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## Phenotypic plasticity in orange and black color-patches in wild guppy (*Poecilia reticulata* Peters) linked to habitat characteristics

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The colors of male guppies vary in hue, chroma, reflectivity, and the number, size, and position of color spots. Although conspicuous visual cues play a major role in sexual selection, they may also pose a risk of predation for the guppies. Whether the fish is conspicuous to predators or not may depend on ambient habitat conditions, and hence, it is hypothesized that the color of guppies may show phenotypic color plasticity linked to their habitat features. The objective of the present study was to demonstrate whether male wild guppies show phenotypic plasticity in orange and black color patches. Guppies were sampled from three locations (two urban water-logged ditches L1, L2 and one natural stream L3, approx. 150 km apart) (n= 60 each) with apparently different physical habitat characteristics. Imaging-based method was used to collect data on number of orange and black color patches on left side of male guppies, and the relative size of those color patches. Hypothesis of phenotypic variation among locations was tested by non-parametric tests using R-software. Male guppies from the stream (L3) had a significantly higher number of black patches ( $p < 0.05$ , Kruskal Wallis test) and the lowest area of orange patches (mean  $0.06 \pm 0.02$ ) than those in the other two locations (L1: mean  $0.10 \pm 0.03$ , L2: mean  $0.08 \pm 0.03$ ) indicating that male guppies at L3 were relatively less conspicuous. Highest relative area of orange color patches was found in guppies at L1 (mean  $0.10 \pm 0.03$ ) followed by L2 (mean  $0.08 \pm 0.03$ ), suggesting that more male conspicuousness is present in those habitats which are polluted ditches with much darker ambient coloration. The study concludes that there is a significant phenotypic variation in color patches in male guppies in different habitats with varying ambient physical features. More geographic samples and data on cohabiting predatory species and guppy abundance are needed to confirm the adaptive value of color variation connected to predation risk and sexual selection.

**Keywords:** Guppy coloration, Intraspecific variation, Predation risk, Sexual selection

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