

NOTE

Hymenoptera Associated with a California Population
of the Russian Thistle Biological Control Agent
Coleophora klimeschiella Toll
(Lepidoptera: Coleophoridae)

Coleophora klimeschiella Toll, whose larvae are casebearers which feed on the foliage of the weed pest Russian thistle (*Salsola australis* R. Brown), is native to Turkey and probably the Soviet Union (Khan and Baloch, 1976. *Entomophaga* 21: 425-428). This moth was imported into U.S. quarantine from Pakistan in 1975 and tested for host specificity. In 1977, it was released in California to control Russian thistle (Hawks and Mayfield, 1978. *Environ. Entomol.* 7(2): 257-261).

Several years later at a *C. klimeschiella* release site two miles northwest of Coalinga (Fresno County) California, several species of native Hymenoptera were discovered to be parasitizing the *C. klimeschiella* casebearers. The *C. klimeschiella* casebearers were gathered, the wasps reared, identified, and the rates of parasitism established.

Coleophora klimeschiella casebearers were collected for rearing on six dates (Table 1). By rearing *C. klimeschiella* individually in gelatin capsules and dissecting their cases after parasitoids emerged, parasitization rates and the *C. klimeschiella* stage killed were established.

Five species of Hymenoptera were reared from *C. klimeschiella*: *Macroneura* n.sp. Walker (Eupelmidae) from larvae and pupae, *Agathis gibbosa* (Say) (Braconidae) from larvae and pupae, *Spilochalcis side* (Walker) from pupae, *Spilochalcis torvina* (Cresson) from pupae (both Chalcididae), and *Catolaccus aeneoviridis* (Girault) (Pteromalidae). The stage which *C. aeneoviridis* killed was not determined, but it is recorded from many Lepidoptera and Coleoptera and as a secondary parasitoid of braconid, ichneu-

monid, and bethylid wasps (Burks. In Krombein et al., 1979, *Catalog of Hymenoptera in America North of Mexico*, Vol. I (Parasitica), Smith. Inst. Press: 806). Hence, this wasp is possibly a primary parasitoid of *C. klimeschiella* or a secondary parasitoid of *A. gibbosa*.

Four additional wasp species were reared in sleeve cages containing Russian thistle and *C. klimeschiella* casebearers: *Haltichella rhyacionia* Gahan (Chalcididae), *Epipteromalus* n.sp. Ashmead, *Norbanus perplexus* Ashmead, and *Pachyneuron* sp. Walker (all Pteromalidae). These species were possible parasitoids of *C. klimeschiella* or from undetected hosts on or in the Russian thistle. A female specimen of *H. rhyacionia* (Coalinga, 2-X-1985, H. Misthe, reared from *Coleophora klimeschiella* in *Salsola australis*, em. 31-X-1985) in the University of California Riverside collection supports the former association. These records of a known central and eastern United States species (Burks 1979, *ibid.*: 860) in California is a significant range extension for this species. *Norbanus perplexus* is reported from and in this case possibly parasitized *Coleophora parthenica* Meyrick, a stem burrowing Russian thistle feeder introduced from the Mediterranean region (Goeden, Ricker, and Muller, 1978. *Environ. Entomol.* 7(2): 294-296). This is the first rearing information for the genus *Epipteromalus*. *Solenopsis xyloni* McCook (Formicidae) was observed preying on *C. klimeschiella* casebearers. In three of five observations, two to four ants attacked a single *C. klimeschiella* casebearer.

In all, 1523 *C. klimeschiella* and 453

Table 1. Parasitism of *Coleophora klimeschiella* (CK) casebearers near Coalinga, California, 1982–1984. Acronyms for hymenopterous parasitoids are AGGI—*Agathis gibbosa* (Braconidae); CAAE—*Catolaccus aeneoviridis* (Pteromalidae); MASP—*Macroneura* n. sp. (Eupelmidae); SPSI—*Spilochalcis side* (Chalcididae); and SPTO—*Spilochalcis torvina* (Chalcididae).

Coll. Date	No. CK Cases w Emerg.	% CK Emerg.	% Parasitism				
			MASP	AGGI	CAAE	SPSI	SPTO
V-26-82	587	79	20	<1	<1	0	<1
VI-10-82	177	52	47	<1	0	0	0
VI-23-82	374	90	7	<1	0	1	1
VIII-3-82	250	97	2	0	0	<1	<1
VI-2-83	151	95	<1	4	0	0	0
V-8-84	437	56	5	38	<1	0	0
Total	1976	77	13	9	<1	<1	<1

parasitoids were reared to adult emergence (Table 1). No insects emerged from many cases. Parasitism (based on emergence) averaged about 22 percent but ranged from 3 to 48 percent among collection dates (Table 1). *Macroneura* n.sp. and *Agathis gibbosa* were most numerous; the other parasitoids were rarely reared.

The wasps *Macroneura* sp., *Cerambycobius* sp. (both Eupelmidae), *Hockeria* n.sp. (Chalcididae), *Catolaccus aeneoviridis* (Girault) (Pteromalidae), an unidentified ichneumonid, and a coleopterous predator *Phyllobaenus atriplexus* (Forster) (Cleridae) were reared in a field colony of *C. klimeschiella* at Indio, California (Goeden et al. 1978). The *Hockeria* specimens belong to a widely distributed, polyphagous species currently in manuscript (Halstead, in prep.). With the exception of *C. aeneoviridis* and possibly *Macroneura* sp., the parasitoids that I reared are not recorded from *C. klimeschiella*. However, some of these species are known parasitoids of other *Coleophora* species (Burks 1979, *ibid*; Carlson, In Krombein et al., 1979. Catalog of Hymenoptera in America North of Mexico, Vol. I, Smith. Inst. Press: 315–740). The *Macroneura* and *P. atriplexus* reared by Goeden et al. (1978) are also known enemies of cecidomyid (Diptera) gall-makers on *Atriplex* spp., a species which commonly inhabits areas with Russian thistle, and hence was thought to be the source of those insects.

Additional host or plant associations for the *C. klimeschiella* parasitoids at the Coalinga site are unknown.

The adaptation of native parasitoids was possibly a reason for the poor establishment and ineffectiveness of *C. klimeschiella* as a biological control agent in southern California (Goeden et al. 1978). The same appears to be occurring at the Coalinga site.

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