SNP (*Single Nucleotide Polymorphisms*) association with honey production for *Apis mellifera* breeding as a tool for increasing environmental pollinators

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Honey is the main product explored by beekeepers [1]. Conventional beekeeping sometimes did not use programs to breeding selection, having colonies with different genetics in commercial apiaries; these colonies can have unfavorable honey production genetic characteristics, affecting significantly productivity [2]. These differences can decrease the efficiency and competitiveness of commercial beekeepers, reducing beekeepers and directly reduction pollinators at the environment, affecting crops and florets sustainability [3]. Wild bees has decreased at last years due lack of natural places caused by deforestation [4,5]. Thus the aims of this research was identified Single Nucleotide Polymorphisms (SNP´s) on Africanized honey bees (AHB) populations with high and low honey production using ddRADseq (Double Digested RAD Sequencing) technique for genomic DNA sequencing. The experiment was conducted at UNESP, Botucatu, Sao Paulo, Brazil. Fifty AHB colonies were used, managed for honey production. During the blossom period, December 2013 to March 2014, supers were added to beehives as needed. Honey production was evaluated individually and ten most productive (High Honey Production, HHP), over 10 kg honey production for each beehive (12.21±1.5 kg), and less productive (Low Honey Production, LHP), less than 10 kg honey production for each beehive (4.8±3.9kg), were selected. Genomic sequencing was done with larvae drone DNA from each colony using ddRADseq technique and then sequenced by Illumina technology (DNA-Seq). 139 095 SNPs were detected at 20 samples analyzed and a variant calling (VCF file) was made. With PLINK v.1.07 program 124 SNP´s with $P<0.001$ was identified as associated with honey production. Thus, with this set of SNPs associated with honey production beekeepers can use at breeding program, increasing their profit and number of colonies at the apiaries, helping increasing pollinators at environment once honey bees are considering the main environmental pollinator.

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