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Varroa mite resistant to Amitraz?

By Dr. Malcolm Sanford

Welcome to the Bee Culture column looking at InsideTheHive.TV, "The show that takes you into the world of bees". InsideTheHive.TV is the effort of Dr. Humberto Boncristiani to create free content about bees to everyone using videos on YouTube. Dr. Boncristiani is an applied honey bee researcher, affiliated with the University of Florida's Honey Bee Research and Extension Laboratory, and you can find more about him in his website (www.InsideTheHive.TV). To take full advantage of this column, readers must have a QR code reader on their phone to scan the QR code provided to access the video that complements this article.

Recently, Dr. Boncristiani attended the American Honey Producers Association in Sacramento, California, and recorded a presentation by Dr. Frank Rinkevich at the Baton Rouge Bee Laboratory in Baton Rouge, LA about Amitraz Resistance in Varroa mites. This 38-minute video is longer is worth the extra time effort to digest the material presented. Dr. Rinkevich begins with the idea that one particular treatment for Varroa, the miticide called amitraz, usually generates a lot of buzz with beekeepers. That's because it is known to have created resistance in Varroa mites, which are no longer killed by the substance in great numbers. Reliance on this miticide inevitably results in resistance, which is a widespread phenomenon across the insect world. He compares resistance to insecticide in house flies with Varroa in honey bees using the same characteristics. This points to both organisms becoming resistant multiple times and in different geographical situations.

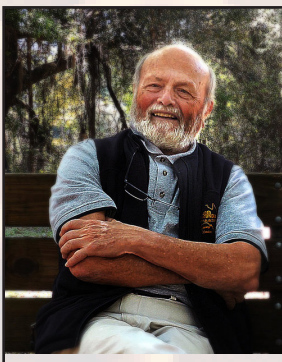


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Research at Project Apis m is also occurring with respect to amitraz resistance. Arian Avalos is described as working to identifying genes associated with the trait to develop a molecular diagnostic test. This could lead to an important goal of having a low cost, extensive, rapid evaluation of amitraz resistance. The take-home messages listed by Dr. Rinkevich, are that 1) amitraz resistance is rare, but detectable; 2) restricted within colonies and within operations; and 3) Apivar® effectiveness is a reliable substitute for measuring resistance using the parent compound (amitraz). In other words, the formulated material on strips called Apivar® is just as effective as using the chemical itself (amitraz), which makes detecting resistance much easier.

Scan the QR code using your phone or tablet to access the video.

Dr. Rinkevich describes techniques to determine baseline toxicity of amitraz, the extent of resistance found in commercial beekeeping operations, along with producing validated measurements of resistance. This is done using vial bioassays for toxicity and measuring the efficiency of the commercial formulation of amitraz, called Apivar®, executed over a three-year period. A considerable number of beekeeping outfits did not show resistance, revealing it's still effective in spite of widespread and consistent use. He describes resistance as generally found within operations and within apiaries. The range of resistance was also quite large among these colonies and apiaries. Much is not known about amitraz itself, specifically its breakdown products. In many chemicals, these can be more toxic than the parent material. Finally, he concludes the biochemical mechanism of resistance needs to be better understood.



Dr. Malcolm T. Sanford is professor emeritus at the University of Florida. Beekeeping consultant and author of Storey's Guide to Keeping Honey Bees.

Varroa parasitizing a honey bee



Photo: Dr. Humberto Boncristiani