

Once upon a time, the VANA story based on the review « virion-associated nucleic acid-based metagenomics : a decade of advances in molecular characterization of plant viruses »

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Over the last decade, viral metagenomic studies have resulted in the discovery of thousands of previously unknown viruses. These studies are likely to play a pivotal role in obtaining an accurate and robust understanding of how viruses affect the stability and productivity of ecosystems. Among the metagenomics-based approaches that have been developed since the beginning of the 21st century, shotgun metagenomics applied specifically to virion-associated nucleic acids (VANA) has been used to disentangle the diversity of the viral world. We summarize herein the results of 25 VANA-based studies, focusing on plant and insect samples conducted over the last decade (2010 to 2022). Collectively, viruses from 94 different families were reliably detected in these studies, including capsidless RNA viruses that replicate in fungi, oomycetes, and plants. Finally, strengths and weaknesses of the VANA approach are summarized and perspectives of applications in detection, epidemiological surveillance, environmental monitoring, and ecology of plant viruses are provided.