THREE INTERESTING INSECTS AND THE CAUSE OF REDUCED VIGOR OF CUP PLANT (*SILPHIUM PERFOLIATUM*) IN AGRONOMIC PLANTINGS

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ABSTRACT

Growing interest in native plants for use as feedstock for cellulosic biomass in ethanol production logically leads to questions about insect-plant associations. Recent studies on the potential for using Cup plant (*Silphium perfoliatum*) revealed three insect species not known from other plants: the Giant eucosma (*Eucosma giganteana*, Lepidoptera: Tortricidae), an aphid (*Uroleucon* cf. *ambrosiae*, Hemiptera: Aphidae), and a parasitoid wasp (*Acanthocaudus* n.sp., Hymenoptera: Braconidae). The wasp is a new and undescribed species, and the aphid may be a new and undescribed species. The moth and aphid are plant predators, while the wasp parasitizes the aphid. The early instar larva of *Eucosma giganteana* is a significant predator of apical meristematic tissues, including floral buds, and may cause upwards of 100% loss of potential seed production. The late instar larva was found boring in the rhizome where they cause an excess of 50% biomass loss of above ground plant portions, and make the crop unharvestable. *Uroleucon* aphids are phloem feeders on the ventral surfaces of new leaves, and populations reproduce rapidly for several weeks and then crash to zero. This aphid does not appear to reduce biomass production. *Acanthocaudus* n.sp was determined to be the primary parasitoid of the aphid, and was observed hovering over aphid colonies before selecting oviposition hosts. The Giant eucosma larva was determined to be the primary cause in the reduction of growth, reproduction, and biomass productivity of Cup plant in agronomic plantings. With the discovery of the aphid and the braconid wasp, this study parallels similar studies that reveal undescribed or poorly known species on native plants brought into agriculture.