

E74 Brazilian Federal Police (BFP) Forensic Activities in the Paleontological Area

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After attending this presentation, attendees will understand some of the aspects of the BFP's forensic actions related to fossils. The main objective of this research was to consolidate existing information on the fossils seized by the BFP, which were the subject of the BFP forensic scientists' examinations between 2005 and 2014.

This presentation will impact the forensic science community by describing and analyzing the recent paleontological forensic activities of the BFP. Although only a few dozen are discovered in a decade, the forensic examination of fossils is very important and requires special attention because of the high scientific and cultural value.

In the context of the BFP, all the technical documents produced by the forensic scientists are recorded and stored in a national forensic database system (Sistema Integrado de Investigação Criminal (SISCRIM)), which contains more than 20 million records and more than 720 thousand documents. The Federal Forensic Science Body of the BFP is composed of a central unit (the National Institute of Criminalistics), in Brasília, and 51 decentralized units, present in all 27 Brazilian state capitals and 24 other strategic cities throughout Brazil.

Brazilian fossils are considered by law as public goods and described as Union heritages. They are legally protected on a federal scale and their trade is prohibited. One of the newest lines of investigation of the BFP is the fight against environmental crimes. For instruction of police and judicial investigations, forensic scientists, with the assistance of paleontologists, perform tests for the identification and description of specimens and fossils of animals and plants, which have been seized due to illegal trade or possession.

A survey was conducted of forensic reports on fossils seized in Brazil. In all, 141 documents were identified (137 reports and 4 technical information items), concentrated in 13 forensic units. A single local unit (Universidad de Ingeniería y Tecnología (UTEC) of Juazeiro do Norte/Ceará), in the Chapada do Araripe, Northeast region, was responsible for 43 of the documents (30.5%). The second, in quantitative terms, with 31 documents (22%) was the forensic unit of São Paulo State. The National Institute of Criminalistics was third with 22 documents (15.6%).

Currently, there are nearly 1,100 forensic scientists working in the BFP on several modalities of forensic science. These are professionals with varied academic backgrounds (18 distinct areas), highly qualified (about one-third of them are postgraduate, at least 80 doctors), well screened (by public contest), and professionally motivated (the BFP is one of the public institutions with greater respect and prestige in Brazilian society); however, there are no paleontologists on the BFP staff and fossil surveys are usually performed by trained experts in related fields, such as geology and biology. The documents examined were produced by 36 forensic scientists (16 of which acted as first author). In cases of greater complexity, the forensic team generally requests assistance and guidance from paleontologists in universities or in the federal agency responsible for the regulation and supervision of mineral matters, the National Department of Mineral Production (DNPM).

The reports examined were classified into 15 categories, according to subject: pseudofossils (6); fish (41); plants (46); mollusks (26); arthropods (14); trilobites (7); bryozoans (1); echinoderms (3); *Mesosaurus* (2); mammals (4); birds (2); dinosaurs (3); paleontological sites (45); reptiles (4); and amphibians (2). Several reports addressed more than one group of fossils. The number of pieces analyzed per report varied from one to hundreds.

Most of the fossils examined consisted of fish, arthropods, and fossilized trunks. The most common geological source of the animal fossils examined are the Cretaceous rocks of the Santana Formation of Chapada do Araripe, with an estimated age between 100 and 150 million years. For the fossilized trunks, there are two known geological sources: the Santa Maria Formation, Upper Triassic (225 million years old) and the Permian Pedra de Fogo Formation (290 million years old).

Considering the legal character of fossils as national heritages, a common practice adopted by the forensic team at the end of the examinations involving fossilized items is that the objects are recommended to be forwarded to teaching and research institutions, museums, and public collections; however, it should be noted that this is a decision that rests with the judge.

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