



**FishBase**



Naturhistoriska  
riksmuseet

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## **FishBase Symposium 2010 — Upptäck!**

### **FishBase Symposium 2010 — Discover!**

Naturhistoriska riksmuseet, Stockholm

Stora hörsalen

18 oktober 2010, 09:00-17:30

## **Program**

### **Presentation av talare**

### **Sammanfattningar**

### **Programme**

### **Speaker Presentations and Abstracts**



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## FishBase Symposium 2010 – Upptäck!

### Program

9:00 – 9:30 Registrering, kaffe och smörgås

Moderator: **Ralf Britz** The Natural History Museum, London

09:30 – 09:45 Inledning **Sven O Kullander** FishBase

09:45 – 10:30 **Melanie L. J. Stiassny** American Museum of Natural History,  
New York *Fishing the Congo: new discoveries and new insights.*

10:30 – 10:50 Fruktpaus

10:50 – 11:35 **Jörg Freyhof** Leibniz-Institute of Freshwater Ecology and Inland  
Fisheries, Berlin *Freshwater fishes of Europe: the discovery of loss*

11:35 – 12:20 **Maurice Kottelat** Cornol, Switzerland *How much does a species  
cost? Fish exploration and mass discoveries in Asia*

12:20 – 13:30 Lunch

13:30 – 14:15 **Tan Heok Hui** National University of Singapore, Raffles Museum  
of Biodiversity Research, Singapore *Discovery of new species –  
Southeast Asian perspectives*

14:15 – 15:00 **Richard L. Pyle** Bishop Museum, Honolulu, Hawai'i *Exploring  
deep coral reefs in the tropical Pacific*

15:00 – 15:20 Kaffepaus

15:20 – 16:05 **Anthony C. Gill** Macleay Museum, Sydney *A question of  
character: museum specimens in fish systematics*

16:05 – 17:30 Diskussion. Symposieavslutning

# FishBase Symposium 2010 – Upptäck!

Förenta Nationerna har förklarat 2010 som det internationella biodiversitetsåret. FishBase Symposium 2010 uppmärksammar det genom att belysa betydelsen av insamling, expeditioner och upptäcktsresor till outforskade delar av jorden. Världsledande fiskforskare berättar om sina insamlingsresor och nya fiskarter i spännande miljöer, alltifrån djuphavsrev och Kongoflodens forsar till sydostasiatiska sumpmarker – och hur viktigt det är att jordens biodiversitet dokumenteras.

Det finns idag över 31.000 fiskarter beskrivna. Mellan 200 och 400 nya arter beskrivs varje år. Flera tusen arter återstår att upptäcka och beskriva. Det finns fog för att säga att fiskfaunan är mycket dåligt utforskad. Nya arter hittas ofta i tidigare outforskade biotoper och på svårtillgängliga platser. Tyvärr finns det väldigt få taxonomer och dessutom mycket begränsade ekonomiska resurser för utforskandet av världens fiskdiversitet trots att mark- och vattenförstöringen stadigt ökar, särskilt i artrika tropiska områden. Så många fiskar, men så lite tid att hinna upptäcka och studera dem.

FishBase Symposium 2010 strävar att visa på betydelsen av explorativ, upptäckande fiskforskning genom positiva exempel från forskare som gjort stora insatser på området under senare år. Föreläsningarna är på engelska.

Melanie Stiassny är expert på afrikanska cichlider. Hon har lett expeditioner till Madagaskar och olika delar av Afrika och själv upptäckt och beskrivit över 45 nya arter. Hon leder nu ett flerårigt projekt som inventerar fiskfaunan i Kongofloden.

Maurice Kottelat har arbetat i fält i södra Asien i över 30 år. Han är den nu levande fiskforskare som beskrivit näst flest fiskarter, mer än 380, i stort sett enbart på egna upptäckter. Han kommer att berätta om fältarbete i både med- och motgångar.

Tan Heok Hui är född och uppväxt i hjärtat av en av de artrikaste miljöerna, Sydostasien, och är ständigt i fält. Han är en av upptäckarna av världens minsta fisk, minstlingen (*Paedocypris progenetica*), som finns i Sumatras sumpmarker.

Richard Pyle uppehåller sig helst på djupt vatten. Med hjälp av ett egenutvecklat återandningssystem kan han och hans kollegor dyka ned till djupa korallrev där de upptäckt en helt ny fauna som inte tidigare kunnat insamlas på traditionellt sätt.

Jörg Freyhof har gjort forskningsresor i Afrika, Asien, och Europa. Han är en av de få forskare som samlar i Europa och som har visat att man visst kan upptäcka nya arter även här. Man får aldrig tänka att "allting är nog redan känt".

Anthony Gill medverkar som expert inte bara på marina fiskar, utan också för sina tankar om betydelsen av studier av exemplar av fiskar för utvecklingshistoriska analyser i fiskforskningen.

## Melanie L.J. Stiassny

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Melanie Stiassny is the Axelrod Research Curator in the Department of Ichthyology at the American Museum of Natural History (AMNH), a Professor in the museum's Richard Gilder Graduate School and an Adjunct Professor at Columbia University and at City College where she has active graduate and undergraduate teaching programs. Before coming to the AMNH she was an Assistant Professor of Biology at Harvard University. Her PhD is from the University of London and she spent three years of postdoctoral research in the Netherlands before joining

the faculty at Harvard University.

Dr Stiassny conducts extensive research throughout the World's tropical freshwaters studying the evolution, behavior, and conservation of fishes and in the course of her ichthyological studies she has described over 45 species new to science. Fishes play a central role in aquatic ecosystems and, as a source of food, are of considerable social and economic importance throughout the world. They are also among the most threatened of all the planet's creatures and many are becoming extinct even before they can be discovered. In the face of these growing threats Dr Stiassny's research focuses broadly on issues in freshwater biodiversity documentation, systematics, bioinformatics, and increasingly seeks to integrate these into conservation planning and sustainable resource management. Working together with an international team of research scientists, government agencies, and international NGO's current projects focus on the poorly documented Congo Basin aquatic ecosystems and seek to provide a synthesis of systematics, phylogeography, population biology, bioinformatics, and remotely sensed hydrological data to address critical issues in conservation planning throughout the basin.

In addition to being Lead Curator for the AMNH's recently renovated Milstein Family Hall of Ocean Life, Dr Stiassny is a scientific advisor to various scientific and conservation organization including the World Wildlife Fund for Nature, Conservation International, the World Resources Institute, the International Foundation for Science and is a member of the National Geographic Society's Conservation Trust. Dr Stiassny has authored numerous scientific papers, books, and articles and is a popular lecturer and participant in Museum travel and educational outreach programs.

## Jörg Freyhof

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Jörg Freyhof is a research scientist at the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) in Berlin. He is also teaching at the Biology Faculty of the Humboldt University in Berlin where he is giving courses for graduate and undergraduate students. Before coming to the IGB he was a research scientist at the Zoological Research Museum Alexander Koenig (ZFMK) in Bonn. His Dr. Sc. is from the University of Bonn and he spent two years of postdoctoral research in Vietnam before joining the IGB.

Dr Freyhof conducts extensive research throughout Eurasian freshwaters studying the diversity, evolution, and conservation of fishes. He is an authority on the ecology and taxonomy of European and Middle East freshwater fishes with 20 years of field experience. He is the European Regional Vice-Chair of the *IUCN-SSC/WI Freshwater Fish Specialist Group*. He has described 50 fish species new to science and is author of more than 100 scientific publications on fish ecology, phylogeny, biogeography and taxonomy, including the book *Handbook of European freshwater fishes* and a forthcoming *Handbook of freshwater fishes of North Africa and the Middle East*. Working together with an international team of research scientists and international NGOs he is currently active as a working coordinator of the EU 7<sup>th</sup> Framework project BioFresh (<http://www.freshwaterbiodiversity.eu/>).

## Maurice Kottelat

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Maurice Kottelat is a Swiss citizen. He obtained his DrSc degree in Amsterdam in 1989. After a few years in the academic milieu and museum taxonomy, he decided to move to free-lance science, specializing in taxonomy, surveys and inventories. He has worked on his own research projects and on contracts for various international organisation, governments, industrial and commercial companies, and NGOs. This gave him the opportunity to conduct field research in areas where few or no ichthyologists had worked before. He has been in the field in most countries of East and Southeast Asia, as well as in southern Europe. He conducted extensive surveys in Laos, Mongolia and Indonesia, among others, leading to the discovery of probably more than 500 species of fishes, amphibians, crabs, shrimps and other aquatic organisms, which have been studied by him and other taxonomists.

His greatest interest is in the fish fauna of hill streams and rapids, loaches, cave fishes, and the history of ichthyology. He is author of 303 publications, including the descriptions of 381 species new to science. He is also author of 9 books including *Freshwater fishes of western Indonesia and Sulawesi* (1993), *Fishes of Laos* (2001), *Freshwater fishes of northern Vietnam* (2001), *Fishes of Mongolia* (2006), and, with J. Freyhof, *Handbook of European freshwater fishes* (2007) and a forthcoming *Checklist of inland fishes of Southeast Asia*. On-going projects include surveys in Laos and Indonesia and various books.

Maurice Kottelat is editor of the scientific journal *Ichthyological Exploration of Freshwaters*; member of the International Commission on Zoological Nomenclature; Dr. honoris causa of the University of Neuchâtel; Honorary Research Associate of the Raffles Museum of Biodiversity Research, Singapore; Corresponding member of the Natural History Museum of Geneva; Honorary foreign member of the American Society of Ichthyologists and Herpetologists; and a past president of the European Ichthyological Society. In 2005 he received the Artedi Lecturer Award.

## Tan Heok Hui

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Tan Heok Hui started his undergraduate studies in the National University of Singapore (NUS) in 1992, where he got involved in the science of fish in a more serious manner. With the encouragement and support of his supervisor (Peter Ng) and mentor (Maurice Kottelat), his family and friends, this interest was nurtured and further cultivated. Having participated in numerous field trips in Southeast Asia during the last 18 years, he is constantly amazed at the diversity of fish inhabiting the waterways of Southeast Asia. Dr Tan obtained his doctorate degree in 2003 from NUS. He has, to date, published more than 50 internationally refereed scientific papers, describing more than 85 species of freshwater fishes new to science, including the world's smallest vertebrate (*Paedocypris progenetica*) from the peat swamp forests of Indonesia. He is currently a Lecturer at NUS, and holds a shared appointment at the Raffles Museum of Biodiversity Research. His area of research nowadays covers local conservation and autecology of alien fish, and ongoing systematic work on Southeast Asian freshwater fish.

## Richard L. Pyle

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Richard Pyle was born and raised in Hawai'i, where his passion for "all things fish" began at a very early age. Earning his PhD under the tutelage of John E. Randall, he focused his efforts on discovering new species. Determined to continue exploring of the coral-reef "Twilight Zone" (200-500 feet / 60-150 meters deep) in a safe and responsible way, he was among the pioneers of modern Technical Diving in the late 1980's, and has traveled the Pacific in search of new species of fishes on deep coral reefs.

Dr Pyle's other focus is the development of computer

database systems, primarily to manage systematic and biogeographic information. He works as Database Coordinator for the Bernice P. Bishop Museum in Honolulu, which is a partner of the Pacific Basin Information Node (PBIN), part of the National Biological Information Infrastructure (NBII).

Dr Pyle is an active participant in international groups that develop standards for biodiversity information management and exchange (including serving as Convener of the Taxon Names and Concepts group of TDWG, the Biodiversity Information Standards body), and has been charged with the task of developing ZooBank – the proposed formal registry of all scientific names for animals. He helped form the non-profit organization "Association for Marine Exploration", which is dedicated to conducting innovative scientific exploration using advanced diving equipment and techniques. He is also a Research Fellow for the Marine Science & Technology Foundation (MSTF) and Schmidt Research Vessel Institute (SRVI), and serves on the International Commission for Zoological Nomenclature (ICZN), the organizational body that has, for the past 114 years, governed the way that animals receive their formal scientific names.

Dr Pyle has authored over a hundred scientific, technical, and popular articles, has received a number of national and international awards (including the prestigious NOGI Award for Science diving) and has been featured in dozens of documentary films, including the IMAX<sup>®</sup> film *Coral Reef Adventure*, and the three-hour BBC production *Pacific Abyss*.

## Anthony C. Gill

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Anthony Gill has just taken up the position of Natural History Curator in the Macleay Museum, University of Sydney, Australia. Prior to this, he held curatorial/research positions in the Natural History Museum, London, and in the School of Life Sciences and International Institute for Species Exploration, Arizona State University. Dr Gill received his PhD from the University of New England, Australia, in 1991 based on research conducted at the Australian Museum, Sydney. He was later a Smithsonian Postdoctoral Fellow in the National Museum of Natural History, Washington, D.C., and Lerner-Grey Research Fellow in the American Museum of Natural History.

Dr Gill's research is primarily on the taxonomy and historical biogeography of Indo-Pacific shorefishes, and on the systematics and anatomy of acanthomorph (spiny-finned) fishes. Among others, he has published on the classification and taxonomy of the Indo-Pacific dottyback fish family Pseudochromidae (where he has described around 1/3 of the 150 or so included species) and on the classification of the acanthomorph suborders Gobioidae (gobies and sleepers) and Percoidae (perch-like fishes). His experience working in a diversity of museums has given Tony a deep appreciation of the importance of collections in evaluating and extending our understanding of global biodiversity.

# Abstracts

**Melanie Stiassny**

***Fishing the Congo: new discoveries and new insights***

From its main source in the Highlands of southeastern Congo, to its exodus into the Atlantic Ocean, the main channel of the Congo River forms a 4374 km arc that twice bisects the Equator. The river and its tributaries drain an area the size of Europe and represent over 14,500 km of navigable passage across Central Africa, providing food, transportation and livelihoods for the over 30 million people who live in this vast region. This enormous wetland system holds the greatest potential for species discovery on the African continent and each trip we have made has resulted in new discoveries and new questions to address.

My work has concentrated on exploring the lower Congo River where, downstream of Pool Malebo to the port town of Matadi, the river is highly channel-constrained with a peculiarly complex hydrology that appears to have isolated it from the remainder of the basin. Channel topology is highly heterogeneous, punctuated by underwater canyons of extreme depth. Water velocities are also extreme, even in areas without surface rapids, and recent measurements have revealed complex flow patterns including shifting counter directional flows and descending and ascending “walls” of fast moving water. Using the latest remote sensing technologies, and with much on-the-ground sampling and systematic analysis, we are beginning to get a much clearer picture of just how the geomorphological template of the river may have played a major role in generating high levels of divergence in diverse groups of fishes.

In what is less than 2% of the area of the Congo basin we have documented the presence of well over 300 fish species and of these upward of 80 appear to be endemic to the lower Congo region. With such unexpectedly high levels of species richness and endemism associated with a complex hydrological regime, this short stretch represents a model system for exploring the mechanisms underlying the generation of diversity in aquatic systems.

## **Jörg Freyhof**

### ***Freshwater fishes of Europe: the discovery of loss***

Europe has a relatively low number of freshwater fish species and with actually 56 species per million km<sup>2</sup> and 0.77 species per million inhabitants. Since the formal start of description of species by Linnaeus in 1758, 950 species and subspecies of freshwater fishes and lampreys have been named from Europe. From these, 563 species are actually treated as valid. The description of about 100 additional species could be still expected, especially if diversity detected by molecular methods would lead to species descriptions. However, the description of lineages almost only being diagnosable by molecular markers as species is still under intensive discussion. The description of new European freshwater fishes is a continuous process with peaks in the 1830s, 1850s, 1920s and 2000s. The number of authors involved in a species description increased from usually one between 1758 and the 1950s to usually more than two in the late 20th century demonstrating a strongly increased effort needed to describe new species. While 274 different authors were involved in species descriptions in Europe, only 22 described more than 10 species. During the last eight years, there was an increasing contribution of molecular data used to discover and to diagnose new species. Newly described species are smaller in body length than previously described species and the proportion of small range species is increasing. Also, the part of new species described from the Mediterranean hotspot is increasing. Consequently, since the late 1980s, more threatened species (following IUCN criteria) are described than unthreatened species.

## **Maurice Kottelat**

### ***How much does a species cost? Fish exploration and mass discoveries in Asia***

The first information on Southeast Asian freshwater fishes dates back to the 17th century and the documentation of their diversity started around 1820. Their exploration and discovery soon sharply increased with the presence of P. Bleeker in the Dutch East Indies (now Indonesia) from 1842 to 1860. As of 17 September 2010, 2953 species have been recorded in inland waters of Southeast Asia (corresponding to 6721 nominal species). The discovery of about 1000 additional species is still expected, in nature and on museum shelves. The bulk of the discoveries results from the work of committed individuals, while institutional programs or projects had virtually no role (the best role they can play is to avoid creating their own programs but target funds to the right individuals ...). Megaprojects have been even less successful in terms of new discoveries. Politics and nationalism are the main obstacle to efficient discovery. The delay between actual discovery and publication (= disclosure to the public) is now on average 8 years (that is, species described in 2010 on average have been discovered in 2002), which is too slow. 584 new strictly freshwater species have been described in 2000-2009 from Southeast Asia.

Surveys conducted in Laos have increased the number of species from about 216 in 1996 to 481 in 2000, including 131 species new to science. This represents more than 1 new species per day effectively spent in the field. The new species have been published within 1-4 years after discovery. The 'cost' of each described and published new species is estimated around USD 550 and 3 work days.

At the other extreme of environment and diversity, a survey conducted in the species-poor western Mongolia in 2006 yielded 4 unnamed species, in fact already known for several years but not yet described because they are part of complex taxonomic groups. Once published the cost of each 'new' species is estimated to be around USD 6,000 and 16 work days.

## **Tan Heok Hui**

### ***Discovery of new species – Southeast Asian perspectives***

There is at present an estimated 3000 species of freshwater fish recorded from Southeast Asia, and this figure is expected to rise. This increase in species number can be attributed to several factors: use of modern species concepts, ability to use fresh characters (e.g. colour), recognition of cryptic species and exploration of de novo habitats. But, are new species that easy to come by? Are special tools or skills required? Does the systematic research work end there? What other potential areas of study are available? The speaker will draw upon personal field experience and research work to shed some light upon the exploration phase of freshwater field work, subsequent discovery of new fish species and follow-up research work.

## **Richard L. Pyle**

### ***Exploring deep coral reefs in the tropical Pacific***

Coral-reef ecosystems are often described as the marine counterpart to tropical rain forests, due to the rich and diverse communities of organisms they support. Tens of millions of people around the world depend on reefs for nourishment, livelihood, and recreation. Biochemicals produced by sessile invertebrates and algae on reefs offer great potential as new classes of medicines and other natural products with pharmacological value. Whereas the vast majority of research concerning coral-reef ecosystems has focused on the shallowest 30 meters, recent investigations have revealed robust reef communities to depths of 150 meters and more.

Amazingly, over 80% of the depth range of coral-reef ecosystems remains almost completely unexplored.

The historical barrier to exploration of these deeper coral-reef environments has been primarily technological. Conventional SCUBA imposes a practical depth limit of about 40 meters for safe and effective research.

Submersibles are capable of much greater depths, but have rarely been used to explore deep coral reefs. Remote sampling methods (traps, trawls) can sample pelagic and abyssal regions, but have generally proven ineffective for sampling organisms inhabiting the rocky coral-reef environment. Over the past two decades, the development of increasingly sophisticated mixed-gas diving technology has opened new doors to biological exploration at these depths, and a series of expeditions throughout the Pacific have revealed both a wealth of new species, and some interesting and unexpected biogeographic patterns.

This presentation will summarize the technological advancements, and showcase some of the more interesting new discoveries and biogeographic trends.

## **Anthony Gill**

### ***A question of character: museum specimens in fish systematics***

The foundation of our understanding of the identification and classification of fishes resides in museum collections. Museum specimens are the only realities traditionally available to systematists — characters and their implied relationships/classifications are interpretations derived from specimens aimed at understanding the greater reality (the natural world). Given current concerns about documenting and conserving global biodiversity, one might anticipate, then, that collections-based systematic ichthyology is thriving. However, support for collections-based research has been in rapid decline over the last decade or two. Increasingly resources, training and positions have been diverted away from morphology-based systematics to molecular systematics. Increasingly too, museum administrators have come to see specimens as a burden rather than an asset, and that collections-based research is old-fashioned and no longer relevant. Using examples primarily from my own research, I will discuss some aspects of why this attitude is both short-sighted and dangerous, and why we must continue to support and develop collections-based systematics.