comparisons of the influence of spatial and temporal aspects on Pseudo-nitzschia genetic variation as well as investigation of bloom-season and non-bloom strains. New insights in the toxicity and sex determination genomic region of the species can inspire further research in Pseudo-nitzschia and other toxic and non-toxic diatoms.

Overwintering does not affect the microbiome diversity in the Brown Marmorated Stink Bug

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The brown marmorated stink bug (BMSB), Halyomorpha halys (Hemiptera: Pentatomidae) is an invasive agricultural insect pest from East Asia that is now widespread in North America, South Europe and Chile. This species survives temperate winters using a particular overwintering strategy including the aggregation of individuals that enter a state of dormancy and starvation. Gut microbial communities have recently been shown to play a crucial role in the biology of many organisms, but it is not known if and how the BMSB microbiota is affected by its dormancy period. To address this we investigated the short-term evolution of BMSB gut microbiota diversity by performing 16S amplicon analysis of five distinct populations, sampled before and after overwintering dormancy in the Province of Trento, northern Italy. Results indicate that the alpha and beta diversities of pre-overwintering microbiota is similar among populations . We also noted the presence of specific pathogens which might be of environmental interest and found Nosema maddoxxi (an important bee pathogen) in two populations (instead, phytoplasmas were absent). We did not find any significant differences in microbiota diversity between the pre-overwintering and overwintered individuals. It is well known that microbiotas in several organisms (e.g., Drosophila melanogaster and Homo sapiens) significantly shift with environmental and dietary changes. Our result is therefore unexpected, since overwintering is associated with starvation and metabolic shifts in BMSB However, it has been shown in some other insects (e.g., the cockroach Periplaneta americana) that microbiota diversity does not change in response to starvation. Our results indicate that BMSB maintains a stable host-symbiont relationship with its microbiota despite overwintering under stressful conditions: this strategy may be related to the previously reported highly specific associations of stink bugs with some of their symbionts. From an applied point of view, our results suggest that the use of the sterile insect technique should characterize the microbiota of original populations before insect release to avoid propagation and spread of potential pathogens such as N. maddoxxi which can be maintained after overwintering.

Large-scale genome reconstructions from human gut metagenomes to study phage-host relationships

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