IISER Team Maps Evolutionary Dispersal Patterns

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A team, led by Sutirth Dey, at **Indian Institute of Science, Education and Research (IISER), Pune**, studied 29,000 fruit flies under controlled conditions in the laboratory. The research aimed at **determining the role of population density of the flies in a location to their dispersion behaviours**, and how evolved male and female flies undertook dispersion.

Evolutionary Dispersal Patterns

The prestigious **U.S. biology journal Evolution** has published the findings. The study has concluded that male and female Drosophila, more commonly known as fruit flies, **undergo differential rates of dispersal as they evolve.** Every organism, including humans, disperses from one location to another, either in search of food or better chances of survival. In simple terms, a location with higher density offers fewer resources, like food, forcing organisms to disperse at a higher rate.

Among many factors influencing this movement are **environment, habitat, and density of a given location.** The scientists attempted to determine this pattern in which female and male fruit flies dispersed as they evolved. One key parameter that researchers used while performing the evolutionary study was **density dependent dispersal** (DDD), which tells the existence of an organism at a particular place. Just as some species live in large groups while others are solitary, movement occurs away from a crowd in some species and towards it in some others. This pattern, termed as 'density dependent dispersal', is central to the understanding of which life forms occur where.

The team first **"evolved" tens of thousands of fruit flies for**

over 75 generations (or three years), thus making them "better" dispersers than their ancestors. In the initial phases, the rate of dispersal of females outnumbered that of males. But as they evolved, the dispersal rate was higher among males. This means evolution completely changed the behaviour and reversed the rate of dispersal of the two sexes, an evidence gathered for the first time. Scientists said **dispersal and its rate offered clues in understanding and predicting movement patterns of organisms.**

The paper is titled '**Dispersal evolution diminishes the negative density dependence in dispersal**'. The study also highlights a greater need to study endangered organisms, especially when their dispersal is increasingly strained due to climate change and fragmentation of suitable habitats.