

*Hordeum jubatum* (Pucc. *graminis*). Although some search has been made for this plant, I have never found it in great abundance. Gray's Manual gives the range sandy sea shore, Upper Great Lakes and westward. Bulletin of Indiana Experimental Station, No. 29, reports the plant as frequently occurring along the Wabash River, but rather sparingly.

The few plants that I have found have their leaves dotted over rather scantily with the uredo, and the culms entirely covered with the teleutospores of *P. graminis*, the latter appearing sub-epidermal.

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TRAUMATROPIC CURVATURE OF TENDRILS. BY D. T. McDOUGAL.

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MECHANISM OF CURVATURES OF ROOTS. BY D. T. McDOUGAL.

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ON THE OCCURRENCE OF THE RUSSIAN THISTLE (*SALSOLA KALI TRAGUS*) IN WABASH COUNTY. BY ALBERT B. ULREY.

[ABSTRACT.]

The Russian thistle is recorded as occurring in two localities near North Manchester, Ind. One locality is on the Erie R. R., while the other is somewhat more than a half mile from the Big Four road.

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SOME ADDITIONS TO OUR KNOWLEDGE OF THE ANATOMY AND EMBRYOLOGY OF THE HOLOSTOMIDÆ. BY L. J. RETTGER.

[ABSTRACT.]

The holostomidæ belong to the class of trematodes and to that division of this class designated as the *digenea*, on account of their passing through two stages, entirely marked off from each other in reaching maturity. They vary in size from almost microscopic forms to forms five to ten mm. long. The holostomidæ are usually parasitic in the intestines of birds, though they have been noted occurring elsewhere. Comparatively few forms are known through all their larval stages, and in some of the few cases apparently known there is still a large element of uncertainty. This lack of definition is caused by the difficulty of finding the larval forms, and then growing the larvæ into the adult parasites.

During last winter while engaged in studying some forms of distomum, I chanced to find living parasites in the liver of *Lymnæa stagnalis* innumerable

larvæ, which, upon careful study, seemed to be larval forms of some trematode. These larvæ had been observed before and designated as tetracotyle from their four sucker-like depressions. The complete literature on the form in question showed that its anatomy was practically entirely undetermined, and study revealed that the few statements made by the earlier observers were not correct. The form was therefore subjected to a critical morphological study and its anatomy fairly well determined. The observations were, however, extended further. It was necessary to determine of what species this was of the larval stage. Following the experiments of the Italian Helminthologist, Ercolani, some of these larvæ were fed to a duck in the hope that the adult forms might make this bird a temporary or forced host at least long enough to mature. The excreta were examined prior to the feeding to see whether the duck might already be harboring similar parasites. None such were found. After about ten days, typical trematode eggs appeared in the excreta, and upon examination the intestines of the duck yielded about forty mature holostomidæ. This seemed a clear case of established identity. These forms had been noted but once before by Ercolani, and he had limited his observations to a few external points. These mature forms were then subjected to a similar morphological study, and because of the excellent material afforded, their anatomy and histology was determined with more success than is usual in dealing with such forms. Ercolani had wrongfully classified the form, and comparison with all the determined species showed this form to be a new one to science.

It was now hoped that the eggs found in the excreta might be watched in their development until they should as larvæ enter again the body of a snail and so complete the life-cycle of this trematode. The early segmentation was followed and its development toward a ciliated embryo noted, but it was not possible to follow the cycle farther. There is, however, from what we know of related forms, no special difficulty in bridging over this gap.

The results of the observations briefly summarized are these:

- (1.) The determination of the anatomy of the tetracotyle larvæ.
- (2.) The identity of this larvæ with a definite adult form of holostomum.
- (3.) The determination of the anatomy and histology of this adult form.
- (4.) The development of the eggs through the earlier stages of segmentation toward the formation of a ciliated embryo.
- (5.) The correct placing of two forms (the larval and the adult) in the systematic arrangement of the trematodes.

[The detailed accounts of these observations, together with the drawings of all the structures described, are intended to appear in a published report later.]