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The Varroa destructor mite is responsible for varroosis, the leading disease weakening and causing the loss of honeybee colonies. With a global prevalence, this pathology significantly impacts both individual bees and entire colonies due to its association with multiple honeybee viruses. In Algeria, beekeepers use various treatment methods and products, and this study aims to assess their effectiveness and potential side effects on colonies.

The trials were conducted on 15 apiaries owned by ten beekeepers in the central region of Algeria (Blida and Boumerdès). Different chemical and natural treatments were tested. The results showed a decline in the effectiveness of chemical compounds, particularly fluvalinate and flumethrin, confirming the high resistance of the mite to these products in Algeria.

Field studies highlighted the importance of biological treatments based on thyme (Apilife Var®, Oxuvar®, and Apibioxal®) as an alternative control method. These products showed promising efficacy but also had negative effects on colonies, including desertion, queen mortality, and brood interruption. Additionally, the use of plants and essential oils produced highly variable results, with moderate effectiveness and noticeable disturbances in colony behavior.

Conversely, oxalic acid treatment in the absence of brood proved to be the most effective method, achieving a mite elimination rate of over 90%. Further laboratory studies are needed to recommend optimal natural solutions for controlling this beekeeping pathology. A combined approach integrating chemical, biological, and biotechnological control strategies appears to be the most effective solution for managing varroosis while minimizing its impact on colonies.