ADVANCING HONEY BEE BREEDING WITH LOW-COST, RAPID AND ACCESSIBLE DNA ANALYSIS TECHNIQUES

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Abstract *– Colony collapse disorder (CCD) is a major concern for beekeeping, and consistent breeding efforts are essential in addressing the various factors that contribute to CCD. Traditional breeding methods are often labour-intensive and may not yield the desired results in improving bee colony characteristics. The DNA analysis offers a potential solution by enabling the acceleration of breeding efforts, increasing predictability and reducing workload. While honey bee DNA analysis has been available for some time, its use in bee breeding has been limited to a few companies and research institutions. This review article aims to expand access to the DNA analysis by summarizing the genetic characteristics that can be determined, methods for predicting the transmission of these characteristics to future generations, and reviewing the most widely available methods and service providers for conducting DNA analyses. By utilizing the DNA analysis, a wider community of bee breeders can effectively address CCD and improve the quality and health of bee colonies.*

Keywords – Accessible technology; colony collapse disorder (CCD); DNA analysis; honey bee breeding; genetic characteristics; low-cost methods; predictive breeding