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Relationship between Silver line Butterfly and Cocktail Ants

- A recent study using X-ray MicroCT technology describes the association between caterpillars of the Lilac *Silverline Apharitis lilacinus* butterfly and cocktail ants.
- The intriguing caterpillar-ant associations have been a subject of study for decades resulting in the understanding of their evolution and ecology.
- Butterflies of the family Lycaenidae, popularly known as Blues and Hairstreaks, have gone in a completely unexpected direction to deal with their predators and do not avoid predatory ants at all.
- Over millions of years of evolution, this butterfly group has evolved a range of adaptations that have tamed their ferocious ant predators into protectors and providers.
- Not only do ants not eat these caterpillars and pupae, they actually care for them and aggressively *protect them from other predators and parasitoids, thus creating an enemy-free space for the butterfly's early stages.*
- Caterpillars are completely dependent on the ants after hatching from eggs, and they are constantly attended by their hosts.
- The *caterpillars live inside the ant nests, often among the ant broods*, and are cared for by the tending ants just like the rest of their own brood.

Silverline Apharitis lilacinus

- This butterfly was rediscovered in India a few years ago after a gap of almost 100 years.
- This species has an *obligate association* with a single species of cocktail ant called Crematogaster hodgsoni.

Locust Outbreak, Upsurge, and Plague

- FAO has warned about spring-bred locust swarms, which migrated to the Indo-Pakistan border and travelled east to northern states.
- They are expected to return back to Rajasthan with the start of the monsoon in coming days.
- The FAO has three categories of Desert Locust situations: outbreak,

upsurge, and plague.

Contents	Locust Outbreaks	Locust Upsurge	Locust plague
Reason	• If there is good rain and green vegetation develops, Desert Locusts can rapidly increase in number and within a month or two. • It can lead to the formation of small groups or bands of wingless hoppers and small groups or swarms winged adults.	• An ‘upsurge’ is formed when an outbreak or contemporaneous outbreaks are not controlled. • If widespread or unusually heavy rains fall in adjacent areas, several successive seasons of breeding can occur that causes further hopper band and adult swarm formation.	• The most serious category, a ‘plague’ can develop when an upsurge is not controlled and ecological conditions remain favorable for breeding. • Locust populations continue to increase in number and size, and the majority of the infestations occur as bands and swarms. • This does not happen overnight; instead, *it takes at least one year or more for a plague to develop through* a sequence that commences with one or more outbreaks and followed by an upsurge.
Expanse	• Such a situation is called an ‘outbreak’, and *usually occurs with an area of about 5,000 sq. km* (100 km by 50 km) in one part of a country.	This is a *more serious Desert Locust situation* and generally affects an entire region.	• A major plague exists when two or more regions are affected simultaneously. • The area in which plagues occur covers about 29 million sq. km and can extend across 58 countries.

FAO Warning	• Before the outbreak stage, the FAO first issues 'Desert Locust threats' that are determined from an analysis of national survey and control data combined with remote sensing imagery and historical records. • Such threats have been issued in 2012, 2013, and 2015. • Not all threats develop into an outbreak.	• In its latest update FAO said spring-bred locust swarms, which migrated to the Indo-Pakistan border and travelled east to northern states, are expected to return back to Rajasthan	• There have been six major plagues in the 1900s, one of which lasted almost 13 years, the FAO website notes.

Kawasaki Disease

- Around the world, children with Covid-19 infection have often shown some symptoms similar to those associated with a rare illness called Kawasaki disease
- It typically affects *children aged under five* with symptoms like red eyes, rashes, and a swollen tongue with reddened lips often termed strawberry tongue and an inflamed blood vessel system all over the body.
- There is constant high fever for at least five days, it also affects coronary functions in the heart.
- The causes of the Kawasaki Disease are not yet Known.
- The strawberry tongue may or may not be present in those with Covid-19.
- *In Covid-19 cases, even adolescents are presenting these symptoms.*
- Steroids remain a key treatment to reduce inflammation.

Compulsory Licensing

- Compulsory Licensing allows governments to license third parties (that is, parties other than the patent holders) to produce and market a patented product or process without the consent of patent owners.
- *Any time after three years* from date of sealing of a patent, application for compulsory license can be made, provided that,

1. Reasonable requirements of public have not been satisfied;
2. Patented invention is not available to public at a reasonably affordable

price;
3. Patented inventions are not carried out in India.

- Compulsory Licensing is regulated under the Indian Patent Act, 1970.
- The Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement) *does not specifically list the reasons that might be used to justify compulsory licensing.*
- However, the Doha Declaration on TRIPS and Public Health confirms that countries are free to determine the grounds for granting compulsory licenses, and to determine what constitutes a national emergency.
- Recently, the CPI (Marxist) party has suggested that the government shall issue compulsory licenses for the manufacturing of a generic version of Remdesivir which is being used to treat Covid-19 patients.
- The issuance of compulsory licences will allow Indian manufacturers to produce a more affordable generic version.

Click here to know more about Covid-19 treatments

Phobos

- Phobos is the innermost and larger of the two natural satellites of Mars, the other being Deimos.
- Both moons were discovered in 1877 by American astronomer Asaph Hall.
- Phobos is a small, irregularly shaped object with a mean radius of 11 km (7 mi) and is seven times as massive as the outer moon, Deimos.
- It is largely believed to be made up of carbonaceous chondrites.
- It is so close that it orbits Mars much faster than Mars rotates, and completes an orbit in just 7 hours and 39 minutes.
- Recently, *The Mars Colour Camera (MCC) onboard ISRO's Mars Orbiter Mission* has captured the image of Phobos, the closest and biggest moon of Mars.
- According to ISRO, the violent phase that Phobos has encountered is seen in the large section gouged out from a past collision (Stickney crater) and bouncing ejecta.
- Shklovsky,Roche, and Grildrig are other craters.

Mars Orbiter Mission - Mangalyaan

- In 2013, ISRO successfully placed the Mars Orbiter Mission spacecraft in orbit around the red planet, in its very first attempt.
- ISRO had launched the spacecraft on homegrown PSLV rocket.

- It had escaped the earth's gravitational field on December 1, 2013.
- MOM mission aims at studying the *Martian surface and mineral composition as well as scan its atmosphere for methane* (an indicator of life on Mars).
- The Mars Orbiter has five scientific instruments

1. Lyman Alpha Photometer (LAP),
2. Methane Sensor for Mars (MSM),
3. Mars Exospheric Neutral Composition Analyzer (MENCA),
4. Mars Color Camera (MCC),
5. Thermal Infrared Imaging Spectrometer (TIS).

Source: the Hindu, Indian Express

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