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Section III: Weeds and potential biological control agents – The spurges

N.E. REES, R.W. PEMBERTON, N.R. SPENCER, P.C. QUIMBY, Jr. and R.M. NOWIERSKI

Rees and Quimby are with the USDA, Agricultural Research Service, Range Weeds & Cereals Research Unit, Montana State University, Bozeman, MT; Pemberton is with the USDA, Agricultural Research Service, Ft. Lauderdale, FL; Spencer is with USDA, Agricultural Research Service, Northern Plains Soil & Water Research Center, Sidney, MT, and Nowierski is with the Department of Entomology, Montana State University, Bozeman, MT

(*Articles begin on following page.)



Aphthona chinchihii

Common name: (None widely accepted)

Type of agent: Insect: Beetle, flea beetle
(Coleoptera: Chrysomelidae).

Native distribution: China.

Original source: China.

BIOLOGY

Generations per year: One.

Overwintering stage: Larval (in the young roots).

Egg stage: Eggs are deposited on the soil surface near the plant or on the plant stem at ground level throughout the summer months.

Larval stage: Upon hatching, larvae migrate down the stem to the root hairs where they begin feeding. They feed through the summer and fall months. Third-instar larvae migrate to the young roots, overwinter, and pupate in the spring. Larvae are similar in size and color to other introduced *Aphthona* species.

Pupal stage: Larvae pupate in the spring and early summer.

Adult stage: Adults are found in the field from early summer until fall.

This species is similar in appearance and color to *A. flava* and is slightly smaller in size at 3 to 3.25 mm (0.12 to 0.13 in) long.



USDA-ARS

Aphthona chinchihii adult on leafy spurge.

Actual adult size



EFFECT

Destructive stages: Adults feed on the foliage, but the main damage is caused by the larvae feeding upon the roots.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex).

Site of attack: Adults feed on the foliage, while the larvae feed in the root hairs and young roots.

Impact on the host: Because of the leaf feeding by the adults, the plants will lose the ability to replace root reserves; the root feeding stunts plant growth and delays the flowering period.

RELEASES

First introduced into the United States: This species is undergoing host-specificity testing in quarantine and is not approved for field release.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stage to transfer: Adult.

Redistribution: Collect the adults with a sweep net. Adults can be kept for several weeks in storage and about a week in shipment if sufficient food is available and insects are kept cool.

COMMENTS

It is believed that the impact of this species will be similar to that of other flea beetles, except probably in a different environment.

Contacts: Luca Fornasari, Lloyd Knutson, Norman Rees, Neal Spencer



Aphthona seriata

Common name: (None widely accepted)

Type of agent: Insect: Beetle, flea beetle
(Coleoptera: Chrysomelidae).

Native distribution: China.

Original source: China.

BIOLOGY

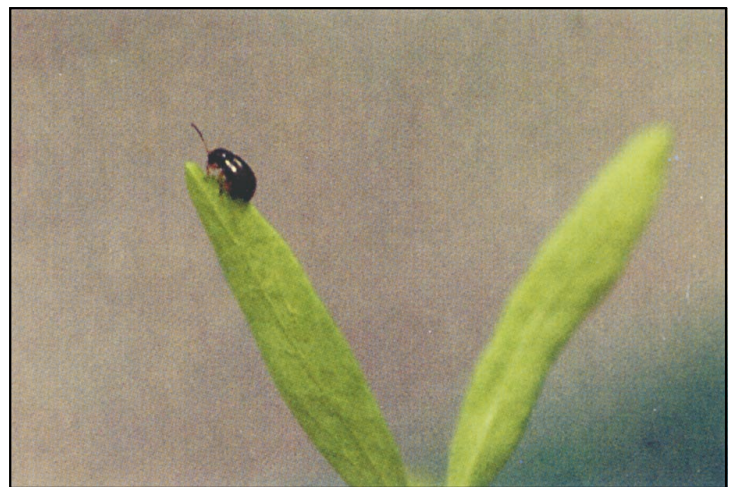
Generations per year: One.

Overwintering stage: Larval.

Egg stage: Eggs are deposited near the juncture of the main stem of the leafy spurge plant and the soil in early spring.

Larval stage: Larvae are present in early spring. The larvae are similar in size and color to other introduced *Aphthona* species.

Adult stage: The adults are black flea beetles that emerge in early summer. They are 2.5 to 2.75 mm (0.1 to 0.11 in) long.



USDA-ARS

Aphthona seriata on leafy spurge.

EFFECT

Destructive stages: Adult and larval.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex).

Site of attack: Adults feed on the leafy spurge foliage while the larvae feed in or on the root hairs and young roots.

Impact on the host: The effects of adult feeding are similar to sheep grazing; larval feeding in the roots reduces the plant's ability to take up nutrients and moisture.

Actual adult size



RELEASES

First introduced into the United States: This species has not been approved for field release.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stage to transfer: Adult.

Redistribution: Collect the adults with a sweep net, sort them, and confine them on plants or in cool containers with food until released.

COMMENTS

This species is similar in color to *A. czwalinae* and is believed to be somewhat similar in action. It appears to have good potential as a biological weed control agent.

Contacts: Luca Fornasari, Lloyd Knutson, Norman Rees, Neal Spencer.



Aphthona venustula

Common name: (None widely accepted)

Type of agent: Insect: Beetle, flea beetle (Coleoptera: Chrysomelidae).

Native distribution: Europe.

Original sources: The former Yugoslavia, Italy, and Switzerland.

BIOLOGY

Generations per year: One.

Overwintering stage: Adult.

Egg stage: Eggs are laid singly or in small groups underground or near a host stem. Egg development takes about two weeks at 21° C (70° F).

Larval stage: Laboratory studies by the International Institute of Biological Control (IIBC) showed the larval feeding range to be restricted to plants in the subgenus *Esula*.

Adult stage: Adults in Europe are found from early March to early November, and are most abundant from early April to early May. Most of the egg-laying by the adult females is completed in early spring. Laboratory studies by IIBC suggest that adult feeding is restricted to plant species in the genus *Euphorbia*.

EFFECT

Destructive stages: Larval and adult.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex) and also *E. amygdaloides*, *E. salicifolia*, and *E. virgata*.

Site of attack: Larvae feed in the root hairs and young roots, while the adults feed on leaves and flowers of the host plants.

Impact on the host: Similar to that of the other *Aphthona* species.

RELEASES

First introduced into the United States: This species is still being tested by IIBC and has not yet been approved for field release.

Now established in: Not released.

Habitat: This species appears to like moist, shady habitats, and is also found in sunny and dry areas in Italy.

Availability: Unavailable.

Stage to transfer: Adult.

Redistribution: Collect the adults with a sweep net.

COMMENTS

Information about this insect is very limited from IIBC as of 1995.

Contacts: Gaetano Campobasso, Robert Nowierski, Dieter Schroeder



Chamaesphecia astatiformis

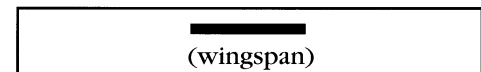
Common name: (None widely accepted)

Type of agent: Insect: Moth, clearwing (Lepidoptera: Sesiidae).

Native distribution: Southeastern Austria, southern Slovakia, Hungary, northern region of the former Yugoslavia, Romania, and across southern Russia east to the Caucasus and central Asia.

Original source: Europe.

Actual adult size



BIOLOGY

Generations per year: One.

Overwintering stages: Sixth- or seventh-instar larval.

Egg stage: Eggs are deposited singly on younger vegetative shoots that are less than 15 cm (6 in) high. They are generally on the lower leaf surface or in the leaf axil in the upper part of the shoot. Females deposit an average of 92 eggs. The incubation period is about 17 days.

Larval stage: Larvae penetrate the plant underground at the stem base and migrate to the root.

There are probably seven larval instars, the sixth or seventh being attained just before winter.

Pupal stage: Larvae generally pupate in 2 to 4 cm (0.8 to 1.6 in) long silky funnels which end at the soil surface.

Adult stage: The moths emerge from early May until late June. They have a wingspan of 13 to 20 mm (0.52 to 0.8 in).

EFFECT

Destructive stage: Larval.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex), cypress spurge (*E. cyparissias*), *E. incisa*, and *E. virgata*.

Site of attack: Roots.

Impact on the host: The larvae reduce root reserves by feeding and living within the larger portions of the host root. In most plants the root is generally destroyed by the time of pupation and there is no vegetative regrowth.

RELEASES

First introduced into the United States: This species is still undergoing host-specificity testing and has not yet been approved for field release.

Now established in: Not released.

Habitat: *Chamaesphecia astatiformis* appears to like mesic to dry, loamy soils in steppe-type biomes; along roadsides; dense, high vegetation; and field margins of continental and subcontinental climates with warm summers.

Availability: Unavailable.

Stage to transfer: Adult.

Redistribution: Collect with a sweep net.

COMMENTS

This species seems to prefer smaller plants than does *C. tenthrediniformis*.

Contacts: Peter Harris, Robert Nowierski, Norman Rees



Note: *C. crassicornis* has been approved for release in the United States since publication of this book.

Chamaesphecia crassicornis

Common name: (None widely accepted)
Type of agent: Insect: Moth, clearwing
 (Lepidoptera: Sesiidae).
Native distribution: Eastern Austria, Romania,
 and southern Czechoslovakia.
Original source: Romania.

BIOLOGY

Generations per year: One, although some individuals may require two years to complete a generation.

Overwintering stage: Pupal.

Egg stage: Eggs are laid in mid-June in Romania.

Eggs are generally deposited in groups of two to four along the stems. The incubation period is 11 to 16 days. Eggs are oval and flattened, dark brown when laid and becoming light brown after emergence of the larvae. The surface of the egg is covered with a network of slightly raised veins which form pentagonal and hexagonal shapes.

Larval stage: Newly emerged larvae either crawl down the stem from where the eggs were laid or drop to the ground before penetrating the plants. They feed just under the cortex below the crown of the plant.

It is believed that there are five larval instars. Third-instar larvae begin to penetrate the central part of the root, and finally the last instar larvae make tunnels about 10 to 20 cm (4 to 8 in) long in the root which they fill with excrement. By the time the larvae reach maturity, the part of the root that contains the tunnels is almost completely destroyed. Mature larvae move to the lower part of the stem where they chew exit holes, then cover them with frass, and pupate.

Pupal stage: The pupal period can last through the winter or through a season and a half, with the adult emerging the following year. During emergence, the pupa protrudes from the stem for about three-fourths of its length and holds itself in place with its anal hooks. In this way the emerging moth is able to free itself.

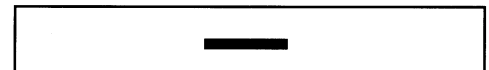
Adult stage: Adults are present from late May until late July. Males live seven days while the females live an average of five days. Gestation lasts one to three days. Number of eggs per female is 29 to 33. Adults are dark brown with yellow and cream striping. They measure 10.4 to 11.6 mm (0.42 to 0.46 in) long with a wingspan of 16 to 22 mm (0.64 to 0.88 in). Hyaline areas of the wing are devoid of scales.



USDA-ARS

Chamaesphecia crassicornis adult.

Actual adult size



EFFECT

Destructive stage: Larval.

Plant species attacked: Leafy spurge
(*Euphorbia virgata* group).

Site of attack: The lower stems are slightly damaged but major damage occurs in the root system.

Impact on the host: The roots that contain larvae are nearly destroyed, the root reserves are reduced, and the plant's ability to replace these reserves is greatly decreased. The vigor of the plant is reduced as is the number of root buds.



RELEASES

First introduced into the United States: This species is being tested for host specificity and has not yet been approved for field release.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stages to transfer: Pupal. Adults can be reared from pupae that are shipped within the roots. Adults kept cool and quickly transported by hand may survive, but adults shipped by commercial carrier will probably arrive damaged and be unable to lay viable eggs.

Redistribution: Dig infested roots from an area where the agent population is high. If proper equipment is available, fertile eggs can be collected in the laboratory and applied to the plants in the field. It may be some time before sufficient numbers of adults will be present for sweep net collections. As long as the roots are not adversely affected by the transfer, the insects do well in them.

COMMENTS

This species is greatly restricted in two ways: it has a narrow host range and is able to survive only in the *E. virgata* group, and it has a very narrow microclimatic and ecological niche.

Contacts: Gaetano Campobasso, Massimo Cristofaro, Pasquale Pecora, Norman Rees, Dieter Schroeder, Neal Spencer

USDA-ARS

Root damage caused by *Chamaesphecia crassicornis*.



Oncochila simplex

Common name: (None widely accepted)

Type of agent: Insect: Bug, lace bug
(Hemiptera: Tingidae).

Native distribution: Europe from Spain to the former USSR (Armenia, Turkistan, Caucasus, Ukraine), from Denmark to Tunisia and southern England.

Original source: Italy.

BIOLOGY

Generations per year: Up to five.

Overwintering stages: Adult and nymph [at the base of the host plant, about 4 to 5 cm (1.6 to 2 in) below the soil surface].

Egg stage: Females average 175 eggs which are deposited within the stems. Incubation takes about 11 days. Eggs are saccular, noticeably curved, and glassy.

Nymphal stage: After hatching, the nymphs assemble in clusters near the empty egg cases and begin to feed. Young nymphs are glassy but turn light gray with age. The top or dorsal surface is smooth and armed with modified lateral spines. There are four nymphal instars. As each instar molts, the cast skin remains attached to the plant.

Adult stage: Adults are first detected in Italy about the end of March and are seen until the end of September. Under ideal conditions, the life cycle requires 33 to 40 days, and the adults live 50 to 70 days. Gestation is 10 to 12 days which is followed by a 36 day egg-laying period. The adults are small [about 4 mm (0.16 in) long] and have a sculptured, lace-like pattern on the upper surface of the body, head, and lateral expansions of the thorax and wings. They possess piercing-sucking mouth parts.

EFFECT

Destructive stages: Nymphal and adult.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex), *E. characias*, *E. cyparissias*, *E. gerardiana*, *E. lathyris*, *E. serrata*, and *E. virgata*, as well as *Thymus* sp. and tansy ragwort (*Senecio jacobaea*).

Site of attack: Stems and leaves.

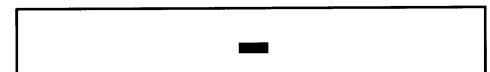
Impact on the host: This multivoltine species is well synchronized with the growing season of



USDA-ARS EBCL

Oncochila simplex adult.

Actual adult size



E. esula. The combined feeding of adults and nymphs causes severe defoliation and death of the host plants' top growth.

RELEASES

First introduced into the United States: *Oncochila simplex* is still being screened and is not approved for field release.

Now established in: Not released.

Habitat: It does well at 20° C (68° F), 70% relative humidity, and 16:8 photoperiod.

Availability: Unavailable.

Stages to transfer: Nymphal and adults.

Redistribution: Collect with a vacuum near the base of the spurge plants. The insects can be kept for short periods at cool temperatures. Shipments should contain plant material and should not exceed four days.

COMMENTS

In host-specificity tests, this insect did complete development on lettuce and corn in addition to the species listed above. However, females did not lay eggs on these plants and there are no records in the literature that this species has ever been collected from or has been a pest of corn or lettuce. Scientists in Europe are now growing corn and lettuce in fields infested with leafy spurge and this candidate agent to determine whether the insect damages these crops.

Contact: Gaetano Campobasso, Norman Rees



Oxicesta geographica

Common name: (None widely accepted)

Type of agent: Insect: Moth
(Lepidoptera: Noctuidae).

Native distribution: Southern Romania, southern Russia, Austria, the former Yugoslavia, Hungary, and Turkey.

Original sources: Hungary, Romania, and Russia.

BIOLOGY

Generations per year: Multivoltine, three to four generations annually

Overwintering stage: Pupal.

Egg stage: Females lay between 60 and 450 eggs. Single egg batches sometimes consist of more than 300 eggs. Eggs are deposited on the underside of the leaves in rows. The incubation period is 9 to 12 days. Eggs are light yellow when deposited, but turn dark brown in two to three days. They are nearly spherical in shape.

Larval stage: There are five larval instars. Larvae move to the top of the plant and make a silken tent which increases in size as the larvae grow. Older larvae feed outside the tent, but return to the tent to rest. As the larvae mature, they completely defoliate the plant near where the eggs were laid as well as adjacent plants.

Mature larvae migrate away from the plants where they fed and pupate in dried leaves.

Dorsal and lateral parts of the larvae are hairy; larvae of the first two instars are light brown and less hairy than older instars. Third to fifth instars are dark brown with yellowish and reddish intersegmental bands.

Pupal stage: Pupal development takes two to three weeks.

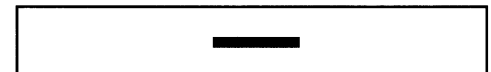
Adult stage: Adults emerge within nine to 13 days after formation of the cocoon and live for about five to eight days (under laboratory conditions). Females lay eggs one to three days after mating. In Russia and Hungary, adults emerge during the second half of July from larvae that are in the field in June. Adults measure 9 to 12 mm (0.4 to 0.5 in) long with a wingspan of 22 to 25 mm (0.9 to 1.0 in). Front wings of the males are light brown with whitish veins and white, angular, transverse stripes. The hind wings of the female are darker than the male's. Female antennae are hair-like, while those of the male are brush-like. The head, thorax, and upper part of the legs of both sexes are covered by tufts of long hairs.



USDA-ARS EBCL

Oxicesta geographica adult.

Actual adult size



EFFECT

Destructive stage: Larval.

Plant species attacked: *Euphorbia amygdaloides*, *E. ceratocarpa*, *E. cyparissias*, *E. lucida*, *E. maculata*, *E. mili*, *E. myrsinites*, *E. oblongata*, *E. palustris*, *E. polychroma*, *E. seguieriana*, *E. stepposa*, and *E. virgata*.

Site of attack: Leaves and flowers.

Impact on the host: Plants are completely defoliated and heavily webbed by this moth.

RELEASES

First introduced into the United States: Currently being tested by USDA-ARS in Europe.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stages to transfer: Larval (hand-carried to new locations); otherwise ship at larval, pupal, and/or egg stage.

Redistribution: Hand-pick mature larvae and, if shipment is intended, allow them to pupate in plant duff. If larvae have been subjected to cool temperatures and decreased day length, the pupae may be stored at 4 to 8° C (39 to 46° F) for several months. Otherwise, storage and shipments should not last longer than about two weeks.



USDA-ARS EBCL

Older *Oxicesta geographica* larva.

COMMENTS

Two hymenopteran parasitoid species, *Aleiodes rugulosus* and *Apanteles* sp., are recorded in Romania.

There is great variation in the host requirements of *Oxicesta geographica* in Europe which indicates different strains of this agent. In laboratory studies, several biotypes of *E. virgata*, along with *E. ceratocarpa* and *E. maculata*, were utilized by the Romanian populations, whereas the other species were utilized by the Russian and Hungarian populations. The strains with a wider host range generally will have more difficulty meeting USDA-APHIS-PPQ requirements for introduction into the United States.



USDA-ARS EBCL

Younger larvae live within a silken tent.

Contacts: Gaetano Campobasso, Jeff Littlefield, Chuck Quimby, Norman Rees, Neal Spencer



Pegomya curticornis

Common name: (None widely accepted)

Type of agent: Insect: Fly
(Diptera: Anthomyiidae).

Native distribution: Central and western Hungary and eastern Austria.

Original sources: Hungary and Austria.

BIOLOGY

Generations per year: One.

Overwintering stage: Pupal (in galled shoots).

Egg stage: Eggs are laid three to four days after adults emerge, generally in early April. Eggs are usually laid singly or in clusters between the immature leaves and floral parts at the tip of developing shoots when the plants are about 20 cm (8 in) high.

Larval stage: For the first four to five weeks, the larvae feed as borers. Larvae first burrow into the developing stem and into and through young leaves or bracts of the shoot tip. They then bore down the center of the shoot, feeding on the pith. This feeding causes callus tissue to form around the tunnel, which builds up if not fed upon. After about four weeks larvae reach the base of the plant. They feed for the next six to eight weeks within the lower part of the stem where they form galls. As the galls are produced, the larvae feed on callus. Galls become apparent between 30 and 40 days after eggs are laid. There are three larval instars; total larval development requires 60 to 80 days in the field.

Pupal stage: Pupation generally occurs in June.

Adult stage: Adults emerge in March and April. Adults are medium-sized flies, with a wing length of 5.0 to 5.6 mm (0.20 to 0.22 in).

EFFECT

Destructive stage: Larval.

Plant species attacked: Leafy spurge (*Euphorbia esula* complex), *E. pseudovirgata*, and cypress spurge (*E. cyparissias*).

Site of attack: Young larvae enter the tip of developing shoots and burrow down the stem to a point below the soil surface.

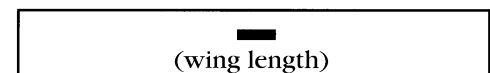
Impact on the host: Galled shoots wilt and eventually die.



USDA-ARS

A discolored leafy spurge stem and gall caused by *Pegomya*.

Actual adult size



RELEASES

First introduced into the United States: Still being tested.

Now established in: Not released

Habitat: Undetermined.

Availability: Unavailable.

Stage to transfer: Pupal (in galls).

Redistribution: Clip the plant above and below the resting place of the pupae. Pupae can be stored at cool temperatures for several months if they are still in winter dormancy.

COMMENTS

Galls containing this fly are about 10 to 15 mm (0.4 to 0.6 in) long and about 4 to 7 mm (0.16 to 0.28 in) wide. They appear as slight swellings of shoots with the surface always smooth. Immature galls are light green or white, but turn brown as they mature. Mature galls that contain pupae have horizontal slits that were created by the mature larvae and that will be used by the adults to escape from the galls. All galls are found on the underground part of the stem, and generally cause the stem to wilt, dry, and eventually break off at ground level.

This species is very close to *Pegomya euphorbiae* in appearance and action.

Contacts: Andrea Gassmann, Robert Nowierski, Norman Rees, Neal Spencer



Pegomya euphorbiae

Common name: (None widely accepted)

Type of agent: Insect: Fly
(Diptera: Anthomyiidae).

Native distribution: Germany, eastern Poland, northeastern France, Italy, Hungary, and the former Yugoslavia.

Original sources: Hungary, Germany, and the former Yugoslavia.

BIOLOGY

Generations per year: One.

Overwintering stage: Pupal (in the galled shoots).

Egg stage: Eggs are deposited three to four days after adults emerge, generally in late March or early April when the plants are about 20 cm (8 in) tall. They are laid singly or in clusters, and generally among the immature leaves and floral parts at the tip of developing shoots.

Larval stage: Only one larva develops per shoot.

For the first four to five weeks, the larvae feed as borers. Larvae first burrow into the developing stem and into and through young leaves or bracts of the shoot tip. They then bore down the center of the shoot, feeding on the pith. This feeding causes callus tissue to form around the tunnel, which builds up if not fed upon. After about four weeks the larvae reach the base of the plant. The larvae then feed for the next six to eight weeks within the lower part of the stem where they form galls. As the galls are produced, the larvae feed on callus. Galls become apparent between 30 and 40 days after eggs are laid. There are three larval instars; total larval development requires 60 to 80 days in the field.

Pupal stage: Pupation generally occurs in June.

Adult stage: Adults emerge in March and April in Europe. Adults are typical, medium-sized flies, with a wing length of 5.0 to 5.6 mm (0.20 to 0.22 in). Males are powdery grey to brownish grey and are differentiated from *P. curticornis* by a frontal stripe that is narrower than the parafrontals.

EFFECT

Destructive stage: Larval (within the shoots).



IIBC

Pegomya euphorbiae adult.

Actual adult size

—
(wing length)

Plant species attacked: The primary host is cypress spurge (*E. cyparissias*), but *E. lucida*, *E. seguierana*, and *E. waldsteinii* are also attacked.

Site of attack: Young larvae enter the tip of developing shoots and burrow down the stem to a point below the soil surface.

Impact on the host: Galled shoots wilt and eventually die.

RELEASES

First introduced into the United States: Still being tested.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stage to transfer: Probably pupal (in the galls).

Redistribution: Cut the plant above and below the gall. Galls with pupae can be kept for a season if the pupae are still in winter dormancy.

COMMENTS

Galls containing this fly are about 10 to 15 mm (0.4 to 0.8 in) long and about 4 to 7 mm (0.16 to 0.28 in) wide. They appear as slight swellings of shoots with the surface always smooth. Immature galls are light green or white but turn brown as they mature. Mature galls that contain pupae have horizontal slits that were created by the mature larvae and that are used by the adults to escape the galls. All galls are found on the underground part of the stem, and generally cause the stem to wilt, dry, and eventually break off at ground level.

Contacts: André Gassmann, Norman Rees, Neal Spencer



Simyra dentinosa

Common name: (None widely accepted)

Type of agent: Insect: Moth
(Lepidoptera: Noctuidae).

Native distribution: Southern Russia, northern Asia Minor, central Asia, Palestine, southern Siberia, and the eastern part of southern Europe, including the former Yugoslavia, Albania, Turkey, Bulgaria, Romania, Greece, and Armenia.

Original source: Greece.

BIOLOGY

Generations per year: One.

Overwintering stage: Pupal.

Egg stage: Eggs are laid on the lower surface of single leaflets in regular rows and in masses, and require a 16- to 19-day incubation period. The disc-like, flat eggs are light yellow when deposited and turn brown as they mature.

Larval stage: There are six larval instars. The first to fourth instars are extremely gregarious. They construct silken webs within which they live and feed. After the first molt, larvae may move to another branch and construct other silken webs. The fifth and sixth instars become solitary, moving from plant to plant as the food supply becomes exhausted. First instars have dark brown heads, yellowish bodies, and their thoracic and abdominal segments possess brown tubercles from which long black hairs protrude. Second and third instars are brownish, while fourth to sixth instars are dark brown with light brown intersegmental bands. The dorsal part of the thoracic and abdominal segments have light brown, hairy tubercles. The sides and lower parts of the thorax and the first six abdominal segments are reddish, while the remainder of the abdominal segments are brownish.

Pupal stage: Pupation occurs in a silken cocoon constructed within dry, twisted leaves.

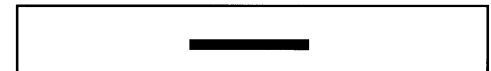
Adult stage: Adults are present from late March until mid- or late April. The wings are light brown with rounded outer edges. The thorax is convex and completely covered with tufts of long, grey hairs. The abdomen is conical and hairy, the female's being swollen and the male's being narrow. Adults measure 14 to 17 mm (0.6 to 0.7 in) long and have a wingspan of 36 to 40 mm (1.4 to 1.6 in).



USDA-ARS EBCL

Simyra dentinosa adult.

Actual adult size



EFFECT

Destructive stage: Larval.

Plant species attacked: *Euphorbia seguieriana* and *E. virgata* are attacked in the field. In laboratory tests, *E. maculata* and *E. spathulata* were suitable hosts.

Site of attack: Leaves and flowers.

Impact on the host: In Greece, *S. dentinosa* larvae feed during April and May when the host plant is in the bolting and blooming stages. Feeding occurs either on the terminal growth or on the top of flowering shoots. When heavily attacked, the aerial portion of the plant is usually seriously damaged, preventing seed production. Some plants can be completely destroyed.

RELEASES

First introduced into the United States:

Still being tested.

Now established in: Not released.

Habitat: Undetermined.

Availability: Unavailable.

Stage to transfer: Pupae.

Redistribution: Hand-pick mature larvae and, if shipment is intended, allow them to pupate in plant duff. If larvae have been subjected to cool temperatures and decreased day length, the pupae may be stored at 4 to 8° C (30 to 46° F) for several months. Otherwise, storage and shipments should not exceed about two weeks.

COMMENTS

In Europe, larvae may be parasitized by *Apanteles* spp. and the pupae by a tachinid species.

Contacts: Jeff Littlefield, Chuck Quimby, Norman Rees, Neal Spencer



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Simyra dentinosa larval mass.



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Older larva of *Simyra dentinosa*.