Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 152-156. doi.org/10.29079/qjvms.2025.158481.1077

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq

Evaluation of dam and offspring weights in Wistar rats after experimental treatment with propolis extract

Ali Habeeb Jaber[1]*, and Duaa Namaa Safah AL-ardhi[2]

[1]Department of Surgery and Obstetrics, [2]Department of Public Health, College of Veterinary Medicine, University of Al-Qadisiyah, Al-Diwaniyah, Iraq

Submitted: March 21, 2025
Revised: May 17, 2025
Accepted: May 18, 2025

Abstract In the present study, used 20 females white rats divided into two groups. Therefore total animals, of age 105 - 110 days. Initially the study animals were weighed and the groups marked; T & C. The treatment group(T) was administered with 40 milligrams/kg of the alcoholic extract bee propolis daily drenching for 30 days and the control group (C) was denied dose. Lastly, weight gained and weight of newborns were analyzed as part of the study at the end of the project. The findings of the present investigation revealed a highly significant difference in the rate of weight gain in favour of the treatment group (T) as compared to control group of animals (C), 57. 31 and 27. 3gm. respectively. The results however failed to reveal any statistical changes in the weight of newborns in both groups of the study 23. 50 and 26. 250gm. respectively. The results of weight of newborn rats which were dosed with the alcoholic extract of the bee propolis is less when compared to the weight of the newborn rats that were not dosed with the alcoholic extract of bee propolis.

Keyword: Alcoholic, newborn, propolis, weight gain, Wistar rats.

Introduction Propolis is made by bee workers for the defense of the beehives (1-6). It is also gathered by hard working bees with a lot of accuracy from plant exudates (7, 8). It is then mixed by bees with saliva and enzymes (9). It is also known as bee glue and it is sticky and wax like (10). It is built by worker bees and stored in the beehives so as to use it to seal spaces and gaps that may appear on the beehives (5,6,11-13). So the role of bee propolis is not only to cover and repair cracks of the hives but also to act as sealants and to soften internal walls of the beehives, bee propolis is also known to be used as disinfectant or sterilizer of the hives (14-19). And yet another fantastic therapeutic attribute of propolis was unveiled, that is, its ability to safeguard bee larvae and honey and to disinfect and sanitize bee nests; it also helps in mummification of bee hives to eliminate infection (3,16-20). Bee propolis is used on the beehives surfaces to provide soft surface that is free from microbes (3, 19). We also cannot forget to add that bee propolis helps to prevent leakage and entry of water into the hive, hence regulating the levels of humidity and also works as a control aspect and regulation of air flow into the beehive (13, 21). Bee Propolis has been consumed by human beings as a medicine food for a long time according to (13). The bioactive compound of bee propolis is currently used as an antibacterial, an anti-inflammatory and an antiviral (3). Other studies also established that bee propolis possess antioxidant, anti-protozoal, anesthetic, anti-tumor, anti-cancer and anti-fungal value added qualities (3,22). The hepatoprotective effect of bee propolis together with the ameliorating and reducing of cellular toxicity have been defined (5). Bee propolis contains arginine, bioflavonoids, provitamin A, vitamin C, and B complex and some minerals among them (13, 23). Bee Propolis is among the most potent natural radical scavangers, or antioxidants (24). According to (25) bee propolis can also protect from the negative impact of psychological stress. Bee propolis is said to have potential effects against hepatic injury (26).

Hence, the purpose of this study was to determine influence of alcoholic extract of propolis on the rate of weight gaining and newborn weights.

Materials and method

Animal ethics and care

The current research was carried out according to the guidelines of the National Research Council for the care and use of laboratory animal. The Ethical Council in the College of Veterinary Medicine, University of Al-Qadisiyah agreed to conduct this experiment.

Ethical Approval

All applicable international, national, and/or institutional guidelines for the care and use of animals were followed. All procedures performed in studies involving animals were in accordance with the ethical standards of the institution or practice at which the studies were conducted. We were explaining the ethical state of animals in our study in details in the materials and method section and included the references that we were depending on.

Animals of the study

This study involved twenty female Wistar rats of about 105- 110 days old the study was conducted in the animal house at the College of veterinary medicine- Al-

Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 152-156. doi.org/10.29079/qjvms.2025.158481.1077

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq

Qadisiyah University. The animals used in the study were kept in plastic cage and under laboratory environment with light of about 12-14 hours and temperature of 25-30 °C., the given study animals were provided with balanced diet.

Alcohol extraction of bee propolis

The method used to prepare the alcoholic extract of bee propolis was (27), using soxhlet device purchased from the WISD Korean.

Design of study

The study animals were selected in both the groups which consists of twenty white female rats, ten rats in each group. The animals used on this experiment were weighed initially and at the end of the study. The control group animals were left without administrating any dose while the treatment group animals received 40 mg/kg per day of alcoholic extract bee propolis for 30 days. At the end of the study period, the gain of the weight in the animals being used in the study was examined together with the weights of the newborns.

Statistical analysis

The charts and frequency tables were prepared using the Statistical Package of Social Science (SPSS) for the data of the current study. The conclusions were drawn based on the results received with the help of the independent T-test for defining the significance of the differences at the probability level p≤0. 01 and with the help of the Chi-square test for defining the significance of the differences of the ratios (28).

Results and Discussion

Weight gain rate

The findings of the current study revealed improved rate of weight gain among the treatment group (T) as compared to the control group (C) at a level of (P≤0.01). The results proved that the dosing of propolis extract had a positive impact on the rate of weight gain and is more manifested in the treatment group where the rate of weight increase reached 57.31 gm. as compared to control group 27. 3 gm., As shown in Table 1 and Figure 1 below. This increase in body weight is attributed to the nutritional components that are found in the alcoholic extract of propolis, and this agrees with the findings done (29) which show that food bee propolis has a positive impact on growth and the overall body performance. Our findings are also in physical growth patterns as (30) reported enhanced body weight gain in rabbits that were subject to studied. In line with (31) that propolis which was part of supplemented rabbit diet enhanced the weight gains and feed conversion. And also with (32) also conducted analysis and concluded common that broiler supplemented propolis increase the body weight and feed conversion, and with what he mentioned (33) with studied on rabbits at 200mg/kg of crude Egyptian propolis enhanced the weight gains and feed conversion ratio and propolis reduced the triglycerides and total cholesterol, it also enhance the oxidative state.

Table 1: Impact of alcoholic extract of bee propolis on the rate weight of means± Standard Error.

Groups / Body weight	C	T
Initial weight	268.144 [a]± 15.54	270.140[a] ±14.213
Final weight	295.444 [a] ±17.354	327.45 [b] ±19.654
Weight gain	27.3 [a]	57.31 [b]

*Different letters mean significant variances (P≤0.01)

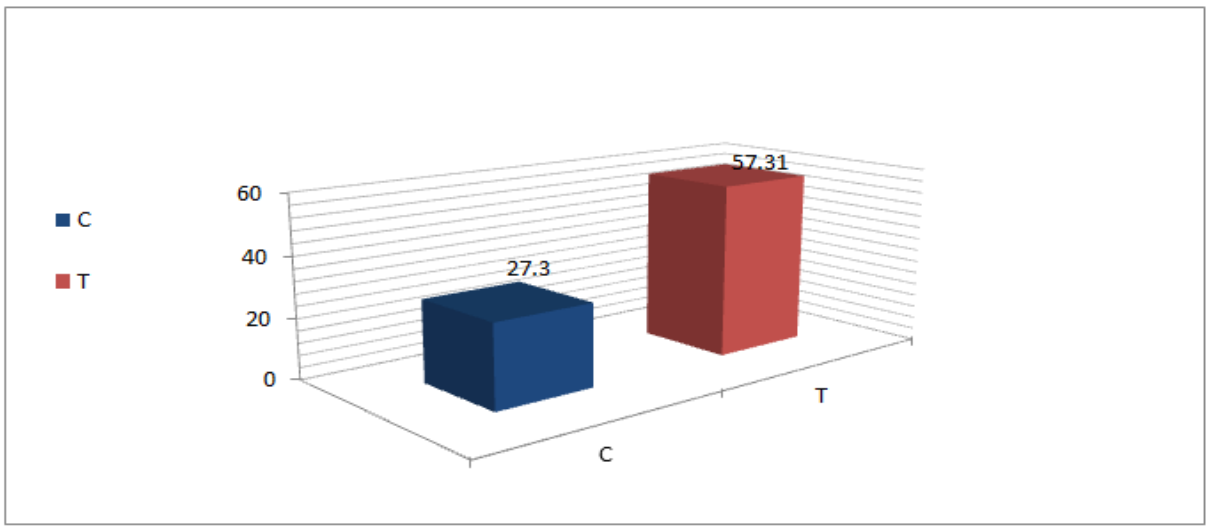

Figure 1: Depicts the influence of alcoholic extract of propolis on increase in weight of the study animals.

Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 152-156. doi.org/10.29079/qjvms.2025.158481.1077

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq

bee propolis and therefore this affected the weight of the newborns, implying that the process is one of intrauterine competition between the fetus unlike the embryos in the wombs of the female rats in the control group. This is in agreement with what was postulated by (24), where they demonstrated that fetuses are outcomes of advanced ovulation, which leads to the production of more than usual numbers of fetuses and lower weight comparative with control group. Also agreement with what (35) pointed out that in a study done on mice to establish the impact of precocious propolis extract during pregnancy on fetal development action revealed that fetuses in the high dose ethanol extract of propolis group had low weight.

Table 2: Reveals the impacts of alcoholic extract of propolis on the newborn weights in two weeks old rats and newborn W/B ratios.

Groups / Weights	C	T
Weights of newborns (Means±SE)	26.250 [a] ± 0.876	23.500 [a] ± 0.912
Ratio of newborn weights to mothers	0.088 % [a]	0.071 % [a]

* Different letters mean significant variances (P≤0.01)

Newborn weights

The findings of the study revealed in the average weight of the newborns that the rats that were treated with the alcoholic extract of bee propolis (T) for two weeks weighed on average 23.5 gm. while no significant difference was noted meaning that this value was compared with the weights of the newborns born from rats that were not treated with the extract (C) at 26. 250 gm., the same observations are true with the weight-to-weight ratio of newborns to mothers, reduced to 0. 088% and, this study found that 0.071% respectively Table (2) Figure (2). This may be attributed to the fact that, the number of newborns were relatively higher in the group of rats that was dosed with the alcoholic extract of bee propolis due to the beneficial ingredients found in

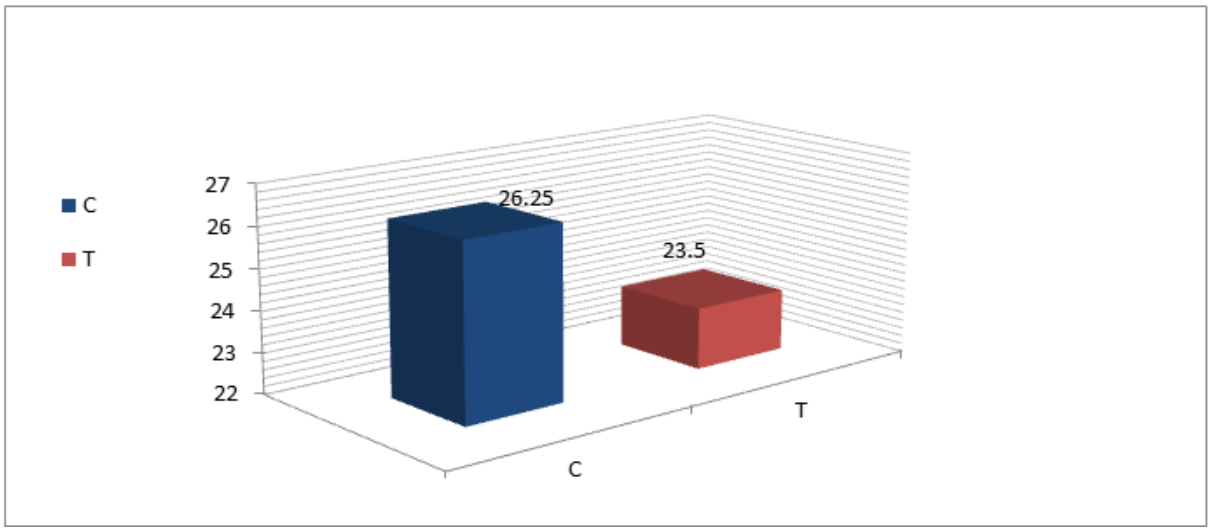

Figure 2: alcoholic extract of propolis significantly affected the newborn weights in the two-week-old rats.

Conflicts of Interest

No conflict of interest is found as declared by the authors.

Acknowledgements

The authors would like to express his gratitude to the College of Veterinary Medicine at the University of Al-Qadisiyah, Iraq for their technical assistance.

Funding source

This research had no specific fund; however, it was self-funded by the authors

Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 152-156. doi.org/10.29079/qjvms.2025.158481.1077

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq

References

1 -Fokt H, Pereira A, Ferreira A, Cunha A, Aguiar C. How do bees prevent hive infections? The antimicrobial properties of propolis. Current research, technology and education topics in applied microbiology and microbial biotechnology. 2010;1:481-93.

2 -Sabir A. Prospect of using propolis in conservative dentistry and endodontic treatment (basic research vs clinical application): prospek penggunaan propolis dalam bidang operative dentistry dan perawatan endodonti (penelitian dasar vs aplikasi klinis. Dentika: Dental Journal. 2014;18(2):185-9. https://doi.org/10.32734/dentika.v18i2.2028

3 -Sforcin JM. Biological properties and therapeutic applications of propolis. Phytotherapy research. 2016;30(6):894-905. https://doi.org/10.1002/ptr.5605

4 -Parolia A, Thomas MS, Kundabala M, Mohan M. Propolis and its potential uses in oral health. International Journal of Medicine and Medical Science. 2010;2(7):210-5.

5 -Toreti VC, Sato HH, Pastore GM, Park YK. Recent progress of propolis for its biological and chemical compositions and its botanical origin. Evidence-Based Complementary and Alternative Medicine. 2013;(1):697390. https://doi.org/10.1155/2013/697390

6 -Wagh VD. Propolis: a wonder bees product and its pharmacological potentials. Advances in Pharmacological and Pharmaceutical Sciences. 2013;(1):308249. https://doi.org/10.1155/2013/308249

7 -Ciftci-Yilmaz S, Azman ZN, Kosem K, Gunduz E, Grenman R. Evaluating antioxidant capacity of different propolis samples from konya, Turkey and their inhibitory effect on head and neck cancer cells. BioRxiv. 2017:183913. https://doi.org/10.1101/183913

8 -Zheng YZ, Deng G, Liang Q, Chen DF, Guo R, Lai RC. Antioxidant activity of quercetin and its glucosides from propolis: A theoretical study. Scientific reports. 2017;7(1):7543. https://doi.org/10.1038/s41598-017-08024-8

9 -Sforcin JM. Propolis and the immune system: a review. Journal of ethnopharmacology. 2007;113(1):1-4. https://doi.org/10.1016/j.jep.2007.05.012

10 -Abdulrhman M, Samir Elbarbary N, Ahmed Amin D, Saeid Ebrahim R. Honey and a mixture of honey, beeswax, and olive oil-propolis extract in treatment of chemotherapy-induced oral mucositis: a randomized controlled pilot study. Pediatric hematology and oncology. 2012;29(3):285-92. https://doi.org/10.3109/08880018.2012.669026

11 -Ahmed R, Tanvir EM, Hossen MS, Afroz R, Ahmmed I, Rumpa NE, Paul S, Gan SH, Sulaiman SA, Khalil MI. Antioxidant properties and cardioprotective mechanism of Malaysian propolis in rats. Evidence-BasedComplementary and Alternative Medicine. 2017;(1):5370545. https://doi.org/10.1155/2017/5370545

12 -Sung SH, Choi GH, Lee NW, Shin BC. External Use of Propolis for Oral, Skin, and Genital Diseases: A Systematic Review and Meta-Analysis. Evidence-Based Complementary and Alternative Medicine. 2017;(1):8025752.Based Complement. Alternat. Med. https://doi.org/10.1155/2017/8025752

13 -Kuropatnicki AK, Szliszka E, Krol W. Historical aspects of propolis research in modern times. Evid Based Complement Alternat Med. 2013. https://doi.org/10.1155/2013/964149

14 -Akbay E, Özenirler Ç, Çelemli ÖG, Durukan AB, Onur MA, Sorkun K. Effects of propolis on warfarin efficacy. Kardiochir Torakochir Pol. 2017;14:43. https://doi.org/10.5114/kitp.2017.66929

15 -Alonso-Salces RM, Cugnata NM, Guaspari E, Pellegrini MC, Aubone I, De Piano FG, et al. Natural strategies for the control of Paenibacillus larvae, the causative agent of American foulbrood in honey bees: a review. Apidologie. 2017:1-14. https://doi.org/10.1007/s13592-016-0483-1

16 -Rufatto LC, Dos Santos DA, Marinho F, Henriques JAP, Ely MR, Moura S. Red propolis: chemical composition and pharmacological activity. Asian Pac J Trop Biomed. 2017. https://doi.org/10.1016/j.apjtb.2017.06.009

17 -Kasiotis KM, Anastasiadou P, Papadopoulos A, Machera K. Revisiting Greek Propolis: chromatographic analysis and antioxidant activity study. PLoS One. 2017;12:e0170077. https://doi.org/10.1371/journal.pone.0170077

18 -Omar R, Igoli JO, Zhang T, Gray AI, Ebiloma GU, Clements CJ, et al. The chemical characterization of Nigerian propolis samples and their activity against Trypanosoma brucei. Sci Rep. 2017;7:923. https://doi.org/10.1038/s41598-017-01038-2

19 -Simone-Finstrom M, Borba RS, Wilson M, Spivak M. Propolis counteracts some threats to honey bee health. Insects. 2017;8:46. https://doi.org/10.3390/insects8020046

20 -Drescher N, Klein AM, Neumann P, Yañez O, Leonhardt SD. Inside honeybee hives: impact of natural propolis on the ectoparasitic mite Varroa destructor and viruses. Insects. 2017;8:15. https://doi.org/10.3390/insects8010015

21 -Afrouzan H, Zakeri S, Mehrizi AA, Molasalehi S, Tahghighi A, Shokrgozar MA, et al. Anti-plasmodial assessment of four different Iranian propolis extracts. Arch Iran Med. 2017;20.

22 -Rajpara S, Wilkinson MS, King CM, Gawkrodger DJ, English JS, Statham BN, et al. The importance of propolis in patch testing: a multicentre survey. Contact Dermatitis. 2009;61:287-90. https://doi.org/10.1111/j.1600-0536.2009.01629.x

23 -Pasupuleti VR, Sammugam L, Ramesh N, Gan SH. Honey, propolis, and royal jelly: a comprehensive review of their biological actions and health benefits. Oxid Med Cell Longev. 2017. https://doi.org/10.1155/2017/1259510

24 -Bogdanov S. Functional and biological properties of bee products. Bee Product Sci. 2011:1-12. Available from: www.bee-hexagon.net.

25 -Arabameri A, Sameni H, Bandegi A. The effects of propolis extract on ovarian tissue and oxidative stress in rats with maternal separation stress. Int J Reprod BioMed. 2011;15(8):509-20. https://doi.org/10.29252/ijrm.15.8.509

26 -Seo KW, Park M, Song YJ, Kim S, Yoon KR. The protective effects of propolis on hepatic injury and its mechanism. Phytother Res. 2003;17(3):250-3. https://doi.org/10.1002/ptr.1120

27 -Deshmuk S, Borle M. Studies on the insecticidal properties of indigenous plant products. J Ethnopharmacol. 1995;37:11-8.

28 -Petrie A, Watson P. Statistics of veterinary and animal science. 3rd ed. Wiley-Blackwell; 2013.

Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 152-156. doi.org/10.29079/qjvms.2025.158481.1077

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq

29 -Abbass A, El-Asely A, Kandiel M. Effects of dietary propolis and pollen on growth performance, fecundity, and some hematological parameters of Oreochromis niloticus. Turk J Fish Aquat Sci. 2012;12:851-9.

30 -Yousef MI, Kamel KI, Hassan MS, El-Morsy AM. Protective role of propolis against reproductive toxicity of triphenyltin in male rabbits. Food Chem Toxicol. 2010;48:1846-

Al-Qadisiyah J. Vet. Med. Sci. 2025; 24 (1): 133-137. doi.org/10.29079/qjvms.2025.157187.1070

ISSN P: 1818-5746
E: 2313-4429
qjvms.qu.edu.iq