Comparative Efficacy of Selective Plate Media in Isolation of \textit{Cl. perfringens} from Milk and Milk Products

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(Received 10.05.2013; accepted 27.09.2014)

ABSTRACT

The aim of the present study was to evaluate the efficacy of SPS and SFP in isolation of \textit{Cl. perfringens}. A total of 240 samples of milk and milk products (60 samples each from raw milk, pasteurized milk, ice cream and shrikhand) was subjected for isolation with both media. Thirty eight samples were found to be positive for \textit{Cl. perfringens} with SPS isolation and 117 samples were positive with SFP. SFP was found to be better than SPS in retrieval of \textit{Cl. perfringens} in all the milk and milk products.

Keywords: \textit{Clostridium perfringens}, milk, SFP, SPS

\textit{Cl. perfringens} type A an important food poisoning strains and ranks 2nd or 3rd in the developed world like USA, Canada, etc (McClane, 2007). It also causes enterotoxemia in both domestic and wild animals leading to severe morbidity and mortality (Das \textit{et al}., 2009; Van Asten \textit{et al}., 2010). Reports also indicated \textit{Cl. perfringens} association with mastitis (Osman \textit{et al}., 2009). The ubiquitous nature of \textit{Cl. perfringens} is responsible for contamination of wide variety of foods like meat, seafood, vegetables and milk and milk products (Bean and Griffin, 1990; Saito, 1990; Varnam and Evans, 1991; Jay, 2005). Most of the food borne infections in humans are associated with meat and meat products but studies have also shown the significant presence of pathogen in milk and milk products. Presence of \textit{Cl. perfringens} in milk and its product is attributed to environmental contamination \textit{viz}., soil or dust, dung/feces of carrier animal or improper handling during collection, distribution and processing of milk (Jay, 2005). Although, the food poisoning reports are few in number but the organism is associated with spoilage of milk and milk products. Thus, considering the importance of the bacteria, in present study two selective media were evaluated for its isolation as previous studies have revealed that single medium wasn’t able to give real picture of the presence of pathogen.

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SPS and SFP was 15.83% and 48.75% respectively, as depicted in Table 1. Shahidi and Ferguson (1971) described similar finding in retrieval of *Cl. perfringens* during a comparative study. The lower incidence in SPS was attributed to the presence of antibiotics in the medium. The antibiotics were not only found to inhibit the growth of other bacteria but also found to inhibit the growth of many strains of *Cl. perfringens* (Shahidi and Ferguson, 1971). During this study, it was observed that differences in retrieval of pathogen were higher between SPS and SFP in the samples of pasteurized milk, ice cream and shrikhand. This may be attributed to heat/cold stress induced to pathogens in these samples. The inhibition of growth of stressed organisms in antibiotic containing media has been reported (Agarwal and Bhilegaonkar, 2001; and Bhilegaonkar et al., 2004).

### References


### Table 1. Comparative efficacy of selective plate media (SPS and SFP) in isolation of *Cl. perfringens*.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Food samples</th>
<th>Sulfite polymixin sulfadiazine (SPS)</th>
<th>Shahidi Ferguson perfringens agar (SFP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of samples tested</td>
<td>Samples positive for <em>Cl. perfringens</em> in SPS</td>
<td>Number of samples tested</td>
</tr>
<tr>
<td>1</td>
<td>Raw milk</td>
<td>60</td>
<td>12 (20%)</td>
</tr>
<tr>
<td>2</td>
<td>Pasteurized milk</td>
<td>60</td>
<td>06 (10%)</td>
</tr>
<tr>
<td>3</td>
<td>Ice-cream</td>
<td>60</td>
<td>14 (23.33%)</td>
</tr>
<tr>
<td>4</td>
<td>Srikhand</td>
<td>60</td>
<td>06 (10.00%)</td>
</tr>
<tr>
<td>Total</td>
<td>240</td>
<td>38</td>
<td>15.83%</td>
</tr>
</tbody>
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