

STUDY THE EFFECT OF AQUEOUS EXTRACT OF MATCHA TEA AS A PRESERVATIVE IN STORING CHICKEN BREAST MEAT

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ABSTRACT : This study was targeted at assessing various characteristics of chicken breast meat from the influence of aqueous extract of matcha tea. The first was the production of aqueous matcha tea extracts and the assessment of the biological efficiency (against bacteria and fungus), and the second consisted of the use of this extract to maintain the chicken breast sliced at 4° C for 12 days (0, 3, 6, 9, 12). Six treatments have been investigated: T₁ control (T₂), T₃ matcha 0.5%, T₄ matcha tea 1.0%, T₅ matcha tea 1.5%, and T₆ industrial BHA antioxidant (T₆). The study included 6 treatments: Biological test results of matcha tea extract have demonstrated a high level of antibacterial activity against test bacteria *Enterobacter* sp., *E. coli*, *Klebsiella* sp., *Bacillus cereus* and *Staphylococcus aureus* and for two mung sp. Aquatic extract matcha tea (T₃, T₄, T₅) treatments were obtained during the twelfth day for the chicken breast samples, as control and water distillation was overtaken by smaller amounts of the total number of bacteria, with treatment T₄ being nearest to the findings of the artificial antioxidant. The degrees of sensory assessment (flavor, tenderness and publicly accepted juiciness) clearly improved, as all the treatments including artificial antioxidants were superior in the fourth treatment, when chicken breast samples were treated with the aqueous extract of matcha tea and stored in a cooling situation.

Key words : Matcha, extract, chicken breast, antibacterial, sensory evaluation.

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INTRODUCTION

Poultry meat is an unusual source of rich nutrients, owing to its high fat content and high protein content, in your diet, and its rich nutrient properties. Anthropomorphs (Chandralekha *et al*, 2012). Fleece is good nutrient media fit, and well for microorganisms and fines to contain meat at high humidity as well as suited to the growth of the nutrition needs of the increased activity of microorganisms that cause food toxicity by secreted compounds, and also lead to economic losses caused by damage to meat (Andres *et al*, 2014). The most significant natural antioxidants that proved helpful in the fight against bacterial oxidation are medical plants and herbs. In addition, industrial superiority over sensory anti-oxidation characteristics via the improvement of meat products (Amaral *et al*, 2018). Matcha tea is recognized as one of the key herbs in terms of green powder from Japanese green tea leaves and it is vital for phenolic chemicals, notably caffeine, which are found there in

significant levels (Horie *et al*, 2017 and Shi *et al*, 2020) referred to the use of Almatcha tea as preservatives and as an anti-oxidant and antibacterial in the package of tuna fish oil, and has demonstrated its effectiveness for 12 weeks at a temperature of 40°C in avoiding oxidation in tuna stock oil given the consumer want to receive cool, fresh and unfrosten chicken meat and the nature of storage of meat in cool conditions, and the importance of matcha tea to the effect that studies on use as a natural substance are effective antioxidant and constantly scarce to preserve meat and extend their shelf life, the study.

MATERIALS AND METHODS

Preparation of matcha tea extract

Matcha tea was bought in the local markets in Henan Shimo Matcha Co. as ready-made envelopes (China). The dry vegetable powder was produced with a water extract of matcha tea, weighed (100 grams) and distilled water added (1000 milliliters). Using 24°C ultrasonic

waves at a temperature of 40°C, the removal was done. Rotary evaporation removed about 90% of the moisture after filtering and the process of drying was totally dry utilizing an electric oven.

Biological activity

A well-diffusion test technique reported by Eloff assessed antibacterial activity (1998). Miss Sara Thamer maintained the bacterial isolates which were utilized in this test from the Food Science Department of the Agriculture Faculty, University of Anbar, Hadi. The *Escherichia coli* and *Enterobacter sp.*, *Kl.b.*, *Staphylococcus aureus* and *Batillu subtilis* contained in the isolates. According to the Magaldi *et al* (2004) approach outlined, various modifications were applied to antifungal activity. A hundred ml of PDA medium was made and infected with a spore suspension of 1 ml, prepared beforehand, quietly mixed and then the petridishes were poured. The diameter of 3 holes was 7 mm. The same volume of distilled water in the third pit was added to 50 µl of matcha aqueous extract at two concentrations. The findings were measured using graduated ruler for three wells in the diameters of inhibitory zones.

Experiment design

This experiment was conducted in the laboratories of the Faculty of Agriculture University of Anbar, including the central laboratory was conducted as well as a section of the analysis in the laboratories of the Ministry of Industry and Minerals Authority R & D, Ibn Al-Bitar. Twenty four birds type Ross males aged 42 days were taken from a breeders in the city of Heet and from one field and slaughtered and then took them categorically the chest, where it was used 15 kg of breast meat after being cut by the knife into cubes by 2 × 3 cm and then mixed pieces chest with each other to ensure distribution evenly and randomly, then the weight of the meat by the balance of the normal and distributed evenly over the six test transactions at 5 intervals. The aqueous extract and BHA antioxidant were added by emerging the cuttings in the suitable solutions for 1 hour at a temperature of 4°C. After that, we get rid of dowsing and filtered solution and left for 10 minutes to make sure the descent of all the water from Alqtaat and dried well using blotting paper, and then distributed in the dishes of cork and by 5 dishes from each treatment and wrapped in a thermal Bnailon well. placed bags sealed and then save them cryotherapy in the degree temperature (±4°C) for the purpose of studying the tests to be studied in the experiment at five stages (0, 3, 6, 9, 12) a day, and the storage was continued for a period of 12 days at 4°C.

RESULTS AND DISCUSSION

Table 1 shows the efficiency inhibitory by the aqueous extract of the tea Almacha Petrkiniz 0.5% and 1% to the bacteria test and it appears from the table that the extract Almacha tea possesses the effectiveness Baalogih noticeable against bacteria testing, has been effective more towards negative bacteria dye cram reaching averages of the countries of regions. Inhibition of 15.5, 19 mM against *Enterobacter sp.* and 14.5 and 16.5 mm against *E. coli* and 13.5 and 17.5 mm against *Klebsiella sp.* and to focus on, respectively, while the inhibitory activity of the extract against the most important bacteria was less. As countries reached Damping 12 and 14 mm towards areas of *Bacillus cereus*, 11 and 12 mm towards *Staphylococcus aureus* and Turkizin, respectively and gave the standard amikacin disk inhibition zone diameter of 21 mm.

Table 1 : Inhibitory efficacy of matcha extract against some types of bacteria.

Treatments	Type of bacteria	Average inhibited (mm)
T ₁ (50%)	<i>Enterobacter sp.</i>	15.5
T ₂ (100%)		19
T ₁ (50%)	<i>E. coli</i>	14.5
T ₂ (100%)		16.5
T ₁ (50%)	<i>Klebsiella sp.</i>	13.5
T ₂ (100%)		17.5
T ₁ (50%)	<i>Staphylococcus aureus</i>	11
T ₂ (100%)		12
T ₁ (50%)	<i>Bacillus cereus</i>	12
T ₂ (100%)		14
T ₁ (50%)		21

Back inhibitory efficiency shown by the Almacha tea extract to the content of the various effective with effects of compounds on the bacteria cells, as the aqueous extract contains a wide range of vehicles with the effects of different bacteria, Falcatekinat known to affect anti-microscopic as well as the neighborhoods of other phenolic compounds, organic acids, alcohols and Aloldehaadat.

These results agreed with Burcus *et al* (2018), who have confirmed efficiency Albaalogih inhibition of tea Almacha and all kinds of green tea against pathogenic bacteria and including *Escherichia coli* and indicated that this effect is due to the presence of Alcaatekin and the high proportion of caffeine in tea Almacha, a compound known stockpiles of the opposite effect of microorganisms. As it led to the inhibition of microbial

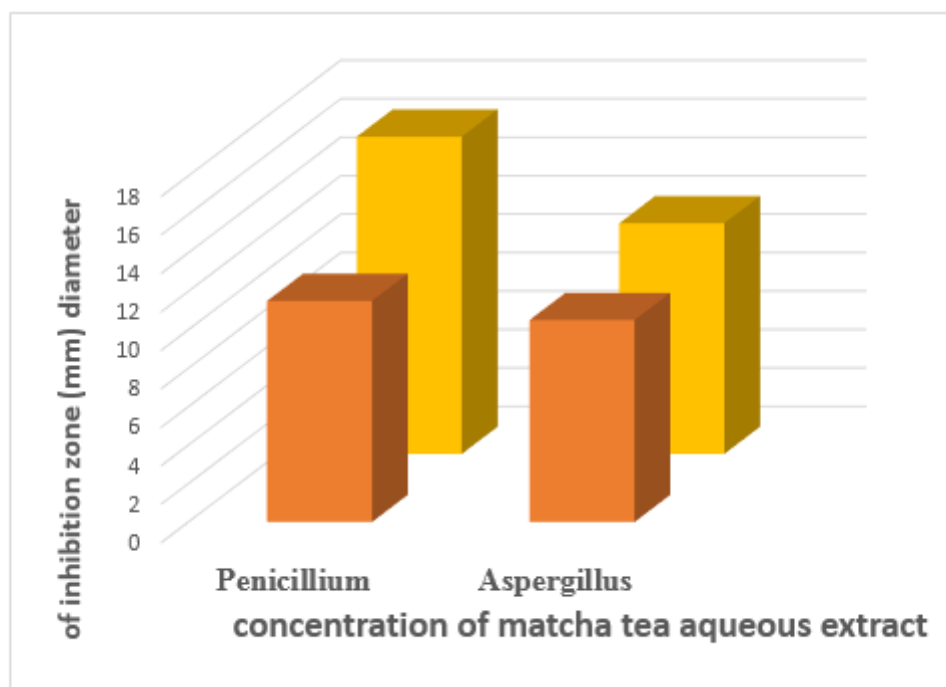


Fig. 1 : Inhibitory activity of matcha extract against two types of fungi.

growth (Atalay and Erge, 2017). As well as the agreed results with Hussein *et al* (2018), who found that the medical efficacy of plants anti-bacterial disease as it contains effective, such as flavonoids compounds, phenols and tannins, as it was a counter effect on the bacteria *Escherichia coli* and *Staphylococcus aureus* significantly.

As shown in Fig. 1, the extract of the matcha tea Mai also has a really discouraging to the two fungi *Aspergillus* and *Penicillium*, as it resulted in the concentration of 1% of the extract to get discouraged areas with diameters of 12 and 16.5 mm respectively, while focusing the reason for 0.5% of it to obtain damping areas with smaller diameters of 10.5 and 11.5 mm, respectively.

Back effective anti-fungal demonstrated by the aqueous extract of tea Almacha to the content of some effective with significant influence in the viability and vitality of fungi compounds, as studies have shown that plants and medicinal herbs and extracts good effects in inhibiting the growth of fungi, so as it contains compounds effective, such as flavonoids, phenols, glycosides, which are known for their strong antagonism to fungi (Kandhari, 2015). These results agreed with Muhammad and Jacob (2019), which affirmed that the plant extracts effective influence on the inhibition of fungal growth for both *Aspergillus* and *Penicillium*, due to the role of the active compounds found in plant extracts which negatively affect the fungal growth.

Effect of matcha tea extract on the microbial quality of chicken breast meat

The results shown in Table 2 and the presence of moral decline ($0.05 > P$) in the total number of bacteria in transactions dipped extract Almacha tea and the treatment of anti-industrial BHA compared with the control treatment, due this fall in pregnancy Almaekeroba to the inhibitory action of the compounds phenolic in the extract matcha tea and thus its role in keeping the flesh and inhibition of bacterial growth and to slow the growth of some types of pathological bacteria as previously mentioned in the examination of the results of the antithesis of bacterial extract Almacha. And it showed a statistical analysis of the fourth treatment outweigh the added coefficients of concentration Almacha tea extract and the results were closer Maicon to the results of anti-oxidation treatment of industrial BHA, as it amounted to (2.18) and if. T. NS. 0 g of meat per day and it became at the end of the storage period (3.88) lo and. T. NS. /gm meat on day 12 for the fourth treatment (1% matcha extract) and (1.98) lo. T. NS./gm of meat for the treatment of artificial antidote in the first period and it amounted to (3.80) lu and. T. NS./ Mines of meat in the last period of refrigeration for the treatment of the industrial antigen compared to the control sample. These results agreed with what happened by both Moawad *et al* (2020) and Yaseen *et al* (2021) that when the treatment of poultry meat materials plant nature with a high concentration of phenolic compounds that act as Maekerobah and antioxidants contribute to the overall reduction of the

Table 2 : Effect of dipping chicken breast pieces in matcha water extract and storing for different periods (0, 3, 6, 9, 12 days) on the total bacterial number (log cfu/g of meat).

Treatment	Storage periods / day				
	0	3	6	9	12
T ₁	3.39 b	3.57 b± 0.06	4.54 b± 0.05	5.36 b± 0.02	6.17 b± 0.06
T ₂	± 0.09	5.64 a± 0.05	6.61 a± 0.02	7.52 a± 0.04	8.53 a± 0.07
T ₃	2.99 c± 0.05	3.51 b± 0.03	4.31 c± 0.07	4.48 c± 0.02	4.82 c± 0.02
T ₄	2.18 d± 0.05	2.61 d± 0.02	3.34 d± 0.02	3.50 d± 0.01	3.88 d± 0.02
T ₅	3.03 c± 0.04	3.27 c± 0.05	4.46 b± 0.03	4.52 c± 0.02	4.76 c± 0.03
T ₆	1.98 d± 0.09	2.13 e± 0.07	3.03 e± 0.04	3.42 d± 0.04	3.80 d± 0.03
	0.001	0.001	0.001	0.001	0.001

The different letters within the same column indicate the presence of significant differences between the treatments at a significant level ($P < 0.05$) T₁ Control treatment (without addition) T₂ (distilled water added) T₃ (matcha tea extract 0.5%) T₄ (matcha tea extract 1%) T₅ (matcha tea extract 1.5%) T₆ (synthetic antibacterial BHA (0.001)).

Table 3 : Effect of drenching chicken breast pieces in matcha water extract and storing for different periods (0, 3, 6, 9, 12 days) on the cryophilic bacteria (log cfu./g of meat).

Treatment	Storage periods / day				
	0	3	6	9	12
T ₁	3.07 b± 0.04	3.25 b± 0.02	4.38 b± 0.09	5.03 b± 0.01	6.12 b± 0.05
T ₂	4.58 a± 0.04	4.59 a± 0.04	6.44 a± 0.06	6.98 a± 0.02	8.40 a± 0.10
T ₃	2.54 c± 0.04	3.14 c± 0.03	3.58 c± 0.07	3.92 c± 0.01	4.71 c± 0.06
T ₄	2.15 d± 0.05	2.22 e± 0.03	2.45 d± 0.02	2.80 d± 0.02	3.51 e± 0.02
T ₅	2.45 c± 0.06	2.85 d± 0.01	3.56 c± 0.03	3.96 c± 0.02	4.47 d± 0.03
T ₆	1.30 e± 0.00	2.07 f± 0.04	2.40 d± 0.01	2.75 e± 0.01	3.46 e± 0.05
sig	0.001	0.001	0.001	0.001	0.001

The different letters within the same column indicate the presence of significant differences between the treatments at a significant level ($P < 0.05$) T₁ Control treatment (without addition) T₂ (distilled water added) T₃ (matcha tea extract 0.5%) T₄ (matcha tea extract 1%) T₅ (matcha tea extract 1.5%) T₆ (synthetic antibacterial BHA (0.001)).

Table 4 : Effect of dipping chicken breast pieces in matcha water extract and storing for different periods (0, 3, 6, 9 and 12 days) on total coliform bacteria (log cfu / g of meat).

Treatment	Storage periods / day				
	0	3	6	9	12
T ₁	3.46 a± 0.03	3.94 b± 0.02	4.34 ab± 0.10	4.70 b± 0.04	4.89 b± 0.01
T ₂	3.69 a± 0.05	4.37 a± 0.06	4.77 a± 0.03	5.13 a± 0.07	5.42 a± 0.02
T ₃	2.38 b± 0.09	3.60 c± 0.04	4.22 bc± 0.05	4.39 c± 0.05	4.53 cd± 0.08
T ₄	2.08 b± 0.09	3.43 c± 0.07	3.53 d± 0.24	4.07 d± 0.07	4.27 d± 0.20
T ₅	2.44 b± 0.03	3.52 c± 0.08	3.80 dc± 0.20	4.42 c± 0.07	4.66 bc± 0.03
T ₆	1.99 b± 0.05	2.42 d± 0.05	3.75 dc± 0.15	4.25 cd± 0.00	4.54 c± 0.08
sig	0.001	0.001	0.001	0.001	0.001

The different letters within the same column indicate the presence of significant differences between the treatments at a significant level ($P < 0.05$) T₁ Control treatment (without addition) T₂ (distilled water added) T₃ (matcha tea extract 0.5%) T₄ (matcha tea extract 1%) T₅ (matcha tea extract 1.5%) T₆ (synthetic antibacterial BHA (0.001)).

number of bacteria.

Between the Table 3 significantly decreased incidence ($0.05 < P$) in Ogartm numbers of psychrotrophic transactions in the addendum tea extract and anti Almacha industrial treatment compared with the control treatment and there is a discrepancy between transactions in periods of conservation chilled. Where it is

psychrotrophic is one of the fundamental causes of damage to the meat during storage cryotherapy has been observed between the added transactions exceed the fourth treatment concentration (1%) extract Almacha tea on transactions extracted and other amounted to values (2.15, 2.22, 2.45, 2.80, 3.51), if and T. NS. /gm of meat and it was the closest to the results of the sixth artificial

antigen treatment (1.30, 2.07, 2.40, 2.75, 3.46) for lo and T. NS. Meat in terms of low numbers of cold-loving bacteria. The reason for this decline to act Inhibitory extract Almacha tea being of medicinal herbs containing many active compounds against bacterial growth and are vehicles phenolic As previously noted the results of the examination of the contrast bacterial and the results of the GC-MASS extract Almacha tea (Table 4). These results are in agreement with the results of Hussein *et al* (2018) and Yaseen *et al* (2021) in the use of plant extracts as antimicrobials for the preparation and treatment of plants.

CONCLUSION

It can be inferred that by utilizing the solution immersion technique for treating chicken breast with water extract of matcha tea (1 per cent) and keeping it cooled for up to 12 days at a temperature of 4°C, an anti-oxidant impact with a decreased oxidation rate has been extremely successful. In the chilling process 4°C for 3, 6, 9 and 12 days, that therapy was successful in inhibiting growth and significantly improved the chicken breast's sensory properties. In aqueous extract of Tea Matcha, Qtaiat breast meat may be used for one hour before chilling, to prolong Alkhozna life, maintaining as long as possible the qualitative properties of the meat.

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