

Vanessa Schulz, Sebastian Steinfartz, Arno Geiger, Kathleen Preißler, Joana Sabino Pinto, Mathias Krisch, Norman Wagner, Martin Schlüpmann

# Ausbreitung der Salamanderpest in Nordrhein-Westfalen

## Literatur (Gesamtliste)

- AULIYA, M., GARCIA-MORENO, J., SCHMIDT, B. R., SCHMELLER, D. S., HOOGMOED, M. S., FISHER, M. C., PASMANS, F., HENLE, K., BICKFORD, D. & A. MARTEL (2016): The global amphibian trade flows through Europe: the need for enforcing and improving legislation. *Biodiversity and Conservation* 25, 2581–2595.
- BLOOI, M., PASMANS, F., LONGCORE, J. E., SPITZEN-VAN DER SLUIJS, A., VERCAMMEN, F. & A. MARTEL (2013): Duplex real-time PCR for rapid simultaneous detection of *Batrachochytrium dendrobatidis* and *Batrachochytrium salamandrivorans* in amphibian samples. *Journal of Clinical Microbiology* 51: 4173–4177.
- CUNNINGHAM, A. A., BECKMANN, K., PERKINS, M., FITZPATRICK, L., CROMIE, R., REDBOND, J., O'BRIEN, M. F., GHOSH, P., SHELTON, J. & M. C. FISHER (2015): Emerging disease in UK amphibians. *Veterinary Record* 176: 18.
- DALBECK, L., DÜSSEL-SIEBERT, H., KERRES, A., KIRST, K., KOCH, A., LÖTTERS, S., OHLHOFF, D., SABINO-PINTO, J., PREISSLER, K., SCHULTE, U., SCHULZ, V., STEINFARTZ, S., VEITH, M., VENCES, M., WAGNER, N. & J. WEGGE (2018): Die Salamanderpest und ihr Erreger *Batrachochytrium salamandrivorans* (*Bsal*): aktueller Stand in Deutschland. *Zeitschrift für Feldherpetologie* 25: 1–22.
- FISHER, M. C. & GARNER, T. W. J. (2007): The relationship between the introduction of *Batrachochytrium dendrobatidis*, the international trade in amphibians and introduced amphibian species. *Fungal Biology Reviews* 21: 2–9.
- LAKING, A. E., NGOC NGO, H., PASMANS, F., MARTEL, A. & T. THIEN NGUYEN (2017): *Batrachochytrium salamandrivorans* is the predominant chytrid fungus in Vietnamese salamanders. *Scientific Reports* 7: 44443.
- LIPS, K. R. (2016): Overview of chytrid emergence and impacts on amphibians. *Philosophical Transactions of the Royal Society, Series B. Biological Sciences* 371: 20150465.
- LÖTTERS, S., GEIGER, A., KERRES, A., KREBS, B., OHLHOFF, D., SCHMELLER, D. S., SCHMIDT, B. R., STEINFARTZ, S., VEITH, M., VENCES, M. & N. WAGNER (2015): Handlungsbedarf und anlaufende Aktivitäten vor dem Hintergrund der Bedrohung einheimischer Schwanzlurche durch einen neuen Salamander-Chytridpilz. *Feldherpetologisches Magazin* 3: 39–40.
- LONGCORE, J. E., PESSIER, A. P. & D. K. NICHOLS (1999): *Batrachochytrium dendrobatidis* gen. et sp. nov., a chytrid pathogenic to amphibians. *Mycologia* 91: 219227.
- MARTEL, A., SPITZEN-VAN DER SLUIJS, A., BLOOI, M., BERT, W., DUCATELLE, R., FISHER, M. C., WOELTJES, A., BOSMAN, W., CHIERS, K., BOSSUYT, F. & F. PASMANS (2013): *Batrachochytrium salamandrivorans* sp. nov. causes lethal chytridiomycosis in amphibians. *Proceedings of the National Academy of Sciences* 110: 15325–15329.
- MARTEL, A., BLOOI, M., ADRIAENSEN, C., VAN ROOIJ, P., BEUKEMA, W., FISHER, M.C., FARRER, R.A., ... & F. PASMANS (2014): Recent introduction of a chytrid fungus endangers Western Palearctic salamanders. *Science* 346: 630–631.
- NGUYEN, T. T., NGUYEN, T. V., ZIEGLER, T., PASMANS, F. & A. MARTEL (2017): Trade in wild anurans vectors the urodelan pathogen *Batrachochytrium salamandrivorans* into Europe. *Amphibia-Reptilia* 38: 554556.
- O'HANLON, S. J., RIEUX, A., FARRER, R. A., ROSA, G. M., WALDMAN, B., BATAILLE, A., ... & M. D. MARTIN (2018): Recent asian origin of chytrid fungi causing global amphibian declines. *Science* 360: 621–627.
- OHST, T., GRÄSER, Y., MUTSCHMANN, F. & J. PLÖTNER (2011): Neue Erkenntnisse zur Gefährdung europäischer Amphibien durch den Hautpilz *Batrachochytrium dendrobatidis*. *Zeitschrift für Feldherpetologie* 18: 117.
- PESSIER, A. P. (2008): Amphibian chytridiomycosis. In: Fowler, M. E. & E. R. Miller (Hrsg.): *Zoo and Wild Animal Medicine. Current Therapy*, Vol 6. Elsevier, St. Louis, Saunders: 137–143.
- SABINO-PINTO, J., BLETZ, M., HENDRIX, R., PERL, R. G. B., MARTEL, A., PASMANS, F., LÖTTERS, S., MUTSCHMANN, F., SCHMELLER, D. S., SCHMIDT, B. R., VEITH, M., WAGNER, N., VENCES, M. & S. STEINFARTZ (2015): First detection of the emerging fungal pathogen *Batrachochytrium salamandrivorans* in Germany. *Amphibia-Reptilia* 36: 411416.
- SABINO-PINTO, J., VEITH, M., VENCES, M. & S. STEINFARTZ (2018): Asymptomatic infection of the fungal pathogen *Batrachochytrium salamandrivorans* in captivity. *Scientific Reports* 8: 11767.
- SCHMIDT, B. R., BOZZUTO, C., LÖTTERS, S. & S. STEINFARTZ (2017): Dynamics of host populations affected by the emerging fungal pathogen *Batrachochytrium salamandrivorans*. *Royal Society Open Science* 4: 160801.
- SPITZEN-VAN DER SLUIJS, A., SPIKMANS, F., BOSMAN, W., DE ZEEUW, M., VAN DER MEIJ, T., GOVERSE, E., KIK, M., PASMANS, F. & A. MARTEL (2013): Rapid enigmatic decline drives the fire salamander (*Salamandra salamandra*) to the edge of extinction in the Netherlands. *Amphibia-Reptilia*, 34: 233–239.
- SPITZEN-VAN DER SLUIJS, A., STEGEN, G., BOGAERTS, S., CANESSA, S., STEINFARTZ, S., JANSEN, N., BOSMAN, W., PASMANS, F. & A. MARTEL (2018): Post-epizootic salamander persistence in a disease-free refugium suggests poor dispersal ability of *Batrachochytrium salamandrivorans*. *Scientific Reports* 8: 3800.
- STEGEN, G., PASMANS, F., SCHMIDT, B. R., ROUFFAER, L. O., VAN PRAET, S., SCHAUB, M., CANESSA, S., LAUDELOUT, A., KINET, T., ADRIAENSEN, C., HAEBROUCK, F., BERT, W., BOSSUYT, F. & A. MARTEL (2017): Drivers of salamander extirpation mediated by *Batrachochytrium salamandrivorans*. *Nature* 544: 353356.
- THIESMEIER, B. & L. DALBECK (2011): Feuersalamander – *Salamandra salamandra*. In: Arbeitskreis Amphibien und Reptilien Nordrhein-Westfalen (Hrsg.): *Handbuch der Amphibien und Reptilien Nordrhein-Westfalens*. Bielefeld (Laurenti). S. 297–336.
- VAN ROOIJ, P., MARTEL, A., HAEBROUCK, F. & F. PASMANS (2015): Amphibian chytridiomycosis: a review with focus on fungus-host interactions. *Veterinary Research* 46: 137.
- VAN ROOIJ, P., PASMANS, F., COEN, Y. & A. MARTEL (2017): Efficacy of chemical disinfectants for the containment of the salamander chytrid fungus *Batrachochytrium salamandrivorans*. *PLoS One* 12: e0186269.
- YUAN, Z., MARTEL, A., WU, J., VAN PRAET, S., CANESSA, S. & F. PASMANS (2018): Widespread occurrence of an emerging fungal pathogen in heavily traded Chinese urodelan species. *Conservation Letters* 11: e12436.