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 i**s 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