Prevalence of *Aeromonas* spp. in Chicken Samples Collected from Retail Shops of Anand (Gujarat)

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**ABSTRACT**

A total of 120 poultry meat samples were screened during the study for isolation, characterization and estimating the prevalence of *Aeromonas* spp. which revealed 66 (55%) samples to be positive for the presence of *Aeromonas* spp. Biochemical characterization revealed 47 isolates to be *A. sobria*, 11 *A. hydrophila* and 8 *A. caviae*. Thus, *A. sobria* appeared to be the most predominant species with 39.16% prevalence, followed by *A. hydrophila* (9.16%) and *A. caviae* (6.66%), respectively. The source (organ) wise study of *Aeromonas* revealed that maximum number of *Aeromonas* isolates were recovered from heart (87.5%), followed by liver (66.66%), thigh muscle and chest muscle (40%), respectively.

**Keywords:** *Aeromonas*, characterization, isolation, poultry meat, prevalence

*Aeromonas* spp. are oxidase and catalase positive, facultatively anaerobic, glucose fermenting, Gram negative, short rod shaped bacteria that are resistant to the vibriostatic agent O/129 (2,4-diamino-6,7 diisopropylpteridine) (Holt *et al*., 1994). Historically, motile *Aeromonads* were phenotypically classified into species *A. hydrophila*, *A. sobria* and *A. caviae*, according to the criteria of Popoff (1984). Motile aeromonads are important foodborne pathogens as they possess virulence properties, such as the ability to produce enterotoxins, cytotoxins, haemolysins and/or the ability to invade epithelial cells. Interest in *Aeromonas* spp. has increased in recent years since they cause gastroenteritis, cellulitis, peritonitis, meningitis and pneumonia in immunocompetent humans (Von Gravenitz, 2007).

*Aeromonas* food isolates can produce different virulence factors, not only at optimal growth temperature, but also at refrigeration temperatures (Merino *et al*., 1995). Mateos *et al*. (1993) reported growth of motile *Aeromonas* spp. at a wide temperature range between 0° and 45°C. *Aeromonas* spp. are widely distributed in the aquatic environment, including raw and processed drinking water (Holmes *et al*., 1996) and have been frequently isolated from various food products such as fish and shellfish, raw meat, vegetables and raw milk, poultry, red meat, pork and beef (Okrend *et al*., 1987, Jindal *et al*., 1993, Hanninen, 1993, Pin *et al*. 1997, Yucel and Citak, 2003).

The present study was therefore undertaken to estimate the prevalence of *Aeromonas* spp. in poultry meat (chicken) samples procured from local market of Anand city.

A total of 120 chicken samples from different parts of the slaughtered birds viz., liver (33), heart (32), thigh muscle (30) and chest muscle (25) were collected aseptically in a sterile plastic containers from various retail poultry shops and different market...
sources of Anand city. The samples were transported to laboratory on ice pack and were processed immediately within 1-2 h of collection.

Ten grams of sample from each source was weighed and homogenized with normal saline solution in a sterile mortar and pestle. The final volume was adjusted to 100 ml with normal saline and 0.5 ml of this homogenized sample was inoculated into 5 ml of alkaline peptone water (APW, pH 8.6) (HiMedia, India) for pre-enrichment at 37°C for 18-24 h. Then a loopful of innoculum was plated on ampicillin dextrin agar (HiMedia, India) at 37°C for 18 h as per the method described by Agarwal and Bhilegaonkar (2003).

Isolates showing typical colony characters and morphology i.e. small to medium size round light yellow colonies were subjected to biochemical characterization for oxidase reaction, ability to ferment glucose, acid production from mannitol and motility. For differentiation of A. hydrophila from A. sobria and A. caviae, a combination of different biochemical tests proposed by Carnahan et al. (1991) and Abbott et al. (2003) were employed using standard techniques.

A total of 66 (55%) chicken samples were found to be positive for the presence of Aeromonas spp. on the basis of their morphological, staining, cultural and biochemical characteristics. Of these 66 isolates, A. sobria was found to be the most predominant (39.16%), followed by A. hydrophila (9.16%) and A. cavie (6.66%).

Out of 33 liver samples screened, Aeromonas spp. were isolated from 22 samples which were confirmed as 13 isolates of A. sobria, 3 A. hydrophila and 4 A. caviae. Speciation of 28 Aeromonas isolates from 32 heart samples revealed 20 A. sobria, 4 A. hydrophila and 2 A. caviae. Twelve Aeromonas isolates were recovered from 30 thigh muscle samples; out of which 8 were A. sobria and 2 each A. hydrophila and A. caviae. Ten isolates of Aeromonas from 25 chest muscle samples were confirmed as 6 isolates of A. sobria and 2 isolates of A. hydrophila (Table 1).

The occurrence of Aeromonas spp. in raw foods of animal origin with varying degree of prevalence has been as reported by earlier workers (Fricker and

<table>
<thead>
<tr>
<th>Part/Organ</th>
<th>No. of samples examined</th>
<th>Positive samples</th>
<th>A. sobria</th>
<th>A. hydrophila</th>
<th>A. caviae</th>
<th>Organ-wise prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>33</td>
<td>22</td>
<td>13</td>
<td>3</td>
<td>4</td>
<td>66.67</td>
</tr>
<tr>
<td>Heart</td>
<td>32</td>
<td>28</td>
<td>20</td>
<td>4</td>
<td>2</td>
<td>87.50</td>
</tr>
<tr>
<td>Thigh muscle</td>
<td>30</td>
<td>12</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>40.00</td>
</tr>
<tr>
<td>Chest muscle</td>
<td>25</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>40.00</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>66</td>
<td>47</td>
<td>11</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>Overall prevalence (%)</td>
<td></td>
<td>55.00</td>
<td>39.16</td>
<td>9.16</td>
<td>6.66</td>
<td>-</td>
</tr>
</tbody>
</table>
The present study revealed that *A. sobria* was the most predominant species in poultry meat with prevalence of 39.16%, followed by *A. hydrophila* (9.16%) and *A. caviae* (6.66%). Similar findings of higher occurrence of *A. sobria* from chicken have been reported by Hanninen (1993) and Kirov et al. (1990).

The results of present investigation clearly demonstrated higher occurrence of *Aeromonas* spp. indicating that chicken could be a potential source of spread of *Aeromonas* infection and present a potential threat to public health (Palumbo et al., 1989; Merino et al., 1995, Bachil et al., 2002).

References


