Effect of hemicellulosic diet on the gut bacterial community of American cockroach *Periplaneta americana*

Bertino-Grimaldi, D[1], Cardoso, A.M.[2], Medeiros, M.N.[3], Nascimento, A.C.B[1], Albano, R.M[4], Machado, E.A.[1,3]

[1]Instituto de Biofísica Carlos Chagas Filho, IBCCF-UFRJ, RJ; [2]UEZO, RJ; [3]DIMAV, INMETRO, RJ; [4]Departamento de Bioquímica, UERJ, RJ, Brazil

Introduction. Apart from their social pest status, cockroaches have received much attention in the last years because of their ability to degrade lignocellulose. Studies have shown that this ability on lignocellulose breakdown also depends of intestinal microbiota. However, few studies have focused on the relation between the food source and bacterial community structure. Objectves.This study aimed to verify the complexity of bacterial community harboured in the American cockroach *Periplaneta americana* gut and how this community responds to the introduction of hemicellulosic compound as an unique food source. Material and methods. The insects were kept under the same conditions, varying only the diet. We compared the microbiota of the *P. americana* fed on xylan or dog chow by sequencing of the hypervariable V4 region 16S rRNA and comparative metagenomic, which was analyzed by MG-RAST. Results and discussion. The most abundant phylum observed in the *P. Americana* gut after ingestion of hemicellulosic compounds was Bacteroidetes, which is a phylum of bacteria commonly found in rumen and known as xylan-degraders.The results showed that the bacterial communities were modified by diet composition. Thereby, after two weeks of xylan-rich diet the population of Lactobacillaceae was reduced and the Enterococcaceae family was increased, when compared to gut microbiota of cockroaches fed dog chow. Furthermore, comparative metagenomic analysis showed high abundance of genes related to xylose metabolism, as xylose isomerase that was three times more observed in this metagenome. The microbiota structure was compatible to that found in other omnivorous animals and xylan-rich diet might to lead the microbiota specialization. Conclusion. The data suggests that food seems to be able to modifiy the microbial arrangement and also alter the metabolism of the bacterial community.

Keywords: hemicellulose, cockroach, insect
Acknowledgment : CNPq