Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 05, Issue: 05 (SEP-OCT, 2025)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

Scientific Classification of Pests of Coriander

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Coriander (*Coriandrum sativum* L.) is a widely cultivated seed spice and leafy herb valued for its aromatic flavor and essential oil content. However, coriander production is severely affected by various insect pests that attack the crop from seedling to harvest, resulting in reduced yield and quality. Integrated Pest Management (IPM) is a holistic and eco-friendly approach that combines cultural, mechanical, biological, and need-based chemical measures to keep pest populations below economic threshold levels. This paper presents the major insect and mite pests of coriander, their scientific classification, identification, nature of damage, and recommended IPM strategies for sustainable management.

Introduction

Coriander, belonging to the family **Apiaceae**, is an important seed spice grown extensively in India, the Mediterranean region, and parts of Asia. The crop is susceptible to several pests that cause significant economic damage. Aphids, leaf miners, thrips, mites, and cutworms are among the most prevalent pests affecting both vegetative and reproductive stages. Over-reliance on chemical pesticides has led to resistance, residue problems, and the loss of natural enemies. Therefore, adopting IPM strategies based on scientific understanding of pest classification, biology, and ecology ensures effective and sustainable pest suppression.

Major Pests of Coriander and Their Integrated Management

1. Coriander Aphid (*Hyadaphis coriandri*)

Scientific Classification:

- **Phylum:** Arthropoda
- **Class:** Insecta
- **Order:** Hemiptera
- **Family:** Aphididae
- **Genus:** *Hyadaphis*
- **Species:** *H. coriandri*

Identification and Nature of Damage: Small, pale-green soft-bodied insects forming dense colonies on flower stalks and tender shoots. Both nymphs and adults suck sap, causing leaf curling, chlorosis, and drying of umbels. Severe infestation results in poor seed set and sticky honeydew that encourages sooty mold.

IPM Practices

a) **Cultural:**

- Use tolerant varieties and avoid overlapping crops.
- Maintain field sanitation and destroy infested crop residues.
- Avoid excessive nitrogen fertilization.

b) **Mechanical:**

- Spray strong jets of water to dislodge aphids.
- Use reflective silver mulch to deter aphid landing.

c) **Biological:**
- Conserve predators like *Coccinella septempunctata* (ladybird beetle) and *Chrysoperla carnea* (green lacewing).
- Apply *Beauveria bassiana* formulations under humid conditions.

d) **Chemical:**
- Neem-based insecticide (Azadirachtin 1500 ppm @ 3 ml/l).
- If needed, spray Imidacloprid 17.8 SL @ 0.3 ml/l at ETL (10–15 aphids/plant).

Cutworm (*Agrotis ipsilon*)

Scientific Classification:
- **Phylum:** Arthropoda
- **Class:** Insecta
- **Order:** Lepidoptera
- **Family:** Noctuidae
- **Genus:** *Agrotis*
- **Species:** *A. ipsilon*

Identification and Nature of Damage: Dark grayish-brown caterpillars that hide in the soil during the day and feed at night by cutting seedlings near the soil surface. Causes patchy gaps in the field, especially at early stages.

IPM Practices

a) **Cultural:**
- Deep summer ploughing to expose pupae.
- Maintain clean weed-free fields.
- Avoid continuous coriander cropping.

b) **Mechanical:**
- Hand-pick larvae in the evening.
- Use light traps (1 trap/ha) for monitoring adults.

c) **Biological:**
- Apply *Metarhizium anisopliae* or *Nomuraea rileyi* formulations.

d) **Chemical:**
- Apply chlorantraniliprole 18.5 SC @ 0.3 ml/l or spinosad 45 SC @ 0.3 ml/l at ETL (2–3 larvae/m²).

2. Leaf Miner (*Liriomyza trifolii*)

Scientific Classification:
- **Phylum:** Arthropoda
- **Class:** Insecta
- **Order:** Diptera
- **Family:** Agromyzidae
- **Genus:** *Liriomyza*
- **Species:** *L. trifolii*

Identification and Nature of Damage: Tiny flies whose larvae tunnel inside leaves forming white serpentine mines, reducing photosynthesis and vigor. Severely damaged leaves dry and shed prematurely.

IPM Practices

a) **Cultural:**
- Remove and destroy mined leaves.
- Avoid staggered sowing and overlapping crops.

b) **Mechanical:**
- Install yellow sticky traps (10–12/ha) for adult monitoring.

c) **Biological:**
- Release parasitoids *Diglyphus isaea* or *Opius pallipes* @ 1000 adults/ha weekly.

d) **Chemical:**

- Spray Abamectin 1.9 EC @ 0.5 ml/l or Spinosad 45 SC @ 0.3 ml/l if >30% leaves are mined.

3. Thrips (*Thrips tabaci*)

Scientific Classification:

- **Phylum:** Arthropoda
- **Class:** Insecta
- **Order:** Thysanoptera
- **Family:** Thripidae
- **Genus:** *Thrips*
- **Species:** *T. tabaci*

Identification and Nature of Damage: Slender insects with fringed wings. They feed on tender leaves, flowers, and umbels causing silvery patches and curling. Thrips also transmit viral diseases leading to flower deformation and yield loss.

IPM Practices

a) **Cultural:**

- Maintain adequate spacing and avoid water stress.
- Remove infested plant parts and weeds.

b) **Mechanical:**

- Install blue sticky traps (10/ha) for monitoring.

c) **Biological:**

- Conserve predators like *Orius laevigatus* and *Chrysoperla carnea*.

d) **Chemical:**

- Spray neem oil (3%) during early infestation.
- Apply Spinosad 45 SC @ 0.3 ml/l or Fipronil 5 SC @ 1 ml/l if pest exceeds ETL (5 thrips/leaf).

4. Red Spider Mite (*Tetranychus urticae*)

Scientific Classification:

- **Phylum:** Arthropoda
- **Class:** Arachnida
- **Order:** Acari
- **Family:** Tetranychidae
- **Genus:** *Tetranychus*
- **Species:** *T. urticae*

Identification and Nature of Damage: Minute reddish mites found on the underside of leaves, causing yellow speckling, bronzing, and curling. Heavy infestations lead to webbing and drying of foliage, especially under dry, warm conditions.

IPM Practices:

a) **Cultural:**

- Maintain field moisture and avoid dust accumulation.
- Remove infested plant debris.

b) **Mechanical:**

- Spray water to wash off mites during early infestation.

c) **Biological:**

- Introduce predatory mite *Phytoseiulus persimilis*.
- Use *Hirsutella thompsonii* (mycoacaricide) formulations.

d) **Chemical:**

- Spray wettable sulfur 80 WP @ 2 g/l or Fenpyroximate 5 SC @ 1 ml/l at ETL (10 mites/leaf).

5. Stem Borer (*Euzophera perticella*)

Scientific Classification:

- **Phylum:** Arthropoda
- **Class:** Insecta

- **Order:** Lepidoptera
- **Family:** Pyralidae
- **Genus:** *Euzophera*
- **Species:** *E. perticella*

Identification and Nature of Damage: Larvae bore into stems and feed internally, causing wilting and hollowing. Affected plants exhibit drying and reduced seed production.

IPM Practices:

a) **Cultural:**
- Destroy infested stems after harvest.
- Rotate with non-host crops like cereals.

b) **Mechanical:**
- Remove and burn infested shoots.

c) **Biological:**
- Apply *Bacillus thuringiensis* (Bt) formulations @ 1 g/l.

d) **Chemical:**
- Spray Chlorantraniliprole 18.5 SC @ 0.3 ml/l if infestation exceeds ETL (10% plants affected).

Conclusion

Coriander (*Coriandrum sativum L.*) is a highly valued aromatic herb and spice crop, extensively cultivated for its seeds and leaves, which are rich in essential oils and bioactive compounds. However, its productivity and quality are severely constrained by a variety of insect and mite pests that attack the crop at different growth stages—from seedlings to mature plants. Major pests such as coriander aphid, cutworm, leaf miner, thrips, red spider mite, and stem borer inflict direct and indirect damage, including sap-sucking, leaf mining, defoliation, webbing, stem boring, and vectoring of viral pathogens, leading to significant economic losses. Understanding the scientific classification of these pests provides critical insights into their life cycles, behavior, host specificity, and vulnerabilities, which are essential for effective pest management.

Integrated Pest Management (IPM) offers a sustainable, environmentally friendly, and economically viable approach for managing coriander pests. By integrating cultural practices (crop rotation, proper spacing, sanitation), mechanical measures (manual removal, traps, water sprays), biological control (predators, parasitoids, entomopathogens), and judicious chemical interventions based on Economic Threshold Levels (ETL), farmers can suppress pest populations effectively while conserving natural enemies and minimizing chemical residues. Emphasis on early detection, regular field monitoring, and adoption of resistant or tolerant varieties further enhances crop protection.

In addition, the adoption of IPM in coriander cultivation promotes ecological balance, reduces the risk of pesticide resistance, and ensures food safety and environmental sustainability. Educating farmers and extension workers about pest biology, identification, and ETL-based interventions is crucial for widespread adoption of these practices. Continued research on pest population dynamics, bio-control agents, and environmentally safe agrochemicals will strengthen the IPM framework. Overall, the application of a science-based, integrated approach not only safeguards coriander yield and quality but also contributes to sustainable agricultural development and higher profitability for farmers.

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