Cardiovascular function during early development is suppressed by nicotine-free, cinnamon flavored, electronic cigarette vapor

Despite a recent surge in vaping related lung illness and an overall lack of research regarding the health implications associated with their use, electronic cigarettes and vaping devices have continued to remain popular among teens and young adults since their introduction to the United States over a decade ago. The popularity of these products among those of childbearing age necessitates research on the potential impact of maternal vaping on embryonic function during development. Here, we examined the effects of nicotine-free, cinnamon, or chocolate, flavored vapor on cardiovascular function during early development using the zebrafish model. Flavored electronic cigarette vapor was produced from a second-generation vaping device and was infused into dechlorinated water at high, medium, and low concentrations. Vapor infused water was distributed among flasks to which zebrafish embryos were added within 4 hours post fertilization. Videos of the heart and blood vessels were recorded at 24 hours post exposure and cardiovascular parameters were measured to assess the effects of cinnamon, or chocolate, flavored vapor on cardiovascular function. At high exposure concentrations, cinnamon flavored vapor significantly inhibited cardiovascular function while chocolate flavored vapor did not, thus indicating that cardiovascular function in the developing embryo may be affected in a flavor dependent manner, even in the absence of nicotine. The results of this study provide much needed data on the potential impact of flavored, nicotine-free, electronic cigarette vapor on cardiovascular function during early development which may occur as a result of maternal vaping during pregnancy.

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Habitat-specific foraging strategies and polymorphic variation of bluegill sunfish, Lepomis macrochirus

As generalists, Bluegill Sunfish (*Lepomis macrochirus*) feed in densely vegetated littoral and pelagic zones. Paradoxically, being a generalist requires that Bluegill adopt habitat-specific foraging strategies in order to successfully exploit local environments. To better understand their foraging behaviors, underwater cameras were

deployed in different locations of Lake Waban, MA to reflect the diversity of local habitats within the lake. We identified three foraging strategies: hunting, grazing, and pelagic feeding. Each strategy is categorized as opportunistic or intentional and some are further subdivided into several modalities. Hunting occurs in shallow littoral zones, is intentional, often performed in groups, and is characterized by repeating cycles of burst-coast-stop-search until prey is visually detected. Grazing also occurs in shallow littoral zones, but is either intentional or opportunistic, and is characterized by three modalities depending on vegetation type. Active grazing involves biting and pulling on pondweed, whereas passive grazing involves hovering near milfoil and delicate suction feeding, and surface grazing involves searching beneath lily pads and explosive bouts of suction feeding. Pelagic feeding occurs in deep open water, is often opportunistic, may occur in groups, and is characterized by intermittent swimming from one morsel to the next. Some correlation exists between phenotype, age, and foraging strategy. For example, darker and deeper bodied adults engage in hunting, whereas lighter and fusiform Bluegill of all ages engage in pelagic feeding. These observations demonstrate the complex behaviors that characterize a paradigmatic generalist and illustrate the multitude of variables that impact their specific feeding strategies.

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Ubiquitous yet inconspicuous: quantifying trophic impact of a widespread oceanic comb jelly (Ctenophore)

The oceanic lobate ctenophore *Ocyropsis spp.* has a widespread distribution throughout tropical and sub-tropical oceans. While patchy, *Ocyropsis spp.* can be abundant with densities exceeding one individual per m^3. However, little is known about the trophic impacts of these animals and differences in habitat and prey capture mechanisms on zooplankton prey (copepods) prevent the use of data from coastal species. In this study we used high-resolution videography and imaging in the field and laboratory to record