

## PIERRE STRINATI AT 90 AND HIS CONTRIBUTIONS TO THE SUBTERRANEAN BIOLOGY IN BRAZIL

### PIERRE STRINATI AOS 90 ANOS E SUAS CONTRIBUIÇÕES PARA A BIOLOGIA SUBTERRÂNEA NO BRASIL

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#### Abstract

The Swiss biospeleologist Pierre Strinati is well known in the field of the subterranean biology for having carried out expeditions to caves and collect samples of cave fauna around the world. He visited caves in around 70 countries and discovered hundreds of new species of invertebrates and two vertebrate species, publishing several scientific papers and books. In 1968, he included Brazil in his itinerary and visited the Areias de Cima cave and the Tapagem cave, both in the region of Iporanga, São Paulo state. He collected several invertebrates and sent them to be studied by specialists, resulting in the publication of 10 papers in which ten new species, one new genus and one new subfamily were described. Half of these species were named after him. Before Dr. Pierre Strinati visit the Brazilian caves, the knowledge about the cave fauna was almost restricted to taxonomic studies. Consequently, he was the first researcher to make a more complete sampling of the biological community of Brazilian caves, inspiring further studies about the subterranean biology in the country. Therefore, his pioneer exploration, in addition to the intensive works made by some Brazilian researchers, established the subterranean biology as a promising field of research in Brazil.

**Key-Words:** biospeleology; caves; invertebrates.

#### Resumo

O biospeleólogo suíço Pierre Strinati é bastante conhecido no campo da biologia subterrânea por ter realizado expedições para visitar cavernas e coletar exemplares da fauna cavernícola em várias regiões do mundo. Ele visitou cavernas em aproximadamente 70 países e descobriu centenas de novas espécies de invertebrados e duas de vertebrados, publicando vários artigos científicos e livros. Em 1968, ele incluiu o Brasil em seu roteiro e visitou as Grutas Areias de Cima e Tapagem, ambas na região de Iporanga, estado de São Paulo. Ele coletou vários invertebrados que foram enviados para ser estudados por especialistas, resultando na publicação de dez artigos, nos quais foram descritas 10 novas espécies, um novo gênero e uma nova subfamília. A metade destas espécies foram nomeadas em sua homenagem. Antes do Dr. Pierre Strinati visitar essas cavernas brasileiras, o conhecimento sobre a fauna cavernícola era quase restrito a trabalhos taxonômicos. Consequentemente, ele foi o primeiro pesquisador a fazer uma amostragem mais completa da comunidade biológica em cavernas brasileiras, inspirando estudos posteriores sobre biologia subterrânea no país. Portanto, sua exploração pioneira, aliada aos trabalhos intensivos realizados por alguns pesquisadores brasileiros, estabeleceram a biologia subterrânea como um campo de pesquisa promissor no Brasil.

**Palavras-Chave:** biospeleologia; cavernas; invertebrados.

The zoologist Pierre Strinati was born in Geneva (Switzerland) on 31 October, 1928. Coming from a family of textile traders, he started to manage the family business after completing his studies (science graduate of the University of Geneva in

1960 and doctorate in zoology from the University of Toulouse in 1965). However, this responsibility did not prevent him from devoting time to other activities like his advocacy for the graphic novels

and the scientific studies (AELLEN, 1980; LINDER, 2015).

The scientific activities of Dr. Pierre Strinati were focused mainly on the caves and the fauna that inhabits these environments. His great curiosity about the physical and biological components of the subterranean environments resulted in several expeditions to visit caves around the world in the company of other biospeleologists. In total, he visited 1626 caves in around 70 countries (Pierre Strinati, pers. com., 2018) (Fig. 1A). As a result, he collected about 300 new cave species (two vertebrates and the rest invertebrates) and 61 of them were named in honor of him (e.g. BRIGNOLI, 1972; CONDÉ, 1997; HUBER, 2005). He also has about a hundred publications in scientific journals and published several books (e.g. STRINATI, 1960, 1971, 1994a, 1994b; STRINATI; CONDÉ, 1995). In 1979 the Natural History Museum of Geneva nominated him a Corresponding Member and in 2014 the ISSB (International Society for Subterranean Biology) appointed him an Honorary Member.

One of the expeditions carried out by Dr. Pierre Strinati had the Brazil as destination. He visited caves located at the Iporanga municipality (São Paulo State) in July 1968, guided by Michel le Bret, and such explorations were not easy given the bad conditions of the roads in that time (Fig. 1B). During the expedition they visited the Tapagem Cave (also known as Diabo Cave) and the Areias de Cima cave (Fig. 1C), collecting several invertebrates (STRINATI, 1968, 1971, 1975; PINTO-DA-ROCHA, 1995; TRAJANO, 2007). Therefore, Dr. Pierre Strinati produced the first species list for these two caves and the specimens collected were studied by several researchers, resulting in the publication of 10 papers (published between the years 1969 and 2000) in which 10 new species, one new genus and one new subfamily were described, some of them being troglobites (BEIER, 1969; CHOPARD, 1970; BRIGNOLI, 1972; TÜRKAY, 1972; WHITEHEAD, 1972; MAURIÈS, 1974; ŠILHAVÝ, 1974, 1979; STRINATI, 1975; YOSHII, 1988; MAURIÈS; GEOFFROY, 2000).

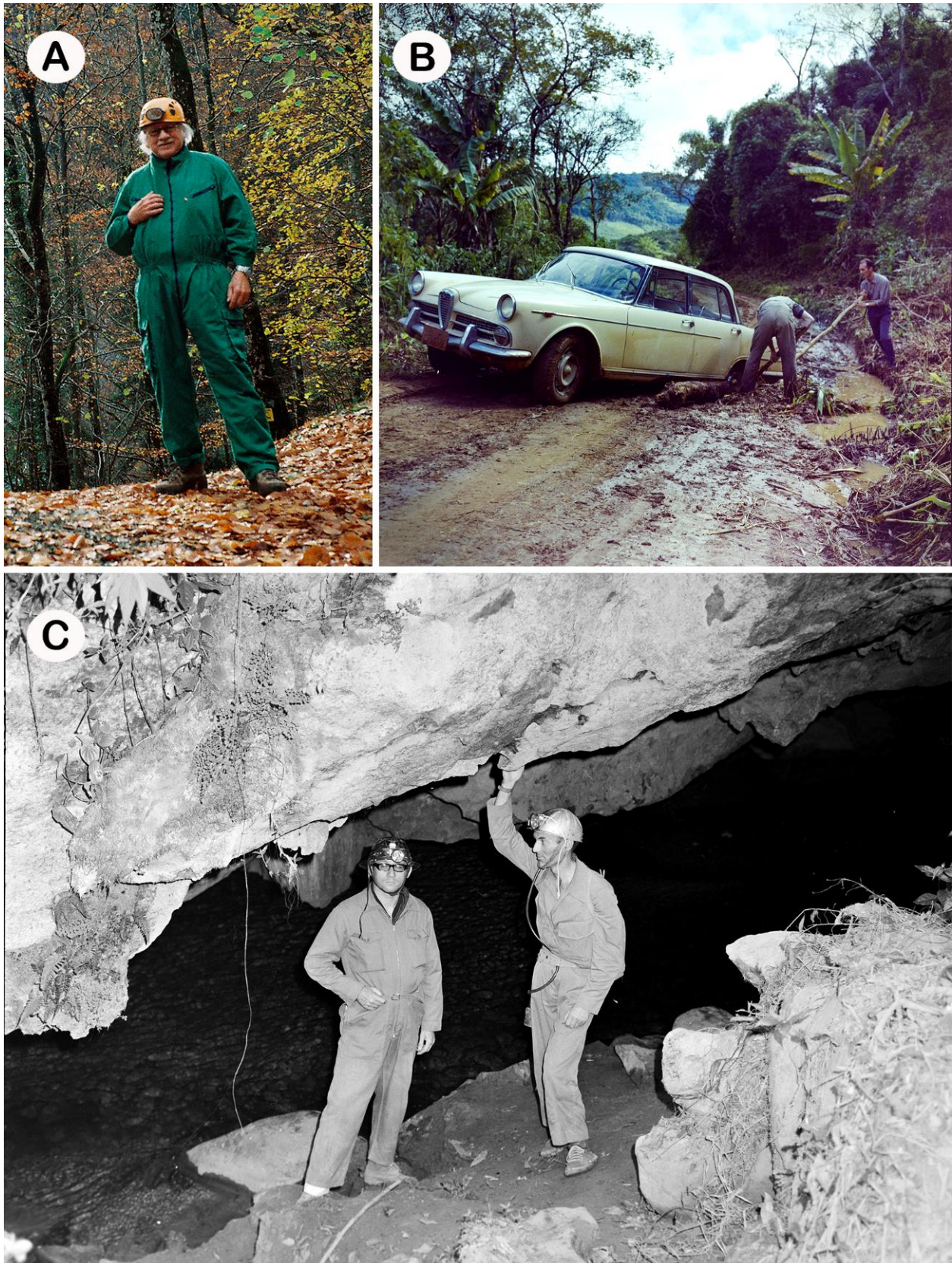
Some of the new taxa found by him in the Brazilian caves were also named after him. One new genus of cricket received the name of *Strinattia* Chopard, 1970 (Fig. 2A), and four new species have his last name as specific epithet: the pseudoscorpion

*Pseudochthonius strinatii* Beier, 1969 (Fig. 2B), the millipede *Pseudonannolene strinatii* Mauriès, 1974 (Fig. 2C), the decapod *Aegla strinatii* Türkay, 1972 (Fig. 2D) and the harvestmen *Pachylospeleus strinatii* Šilhavý, 1974 (Fig. 2E) (BEIER, 1969; CHOPARD, 1970; TÜRKAY, 1972; MAURIÈS, 1974; ŠILHAVÝ, 1974).

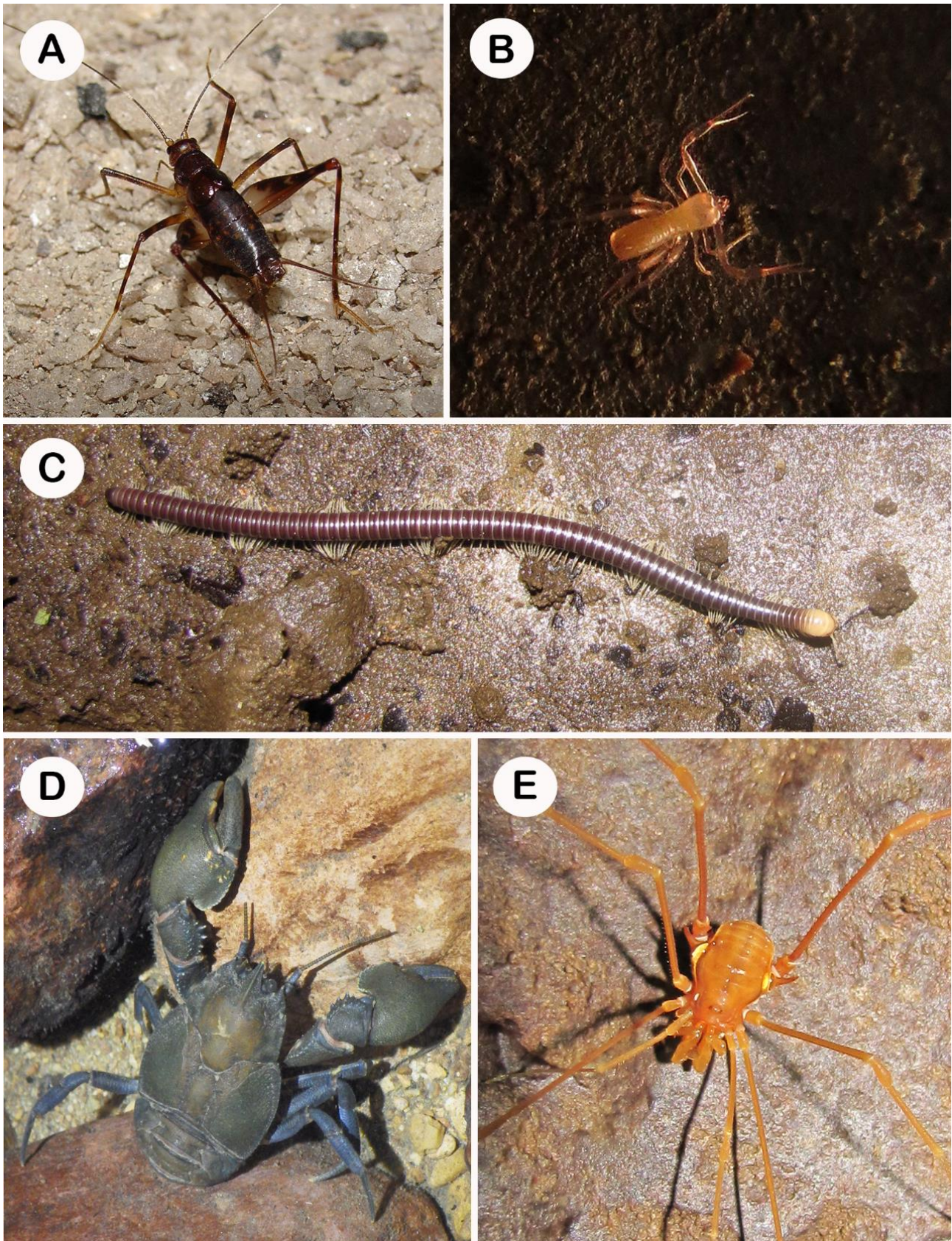
Before Dr. Pierre Strinati visit the Brazilian caves in 1968, the knowledge about the cave-dwellers was almost restricted to studies performed by taxonomists. As examples, we can cite the description of the catfish *Pimelodela kronei* in 1907 by Ribeiro and in the following years the description of invertebrates like crickets and a fly by Costa-Lima, whip spider and harvestman by Mello-Leitão, millipedes by Otto Schubart, harvestman by H. Soares and thread-legged bugs by Wygodzinsky (RIBEIRO, 1907; COSTA-LIMA, 1932, 1940; MELLO-LEITÃO, 1933, 1937, 1940; SCHUBART, 1946; SOARES, 1966; WYGODZINSKY, 1950; PINTO-DA-ROCHA, 1995). Consequently, Dr. Pierre Strinati was the first researcher to sample the biological community of Brazilian caves as whole, encouraging further studies about the subterranean biology in the country. Among these studies, we can cite the historical outstanding article by Dessen et al. (1980), in which the cave fauna of some Brazilian regions was sampled in a systematic way for the first time, being a landmark of the subterranean biology in this country. Afterwards, Dra. Eleonora Trajano, one of the authors of the study previously mentioned, continued and intensified the studies about cave fauna, establishing the pillars of the subterranean biology in Brazil (e.g. TRAJANO, 1987, 1991, 1992; TRAJANO; GNASPINI-NETTO, 1991; TRAJANO; MOREIRA, 1991). Accordingly, the pioneering exploration of Dr. Pierre Strinati represented a remarkable contribution that opened the doors to studies of the Brazilian cave fauna in a community-level approach, which makes him one important and influential person in the biospeleological scenario of our country.

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**Figure 1:** Pictures of Dr. Pierre Strinati taken on his birthday (31 October, 2018) and during the expedition carried out by him in Iporanga municipality (São Paulo state, Brazil) in July 1968: A) Dr. Pierre Strinati before his 1626<sup>th</sup> cave visit, Grotte aux Fées de Vallorbe (Switzerland VD6), on his 90<sup>th</sup> birthday (phot. Filippo Munafo, 31.X.2018); B) The bad conditions of the roads in the Iporanga region in 1968 were one of the difficulties faced by Dr. Pierre Strinati, Claude Chassan (left) and Michel Le Bret (right) (phot. Pierre Strinati, 29.VII.1968); C) Dr. Pierre Strinati (left) and Michel Le Bret at the Areias de Cima cave (phot. Claude Chassan, 29.VII.1968).



**Figure 2:** The Brazilian cave taxa that were named after Dr. Pierre Strinati: A) A cricket of the genus *Strinatia* Chopard, 1970; B) The pseudoscorpion *Pseudochthonius strinatii* Beier, 1969; C) The millipede *Pseudonannolene strinatii* Mauriès, 1974; D) The decapod *Aegla strinatii* Türkay, 1972; E) The harvestmen *Pachylospeleus strinatii* Šilhavý, 1974. The photos A, B, C and E were taken by Rodrigo Lopes Ferreira and the photo D was provided by Lucas Mendes Rabelo.

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