# ENTOMOLOGY

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## ABSTRACTS

**Cereal Leaf Beetle Parasite Program in Indiana.** JOHN J. FAVINGER, Indiana Department of Natural Resources, Indianapolis, Indiana 46204. ——Four hymenopterous parasites of cereal leaf beetle have been released in most Indiana counties where sufficient C.L.B. populations exist to warrant the introduction of biological controls. A mymarid egg parasite *Anaphes flavipes* (Forester) has since been recovered from fifteen counties. Two ichneumonid egg parasites, *Diaparsis n. sp.* and *Lemophagus curtus* (Fomes) have been recovered from two and three counties respectively. A eulophid egg parasite *Tetrastichus julis* (Walker) had been recovered in six counties previous to 1976 but in eighteen additional counties during June 1976.

**A Distributional Survey of the Trichoptera Fauna of Delaware County, Indiana.** WILLIAM TOZER and STEVEN NEWHOUSE, Department of Biology, Ball State University, Muncie, IN 47306.——A faunal survey representing eleven families, twenty-eight genera of Trichoptera (caddisflies) of Delaware County, Indiana during 1974-1976 is presented. Twenty-nine of fifty-five species of caddisflies collected during this study are new distributional records for Indiana. Most of the species presented belong to the families Hydropsychidae, Leptoceridae and Hydroptilidae. This list is not an exhaustively complete survey of the Delaware County region; rather, it is intended to provide stimulation for additional work of this nature.

**Studies on the Reproductive Biology of *Meteorus leviventris* (Wesmael) (Hymenoptera: Braconidae).** DAVID THOMAS, 464 5th Street, Madras, Oregon 97741, and R. B. SCHOENBOHM, Department of Entomology, Purdue University, West Lafayette, IN 47907.——The black cutworm parasite, *Meteorus leviventris*, exhibits arrhenotokous parthenogenesis; that is, females are produced from fertilized eggs, while males develop from unfertilized eggs. The daily and total egg deposition in black cutworm hosts was compared between virgin and mated parasites. It was thought that insemination might alter the females rate of oviposition; however, no significant difference was found in the daily and total egg deposition of the two female groups. Combined results of the two groups averaged 15.5 eggs oviposited per day, and 97.4 oviposited in a life time. Reproductive morphology was also studied.

**A Rearing Procedure for *Meteorus leviventris* (Wesmael) (Hymenoptera: Braconidae), a Parasite of the Black Cutworm.** R. B. SCHOENBOHM, and F. T. TURPIN, Department of Entomology, Purdue University,

West Lafayette, IN 47907.——*Meteorus leviventris* was the most common parasite found infesting black cutworm larvae collected in Indiana in 1974, 1975, and 1976. Parasite adults reared from black cutworm larvae collected in 1975 were used to establish a colony which is now 15 months old, or ca. 30 generations from wild. Laboratory reared black cutworm larvae are used for colony hosts. An average of ca. 200 adult female parasites are produced per day by the colony.

**A Population Study of *Cicindela sexguttata*, the six-spotted tiger beetle (Coleoptera: Cicindelidae).** C. BARRY KNISLEY, Dept. of Biology, Franklin College, Franklin, Indiana 46131.——A population of *C. sexguttata* was studied during the spring and early summer of 1975 and 1976 in an oak-hickory forest in Johnson County, Indiana. Census, mark-recapture, and observation were used to determine the effects of season, temperature, sunlight, and other factors on abundance, activity, and distribution of adult beetles. Most of the studies were restricted to a dirt road which ran through the woods since preliminary studies showed that beetles were most numerous here. Adults first appeared in early April, were most abundant from late April to early June, and began to disappear in mid June. Activity and numbers collected were significantly correlated with ground and air temperatures. Beetles were present in a variety of microhabitats of the forest, but were usually restricted to sunny areas. Changes in their distribution pattern within the habitat were correlated with changes in sunlight distribution. Through early May beetles were scattered somewhat evenly along the dirt road as were the patches of sunlight, but, as trees leafed out the beetles became aggregated and restricted to the limited sun patches. Other factors, such as topography, soil characteristics, and prey distribution seemed of little significance in influencing distribution. Recapture data indicated that movement of beetles along the trail was typically limited to distances of less than 100 meters. Observations on feeding habits revealed that ants were the predominate prey although a wide variety of other insects were taken. Mating was observed frequently and was most common during late May.

**The Life and Work of Thomas Say.** B. ELWOOD MONTGOMERY, 906 North Chauncey Avenue, West Lafayette, Indiana 47906.——Adapted from an address, "The Life and Times of Thomas Say" presented at the Spring meeting of the Academy, New Harmony, Indiana, April 23, 1976.

In 1976 we may celebrate the Sesquicentennial of Science in Indiana as well as the National Bicentennial. The Sesquicentennial commemorates the arrival of Thomas Say and other scientists at the Owen Community at New Harmony in January, 1826. Although not immediately evident all of the scientists who came to New Harmony in 1826 contributed to the attainment of American Independence.

It should be evident to everyone that 1776 marked only the beginning of the struggle for independence and that this struggle continued for many years. In fact, The War of 1812 is frequently called the Second War of Independence and the contest for control in the western

areas—the upper Mississippi Valley and the far Northwest Territory —entended into the 1820's.

The colonial status was, perhaps, more slowly removed in the cultural fields, especially in the Natural Sciences, than in the political area. Geological and Biological exploration and study was long carried on in this country by visiting European students, or the studies were made and published in Europe based upon materials sent from America.

Of course, some study of Natural Science was started fairly early in America and a limited amount of publication had taken place by the time of the Revolution. This indigenous study continued to develop and had reached at least a moderate bloom at the time of the migration of the scientists to New Harmony. Much of the development had taken place in Philadelphia; all of the scientists who came in 1826 from Philadelphia to Indiana had been very active in scientific research and publication. The departure of so many of the most active workers (Maclure, Say, Lesueur, Troost) appeared to deprive Philadelphia of its leadership as a center of scientific work in this country.

No one contributed to the final attainment of independence in more areas than Thomas Say. He served in the Pennsylvania Militia in the War of 1812, and was the naturalist in two expeditions made by the army into the West—one to the Rocky Mountains and the other to the Dakota-Minnesota-Canada area, in 1819-1820 and 1823 respectively. Previous to these expeditions he had explored extensively in the Atlantic coastal areas—from Philadelphia through New Jersey to Egg Harbor (more than once), to the outer shore of Maryland and to Georgia and Florida. After coming to New Harmony he made one collecting trip of several months (chiefly for shells?) through Ohio and Kentucky and went to Mexico over one winter.

As the fauna was almost unknown the most important work in Biology at that time was the discovery and description of new species. This Say did on a very extensive scale. He published the first paper in America on fossil invertebrates. He seems to have studied almost every group of animals, describing thousands of insects of almost all orders, hundreds of Mollusca, many Crustacea, and a few to many species in each of several other groups—jellyfish, earthworms, leeches, frogs, snakes, birds and mammals.

On the two western expeditions he studied the Indians; he compiled vocabularies of some of the western tribes and described their habits and life; most of the accounts of parleys with the Indian groups included in the Reports of these Expeditions appear to have either been written by Say or based upon his notes.

**Evaluation of Insecticides for Adult Western Corn Rootworm Control.** DAVID M. LEVA, Purdue University, West Lafayette, Indiana 47906. ——Insecticides were evaluated as potential population suppression agents in a Western Corn Rootworm, *Diabrotica virgifera* (LeConte), control program. The insecticides were applied to field corn with a self propelled high-boy applicator. Insecticide treated leaves were

randomly selected from treated plots, and used in a bio-assay with Western corn rootworm adults. Contact mortality data were recorded and the time period the various insecticides maintained at least 50% mortality were calculated. Results indicate that Sevin-4-Oil provided more than 80% mortality for 4 weeks, other compounds had an effective life of 4 to 7 days. This time interval of 4 to 7 days may be long enough for protection during corn silking and pollination. However, much longer control is needed if an adulticide is to be an effective Western Corn Rootworm population suppression agent.

**Seasonal patterns of adult emergence and flight of the western corn rootworm, *Diabrotica virgifera.*** GORDON VANWOERKOM.——Seasonal patterns of adult emergence were determined by placing 6 ft x 6 ft x 5 ft screen cages over corn planted at four different planting dates. Seasonal flight patterns were determined using two types of sticky traps: one quart cylindrical cartons placed at ear level and gallon cylindrical cartons placed at heights of 10, 15, 20, and 25 feet. Beetles emerging in cages and caught on sticky traps were counted and sexed every 48 hours. Differences in numbers emerging among planting dates were noted, and sex ratios of emerging beetles were compared to sex ratios of beetles caught on sticky traps. Results showed that 80% of the beetles caught throughout the season on sticky traps 10 feet and higher were females while at ear level 80% of the beetles captured were males. Adult emergence began on July 8 with a high prcentage of males. After the first two weeks the number of females emerging increased significantly.

**Horned oak gall, *Callirhytis punctata* (O.S.) on pin oak in LaPorte Co., Ind.** R. B. CUMMINGS, Department of Natural Resources, Indiana.—— Most insect galls on plants are innocuous. Gouty & Horned oak galls caused by this genus of Cynipid wasps are considered to be economically important.

Fourteen pin oaks planted along one mile of Indiana two were studied in 1975 and 1976.

Based on the age of branches at the site of galls, the first infestation of these trees was about ten years ago.

Six trees without galls averaged 16.9 inches diameter at breast height. Three trees which were heavily infested by horned oak gall averaged 14.7 inches D.B.H. The heavy infestations caused a 13% loss of diameter growth within a period of ten years.