Orange Serum Agar

Orange Serum Agar is used for cultivation and enumeration of microorganisms associated with the spoilage of citrus products, cultivation of Lactobacilli, other aciduric organisms and pathogenic fungi.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casein enzymic hydrolysate</td>
<td>10.000</td>
</tr>
<tr>
<td>Yeast extract</td>
<td>3.000</td>
</tr>
<tr>
<td>Dextrose</td>
<td>4.000</td>
</tr>
<tr>
<td>Dipotassium phosphate</td>
<td>2.500</td>
</tr>
<tr>
<td>Orange serum (Solids from 200 ml)</td>
<td>9.000</td>
</tr>
<tr>
<td>Agar</td>
<td>17.000</td>
</tr>
<tr>
<td>Final pH ( at 25°C )</td>
<td>5.5±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters**

**Directions**

Suspend 45.5 grams in 1000 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. AVOID OVERHEATING. Mix well and pour into sterile Petri plates.

**Principle And Interpretation**

Fruit juices are generally acidic, with pH values ranging from approximately 2.4 for lemon juice, to 4.2 for tomato juice. The low pH of these foods is selective for yeast, moulds and a few groups of aciduric bacteria. The microorganisms of greatest significance in citrus juices are the lactic acid bacteria, primarily species of *Lactobacillus* and *Leuconostoc*, yeast and moulds. Microbial spoilage of these citrus fruit juices are most commonly due to aciduric microbes such as lactic acid bacteria and yeast. The lactic acid bacteria include *Lactobacillus fermentum, L. plantarum*, and *Leuconostoc mesenteroides*.

Orange Serum Agar is recommended by APHA (1) for cultivation of Lactobacilli and other aciduric organisms. Orange Serum Agar was originally developed by Murdock et al (2) and Hays (3) for examining citrus concentrates. Hays and Reister further used this medium for studying the spoilage of orange juice (4). Dehydrated agar medium containing orange serum was reported by Stevens (6). Orange Serum Broth is used to initiate growth of saprophytic, pathogenic fungi in small samples (5).

Casein enzymic hydrolysate provides essential nitrogenous nutrients while dextrose serves as the fermentable carbohydrate and energy source. Yeast extract supplies B-complex vitamins, which stimulate growth. Orange serum provides an optimal environment for the recovery of acid tolerant microorganisms from citrus fruit products.

**Quality Control**

**Appearance**

Cream to yellow homogeneous free flowing powder

**Gelling**

Firm, comparable with 1.7% agar gel.

**Colour and Clarity of prepared medium**

Medium to dark amber coloured clear to slightly opalescent gel forms in Petri plates

**Reaction**

Reaction of 4.55% w/v aqueous solution at 25°C. pH : 5.5±0.2

**pH**

5.30-5.70

**Cultural Response**

Cultural characteristics observed after an incubation at 35-37°C for 40-48 hours. (Fungal species are incubated at 25-30°C)
### Organism

- **Cultural Response**
  - *Aspergillus brasiliensis* **ATCC 16404**
  - Candida albicans **ATCC 10231**
  - Lactobacillus acidophilus **ATCC 4356**
  - Lactobacillus fermentum **ATCC 9338**
  - Leuconostoc mesenteroides **ATCC 12291**
  - Saccharomyces cerevisiae **ATCC 9763**

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Growth</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aspergillus brasiliensis</em> <strong>ATCC 16404</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td></td>
</tr>
<tr>
<td>Candida albicans <strong>ATCC 10231</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>&gt;=50%</td>
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<tr>
<td>Lactobacillus acidophilus <strong>ATCC 4356</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>&gt;=50%</td>
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<tr>
<td>Lactobacillus fermentum <strong>ATCC 9338</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>&gt;=50%</td>
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<tr>
<td>Leuconostoc mesenteroides <strong>ATCC 12291</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>&gt;=50%</td>
</tr>
<tr>
<td>Saccharomyces cerevisiae <strong>ATCC 9763</strong></td>
<td>50-100</td>
<td>good-luxuriant</td>
<td>&gt;=50%</td>
</tr>
</tbody>
</table>

**Key:** * - Formerly known as *Aspergillus niger*

#### Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

#### Reference


**Disclaimer:**

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