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On the Part played by Insects during the Flowering of Arum crinitum, Ait. By M. B. SCHNETZLER.

The spathe of *Arum crinitum* diffuses so strong an odour of putrid flesh that the insects which deposit their eggs upon decomposing animal matters are attracted by it. The author found dozens of specimens of *Musca Caesar* at the bottom of the spathe: they had deposited their eggs; and numerous small larvæ were creeping among the viscous hairs lining the interior of the spathe. Common house-flies and even mites were also caught among these hairs.

Sir John Lubbock has described the transportation by insects of the pollen of *Arum maculatum* to the protogynous stigmas of other individuals. Hairs, which are nothing but aborted stamens, are directed from above downwards, and thus facilitate the access of the insect to the lower part of the spathe, which, by means of these hairs, becomes a temporary prison for it.

In *Arum crinitum* all the hairs produced by the abortion of the sexual organs are directed from below upwards; and although they do not present any great obstacle to the access of insects they certainly do not facilitate their entrance. The viscous hairs which line the inner surface of the spathe, however, are directed downwards, and certainly present an obstacle to the escape of insects from the bottom of the spathe.

On examining under the microscope the ovaries of *Arum crinitum* at the time when numerous flies occurred at the bottom of the spathe, the stigma was found ready to receive the pollen, and a few grains of pollen were already there, besides many crystals of oxalate of lime. The stamens, although the anthers were not yet open, contained perfectly ripe pollen; and the least pressure sufficed to make it issue from the anthers.

All the flies found by the author at the bottom of the spathe were dead. The insects penetrating into this prison do not, therefore, carry out the pollen which has ripened during their captivity, as described by Lubbock in the case of *Arum maculatum*; nor is this the office of their larvæ (which soon die of starvation) or of the mites. Of the flies attracted by the fetid odour of the plant some lay their eggs at the bottom of the spathe, and then, being prevented from escaping from their prison by the viscous hairs which line its entrance, they die. Others, less pressed to oviposit, are attracted by the glandular hairs which cover the spadix and lead them, like the rungs of a ladder, to the stamens. Here, walking over the anthers, they cause the pollen to escape; and still ascending the spadix in the direction of the hairs, they fly away to lay their eggs in another spathe, at the bottom of which they deposit upon the stigmas the pollen derived from the stamens of the former plant, and finally die in their turn.

When the dead flies are examined after the lapse of a few days, their chitinous envelope is found dried up; but this is not the result of simple desiccation, as the insect lies upon a moist surface, upon which a portion of the liquid contents of the hairs has

exuded. These hairs are filled with a purplish-red, violet, or even blue liquid. When the violet or blue liquid is treated with dilute sulphuric acid it becomes bright red. Ammonia restores the original colour. The purple-red liquid scarcely changes colour with acid; but it becomes violet or blue under the influence of ammonia. The purple-red hairs which cover a great part of the inner surface of the spathe of *Arum crinitum* may therefore probably contain an acid which, like that exuded from the hairs of *Drosera*, may contribute to the conversion of the nitrogenous materials of insects into matters capable of absorption by the spathe.

The spathe is, in fact, a simple leaf, the parenchyma of which contains grains of chlorophyll, like all leaves capable of assimilation. We need only immerse the purple spathe of *Arum crinitum* for a few days in a saturated solution of borax, to get rid of all the colouring-matters which masked the green colour of the chlorophyll. Thus, while admitting the possibility of the transportation of the pollen of *Arum crinitum* by flies to the stigmas either of another individual or of the same, the author is of opinion that insects also furnish nitrogenous nourishment to the plant through the mediation of the spathe. The name of *Arum muscivorum*, given to the plant by the younger Linné, would therefore be appropriate*.

The so-called hairs which occur above the fertile stamens up to the extremity of the spadix present a structure very different from that of ordinary hairs. They are formed by an epidermic tissue, a parenchyma, and an axial vascular cord composed of tracheids. They are stamens, transformed, like those immediately below the fertile stamens, into glandular organs, which perform the same function as the aborted stamens of *Parnassia palustris*. The numerous living *Bacteria* which occurred upon the bodies of the dead flies among the hairs of the spadix of *Arum crinitum* show that here we have to do with a simple putrefaction of the albuminous materials of the insect; none of the dead flies among the viscous hairs lining the interior of the spathe presented any trace of *Bacteria*. Between the stamens and the pistils there is a whorl of aborted ovaries in the form of glandular appendages.—*Comptes Rendus*, September 8, 1879, p. 508.

On a new Species of Wild Dog from Demerara.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—I observe that inadvertently I have omitted to name the new species of dog described by me *suprà*, p. 316. I propose for it the name of *Canis rudis*.

British Museum,
October 1, 1879.

Believe me,
Yours truly,
A. GÜNTHER.

* M. E. Aschmann has also cited *Dracunculus crinitus* among insectivorous plants. See Just's 'Botanische Jahresbericht,' 1877, p. 730.