

Introduction

Rice distillers' by-product (RDP) is a widespread coproduct from alcohol industry in Vietnam and in Asia, and is an excellent source of protein, fiber, and minerals. To the best of our knowledge, to date, no data are reported on effects of RDP on gut microbiota composition. In this study, colonic bacterial microbiota of weaned piglets fed diets containing increasing amounts of RDP was identified using 16S rRNA amplicon sequencing.

Material and Methods

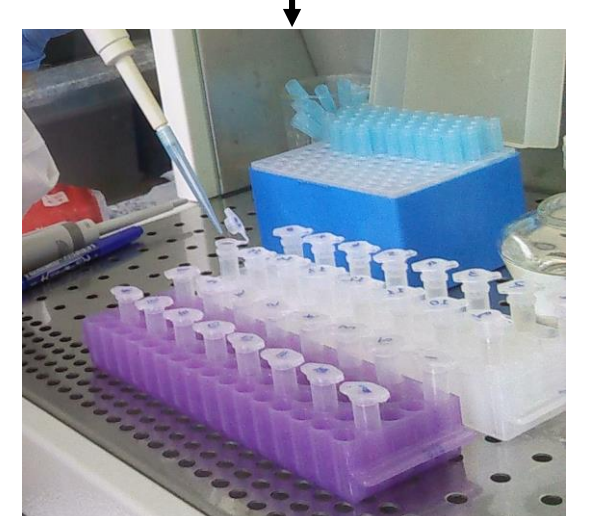
The study was carried out from January to March 2017 at a private farm specialized in pig production, Vietnam. A total of 48 healthy weaned castrated male crossbred pigs [♂Duroc × ♀(Landrace × Yorkshire)], initial body weight 7.5 ± 0.9kg (Mean ± SD), and age about 4 wks, were individually ear tag numbered and randomly allocated into three diet-groups of 4 replicates. Pigs were fed one of 3 diets including, in DM, 0% RDP (RDP0, control), 15% RDP (RDP15) and 30% RDP (RDP30) during a total of 35-d experiment for 2 stages (days 0-14 and days 15-35). On days 14 and 35, eight piglets per treatment were exsanguinated and eviscerated for collection of digesta samples at 6 hours after feeding. Individual samples of each colonic digesta were collected in sterile tubes (PSP@ Spin Stool DNA Plus Kit), and DNA extracted in Biotechnology laboratory and stored at -20°C. PCR-amplification of the V1-V3 hypervariable region of bacterial 16S rDNA and sequencing on a Illumina MiSeq sequencer were performed. Bacterial diversity components and community abundance between diets were compared using a Kruskal-Wallis test respectively with a Dunn's post-hoc test and, measure of Storey False Discovery Rate followed by a Tukey-Kramer post-hoc test (STAMP software).



Experimental pigs



Collected samples



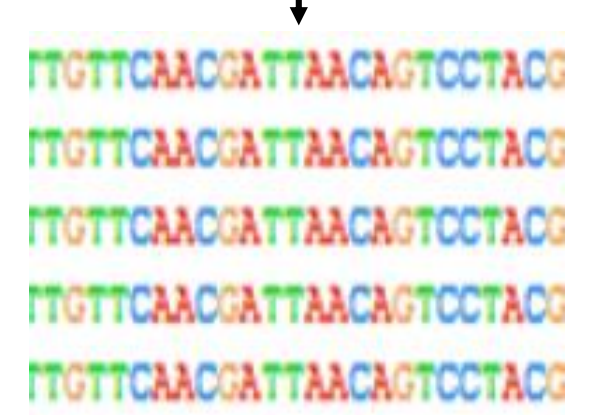
Extracted DNA



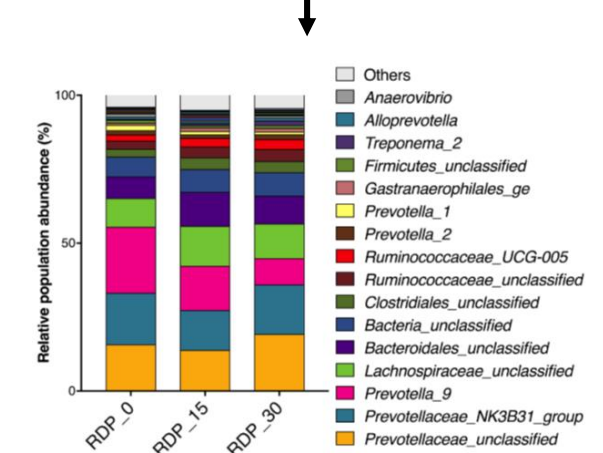
PCR running



Sequencing run



BLASTn



Results

Analysis process

Results

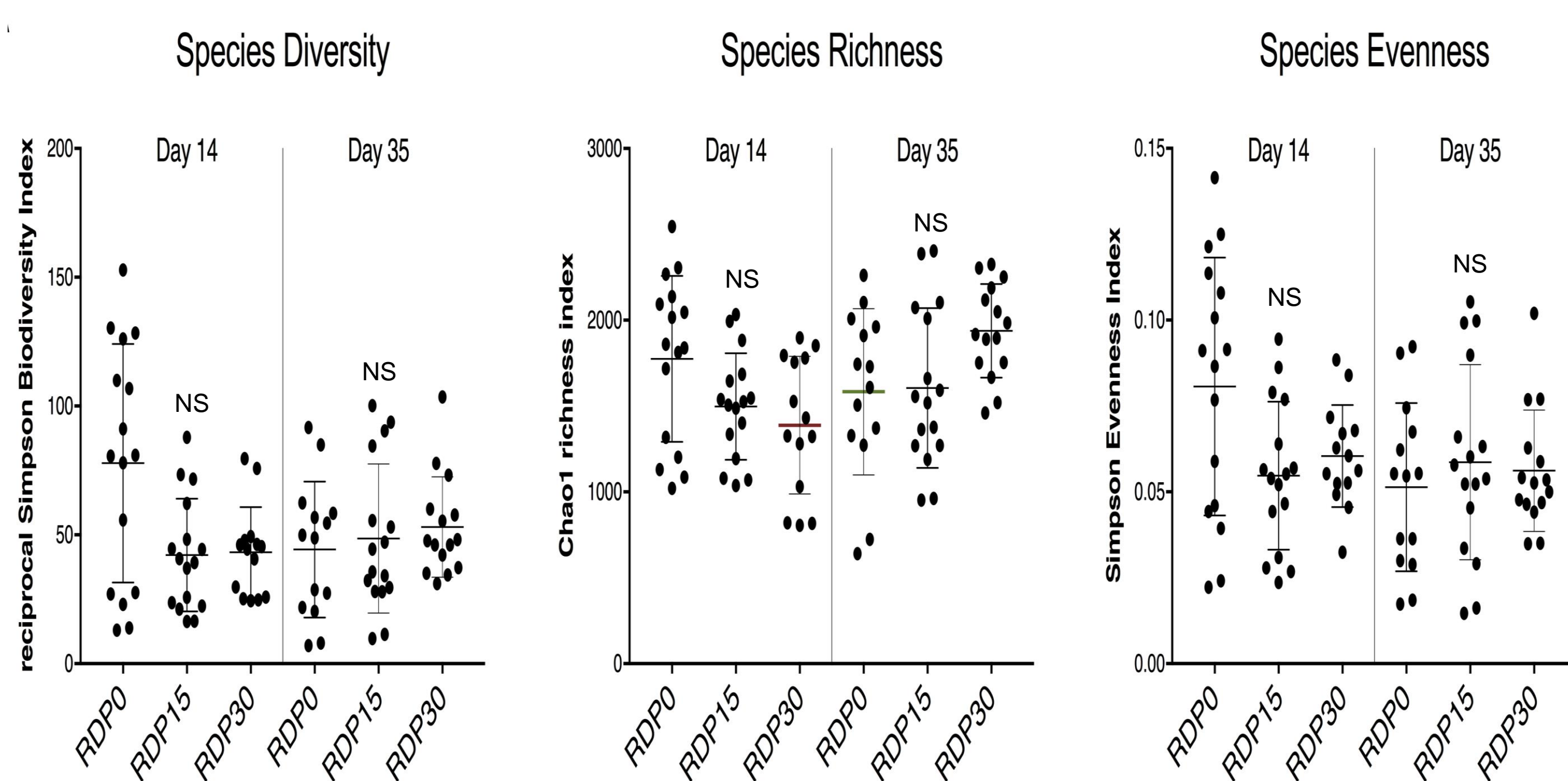


Figure 1. Alpha diversity comparisons for colon of weaned piglets fed RDP levels on d14 and d35

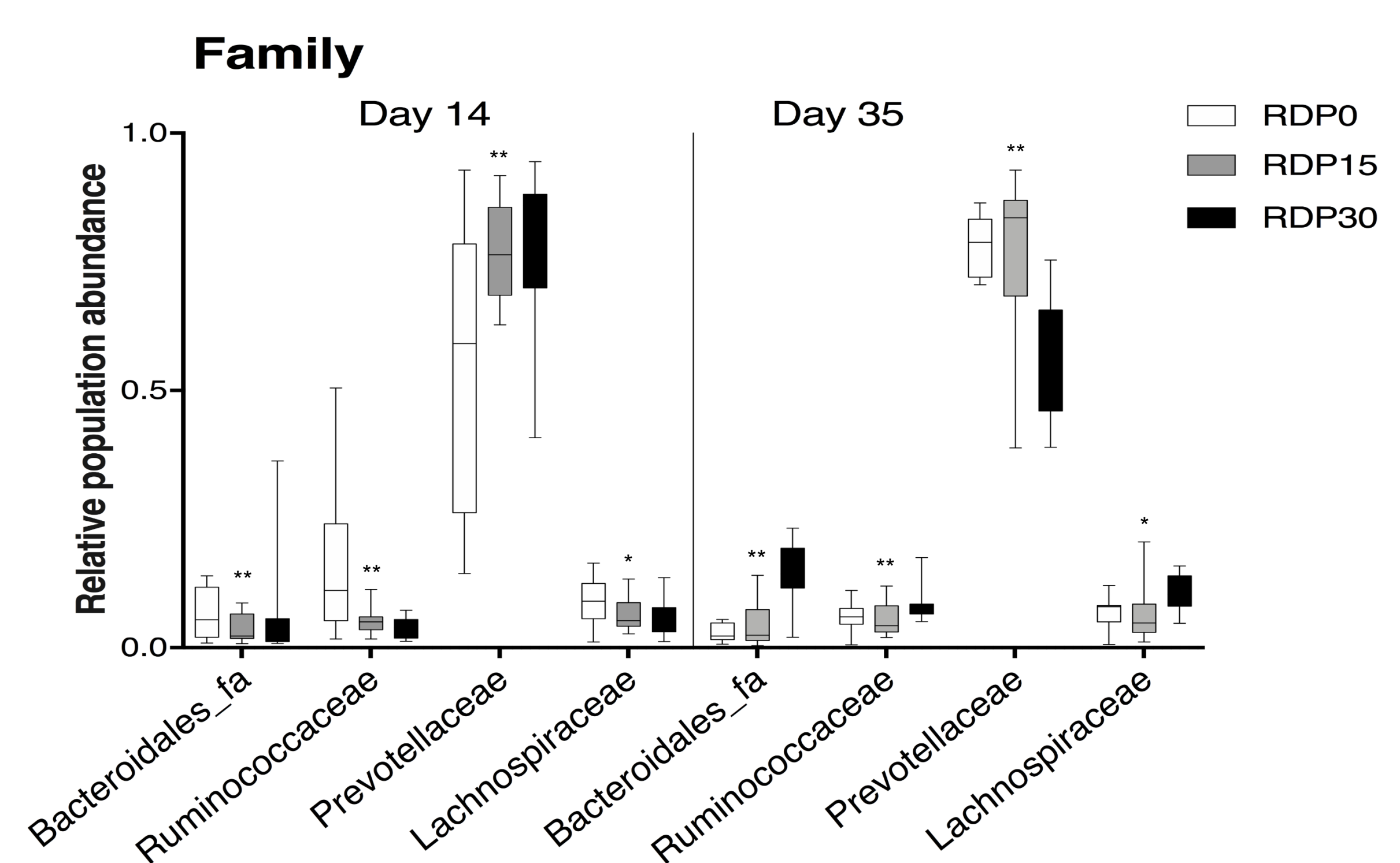


Figure 2. Relative abundance of selected bacterial family of weaned pigs fed diets containing RDP levels on d14 and d35

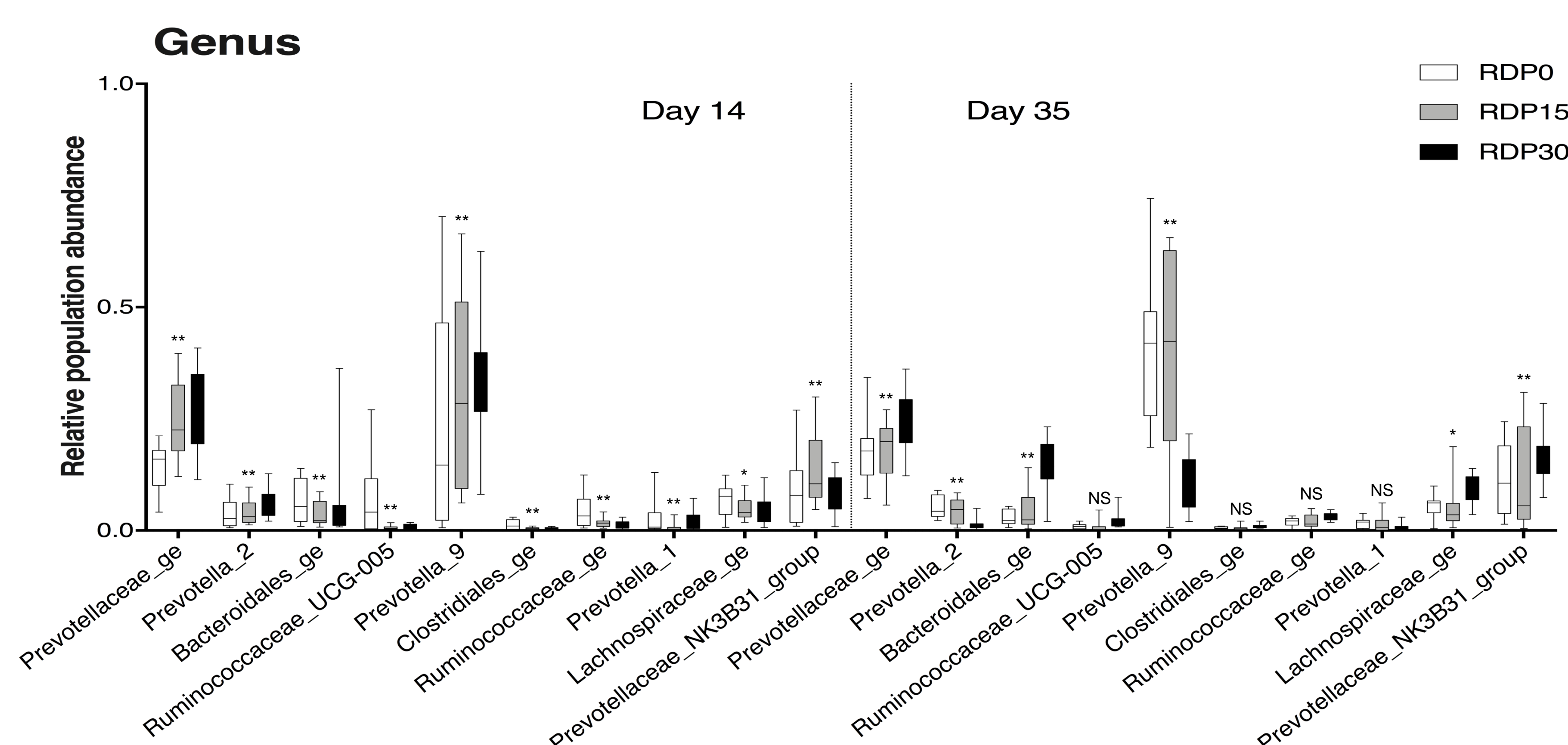


Figure 3. Relative abundance of selected bacterial genera of weaned pigs fed diets containing RDP levels on d14 and d35

Conclusion

Weaned pigs fed RDP showed their colonic microbiota composition modulated over the periods with higher abundance of population bacteria susceptible to improve animal performance.