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## A Further Report on the May Beetles (Phyllophaga Spp.) in Iowa

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rating varied from the two by only one of the five divisions of the scale.

STATE UNIVERSITY OF IOWA,  
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A FURTHER REPORT ON THE MAY BEETLES  
(*PHYLLOPHAGA* SPP.) IN IOWA

H. E. JAQUES

White grubs have been doing serious damage in Iowa every third year for about three decades. In 1921 this area of heavy infestation reached south-east Iowa. Their distribution has been mapped for 1921<sup>1</sup> and for 1924<sup>2</sup>. What threatens to be the most destructive infestation for many years is due for the spring and summer of 1927.

The adults of the white grubs are May beetles representing some ninety species in North America. It is apparent that many of the species have a three-year life cycle which brings the destructive "Brood A" into conflict with the farmer every third year. The adult May beetles appear from early April until well through the summer of the year preceding their heavy destruction as grubs. These beetles all have the same general shape, but range from a pale yellow to a very dark brown in color and from slightly less than one-half inch to practically one inch long.

With a view to finding just how many species are involved in the Iowa infestation, and studying the relative frequency of the different species, adults of "Brood A" were collected in 1923 and separated to species. In 1925 "Brood C" was collected.<sup>3</sup>

During the spring and summer of 1926 collections of adults of brood A were made in twenty-one counties of the state and over ten thousand beetles secured. When carefully separated to species these revealed twenty-two different species. The counties represented were Decorah, Floyd, Sac, Benton, Linn, Jackson, Poweshiek, Iowa, Cedar, Warren, Mahaska, Keokuk, Muscatine, Scott, Monroe, Wapello, Jefferson, Henry, Appanoose, Davis, and Van Buren.

<sup>1</sup> Jaques, H. E. Brood A of the May beetles extends its range in Iowa. Proc. Ia. Acad. Sci., Vol. XXIX, pp. 163-164.

<sup>2</sup> Jaques, H. E. The 1924 outbreak of brood A of white grubs in Iowa. Proc. Ia. Acad. Sci., Vol. XXXII, pp. 423-424.

<sup>3</sup> Jaques, H. E. A preliminary survey of May beetles (*Phyllophaga* sp.) in Iowa. Proc. Ia. Acad. Sci., Vol. XXX, p.

The list of species with the number of specimens for each species follows.

LENG'S CATALOG NUMBER	NAME	NO. OF SPECIMENS
13497	futulis	1370
13501	prunina	2
13503	crassissima	123
13506	inversa	123
13507	bipartita	4
13508	micans	31
13510	vehemens	23
13511	fusca	5234
13514	hornii	15
13515	fervida	14
13516	anxia	42
13517	drakei	15
13519	barda	2
13522	fraterna	134
13523	fosteri	1
13530	rugosa	569
13534	implicata	239
13535	balia	3
13538	hirticula	2568
13540	ilicis	12
13544	crenulata	6
13563	tristis	9
Total		10539

This list adds two species (*hornii* and *barda*) not heretofore reported for Iowa and brings the total number of species reported for the state up to thirty-one. It is hoped to continue this study for a period of years with a view to a better determination of their life history in this region.

We wish to acknowledge with thanks the help of the County Agriculture Agents, teachers and students which made this large collection possible and to Robert J. Sim for doing the larger part of the separation and determination work.

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MT. PLEASANT, IOWA.

### THE ORGANS OF THE PARIETAL FOSSA IN ELASMOBRANCHS

R. E. SMILEY, W. R. INGRAM, AND E. BLAGG

Davidson, in a paper on the musculature of *Heptanchus maculatus* (1918), mentions a small shield-shaped organ to be found in the parietal fossa, and in connection with it a pair of small muscles having their origin on the cranium and dorsal longitudinal muscles. He believes that these muscles constrict this sac-like organ.