Bees disease -- 1 step closer to finding a cure

Scientists in Germany have discovered a new mechanism of infection for the most fatal bee disease. American Foulbrood (AFB) is the only infectious disease which can kill entire colonies of bees. Every year, this notifiable disease is causing considerable economic loss to beekeepers all over the world. The only control measure is to destroy the infected hive.

The mechanism of infection (pathogenic mechanism) was originally thought to be through the growth of a bacterium called Paenibacillus larvae in the organ cavity of honey bee larvae. The accepted view was that the bacteria germinate preferentially at either end of the gut of honey bee larvae then make holes in the gut wall and enter the larval organ cavity, the presumed primary place of bacterial proliferation.

In a paper published in *Environmental Microbiology*, Professor Elke Genersch and colleagues in Berlin explain that they have discovered that these bacteria cause infection in a completely different way. They colonize the larval midgut, do most of their multiplying in the mid-gut - living from the food ingested by the larvae - until eventually the honey bee larvae gut contains nothing but these disease-causing (pathogenic) bacteria. It isn't until then that the bacteria 'burst' out of the gut into the organ cavity thereby killing the larvae. These findings are a major breakthrough in honeybee pathology.

"Now that we fully understand the way in which this disease works, we can start to look at ways of preventing the spread of infection" said Professor Genersch.

Honeybees are important pollinators of crops, fruit and wild flowers. Therefore, they are indispensable for a sustainable and profitable agriculture but also for the maintenance of the non-agricultural ecosystem. Honeybees are attacked by numerous pathogens including viruses, bacteria, fungi and parasites. For most, if not all of these diseases, the molecular pathogenesis is poorly understood hampering the development of new ideas about how to prevent and combat honeybee diseases.

Professor Genersch added: "Molecular understanding of pathogen-host interactions is vital for the development of effective measures against infectious diseases. Therefore, in the long run, our findings will help to save large numbers of bees all over the world."

Source: Wiley