

BEE BOTANY AND ENTOMOLOGY.

A CHAPTER ON BOTANY FOR BEE-KEEPERS. BY PROF. W. J. BEAL, AGRICULTURAL COLLEGE, LANSING, MICH.

I AM frequently asked to identify or give names to certain plants upon which some person has seen bees at work. This does not usually occupy much of my time, especially if the specimens are well put up, as most of them are known at sight or after a few moment's examination.

But, the thought occurs to me, of what benefit can it be to the person sending the plant to know whether it is *Aster machrophyllus*, *Aster prenanthoides*, or *Aster grandiflorus*; whether it is *Solidago petiolaris*, *Solidago canadensis*, or *Solidago missouriensis*? My examples are some which are included in the list lately received. Of *Asters*, we have in the Northern States 41 species, besides perhaps forty to one hundred more which much resemble them, to a person unaccustomed to Botany. Of *Solidago* or Golden rods, we have 37 species and some others much resembling them. Scarcely one of these has a separate or distinct common name. *Asters* look too nearly alike to be distinguished from each other by any one but an expert. The same is true of Golden rods and of a vast number of other bee plants. If told once, the name of a species, people cannot be trusted, in many cases, to gather seeds or point out the plant. They will get the species and even the genera "all mixed up." Even the botanist gets some of them mixed occasionally. Our country is renowned for the abundance and variety of her *Asters* and Golden rods in September till the hard frosts appear. These are found in open or unwooded regions, in swamps, along streams, and on the prairies. The fact is, there are nearly a hundred times as great a variety of flowers which furnish bees with food, as most people imagine. On checking off for a noted bee-keeper who wanted to make a list of bee plants, he seemed much surprised at the great number, and said he only wanted the best of them. Which are the best? The forty one *asters* are all good. In one locality, certain species abound in great numbers; in other places some disappear and others take their places. To be sure, there are some *asters* and other plants affording good honey or pollen, which rarely exist in large numbers. The same is true of golden rods and of many other plants. I suppose a plant is desirable if it exist in quantity large enough to afford much food during a long period, or if it afford food at a certain time when most other flowers are scarce.

I have made the action or behavior of insects on flowers a study for years. Some flowers are only visited in the morning or forenoon, as the dandelion; others in afternoons, others at all times of day when not raining. I tell no news by saying that basswood and raspberries afford good honey, while tulip tree and lobelia afford honey which is unpleasant or unwholesome to some persons.

The *Ranunculaceae*, Crowfoot family, afford us 30 species or more upon which bees work; some of them open very early in spring. The *Cruciferae* or mustard family, about 70 species; *malvaceae* or mallow family, over 20 species; *Geraniaceae* or geranium family 13; *Anacardiaceae* or sumachs, six; *Tilaceae* or vine family, 7; *Sapindaceae* or maples etc., 11; *Leguminosae* or Pulse family, 110 or more natives, besides some exotics; *Rosaceae* or rose family, 83 and several exotics; *Saxifragaceae* or Saxifrage family, about 30; *Caprifoliaceae*, Honeysuckles etc., about 30; *Compositae*, Sunflowers, *asters* etc., perhaps 325, besides many in cultivation; *Lobeliaceae*, Lobelia family, 13; *Campanulaceae*, Bellflowers, 7; *Ericaceae*, heath family, 60; *scrophulariaceae*, fig worts, about 60; *Verbenaceae*, verbenas, 10; *Labiatae*, mints, many of much value, 78; *Borraginaceae*, Borage family, 28;

Asclepiadaceae, milkweed family, 25; *Polygonaceae*, Buckwheat family, 38; *Liliaceae*, lily family, 50. Besides these there are many where there is only one or two or a few in a small order, perhaps not far from 570. Then probably there are a hundred or more about which I am uncertain. If I have added correctly, I give above, about 1775 species from which bees get more or less honey or pollen. These grow east of the Mississippi river and north of Kentucky in the United States. Some, like the grasses and pines, have no showy or fragrant flowers and afford little or no honey. As a general rule, those plants which produce odorous or showy flowers afford honey and will be visited by honey bees unless the flower is of a shape which makes it impossible for the bee to reach the food.

It would be a great source of pleasure, and in some cases perhaps of profit also, for every bee-keeper to be a good botanist. In fact, every person should study botany more less, as any one can if he only tries and perseveres. The culture it gives, the enjoyment, the discipline, all place botany in a high position as a science.

HONEY DEW.

I SAID in my last communication, the absence of all wild and cultivated flowers during this year, 1876, was very like the year 1865, but owing to the atmospheric constitution favoring the development of this "myth," Honey Dew had caused this to be remarkable as a bountiful honey season. We have removed honey boxes until tired out and now all the boxes are full on the colonies. Some hives have a comb a foot long attached to under part of the triangle, well filled with as nice honey as any in boxes; the bees having been driven in by cold weather. One large box hive, empty, sitting in contact with a full colony on either side, was filled with honey nearly as white as the driven snow, and abandoned upon the approach of cold weather. It contained over 4000 cubic inches of honey.

Why do I call this Honey Dew a myth? Because as yet, no satisfactory explanation of its production has been given. We are all conjecturing and each man has his theory. Langstroth and others attribute it to Aphides. I have seen cotton fields covered with it. In riding through prairie grass at early dawn, I have been stuck all over with it and my horse made so disagreeable that ablution of myself and horse was necessary before proceeding. I know apiaries bordering on these floral prairies, often of the old fashioned gum hive or barrels, kegs or any other rude hollow material, during a Honey Dew season to yield vast quantities of as pure nice honey as ever was taken from box or frame. There among grass and flowers was emphatically the land that flowed with milk and honey. The Honey Dew mystery has not been solved.

Dry weather is *sine qua non* to production of Honey Dew. Every observer will testify to this fact. It will continue as long as the dry weather lasts and cease with the first heavy fall of rain. No man ever saw Honey Dew to any extent during a wet season. Whatever produces the Honey Dew of this region of country renders our apiarians rich and prosperous in such seasons—they are poor without it, for all the honey bearing blossoms furnish more the pabulum of bee life than they do of pure honey in wet seasons.

I hope some enlightened contributor of GLEANINGS will give this Honey Dew subject his attention and communicate whatever he may discover, to the world of science and thereby give an impetus to investigating the effects of vegetable respiration and chemical affinities in floral regions. I am free to confess my entire ignorance of the true causes resulting in the compound called Honey Dew. That the aphids and some other insects distill a kind of nectar, I know to be the fact; but the idea that it can spread a mantle of honey over vast acres of country, both prairie and wilderness in one night, and for a succession of nights lasting weeks and months, is simply absurd. Honey Dew in our present condition of knowledge appears as a result of something—we do not know what that something is.

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Council Bend, Ark., Oct. 29th, '76.