

ENTOMOLOGY

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ABSTRACTS

New Records of Indiana Collembola. JOHN W. HART, Hayes Research Foundation, Inc., Richmond, Indiana 47374.—One hundred twenty four species and forms of Collembola have been reported by the author (2, 3, 4, 5). This paper lists an additional fifteen. In the list of new records which follows, those collected from the Brookville Ecological

Research Center are indicated by an asterisk (*).

Hymenaphorura sibirica (Tullberg), 1876; *Handschiniella parvicornis* (Mills), 1934; *Hypogastrura harveyi* (Folsom), 1902; *Tomocerus bidentatus* Folsom, 1913 [Christiansen]; *Folsomides marchicus** (Frenzel), 1941; *Isotoma albella* Packard, 1873; *Isotoma notabilis* Schäffer, 1896; *Isotoma tariva** Wray, 1953; *Entomobrya atrocincta* (Schött), 1896; *Willowsia buskii* (Lubbock), 1870; *W. nigromaculata* (Lubbock), 1873; *Pseudosinella argentea* Folsom, 1902; *Odontella (Xenyllodes) armata** (Axelson), 1903; *Microgastrura minutissima** (Mills), 1934; *Micanurida pygmaea** Börner, 1901. Author's voucher specimens are located in the Joseph Moore Museum, Earlham College.

The Ensifera (Orthoptera) of Indiana. J. L. STEIN and W. P. McCafferty, Department of Entomology, Purdue University, West Lafayette, Indiana 47907.—On the basis of research involving field collecting, literature review, and the examination of specimens housed primarily in the entomological collection of Purdue University, but also the University of Michigan, and the Illinois Natural History Survey, a systematic review of the Ensifera (Orthoptera) species of Indiana has been completed. A total of 82 species of this suborder were found to occur in Indiana with an additional 11 species which may occur in the state but have not been taken within its borders. For 61 of the Indiana species, 400 new county records have been established. Species have been categorized according to Mumford's (1969) faunal distributional areas of Indiana. The nomenclatural synonymies for the species involved have been updated, and illustrated identification tables have been constructed for all of the 93 species treated.

Eusociality in *Ceratina calcarata* Robt. (Hymenoptera: Anthophoridae). LELAND CHANDLER, Department of Entomology, Purdue University, West Lafayette, Indiana 47907.—Species of *Ceratina* possess many attributes prerequisite to social behavior, such as female-progeny

association, interacting overwintering aggregations, and cooperative prehibernation food storage. Species of related genera have evolved social habits and others have developed as social cleptoparasitoids. *C. calcarata* nests containing females and developing brood were placed in the Purdue Comparative Ethology Chambers where favorable weather conditions were programmed continuously. The emergence of the brood was followed by a short period of quiescence, and then by a burst of unique activity. Several females from each of three nests began collecting pollen; returning to their respective nests; and, forming, cooperatively, pollen balls which were not separated from one another by cell partitions. While each pollen ball received one egg, larval feeding was unrestricted over the accumulation. The founding female from one nest maintained a peculiar dominance over the others with no nest activity beginning until she had flown to each nest, had circled and partially entered the burrow.

Additions to the life history of *Chalybion zimmermanni* Dahlbom (*Hymenoptera: Sphecidae*). GERTRUDE L. WARD and KATHERINE J. COLE, Joseph Moore Museum, Earlham College, Richmond, Indiana 47374.—During the summer of 1974, a study of *Chalybion zimmermanni* Dahlbom in Indiana added two araneid spiders (*Mangora gibberosa* (Hentz) and *Neoscona arabesca* (Walckenaer)) to the list of food provided for the developing young wasps. Either live larvae or exuviae of *Trogoderma* spp. (Coleoptera: Dermestidae) were found in 11 per cent of unsuccessful *C. zimmermanni* nests and appeared to be the major cause of death of the young wasps. In captivity, two species of flowering plants, *Conium maculatum* L. and *Pastinaca sativa* L. were attractive to adult *C. zimmermanni*.

Blood meal identifications of *Culex pipiens pipiens* (northern house mosquito) collected during 1972 and 1973 in Delaware and Henry Counties, Indiana. R. E. SIVERLY, Public Health Entomology Laboratory, Ball State University, Muncie, Indiana 47306.—A total of 111 blooded *C. p. pipiens* collected from five different sites in summer and early fall were tested for blood meal identification by the preciptin technique. Almost half of the engorged specimens were taken from a chicken house and 96 percent of these had fed on chickens. However, the same incidence of chicken feeding prevailed when all sites were considered. Other avian hosts available included pigeons and passerine birds. Mammal hosts available included horses, goats, cattle, dogs and humans.

All collecting sites were located near industrial waste lagoons where mosquito production was very high.

Transport of Fungi by *Reticulitermes flavipes* (Kollar) (*Isoptera: Rhinotermitidae*). CATHY COYLE,¹ Life Science Department, Indiana State University, Terre Haute, Indiana 47809.—Eighteen fungi, including one oomycete, three zygomycetes, and fourteen Fungi Imperfecti, were isolated from workers of the eastern subterranean

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termite, *Reticulitermes flavipes* (Kollar). These fungi were isolated from the integument of the termites as well as from the foregut, midgut, hindgut and pellets. The relationships between the fungi and termites remain obscure, although some forms of the fungi associated with the termites were also present in wood cultures.

The Effect of Tobacco Brown Pigments on Tumorigenicity in *Drosophila melanogaster*. JAMES C. TAN and SUZANNE E. HAMADA, Department of Biology, Valparaiso University, Valparaiso, Indiana 46383. —Brown pigments in cigarette and cured tobacco leaves are high molecular weight substances and heterogeneous in chemical composition. They have been suspected to possess carcinogenic activities. This is a study of their effects on tumorigenic activity in highly inbred strains of the tu50j stock in *Drosophila melanogaster*.

F₁ larvae from the mating of tu50j young adults were either allowed to grow continuously in a standard *Drosophila* medium containing the experimental agent or treated for one hour in an aqueous solution at various concentrations of pigment (0.01, 0.03, 0.05 and 1%) prior to their transfer to the normal medium. Normal and tumor-bearing F₁ young adults were recorded. The results indicated that there were statistically significant differences in the proportion of tumor-bearing flies among the treated groups as well as between the treated groups and the control.

Computer Simulations as a Research Tool for Agricultural Entomologists. F. T. TURPIN, Department of Entomology, Purdue University, West Lafayette, Indiana 47907. —As part of a continuing effort at Purdue University to gain insight into questions regarding insect management on corn, we have simulated the population dynamics of the corn rootworm. This simulation has been used to study the effect of cultural factors on the population of the rootworm and the related impact on resulting crop loss. The model can be used as an aid to projecting the need for plant protection measures and allows researchers to look at various factors influencing rootworm populations without costly field experiments.

Entomological Problems, Programs, and Progress at the Federal University of Vicosa. VICOSA, M. G., Brasil. LELAND CHANDLER, Department of Entomology, Purdue University, W. Lafayette, Indiana 47907 and JOSE A. H. FREIRE, Departamento de Fitotecnia, Universidade Federal de Vicosa, Vicosa, Minas Gerais, Brasil. —The foundation of entomology at the Federal University of Vicosa were established by the late Prof. Frederico Vanetti. The present staff of four (J.A.H. Freire, J. O. de Lima, S. B. Nogueira, and J. C. Zanoncio) were his students; he wrote three texts (Entomologia Geral, Entomologia Agrícola, Cursa de Entomologia); he initiated the research and teaching collections; and, he bestowed upon the department a philosophy of inspiration, achievement, pride and scholarliness. Prof. Vanetti's tenure was the era of the "chair professor"; however, as the University developed this era closed and has been replaced by a "land grant philosophy".

Entomology is a section within the Department of Fitotecnia, although it was recently and temporarily a part of the Biological Institute. Presently, the staff offers four courses (General, Agricultural, Forest, Methods of Insect Control) as service courses since entomology has no individual curriculum. Teaching occupies a major portion of staff time and classes have an exceptionally large enrollment. The courses are excellent in content and presentation but are quite rigorous, fully equivalent to our dual-level courses for entomology majors at Purdue.

A variety of research is conducted but the lack of personnel and of time prevents any sustained research program development. Currently, research is being carried out on bananas (rhizome borers), coffee (berry borer, leafminer), vegetables (black cutworm, diamond-back moth), stored grain (pest complex), and on the omnipresent "sauva" (leaf-cutter ants) and mound-building termites.

As agricultural development intensifies, pest problems have become seriously acute and in many crops are limiting factors. Considering that the state of Minas Gerais is slightly larger in area than the state of Texas, these problems become almost incomprehensible. Crops such as rice, cotton, citrus, sorghum, soybeans and roses receive little or no attention, and forestry, livestock, and pasture problems are grave.

Summarily, entomology at Vicosia is faced with one of the most intriguing scientific challenges of our time. Fortunately, the foundation which was established by Prof. Vanetti is of such excellence that the challenge can be met. The staff is fully capable of providing the leadership and guidance required in this accomplishment. The critical need is for additional personnel, the initiation of an entomological curriculum through which new entomologists can be educated, and appropriate funding to perform the research which is so essential.