

Alloherpesviruses

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Amphibian herpesviruses

- *Alloherpesviridae*
 - Herpesviruses of fish and amphibians
 - Similar to members of the family *Herpesviridae* (found in mammals, birds, reptiles)
 - Enveloped, dsDNA, pleomorphic, cause latent infections
 - Herpesviruses of amphibians that have been characterized cluster in the genus *Batravirus*

Amphibian herpesviruses

Virus species	Virus names	Known host range	Disease (selection)	Known geographic distribution
B. ranadallo1	LTHV, RaHV1	Northern leopard frog, green frog, pickerel frog, possibly others	Renal adenocarcinoma	North America, possibly South America
B. ranadallo2	FV4, RaHV2	Northern leopard frog	Unclear, deaths of tadpoles following experimental infection	North America
B. ranadallo3	RaHV3	Common frog, detections in several other species reported	Proliferative dermatitis	Europe
Unassigned	RaHV4	Chinese tiger frog	Unknown	Asia
Proposed	RaHV5	Iberian painted frog	Proliferative dermatitis	Europe
B. ranadallo5				
Unassigned	BfHV1	Common toad, detections in several other species reported	Proliferative dermatitis	Europe

Amphibian herpesviruses

- *Batravirus ranadallo1*
 - First herpesvirus described in amphibians
 - Lucké tumor herpesvirus, ranid herpesvirus 1
 - Causes Lucké's adenocarcinoma in northern leopard frogs (*Rana pipiens*) and related species
 - Renal adenocarcinoma
 - Development dependent on lifestage and environmental temperature
 - Eggs and developing embryos can become infected
 - Primary renal adenocarcinomas and virus replication at 7-21°C
 - Tumor growth, invasion and metastasis, but no viral replication at higher temps (28°C)



Amphibian herpesviruses

- *Batravirus ranadallo2*
 - Found in northern leopard frogs (*Rana pipiens*)
 - While trying to isolate RaHV1 in cell culture
 - Clinical relevance not known
 - Associated with severe edema in transmission study with larval frogs
- Ranid herpesvirus 4
 - Somewhat related to *Batravirus ranadallo2*
 - Found in lung, liver and spleen tissues of Chinese tiger frogs (*Hoplobatrachus rugulosus*)
 - Metatranscriptomic analysis



Amphibian herpesviruses

- In Europe:
 - Multiple cases of suspected herpesvirus infections in frogs in Europe beginning in the 1990's (Mutschmann und Schneeweiß, 2008; Garner et al., 2013)
 - Associated with skin lesions and, in some cases, renal adenocarcinomas
 - Affected multiple species:
 - Agile frogs (*Rana dalmatina*)
 - Common frogs (*Rana temporaria*)
 - Common spadefoots (*Pelobates fuscus*)
 - Moor frogs (*Rana arvalis*)
 - Found in Germany, Italy, Switzerland, and the UK

Amphibian herpesviruses

- *Batravirus ranidallo3*
 - Ranid herpesvirus 3 (RaHV3)
 - First described in common frogs (*Rana temporaria*) in Switzerland (Origgi et al., 2017)
 - Associated with greyish hyperplastic skin lesions
 - Also detected in the UK, Norway, and Germany (Franklinos et al., 2018; Origgi und Taugbøl, 2023; Leineweber et al., 2025)
 - Detections in common frogs and other species
 - In several cases no association with skin lesions



Origgi FC, Taugbøl A. Ranid Herpesvirus 3 Infection in Common Frog *Rana temporaria* Tadpoles. *Emerg Infect Dis.* 2023;29(6).

Amphibian herpesviruses

- Proposed *Batravirus ranidallo5*
 - Ranid herpesvirus 5 (RaHV5)
 - Discovered in Iberian painted frogs (*Discoglossus galganoi*) in Spain (Bosch et al., 2025)
 - Skin lesions: thickened grey to lue discoloration
 - Epidermal hyperplasia
 - Co-infections with Bd or a ranavirus reported in several cases

OPEN **A novel amphibian herpesvirus (candidate *Batravirus ranidallo5*) associated with disease in free-ranging Iberian painted frogs (*Discoglossus galganoi*) in Spain**

Jaime Bosch¹, Barbora Thumsová², Justina Pérez-Martín², Carlos Caballero-Díaz², Roser Velarde³, Albert Martínez-Silvestre⁴, Jasmine Portmann^{5,6} & Francesco C. Origg^{6,7,8}



Amphibian herpesviruses

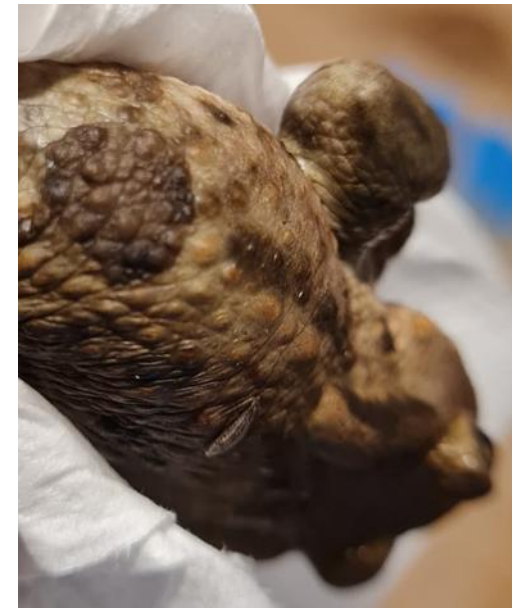
- Bufonid herpesvirus 1 (BfHV1)
 - First described in common toads (*Bufo bufo*) in Switzerland (Origgi et al., 2018)
 - Animals with severe dermatitis
 - Outbreaks had been observed annually since 2014
 - Also found in common toads in multiple German states (Eisenberg et al., 2021; Kürbis und Origgi, 2021; Leineweber et al., 2025; Marschang et al., 2025))
 - Disease outbreaks with multifocal ulcerative dermatitis
 - Virus also detected in animals with no lesions
 - Virus detection in other species also reported



Origgi, F.C., Schmidt, B.R., Lohmann, P. et al. *Bufonid herpesvirus 1 (BfHV1) associated dermatitis and mortality in free ranging common toads (Bufo bufo) in Switzerland. Sci Rep* **8**, 14737 (2018).

BfHV1

- In common toads:
 - High prevalences found in various common toad populations in Germany
 - Very high prevalence (>90%) in common toads in Brandenburg
 - Lower (68.82%) in Schleswig-Holstein
 - Suspicious skin lesions observed in toads in Brandenburg for several years – but not reported in the toads sampled
 - Common toad populations in stark decline
- Found in other species in ongoing projects
 - Common spadefoot toads
 - Water frogs
 - Common frogs
 - Natterjack toad
 - Moor frog
 - Northern crested newt
 - Smooth newt



**Thank you for your
attention!**



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