



# Effektiwiteit van die produk F10 teen Chytrid-fungus by amfibieë

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**Efficacy of the product F10 against amphibian chytrid fungus.** Outbreaks of pathogens that threaten both humans and nature have increased in recent years. Infectious and transmittable diseases, such as chytridiomycosis, caused by the emerging pathogen *Batrachochytrium dendrobatidis*, has been identified as one of the most important drivers of the current decline in amphibian numbers. This pathogen has spread globally and is not only responsible for the declines in amphibian population numbers, but also for the extinction of species in several countries. As part of the Amphibian Conservation Action Plan, the IUCN recommended *ex situ* breeding of amphibian species to try and stem the global loss of amphibian species. Due to chytridiomycosis being one of the most eminent threats for amphibians, it poses an additional threat for the *ex situ* breeding plan. There is therefore a need for safe and effective measures to treat chytridiomycosis, especially in breeding programs for endangered species. F10 (Health and Hygiene) is a veterinary antiseptic that is known to be 100% effective in killing chytrid cultures *in vitro*. Before any chemical treatment can be applied the efficacy of F10 has to be determined to establish if F10 can be effectively applied across different amphibian species and across different life stages. We propose to develop a treatment protocol for F10 for the effective treatment of amphibian chytridiomycosis. Tadpoles of *Amietophrynus gutturalis* were exposed to different concentrations of F10 for different time intervals to determine survival rate. Survival of chytrid fungal zoospores was determined in the presence of F10. The results obtained showed survival of tadpoles at a 1:10 000 concentration of F10 for 30 min, but only for 30 s to 3 min at a 1:3000 concentration, which makes it impractical to implement. Furthermore, the *in vitro* tests showed that the zoospores died after 10 min at a 1:10 000 concentration and 30 min at a 1:15 000 concentration. The successful treatment of tadpoles will increase the species chance for survival, as the pathogen will be eradicated before the tadpole metamorphoses and reaches the disease-susceptible life stage. By establishing a partnership between the industry, academic and zoo or wildlife communities we hope to maximise the likelihood of implementing this program in the future and thus ensuring long term sustainability.

Uitbrake van patogene wat beide die mens en natuur bedreig het die afgelope paar jaar toegeneem. Oordraagbare en aansteeklike siektes, veral chytridiomikose, wat veroorsaak word deur die patogeen, *Batrachochytrium dendrobatidis*, is geïdentifiseer as een van die belangrikste drywers in die afname van amfibieërgetalle. Die patogeen is regoor die wêreld versprei en nie net verantwoordelik vir die afname in amfibieër-bevolkingsgetalle nie, maar ook vir die uitsterwing van spesies in verskeie lande. In 2005 het die IUCN *ex situ*-teling van amfibieërspesies aanbeveel as deel van die *Amphibian Conservation Action Plan* om die globale verlies van amfibieërspesies te stuit. Weens die feit dat chytridiomikose een van die mees prominente bedreigings vir amfibieë wêreldwyd is, hou dit 'n bykomende uitdaging vir die *ex situ*-bewaringsplan in. Dus is daar 'n leemte vir doeltreffende en veilige behandeling van chytridiomikose in amfibieë, veral dié in aanhoudingsprogramme vir bedreigde spesies.

F10 (*Health and Hygiene*) is 'n veeartsenykundige ontsmettingsmiddel wat 100% effektiwiteit toon in die behandeling van *in vitro*-chytridkulture. Voordat enige chemiese behandeling toegepas kan word, moet daar eers bepaal word wat F10 se doeltreffendheid is, aangesien daar tans geen behandeling is wat effektief aangewend kan word vir verskillende spesies en verskillende lewens stadiums nie. Ons beplan dus om 'n effektiewe behandelingsprotokol vir die toediening van F10 te ontwikkel. Paddavisse van *Amietophrynus gutturalis* is aan verskillende konsentrasies van F10 asook vir verskillende periodes blootgestel om te bepaal by watter toedieningsprotokol die paddavisse sal oorleef. Daarna is die oorlewing van chytridfungus-zoospore in die teenwoordigheid van F10 bepaal. Daar is bevind dat paddavisse oorleef by 'n 1:10 000 konsentrasie F10 vir 30 min, maar slegs vir 30 s tot 3 min by 'n 1:3000 verdunning van F10, wat dit onprakties maak om te gebruik. Verder het die *in vitro* toetse getoon dat chytrid by 'n 1:10 000 verdunning reeds sterf na 10 min en by 1:15 000 na 30 min. Die suksesvolle behandeling



van paddavisse sal dus die paddaspesie se kans op oorlewing aansienlik verhoog, aangesien die patogeen gedood sal wees voor die paddavis metamorfeer en in die siekte-vatbare lewensstadium in beweging. Deur 'n vennootskap tussen die

industrie, akademie en dieretuingemeenskappe te vestig, beoog ons om die waarskynlikheid van die program se implementering in die praktyk te maksimaliseer, en dus langtermyn volhoubaarheid te verseker.