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### • LETTERS

## Attraction to Orange: Sexiness, Not Gluttony

In her article "Guppy sex and gluttony guided by orange glow" (News of the Week, 8 March, p. 1816), Virginia Morell reviews recent evidence published by Rodd *et al.* suggesting that the sexual preference of female guppies (*Poecilia reticulata*) for males with orange spots is explained by the notion that orange resembles food (1). Of course, it is difficult to separate females' attraction to food from the attraction to males that are stronger and faster and, thus, able to consume more orange-colored cabrehash fruit, which is limited in supply. Indeed, our observations suggest that, for female guppies, orange spots signal sexiness and, moreover, the virility of a potential mate.

One week after birth, a group of guppy fry, including both males and females, were separated into two cohorts and fed diets with or without the addition of testosterone (250 mg/kg of diet). Within 3 weeks, those fish consuming testosterone developed bright orange spots (panel A of figure), which continued to develop with maturation (panel C) and remained, throughout their lives (even in female guppies, panel E). However, those raised without testosterone did not express orange spots early in life (panels B and D), and females that were not exposed to testosterone did not express orange spots at any stage in life (panel F).

Coloration of fish skin is determined by deposition of pigments within the skin (2). As fish cannot synthesize carotenoids, the coloration of (male) *Poecilia reticulata* is indicative of their ability to forage within carotenoid-limited environments and thus is a measure of health and vigor. In addition, the orange spots of male guppies contain another pigment called red pteridine, which, unlike carotenoids, can be synthesized de novo (3).

The rapid appearance of orange spots in testosterone-treated guppy fry but not in untreated fish is curious, given that both groups consumed the same diet. One possibility is that testosterone is a key regulator of pteridine biosynthesis and influences the production and distribution of pigment within the skin, leading to the appearance of orange spots in males and females.

We favor sexiness, rather than gluttony, as the key determinant of female guppies' sexual preference for the orange spots of a male guppy, indicating testosterone (masculinity and vigor) and, by extension, the viability of the potential mate.

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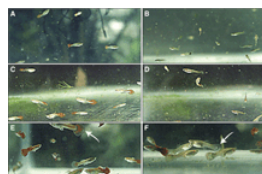
In *Science Magazine*

NEWS OF THE WEEK  
ANIMAL BEHAVIOR

[Guppy Sex and Gluttony Guided by Orange Glow](#)

Virginia Morell

*Science* 8 March 2002: 1816.



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(A) Four-week-old testosterone-treated fry. (B) Four-week-old nontreated fry. (C) Six-week-old testosterone-treated fry. (D) Six-week-old nontreated fry. (E) Six-week-old testosterone-treated fry. (F) Six-week-old nontreated fry.

adults (one female is indicated by an arrow).

initially evolved for detecting rare but rich food sources.

The results presented by Jayasooriya *et al.* on the effects of testosterone on are fascinating from a developmental perspective (6), but they bear the same hypothesis as Morgan's results bore to Darwin's theory. That is not to say that of male coloration is irrelevant for female mate preference evolution. If females with high-testosterone males, this could select for exaggeration of the female coloration. But simply showing that testosterone is involved in the regulation not illuminate the ultimate questions about why mate preferences, or the sex they favor, have evolved.

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#### NEWS OF THE WEEK

ANIMAL BEHAVIOR

#### Guppy Sex and Gluttony Guided by Orange Glow

Virginia Morell

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