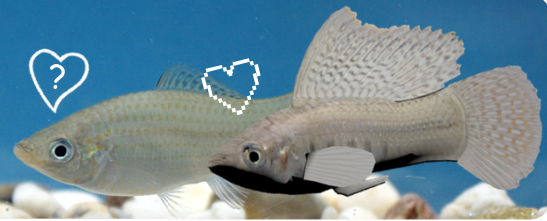


# The virtual Lover – Do real fish interact with 3-D fish in questions of mate-choice?

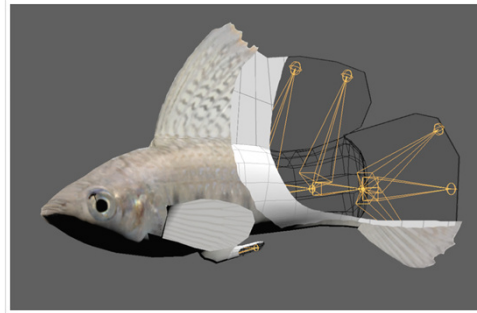


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## Why using virtual fish?

Due to their high variability in both morphology and behavior, virtual animal models provide the potential to unravel fundamental questions when studying mate-choice. What is the critical information and what is not? To get to the roots of mate-choice decisions in the sailfin molly (*Poecilia latipinna*) a virtual photorealistic 3-D fish was designed for the prospective use in behavioral experiments. With the aid of virtual fish we hope to shed more light on the mollies' fascinating strategy of mate-choice copying. Here we present results of initial choice tests concerning perceptibility using the new 3-D fish prototype compared to other stimuli. Females were given 2 x 5 min to choose between either virtual, video, or real male fish.



See the virtual fish in action!  
<http://youtu.be/sdlfum0G2G4>

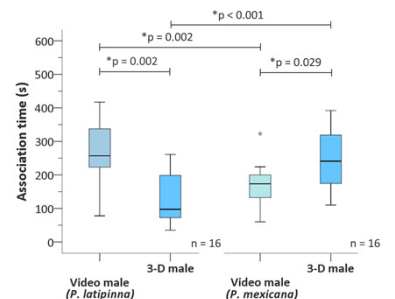
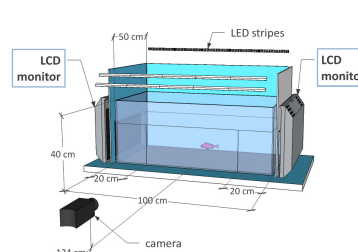
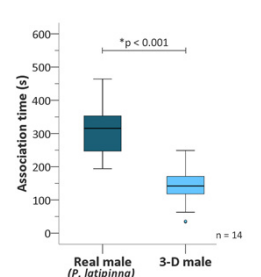
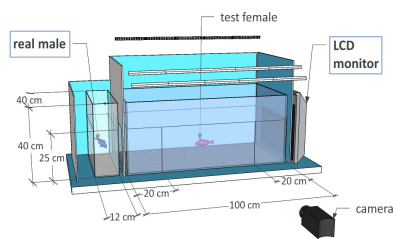
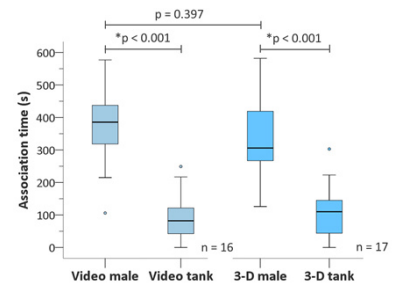
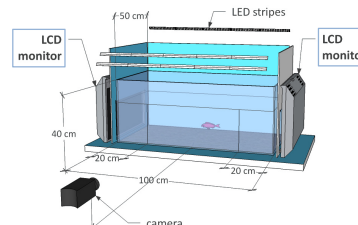
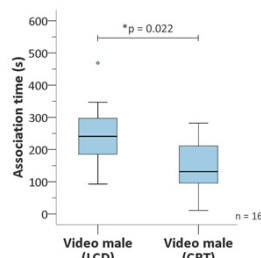
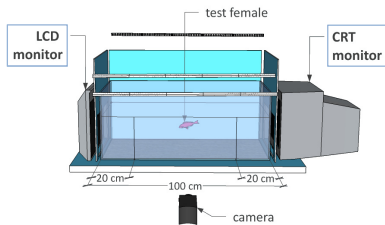


See a short video of the tracking system!  
<http://youtu.be/we2KCQgZujl>

## How to build a virtual fish?

The virtual 3-D fish was designed on the basis of measurements and textures of one living sailfin molly male. A 3-D wire mesh of the fish body was created using the modelling program Blender 2.70a. The wire mesh was equipped with a virtual skeleton consisting of 22 bones to enable movement of the different body parts. Special attention was given to the flapping movement of the dorsal fin to simulate courtship. To generate a photorealistic texture, a picture was then wrapped around the mesh. The model was animated in the Irrlicht game engine and can be steered freely via gamepad. A real-time tracking system operating in 3-D could already be established to assist in future experiments.

## How attractive is the virtual fish in comparison to other typical stimuli?



## The validation of the prototype shows ...

- that females preferred the presentation of a video stimulus on LCD screen over one shown on CRT screen.
- females spent significantly more time in front of a real male fish when shown together with the 3-D male.
- the 3-D male attracts females and was preferred over an empty virtual tank.
- association time was similar when using a video stimulus and a 3-D male.
- females preferred the video stimulus over the 3-D male. But when compared to a heterospecific video stimulus, females spent significantly more time in front of the conspecific 3-D male, hence indicating that it seems to provide information for species recognition.