

## Painted Lady Butterfly

**Prelims** - Biodiversity, species migration, scientific innovations, and climate change impacts.

**Mains (GS - I & III)** - GS I (Biogeography, species adaptation) | GS III (Biodiversity conservation, climate change, scientific advancements).

### Why in News?

A recent study found that painted lady butterflies (*Vanessa cardui*) don't have significant genetic differences between short- and long-distance migrants.

- Painted Lady butterfly is a medium-sized butterfly belonging to the Nymphalidae family.
- It is renowned for its extensive migratory patterns and adaptability to various habitats.
- **Habitat** - Thrives in diverse environments, from temperate grasslands to deserts.
- They can be found on every continent except Antarctica and South America.
- **Conservation status** - Listed as Least Concern on International Union for Conservation of Nature's Red List.
- **Migratory Behaviour** - This species is a long-distance migrant, originating from areas like the desert fringes of North Africa, the Middle East, and Central Asia.
- Each year, it moves northwards, recolonizing mainland Europe and reaching Britain and Ireland.



### Key findings of the study

- **Isotope Tracking** - Scientist studied about the species using the ratios of the isotopes in the wings of species.
- Wings retain hydrogen & strontium isotopes from larval food/water, revealing birthplace.
- **No genetic difference in migration** - Short- and long-distance painted lady butterflies belong to a single interbreeding population.
- **Migration driven by environment** - Distance covered depends on environmental

*factors, not genetics.*

- **Single migratory cycle** - Painted Lady butterfly can travel up to 15,000 km in a single migratory cycle, one of the longest insect migrations on the earth.

A "**single migratory cycle**" refers an animal (like a bird) makes one round trip between two places—usually moving from a breeding area to a wintering area and back—due to seasonal changes or food needs.

- **Multi-generational migration** - The full migration cycle spans 8-10 generations.
- **Super fly Adaptations** - Thoracic muscles like "bodybuilders" enable high-speed, high-altitude flights.
- *Wing shape/size doesn't predict migration distance.*
- **Different from bird migration** - Butterflies *don't return to a single breeding ground*, unlike birds.

## Phenotype

- **Phenotype** is a physical, biological, or behavioural characteristic shaped by genetics as well as environmental factors.
  - **Example** - Skin and hair colour in humans, vocal behaviour among birds, and the migratory patterns of some animals.
- *Scientists use phenotyping to study migration patterns* in butterflies.
  - **Example** - By examining butterfly wings, researchers can determine their place of origin based on isotopic composition.

## References

1. [The Hindu | Painted Lady](#)
2. [Britannica | Painted Lady](#)