

Research Highlights

Mate-guarding behaviour favours a familiar face

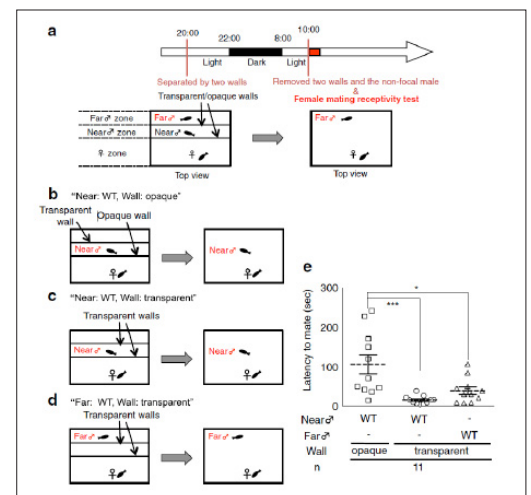
Okayama University researchers confirm the role of mate-guarding in males for blocking the female’s visual familiarity with rival males to improve mating success in a medaka fish model.

“Male-male competition and female mate choice are considered to be major constituents of mating strategies and many studies of these behaviors have been performed individually,” explain Hideaki Takeuchi at Okayama University and the University of Tokyo and his collaborators in Japan and the US in their report. Previously, this team reported that male medaka fish in a triangle relationship (two males and one female) hold a position between the rival male and a female, which results in improvement of mating success. However the significance of different effects from this mate-guarding behaviour –such as visual familiarity and apparent social dominance – had not previously been understood.

The researchers used a transparent aquarium split into 3 compartments with the female in the end compartment. Male and female fish were selected at random and stored in the compartments for around 12 hours overnight before being released to mate.

The enhanced female receptivity (the decreased latency to mate) with transparent walls versus opaque walls confirmed the importance of visual familiarity. The team also quantified the mate guarding behaviour of the near fish and confirmed that by blocking the far fish from view, they impeded the visual familiarization in the far fish. Mutant fish that have mate-guarding behaviour deficits did not inhibit the mating success of the far fish.

The importance of visual familiarity was further corroborated in tests distinguishing the dominant males from their preceding mate-guarding behaviour. When a separation procedure was then used to block the dominant males from view, the dominant males fared unfavourably in offspring paternity tests.



Novel visual familiarization system with separation condition (a) Time-course of the female mating receptivity test. A case of far focal male is shown. (b-d) Separation conditions for the female mating receptivity test in dyadic relationships. Fish were randomly picked from two communal tanks each containing four males and four females and the same males were used several times in the three conditions. (b) “Near: WT, Wall: opaque” The female couldn’t see the male in the near zone and mated with it the next morning. (c) “Near: WT, Wall: transparent” The female could see the male in the near zone from a close proximity and mated with it the next morning. (d) “Far: WT, Wall: transparent” The female could see the male in the far zone from some distance and mated with it the next morning. (e) Visual familiarization enhanced female receptivity even if the male was located in the far zone. Mean ± SEM. ***P < 0.0001

Mating criteria for different species range from plumage and colouring to behavioural dominance and visual familiarity. The researchers suggest that female mate preference for familiar mates may help ascertain social dominance in males.

Publication and Affiliation

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