



Eva Crane Trust

ECTD_237aa

TYPESCRIPT: Honey from different insects

SOURCE: Eva Crane's personal collection.
Unpublished lecture given at Örebro, Sweden

DATE: April 1991

28/1/91

HONEY FROM DIFFERENT INSECTS

One essential feature in the evolution of social bees was the ability of a colony to prepare and store a source of energy that would not spoil, for its use during the next dearth period when the bees cannot collect nectar. Nectar itself contains so much water that it would ferment and spoil, and bees developed the ability to produce two enzymes, invertase and glucose oxidase, which enabled them to convert the nectar into honey. Honey keeps for long periods, because of its exceptionally high concentration of sugars - even up to 85% - which inhibits the growth of micro-organisms.

Two enzymes are produced by all social bees. The honeybees have the largest colonies and produce and store the most honey; there is one species in Europe and Africa, and there are three others in Asia. Another important group of social bees are the stingless bees (Meliponinae), with about 500 species - all tropical. The much smaller group of bumble bees (Bombus) live in the north temperate zone. Other honey-storing insects are certain social wasps in the South American tropics, and honey ants in some parts of the Americas and Australia; these ants cannot build combs, and store their honey in the abdomens of certain individuals, in the colony known as repletes.

A group of quite different insects take part in the production of honeydew honey. These are plant-sucking Hemiptera that include coccids (scale insects), lachnids and aphids. They have mouthparts which can pierce leaves or some other part of the host plant and so release the sap inside. Bees cannot do this as their mouthparts have no piercing structure. The plant-sucking insects feed on the sap, but this contains rather little protein, and to obtain enough of it, they have to consume very much liquid. The excess liquid by-passes the midgut and is

excreted as honeydew, which contains sugars and is sweet, and attracts bees and other insects.

Most plants on which honeydew is produced are trees. About 20 of them are important on a world basis; 6 conifers (Pinaceae), 5 oaks and beeches (Fagaceae), and others which include poplars, chestnuts, willows and limes. One tree species may carry populations of more than one honeydew-producing insect. For instance 3 species of Cinara (lachnids) and 2 species of Physokermes (coccids, scale insects) may feed on Norway spruce (Picea abies). Honeydew flows usually occur in late summer when populations of the plant-sucking insects have grown to a maximum. Colonies of bees taken to such a flow can store up to 40 kg of honey from the honeydew.

Honeydew honey differs from nectar honey in several ways. It contains less of the monosaccharides fructose and glucose, and up to 10% or more of trisaccharides such as melezitose. It has a higher mineral content than nectar honey. Like nectar honey, it contains enzymes from the bees; in addition it contains enzymes from the gut and saliva of the honeydew-producing insects. Some of the materials in honeydew honey cannot be absorbed by the honeybee gut and this honey is therefore unsuitable as the sole winter food for colonies when temperatures are too low for them to fly out and defaecate.

Honeydew honey does not come from flowers, and so does not contain pollen. More important for the beekeeper is the fact that bees working a honeydew flow do not collect pollen from the plants on which they are foraging. Colonies cannot rear brood unless they have pollen, so if no flowers in the neighbourhood are producing pollen, the beekeeper must feed the colonies with a pollen substitute.