

## Biology and Management of Cotton Grey Weevil: A Review

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### ABSTRACT

*Cotton grey weevil is becoming a primary pest of agricultural and horticultural crops all over the world including Pakistan. The various management strategies such as chemical, biological and cultural have been adopted against this pest throughout the globe. The previous published literature was reviewed with the aim to evaluate the best strategy among all strategies to control the pest. Male is shorter as compared female with approximately 6.0 to 8.5 mm length. Adult feed on the leaves and cause huge crop losses. The current reviewed literature concluded that chemical control can give quick control of adult due to their fly ability while control of pupae, larvae and eggs is difficult due to their location in or on the soil. The excessive use of chemicals to control pest can caused mortality of other biological fauna. To avoid the excessive application of chemicals, biological and botanical control should be promoted and applied that will prove best option against the current pest.*

**Keywords:** *Cotton grey weevil, Asian grey weevil, Life cycle, Host plants, Integrated Pest Management.*

### INTRODUCTION

*Cotton grey weevil, Myllocerus* spp. is the most important pest of cotton crop which belonging to Curculionidae family under the order Coleoptera. It is the most destructive pest of various fruit and ornamental plants (Hill 1987; & Mannion et al., 2006). It is also called Asian grey weevil/Sri lankan weevil which has been spread from Asia (Pakistan, Indian, Srilanka) to America and European countries. Almost there are 336 species of this

Genus has been identified from Asia, Africa, Australia, America (O'Brien et al., 2006) and about 73 species reported from the Indian subcontinent.

It is a polyphagous insect, attack on more than 20 host plants which are economically important. The adult of this pest damages the different ornamental, fruit and vegetables plant species feeding on foliage, however, larvae attack on roots.

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This pest attack can be controlled by traditional techniques including insecticidal applications. Owing to its flight behavior, hiding ability, chemicals-based practices are considered not good for the control of its attack. The weevils can be eliminated from plants by shaking a branch to collect and dumped into the soapy water. The insecticides recommended by the government has applied in field for pest attack control and updated yearly.

The IPM practices such as carious agronomic practices, chemicals, biological practices and mass trapping of adults have been developed and implemented in all over the world where this pest attack has severally found.

### Taxonomic classifications

*Mylocerus* most common genus of grey weevil which has different species and subspecies which attack on more than 20 different crops in Indo-Pak subcontinent (O'Brien et al., 2006). The most important species including cotton grey weevil, *Mylocerus maculosus* Desbrochers (Curculionidae: Coleoptera), Asian Grey Weevil, *Mylocerus undecimpustulatus undatus* Marshall (Curculionidae: Coleoptera) and also called Srilankan weevil. The other species almond weevil (*M. leivirens*), mango leaf weevil (*M. sabulosus*), cocoa green leaf weevil (*M. viridanus*), apple weevil (*M. discolor*) and coconut ash weevil (*M. curvicornis*).

### Hosts range

The Genus *Mylocerus* of economic importance and has a wide host range of over 150 plant species. There are many plant species can be attacked by this pest including Citrus (*Citrus* spp.), Green buttonwood (*Conocarpus erectus*), Hong Kong orchard trees (*Bauhinia x blakeana*), Coco-palm (*Chrysobalanus icaco*), Date palm tree (*Phoenix roebellenii*), Peach tree (*Prunus persica*), Crepe myrtle (*Lagerstroemia indica*), Pepper (*Capsicum* spp.), Strawberry plant (*Muntingia calabura*), Egg-plant (*Solanum melongena*), Plumbaginaceae (*Plumbago auriculata*),

Polygonaceae (*Coccoloba diversifolia*), Rhamnaceae (*Kragiodendron ferreum*), Rosaceae (*Eriobotrya japonica*), Ulmaceae (*Celtis laevigata*), Verbenaceae (*Duranta erecta*), Vitaceae (*Parthenocissus quinquefolia*), Aquifoliaceae (*Ilex cassine*), Arecaceae (*Caryota nucifera*), Asteraceae (*Ambrosia artemisiifolia*), Bombacaceae (*Bombax ceiba*), Calophyllaceae (*Mammea sapota*), Chenopodiaceae (*Spinacia oleracea*), Chrysobalanaceae (*Chrysobalanus icaco*), Combretaceae (*Bucida buceras*), Cupressaceae (*Platycladus orientalis*) and Elaeocarpaceae (*Muntingia calabura*).

Another plant species Areca palm (*Dypsis lutescens*); Longan (*Euphoria longana*), Hibiscus plant (*Hibiscus rosa-sinensis*); Lychee tree (*Litchi chinensis*), Mamey (*Mammea sapota*); Winged bean (*Psophocarpus tetragonolobus*), Australian bush-cherry (*Syzygium paniculatum*) and Tropical almond (*Terminalia catappa*) (Shanthichandra et al., 1990; & Thomas, 2000).

### Global Distribution

The *Mylocerus* spp., found in all over the world from Asian continent (India, Pakistan, China, Japan and Srilanka) Americas Florida sites (Charlotte, Collier, Miami-Dade, Palm Beach, Orange, Polk and Sarasota) (George et al., 2015); Africa, Palearctic, Indonesia and Australia and Europe. It was first reported from Srilanka in 1990 from leaves of winged bean (Shanthichandra et al., 1990); from South Florida, it was reported in 1995; USA from Broward County, FL, 2000; India (Kerala) 2010; Caribbean UK Overseas Territories, 2016; (Thomas 2005; O'Brien et al., 2006; & Josephraj Kumar, 2011).

### Biology and life cycle

#### Eggs

The female weevil laid up to 360 eggs on organic materials on the soil surface within the 24 hours. The eggs are oval shaped (0.5 mm length) creamy white in color laid in clusters form. At near to hatching creamy color change into brownish (Atwal, 1976).

**Larvae**

The white color grub with brownish red head size ranges 1-4 mm in length from first to later instar larvae (fourth). They feed on the roots of plants under the soil and then pupate inside the soil (Butani, 1979).

**Pupal stage**

Pupation took place in soil which lasted 5-7 days.

**Adults**

The adults of this weevil may range from 6-8.5mm in length while female weevil is larger than male (1-2 mm approximately), and weevils have dark dotted to greyish elytra with yellow colored head. The weight of the female weevil is twice that of male (George et al., 2015). The weevils feed on the margin of leaves and eating away small patches of leaf lamina, adult lives vary in both seasons from summer (8 -11 days) to winter (4-8 months) (Butani, 1979).

**Total life period from egg to adult**

Its total life period from egg to adult was three weeks that reported by many researchers. The variations had been recorded by many early researchers on the basis of environmental conditions (Thomas, 2005).

**No. of generations**

8-10 number of generations per year had been reported by many scientists (Josephraj Kumar et al., 2010).

**Damage**

Leaf notching can cause during severe attack of adults that feed on leaves. Adults feed on the margin or corner of leaf and during severe attack of pest, complete defoliation of leaves occurred. It has been observed that adults mostly feed on the new leaves of plant and resulting plant decline and even stunting the plant growth (Arevalo & Stansly, 2009; & George et al., 2019).

**Management****Quarantines**

Several species of the Genus *Myllocerus* has been considered pests but no patent information on a specific quarantine was found. Although, few references exist on this weevil may be considered as a pest of quarantine significance.

**Cultural Control**

The grub of this weevil can be killed by frequent hoeing, trap cropping is a very good strategy to eradicate cotton grey weevil from

the cotton field. Integration of cultural practices with other practices is a tremendous potential for the management of cotton grey weevil. By use of these practices, farmer will be less dependent on the use of chemical based products for insect pest control and are very helpful for small scale farmers.

**Biological control**

Several natural enemies are helpful for the control of *Myllocerus undecimpustulatus undatus*. Braconid parasite *Dinocampus mylloceri* Wilkinson (Pruthi and Batra, 1960) and semi-parasitic mite was recorded as natural enemies of this weevil. In India, semi-parasitic mites have been observed in the body of cotton grey weevil during experiment (Geetha et al., 2013). These all may be considered as biological control agents for this weevil.

**Chemical Control**

Several insecticides carbaryl, acephate and pyrethroids are effective for controlling of leaf-feeding insects and these are especially for *Myllocerus* spp., to suppress the populations. However, larvae buried inside the soil and pupate, so methyl iodide and methyl bromide soil fumigation techniques have good options as fumigants against these types of insects (Eayre et al., 2000; & Waggoner et al., 2000). (Arevalo & Stansly, 2009) applied chlorpyrifos on ground and foliage which provided better control against the cotton grey weevil in Florida.

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