

# *Oberea erythrocephala*



## Classification

**Phylum:** Arthropoda

**Class:** Insecta

**Subclass:** Pterygota

**Division:** Endopterygota

**Order:** Coleoptera

**Suborder:** Polyphaga

**Superfamily:** Chrysomeloidea

**Family:** Cerambycidae

**Subfamily:** Lamiinae

**Tribe:** Saperdini

**Genus:** *Oberea*

**Species:** *O. erythrocephala* (Schrank.)

## General Life History

*Oberea erythrocephala* overwinters as a dormant larva within a leafy spurge root. The overwintered larvae resume development in the following spring. In late spring, larvae construct a pupal cell in the upper part of the root crown and molt to the pupal stage. Adult beetles chew through the remaining root crown tissue and exit the pupal cell, emerging from the soil in early to mid-summer. *O. erythrocephala* adults feed on leafy spurge leaves, flowers and stem tissue. They are slender beetles about 10-12mm long, with characteristic reddish-orange head and thorax and long, slender antennae. *Oberea erythrocephala* beetles are active fliers, and on warm days may be found moving about on or above the leafy spurge canopy. Adults are relatively long-lived, capable of surviving up to a month or longer under field conditions (Schroeder, 1979).

Mating occurs on the upper part of leafy spurge shoots. After mating, the female girdles a leafy spurge stem, chewing completely around the upper part of the stem one or more times (Schroeder, 1979). An egg niche is chewed into the spurge stem above the girdles, into which a single egg is laid; after oviposition, this niche is usually sealed by dried spurge latex. Generally, only a single egg is laid on each attacked shoot.

Eggs hatch in about two weeks, and young larvae tunnel downward through the stem and enter the root crown area. Most larval feeding occurs within the root crown and largest lateral roots, beginning in mid to late summer and continuing until the onset of dormancy in the fall. Most of the internal root crown tissue is consumed by the time larval development is completed. Though only one larva typically survives in each attacked shoot, several larvae may complete development in leafy spurge plants with large root systems (Schroeder, 1979)

In Europe, *Oberea erythrocephala* completes its life cycle in one year (Schroeder, 1979), but two years are apparently required to complete development in most of the United States and Canada. In North America, *O. erythrocephala* larvae continue feeding through a second summer, enter dormancy over a second winter, and complete development during the subsequent spring.

## Host Range In The Field and Greenhouse Testing

*Oberea erythrocephala* appears to feed only on leafy spurge (*Euphorbia esula* L.), cypress spurge (*E. cyparissias* L.) and a few other closely related *Euphorbia* spp. in its native Europe (Schroeder, 1979). To date, introduced populations of *O. erythrocephala* have been reported only from *E. esula*. Controlled greenhouse studies showed at least limited feeding and some oviposition by *Oberea erythrocephala* adults on a number of European *Euphorbia* spp. in several subgenera (Schroeder, 1979; 1980). However, only a few European *Euphorbia* spp. in the subgenus *Esula* supported larval development and thus could be considered likely hosts (Schroeder, 1979; 1980). No North American spurges in the subgenus *Esula* were included in these tests. Thus, the host plant range of *Oberea erythrocephala* appears restricted below the subgeneric level, and may only include leafy spurge and other Eurasian *Euphorbia* species in the subgenus *Esula*.

## List of Known Parasitoids and Predators

Several specialized hymenopteran parasitoids (Braconidae and Ichneumonidae) have been reported among European populations of *Oberea erythrocephala* (Schroeder, 1979). However, these parasitoids do not occur in North America, and no native or introduced parasitoids have been reported among *O. erythrocephala* populations in the United States.

## Impact of *Oberea erythrocephala* on Leafy Spurge

Under optimal site conditions, *Oberea erythrocephala* populations will, directly or indirectly, kill leafy spurge plants over large areas. As leafy spurge stems densities decline, the relative abundance of nontarget grasses and forbs will increase. The host range of *Oberea erythrocephala* is limited to plant species in the subgenus *Esula* of the genus *Euphorbia*, including the target weed (*Euphorbia esula* L.) and cypress spurge (*E. cyparissias* L.), an introduced weed in eastern North America. The two federally protected native spurges (*Euphorbia garberi* Engelm. and *E. deltiodes* Engelm. ex Chapm) are in the subgenus *Chamaesyce* (Pemberton, 1985) and are not potential host plants for *Oberea erythrocephala*.

The potential host status of 21 North American species (occurring north of Mexico) in the subgenus *Esula* (Pemberton, 1985) has not been evaluated. This group includes *E. purpurea* (Raf.) Fernald and *E. telephiodes* Chapm., two rare species being considered for protection (Pemberton 1985). Nine of the 21 native species in the subgenus *Esula* are annuals (Pemberton, 1985) that could possibly be utilized “temporarily” by *Oberea erythrocephala*, but would not permit completion of the life cycle and, hence, population establishment; beetle larvae require plant roots year-round. The 12 perennial species in the subgenus could be considered possible *O. erythrocephala* hosts, though most occur in the southern US and are not sympatric with leafy spurge populations (Pemberton, 1985).

## Location where *Oberea erythrocephala* was originally collected

Releases of *Oberea erythrocephala* in the United States were collected in northern Italy and in Switzerland. *O. erythrocephala* naturally occurs throughout southern Europe, through Russia into southern Siberia, and in central Asia (Schroeder, 1979).

## Current North American Distribution

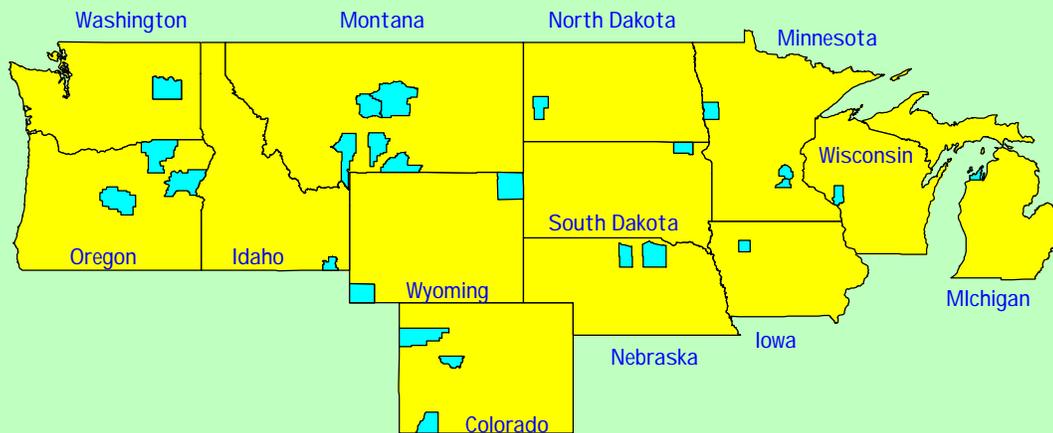
*Oberea erythrocephala* was approved for United States release in November 1979. Through 1999, *O. erythrocephala* has been released in 13 states and over 25 counties. Established populations are present in Colorado, Montana and North Dakota. The status of populations in other states remains uncertain. The insect also has a limited distribution in central and western Canada.

## Expected North American Range

There are no obvious climatic or ecological barriers to survival and establishment of *Oberea erythrocephala* in most or all of the spurge-infested areas of the United States and Canada. Anecdotal evidence suggests that this agent may be poorly adapted to far-northern areas of the United States, and recent redistribution efforts have concentrated in the southern spurge-infested states. Of course, the ultimate North American range of this insect will reflect the extent of human redistribution activities.

# Oberea erythrocephala

USDA - APHIS - PPQ 1989 - 1999 Redistribution



Data Source: BBCS Biocontrol of Weeds Database

Map by Harold Ziolkowski USDA-APHIS-PPQ Bozeman Biological Control Station

## Specific References on *Oberea erythrocephala*

**Schroeder, D. 1979.** Investigations on *Oberea erythrocephala* (Schrank.) (Col.:Cerambycidae), a possible biocontrol agent of leafy spurge, *Euphorbia* sp. (Euphorbiaceae) in Canada. Intl. Inst. of Biol. Contr., Delémont, Switzerland. Final Report. 25.

**Schroeder, D. 1980.** Investigations on *Oberea erythrocephala* (Schrank) (Col.: Cerambycidae), a possible biocontrol agent of leafy spurge, *Euphorbia* spp. (Euphorbiaceae), in Canada. Z. angew. Entomol. 90: 237-254.