

Table 1. An overview of traditional and emerging techniques to investigate microbial diversity and function within the venom microenvironment, including potential challenges and considerations when designing experiments and conducting analyses.

Methods and Approaches to Understanding Venom Microbiomes					
Focus	Technique	Taxonomic classification	Functional data	Advantages	Primary considerations
Venom Microbiome Exploration	Metagenomics	YES	NO	Biomarker discovery, Comparative analysis	Contamination risk, dissection, library preparation
Venom production and regulation	Transcriptomics	NO	YES	Gene expression pattern, Key genes, Comparatives analysis with microbial genes	Difficulty in RNA extraction and processing, transcript sorting
Protein composition, Protein family exploration	Proteomics	NO	YES	Detect protein interactions or levels, Functional potential	Complex biological samples, database searches, statistical analysis
Chemical profiling and pathways	Metabolomics	NO	YES	Metabolite profiling, Comprehensive, Functional	Interdisciplinary collaboration, compound identification
Host health, Ecology, Selection	Isolate Cultures	YES	NO	Selective, Strain identification, AMR testing	Technical expertise, careful planning, contamination risk