and 2000, it has been possible to compile a more complete preliminary list for East Africa (Callea *et al.*, 2005). The conspicuous collection of Andrea Rossi consists of two separate batches, the first comprises a series of continental shells from South America, the other the reproduction of continental Palaeartic gastropods, with the faithful reproduction, with resins and skilfully modelled coloured, of their body mounted on the original shell of the reproduced species. This acquisition takes into account a higher value as continuing the tradition of the museum to preserve artefacts that are a conjugation between the artistic and the scientific rigor that was, since the birth of the Museum, with the anatomical waxes, one of the characteristics associated with the dual personality of Florence town.

In the last twenty years, many researches on our national territory, in the peninsular south-central areas (Tuscany, Lazio, Campania, Basilicata, Apulia, Calabria) and in the Italian islands (Tuscan Archipelago, Tremiti, Sardinia, Asinara, Sicily, Egadi, Pelagie, Ustica) have been carried out. With this research it was possible to increase the knowledge of the national malacofauna redesigning the knowledge of some districts and also with the discovery and description of several new species.

The new data combined from the study of the collected material and the historic collections made possible to play a key role in the realization of national projects such as the one promoted by the Ministry of Environment called Checklist and distribution of the Italian fauna (Bodon *et al.*, 2005a; 2005b).

At local level, researches in the region led to the creation of the malacological list within the project «Tuscan Natural Repertoire» (Re.Na.To.), essential for the protection of habitats and conservation of rare or endangered species in Tuscany (Cianfanelli *et al.*, 2005). In response to the demands imposed by the European directives («Direttiva Habitat»), the Tuscany Region has promulgated the Regional Law 56/2000, to which some provinces have responded by initiating specific projects to comply with the direction set by the regional legislation. The provinces of Arezzo, Prato, Pistoia and Florence, have funded projects for the study of molluscs to be protected including edible species, in attachments of Regional Law 56/2000. With this research technical reports were produced and they have allowed local governments to make operational decisions, for the protection of the local wildlife. Nourished grey literature produced for the provincial government by the experts of the Museum (Cianfanelli, 1998, 2009b; Cianfanelli & Lori, 2006, 2008a, 2008b, 2008c; Cianfanelli *et al.*, 2010; Lori & Cianfanelli, 2002, 2003, 2004, 2005,

2007, 2008) has sometimes been made available with the publication on the Websites of the provinces (Cianfanelli & Barbaresi, 1998a, 1998b; Cianfanelli & Lori, 2007, 2008a; Lori & Cianfanelli, 2003, 2007).

A new threat to the conservation of the species is now given by the biological invasions, after habitat destruction, and it is considered the main cause for biodiversity loss (Wilson, 2003). For this reason, adequate research relating to alien species have been carried out with projects like the Atlas of alien species in Tuscany (ALT) and the Project Atlas of alien species in Lazio (PASAL) (Cianfanelli & Bodon, in press). In addition to providing an overview of the situation of allochthonous shell species both nationally (Bodon *et al.*, 2004; Cianfanelli *et al.*, 2007; Gherardi *et al.*, 2008) and for some regions: Tuscany (ALT) and Lazio (PASAL), the purpose of these projects was to allow the prevention. It is well demonstrated that the more timely interventions have much higher chances of success in the fight of biological invasions (Lori & Cianfanelli, 2007; Gherardi *et al.*, 2008; Cianfanelli, 2009a).

One of the institutional tasks of a Natural History Museum is the protection of species of interest such as endemics that often, because of their extreme localized habitat, may be in danger, and for this reason that research projects – such as the one implemented for a gastropod, *Melanopsis etrusca*, present only in few stations of thermal waters of southern Tuscany – are essential for the functioning of conservation measures that the institutions should realize.

For the species conservation, collaboration with institutions such as the International Union for Conservation of Nature (IUCN) is also essential; in fact the museum staff helped with the production of the forms on endangered species comprised in the Red List of Threatened Species (IUCN, 2012).

Divulgence remains one of the important functions of the researcher as well as transferring knowledge to non-experts. It is for this reason that specialists in the Natural History Museum did not omit the diffusion with related publications, for example, the importance and fragility of island fauna (Cianfanelli, 2002), the complexity of a fauna from a limited area such as of a province (Cianfanelli, 2009a), the unexpected variety of the fauna in a city park (Cianfanelli & Lori 2008d), the hazards arising from the introduction of alien species (Gherardi *et al.*, in press), but also the ferment of activities that lie within a museum through self-expression, to understand what is the role of an institution which, by common place, is believed static (Innocenti & Cianfanelli, 2009; Poggesi *et al.*, 2009).

The management of collected and stored data is fundamental, it is in fact a priority the recording of collecting information in the course of research in modern databases that allow the rapid processing of data. The effort to record all the information in digital for-



mat has been remarkable and goes hand in hand with the study and publication of both historical and newly acquired material.

### *Carcinological researches*

#### *History*

It is assumed that the first pieces that constituted the Crustacean collection are from the collections of Georg Everard Rumpf (1627-1702) purchased by the Grand Duke Cosimo III de Medici, from the register written by Giovanni Targioni Tozzetti for the Royal Galleries. In the manuscript some crustaceans («crab, crayfish and barnacles») are listed, unfortunately not currently identifiable, even if Rumpf collected only in the Indonesian town of Amboina.

Since 1860, when the Royal Institute of Higher Studies was established, with the creation of the Section of Natural Sciences there was a new impetus to the study and expansion of existing collections, thanks to the research conducted by Adolfo Targioni Tozzetti (1823-1902) who ordered in a systematic way all the groups of invertebrates, including thus the Crustaceans, for the establishment of the Italian and exotic collections (Bargagli, 1902). In La Specola Museum Targioni Tozzetti participated in many national and international exhibitions, for example in 1862 in London, in 1867 at the Universal Exhibition in Paris, in 1880 the fishery exposure in Berlin. The exposures were occasions to present the activities of the Section of Natural Sciences, exhibiting significant pieces from the collections, but also opportunities to purchase or exchange specimens with Italian, European and non-European institutions or museums. In fact, as a result of participation in the exhibition in Berlin in July 1880 several specimens of crustaceans from Kiel, Cologne and Japan came to the Museum and a number of specimens of exotic crustaceans were exchanged with the Museum of Natural History in Berlin.

Targioni Tozzetti personally collected a large amount of specimens. In 1869 he organized a three-month trip in Sardinia, where, in addition to numerous invertebrates including molluscs, crustaceans and insects, also collected ornithological and ichthyological data. In 1873, at the invitation of the Museum of Natural History in Stockholm, Targioni went on the coast of Sweden to study fishing and the fish laboratories, bringing back to the Museum of Florence, a remarkable collection of shellfish from the Swedish coast.

A lot of marine crustaceans were collected during several oceanographic expeditions, from the cruise ships «Magenta» (1865-1868), «Vettor Pisani» (1882-1884), «Liguria» (1903-1905), «Ammiraglio Magnaghi» (1923-1924), that circumnavigated the world, and from the vessel «Washington» (1881-1884), that explored the Mediterranean Sea.

Targioni Tozzetti (1872a, 1872b, 1877) published some works in particular on species collected from the «Magenta» cruise, which visited various places especially in Southeast Asia. Angelo Senna (1866-1952) studied the collections of the «Liguria» and «Washington» (Senna, 1902, 1906). With regard to the collections of the Mediterranean abyssal fauna by «Washington», it is worth remembering a kind of lobster-like crustacean, *Polycheles thyphlops*, which was collected by Enrico H. Giglioli between 950 and 2145 meters, immediately published in the prestigious journal *Nature*, a few days after the discovery, in response to a statement by the British marine biologist William B. Carpenter that argued the Mediterranean completely azoic (Giglioli, 1881).

Many of the planctonic crustaceans from «Vettor Pisani», «Liguria» and «Ammiraglio Magnaghi» were examined by Giuseppe Colosi, a Sicilian zoologist, scrupulous and eclectic scholar of several groups of invertebrates, specialist in systematics and Botany and supporter of the evolutionary theory of Hologenesis (Colosi, 1917, 1919b, 1920b, 1924). Some groups of amphipods were studied by Clelia Cecchini, which later became director of the Istituto Tecnico Toscano while Mysida, Lophogastrida and Euphausiacea were studied by two Colosi assistants during his stay at Naples University, Beatrice Torelli and Isabella Coifmann (1912-2006) (Coifmann, 1936, 1937a, 1937b). Coifmann, among other papers, identified the freshwater decapods collected by Nello Beccari in British Guiana in 1932, recognizing some species new to science (Coifmann, 1939).

#### *Current research*

Since 1992, the collections were partly re-catalogued, updating their previous accommodation. The collections were moved and expanded, taking up new spaces and places where they are preserved and studied. The publication of catalogues on crustacean groups is slowly progressing (Innocenti, 2006a, 2006b, 2006c, 2007, 2009).

Present research is focusing on Tuscan region, with particular emphasis to the monitoring of alien species, the increased knowledge of the status of native species and a greater commitment to the knowledge of the local fauna. In particular, research is in progress on the distribution of freshwater decapods in Tuscany, in order to provide a detailed picture of the regional situation of crayfishes, freshwater crabs and shrimps (Cianfanelli *et al.*, 2008, Innocenti & Cianfanelli, 2012).

Research in exotic areas mainly focuses on East Africa, through the study of the carcinological fauna from mangrove environment, in collaboration with the research carried out by researchers of the Department of Biology at the University of Florence (Vannini & In-

nocenti, 2000, Galil & Innocenti, 2001, Innocenti & Vannini, 2007).

The collection of «La Specola» Crustaceans is particularly rich in the orders of Isopoda, Amphipoda, Stomatopoda and especially Decapoda. The collection contains specimens preserved in alcohol mainly coming from the exploration of the Italian coast and the Mediterranean, especially from the Tyrrhenian Sea.

Tuscany and its Archipelago are the subject of special studies in specific projects financed by national and local public authorities (Regione Toscana, Marine Biodiversity Project in Tuscany). This project, called BioMart is a thorough investigation of the rocky seabed of the Tuscan Archipelago. Since 2007 the collection has been enriched with numerous decapods crustaceans, providing a «snapshot» of the current populations of wildlife rocky bottom.

In recent decades, the collection of crustaceans decapods and stomatopods has been greatly enriched in number and variety of species as a result of recent research missions in Somalia and Kenya conducted by the Centro per lo Studio della Faunistica ed Ecologia Tropicale, CNR, and the Museum. In addition, thanks to the collaboration with the Institute Israel Oceanographic and Limnological Research (IOLR) of Haifa, specimens of Crustacea Decapoda from the Red Sea (lessepsian species), and now confirmed in the eastern Mediterranean are often donated. The collaboration with the IOLR, endowed in 1995, came after the study on the biology and ethology of the lessepsian decapod crustacean *Charybdis longicollis*. The crab, reported for the first time in the eastern Mediterranean in 1954, quickly spread, becoming one of the dominant species in the fishing nets. In 1992 it was found to be parasitized by the lessepsian rhizocephalan crustacean *Heterosaccus dollfusi*. Despite the high prevalence of the parasite and its impact on its host (at the time it is infected, it becomes sterile) for more than twenty years, there is not a noticeable reduction in the crab population, but high rates of infection and even a large number of parasites per host are yearly reported (Innocenti *et al.*, 1998, Innocenti *et al.*, 2003, Innocenti & Galil, 2007; 2011).

## *Entomological researches*

### *History*

In the entomological collections of the Museum about a million insect specimens are preserved, the oldest of which date back to the first half of the nineteenth century (Bartolozzi & Sforzi, 2009). Unfortunately, the entomological specimens of the first museum collection in the eighteenth century are missing, having been damaged and destroyed in the course of time. One of the most important 'historical' collections of the museum is undoubtedly the Rondani collection of dipterans and hymenopterans. Camillo Rondani (1808-1879) was

a famous entomologist and described very many new species; hence, his collection has enormous scientific importance, since it includes the «type specimens» from which he named the new species.

For this reason, specialists from all over the world must constantly examine this material to solve various taxonomic and systematic problems. Types are unique specimens that must be preserved in museums with the utmost care in view of their enormous scientific value. In the Rondani collection alone, there are around a thousand of them.

Another collection of great importance is that of Lepidoptera (mostly Italian, but not only) by Roger Verity (1883-1959). Son of the English nobleman Richard Verity and the Florentine noblewoman Matilde Fenzi, he was a physician and a great lover and expert of butterflies. Also in this collection, consisting of tens of thousands of samples, there are about two thousand type specimens on which Verity described new species, breeds or varieties.

Among the coleopterans, «La Specola» houses one of the world's most important collections of the family Brentidae. The presence of such a rich collection in the museum is due to the fact that some of the most internationally famous specialists on these coleopterans worked in Florence. The first was Angelo Senna, who described many new species and published a large number of papers, later he was joined by his pupil Enrica Calabresi (1891-1944).

Worthy of note is then the collection of beetles by Alfredo Andreini (1870-1943), which contains a number of interesting specimens, including many types, not only from Italy but also from Eritrea, where Andreini served as medical officer of the Italian Army in the colonial period.

In more recent times, among the various acquisitions is particularly noteworthy the collection Failla, which was donated to the Museum in 1988 by the family of Silvio Failla (1905-1988). Failla assembled in his lifetime a large collection of Italian beetles, all captured during his visits to various Italian cities throughout his career as a magistrate. Profound connoisseur of the Italian coleopteran fauna, Failla collected many tens of thousands of specimens in about 60 years, all carefully studied and identified.

The meritorious practice of donating scientific collections at the Museum continues today, for example the collection Rocchi, which was donated to the Museum by the owner Saverio Rocchi in 2006 and consists of approximately 40,000 specimens of Italian and foreign aquatic beetles, (Bartolozzi, 2007). Its value lies in the fact that is a valuable archive of the wetlands of Tuscany, because it is the result of forty years of research carried out in this particular type of environment, now severely compromised due to land reclamation, pollution and urbanization.

The historical collections thus have a value that often goes beyond the pure interest for the study of species they contain, as they are also a testimony of a past wildlife population, which often does not exist today as a result of environmental or climate changes, largely due to the anthropogenic influence. The data are even more valuable, because they allow researchers to evaluate the influence of environmental changes on the geographic and temporal distribution of the species, whereas they also allow the development of prediction models for the future.

### *Current research*

In recent years, the Museum has organized numerous entomological campaigns in the Tuscany region, with particular attention to protected areas. Several studies have been carried out for example in the Tuscan Archipelago National Park, in particular on the island of Pianosa, with the publication of several scientific contributions (Abbazzi *et al.*, 2004a, Lo Cascio *et al.*, 1999, 2000). Extensive studies on beetles and butterflies were also made in the National Park of Casentino Forests, Mount Falterona and Campigna (Cecchi & Bartolozzi, 1997; Abbazzi *et al.*, 2004b; Dapporto *et al.*, 2004; Bartolozzi *et al.*, 2008), and in the Maremma Regional Park (Nistri *et al.*, 1993; Sama & Bartolozzi, 1993; Abbazzi *et al.*, 1998; Magnani *et al.*, 1993; Sforzi & Bartolozzi, 2007; Nappini & Dapporto, 2009). For example in the latter protected area an interesting new species of flightless and blind beetle, living in the subsoil, *Otiorhynchus taitii*, has been collected and described (Abbazzi *et al.*, 1992). Researches were also carried out on behalf of public institutions, such as the Province of Arezzo and Prato (Bartolozzi *et al.*, 2010). Thanks to the experience gained during the research on Tuscan entomological fauna, the museum staff has been able to contribute to the drafting of the Regional Law 56/2000 on the protection of minor fauna and to realize the Red Book of Insects of Tuscany (Sforzi & Bartolozzi, 2001).

With regard to the scientific research of taxonomic type, the published contributions on various families of beetles such as Dytiscidae, Brentidae, Lucanidae, are particularly important.

A major commitment of the museum was also to organize over the past 30 years a large number of entomological expeditions in tropical countries. These expeditions have significantly enriched the museum's collections, in particular those of coleopterans. From a scientific point of view these expeditions have allowed the description of a large number of new species, especially of African origin (Bartolozzi *et al.*, 2002).

In Africa, the main scientific missions were conducted in East Africa (Somalia, Ethiopia, Kenya, Tanzania),

but several studies have been carried out in other countries, such as Madagascar, Botswana, Gabon, Congo. During the extensive research conducted in Kenya interesting collections were made on several occasions in the coastal forest of Arabuko Sokoke, located just south of Malindi, one of the few remaining coastal forests in East Africa. Numerous research trips also focused on other continents, such as Asia (Vietnam, Malaysia, India) and South America (Ecuador).

In the period 2010-2012, the Museum has signed a Memorandum of Understanding with the Vietnam National Museum of Nature in Hanoi and this fact led to the emergence of a fruitful collaboration with Vietnamese colleagues, resulted in three scientific expeditions in the north of the country, in a variety of National Parks and Nature Reserves. It should be noted that bilateral cooperation agreements are now the best way to carry out research in tropical countries. It is ended the time in which the Western colonizers collected indiscriminately zoological, botanical and anthropological samples in third world countries to enrich their museums, and there was no scientific or cultural exchange. Today, however, it is sought the contribution to the training of colleagues and the dissemination of scientific knowledge in other countries. A small example of this can be witnessed by the creation of a photographic exhibition on the nature of Vietnam, held in Hanoi and in Florence, thanks to the photos taken by the photographer of the Museum Saulo Bambi during the expeditions in that country (Bartolozzi & Bambi, 2010).

### CONCLUSION: THE NUMBERS

Making a resume of the research conducted by the Natural History Museum of the University of Florence in the last twenty years, we can recapitulate that:

- research missions in the country and in the rest of the world have led to the enrichment of the collection for an approximate number of 350 thousand specimens
- the study of the collected material has allowed the description of about 220 species new to science with the cataloguing of their holotypes and paratypes
- 270 scientific papers have been published
- 15 popular contributions have been published
- the present writers participated in numerous conferences, with the presentation of original contributions
- the present writers designed, produced, realized or participated as experts in numerous projects including 1 European, 4 Ministerial, 3 Regional, 20 Provincial, 1 for the Superintendency for National Heritage and cultural activities.



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