caterpillars of the latter species I counted respectively, 115, 131, 213 and 228 eggs of these parasites. I mention this, seemingly disconnected circumstances, because the same species of Cuckoo is fond of all these caterpillars, and we are met with that perpetual puzzle to economic entomologists, viz., to determine the exact economic value of an organism. If the bird ate only the unparasitized caterpillars, it would be wholly beneficial, but, on the other hand, if it devours parasitized caterpillars, it has done no good, because these would have died in any case, and has done actual harm, because it has destroyed beneficial insects.

Notes on Reared Hymenoptera from Indiana.

F. M. Webster.

The material upon which this list is based was obtained during two trips to southern Indiana, the first late in August and the last late in October, 1902, while in the employ of the United States Department of Agriculture, and making some special investigations of certain insects attacking growing wheat. My first intention was to present a paper that would include only such species as were new to science, but I have in addition to such, found so many forms that are new to the State, and others discovered by me about Lafayette, years ago, but of whose habits nothing was known, have been farther investigated, throwing new light on their life history and habits, that I later decided to include all of the Hymenoptera reared by me, but not previously reported as inhabiting Indiana. I may add that the nature of my investigations required that considerable quantities of wheat stubble, and the stems of *Elymus canadensis* and *E. virginicus*, *Tricuspis sesleroides* and *Bromus secalinus*, the latter being the common cheat of the wheatfields, be collected and the *Isosoma* and other insects inhabiting these stems secured. The stems of these grasses and the wheat stubble were collected and placed in pasteboard boxes so that everything developing within them was thus secured. It will be observed, then, that the prime object of my rearings was to determine the food plants of the *Isosoma*, the parasitic species, though of much importance, were of secondary signification in these studies.

Isosoma grande, which I reared about Lafayette, during the years 1884 to 1886, and established the fact of a dimorphism and alternation of

generations before unknown among these insects in this country, was represented in my rearings from wheat stubble, collected from about New Harmony and Princeton, by the spring form *minutum*.

Isosoma tritici Fitch was also reared from wheat straw from these localities. Specimens of the latter occurring among the former are quite strongly contrasted, the latter being quite large for these insects and possessing fully developed wings, whereas the former are much smaller and wingless. Reared also from *Elymus virginicus*, an entirely new food plant for the species.

Isosoma maculatum Howard was reared in considerable numbers from the stems of cheat, *Bromus secalinus*. The species was described from individuals collected by me about Lafayette during June, 1885, and May, 1886, but the food plant has up to this time remained unknown.

Isosoma albomaculatus Ashmead, originally described from West Virginia, was reared from *Bromus secalinus* in great numbers, also to a lesser extent from the stems of *Elymus virginicus*.

Isosoma elymi French was reared in profusion from *Elymus*. This species, at one time supposed to be a wheat insect, confines itself strictly to the grasses. I have never reared it from wheat straws and have never reared *Isosoma grande* from anything else except wheat.

Isosoma (flaripes) hordei Harris was reared from stems of *Elymus canadensis* and in such numbers as to give economic importance to the fact. The rearing of the Joint Worm species, *I. hordei*, and one of the wheat straw worm species, *I. tritici*, from *Elymus*, both of which are wheat insects, shows very plainly that though the farmer may overcome these in his cultivated fields, unless he is careful to destroy these grasses growing along roadsides and in uncultivated fields, a continual reinfestation will be going on, and he must fight his foes in the grasses as well as in his cultivated grains. Besides these, there is a species of Isosoma, of which I have only been able to rear the male, but the larvæ of which infest the stems of *Tricuspis sesleroides*, and I have reared these from stems collected near Orleans, Indiana. There is probably still another species of *Isosoma*, at present not distinguishable from *I. hirtifrons* Howard. This last had until now been known only from rye straw in California. I did not rear this from Indiana, but in Illinois the common cheat, *Bromus secalinus*, appears to be its sole food plant. The larvæ are found in the stems, and as the stems of cheat in Indiana contain an abundance of

larvæ it is not unlikely that those of this species are among them. It is not unlikely to be found infesting rye also.

Torymus sp? This is parasitic on the Isosoma larvæ infesting the stems of *Tricuspis*.

Another species of parasitic Hymenoptera has been determined as a new species of a new genus of the family *Encyrtidæ*.

Eurytoma nov. sp. This was reared from the stems of *Elymus canadensis*, the adults emerging in late August.

Parapteromalus isosomatis Ashmead, nov. gen. et. sp. This is parasitic on a cell inhabiting *Isosoma*, affecting *Elymus*. The adults appear in late summer and at once proceed to oviposit in the occupied cells of the Isosomas. That is to say, they have developed in the bodies of their hosts while the latter have been in the process of development and, now, oviposit in the fully grown larvæ, there being thus two broods of the parasite to one of the host.

Coccidencyrtus flavus Ashmead, nov. sp. This is doubtless connected in some manner with a coccid that inhabits the stems of *Elymus*.

Oligosita americana Ashmead, nov. sp. This is an egg parasite and belongs to a genus not before reported from America. A single species is known from Europe and three from the island of Ceylon.

Elasmus websteri Ashmead, nov. sp. Reared from either the stems of Elymus or from the stubble of wheat, in either case it is probably in some way connected with some species of Isosoma.

Xanthoencyrtus nigroclarus Ashmead, nov. gen. et. sp. Reared from stems of *Elymus*, but not probably in connection with the Isosomas.

The following were reared in considerable numbers from leaves and stems of grasses about Champaign and Urbana, Illinois, within which the host insects were feeding, and doubtless are to be found in Indiana also.

Polyneura citripes Ashmead, nov. sp. Reared from stems of *Eragrostis poaoides*, an egg parasite whose exact host is unknown.

Pedobius websteri Ashmead, nov. sp. Parasitic on a dipterous leaf miner affecting *Panicum proliform* by mining in the tips of the leaves. As I have found the same leaf attack in various localities in Indiana, presumably done by the same dipterous insect, it is not at all unlikely that the parasite is also found in Indiana, as I have reared them in great numbers from about Urbana, Illinois. Only one other species of this genus is known, and it is also a dipterous parasite.