



## Prof. Dr. Heike Pröhl

apl. Prof. Dr. rer. nat. Heike Pröhl



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Heike Pröhl

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### Members of working group

#### **Associated PhD/Doctoral students**

Johara Bourke

#### **PhD/Doctoral students**

Corinna Dreher

#### **Master/Diplom students**

Christian Inglis-Arkell (Uni Bremen)  
Tobias Menig (Uni Würzburg)

#### **Bachelor students**

Runa Lahmann  
Stefanie Voß  
Kevin Meyer  
Martin Scherm (Uni Marburg)

#### **Alumni**

Dr. rer. nat. Oscar Brusa  
Dr. rer. nat. Astrid Krug  
[Dr. rer. nat. Ivonne Meuche](#)  
Jana Kirchhoff MSc  
Falk Eckhardt MSc  
Stefanos Anastasiadis MSc  
Sabrina Rochmann BSc  
Henrik Reinke BSc  
Dipl.-Biol. Augustin Probst  
Dipl.-Biol. Janina Eulenbug  
Diplo-Biol. Konrad Staudt  
Simon Masche BSc  
Dipl.-Biol. Thomas Dejaco  
Dipl.-Biol. Julio Günther  
Dipl.-Biol. Carsten Goldhausen  
Thomas Ostrowski, Staats-Ex.  
Dipl.-Biol. Kristine Heisler  
Dipl.-Biol. Frank Weihmann  
Dipl.-Biol. Annika Ruprecht

Dipl.-Biol. Jan Karsch  
Dipl.-Biol. Sabine Hagemann

### Professional and Scientific Career

#### Since 2010

Außerplanmäßige Professorin at the Institute of Zoology, TiHo Hannover

#### 2004 - 2010

Junior professor at the Institute of Zoology, TiHo Hannover

#### 2003

Professor for Behavioural Ecology at the Instituto Internacional de Conservación y Vida silvestre, Universidad Nacional (Costa Rica)

#### 2000 - 2003

Post-doctoral fellowship at the University of Texas at Austin (USA) and the Smithsonian Tropical Research Institute (Panama)

#### 1996 - 2000

Doctoral student at the Leibniz University of Hannover

### Publications

#### I. Articles in peer reviewed journals

#### 2019

Yang Y, Blomenkamp S, Dugas MB, Richards-Zawacki CL, Pröhl H (2019) **Mate choice vs mate preference: inferences about color assortative mating differ between field and lab assays of poison frog behavior.** American Naturalist (accepted)

Riedner D, Weißmann A, Höppner C, Buschmann H, Pröhl H (2019) **Struktur und Entwicklung der größten Subpopulation der Gelbbauchunke (*Bombina variegata*) in Niedersachsen.** Zeitschrift für Feldherpetologie (in press)

Pröhl H, Scherm MG, Meneses S, Dreher CE, Meuche I, Rodríguez A (2019) **Female-female aggression is linked to food defence in a poison frog.** Ethology (in press)

Sanchez E, Pröhl H, Lüddecke T, Schulz S, Steinfartz S, Vences M (2019) **The conspicuous postmetamorphic coloration of fire salamanders, but not their toxicity, is affected by larval background albedo.** JEZ-B Molecular and Developmental Evolution (in press)

Rößler DC, Lötters S, Mappes J, Valkonen JK, Menin, M, Lima AP, Pröhl H (2019) **Sole coloration as an unusual aposematic signal in a Neotropical toad.** Scientific Reports 9: 1128.

#### 2018

Rößler DC, Pröhl H, Lötters S (2018) **The future of clay model studies** BMC Zoology 2018, 3:6

#### 2017

Preißler K, Pröhl H (2017) **The effects of background coloration and dark spots on the risk of predation in poison frog models.** Evolutionary Ecology 31: 683-694

Auffarth J, Krug A, Pröhl H, Jehle R (2017) **A genetically-informed Population Viability Analysis reveals conservation priorities for an isolated population of *Hyla arborea*.** Salamandra 53: 171-182

Oswald P, Taddey K, Auffarth J, Brandt T, Pröhl, H (2017) **Conservation genetics of a mirrored population of the European tree frog (*Hyla arborea*).** Salamandra 53: 368-378

Dreher C E, Rodriguez A, Cummings ME, Pröhl, H (2017) **Mating status correlates with dorsal brightness in some but not all poison frog populations.** Ecology and Evolution 7: 10503-10512

#### 2015

Dreher CE, Cummings ME, Pröhl H (2015): **An Analysis of Predator Selection to Affect Aposematic Coloration in a Poison Frog Species.** PLoS One 10, 6: e0130571

#### 2014

Pröhl H (2014) **The Complete *Oophaga pumilio*.** Copeia, accepted.

Willink B, García-Rodríguez A, Bolaños F, Pröhl H. (2014) **The interplay between multiple predators and prey color divergence.** Biological Journal of the Linnean Society 113(2) · September 2014?DOI: [10.1111/bj.12355](https://doi.org/10.1111/bj.12355)

Galindo Uribe D, Sunyer J, Hauswaldt S, Amezcua A, Pröhl H, Vences M (2014) **Color and pattern variation and Pleistocene phylogeographic origin of the strawberry poison frog, *Oophaga pumilio*, in Nicaragua.** [Salamandra](https://doi.org/10.1111/sala.12355) 50(4):225-235 · December 2014?

Dreher CE, Pröhl H (2014) **Multiple sexual signals for mate attraction in an aposematic, colour-diverse poison frog.** Frontiers in Ecology and Evolution 2: 22

Willink B, Bolaños F, Pröhl H (2014) **Conspicuous displays in cryptic males of a polytypic poison-dart frog**. Behav Ecol Sociobiol: 68: 249-261

## 2013

Willink B, Bolaños F, Pröhl H (2013) **Conspicuous displays in cryptic males of a polytypic poison-dart frog**. Behav Ecol Sociobiol: DOI 10.1007/s00265-013-1640-4

Pröhl H, Willink B, Hauswaldt S (2013) **Geographic variation in sexual signals and behaviour in two species of poison frogs**. Evolutionary Ecology Research 15: 667-687

Pröhl H, Eulenberg J, Meuche I, Bolaños F (2013) **Parasite infection has little effect on sexual signals and reproductive behaviour in strawberry poison frogs**. Evol Ecol 27: 675-692

Meuche I, Brusa O, Linsenmair KE, Keller A, Pröhl H (2013) **Only distance matters - non-choosy females in a poison frog population** Frontier in Zoology 10: 29

Willink B, Brenes Mora E, Bolaños F, Pröhl H (2013) **Not everything is black and white: Color and behavioural variation reveal a continuum between cryptic and aposematic strategies in a polymorphic poison frog**. Evolution 67: 2783-2794

Krug A, Pröhl H (2013) **Population genetics in a fragmented population of the European tree frog (*Hylo arborea*)**. Amphibia Reptilia 34: 95-107

Brusa O, Bellati A, Meuche I, Mundy NI, Pröhl H (2013) **Divergent evolution in the polymorphic granular poison-dart frog, *Oophaga granulifera* : genetics, colouration, advertisement calls and morphology**. J Biogeogr 40: 394-408

## 2012

Meuche I, Linsenmair KE, Pröhl H (2012) **Intrasexual competition, territoriality and acoustic communication in male strawberry poison frogs (*Oophaga pumilio*)**. Behavioral Ecology and Sociobiology: online first [DOI 10.1007/s00265-011-1309-9]

## 2011

Meuche, I. und H. Pröhl (2011). **Alternative mating tactics in the strawberry poison frog (*Oophaga pumilio*)**. The Herpetological Journal 21: 275-277

Meuche, I., K.E. Linsenmair und H. Pröhl (2011). **Female territoriality in the strawberry poison frog (*Oophaga pumilio*)**. Copeia 3: 351-356

Pröhl H, Ostrowski T (2011): **Behavioural elements reflect phenotypic colour divergence in a poison frog**. Evol Ecol 25:993 1015

Hauswaldt JS, Ludewig A-K, Vences M, Pröhl H (2011) **Widespread co-occurrence of divergent mitochondrial haplotype lineages in a Central American species of poison frog (*Oophaga pumilio*)**. J Biogeog 38: 711-726

## 2010

Masche, S.; Zimmermann, H.; Pröhl, H. (2010): **Description and ecological observations of the tadpole of *Ranitomeya variabilis* (Anura: Dendrobatidae)**. South American journal of herpetology 5, 3 (2010) 207-211

Pröhl, H.; Ron, S. R.; Ryan, M. J. (2010): **Ecological and genetic divergence between two lineages of Middle American túngara frogs *Physalaemus (=Engystomops) pustulosus***. BMC evolutionary biology 10 (2010) 146

Röll, B.; Pröhl, H.; Hoffmann, K.-P. (2010): **Multigene phylogenetic analysis of *Lygodactylus* dwarf geckos (Squamata: Gekkonidae)**. Molecular phylogenetics and evolution 56, 1 (2010) 327-335

Staudt K, Meneses Ospina S, Pröhl H (2010) **Foraging behaviour and territoriality of the strawberry poison frog (*Oophaga pumilio*) in dependence of the presence of ants**. Amphibia-Reptilia 31: 217-227

## 2009

Hauswaldt, S.; Ludewig, AK.; Hagemann, S.; Pröhl, H.; Vences, M. (2009): **Ten microsatellite loci for the strawberry poison frog (*Oophaga pumilio*)**. Conservation Genetics 10: 1935-1937.

Weihmann, F, Podlousky R, Hauswaldt S, Pröhl H (2009): **Naturschutzgenetische Untersuchungen von Populationen der Gelbbauchunke *Bombina v. variegata* im südlichen Niedersachsen**. Zeitschrift für Feldherpetologie 16: 183-200.

## 2007

Pröhl H.; Hagemann S.; Karsch J.; Höbel G. (2007): **Geographic advertisement call variation in the strawberry poison frog *Dendrobates pumilio***. Ethology 113, 9: 825-837.

Hagemann, S.; Pröhl, H. (2007): **Mitochondrial paraphyly in a polymorphic poison frog species (Dendrobatidae; *D. pumilio*)**. Molecular Phylogenetics & Evolution 45,2: 740-747.

## 2006

Pröhl H.; Koshy R.A.; Mueller U.; Rand A.S.; Ryan J.R. (2006) **Geographic variation of genetic and behavioral traits in northern and southern túngara frogs**. *Evolution* 60(8): 1669-1679.

## 2005

Pröhl, H. (2005): **Territorial behavior in dendrobatid frogs**. *J Herpetol* 39(3): 354-365.

Pröhl, H. (2005): **Clutch loss affects the operational sex ratio in a poison frog**. *Behav Ecol Sociobiol* 58: 310-315.

## 2003

Pröhl, H.. (2003): **Variation in male calling behaviour and relation to male mating success in the strawberry poison frog (*Dendrobates pumilio*)**. *Ethology* 109(4): 273-290.

## 2002

Pröhl, H.; Adams, R.M.M.; Mueller, U.; Rand, S.; Ryan, M. (2002): **Polymerase chain reaction for polymorphic microsatellite loci from the tungara frog *Physalaemus pustulosus***. *Molecular Ecology Notes* 2: 341-343.

Haase, A.; Pröhl, H. (2002): **Female activity patterns and aggressiveness in the strawberry poison frog *Dendrobates pumilio* (Anura: Dendrobatidae)**. *Amphibia-Reptilia* 23: 129-140.

Pröhl, H., (2002): **Population differences in female resource abundance, adult sex ratio and male mating success in *Dendrobates pumilio***. *Behavioral Ecology* 13: 175-181.

## 2001

Pröhl, H.; Berke O. (2001): **Spatial distribution of male and female strawberry dart-poison frogs and their relation to female reproductive resources**. *Oecologia* 129: 534-542.

## 1999

Pröhl H.; Hödl W. (1999): **Parental investment, potential reproductive rates and mating system in the strawberry dart-poison frog *Dendrobates pumilio***. *Behav Ecol Sociobiol* 46: 215-220.

## 1997

Pröhl H. (1997) **Patrón de actividad reproductiva de *Dendrobates pumilio* (Anura: Dendrobatidae)**. *Revista de Biología Tropical* 45: 1671-1676.

Pröhl H. (1997) **Territorial behavior of the Strawberry Poison-dart Frog, *Dendrobates pumilio***. *Amphibia-Reptilia* 18: 437-442.

## II. Abstracts of international conferences

### 2014

Pröhl H, Willink B (2014) **Divergence in anti-predator behavior in two species of poison frogs**. Talk, Deutscher Herpetologentag, Bonn (accepted abstract)

### 2013

Knorr K, Pröhl H (2013) **Isolation by time in the yellow-bellied toad, *Bombina variegata*?** Poster, 17th European Congress of Herpetology, Veszprém, Hungary

Willink B, Garcia Rodriguez A, Bolanos F, Pröhl H (2013) **Multiple predators influence coloration divergence in a poison frog**. Talk, ATBC, San Jose

Knorr K, Pröhl H (2013) **Genetic population structure of the fire-bellied toad (*Bombina variegata*) in time and space. Implications and conservation**. Talk, Open Landscapes: ecology, management and nature conservation, Hildesheim

### 2012

Meuche I, Linsenmair KE, Pröhl H (2012) **Female territoriality in the strawberry poison frog, *Oophaga pumilio***. Poster, WHC, Vancouver 2012

Meuche I, Linsenmair KE, Pröhl H (2012) **Territoriality and acoustic communication between competing males of strawberry poison frogs**. Poster, WHC, Vancouver 2012

Pröhl H. (2012) **Behavioral ecology and sexual selection in strawberry poison frogs, or how a frog became a star**. Invited Talk, Symposium: Poison frog evolution, ecology and behaviour. WHC, Vancouver

Dreher C, Pröhl H. (2012) **The importance of coloration and advertisement calls for mate choice in strawberry poison frogs**. Invited Talk, Symposium: Poison frog evolution, ecology and behaviour. WHC, Vancouver

Willink B, Brenes-Mora, E, Pröhl H, Bolaños F (2012) **The role of anti-predator strategies driving color variation in the poison**

frog *Denrobates granulifera*. Invited talk, Symposium: Poison frog evolution, ecology and behaviour. WHC, Vancouver 2012

Meuche I, Linsenmair KE, Pröhl H (2012) **How many frogs do you have to kiss to find a prince?** Talk. WHC, Vancouver 2012

Brusa O, Bellati A, Meuche Y, Mundy N, Pröhl H (2012) **Divergent evolution in the polymorphic granular poison-dart frog, *Oophaga granulifera*: genetics, colouration, advertisement calls and morphology.** Abstract, DZG, Konstanz

Dreher C, Pröhl H (2012) **The importance of calls and colours for mate choice in strawberry poison frogs (*Oophaga pumilio*).** Talk, Graduate Meeting of Evolutionary Biology, DZG, Siegen, 2012

## 2011

Meuche I, Linsenmair KE, Pröhl H (2011) **Behavioral strategies of competing males in strawberry poison frogs.** Poster, SEH 2011, Luxemburg

Brusa O, Pröhl H. (2011) **Morphological and bioacoustic diversification in the neotropical poison frog *Oophaga granulifera*.** Poster, ESEB 2011, Tübingen

Pröhl H, Brusa O. (2011) **Geographic variation in sexual signals and behavior in two species of poison frogs.** Invited Talk, Behaviour 2011, Indianapolis

Meuche I, Linsenmair KE, Pröhl H. (2011) **How many frogs do you have to kiss to find a prince?** Talk, SEH 2011, Luxemburg

## 2010

Krug A, Pröhl H. **Phylogeographic population structure of European Tree frogs (*Hyla arborea*) in Germany and adjacent areas.** Talk, SEH 2011, Luxemburg

Pröhl H, Dreher C, Ostrowski T (2010) **Aposematische und kryptische Verhaltensstrategien beim Erdbeerfrosch *Oophaga pumilio*.** Vortrag, Deutscher Herpetologentag, Frankfurt.

Krug A, Kirchhoff J, Pröhl H (2010) **Ein populationsgenetischer Überblick über die Laubfroschvorkommen Niedersachsens.** Vortrag, Deutscher Herpetologentag, Frankfurt.

Goldhausen C, Günther J, Podloucky R, Hauswaldt S, Pröhl H (2010) **Naturschutzgenetische Untersuchungen in ausgewählten Vorkommen des Springfrosches (*Rana dalmatina*) in Niedersachsen.** Vortrag, Deutscher Herpetologentag, Frankfurt.

## 2009

Meuche, I.; Pröhl, H.; Linsenmair, KE. (2009): **Female mate choice tactic and preferences in the neotropical strawberry poison frog, *Oophaga pumilio*.** DZG Annual Meeting, September 2009

Pröhl, H.; Ostrowski, T. (2009): **Behavioral differences between aposematic and cryptic colour morphs of the strawberry poison frog *Oophaga pumilio*.** DZG Annual Meeting, September 2009

## 2008

Krug, A.; Podloucky, R.; Pröhl, H (2008): **Populations-genetische Methoden bei Amphibien mit Fallbeispielen aus Niedersachsen.** Internationale Tagung der AG Feldherpetologie der DGHT: Methoden der Feldherpetologie, Bonn, 08.-09.09.2008

Pröhl, H (2008): **Contrasting variation in calls and colours in the strawberry poison tree frog *Oophaga pumilio*.** Dendrobatid Frog Biology Symposium, 6th World Congress of Herpetology, Manaus (Brasil). 17.-22.08.2008

Pröhl, H (2008): **Naturschutzgenetische Untersuchungen an Amphibien: Drei Fallbeispiele aus Niedersachsen.** Internationale Fachtagung zur FFH-Problematik am Beispiel der Amphibien. Osnabrück, 11.-13.09.2008

## 2007

Pröhl, H.; Hagemann, S. (2007): **Bioacoustic and genetic variation in the strawberry poison frog, *Dendrobates pumilio*.** In Abstract Book 14th European congress of herpetology, Porto, Portugal, 19.-23.09.2007, S. 277

Meuche, I.; Linsenmair, K.E.; Pröhl, H. (2007): **Preferences for male call parameters in the strawberry poison frog, *Dendrobates pumilio*.** In 6th International Zoo and Wildlife Research Conference on Behaviour, Physiology and Genetics, Berlin, 07.-10.10.2007, S. 147

Meuche, I.; Linsenmair, K.E.; Pröhl, H. (2007): **Preferences for male call parameters in the strawberry poison frog, *Dendrobates pumilio*.** In Abstract Book 14th European congress of herpetology, Porto, Portugal, 19.-23.09.2007, S. 253

Krug, A.; Pröhl, H. (2007): **Conservation genetics of the European tree frog in Lower Saxony, Germany.** In Population genetics modelling and habitat fragmentation: separating recent and ancient events for Conservation genetic workshop, Oeiras, Portugal, 19.-21.09.2007, S. 16

Krug, A.; Manzke, U.; Pröhl, H. (2007): **Genetic structure and microsatellite variation in a fragmented tree frog (*Hyla arborea*) population.** In Abstract Book, 14th European congress of herpetology, Porto, Portugal, 19.-23.09.2007, S. 240

Krug, A.; Manzke, U.; Pröhl, H. (2007): **Genetic structure and microsatellite variation in a fragmented tree frog (*Hyla arborea*) population.** 6th International Zoo and Wildlife Research Conference on Behaviour, Physiology and Genetics, Berlin,

## 2005

Hagemann, S.; Pröhl, H. (2005): **Phenotypic and genetic diversity in the strawberry dart-poison frog *Dendrobates pumilio***. 98. Jahresversammlung der DZG, Abstractband, p108

Pröhl, H. (2005): **Bioacoustic variation, genetic variation and mate choice in Central American tungara frogs, *Physalaemus pustulosus***. 98. Jahresversammlung der DZG, Abstractband, p 24

## 2004

Pröhl H.; Mueller U.; Rand A.S.; Ryan M. (2004): **Population genetic analysis of a secondary zone of contact in tungara frogs: did a double invasion of Middle America yield two species of tungara frogs?** Symposium-Vortrag. Animal Behavior Society, XLI Meeting, Oaxaca, ( Mexico).

## 2002

Pröhl H.; Berke O. (2002): **Spatial distribution of adult strawberry poison frogs in relation to phytotelmic tadpole rearing sites**. Vortrag (auf Einladung), Joint Meeting of Ichthyologists and Herpetologists in Kansas City (USA).

## 1999

Pröhl H. (1999): **Reproductive strategies of dart-poison frogs**. Abstract. Vortrag, German American Biological Science Symposium GABS. Hannover.

Pröhl H. (1999): **Habitat influence on the mating system of the strawberry dart-poison frog, *Dendrobates pumilio***. Advances in Ethology 34: 184. Vortrag, XXVI. Internationaler Ethologen-Kongress in Bangalore (Indien).

Pröhl H. (1999): **Habitat einfluß auf das Paarungssystem des Erdbeerfröschchens *Dendrobates pumilio***. Zoology (Suppl. II): 102: 33. Vortrag, 92. Jahrestreffen der Deutschen Zoologischen Gesellschaft.

Pröhl H. (1999): **Paarungssystem und sexuelle Selektion beim Erdbeerfröschchen *Dendrobates pumilio* in zwei unterschiedlich strukturierten Habitaten**. Abstract P-5.8, 12. Poster, 12. Jahrestreffen der Deutschen Gesellschaft für Tropenökologie (GTÖ).

## 1994

Pröhl H. (1994): **The reproductive behaviour of *Dendrobates pumilio***. Poster für den Workshop Population biology of Amphibiens in Wien Sept. 1994. Österreichische Akademie der Wissenschaften, International Society for the Study and Conservation of Amphibiens und Österreichische Gesellschaft für Herpetologie.

## III. Books

### 1997

Pröhl, H. (1997): **Los Anfibios de Hitoy Cerere, Costa Rica**. Guia de campo (Feldführer). Editorial García Hermanos, San José. p 66.

#### [Review for](#)

#### **Funding agencies**

Deutsche Forschungsgemeinschaft, National Science Foundation (USA), Deutsche Bundesstiftung Umwelt (DBU), L. Oreal Österreich, Graduate Women in Science Fellowship, Wilhelm-Peters-Fond (DGHT), National Geographic Society, Humboldt Foundation, German Academic Exchange Service (DAAD)

#### **Professional Journals**

Journal of Evolutionary Biology, Molecular Ecology, Journal of the Linnean Society, Ethology, Behavioral Ecology, Behavioral Ecology and Sociobiology, Animal Behaviour, Ethology Ecology and Evolution, Behaviour, Journal of Herpetology, Herpetological Journal, Amphibia-Reptilia, Alytes, Revista de Biología Tropical, Journal of Biogeography, Journal of Applied Ecology, Biotropica etc.

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