

EFFECT OF DIETS CONTAINING BEE PROPOLIS ON INTESTINAL DEVELOPMENT AND BLOOD CHARACTERISTICS OF WHITE ROMAN GEESE

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ABSTRACT

The aim of this experiment was to study the effect of bee propolis added to the balanced diet on growth performance, intestinal development and blood characteristics of the White Roman geese. The experiment were divided into four treatment groups: G1 group (G1): the control group which were no antibiotic used; G200 group (G200) which were added 200ppm bee propolis to the balanced diet; G400 group (G400) which were added 400ppm bee propolis to the balanced diet; G800 group (G800) which were added 800ppm bee propolis to the balanced diet. The final weight of four groups at twelve week age were 4.80, 4.74, 4.78, and 4.87kg, respectively. There were no significant among groups ($p > 0.05$). The evaluation of intestinal morphology at 12 week age of White Roman geese were included villus height, villus width, villus circumference, villus area, and crypt depth of duodenum, jejunum, and ileum. The results were shown that in the duodenum there were no significant among groups ($p > 0.05$); in the jejunum the villus area of G800 and crypt depth of G400 were significant among groups ($p < 0.05$); in the ileum the villus height and crypt depth of G400 were significant among groups ($p < 0.05$). So the high dosage bee propolis added to the diets the intestinal development could get the better growth in geese. As for the blood characteristics the cholesterol value of G200, G400 and G800 were lower than that of control group at the 12 week. Hence bee propolis added to the diets could improve the development of small intestine. But there were no improvement the growth performance in the White Roman geese.

Keywords : bee propolis, intestinal morphology, blood characteristics, White Roman geese

INTRODUCTION

According to the research of propolis extract, containing over two hundred kinds of substances, which, to the highest content of flavonoids, but also the essence of propolis, extract about 30-40%, (Marcucci, 1995; Bankova et al., 1983, 2000), most of propolis pharmacological and biological activity against the main components of such substances capable of regulating body metabolism, antioxidant, anti-inflammatory, anti-allergy and anti-cancer role, and is capable of regulating immunity, the efficacy of radical Quinu. By Chen (2004) pointed out that the biological activity of propolis products were closely related to its chemical composition, and compositions of propolis is by its origin, the production

season, and even bee species and other factors. Kujumgiev et al. Comparison of antimicrobial resistance and geographical origin of different chemical composition of propolis, the results show that all samples have significant antibacterial and antifungal.

Hu et al (2006) to the nano test hyperlipidemia rats fed with propolis, propolis has shown significantly lower serum cholesterol. Propolis on high cholesterol, high cholesterol and atherosclerosis have a preventive effect, and prevention of arterial blood vessels significantly increased collagen fibers and preventing the accumulation of cholesterol in the liver function.

This study intends to add the use of natural propolis balanced diet in White Roman geese, the geese by testing growth performance, blood characteristics and traits of intestinal villi, to evaluate the propolis as a natural feed additive for the possibility of geese.

MATERIALS AND METHODS

- 一、Commercial strains of White Roman geese used in goslings hatched later, the male and female identification. And grouped as follows, (1) control group: at each growth stage of the diet had no added antibiotic drugs; (2) propolis group (propolis powder 40%): adding different doses of propolis extract; 200ppm, 400ppm, 800ppm in the control group test diets, each treatment group 4 repeat and repeat the test 10 geese and feeding for 12 weeks (0-12 weeks old) and drinking water and feed during the test were ad libitum. During the test, were weighed respectively, 1 day, 4 weeks, 8 weeks and 12 weeks age, and at 4 weeks, 8 weeks and 12 weeks age, each randomly taken from each of the male and female one blood, the serum to whole automatic biochemical analyzer (Automatic Analyzer) analysis of plasma uric acid, calcium, organic phosphorus, cholesterol, triglyceride, and total phosphorus. After slaughtering geese captured the duodenum, jejunum and ileum, intestinal biopsy was completed using the electron microscope to see the villous traits calculated using OLYSIA Bio report villi of the length, width, perimeter, area, and crypt depth of character.
- 二、Experimental data were in accordance with Statistical Analysis System (SAS, 1988) for statistical analysis, using general linear model procedures (General Linear Model Procedure, GLM), the analysis of variance, calculate the average and compare the differences.

RESULTS AND DISCUSSION

Geese dietary add propolis on the growth performance of geese in the table 1. The end of 12 weeks of age the average weight of the control group was 4.80 kg, add the propolis group were 4.74, 4.78 and 4.87 kg, there was no difference between the groups ($P > 0.05$), but the added weight of propolis 800ppm average higher than other groups. Another survival rate

were 97.5%, 95%, 95% and 97.5%, there was no difference between groups ($P > 0.05$). Therefore, add the propolis in geese diets on growth performance in the improvement effect was not significant. The Small intestine villi traits of the 12 weeks old (Table 2), the Circumference and area of the duodenum of 800ppm group was the highest, and there was significant difference ($P < 0.05$), the villi height was highest of 400ppm group. The width and circumference of jejunum villi was no significant difference, but to add propolis 800ppm was higher, and area was significant of difference between the control group ($P < 0.05$), the villus height and crypt depth was highest of 400ppm groups. The height, width and crypt depth of the Ileum villi was higher of 400ppm group and the villi height there was significant difference ($P < 0.05$) with the control group. The Circumference and area was higher of the 800ppm group, but there was no significant difference ($P > 0.05$). The results showed that the geese of dietary add propolis of the small intestinal villi there is no significant improvement effect, but overall, the growth of the small intestinal villi was the trend of better.

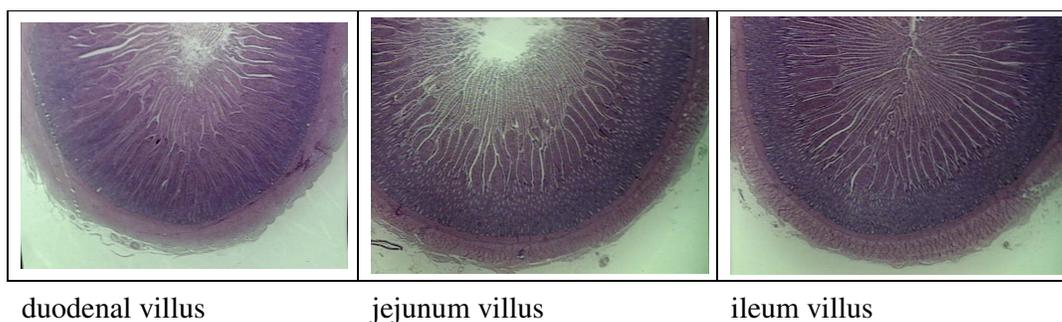


Fig. 1. The geese intestinal biopsy of the 12 weeks old.

Confirmed by many studies, propolis on the heat stability was high and the outside temperature would not affect the results. Even if heated to high temperatures the components would not change. However, propolis was influenced by place of origin, seasonal and acquisition mode, acquisition time, extraction methods and preparation methods etc. So the propolis quality was not very fixed. There were many active ingredients of propolis, so it can not be a single component to judge the merits of its quality. The propolis has antibacterial, anti-inflammatory, blood pressure, strengthening the immune system function, The results of this study, blood analysis also showed that propolis has reduced the amount of cholesterol in the blood of geese. It could be used as feed additives to production of high protein and low cholesterol remains to further explore the characteristics of the geese. The propolis as low yields and higher prices so in terms of raising the cost of cost-effective. If the propolis extraction of residues were cheaper to replace the propolis extract reduce their production costs and achieve the same effect will more in line with economic costs.

REFERENCES

1. 胡福良、李雅晶、張挺。2006。蜂膠對實驗性高脂血症大鼠脂質代謝的影響。台灣昆蟲特刊 8: 217-224。
2. 陳嘉南。2004。台灣蜂膠之抗癌機制與促進神經幹細胞生長及分化的探討及茶成分對神經幹細胞分化之研究。國立台灣大學生物化學研究所博士論文，300頁。
3. 陳裕文、陳嘉南、林仁混、何鎧光。2006。台灣蜂膠的研究與開發。台灣昆蟲特刊 8: 51-65。
4. Bankova V. S., S. L. de Castro, M. C. Marcucci. 2000. Propolis: recent advances in chemistry and plant origin. *Apidologie* 31: 3-15.
5. Bankovaa V., G. Boudourova-Krastevaa, S. Popova, J. M. Sforcinb and S. R. C. Funarib. 1998. Seasonal variations of the chemical composition of Brazilian propolis. *Apidologie* 29: 361-367.
6. Farnesi A.P., R. Aquino-Ferreira, D. De Jong, J.K. Bastos and A.E.E. Soares. 2009. Effects of stingless bee and honey bee propolis on four species of bacteria. *Genetics and Molecular Research* 8 (2): 635-640.
7. Kujumgiev A., Tsvetkova I, Serkedjieva Yu, Bankova V, Christov R, Popov S. 1999. Antibacterial, antifungal and antiviral activity of propolis from different geographic origins *J Ethnopharmacol* 64: 235-40.
8. Marcucci M. C. 1995. Propolis: chemical composition, biological properties and therapeutic activity. *Apidologie* 26: 83-99.