



Pacific Pests and Pathogens - Fact Sheets

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Amaranthus stem weevil (351)



Photo 1. Larva of *Hypolixus* species, inside hollowed out centre of Amaranthus stem. Note the amount of frass present.



Photo 2. Larvae and frass, *Hypolixus* species, inside hollowed out centre of Amaranthus stem.



Photo 3. Larva, *Hypolixus* species, inside Amaranthus stem.



Photo 4. Larva, *Hypolixus* species, inside Amaranthus stem.



Photo 5. Amaranthus stem weevil, *Hypolixus* species.

Common Name

Amaranthus stem weevil. Amaranthus weevil, pigweed weevil.

Scientific Name

Hypolixus species. The species recorded by CABI¹ are *Hypolixus ritsemae*, *Hypolixus truncatus*, and *Hypolixus nubilosus*. *Hypolixus haerens* is reported as the most common pigweed weevil in Kenya.

Distribution

Restricted. *Hypolixus truncatulus* (India, Mexico, Pakistan, and Thailand), *Hypolixus ritsmae* (Vanuatu), *Hypolixus haerens* (Kenya and South Africa), and *Hypolixus nubilosus* (Egypt and Kenya). The species in Fiji is unidentified.

Hosts

Amaranthus species. In Fiji, the edible variety (Indian spinach or *chauraiya*) is *Amaranthus viridis*. Other hosts of *Hypolixus* species are *Amaranthus spinosus*, a noxious weed in more than 40 countries, and the many *Amaranthus* species referred as "pigweeds". In India, *Hypolixus* is also recorded feeding on *Acacia*, and *Dalbergia* (rosewood), and *Hypolixus pica* on almond in Turkey.

Symptoms & Life Cycle

The grubs or larvae do the damage by boring through the central part of the stems and branches, which become filled with frass (Photo 1). Additionally, larvae and adults spread fungi (*Fusarium* species) that cause decay and cankers on in branches, stems and at the root collar. Several larvae (20 to 30) occur in the same stem causing plants to weaken, wilt, split longitudinally, and sometimes die. Plants are also more susceptible to wind damage.

Of the several species reported, studies have been mostly on *Hypolixus truncatulus* in India. The symptoms and life cycle of this species are given here. Eggs are laid singly in holes in the stems, branches or leaf stalks, and plugged by a green secretion from the weevil. The eggs hatch and the grubs bore into the stems to feed on the pith making zigzag tunnels that become filled with frass (Photos 2-4). After about a month, and several moults, the larvae pupate in chambers at the base of the stem or at the lowest branch. Here galls form. Just before pupation the larvae burrow to the surface of the stem leaving all but the outer layer as a 'window' to the outside. Pupation lasts about two weeks (at 27°C) after which the adult emerges through the window left by the larva. Adults, up to 14 mm long, dark brown with patches of light brown (Photo 5). They feed on *Amaranthus* leaves.

Survival occurs in the remains of the harvested stems, and also in the stumps left in the soil. Spread occurs in (traded) infested stems, and also by adult weevils on the wing.

Impact

Hypolixus attack on *Amaranthus* can result in stunted, twisted plants, and cankers on the stems and branches. In India, Kenya and Mexico, *Hypolixus* weevils are considered important pests, and in many other countries a potentially important one where fast growing *Amaranthus* is gaining popularity as a nutritious vegetable. The impact of these weevils is increased by their ability to spread *Fusarium* species that cause stem and branch decay and cankers.

The damage is such that in some countries *Hypolixus* has been used as a biocontrol agent. CABI¹ reports that *Hypolixus truncatulus* has been released in Thailand for the control of *Amaranthus spinosus*, a major weed of many crops. The releases have been so successful that the weevil may replace the use of herbicides for control of this weed.

Detection & inspection

Look for plants that are stunted, wilted, deformed; slit open the stems to find the tunnelling larvae in galleries filled with frass. Look for the adults on the foliage.

Management

CULTURAL CONTROL

Before planting:

- Collect and destroy wild *Amaranthus* in the vicinity of cultivated crops.
- Do not plant new *Amaranthus* crops next to those that are infested with the weevil.

During growth:

- Monitor crops regularly, and pull out and destroy any wilting plants.

After harvest:

- Collect and burn or bury as much of the crop as possible

CHEMICAL CONTROL

In India, boiled neem seed extract (5% w/v) is used as a spray on *Amaranthus* crops. Malathion has also been recommended. It is likely

that plant-derived-products (botanicals), derris and pyrethrum would also be effective against adults, as would synthetic pyrethroids. However, it is doubtful that any of these products are likely to be effective against larvae and pupae concealed within the stems and branches.

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¹CABI *Amaranthus spinosus* (spiny amaranth) (2017) Crop Protection Compendium. (www.cabi.org/cpc). Information from Tara JS (2009) Bionomics of *Hypolixus truncatulus* (L.) (Coleoptera: Curculionidae: Lixinae: Lixini), a major pest of *Amaranthus caudatus* L. Mun. Ent. Zool. Vol. 4(2); and Chittora A (2015) Insect pests of amaranthus and moringa. (<https://www.slideshare.net/AkshayChittora/insect-pests-of-amaranthus-and-moringa-53613459>); and Rajeshkanna *et al.* (2017) Biology and management of Amaranthus stem borer (*Hypolixus truncatulus*) Coleoptera: Curculionidae). Annals of Sri Lanka Department of Agriculture 19: 258-266; and from Blodgett J., Swart WJ, Louw SvM (2004) Identification of fungi and fungal pathogens associated with *Hypolixus haerens* and decayed and cankered stems of *Amaranthus hybridus*. Plant Disease 88:333-337. Photos 1-5 Mani Maa, SPC, Sigatoka Research Station, Fiji.

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