Understanding the response of animals to changing oxygen concentrations is imperative to interpreting the role of atmospheric oxygen, both in the past evolution of our biosphere, and the continued evolution of the future.

Here, we explore a potential relationship between the size of dragonflies, and atmospheric oxygen levels, drawing examples from the large dragonflies of the past, and modern species we can observe in the present. We then examine how changing oxygen levels in the future could potentially affect dragonfly size.

These questions were approached through a literature review, gathering information and using examples of the past and present, and speculations of the future. Throughout the review process, we found oxygen levels have been variable throughout not only the early years of Earth’s history, but the recent past, during which insects evolved and diversified. Periods of high oxygen levels are associated with large insects, such as the giant dragonfly (Meganeura). Larger dragonflies require greater respiratory investment, due to the limitations of a respiratory system that relies so heavily on simple diffusion. Because of this, higher oxygen levels help ease these requirements and facilitate larger dragonfly sizes. In contrast, lower oxygen levels likely decrease the size of dragonflies. In the future, it does not seem that oxygen levels will significantly rise, meaning we cannot expect dragonfly size to significantly increase, provided no innovative adaptation arises.

Themes:

Check (highlight) the most applicable theme according to the abstract.

| Innovation and Technology | Health and Wellness | Culture and Society | Sustainability and Conservation |

Comments: Concise primer on oxygen-driven evolution of dragonflies. All the best at MURC!