Difference Between Complete and Incomplete Metamorphosis

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Difference Between Complete and Incomplete Metamorphosis

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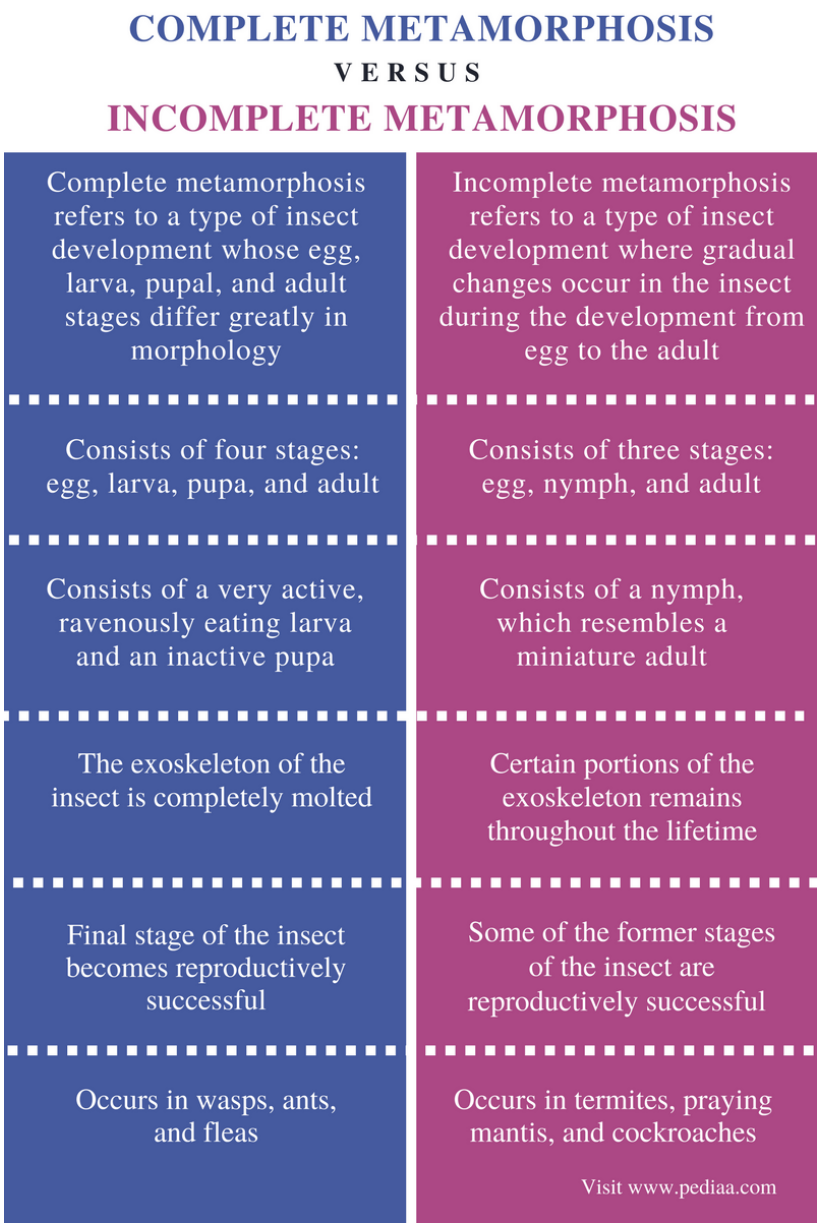
Main Difference – Complete vs Incomplete Metamorphosis

Metamorphosis is the change in the body form and habits during the development cycle of animals. Complete metamorphosis and incomplete metamorphosis are two growth types of insects where the body form of insects changes during their lifecycle. Both complete and incomplete metamorphosis extend from the egg stage to the adult stage. Complete metamorphosis consists of four stages: egg, larva, pupa, and adult. However, the incomplete metamorphosis consists of three stages: egg, nymph, and adult. The **main difference** between complete metamorphosis and incomplete metamorphosis is that **complete metamorphosis consists of a very active, ravenously eating larva and an inactive pupa whereas incomplete metamorphosis consists of a nymph, which resembles a miniature adult.** Complete metamorphosis occurs in wasps, ants, and fleas while incomplete metamorphosis occurs in termites, praying mantis, and cockroaches.

Key Areas Covered

Key Terms: Adult, Complete Metamorphosis, Egg, Incomplete Metamorphosis, Larva, Nymph, Pupa



What is Complete Metamorphosis

Complete metamorphosis is the type of insect development that includes egg, larva, pupal, and adult stages, which differ greatly in morphology. The lifecycle of butterflies, ants, fleas, bees, beetles, moths, and wasps are examples of the complete metamorphosis. The lifecycle of ants is shown in *figure 1*.

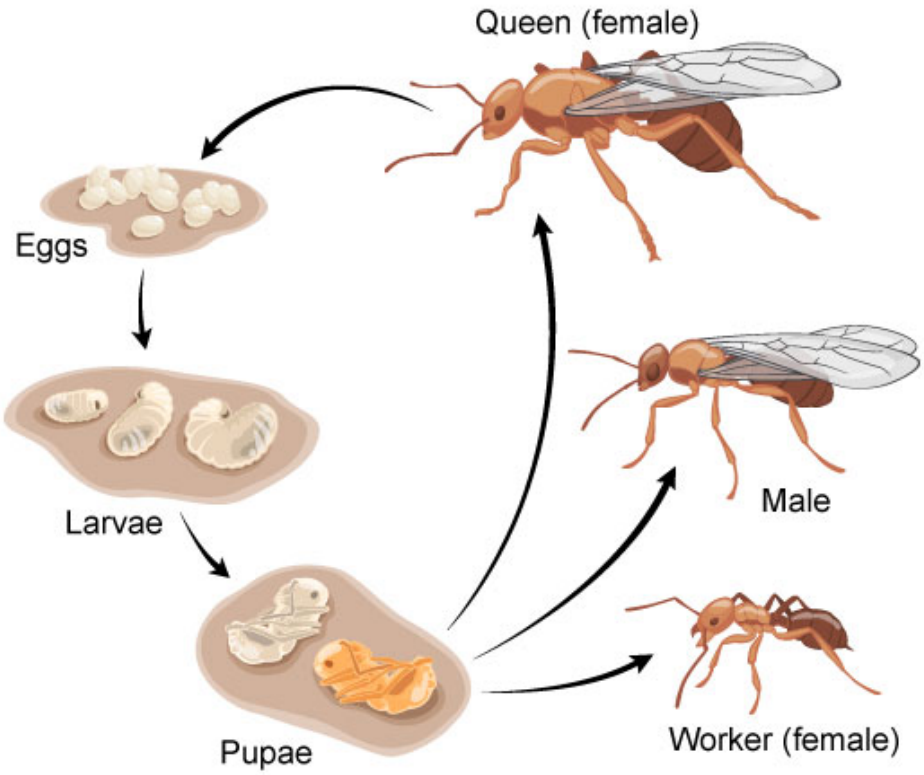


Figure 1: Complete Metamorphosis

The complete metamorphosis starts with the laying of eggs by the female insect. The larva, which is the second stage of the complete metamorphosis, are hatched from the eggs. The larval stage can completely differ from the adult stage in morphology, behavior, and/or habitat. The larval body is soft and worm-like. The characteristic feature of the larva is their ravenous feeding. Due to this great appetite for food, the larval stage shows very fast growth. During their growth, larva molts their skin several times. The pupal stage begins with the formation of cocoons around the larvae. Butterfly cocoons are shown in *figure 2.*

Figure 2: Butterfly Cocoons

The larva is inactive and does not feed when they are inside the cocoons. Their bodies develop more segments, internal organs, legs, and wings. The pupal stage may exist from 4 days to several months. The break out of the cocoon frees a fully developed larva.

What is Incomplete Metamorphosis

Incomplete metamorphosis refers to a type of insect development in which gradual changes occur in the insect during the development from the egg to the adult. Both complete and incomplete metamorphosis are shown in *figure 3.*

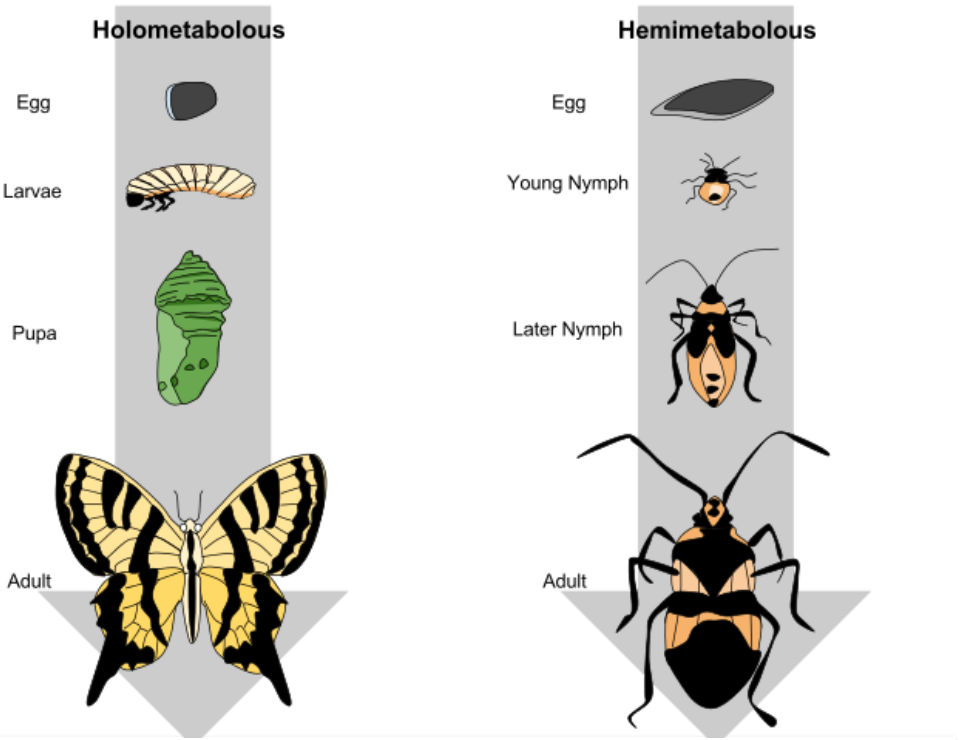


Figure 3: Complete and Incomplete Metamorphosis

The three stages of the incomplete metamorphosis are egg, nymph, and adult. The eggs are laid by the female insect. In most cases, the eggs are covered by an egg case, which protects and hold the eggs together. The eggs hatch into younger nymphs. The nymph resembles the adult without wings. The nymph is also smaller than the adult. The nymph eats the same food as the adult. It develops into the adult through a series of molts. It shed its exoskeleton 4-8 times. When it becomes an adult, the molting does not occur. The incomplete metamorphosis of lice is shown in *figure 4.*

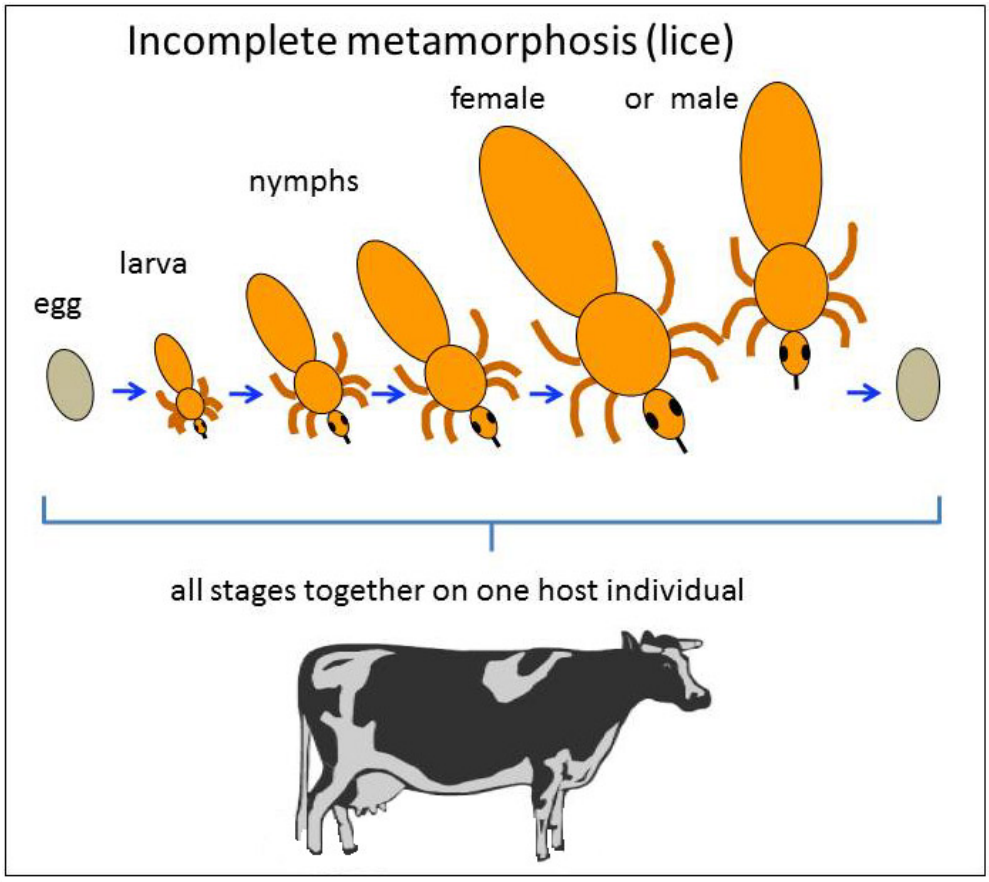


Figure 4: Incomplete Metamorphosis

The incomplete metamorphosis occurs in termites, lice, true bugs, grasshoppers, praying mantis, crickets, and cockroaches.

Similarities Between Complete and Incomplete Metamorphosis

- Both complete and incomplete metamorphosis are types of growth of insects.
- Body form of the insect changes in both complete and incomplete metamorphosis.
- Both complete and incomplete metamorphosis extend from the egg stage to the adult stage.
- A series of molts occur in both complete and incomplete metamorphosis while growing into adult.

Difference Between Complete and Incomplete Metamorphosis Definition

Complete Metamorphosis: Complete metamorphosis refers to a type of insect development whose egg, larva, pupal, and adult stages differ greatly in morphology.

Incomplete Metamorphosis: Incomplete metamorphosis refers to a type of insect development where gradual changes occur in the insect during the development from egg to the adult.

Stages

Complete Metamorphosis: Complete metamorphosis consists of four stages: egg, larva, pupa, and adult.

Incomplete Metamorphosis: Incomplete metamorphosis consists of three stages: egg, nymph, and adult.

Larva/Pupa/Nymph

Complete Metamorphosis: Complete metamorphosis consists of a very active, ravenously eating larva and an inactive pupa.

Incomplete Metamorphosis: Incomplete metamorphosis consists of a nymph, which resembles a miniature adult.

Exoskeleton

Complete Metamorphosis: The exoskeleton of the insect is completely molted during the complete metamorphosis.

Incomplete Metamorphosis: Certain portions of the exoskeleton of the insect remains throughout the lifetime in incomplete metamorphosis.

Reproductive Ability

Complete Metamorphosis: Final stage of the insect becomes reproductively successful in complete metamorphosis.

Incomplete Metamorphosis: Some of the former stages of the insect are reproductively successful in incomplete metamorphosis.

Examples

Complete Metamorphosis: Complete metamorphosis occurs in wasps, ants, and fleas.

Incomplete Metamorphosis: Incomplete metamorphosis occurs in termites, praying mantis, and cockroaches.

Conclusion

Complete and incomplete metamorphosis are two types of growth forms in insects. The complete metamorphosis occurs through four stages: egg, larva, pupa, and adult. The incomplete metamorphosis occurs through three stages: egg, nymph, and adult. The pupa stage is not developed during incomplete metamorphosis. Therefore, the main difference between complete and incomplete metamorphosis is the differential stages developed during each type of growth.

Reference:

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Lakna, a graduate in Molecular Biology & Biochemistry, is a Molecular Biologist and has a broad and keen interest in the discovery of nature related things

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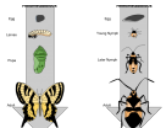

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