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Rhinoceros Beetle (*Oryctes rhinoceros*) in Oil Palm

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INTRODUCTION

The rhinoceros beetle, ***Oryctes rhinoceros* (L.)**, is an important insect pest of oil palm, particularly young and immature palms. It belongs to the order Coleoptera, family Scarabaeidae and subfamily Dynastinae. The pest undergoes complete metamorphosis through four stages: egg, larva, pupa and adult, with the complete life cycle generally lasting about 4–9 months under favourable conditions. Adult beetles are mainly nocturnal and bore into the base of unopened spear leaves, producing holes and characteristic V-shaped cuts on newly emerged leaves. Repeated attacks can reduce photosynthetic area, retard palm growth and, in severe cases, cause young palm death. Decomposing trunks, stumps, logs and other organic materials provide suitable breeding sites and encourage population build-up. Effective management requires integrated pest management involving field sanitation, proper residue management, pheromone trapping, biological control and need-based chemical control.

Taxonomic Classification

Category	Classification
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Coleoptera
Superfamily	Scarabaeoidea
Family	Scarabaeidae
Subfamily	Dynastinae
Genus	*Oryctes*
Species	*Oryctes rhinoceros* (Linnaeus)
Common name	Rhinoceros beetle / Coconut rhinoceros beetle

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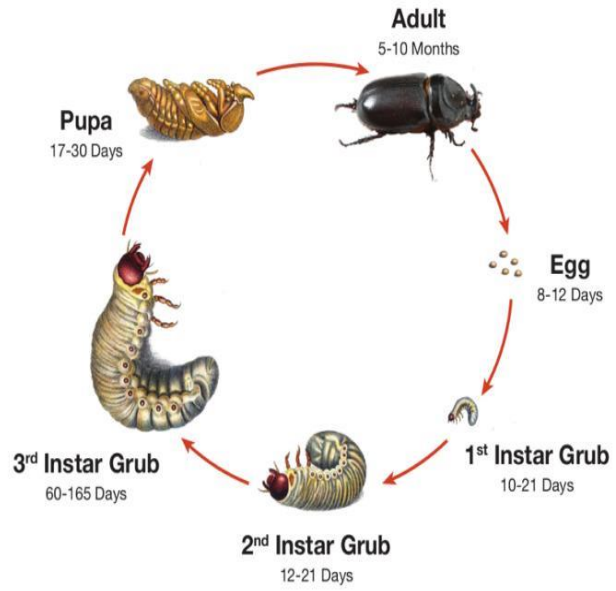

Egg → Larva (Grub) → Pupa → Adult

Life Cycle

Egg Stage

The female rhinoceros beetle lays its eggs in **moist, decomposing organic materials**, which provide favourable conditions for egg development and subsequent larval growth. Common breeding substrates include decomposing oil palm trunks, rotten coconut trunks, stumps, compost, sawdust, decaying plant residues, organic waste and humus-rich materials. Such decomposing materials are particularly important in oil palm replanting areas, where accumulated residues can provide suitable breeding habitats and contribute to the build-up of beetle populations.

Larval Stage

The larva, commonly called the **white grub**, develops in decomposing organic material and passes through several instars before pupation. This stage is an important target for biological control, particularly with the entomopathogenic fungus ***Metarhizium anisopliae.***

Pupal Stage

The mature grub transforms into a **pupa within the breeding material**, where it remains inactive and undergoes transformation into the adult beetle.

Adult Stage

The adult is a large, dark-coloured beetle with a characteristic **horn-like projection** and is mainly active during the night for feeding and mating.

It attacks young oil palms by boring into unopened spear leaves, producing holes and characteristic **V-shaped cuts** when the leaves unfold.

Infestation/Attack Stages of Rhinoceros Beetle in Oil Palm

Rhinoceros beetle (*Oryctes rhinoceros*) can infest oil palms at different stages, but young palms, particularly those below 3 years of age, are more vulnerable**.** Adult beetles bore into the crown and unopened spear leaves, where they feed on tender tissues. The damage becomes visible when the leaves emerge, showing

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characteristic V-shaped or triangular cuts. In palms aged 3–5 years, repeated attacks can cause crown damage, abnormal leaf development and reduced plant vigour. Mature palms may also be attacked, especially when suitable breeding materials are present in the plantation. Severe and repeated infestation can damage the growing point, reduce photosynthetic area and, in young palms, may ultimately lead to palm death

Damage Symptoms of Rhinoceros Beetle in Oil Palm

- V-shaped or triangular cuts on newly opened leaves.
- Holes and bore marks in the unopened spear leaf and crown region.
- Damaged or distorted spear leaves due to feeding on tender tissues.
- Broken or deformed young fronds after repeated attacks.
- Reduced leaf area and photosynthetic capacity because of damaged fronds.
- Crown deformation under severe and repeated infestation.
- Poor growth and reduced vigour, particularly in young palms.
- Severe damage to the growing point may result in wilting and death of young palms.
- In mature palms, repeated crown damage can contribute to reduced productivity and bunch yield.

Management

- **Field sanitation:** Remove and properly decompose or destroy dead palm trunks, rotting logs, manure heaps and other organic materials that can serve as breeding sites.

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- **Mechanical control:** In young palms, inspect the crown regularly and remove adult beetles or damaged material manually using a suitable hook.
- **Pheromone traps:** Use **Oryctes pheromone traps** for monitoring and mass trapping of adult beetles. Place traps strategically around the plantation and maintain them regularly.
- **Biological control:** Apply the entomopathogenic fungus ***Metarhizium anisopliae*** to suitable breeding sites. It can infect the larval stages and help suppress the beetle population.
- **Chemical control:** If infestation reaches economically important levels, use **only locally registered insecticides**, following the approved label dose, application method, safety precautions and local agricultural recommendations.
    - **Phorate granules @ 20 g per plant in the crown region**.
    - Place **1–2 naphthalene balls in the crown region** of each young palm.
    - Under severe infestation apply **chlorpyrifos @ 1.5 ml per litre of water**.
    - **lambda-cyhalothrin @ 1 ml per litre of water** for rhinoceros beetle management, subject to approved label recommendations.
- **Regular monitoring:** Check young palms, especially those **below 3 years**, for bore holes, damaged spear leaves and characteristic **V-shaped cuts** on newly opened fronds.

CONCLUSION

The rhinoceros beetle, *Oryctes rhinoceros* (L.), is a major pest of oil palm, particularly young and immature palms. Adult beetles damage unopened spear leaves, causing holes, V-shaped cuts, distorted fronds and reduced palm growth. Proper sanitation, residue management, pheromone trapping, biological control and need-based chemical control are important for effective management. Early detection and integrated pest management (IPM) are essential for reducing beetle populations and maintaining healthy, productive oil palm plantations.

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