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Efforts To Control Contamination of Chicken Carcass by *Helicobacter Pylori.*

Heba R. Desouky[1], Zeinab A.M. Mahdy[2], Nesma M.G. Ahmed[2] and Heba Abd El Shafi[1]

[1] *Fellow in University Hospital, Benha University, Egypt.*

[2] *Bacteriology Department, Animal Health Research Institute "Benha branch", Agriculture Research Center (ARC), Egypt.*

Abstract

THIS study clarified the prevalence of *Helicobacter* species in chicken samples with special focusing to *Helicobacter pylori* resistance, prevalence, and the potential of garlic oil to control *H.pylori*. The results showed the presence of *H.pylori* in 8.9% of samples, with the uppermost occurrence in liver (13.3%), followed by gizzard (10%) and chicken meat (3.3%). *H.pullorum*, *H.cinaedi*, and *H.hepaticus* were also identified. The *H.pylori* isolates exhibited high resistance to streptomycin (100%), erythromycin (87.5%), nalidixic acid (75%), and penicillin G (75%), with an average Multiple Antibiotic Resistance index of 0.507. All isolates carried the *hrgA* gene, while *cagA* and *vacA* genes were detected in 75% and 62.5% of the isolates, respectively. Garlic oil treatments demonstrated a dose-dependent reduction in *H. pylori*, counts in vitro on the first day, the reduction percentages were 29.7%, 35.1%, and 45.9% for the respective garlic oil concentrations of 0.5%, 1%, and 1.5%. By the third day, the reductions increased to 62.5%, 72.9%, and 79.1%, respectively. These findings highlight the potential risk of *Helicobacter* contamination in chicken products and suggest garlic oil as a possible natural intervention strategy.

Keywords: *Helicobacter pylori*, Chicken meat and giblets, Garlic oil.

Introduction

Helicobacter pylori stand out as a prominent bacterium that affects humans and cause severe digestive diseases like chronic gastritis, peptic ulceration, duodenal ulcer, and gastric cancer [1]. It was ranked as food borne carcinogenic microbe by WHO in 1994 [2]. It belongs to *Helicobacter* genus, family Helicobacteraceae [3].

The *Helicobacter* genus includes two distinct classes which differ through their body locations, gastric *helicobacter* lives in stomach lining tissues (like *Helicobacter pylori)*, whereas enterohepatic species *Helicobacter* establish residence through the lower gastrointestinal tract including liver and biliary tracts and intestines like *H.canadensis*, *H.pullorum*, *H.hepaticus*, and *H.bilis*, that lead to hepatitis, cholecystitis, and inflammatory bowel disease [4,5].

Helicobacter pylori is a microaerobic, Gram-negative bacterium that measures 0.5 to 5 μm in length and has a helical or curved rod shape, equipped with 5 to 7 polar sheathed flagella (approximately 3 μm long). This morphology enables *H. pylori* to effectively navigate the acidic mucus of the stomach. Its cell wall structure includes an outer membrane, a thin peptidoglycan layer, and an inner cytoplasmic membrane, with the potential presence of a capsule. *H. pylori* can change its shape from spiral to coccoid under certain conditions, such as antibiotic exposure, and exhibits significant morphological variability and diversity among

*Corresponding authors: Dr. Heba Rabiee Desouky, E-mail: heba.desouky@fmed.bu.edu.eg.Tel.: 01204659572.
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strains, allowing it to adapt to various environments and growth scenarios [4, 6].

People consume poultry meat, especially chicken meat extensively because it contains essential components, but such items can get contaminated throughout the processing stages including poultry raising and handling and slaughtering processes [7]. *Helicobacter pylori* mainly present in the intestines of chickens and may shed into environments through fecal content. Absence of hygienic condition during processing of chickens plays a role in enhancing their contamination by such microbe [8]. So, the contaminated chicken meat mainly acts as a resource of infection to humans by *Helicobacter pylori.*

H. pylori severity increases due to antibiotic resistance development and its possession of virulence genes including cytotoxin associated gene A(*cag*A), vacuolating cytotoxin A(*vac*A) along with restriction endonuclease replacing gene A (*hrg*A) which jointly produce serious gastric disorders [9]. The drug therapies developed to treat disorders related to *H. pylori* have shown improved effectiveness worldwide but their use through this program remains limited because of resistant strains and adverse side effects alongside high expense [10]. This directs the world's attention to using medicinal plants like garlic [11].

The application of garlic extracts as a potent bioactive compound used against several diseases was reported by several authors [12,13]. In addition, its powerful effect as antibacterial agents against both type of bacteria "Gram-positive and negative" as demonstrated by [14,15].

Based on the previous findings, the current study aimed to assess the prevalence of *Helicobacter* species in chicken-meat and giblets. It also analysed both the antimicrobial response of isolated *H. pylori* although it confirmed the existence of virulence genes "*Vac*A, *Cag*A, and *hrg*A" and tested the *invitro* antibacterial effects of garlic oil with concentrations of 0.5%, 1% and 1.5%.

Material and Methods

Sampling.

Ninety random samples of chicken-meat, liver, and gizzard (thirty samples from each) were gathered from small poultry slaughter stores located in Kalyobia governorate, Egypt during the period from February 2024 to April 2024. The samples collected from freshly slaughtered chicken or that refrigerator preserved within 12hrs after slaughtering and kept at -18°C till examination.

Bacteriological examination of Helicobacter species

Selective pre-enrichment through mixing 25 gm of examined samples with 225 ml of Brucella broth supplemented with 5% sheep blood and homogenized in Stomacher® 400 (Seward, Worthing, UK) then incubated the mixture at 37 °C for 48 hours under a microaerophilic condition using anaerobic jar "BBL GasPak™". Then 100 µL of enriched were inoculated into Columbia blood agar supplemented with 5% sheep blood and incubated in microaerophilic condition at 37°C for 7 days. The suspected colonies were further examined by staining, oxidase and urease tests to confirm its gram-negative curved rods, positive oxidase and urease [16].

In-vitro antibiotic sensitivity test for the isolated Helicobacter pylori.

This occurs by using disc diffusion method following the guidelines of CLSI [17] through using sixteen different antibiotics "Amikacin (AK), Ampicillin (AM), Cefotaxime (CF), Cephalothin (CN), Clarithromycin (CL), Ciprofloxacin (CP), Erythromycin (E), Gentamicin (G), Kanamycin (K), Metronidazole (M) , Nalidixic acid (NA), Neomycin (N), Penicillin (P), Streptomycin (S),), Sulfamethoxazole (SXT), and Tetracycline (T)" (*Oxoid Limited, Basingstoke, Hampshire, UK*). The interpretation of the results adhered to the standards set forth by the National Committee for Clinical Laboratory Standards [18] Table 1. Each strain's Multiple Antibiotic Resistance index was determined based on the formula defined by Singh et al. [19].

Molecular examination of the virulent genes in the isolated Helicobacter pylori.

The molecular examination of virulent genes "*hrg*A*, cagA, and vacA"* were conducted by using a set of primers as described in Table 2. [41-43]

Extraction method:

The procedures of the extraction occur by using QIA amp kit as follow, picking one or two colonies from an overnight culture and suspending it into1.5 ml of phosphate buffer saline PBS, mix for 2 minutes, then put in boiling water bath for about 15 min, after that cooling in ice and centrifugation at 13.000 xg for 1 min. Ten microliter of produced supernatant were transferred to sterile Eppendorf to be used as DNA template. [20]

Amplification of virulent genes.

This occurs by using Multiplex PCR techniques. The total volume of the amplicon was 25 µl that formed from 10 µl of DNA template, 1 U Taq polymerase, 10 p.mol of primers of both directions of all the selected genes (*hrgA, cagA* and *vacA*) per reaction, 0.25 mmol deoxynucleotide triphosphate and 2–3 mmol MgCl2 in standard PCR buffer. The thermocycler reaction occurs for 35 cycles through the following program: the initial denaturation occurs at 95°C for 5min, after that annealing at 52°C for 1 min, followed by one minute for extension at 72°C, finally the elongation occurs at 72°C for 7 min. The formed PCR product and the 100 pb DNA ladder

were spotted in agarose gel with 0.3% ethidium bromide in 10% Tris–borate EDTA buffer and electrophoresed under UV illumination to see their amplification. [21]

Trial to combat the activity of Helicobacter pylori in chicken meat by using Garlic oil.

The virulent strain of *Helicobacter pylori "positive for vacA, cagA, hrgA* and tetA genes" *used in this experimental trial is obtained from* Food Analysis Center, Faculty of Veterinary Medicine, Benha University. And Garlic oil was purchased from Al-Kaptain company.

The experiment done in 20 pieces of chicken fillets (100 g each) was exposed to UV illumination for 20 min at first to reduce the bacterial load in their surface, then ensure their sterility through culturing in the specific media [38]. A dense culture of the strain was prepared in concentration3×10^6 organism/ ml (such count is indicated to be pathogenic to man). The sterile fillets were divided into four groups, control untreated groups, the 2nd, 3rd and 4th groups that were treated with garlic oil with concentrations (0.5%, 1% & 1.5%). All groups inoculated with *Helicobacter pylori* strain and stored in refrigerator at 4°C. All groups (either control or treated) were examined for enumeration of *H. pylori* at zero-day (within 2 hours after handling) then periodically for 3 successive days (0, 1, 2 and 3 days) "The storage is only 3 days where the research is interested to study the effect of garlic oil *H. pylori* as pathogen (Not to study the shelf life of chicken fillets". The test repeated 3 times "(Each trial was performed using 20 pieces of chicken fillets). There are 4 pieces were used as control negative" [22].

Results

The prevalence of *Helicobacter* species in the inspected samples demonstrated the presence of various *Helicobacter* species, as illustrated in Figure 1 (A & B). *Helicobacter pylori* was discovered in 8 out of 90 samples (8.9%), with the highest prevalence observed in the liver (13.3%), followed by the gizzard (10%) and chicken meat (3.3%). *Helicobacter pullorum* was identified in 5 out of 90 samples (5.6%), being isolated from both the liver and chicken meat at a rate of 6.7%, and from the gizzard at 3.3%. Additionally, *Helicobacter cinaedi* was found in only 2 out of 90 samples (2.2%), both of which were isolated from the gizzard. Lastly, *H. hepaticus* was detected in only one out of 90 samples (1.1%), which was isolated from chicken liver.

The antimicrobial susceptibility to the isolated *H. pylori* against tested antibiotics revealed the appearance of complete resistance toward Streptomycin (100%) and high resistance rates for Erythromycin (87.5%), Nalidixic acid (75%), and Penicillin G (75%). While showed lower resistance toward Sulfamethoxazole, Cephalothin, Tetracycline, Cefotaxime, and Neomycin as follows 62.5%, 50%, 50%, and 50% respectively. Otherwise, it showed high susceptibility toward Gentamicin, Amikacin, and Kanamycin represented 87.5%, 75%, and 62.5% respectively, as seen in figure 2.

Table 3 showed the antimicrobial profile of isolated *H. pylori* while indicating the MAR index to evaluate their antibiotic resistance level. According to the recorded results the first strain exhibits complete resistance to all tested antibiotics (MAR index of 1), indicating a multidrug-resistant phenotype. As the strains progress from the first to the eighth (1 to 8), there is a notable decrease in the antibiotics they were resistant and so a decline in the MAR indices. The last strain showed resistance only to Streptomycin with a MAR index of 0.062, indicating minimal resistance. The average MAR index across all tested strains was 0.507.

The molecular examination to the virulent genes "*hrgA, cagA, and vacA*" by multiplex PCR showed appearance of endonuclease- replacing A gene "*hrgA*" gene in all examined *H. pylori* isolates (100%). While cytotoxin- associated antigen gene "*cagA*" appear in 2 out of 3 isolates from chicken gizzards and in all 4 isolates from liver. In addition, vacuolating cytotoxin gene "*vacA*" appeared in the only strain isolated from chicken meat, two out of three isolates from chicken gizzards and from two out of four isolates from chicken liver Figure 3.

The effects of using different concentrations of garlic oil (0.5%, 1%, and 1.5%) on *Helicobacter pylori* was illustrated in table 4. where at zero time, all treatments showed equivalent counts of *H. pylori* at approximately 3×10^6 CFU\gm. When the time extended, the control group exhibited an increase in bacterial count from day one to day three, reaching up to 4.8×10^6. In contrast, garlic oil treatments significantly reduced *H. pylori* count over time, with higher concentrations showing more pronounced effects. On the first day, the reduction percentages were 29.7%, 35.1%, and 45.9% for the respective garlic oil concentrations of 0.5%, 1%, and 1.5%. By the third day, the reductions increased to 62.5%, 72.9%, and 79.1%, respectively, indicating a dose-dependent antimicrobial effect of garlic oil.

Discussion

Countless individuals globally consume chicken daily as a key source of protein, making hygienic practices in chicken supply and preparation critically important for public health [23]. Although there is no direct evidence of considering food products as source of *H. pylori* infection, but several studies have been isolated from meat sources [24].

As determined in the current study, *H. pylori* was detected in 13.3% from the examined liver, 10% from gizzard, and 3.3% from chicken meat. This is higher than that reported by Elrais et al. [25] detected the existence of *H. pylori* in 4%, 10%, and 2% from chicken-meat, liver and gizzard samples, respectively. Also, Abd Elhameed et al. [26] determined the existence of *H. pylori* in 4%, 10%, and 6% from the examined chicken meat, liver and gizzard. The overall *H. pylori* in the examined samples in the current research was 8.9%, this was higher than that determined by Elrais et al.; Abd Elhameed et al. and ElDairouty et al. [25-27] who detected existence of *H. pylori* in 5%, 5.3% and 6 % from examined samples. But lower than that mentioned by Meng et al. and Almashhadany et al. [28,29] who detected presence of *H. pylori* in 36%, and 13.8% from examined chicken samples. The presence of *H. pylori* in chicken products and giblets arises when workers fail to clean their hands properly as they work with different sections of raw chicken. Washing chicken carcasses with unclean water has been identified as another source that allows *H. pylori* to be present in meat. The presence of *H. pylori* in chicken specimens may also developed from using of contaminated tools at the slaughterhouse facility [25].

Another *Helicobacter* species isolated from the chicken samples were *H.pullorum* that present in 5.6% of examined samples this higher than that reported by Hamada et al., Elrais et al., and Abd Elhameed et al. [23,25,26] found the incidence of *H.pullorum* in the examined chicken samples were 4.44%, 4.24%, and 2.5%, respectively. While for other *Helicobacter* species "like *H.cinaedi* and *H.hepaticus*" that detected in 2.2% and 1.1% respectively, this similar to that reported by Hamada et al. [23] and higher than that detected by Abd Elhameed et al. [26] who found *H. cinaedi* and *H. hepaticus* with percentage 1.5%, and 0.5%, respectively.

The susceptibility of *H. pylori* strains to different antibiotics was demonstrated in heat map figure 2. were the examined strains showed 100% resistance toward Streptomycin, 87.5% to Erythromycin, 75% to Nalidixic acid, 75% to Penicillin G, and 62.5% to Sulfamethoxazole, this is nearly like the results detected by Hamada et al. [23] that found that the isolated *H. pylori* from chicken-meat samples exhibit resistance to Amoxicillin, Penicillin, Oxytetracycline, Nalidixic acid, Ampicillin, and Norfloxacin. In addition, Mashak et al. [30] reported that the isolated *H. pylori* from raw meat samples showed resistance toward tetracycline, erythromycin, levofloxacin, and amoxicillin. Also, Elrais et al. [25] found that the isolated *H. pylori* from chicken-meat samples exhibited a high rate of resistance toward clarithromycin, metronidazole, tetracycline, levofloxacin, and amoxicillin.

The assessment of the MAR index for the isolated *H.pylori* strains clarified that 75% from the examined strains showed resistance to more than four antibiotics examined in this study, this came in agreement with Hamada et al. [23] who found that 71.42% of examined strains showed resistance against three or more of the antimicrobial drugs used. These findings highlighted the global alarm to consider chicken meat and giblets as a key source of contamination by resistant strain of *H. pylori* [23]. The higher susceptibility of the isolated strains to gentamicin, amikacin, and kanamycin may be explained by the inability of such drugs "aminoglycoside drugs" to be absorbed by the gastrointestinal tract owing to their polar characters "water-soluble nature" [31] and so the optimum way for administration of such drugs is only through intravenous or intramuscular ways which not suitable for curing *H. pylori* infection [32].

The virulence of the isolates was dominated through screening the viability of the virulent genes "*hrgA, cagA, and vacA"* within the isolated strains by using multiplex PCR. The usage of Multiplex-PCR serves mainly for genetic identification and genotyping of conserved genes found in *H.pylori* strains extracted from clinical samples [33]. In the current study, the *hrgA* gene was noticed in all examined strains (100%), while *cagA* gene appears in 75% from examined strains, and *vacA* gene appears in 62.5% from examined samples, this is partially like the findings of Elrais et al. [25] detected presence of *vacA*, *cagA*, and *hrgA* in the examined strains with percentage 66.7%, 77.8%, and 100%, respectively. In addition, Asadi et al. [34] detect presence of *cagA* and *VacA* genes in examined strains at 60% and 75%, respectively. Moreover, Piri-Gharaghie et al. [35] demonstrated presence of *VacA* and *cagA* in examined strains at 75% and 60%, respectively.

The challenge in the treatment scenario due to expansion in multidrug resistant within *H. pylori* directed the researcher to replace it with natural products. One of the promising agents was using garlic oil [11]. The main active principle of garlic oil is heat-resistant allicin that has a strong antibacterial effect against wide range of bacteria [36]. It acts through binding protein and destructing cell wall of microorganism [37]. The results tabulated in Table (4) demonstrate that garlic oil treatments significantly reduced *H. pylori* count over time, with higher concentrations showing more pronounced effects, this is similar to the results of Almashhadany et al. [38] found that treating chicken-meat with garlic extract moderates the count of *H. pylori*. While disagree with [39,40] who found that there is no

inhibitory effect for garlic on *H. pylori.* The inhibitory effect of garlic oil was attributed to its sulfur-containing compounds, particularly allicin, and their interactions with bacterial physiology. Allicin disrupts bacterial enzymes (e.g., cysteine proteases) by modifying thiol groups, impairing metabolic pathways critical for survival [41].

Conclusion

This study highlights the presence of *Helicobacter pylori* and other *Helicobacter* species in chicken meat and giblets, emphasizing the importance of hygienic practices in chicken handling and processing. The detected prevalence of *H. pylori* (8.9%) was higher than some previous studies, suggesting potential contamination sources such as inadequate worker hygiene, unclean water, and contaminated slaughterhouse tools. The detection of virulence genes (*hrgA, cagA, and vacA)* further confirms the pathogenic potential of these strains. Furthermore, the identified *H. pylori* strains exhibited high rates of antibiotic resistance, particularly to streptomycin, erythromycin, nalidixic acid, penicillin G, and sulfamethoxazole. This multidrug resistance underscores the need for alternative treatment strategies. Garlic oil demonstrated a promising antimicrobial effect against *H. pylori* in vitro, with higher concentrations leading to significant reductions in bacterial counts over time. These findings suggest that garlic oil possibly will used as a potential natural alternative for controlling *H. pylori* in chicken meat.

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Declaration of Conflict of Interest

The authors declare that there is no conflict of interest.

Ethical approval: the practices used in this research were approved by Scientific Research Ethics Committee, Faculty of Medicine, Benha University with Ethical Approval Number (rc 11-11-2024).

TABLE 1. Breakpoints for different antibiotics used against *Helicobacter pylori*.

Antibiotics	Concentration	Sensitive (mm)≤	Intermediate (mm)	Resistant (mm) ≥
Amikacin (AK)	30 µg	12	13-15	16
Ampicillin (AM)	10 µg	13	14-17	18
Cefotaxim (CF)	30 µg	17	18-22	23
Cephalothin (CN)	30 µg	14	15-17	18
Ciprofloxacin (CP)	5 µg	15	16-19	20
Clarithromycin (CL)	15 µg	10	11-12	13
Erythromycin (E)	15 µg	13	14-22	23
Gentamicin (G)	10 µg	12	13-14	15
Kanamycin (K)	30 µg	13	14-17	18
Metronidazole (M)	50 µg	16	17-19	20
Nalidixic acid (NA)	30 µg	13	14-18	19
Neomycin (N)	30 µg	12	13-16	17
Penicillin (P)	10 µg	20	21-28	29
Sulfamethoxazol (SXT)	25 µg	10	11-15	16
Streptomycin (S)	10 µg	11	12-14	15
Tetracycline (T)	30 µg	14	15-18	19

TABLE 2. Primer sequences of *Helicobacter pylori* used for PCR.

Target gene	Oligonucleotide sequence (5′ → 3′)	Amplification (bp)	References
hrgA	F: **5′** TCTCGTGAAAGAGAATTTCC **′3** R: **5′** TAAGTGTGGGTATATCAATC **′3**	594	**[42]**
cagA	F: **5′** GCGATTGTTATTGTGCTTGTAG **′3** R:**5′**GAAGTGGTTAAAAAACAATGCCCC **′3**	499	**[43]**
vacA	F: **5′** ATGGAAATACAACAAACACAC **′3** R: **5′** CTGCTTGAATGCGCCAAAC **′3**	259	**[44]**

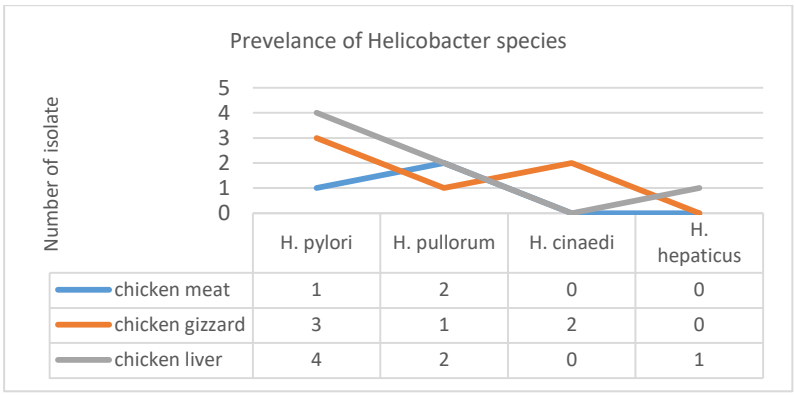

Fig. 1. A&B. Prevalence of *Helicobacter* species isolated from the tested samples of chicken-meat and giblets "30 samples from each".

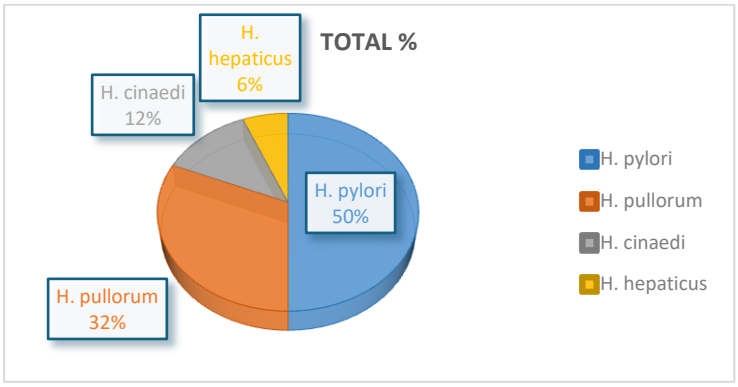

Fig 2. Heat map for *in-vitro* antimicrobial sensitivity tests for the isolated *H.pylori* "n=8"

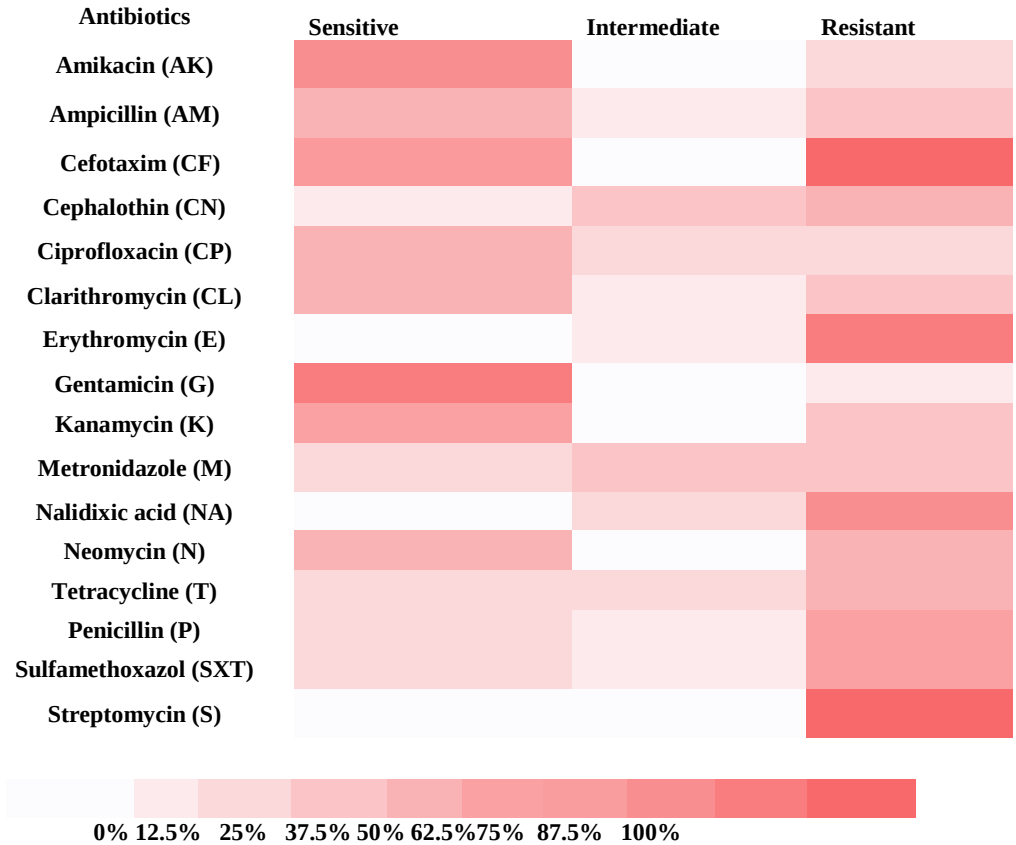

TABLE 3. Antimicrobial resistance profile of the isolated *H.pylori* "n=8"

NO	Strains	Antimicrobial resistance profile	MAR index
1	*H. pylori*	**S, E, NA, P, SXT, CN, T, CF, N, M, CL, AM, K, CP, AK, G**	**1**
2	*H. pylori*	**S, E, NA, P, SXT, CN, T, CF, N, M, CL, AM, K, CP, AK**	**0.937**
3	*H. pylori*	**S, E, NA, P, SXT, CN, T, CF, N, M, CL, AM, K**	**0.812**
4	*H. pylori*	**S, E, NA, P, SXT, CN, T, CF, N, M**	**0.625**
5	*H. pylori*	**S, E, NA, P, SXT**	**0.313**
6	*H. pylori*	**S, E, NA, P**	**0.250**
7	*H. pylori*	**S, E**	**0.125**
8	*H. pylori*	**S**	**0.062**
		Average	**0.507**

S: Streptomycin **E: Erythromycin** **NA: Nalidixic acid** **P: Penicillin**
SXT: Sulphamethoxazol **CN: Cephalotin** **T: Tetracycline** **CF: Cefotaxim**
N: Neomycin **M: Metronidazole** **Cl: Clarithromycin** **AM: Ampicillin**
K: Kanamycin **CP: Ciprofloxacin** **AK: Amikacin** **G: Gentamicin**

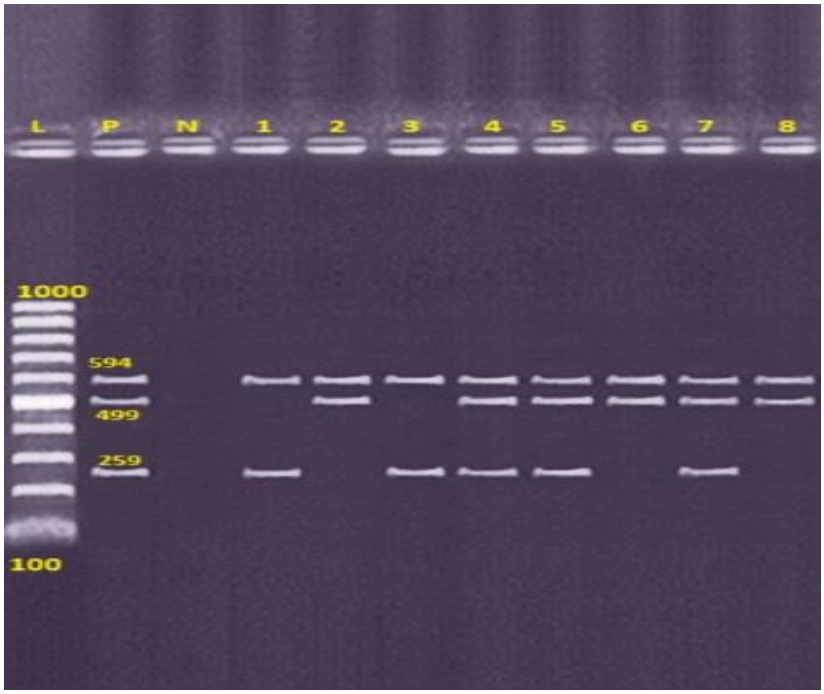

Fig. 3. Amplification of virulent genes by multiplex PCR.

Agarose gel electrophoresis for the virulent genes of *Helicobacter pylori* strains *VacA* (259 bp), *CagA* (499 bp) and *hrgA* (594 bp).
Lane L: 100-1000 bp ladder "DNA marker".
Lane P: Control positive *H.pylori* for *vacA*, *cagA* and *hrgA* genes.
Lane N: Control negative.
Lanes 4, 5 & 7: Positive *H.pylori* for *vacA*, *cagA* and *hrgA* genes.
Lanes 2, 6 & 8: Positive *H.pylori* for *cagA* and *hrgA* genes.
Lanes 1 & 3: Positive *H.pylori* for *vacA* and *hrgA* genes.

N.B.
Lane 1 represented chicken meat
Lanes 2, 3 & 4 represented chicken gizzard
Lanes from 5 to 8 represented chicken liver

TABLE 4. Effect of Garlic oil on *Helicobacter pylori* experimentally inoculated to chicken fillets (3×10^6/g).

Treatment / Storage time	Control	0.5% Garlic oil		1% Garlic oil		1.5% Garlic oil	
		Count	R %	Count	R %	Count	R %*
Zero time	$3\times10^6\pm 0.1\times10^6$	$3\times10^6\pm 0.1\times10^6$	------	$3\times10^6\pm 0.1\times10^6$	------	$3\times10^6\pm 0.1\times10^6$	------
1st day	$3.7\times10^6\pm 0.2\times10^{6\,a}$	$2.6\times10^6\pm 0.1\times10^{6\,b}$	29.7	$2.4\times10^6\pm 0.1\times10^{6\,c}$	35.1	$2.0\times10^6\pm 0.1\times10^{6\,d}$	45.9
2nd day	$4.5\times10^6\pm 0.4\times10^{6\,a}$	$2.2\times10^6\pm 0.1\times10^{6\,b}$	51.1	$1.9\times10^6\pm 0.1\times10^{6\,c}$	57.8	$1.7\times10^6\pm 0.8\times10^{6\,d}$	62.2
3rd day	$4.8\times10^6\pm 0.4\times10^{6\,a}$	$1.8\times10^6\pm 0.1\times10^{6\,b}$	62.5	$1.3\times10^6\pm 0.1\times10^{6\,c}$	72.9	$1.0\times10^6\pm 0.1\times10^{5\,d}$	79.1

R %*= Reduction %

*Mean values with different superscripts in the same rows are significantly different at ($P<0.05$).

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الجهود المبذولة للتحكم في تلوث ذبائح الدجاج بميكروب الهيليكوباكتر بيلوري.

هبه ربيع دسوقي [1]، زينب عبد الرحمن محمد مهدي [2]، نسمه محمد جمال [2]، هبه عبد الشافي [1]

[1] زميل في المستشفى الجامعي، جامعة بنها، مصر.

[2] قسم البكتريولوجي، معهد بحوث الصحة الحيوانية، مركز البحوث الزراعية، الجيزة، مصر.

الملخص

أوضحت هذه الدراسة مدي انتشار أنواع الهيليكوباكتر في عينات الدجاج مع التركيز بشكل خاص على مقاومة ميكروب الهيليكوباكتر بيلوري وتحديد مدي انتشارها وإمكانية السيطرة عليها باستخدام زيت الثوم. وقد أظهرت النتائج وجود الهيلكوباكتر بيلوري في 8.9٪ من العينات، وقد سجلت اعلي نسبة في الكبد (13.3٪)، تليها القوانص (10٪) ثم لحوم الدجاج (3.3٪). كما تم عزل عترات اخري من الهليكوباكتر كالهليكوباكتر بلورم ، الهليكوباكتر سينادي و الهليكوباكتر هيبتيكس . وقد أظهرت عزلات الهليكوباكتر بيلوري مقاومة عالية للستربتومايسين (100٪) والإريثروميسين (87.5٪) وحمض الناليديكسيك (75٪) والبنسلين ج75)٪ (، بمتوسط مؤشر مقاومة للمضادات الحيوية المتعددة 0.507. وقد لوحظ وجود جين الضراوة *hrgA* في جميع العزلات ، بينما تم اكتشاف جينات *cagA* و *vacA* في 75٪ و 62.5٪ من العزلات ، على التوالي. وقد أظهر استخدام زيت الثوم انخفاضا ملحوظا في عد الهليكوباكتر بيلوري اعتمادا علي تركيزه ، فسجل في خلال اليوم الأول من التجربة نسبة أنخفاض 29.7٪ و 35.1٪ و 45.9٪ مقابلة لتركيزات زيت الثوم 0.5٪ و 1٪ و 1.5٪ علي التوالي . وبحلول اليوم الثالث وصل نسبة الانخفاض الي 62.5%، 72.9%، 79.1% علي التوالي. وبذلك سلطت هذه النتائج الضوء على المخاطر المحتملة لإمكانية تلوث منتجات الدواجن بميكروب الهيليكوباكتر وتقترح استخدام زيت الثوم كاستراتيجية تدخل طبيعية محتملة.

الكلمات الدالة: الهليكوباكتر بيلوري ، لحوم الدواجن ومخلفاتها الصالحة للأكل، زيت الثوم.