

Abstract

Thousands of parrots all over the world suffer from illnesses and medical complications that can result from interactions between their immune system and bacteria in their digestive tract. The aim of this master's thesis is to understand the link between symptoms of these medical issues, the composition of blood and gastrointestinal microbiota in parrots. Using the hematological methods, 198 blood samples representing 53 parrot species were analyzed. The composition of microbiome was defined by combination of a molecular approach using bacterial 16S rRNA gene sequencing in 132 fecal samples, 12 intestine samples, 228 cloacal swabs and 236 beak swabs representing in total 61 parrot species and a diagnostic approach by psittacine fecal Gram's stain method. Significant association of hematological parameters with individual, environmental and clinical factors was observed, as well as its considerable interspecific variability. Absolute heterophile and lymphocyte counts have been shown more useful for infectious and autoimmune disease monitoring than H/L ratio. Relative numbers of basophiles were the best indicator for behavioral disorders. In relation to hematological parameters, the effect of the bacterial family Flavobacteriaceae, as part of the oral microbiota, and the bacteria *Escherichia* or *Shigella*, presented in the bacterial communities in cloaca, on the H/L ratio was revealed. Principal component analysis based on Bray-Curtis distance metric indicated that the oral swab microbiota differed from all other parrot microbiota samples. In contrast, all intestinal specimens have shown considerable consistency in their taxonomic composition. Among fecal, cloacal and oral microbiota, intra- and interspecific variability in composition has been revealed. In conclusion, these results provide useful information for the basic evolutionary-immunological research as well as having practical potential in veterinary and zoohygienic practice.

Keywords: Psittaciformes, Hematology, Microbiota, 16S rRNA gene