OCCURRENCE OF AEROMONAS HYDROPHILA IN RAW MILK
(With 2 Tables)

By
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SUMMARY
A total of 100 random samples of raw milk were collected from dairy farms, dairy shops, and street vendors in Assiut City. The samples were examined for Aeromonas hydrophila. The organism could be isolated from 30% and 28% of the examined samples using MacConkey's and Rimler Shotts agar with an average count of 3.2 X 10$^2$ and 3 X 10$^2$ /ml respectively, while using MPN technique 38% of the examined samples were positive for the organism.

The public health hazard and suggestive measures were discussed.

INTRODUCTION
Aeromonas hydrophila occurs widely in nature, but is especially common in water supplies. A. hydrophila has long been recognized as a pathogen of fish and frogs (POPOFF, 1984). The organism is now receiving renewed interest as a human pathogen and is being isolated from cases of human diarrhea (RAHIM et al., 1984 and BUCHANAN & PALUMBO, 1985).

Gastroenteritis caused by A. hydrophila is recognized more frequently. Onset time is from 22 to 34 h., affected individuals suffered from nausea, vomiting, cramps and
diarrhea (GOODIN et al., 1983). In addition to gastroenteritis, A. hydrophila infects human causing several diseases such as osteomyelitis (LOPEZ et al., 1968), septicemia (KETOVER et al., 1973), meningitis (QADRI et al., 1976), endocarditis (DAVIS et al., 1978) and skin infection (JOSEPH et al., 1979). On the other hand, A. hydrophila produces a number of potential virulence factors, including enterotoxins, cytotoxins, hemolysins, lipases and proteases (TRUST AND CHIPMAN, 1979), thus it possesses a highly significant public health problem as well as it is of economic importance.

During the past several years there has been increasing interest concerning the role of A. hydrophila as a cause of human gastroenteritis. Recently, BUCHANAN (1984) has indicated that A. hydrophila is one of a pathogenic group which is considered as a food-borne organism. Food is very likely to be involved as a vehicle of transmission of such organism. A. hydrophila could be readily isolated in considerable numbers from raw milk by KIELWEIN et al. (1969). RICHARDSON and TEWHAITI (1978) found that protease secreted by an A. species isolated from raw milk was thermo resistant and capable of hydrolysing milk proteins, while COUSIN (1982) stated that several strains of Aeromonas spp. have been isolated from raw and pasteurized milk and butter. The organism increases in number during cold storage leading to deterioration and/or spoilage of milk and milk products. KALOGRIDOU-VASSILIADOU et al. (1982) reported that about 20% of gram-negative rods isolated from bulk farm milk were found to be aeromonads. While PALUMBO et al. (1985) found that the level of A. hydrophila in raw milk at the time of purchase (2.2 X 10^2 to 2.2 X 10^3/ml) increased 10 to 1000fold during 1 Wk of storage at 5°C, and indicated that A. hydrophila is capable of competitive psychrotrophic growth in a variety of foods.

A. hydrophila has been identified as a part of the microflora of various foods; the quantitative data on its incidence and extent in milk is generally lacking therefore, the initial purpose of this investigation is to study the occurrence of A. hydrophila in raw milk.

**MATERIAL and METHODS**

A total of 100 random samples of raw milk were collected from dairy farms, dairy shops, and street vendors in Assiut City. The samples were dispatched to the laboratory in clean dry and sterile containers with a minimum of delay. Preparation of samples for examination was carried out according to standard methods for the examination of dairy products (A.P.H.A., 1978). Storch's test was used for detection of heat treatment of the examined milk samples according to LAMPERT, 1975.

1- *Aeromonas hydrophila* count:

Numbers of *A. hydrophila* were determined using MacConkey's agar (Difco) and Rimler Shotts agar (SHOTTS and RIMLER, 1973). Duplicate plates were prepared and incubated at 35°C for 24 h. Typical colonies were picked and confirmed as *A. hydrophila* according to POPOFF and VERON., 1976.

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The 3-tube MPN method using trypticase soy broth with ampicillin (TSBA) was used to enumerate A. hydrophila.

Isolation and identification of A. hydrophila was carried out according to POPOFF and VERON (1976).

RESULTS

All the results were recorded in Tables 1 and 2.

<table>
<thead>
<tr>
<th>Media used</th>
<th>No. of examined samples</th>
<th>Positive samples</th>
<th>Count/ml</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
<td>average</td>
<td></td>
</tr>
<tr>
<td>MacConkey's agar</td>
<td>100</td>
<td>30</td>
<td>30</td>
<td>60</td>
<td>9x10^4</td>
<td>3.2x10^4</td>
<td></td>
</tr>
<tr>
<td>Rimler Shotts agar</td>
<td>100</td>
<td>28</td>
<td>28</td>
<td>90</td>
<td>7x10^4</td>
<td>3x10^4</td>
<td></td>
</tr>
</tbody>
</table>

Table (2): Incidence and frequency distribution of A. hydrophila in examined raw milk samples using MPN technique.

<table>
<thead>
<tr>
<th>No. of examined samples</th>
<th>Positive samples</th>
<th>Count/ml</th>
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<tr>
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</tr>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>100</td>
<td>38</td>
<td>38</td>
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DISCUSSION

Table 1 shows that 30% of the examined raw milk samples contained A. hydrophila with an average count of 3.2 x 10^4/ml using MacConkey's agar, while on Rimler Shotts agar 28% of the examined samples contained the organism with an average count of 3 x 10^3/ml.

The sensitivity of Rimler Shotts medium was studied in comparison with MacConkey's agar. MacConkey's agar was chosen for comparison since it is capable of growing most of the gram-negative organisms of the enteric and associated groups. No significant difference in the ability to propagate A. hydrophila was observed between the two media and this substantiate what have been reported by SHOTTS and RIMALER (1973).

The results in Table 2 reveal that 38% of raw milk samples were positive for A. hydrophila using MPN technique, and 3 samples contained 3-10, 8 samples from 10-100, 18 samples from 100-1000 and 9 samples 1000. These finding show that MPN technique is more reliable for isolation and enumeration of A. hydrophila from foods containing low population than direct plating technique (LANCETTE and HARMON, 1980).
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Lower incidence of A.hydrophila was previously reported by PALUMBO et al. (1985). The presence of A.hydrophila in raw milk has been reported by several authors (KIELWEIN et al., 1969; BUCHANAN & PALUMBO, 1985 and PALUMBO et al., 1985).

It is worth to mention that, the presence of A.hydrophila in milk must be regarded as public health hazard, because it has been established that A.hydrophila produces a number of potential virulence factors as well as, it can withstand stressfull conditions as, it survive low temperature - 17°C for 18 months. Strict hygienic measures and pasteurization of milk are recommended to avoid contamination by A.hydrophila.

REFERENCES


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