Assessing methodological variability in gut microbiome studies: lessons from Southeast Asian for effective conservation strategies.

ABSTRACT

Gut microbiome studies have gained significant attention in recent years due to their potential in unveiling the role of microbial communities in animals' health and ecological processes. However, the lack of standardized protocols in sample handling and processing across studies introduces variability, impeding the comparability of findings. This study addresses this issue by examining methodological variations in gut microbiome research on wildlife and domesticated animals in Southeast Asia. A comprehensive search of 91 relevant studies on the SCOPUS database yielded 54 suitable publications for review, encompassing diverse taxa such as invertebrates (20), fishes (7), reptiles (3), birds (5), and mammals (19). Notably, various methodological approaches were employed to characterize microbial communities, including the source of isolation, various culture-based approaches, sequencing methods, and the targeted markers. Based on the information provided in this study, future studies should strive to develop guidelines and best practices specific to gut microbiome studies. This would enhance comparability and facilitate the integration of findings. Such efforts will also advance our understanding of the microbial diversity associated with wildlife, and its potential implications for their health and conservation.