Tikrit Journal of Veterinary Sciences (2025) 4(2): 40-47
DOI : 10.25130/tjvs.4.2.6

IRAQI Academic Scientific Journals

TJVS Tikrit Journal of Veterinary Sciences

Tikrit Journal of Veterinary Science

The effect of Wormwood (Artemisia Capillaris) and Coriander powder extract (Coriandrum sativum) on the productivity traits of Japanese quail (*Coturnix coturnix japonica*)

Omer Isam

Department of Public Health, Faculty of Veterinary Medicine, Tikrit University, Republic of Iraq.

ARTICLE INFO.

Article history:
-Received: 1/7/2025
-Received In Revised Form:20/8/2025
-Accepted: 8/9/2025
-Available online:30/12/2025

Keywords:
Coriander, Extract, Productivity, Quail, Wormwood.

Corresponding Author:
Name: Omer Isam
E-mail:
P.h.d.omerisam@tu.edu.iq
Tel:07701816374

ABSTRACT

The objective of this study was to examine the effect of watery extracts of Wormwood and Coriander powder on some productive performance of Japanese quail (Coturnix coturnix japonica) at the Department of Veterinary Public Health, College of Veterinary Medicine, Tikrit University, Iraq, between December 18, 2023, and January 17, 2024. One-day-old Japanese quail chicks (n=160, weighing 7 grams) were randomly assigned to four treatment groups, with a replication of 10 birds per group. The treatments included:

• T1 (Control Group): Plain drinking water.
• T2: 15 ml of Wormwood powder extract/liter of drinking water.
• T3: 15 ml of Coriander powder extract/liter of drinking water.
• T4: A combination of Wormwood powder extract + Coriander powder extracts of 7.5 ml of Wormwood + 7.5ml of Coriander powder extract/liter of drinking water.

Chickens were kept under typically management conditions and provided with nutritional balanced diet accorded to NRC 1994 guidelines. The parameters of productive evaluation in present study included body weight, feed consumption, feed conversion ratio (FCR) and weight gain. The collected data were tested by used complete randomly design (CRD), and comparatives mean by Duncan multiple range tests in significant levels of $P \leq 0.05$.

The results indicated that treatments T3 and T4 led to increase growth, body weight, and feed consumption during 5 and 6 weeks, while no reported significant changes in FCR.

The extracts of Coriander and Wormwood, whether used together or separately, can act as natural growth enhance to improving growth performance in quail production. Present safer and more responsible alternatives to convention antibiotics.

Introduction

The poultry industry is essential in animals farming, serving as a quick and effective provider of high-quality proteins. The Japanese quail (*Coturnix coturnix japonica*) is noted for its minimal nutritional needs, excellent productivity, fast growth rate, and outstanding quality of eggs and meat [1] .

The impact of stress and diseases on production efficiency causes used antibiotics as growth promoters by producers. The antibiotic used to treatment diseases due to bacterial resistance and accumulation of residues in Chickens products, causes health risks to consumers[2] . Recently, interest has increased to natural alternatives, such as aromatic herbs and medicinal plants, which contains bioactive compounds (phenolics, flavonoids, essential oils) with digestive-enhancing properties, antioxidant, and antimicrobial [3] .

The extracts of Wormwood are considering an alternative to growth promoting antibiotics. Artemisia absinthium contains an antibacterial and antioxidant compound that enhances digestion and nutrient utilization, which effect to growth and feed efficiency [4]. Coriander and Wormwood when administration combination or individually on the productive traits of Japanese quails.

Some studies have investigated the effects of Coriander and Wormwood individually on performance of poultry, limited studies has examined their combined effect on the productive traits of Japanese quails. Therefore, this study aims to fill this gap by evaluating the effects of both extracts, individually and in combination, on growth performance and feed efficiency in Japanese quail.

Materials and Methods

Experimental Site and Duration.

The experiment was conducted at the College of Veterinary Medicine, University of Tikrit, Department of Veterinary Public Health, from December 18, 2023, to January 17, 2024.

Experimental Birds and Housing Conditions.

In the study, we used a total of 160 Japanese quail (Coturnix coturnix japonica). I raised the birds at 1 day old, with an average weight of 7 grams. The birds were kept in cages controlled for environmental conditions (100 x 50 x 50 cm; length x width x height) with 10 birds per cage, and there was sufficient space for mobility, ventilation, and consistent management. Birds were provided ad libitum access to feed and water.

The environmental conditions were:

Temperature: had been maintained at 37 ± 1°C during week one and gradually reduced to an approximate temperature of 24 ± 2°C by week six.

Relative Humidity: was maintained at 55-65% during the experimental period.

Lighting Program: 23 hours of light and 1 hour of darkness during weeks one, two, and three, followed by 16 hours of light and 8 hours of darkness, to the conclusion of the experiment.

Experimental Design.

- There were four main experimental treatment groups, with four replicates of 10 birds:
- T1 (Control): Distracting water only, no additives.
- T2: 15 mL of the Wormwood powder extract/ L of drinking water.
- T3: 15 mL of the Coriander powder extract/ L of drinking water.
- T4: 7.5 mL of the Wormwood powder extract + 7.5 mL of Coriander powder extract/ L of drinking water.

Diet.

Birds were fed a balanced diet formulated according to[5] recommendations, with free access to feed and water (*ad libitum*).

Note that the feed rations are uniform for all birds in terms of their energy and protein balance, given the addition of extracts to the drinking water.

Preparation of Plant Extracts.

Watery extracts were prepared according to[6] with minor modifications:

1. 100 g of plant powder (Wormwood or Coriander) was mixed with 1 L of boiled distilled water (1:10 w/v).
2. The mixture was incubated in a water bath at 60°C for 1 hour and then left at room temperature for 24 hours.
3. The solution was filtered several times to obtain a clear extract, which was stored at 4°C until use.
4. The concentrated extract was used to prepare the treatment doses.
5. To ensure consistency and quality of the extracts, the water used was analyzed for pH, total dissolved solids (TDS), and conductivity before preparation. The extract concentration was standardized by measuring total solids content gravimetrically.

Measured Parameters

- Live body weight (g/bird).
- Weight Gain (g)
- Feed intake (g/bird)
- Feed conversion ratio (FCR).

Statistical Analysis.

All data were analyzed using SPSS software. A **one-way analysis of variance (ANOVA)** was used to identify significant differences among the treatment groups. Duncan's multiple range test was employed for mean separation at a significance level of **P < 0.05**.

Additionally, a **completely randomized design (CRD)** was applied using Statistical Analysis Software [7]. The statistical model used was:

$Yij = \mu + ti + eij$

Where:

- Yij = Observed value
- μ= Overall mean
- ti = Effect of the i-th treatment
- eij = Random error associated with observation

Table 1. Effect of watery Extracts of Wormwood and Coriander on Live Body Weight (g) of Japanese quail from Weeks 3 to 6

Treatment	3 Weeks	4 Weeks	5 Weeks	6 Weeks
T1 (Control)	88.54 ± 1.53	135.11 ± 3.45	173.25 ± 3.27b	202.34 ± 2.55b
T2 (Wormwood 15 ml/L)	88.36 ± 1.62	135.67 ± 3.59	172.99 ± 3.45b	200.67 ± 3.11b
T3 (Coriander 15 ml/L)	89.11 ± 1.49	136.24 ± 4.01	181.11 ± 2.78a	221.59 ± 2.98a
T4 (Wormwood 7.5 + Coriander 7.5 ml/L)	89.36 ± 1.51	135.89 ± 3.97	180.99 ± 3.21a	222.48 ± 3.17a
Significance	ns	ns	*	*

ns = not significant, :*= significant at P ≤ 0.05

The data from Table 1 showed that adding Coriander extract mixed with water at 15 ml/L or mixing it with Wormwood (7.5 + 7.5 ml/L) greatly helped Japanese quail gain body weight compared to the control groups (T1 and T2). Clear differences were seen in the fifth and sixth weeks, but no clear changes were seen in the third and fourth weeks. This result suggests that the good impacts of natural extracts take some time to showing effect in helping digestion and absorption of nutrient and help to growth of good bacteria in gut and inhibition of bad bacteria. These actions, when put together, help increase body weight, especially as they grow older.

These results match those shown by [8], who discovered that Wormwood extracts caused quails to gain more total body weight. Similarly, [9] confirmed that natural herbal additives improve how well poultry grow and produce. Also,[10] proposed that Coriander helps with weight gain by making protein and fat digestion better and improving energy use.

To sum up, using water-based extracts from Wormwood and coriander, either alone or together, greatly improves how well Japanese quail grow overall. Their effects are more obvious after the fourth week, and the most growth happens closer to the end of the growth period.

Table 2. Effect of watery extracts of Wormwood and Coriander on Weight Gain (g) of Japanese quail from Weeks 3 to 6

Treatment	3-4 Weeks	4-5 Weeks	5-6 Weeks	Cumulativ 3-6 Weeks
T1 (Control)	46.57 ± 2.78	38.14 ± 3.14**b**	29.09 ± 3.11**b**	113.80 ± 2.75**b**
T2 (Wormwood 15 ml/L)	47.31 ± 2.56	37.32 ± 2.96**b**	27.68 ± 2.85**b**	112.31 ± 2.36**b**
T3 (Coriander 15 ml/L)	47.13 ± 2.66	44.87 ± 2.54**a**	40.48 ± 3.25**a**	132.48 ± 2.69**a**
T4 (Wormwood 7.5 + Coriander 7.5 ml/L)	46.53 ± 2.49	45.10 ± 3.01**a**	41.49 ± 3.17**a**	133.12 ± 2.49**a**
Significance	ns	*	*	*

ns = not significant, :*= significant at P ≤ 0.05

The data in Table 2 show that using water-based solutions made from Wormwood and Coriander had a noticeable effect on how much weight Japanese quail gained. It was clear that using mix T3 (Coriander at 15 ml per liter) and mix T4 (Wormwood at 7.5 plus Coriander at 7.5 ml per liter) led to the most weight gain, mostly later in the study (from week 4 to week 6), when compared to the group that got no treatment (T1) and the group that only got Wormwood (T2).

In the starting period, there were no major changes in what was being tested, showing that it took some time for the solutions to start having an effect.

The Coriander alone or mixed with Wormwood effect on the birds growth better starting appear in week 4 and in week 5, both T3 and T4 continues in better results, and in week 6 was the total weight gain higher in these groups (132.48g and 133.12g) respectively, comparative with control group (at 113.80 g) and with Wormwood group (112.31g).

The Coriander and Wormwood were significantly effect on productive performance of the Japanese quail, probably because of the active substances they contains. Coriander has natural oils that help digestion and absorption nutrient, and improving the health of the digestive system, these results were similarity with results reported by[11].

Wormwood can enhance immune system and inhibited germs. When used alone, Wormwood exhibits limited efficacy, while it gives good results with Coriander does. The extra benefit showed
in T4 (Coriander and Wormwood) was good effects on body used of food and nutrients. These results in this study agreement with results reported by[9]. Similarly, [12] demonstrated that natural plant supplements improve poultry growth. [13] also noted how these supplements help Japanese quail thrive. Using Coriander water or a mixture of Coriander and Wormwood helps increase the weight of Japanese quail, with better results in later stages of their lives. This suggests that providing additional Coriander may be an effective natural way to help poultry grow on farms.

Table 3. Effect of water extracts of Coriander and Wormwood on feed intake (g) of Japanese quail from 3 to 6 Weeks

Treatment	3-4 Weeks	4-5 Weeks	5-6 Weeks	Cumulativ 3-6 weeks
T1 (Control)	104.16 ± 3.12	140.50 ± 7.35**b**	173.75 ± 5.15**b**	418.41 ± 10.45**b**
T2 (Wormwood 15 ml/L)	105.11 ± 3.24	141.25 ± 6.45**b**	175.25 ± 5.94**b**	421.61 ± 8.54**b**
T3 (Coriander 15 ml/L)	104.76 ± 2.98	144.00 ± 8.67**a**	181.25 ± 5.15**a**	430.01 ± 12.41**a**
T4 (Wormwood 7.5 + Coriander 7.5 ml/L)	105.27 ± 3.15	140.75 ± 6.45**b**	181.75 ± 6.12**a**	427.77 ± 8.69**a**
Significance	ns	*	*	*

*= significant, ns = non-significant, at P≤0.05

The water mixed with Coriander and Wormwood (separately or together) provided to Japanese quails, affects on food Japanese quail eat from their 3 to 6 weeks of life (Table 3). The results show that at the start, non-significant between the different groups, but later on, the birds eating more, especially when they just had Coriander (T3) or Coriander mix with Wormwood (T4).

- Week 3: How much food they ate was about the same for all groups (T1 = 104.16 g, T2 = 105.11 g, T3 = 104.76 g, and T4 = 105.27 g), meaning there was no real difference between them.
- Week 4: T2 (141.25 g) and T3 (144.00 g) ate a bit more, but T1 (140.50 g) and T4 (140.75 g) stayed at about the same level; this change was a big deal only for T2 and T3 (P ≤ 0.05).
- Week 5: T3 (181.25g) and T4 (181.75g) showed eating more, comparative with T1 (173.75g) and T2 (175.25g).

Cumulative intake (3–6 Weeks):

The higher total feed eating was showed at T3 (430.01g) and T4 (427.77g), following by T2 (421.61g), while lower was in the control group T1 (418.41g).

The results of present study indicate to water extracts of Coriander alone or mixed with Wormwood was significantly enhances eating the feed, especially in the end stages of growing.

Coriander contains bioactive compounds act to stimulation digestive enzymes activity, improve health of gut, and enhance absorption of nutrient. While Wormwood also contains sulfur compounds with health benefits, its effectiveness appears to be greater when used in combination with coriander. The current results are consistent with those of[10] , who observed a higher in eating of feed and live body weight in poultry supplemented with plant extracts. Similarly, [11] demonstrated that plant additives improve eating of feed in poultry. [14] confirmed that Coriander supplementation had positive effects on feed eating and growing performance in Japanese quail. Taken together, these results indicate that wateryextracts of Coriander and Wormwood , whether administered individual or mix, stimulation feed eating in Japanese quail, with the most pronounced effects appearing after the fourth week of age. Increased feed eating is closely association with the observed improvement in growth performance and body weight gain.

Table 4. Effect of water extracts of Coriander and Wormwood on feed conversion ratio (FCR) of Japanese quail from 3 to 6 Weeks.

Treatment	3 Weeks	4 Weeks	5 Weeks	6 Weeks
T1 (Control)	2.24 ± 1.45	3.68 ± 1.37	5.97 ± 2.42	3.68 ± 4.71
T2 (Wormwood 15 ml/L)	2.22 ± 1.39	3.78 ± 1.48	6.33 ± 2.38	3.75 ± 2.39
T3 (Coriander 15 ml/L)	2.22 ± 1.41	3.21 ± 1.37	4.47 ± 3.45	3.25 ± 3.48
T4 (Wormwood 7.5 + Coriander 7.5 ml/L)	2.26 ± 1.43	3.12 ± 1.43	4.38 ± 3.45	3.21 ± 3.41
Significance	ns	ns	ns	ns

ns: non-significant

The data in Table 4 indicate that adding watery extracts of Wormwood and Coriander to the feed, either individually or in combination, did not produce statistically significant differences in the feed conversion ratio (FCR). This convergence of results suggests that although the extracts improved growth performance and increased feed intake, these improvements did not translate into a significant improvement in feed utilization efficiency.

During weeks 3 and 4, the FCR values were similar across all dietary treatments (T1–T4), indicating that the effect of the extracts on nutrient utilization during the early growth stage was limited. In contrast, during weeks 5 and 6, birds receiving Coriander alone (T3) or the extracts in combination (T4) showed a slight improvement in FCR values compared to the control group and the group receiving Wormwood alone. However, these differences were not statistically significant. This trend suggests a potential role for Coriander in improving digestion and nutrient absorption. However, the magnitude of this effect was not sufficient to produce a significant improvement in the feed conversion ratio during the trial period.

These results match what [15]; they said that extracts helped growth without greatly changing FCR in quail. Likewise,[16] and[17] mentioned that adding natural plant things helped poultry gain weight and eat more, but it didn't always make feed conversion much better. To wrap up, liquid extracts from Wormwood and Coriander helped growth performance traits, like body weight and food eating, but didn't change FCR much. This implies that these natural extracts are more about helping growth and eating than about making feed use more efficient. The helpful effect of plant additives on quail performance isn't just with Wormwood and coriander. Mohamed and team said similar things in 2024, showing that adding frankincense oil and ginger improved growth performance, carcass traits, and meat quality in Japanese quail. This backs up the overall idea that plant-based things can make poultry more productive and improve meat quality.

Practical Implications: The results from this research show that the good effects of plant-based additives on Japanese quail aren't just about Wormwood and coriander. Similar boosts in growth performance, carcass traits, and meat quality have been seen with other natural additives, like frankincense oil and ginger[18]. These results back the broad idea that plant-based compounds can work as good natural growth helpers, improving food eating, weight gain, and

overall productivity, while being a safe option to antibiotics in poultry farming.

References

[1] Hamad, K. and AL-Barzinji, Y.M.S. (2022). Evaluation of meat and egg production characteristics of crossbred local quail. Euphrates J. Agric. Sci., 14,187- 194. https://iasj.rdd.edu.iq/journals/uploads/2025/04/24/4111b79e5dc094cfccb0a601d199bf23.

[2] Burt, S. (2004). Essential oils: Their antibacterial properties and potential applications in foods—a review. International Journal of Food Microbiology, 94(3), 223–253. https://doi.org/10.1016/j.ijfoodmicro.2004.03.022.

[3] Hashemipour, H., Kermanshahi, H., Golian, A., & Veldkamp, T. (2013). Effect of thymol and carvacrol feed supplementation on performance, antioxidant enzyme activities, fatty acid composition, digestive enzyme activities, and immune response in broiler chickens. Poultry Science, 92(8), 2059–2069. https://doi.org/10.3382/ps.2012-02685.

[4] Ibatullin, I., Sychov, M., Umanets, D., Ilchuk, I., Balanchuk, I., Umanets, R., Holubieva, T., Andriinko, L., Otchenashko, V., Makhno, K., Tytariova, O., & Kuzmenko, O. (2022). Influence of feeding Wormwood (Artemisia capillaris) on quail meat productivity. Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 70(4-5), 307–316.

[5] NRC (National Research Council). (1994). Nutrient requirements of poultry (9th ed.). Washington, DC: National Academy Press.

[6] Hernández, T. & Hernández, A. (1994). Available carbohydrates in alfalfa leaf protein concentrates. Journal of Agricultural and Food Chemistry, 42(8), 1747–1749.
DOI: 10.1021/jf00044a033

[7] SAS Institute Inc2010. SAS 9.2 Software. Cary, NC: SAS Institute Inc; 2010.

[8] Sychov, M., Umanets, D., Balanchuk, I., Umanets, R., Ilchuk, I., & Holubieva, T. (2024). Effect of feeding Artemisia capillaris on egg production and egg quality in quail. Animal Science and Food Technology, 15(1), 105–120. https://doi.org/10.31548/animal.1.2024.105.

[9] Eldamrawy, S. Z., Elghioushy, A. B., & El-Rayes, T. K. (2023). Effect of sweet Wormwood (Artemisia annua L.) leaves meal supplementation on oxidative status and immune-response of broilers. Journal of Sustainable Agricultural and Environmental Sciences. (Note: Year, volume, and page numbers were not present in the provided text snippet.).

[10] Ramteke, R., Gendley, M. K., Dubey, M., Dutta, G. K., & Jain, A. (2022). Effect of turmeric and Coriander powder as phytobiotic feed supplement in poultry production: A review. Just Agriculture, 2(8), 1–4.

[11] Güler, T., Ertaş, O. N., Çiftçi, M., & Dalkılıç, B. (2005). The effect of Coriander seed (Coriandrum sativum L.) as diet ingredient on the performance of Japanese quail. South African Journal of Animal Science, 35(4), 261–268.

[12] Agnieszka ,Sa . Joanna, P. Paweł, K. Agnieszka, R. Hosam O. Elansary, Fahed A. Al-Mana, Mohamed A. M, and Halina, E.(2020), Artemisia absinthium L.—Importance in the History of Medicine, the Latest Advances in Phytochemistry and Therapeutical, Cosmetological and Culinary UsesPlants 2020, 9, 1063; doi:10.3390/plants9091063.

[13] Kaab, H. T., Hameed, S. S., & Sahib, A. M. (2022). The effect of Artemisia on immune response and productive performance against Newcastle disease in broiler chickens. Journal of World's Poultry Research, 12(1), 22–30.

[14] Ahmad, M., Kumar, A., & Singh, P. (2016). Effects of Coriander (Coriandrum sativum L.) seed powder on growth performance of broiler chickens. Krishi Vigyan, 5(1), 57–59. https://doi.org/10.5958/2349-4433.2016.00034.9.

[15] Bodea, A., Dronca, D., Ciochină, L. P., Simiz, E., Peț, I., Ștef, L., Iancu, T., Păcală, N., Ahmadi, M., Popescu, R., Filimon, N. M., & Dumitrescu, G. (2020). The effect of Coriander on the histological structure of the intestine and liver in broilers. Scientific Papers: Animal Science and Biotechnologies, 53(2), 110–115.

[16] Isam, O., Al-Doori, A. D. S., Al-Doori, A. A. D., Aldarraji, S. A. J., & Al-Saada, Q. (2025). Effect of waterыextract of garlic, cinnamon and their mixture on the productive performance and carcass characteristics of Japanese quail. International Journal of Veterinary Science and Animal Husbandry, 10(1), 273–282. https://doi.org/10.5281/zenodo.7645626.

[17] Al-Hayani, A. J., Mohammad, A. A., & Al-Kattan, M. M. (2025). Effect of Coriander seeds extract on some biochemical parameters and body weight gain of Japanese quails. Assiut Veterinary Medical Journal, 71(185), 267–275.

[18] Mohamed, L. A., et al. (2024). Growth performance, carcass traits and meat physical characteristics of Japanese quail fed frankincense oil and ginger. Poultry Science, 103(4), 101482. https://doi.org/10.1016/j.psj.2024.101482

Tikrit Journal of Veterinary Sciences (2025) 4(2): 40-47
DOI : 10.25130/tjvs.4.2.6

تاثير المستخلصات المائية للشيح والكزبرة على بعض الصفات الانتاجية لطائر السمان

عمر عصام

فرع الصحة العامة، كلية الطب البيطري، جامعة تكريت، تكريت، العراق.

الملخص

تهدف هذه الدراسة الى معرفة تأثير المستخلصات المائية لمسحوق الشيح ومسحوق الكزبرة على بعض الصفات الانتاجية لطائر السمان،تم تربية الافراخ في البيت الحيواني التابع الى كلية الطب البيطري/جامعة تكريت للفتره من ١٨/١٢/٢٠٢٣- ١٧/١/٢٠٢٤ وكان عدد الافراخ ١٦٠بعمر يوم واحد وبمعدل وزن ٧ غرام وتم توزيع الافراخ عشوائيا على اربع معاملات تجريبية بواقع ٤ مكررات لكل معاملة

وكان التوزيع كالتالي

١-معاملة السيطرة : مياه شرب بدون اضافات

٢-معاملة اضافة ١٥ مل /لتر من مستخلص الشيح

٣ -معاملة اضافة ١٥ مل /لتر من نستخلص الكزبره

٤-معاملة اضافة ٧.٥ مل من مستخلص الشيح مع ٧.٥ مل من مستخلص الكزبرة /لتر

تم تربية الافراخ تحت ظروف مسيطر عليها وتزويدها بعلائق متزنه حسب نظام .NRS

الصفات المدروسة وزن الجسم ، الزيادة الوزنية ، كمية العلف المستهلك ، كفاءة التحويل الغذائي ، تم استخدام التصميم العشوائي الكامل(CRD) وتم اختبار دنكن على معاملات التجربة عند مستوى

اشارت النتائج الى ان المعاملاتT3 و T4ادت الى زيادة وزن الجسم والزيادة الوزنية وكمية استهلاك العلف للاسبوع الخامس والسادس.

يمكن استعمال المستخلص المائية من الشيح والكزبرة بشكل منفرد او منجمع لتحسن اداء وزن الجسم في طائر السمان.

تستخدم المستخلصات كبدائل اكثر امانا من المضادات الحيوية التقليدية

الكلمات المفتاحية : الكزبرة ، الشيح ،مستخلص ،الانتاجية ،السمان