

Study of Effects of propolis on the some Biochemical parameters in broiler chickens.

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Abstract:

Propolis (bee glue) is the resinous substance collected by bees from the leaf buds & bark of trees, especially poplar & conifer trees. Bees use the propolis along with bees wax to construct their hives. Propolis has properties, such as antibiotic activities, anti-inflammatory, anesthetic, Immunomodulatory, antioxidant, carcinostatic. The purpose of this study was to analyze some biochemical parameters of bee glue in drinking water of small chickens. The experiment included three groups : first group (6 chicks) was given the drink water added to alcoholic propolis in 20% for month twice daily. The second group (6 chicks) was given alcohol only at 20% while third group (6 chicks) was given drinking water only. The results showed no significant differences at ($p < 0.05$) in the first group (treated group) as compared with control group in the level of total protein, urea, creatinine, (AST and ALT) aparameters but at a significant different ($p < 0.01$) might be show a few increase in (AST and ALT) negligibly compared with control group .

Introduction

Propolis has attracted public interest since it is a natural product with many biological properties. It has been used since ancient times in folk medicine in many parts of the world. The ancient Egyptians used it to embalm their dead; in the Balkan states, propolis is still one of the most frequently used medications to day (Bankova *et al* ;1992, Boudourova *et al* ; 1997).

Ethanolic & aqueous propolis extracts have been shown to inhibit several oxidative reactions, with significant antioxidant properties (Dobrowolski *et al* ; 1991). Ethanol- soluble derivatives of propolis possesses photoactive compounds, as shown by photodynamic reactions. (Giurgea *et al*;1981) observed that propolis exerts some of its anti-inflammatory & anti infection properties through the inhibition of dihydrofolate reductase activity, which plays an important role in the intermediary metabolism, mainly in rapidly dividing cell such as bacteria or uncontrolled growing tissue like tumors (Kaneeda *et al* ;1992 , Kedzia *et al* ; 1994, 8)More than 180 propolis constituents have been identified by gas chromatography- mass spectrometry (GC- MS). These compound can be grouped as follows: free aromatic acids; flavonoids; benzyl, methyl butenyl phenyl ethyl, cinnamyl & other esters of these acids Marcucci, M. C. (1995), Novelliel, *et al* ; (1995). Chalcones & dihydrochalcones; terpenoids & others as sugars, ketones, & alcohols (Strehl, E *et al* ; 1994).Although in small quantities, these compounds can have important positive & negative effects on the therapeutic properties Toth, G. (1985), Volpert, R.; Elstner, E. (1993). Propolis allergy & contact dermatitis have been reported (Z. & Zhang, Z. (2002), differently from allergy to honey, which contains allergens derived from flowers. Kaneeda and Nishina (Kaneeda *et al* ;1992) observed after oral propolis administration to mice, there are no anatomical abnormality in these animals, suggesting the absence of side effects after propolis treatment. The aim of this work, is to analyze the some biochemical parameters of broiler chickens after alcoholic propolis administration by determining some biochemical variables.

Materials & Methods

Propolis samples: collected from the colonies of local honeybees, in Al-Diwanyia city throughout a whole year using plastic nets. At the end of month, net were taken & frozen to promote propolis removal (Walker, P.; Crane, E. (1988), Zarj, H. (1990). Samples were pooled by season.

Preparation of propolis solution: propolis obtained in each season was stirred and 20% ethanolic extract of propolis (EEP) were prepared (20g of propolis) to 100ml of 95% ethyl alcohol. This was protect from bright light and moderately shaken at room temperature. After 3 days, the extracts were filtered & used to prepare 20% propolis hydroalcoholic solutions (Lin,et al ; 1999).

Animal group & treatment: eighteen male small chickens weighing 100-150 gm divided in to 3 groups (G_1 , G_2 , G_3) of 6 chickens each group.

G_1 , received 20% propolis hydroalcoholic solutions from winter samples. G_3 as a control group received drink water only, chickens received 0.5 ml by gavages twice a day for 1 month (Toth, G. (1985). G_2 received 20% from alcoholic solution just without propolis.

Serum samples & biochemical determinations:

After treatment, the chickens were sacrificed by overetherization and decapitation (by heart puncture) and blood samples were collected and centrifuged at 3.000 rpm for 10 minutes. Serum was used for measuring total protein, urea, creatining, (AST & ALT) aminotransferases determinations were performed using automated biochemical analyzer (multianalyzer technician RA-XT, Bayer) (Marcucci, M. C. (1995).

Statistical analysis:

Analysis of variance was used to examine the treatment effects comparison between the means was performed by F test with LSD under ($P<0.05$) and ($P<0.01$) Zarj, H. (1990).

Results

Propolis administration to small broiler chicken showed no alterations in the seric level of total protein, urea, creatinine, AST & ALT (Table 1). When compared with control group G_2 and G_3 alcoholic group Table 1 summarizes some biochemical determinations. In general, no alterations were seen in biochemical variable in serum of propolis- treated chickens.

Table(1): Effect of propolis on some biochemical parameters in chicken

Biochemical parameters	G ₁ (propolis group)	G ₂ (alcoholic group)	G ₃ (Control group)
1- Total protein (g/dl)	6.1±0.19	6.06± 0.09	6.4±0.2
2- Urea (mg/dl)	45.2±2.5	43.0±0.9	45.0±2.0
3- Glucose (mg/dl)	70.0±2.4	96.0±2.9	70.3±1.8
4- Creatinine (mg/dl)	0.56±0.02	0.51±0.06	0.54±0.02
5- AST u/l	33.00±1.67	30.4±1.14	30.9±1.12
6- ALT u/l	31.60±2.02	30.80±1.48	30.00±2.5

Results are expressed as (mean ± SE of 6 animals) of each group.

Discussion

The large number of chemical compounds in propolis may justify its many biological activities. However, it is possible to hypothesize that its complex composition may lead to damage in the organism (Dobrowolski *et al* ; 1991). In this study, biochemical determinations in chickens treated with propolis from the end of the winter season were performed after 1 month administration of propolis, since alteration in biochemical components may be seen after hours or a few days treatment, histopathological alterations may be observed (Bankova, *et al* ;1992, Boudourova *et al* ;1997, Kaneeda *et al* ;1992). Volpert and Elstner (Volpert, R.; Elstner, E. (1993) reported the importance of choosing the biological components to be determined in dose- effect relation studies, mainly when the drug action machines, as in propolis, is not clear. Thus, alterations in these variable help in the understanding of biological effects related to treatment. In a previous work, was showed that after propolis administration to chickens. ALT had no alterations in specific activities. Since this enzymes are related to damage in the liver it might be hypothesized that propolis did not affect this tissue Li. & Zhang, Z. (2002).

Frankiewicz and Schller(Frankiewicz, L.; Schller, S. (1990) after treating elderly patients with propolis capsules, observed normal concentration of urea & creatinine aminotransferase activities (AST & ALT). Dobrowolski *et al* (1991) observed elevated activities of seric ALT & AST in arthritic rats, reversing this effect after propolis treatment. In this assay, propolis administration to chickens did not induce alterations in ALT & AST specific activities. These enzymes are widely

distributed in tissue, AST is predominantly found in the heart, liver, skeletal muscle, kidney, pancreases, ALT in the liver, kidney & heart. Seric levels of these enzyme have been thought to be a tool to study both cell viability and changes in cell membrane permeability (Lin, S et al ; (1999), Li. & Zhang, Z. (2002). AST activity was significantly higher in the hydroalcoholic propolis solution- treated group (G₃), when compared to the alcoholic- treated groups (G) and control group (P<0.01). however, in this work the evidence that propolis does not induce kidney damage came from urea & creatinine, determinations, urea concentration in blood is a consequence of its production rate during amino acid catabolism and its excretion by the kidney. Creatinine concentration in blood is a result of the balance between creatinine production by the muscle and excretion by the kidney, Li and Zhang (2002) reported that urea and creatinine determinations as a parameter of kidney damage, As well as other determinations presented here, no allocation was seen in total protein seric concentration in propolis- treated groups. Giurgea *et al*(1981) suggested this apitherapeutic diminishes amino acid concentrations in blood, inducing protein synthesis & showing anabolic effects. Kedzia *et al*(1992) found serum glucose at physiological levels after administering propolis to rabbits our data also revealed normal seric glucose concentration in propolis- treated groups.

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دراسة التأثيرات البايوكيميائية لمادة البروبوليس في فروج اللحم.

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الخلاصة

البروبوليس ويعرف أيضاً بصمغ النحل وهو مادة انتجتها يجمع من قبل عاملات نحل العسل من الأجزاء النامية للأشجار والشجيرات كبراعم الأوراق وقلف الأشجار يستخدمه النحل مع شمع النحل لتضييق مداخل خلاياه ويملك البروبوليس خواصاً مضاداً للميكروبات ، مضاداً للالتهابات ، فعلاً مخدراً ، محفزاً مناعياً ، مضاداً للاكسدة و مثبتاً للسرطان. تمت في هذه الدراسة معرفة بعض التأثيرات البايوكيميائية والفسلجية لصمغ النحل في ماء الشرب في صغار الدجاج. إذ قسمت إلى ثلاث مجاميع الأولى أعطيت ماء الشرب المضاف إليه البروبوليس الكحولي وبنسبة 20% ولمدة شهر لمرتين في اليوم والمجموعة الثانية أعطيت الكحول 20% والمجموعة الثالثة أعطيت ماء الشرب الاعتيادي ، وكانت النتائج عدم تسجيل أي فروقات معنوية تحت مستوى احتمالية (5%) في المجموعة المعاملة مقارنة مع مجموعة السيطرة في كل من المعايير التالية: قياس مستوى البروتين الكلي والسكر واليوريا والكرياتينين والأنزيمات الناقلة للاكتين (ALT, AST) ، عند مستوى معنوية (1%) كان هنالك ارتفاع طفيف في (ALT & AST) لم يؤخذ بنظر الاعتبار مقارنة بمجموعة السيطرة.

