



EDITORIAL PROCEEDINGS OF THE XV ISFB

Introduction to the XV International Symposium on Flatworm Biology and the Proceedings of the Symposium

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Since 1970, the International Symposia on Flatworm Biology (ISFBs) have been the premier event for discussing and disseminating the latest research on free-living flatworms, “Turbellaria”. These symposia are held approximately every three years, each time in a different country (Fig. 1). ISFBs always gather a relatively small number of researchers, reflecting the small but mighty community of flatworm researchers (Table 1). Because of the vibrant and familiar community of researchers, regular participants frequently express the feeling of belonging to a small family. By 1985, the evidence that the “Turbellaria”—which also includes some parasitic organisms—is a paraphyletic group was the catalyst to welcome researchers who study flatworms of the parasitic Neodermata into ISFBs.

The XV ISFB was delayed by two years due to the isolation restrictions resulting from the COVID-19 pandemic. The logo of the XV ISFB consisted of two elements: the lettering, inspired by the graphism of the increasingly endangered Brazilian indigenous peoples; and a terrestrial flatworm *Geoplana vaginuloides* (Darwin, 1844), which was identified and described not far from the venue (Fig. 2). This latest edition of the symposium was held at the Center for Marine Biology (CEBIMar), Universidade de São Paulo (USP), São Sebastião, State of São Paulo, Brazil. The venue is located on the beach between the Atlantic Ocean and the magnificent Atlantic Forest and offers dedicated laboratories for the participants who stayed longer to collect and study local flatworms.

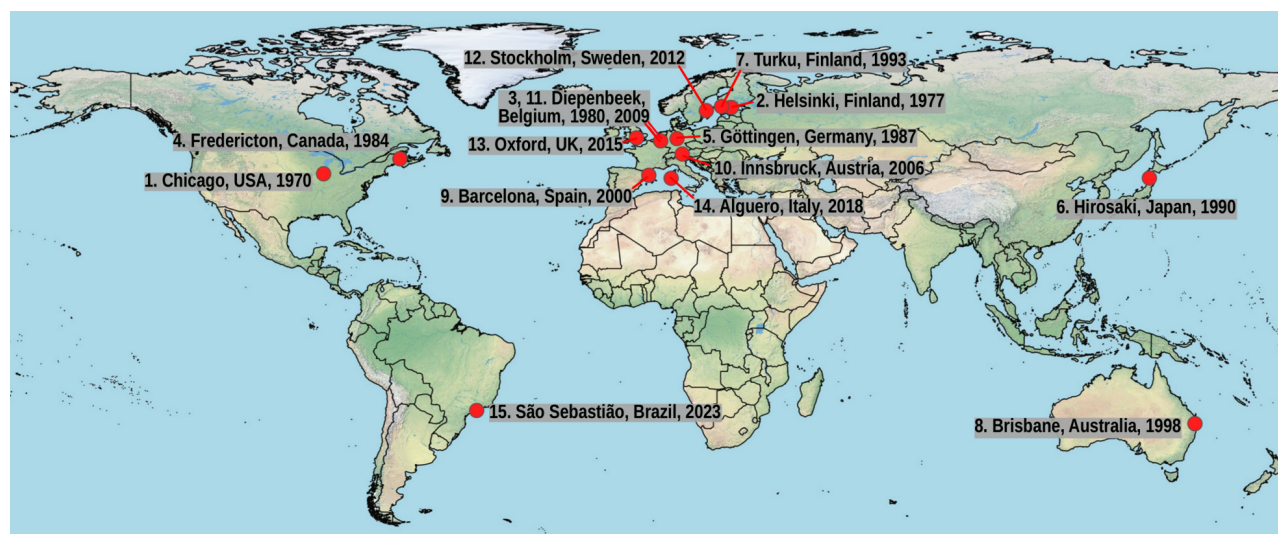


Figure 1. Location of all fifteen International Symposia on Flatworm Biology, including city, country and year of celebration.



Figure 2. Logo of the XV ISFB.

Lately, there has been a proliferation of meetings on narrower taxonomic flatworm groups or specific aspects of them, such as the International *Macrostomum* Meeting, the European Meeting on Planarian Biology, and the North American Planarian Meeting. As a result, conferences like the ISFB face a challenge in competing to attract participants. Nonetheless, the ISFB continues to emphasize diversity in both scientists included and animals studied, enticing a wide variety of international flatworm enthusiasts. The XV ISFB was attended by 47 scientists from 19 countries, namely Argentina (1 participant), Austria (2), Belgium (6), Brazil (9), Canada (1), China (1), France (2), Germany (5), Italy (1), Japan (2), Netherlands (1), Peru (1), Poland (1), South Korea (2), Spain (3), Sweden (1), United Kingdom (2), United States of America (3), and Uruguay (3) (Fig. 3). Our exciting plan to have the scholar Gyrhaiss Kasembebe (Université de Lubumbashi, Democratic Republic of Congo) from the underrepresented continent of Africa turned into frustration because of a visa denial by the authorities. The participation of young scientists, especially those from developing countries, was encouraged by lowering the registration fees and making room in the program for oral communications and one-minute oral presentations of posters. The 47 participants gave 39 lectures and presented 24 posters on turbellarian and neodermatan organisms, covering a wide range of topics that included phylogenomics, phylogeny, barcoding, molecular cell biology, regeneration, organismal diversity, ecology, anthropic disturbance, species interactions, and taxonomy. The program and abstracts are available at http://planarias.each.usp.br/system/artigos/214/original/XV-ISFB-Program_AbstactsJul2023.pdf.

The present Proceedings cover a selection of works presented at the XV ISFB and submitted for peer review. We were not able to determine why some participants declined to submit their manuscripts for publication in this special issue of *Zoologia* – an International Journal for Zoology. Possibly, there are several explanations including some projects that were in a preliminary form, some manuscripts that had already been submitted elsewhere shortly before

the symposium, or in some cases other journals might have been preferred because they are focused on a more restricted or a wider audience. Whatever the cause, the proceedings themselves have become less regular over the years and we are pleased to share the exciting work contributed by fantastic scholars in this issue (Table 1).

Table 1. List of all 15 International Symposia on Flatworm Biology, with year, number of participants, oral communications and full papers published in the proceedings.

Symposia	Participants	Oral communications	Full papers in the proceedings
I. Chicago, USA, 1970	?	?	22
II. Helsinki, Finland, 1977	22	?	16
III. Diepenbeek, Belgium, 1980	57	30	37
IV. Fredericton, Canada, 1984	66	70	45
V. Göttingen, Germany, 1987	130	87*	73
VI. Hirotsaki, Japan, 1990	142	?	50
VII. Turku, Finland, 1993	89	55	50
VIII. Brisbane, Australia, 1998	71	74	39
IX. Barcelona, Spain, 2000	85	40	22
X. Innsbruck, Austria, 2006	~103	48	–
XI. Diepenbeek, Belgium, 2009	116	42	11
XII. Stockholm, Sweden, 2012	60	32	–
XIII. Oxford, United Kingdom, 2015	95	55	–
XIV. Alghero, Italy, 2018	89	51	–
XV. São Sebastião, Brazil, 2023	47	39	10

(*) It might include poster presentations, (–) Proceedings were not published, (?) unknown.

Half of the papers published in these Proceedings are related to land planarians (Geoplanidae). Song & Carbayo (2024) presented an overview on the known South Korean land planarians and the discovery of new taxa. Justine et al. (2024), updated the distributional status of land planarians introduced in France and French overseas territories. Rossi et al. (2024), demonstrated that *Paraba multicolor*, the type species of this genus, is a member of *Geoplana* and accordingly proposed a new name for the genus. Carbayo (2024a) presented a background of the complex taxonomic history of one of the most popular names of land planarians, *Geoplana*. Milanese & Carbayo (2024), showed for the first time that distinct species of Geoplaninae land planarians have differential abilities to regenerate after being cut in two. Two papers deal with systematics or development of the freshwater planarians: Dai et al. (2024), reported a range of developmental errors in planarian hatchlings, while Catalá et al. (2024), communicated several molecular-based lineages of the genus *Girardia*, including undescribed species, and a member of *Cavernicola* for Cuba.



Figure 3. Participants of the XV ISFB, with affiliation. Photo by Jean-Lou Justine. (1) Kenneth De Baets, University of Warsaw; (2) Jimena Montagne, Universidad de la República de Uruguay; (3) Christoph Hahn, University of Graz; (4) Inés Guarnaschelli, Universidad de la República de Uruguay; (5) Niels Van Steenkiste, University of British Columbia; (6) Yuki Oya, J.F. Oberlin University; (7) Chris Laumer, The Natural History Museum; (8) Thainá Cortez, Universidade de São Paulo; (9) Robert Okazaki, Weber State University; (10) Federico David Brown Almeida, Universidade de São Paulo; (11) Ulf Jondelius, Swedish Museum of Natural History; (12) Giulia da Silva Marangoni, Universidade de São Paulo; (13) Kimi Kim, Ewha Womans University; (14) Jhoe Reyes, Universidad Científica del Sur; (15) Marina Lorenzo, Universitat de Barcelona; (16) Julian P.S. Smith III, Winthrop University; (17) Diane Rudulph; (18) Juliana Bahia Maceira, SNSB: Zoologische Staatssammlung München; (19) Rachel Roberts-Galbraith, University of Georgia; (20) Lisandra Benítez Álvarez, Institute of Evolutionary Biology; (21) Laura Vanstraelen, Hasselt University; (22) Maarten Vanhove, Hasselt University; (23) Marlies Monnens, Hasselt University; (24) Kelly Thys, Hasselt University; (25) Nikol Kmentová, Hasselt University; (26) Tiziana Gobbin, Hasselt University; (27) Shanèze Noël, IEEs-Paris; (28) Matthäus Greilhuber, Natural History Museum Vienna; (29) Marta Tischler, University of Göttingen; (30) Marco Curini Galletti, University of Sassari; (31) Emilia Failache, Universidad de la República de Uruguay; (32) Jeremias N. Brand, Max Planck Institute for Multidisciplinary Sciences; (33) Longhua Guo, University of Michigan; (34) Ludwik Gasiorowski, Max Planck Institute for Multidisciplinary Sciences; (35) Ji-Hun Song, Nakdonggang National Institute of Biological Resources; (36) Jordi Solana, Oxford Brookes University; (37) Jean-Lou Justine, Muséum National d'Histoire Naturelle; (38) Aoi Tsuyuki, Hokkaido University; (39) Fernando Carbayo, Universidade de São Paulo; (40) Miquel Vila-Farré, Max Planck Institute for Multidisciplinary Sciences; (41) Marta Riutort, Universitat de Barcelona; (42) Veronica Bulnes, Universidad Nacional del Sur, Argentina; (43) Vítor Milanese, Universidade de São Paulo; (44) Beatriz Elias Ranelli, Universidade de São Paulo; (45) Karine Gobetti de Oliveira, Universidade de São Paulo; (46) Yolanda Portella, Universidade Estadual Paulista. Participants not in the picture: Ilana Rossi, Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul; Syske de Waart, Naturalis Biodiversity Center.

Okazaki and Kajihara (2024) reported a complex community of ectosymbiotic proseriatan turbellarians found in the egg mass of the commercially important horsehair crab in Japan. De Bates et al. (2024), reviewed the literature on platyhelminth fossils to infer the pattern of origin of some taxonomic groups and the colonization of certain habitats or regions, and their results showed surprising agreement with molecular phylogenetic hypotheses. Finally, Kasembebe et al. (2024), presented new geographical records and several new species of monogeneans of *Quadriacanthus* found in fish gills in the Democratic Republic of Congo.

These proceedings also include two tributes on three deceased admirable researchers. Eudóxia Maria Froehlich studied triclads. She passed away in 2015, but an obituary was not published in any scientific journal. Claudio Gilberto Froehlich devoted part of his scientific career to the study of terrestrial triclads (Carbayo 2024b). Anno Faubel died in 2023. He mainly studied Acoelomorpha and Polycladida (Bulnes et al. 2024).

The range of scholarship presented gave all attendees an appreciation of the beautiful diversity of flatworms. We relished in our shared acknowledgement of flatworms still to be discovered, especially within understudied meiofauna and in undersampled regions of the globe. Presentations on a wide range of parasitic flatworms raised exciting questions regarding the establishment, evolution, and elaboration of parasitism. And shared research that emphasized responses of flatworms to a changing climate provided a point of somber reflection for all attendees, particular as we met in such a beautiful and vulnerable location. One particular strength of the meeting was a selection of talks that featured collaborative work between scholars, often centering citizen scientists and scholars who reside within important, historically underrepresented study locations.

After 39 years, the upcoming ISFB will return to Göttingen, Germany, and we hope to see many of you there.

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