Zwaartekracht

Fotograaf: Natasja van de Streek

We zagen een kikker lopen en dachten dat we daar wel een leuke foto van konden maken. Toen sprong hij van de hand af en maakte ik deze foto.

-----------------------------------------------------------------------

Julian Langowski, PhD-student dierwetenschappen  
**Doet onderzoek naar hoe de tenen van kikkers werken**

I see a frog during a jumping manoeuvre that is about to go wrong. Will the frog be able to reorient itself? And how did it get into this situation? Maybe we can learn something from that unlucky fellow?

Frogs are amphibians and have wet skin from the secretion of mucus, which means: (1) they can breathe through their skin and (2) they have wet toes. Whereas for us humans wet toes are ‘only’ mildly annoying, wet toes can be a serious problem for frogs. Have you ever tried running, climbing, or even jumping on a wet slippery surface? Frogs do so during every step. Maybe that is the reason why the jump went wrong?

“The approach of learning from nature for technology is called biomimicry and is not only limited to the gripping of tree frogs. Nature provides a virtually infinite number of solutions for various challenges”

So called tree frogs seemingly have found a way to live with—and possibly even to take advantage of—their wet feet. The outermost skin cells on the toes of tree frogs form a surface pattern, which helps these animals stick to smooth and rough, wet and dry surfaces. But also the structures in the inside of the toe, for example connective and muscular tissue, support attachment.

In my PhD thesis I study these and other aspects of tree frogs’ toe pads to gain an insight into the remarkable attachment performance of these animals.

Studying tree frog attachment not only helps to understand the evolution and ecology of these animals, but also has practical relevance. If we understand how tree frogs solved the problem of sticking with their slippery feet, we may be able to use this solution for technical problems, for example in surgery. Similarly to tree frogs, surgeons are faced with the problem of how to grip wet slippery tissues and organs.

The approach of learning from nature for technology is called biomimicry and is not only limited to the gripping of tree frogs. Nature provides a virtually infinite number of solutions for various challenges, from the development of better aircraft wings inspired by flying animals to the design of faster searching algorithms inspired by the swarming behaviour of ants. We just have to ask the right questions.