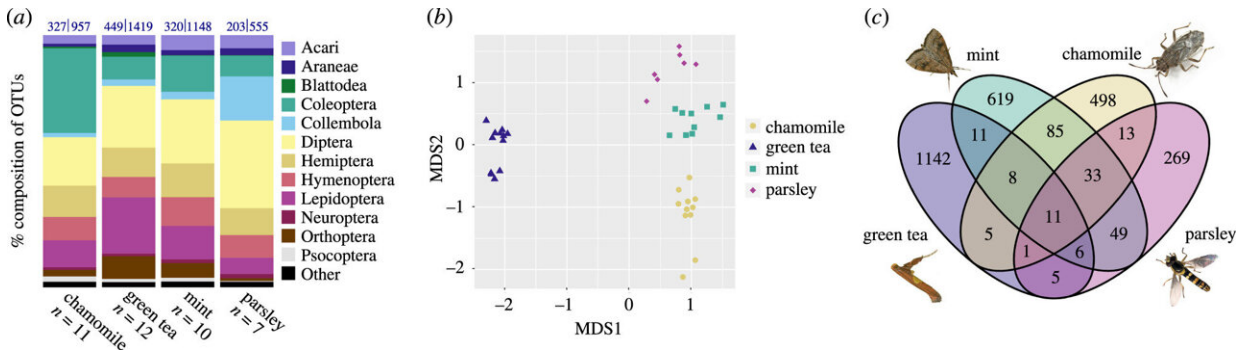
Tea and dried herb samples reveal large numbers of arthropod eDNA

June 15 2022, by Bob Yirka



Taxonomic composition of arthropods recovered from dried plant samples. (a) Bar plot showing per cent composition of OTUs by arthropod order. Numbers above bars indicate mean number of OTUs|total number of OTUs recovered from each plant. (b) NMDS ordination of arthropod composition by sample. (c) Venn diagram showing total numbers of OTUs (greater than 10 reads for a given plant) recovered for each plant. Exemplary arthropods are shown next to plants from which they were recovered, clockwise from upper left: Udea profundalis (crambid pest of mint), Nysius senecionis (lygaeid pest of chamomile), Sphaerophoria scripta (hoverfly associated with Apiaceae), Caloptilia theivora (gracillariid pest of tea). Credit: *Biology Letters* (2022). DOI: 10.1098/rsbl.2022.0091

A team of researchers from Trier University and the Max Planck Institute for Evolutionary Biology reports that there are large amounts of arthropod eDNA in commercially sold tea and dried herbs. In their paper

published in the journal *Biology Letters,* the group describes collecting multiple samples of commercially sold teas and dried herbs and then analyzing each sample for environmental DNA (eDNA).

eDNA is left behind in natural environments by creatures such as spiders and other arthropods when they chew or crawl on surfaces. They can leave behind saliva when they chew or defecate. Either material contains small amounts of DNA, which researchers can find using methods developed over the past several years. Most such approaches start by identifying parts of DNA strands that are common to a certain group of organisms, such as arthropods. In this new work, the researchers used such an approach to separate bug eDNA from plant DNA. They then boiled the samples in water, from which they obtained the eDNA. Next, they studied the eDNA to identify their source.

Prior work studying eDNA has typically involved study of material sampled from both wet and dry locations. The researchers note that they get their best results when they find samples that have been well-preserved in some manner, which got them to thinking about teas and herbs. In their work, the team studied 40 tea and herb samples and found eDNA for over 1,200 unique species of arthropods. More specifically, they found evidence of 3,264 arthropods such as predators, herbivores, detritivores and parasitoids. And they found that every sample contained eDNA from at least 200 creatures in it and that green tea had the most.

The researchers suggest their work expands the range of eDNA study and opens the door to the possibility of using their technique as a way of monitoring certain ecosystems—something that could prove useful as global warming continues to have a wide range of variable impacts across the planet.

More information: Henrik Krehenwinkel et al, The bug in a teacup—monitoring arthropod–plant associations with environmental

DNA from dried plant material, *Biology Letters* (2022). DOI: 10.1098/rsbl.2022.0091