Identification, Characterization, Antibiotic Resistance of Aeromonas Hydrophila in Chicken Intestine

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Abstract - ***Motile Aeromonas species were present in all samples including retail lamb meat and offal; so it was concluded that meat products were potentially significant sources of virulent Aeromonas species and might play an important role in the etiology of Aeromonas gastroenteritis .Since meats products are important source of nutrition and could act as a factor in transfer of pathogenic strain and since there is no any published report as to the prevalence and patterns of Aeromonas species isolated from raw meat The major objective of the paper is to isolates and identify the Aeromonas hydrophila from the chicken intestine by using various standard test.***

Index Terms: Aeromonas sp, Chicken Intestine, Meat, Pathogen

I. INTRODUCTION

Aeromonas spp are ubiquitous Gram negative bacilli, now a day classified within the Aeromonadaceae family (Evangelista et al., 2010). The species of this genus have long been known to cause different type of infections in fish, reptiles and amphibians, and some species mainly, A. hydrophila, a sobria and A. caviae have been described as emergent food borne pathogens implicated in human gastroenteritis ranging from mild diarrhea to chlora-like illness (Figueras et al., 2000). Aeromonas have been reported in untreated and chlorinated drinking water, fresh food, seawater, milk, vegetable, ice cream, and several meats, including pork, beef and poultry (Abbott et al., 1998, Abbott et al., 2003).

Aeromonas veroni, Aeromonas sobria and Aeromonas hydrophila. Food borne gastroenteritis associated with Aeromonas spp has been reported in humans from all age groups and is particularly severe in risk populations like very young children and old immune compromised patients. It is important that Aeromonas spp, found in food are able to produce different exotoxins, some of which are clearly enterotoxins (Ergin Kariptas et al.,2009).

Broiler carcass and carcass parts have been contaminated to important level with motile Aeromonas species and it has been risk for public health (Koca et al.,2003). Furthermore, isolated A. hydrophila in nearly 3500 wild and pet birds provide statistically significant evidence that the composition of the intestinal flora may depend on dietary habits(Dijkshoorn,2001). The infection was found in 1.9 of the carnivorous and herbivorous species, in 7.1% of the omnivorous and in 12.4% of the carnivorous and insectivorous birds(Kingombe et al.,1999). The broad spectrum of infection with A. hydrophila is paralleled by a range of virulence factors including adhesions, cytotoxins, haemolysin, and various enzymes. However, most strains of A. hydrophila produce enterotoxins, regardless of the source(Kirov,1990).The presence of several genes encoding for putative virulence factors and phenotypic activities that may play an important role in A. hydrophila infection(Delamare et al.,2002).

Contaminated poultry products are widely accepted as a major source of enteric Salmonella and Aeromonas infections. Foods of animal origin like fishes and other sea foods, meat and meat products, poultry, eggs, milk and milk products have been reported to be contaminated by these organisms. Salmonella and Aeromonas have been implicated as potential food poisoning agents and have been responsible for various human infections including gastroenteritis and extra intestinal infections (Faby et al., 2012).

II. MATERIALS AND METHODS

The chicken intestine were collected from various slaughter houses and supermarkets of Coimbatore (Kuniyamuthur (I1), Marudumalai (I2), Echanari (I3), Bharathi stores (I4),Nilgiri Departmental store (I5). The collected samples were enriched in peptone water and then streaked onto Nutrient agar, Mac Conkey agar and Starch Ampicillin Agar. The organism was identified based on Preliminary test and Biochemical tests results (Bachhil,1995).

A. Sample collection

Collection from slaughter houses

The chicken intestine samples were collected from various slaughter houses and processed within 2 hours of collection. The samples were collected from various slaughter house and departmental stores of Coimbatore, Tamil Nadu, India.

B. Enrichment of samples:

The samples were enriched in 100ml peptone broth and kept for incubation at 37°C for 24 hours (Buchanan et al.,1985).

C. Isolation of the organism:

After enrichment of the samples were directly streaked on to various media such as Nutrient Agar, Mac Conkey Agar, Starch Ampicillin Agar, Blood Agar and incubated at 37°C for 24 hours at microaerophilic condition. The positive colonies were maintained in Nutrient Agar for further studies (Carnahan et al.,1991).

III. MICROSCOPIC EXAMINATION AND BIOCHEMICAL TESTS

The samples collected were treated in enriched media and for preliminary identification biochemical tests were performed. (Kirov et al., 1993)

IV. RESULTS AND DISCUSSION

Aeromonas have found to be a causative agent of human gastroenteritis and other infections. Aeromonas is the most predominant organism found in various parts of chicken sample majorly intestine. The I1 sample collected from Kuniamathur produced positive isolates of Aeromonas sp. Further the unique colonies after preliminary identification were cultured in enriched medium and biochemical test were performed.

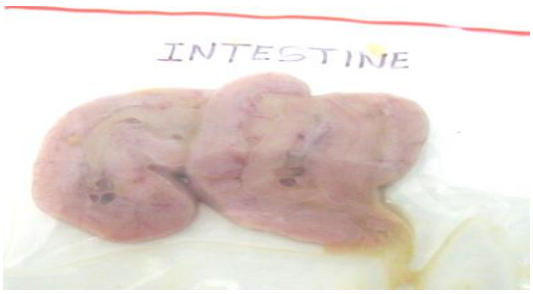

Figure 1: Intestine

Table 1.Prevalence of Aeromonas Spp In Chicken Intestines

S. No	Samples (Intestine)	Positive Isolates	%	Negative Isolates	%
1	I1	17	89.4	2	10.52
2	I2	13	81.25	3	18.75
3	I3	12	80	3	20
4	I4	3	75	1	25
5	I5	6	66.6	3	33.3
TOTAL		51		12	

V. MORPHOLOGICAL CHARACTERIZATION

Table-2: Biochemical Characteristics of Aeromonas Hydrophila

S. NO	BIOCHEMICAL TESTS	*Aeromonas* sp
1	Indole	+
2	Methyl red	+
3	Voges –Proskauer	+
4	Citrate	+
5	Nitrate	+
6	Triple iron Sugar Test	A/AK+GAS+H^2S+
7	Glucose	Acid Gas+
8	Lactose	_
9	Maltose	+
10	Mannitol	+
11	Sucrose	+

Increased awareness of Aeromonas species in animals and human has stimulated interest about possible existence and distribution among chickens. The Aeromonas organism appears to be wide spread in nature, epidemiological studies have shown that it ispresent in water, fruits and vegetables (Chopra et al., 1990 and Dumontet et al., 2003). At the same time Aeromonas species has been implicated in several

outbreaks of food and water illness (Colwell et al., 1986 and Davin et al.,1988).

In this present investigation, it was observed that Aeromonas species are present in maximum of the chicken samples (intestine) which were collected from various regions. This indicates that the chicken samples are contaminated with Aeromonas species.

A. hydrophila species were isolated from intestines of chickens with cases of fowl cholera. Although A. hydrophila has not been reported as an important poultry pathogen in Jos, Nigeria, the isolation of this agent in cases of fowl cholera in chickens (Dumontet et al., 2003).

Aeromonas sp cause a variety of extra intestinal infections such as Wound infections, Meningitis, Osteomyelitis Septic arthritis, Endocarditic, Peritonitis, Eye and Urinary tract infections. A. hydrophila, A. cavia, A. sobria is known to be pathogenic to isolated the chicken samples. Expression of virulence factors are multifactorial and host susceptibility dependent.

IV. CONCLUSION

The intestines of chicken samples were collected from various slaughter houses and supermarkets. Out of five samples collected from various slaughter houses and supermarkets, I1 showed Aeromonas sp growth on Starch Ampicillin Agar.This paper silhouettes of isolation of Aeromonas sp from intestine in the specific region of Tamil Nadu.

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