

INSIDE JEB

The drawback of placentas for live-bearing fish



Fishes have had a long time since the dawn of life to play around with how they reproduce. While many never meet their parents, hatching from externally laid eggs, others are protected within their mothers' bodies, consuming their egg yolk as they develop. An even more select group are nourished continually by their mothers through a placenta, which is great during times of plenty, but when food is scarce, what then? Youngsters that continually depend on their mothers for nutrition as they develop could be in trouble. To find out how *Phalloptychus januarius* embryos – which are supplied with nutrition via a placenta – cope, Andres Hagmayer, Martin Lankheet, Johan van Leeuwen and Bart Pollux from Wageningen University, The Netherlands, cut the mothers' provisions by 75% and waited to see what impact it had on their developing young.

After collecting newborn fish – some of which had only experienced deprivation

for a week of gestation, whereas others had completed their entire development (4 weeks) while their mothers were on reduced rations – Hagmayer and Judith Bijsterbosch (Wageningen University) recorded mass, fat carried and whether the fry gained weight over the first week of life. Meanwhile, Lankheet and Bijsterbosch analysed the fish's swimming when startled and while feeding.

Sure enough, the offspring of mothers on a meagre diet didn't fare well: they were smaller and carried less fat than the youngsters of well-fed mothers. In addition, fish born after longer periods of scarcity were even smaller and leaner. And when the team followed up over their first week of life, these fish didn't thrive; even though they grew, they failed to gain fat. The youngsters' swimming also failed to improve as quickly as that of fish from well-fed mothers, with the newborns of mothers fed poorly for the longest time

showing the least improvements in their swimming. 'This suggests that maternal food availability during pregnancy affects the development of swimming capabilities after birth', Hagmayer says.

So, *P. januarius* youngsters that develop within their mothers when food is scarce are at a disadvantage relative to species that provision their eggs with everything they need to develop before abandoning them to get on with it. 'Our study shows that placental provisioning can be disadvantageous when maternal food is scarce', concludes Hagmayer.

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