

**THE SWALLOW BUG, *OECIACUS VICARIUS* HORVATH (HEMIPTERA:
CIMICIDAE), A HUMAN HOUSEHOLD PEST**

R. B. EADS, D. B. FRANCY, AND G. C. SMITH

Vector-Borne Diseases Division, Bureau of Laboratories, Center for Disease Control, Public Health Service, Department of Health, Education, and Welfare, P.O. Box 2087, Fort Collins, Colorado 80522.

Abstract.—The swallow bug, *Oeciacus vicarius* Horvath, is reported attacking humans in homes in both urban and rural localities in Colorado and Wyoming. Cliff swallow colony management techniques designed to eliminate or mitigate swallow bug annoyance to both the birds and humans are discussed.

Interest in the swallow bug, *Oeciacus vicarius* Horvath, has been heightened by the isolation in this laboratory of two viruses from these insects collected from nests of the cliff swallow, *Petrochelidon pyrrhonota*, near Fort Morgan, Colorado (Hayes et al., 1977). The viruses, one related to western equine encephalitis virus and the other in the Venezuelan equine complex, were also isolated from nestling cliff swallows and nestling house sparrows, *Passer domesticus*, being reared in cliff swallow nests.

Even though the swallow bugs have not been incriminated in the transmission of human disease organisms, they are household pests in portions of the cliff swallows' summer range when these birds build their characteristic mud nests with downcurved entrance tunnels on human dwellings. We have also commonly recovered *O. vicarius* from nests of the barn swallow, *Hirundo rustica*, and the bank swallow, *Riparia riparia*, in northern Colorado. However, large populations of the bugs are most frequently encountered in cliff swallow nests.

During the summer of 1978, we received for identification numerous collections of *O. vicarius* reportedly attacking humans in homes located in both urban and rural localities in Colorado and Wyoming. Since the bugs may become pestiferous and are vectors of potential human disease agents, some management of cliff swallow colonies on dwellings obviously is appropriate. It must be borne in mind, that the birds and their nests are protected by both federal and state statutes. Permits from the appropriate authorities are

required for nests to be removed or for the birds to be interfered with in any way.

Dr. Everett W. Spackman, Extension Entomologist, University of Wyoming, Laramie, sent us a newspaper clipping concerning a \$150.00 fine assessed a Teton Village property owner for destroying cliff swallow nests. The story contained inaccurate statements which indicate that the entire problem of cliff swallows nesting on human habitations needs to be put into proper perspective. We will attempt to do so here.

Usinger (1966) listed 74 species in 22 genera within the family Cimicidae. Twelve of the genera are associated with bats and nine with birds. The genus *Cimex* includes species commonly attacking both birds and mammals.

The cimicids are temporary ectoparasites, feeding relatively rapidly and retreating to host harborages such as nests, roosts, and cracks and crevices in rooms. They are poorly adapted for clinging to fur or feathers and normally spend little time on host animals. However, the speed with which new nesting or roosting sites become infested attests to the fact that the bugs are transferred on their hosts fairly efficiently, at least for comparatively short distances.

Usinger (1966) indicated that three species of cimicids have been called "human bed bugs" because of their ability to sustain themselves and reproduce with man as the sole or principal host animal. They are *Cimex lectularius* Linnaeus, *C. hemipterus* (Fabricius), and *Leptocimex boueti* (Brumpt). The ubiquitous *C. lectularius*, closely associated with man since he and bats shared the same caves, has spread with human beings and their heated domiciles over much of the world. In addition to man, the species feeds on bats, chickens, and a variety of other domestic animals. *Cimex hemipterus* feeds on man, chickens, and bats in both the old and new world tropics and has been recorded to do so in Florida in the United States. *Leptocimex boueti* feeds on bats and man in West Africa.

In addition to the human bed bugs, a number of bat and bird cimicids bite man when disturbed in their retreats or under experimental conditions. Myers (1928) reported being bitten by swallow bugs while collecting them in the field and working with them in the laboratory. Our experiences have been similar. We collected swallow bugs for virus testing directly from the nests in the field or from nests brought into the laboratory with battery-powered hand aspirators or power vacuum equipment. Bugs escaping onto our hands bit freely, producing a moderately painful initial sensation, especially when they attacked the tender skin between the fingers. The resulting wheal frequently itched for several days.

None of the individuals working with *O. vicarius* in this laboratory have demonstrated serious initial or delayed hypersensitivity to their bites or developed this condition after repeated exposure. Conversely, there has been no evidence that anyone has been completely desensitized to their bites.

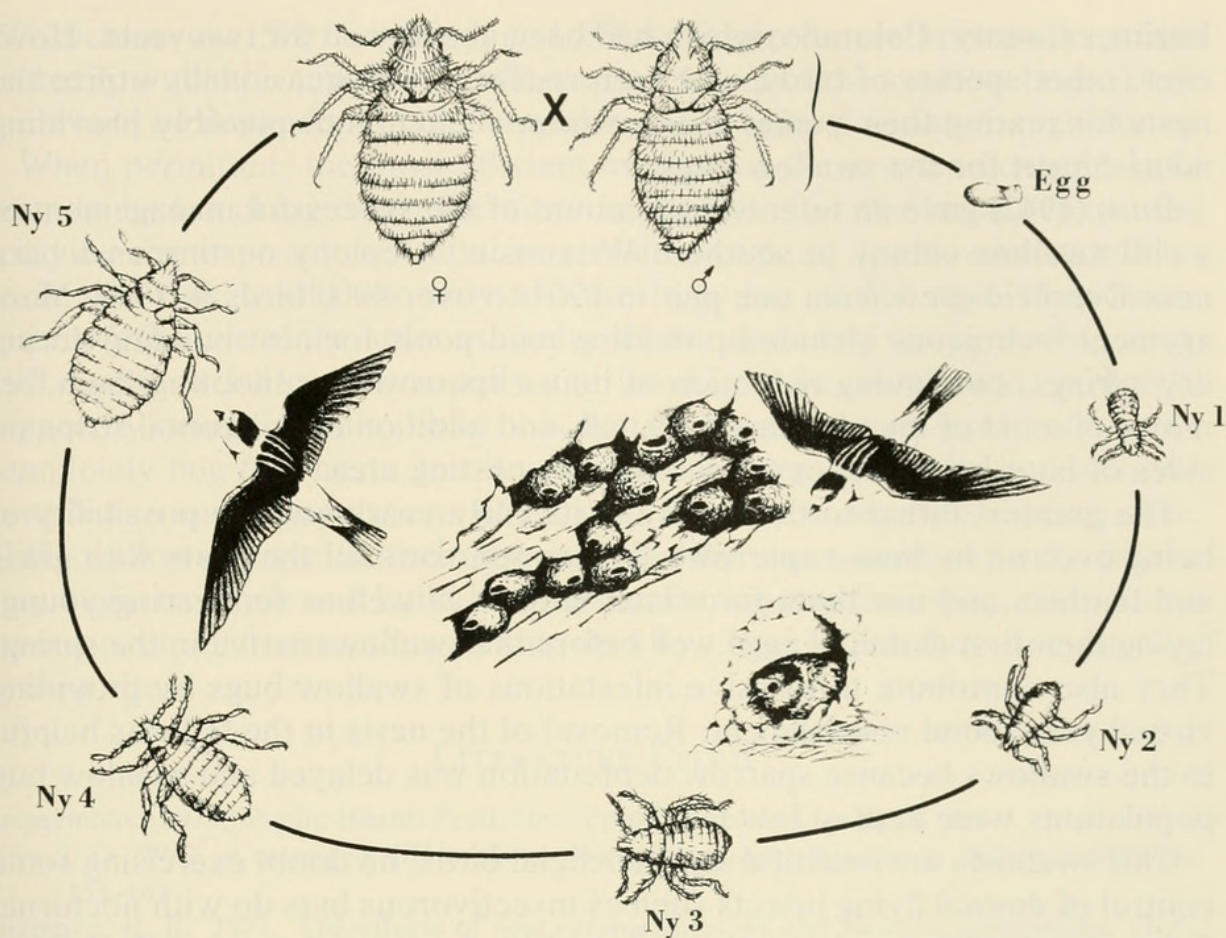


Fig. 1. Life cycle of the swallow bug, *Oeciacus vicarius*.

The life cycle of *O. vicarius* is adjusted to long periods of fasting. In northern Colorado cliff swallows usually begin returning from the Southern Hemisphere in late April or early May and depart in late August or early September. April and May are spent feeding, investigating nesting sites, repairing old nests, or building new ones. The birds actually occupy the nests for the months of June and July during egg laying, brooding, and caring for the young. Both young and adult birds usually leave the nests around the first week in August.

The normal *O. vicarius* reproductive cycle begins in the spring with the return of the swallows to the nests. After feeding, the females lay eggs on the outsides of the nests. In the laboratory, at 23°C, with food source continually available, about two months are required for a complete generation. In the field, the cimicid generations overlap with all stages of nymphs and adults overwintering in the nests. The bugs become torpid in cold weather but will feed on laboratory animals when brought into the laboratory. If given continuous access to hosts, the engorged females oviposit readily. The life cycle is illustrated in Fig. 1.

Survival of the bugs in old swallow nests is phenomenal. Smith and Eads (1978) observed living bugs in the nests of a colony of cliff swallows in

Larimer County, Colorado, which had been abandoned for two years. However, other species of birds, and even rodents, will occasionally utilize the nests for rearing their young and/or winter shelter, thus possibly providing nourishment for the swallow bugs.

Buss (1942) gave an interesting account of the successful management of a cliff swallow colony in southern Wisconsin. A colony nesting on a barn near Deerfield grew from one pair in 1904 to over 4000 birds in 1942. Management techniques included providing mud pools for nest building during dry springs, continuing reduction of house sparrows by shooting them, removal of most of the old nests each fall, and addition of horizontal strips on sides of barn below eaves to increase the nesting area.

The greatest threat to the colony in its early years was the possibility of being overrun by house sparrows. House sparrows fill the nests with grass and feathers and use them for winter shelter as well as for rearing young, laying their first clutch of eggs well before the swallows arrive in the spring. They also contribute to massive infestations of swallow bugs by providing virtual year-round nourishment. Removal of the nests in the fall was helpful to the swallows because sparrow depredation was delayed and swallow bug populations were kept at low levels.

Cliff swallows are beautiful and beneficial birds, no doubt exercising some control of diurnal flying insects such as insectivorous bats do with nocturnal flying insects. Obviously, nothing should be done to adversely affect these birds. However, it must be realized that their nesting on homes and inhabited buildings can be a mixed blessing.

Ideal nesting sites are cliff faces, bridges, and culverts near a water supply. The swallows are familiar sights drinking on the wing over ponds and lakes and feeding on midges and other Diptera which develop in the water. The swallows may be forced to the wide-spread use of buildings as nesting sites in areas without cliff faces and with water shortages near bridges and culverts.

Swallow colony management would seem desirable when swallow bug populations overrun the nests, invade buildings and homes, and attack the inhabitants. Controlling the bugs would also be helpful to the nestling swallows.

Chapman (1973) effectively controlled swallow bugs by spraying the nests and substrates twice weekly with .2% naled during the nesting period. This short-lived organophosphate was found by Moss and Camin (1970) to be nontoxic to avian hosts. A comparison of nestlings in controlled and uncontrolled nests revealed that the ectoparasites significantly reduced nestling weights and feather growth. Nestling mortality was higher in parasitized colonies.

Several effective insecticides against human bed bugs are listed in *Public Health Pesticides* (Anonymous, 1973), including .1% trichlorfon, 1% ronnel,

.5% dichlorvos, .5% malathion, and .2% synergized pyrethrin sprays which probably would be suitable for off-season control of the swallow bugs. Their use would be dependent upon compliance with federal and state regulations.

When permitted, the most efficient method of *O. vicarius* control would seem to be knocking down the nests in the fall after the birds depart, and spraying the exposed nest attachment sites with an approved residual insecticide. This would not only kill the bugs but would also deny house sparrows the use of the nests as winter shelter and early spring nesting sites. Cliff swallows build nests rapidly and would not be discouraged or handicapped by being forced to build new nests. This procedure would not insure completely bug-free nests, but it will certainly keep the numbers down. We have found small populations of *O. vicarius* in new swallow nesting sites. Cliff swallows arrive in their summer nesting areas several weeks before they begin to repair and build their nests. During this time they explore and even roost in old nests, thus picking up a few bugs which they carry to new nesting sites.

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