BACTERIA ASSOCIATED WITH USED AND UNUSED LIPSTICK

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Abstract: Bacteriological analysis of used and unused lipstick was carried out to identify bacterial associated with lipsticks. 8 samples were analyzed. (4 used lipstick and 4 un-used lipsticks). A total of four (4) bacterial isolates were identified; Staphylococcus aureus, Enterococcus spp. Escherichia coli and Streptococcus pyogenes. The percentage occurrence of bacterial isolated from used lipsticks was 70% while that from un-used samples were 30%. The result shows that there is more bacterial occurrence on the used samples than the un-used sample. The difference in the bacterial occurrence on the used lipstick sample may be due to unhygienic handling, raw materials, environmental condition, and sharing of lipsticks with others.

Key words: Lipstick, Bacteria, Used, Unused
women in North America use lipstick regularly and over 30% of them have 20% lipstick in their possession in any time of their adult life. (Riordan and Theresa, 2004).

Lipstick was seen as symbol of adult sexuality. Teenage girls believed that lipstick was a symbol of womanhood. Adult saw it as an act of rebellion. Many Americans, especially immigration did not accept teenage girls wearing lipstick. A study in 1937 survey revealed high at over 50% of teenage girls fought with their parent over lipstick. Mitchell and Jacqueline, (2007).

Lipstick has been an invention that has lasted over centuries. Women have been using lip-coloring for enhancement and beauty assistance. Cosmetic chemist have been working hard in trying to improve lip-coloring without considering the effect of those micro-organism may be useful or harmful. This means chemists have many requirements to meet. They have to consider the melting, seating, and long-lasting stay of lipstick. Nine out of ten are putting their health and look at risk be applying make-up and lipstick to their skin. (Beth, 2007).

The objective of the study is the demonstration of the possibility of identifying the bacteria associated with lipstick for further analysis or for larger views.

**Materials and Methods**

**Sample Collection:** Eight samples were collected from different locations, four used lipsticks, and four un-used lipsticks, to study and determine the bacteria associated with lipstick. The colonies of the bacteria obtained were sub-culture into a fresh Nutrient Agar plate and poured into the Petri dishes and the lipstick

**Method:** All media used were weighed appropriately and prepared according to the manufacturer’s instruction (nutrient Agar and Blood Agar). They were autoclaved at 121°C for 15 minutes. And were allowed to cool and poured into the Petri dishes and the lipstick

**Identification of Various Isolates Obtained in the Cultures:** The following bio-chemical tests were carried out for the characterization and identification of the organisms:

1. Gram’s stain
2. Catalase test
3. Citrate utilization test
4. Indole test
5. Oxidase test
6. Motility test

**Result: Bacteria Isolate and Growth from Used and Un-Used Lipsticks**

<table>
<thead>
<tr>
<th>Lab Code</th>
<th>Organism</th>
<th>Occurrence</th>
<th>% of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Used lipstick 1</strong></td>
<td><em>Enterococcus spp. and E.coli</em></td>
<td>1 = 2</td>
<td>20</td>
</tr>
<tr>
<td><strong>Used lipstick 2</strong></td>
<td><em>Streptococcus pyogenes and E.coli</em></td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td><strong>Used lipstick 3</strong></td>
<td><em>Enterococcus spp.</em></td>
<td>1 = 2</td>
<td>10</td>
</tr>
<tr>
<td><strong>Used lipstick 4</strong></td>
<td><em>Enterococcus spp. and Streptococcus pyogenes</em></td>
<td>1 = 2</td>
<td>20</td>
</tr>
<tr>
<td><strong>Un-used lipstick 1</strong></td>
<td><em>Streptococcus pyogenes and E.coli</em></td>
<td>1 = 2</td>
<td>20</td>
</tr>
<tr>
<td><strong>Un-used lipstick 2</strong></td>
<td><em>Staphylococcus aureus</em></td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td><strong>Un-used lipstick 3</strong></td>
<td>No Growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Un-used lipstick 4</strong></td>
<td>No Growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>
### Table 2: Biochemical Test

<table>
<thead>
<tr>
<th>Lab code</th>
<th>Gram stain</th>
<th>Motility</th>
<th>Catalase</th>
<th>Citrate</th>
<th>H2S</th>
<th>Lactose</th>
<th>Glucose</th>
<th>Indole</th>
<th>Oxidase</th>
<th>Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Used lipstick 1</strong></td>
<td>Gram+ Cocci</td>
<td>+</td>
<td>+ instant bubble production</td>
<td>+ presence of growth (blue in colour)</td>
<td>+ gas Production</td>
<td>+ presence of yellow colour</td>
<td>+ presence of acid production yellow</td>
<td>- No colour change</td>
<td>- No purple colour change</td>
<td><strong>Enterococcus and E.coli</strong></td>
</tr>
<tr>
<td><strong>Used lipstick 2</strong></td>
<td>Gram- rod</td>
<td>-</td>
<td>+ instant bubble production</td>
<td>- No presence of growth</td>
<td>+ gas Production</td>
<td>+ presence of yellow colour</td>
<td>+ presence of acid production yellow</td>
<td>- No colour change</td>
<td>- No purple colour change</td>
<td><strong>Streptococcus pyogenes and E.coli</strong></td>
</tr>
<tr>
<td><strong>Used lipstick 3</strong></td>
<td>Gram- cocci</td>
<td>+</td>
<td>+ instant bubble production</td>
<td>+ presence of growth (blue in colour)</td>
<td>+ gas Production</td>
<td>+ presence of yellow colour</td>
<td>+ presence of acid production yellow</td>
<td>- No colour change</td>
<td>- No purple colour change</td>
<td><strong>Enterococcus spp.</strong></td>
</tr>
<tr>
<td><strong>Un-used lipstick 4</strong></td>
<td>Gram-ve cocci</td>
<td>+</td>
<td>_ slow bubble production</td>
<td>+ presence of growth (blue in colour)</td>
<td>+ gas Production</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td><strong>Enterococcus spp. and Streptococcus pyogenes</strong></td>
</tr>
<tr>
<td><strong>Un-used lipstick 1</strong></td>
<td>Gram- cocci</td>
<td>+</td>
<td>+ instant bubble production</td>
<td>+ presence of growth (blue in colour)</td>
<td>+ gas Production</td>
<td>+ presence of yellow colour</td>
<td>+ presence of acid production yellow</td>
<td>- No colour change</td>
<td>- No purple colour change</td>
<td><strong>Streptococcus pyogenes and E.coli</strong></td>
</tr>
<tr>
<td><strong>Un-used lipstick 2</strong></td>
<td>Gram- cocci</td>
<td>+</td>
<td>+ instant bubble production</td>
<td>+ presence of growth (blue in colour)</td>
<td>+ gas Production</td>
<td>+ presence of yellow colour</td>
<td>+ presence of acid production yellow</td>
<td>- No colour change</td>
<td>- No purple colour change</td>
<td><strong>Staphylococcus aureus</strong></td>
</tr>
</tbody>
</table>
Discussion: Lipsticks are not supposed to be sterile as they contain nutrients which support the growth of variety of bacteria. However, lipsticks product must have to be free from pathogen and total aerobic bacterial load should be low which could not impair skin defense mechanism.

From Table 1, the total bacterial occurrence on the used lipstick samples was 70% and that of the un-used lipstick samples were only 30% which indicated that there was greater bacterial occurrence on the used samples than the un-used samples.

Table 2 represents the result of biochemical identification of bacterial isolates. A total number of four bacteria species were isolated; *Escherichia coli*, *Enterococcus* spp., *Streptococcus pyogenes* and *Staphylococcus aureus*. The various bacterial identified above were carried out using various biochemical test ranging from gram staining, motility test, indole test, citrate test, catalase test and oxidase test.

*Staphylococcus aureus* is a gram negative, it displays a red colour which indicates gram (-) negative when viewed under the electron microscope. Gram stain is by far the most widely used procedure for staining bacteria (Nester et al., 2007vi). The bacterium is test positive in catalase, citrate, and motility.

*Enterococcus* spp., *E.coli* and *Strep. pyogenes* were the most isolated of all samples with *Staphylococcus aureus* the isolated (Table 2). Raw materials, unhygienic handling, and environmental condition may be responsible for high growth of bacteria in lipsticks products. Some chemicals such as lead, lip, beeswax, Ozokerite, candelilla wax, lanolin, petrolatum, mineral oil and protein alcohol etc of lipsticks storage temperature, products pH availability of O₂ (oxygen) and poor activity of preservatives also can facilitate then growth of microbes (Gunther, 2005viii). The presence of pathogenic bacteria might be responsible for unpleasant smell and spoilage of lipsticks products.

Contamination of consumer products with organism is a common problem in the manufacturing process. Organisms like bacterial contamination are of particular concern in lipsticks and personal care product, since these products come into direct contact with our bodies.

Microbial contamination testing is essential to ensure the quality and integrity of your products;
1. The lipstick can be contaminated by sharing with others.
2. Man of these microbes (bacteria) live on our skin already even when you are healthy. Every time you expose makeup to the applicator rub it on your skin and then go back to the product you are dunking fresh bacteria into it.

Conclusion: From the result obtained, there were high bacterial occurrence on the used lipsticks which was 70% while there were low bacterial occurrence on the un-used lipstick which was 30% composition. The difference in the bacterial occurrence on the used lipstick samples may be due to unhygienic handling, raw materials, environmental condition, and sharing of lipsticks with others. Conclusively lipstick usage was not discouraged but establishing the fact that, there are bacteria associated with lipstick.

Recommendation: If you have accumulated makeup over the years and never seem to throw away, it may be time for an out with the old, in with the new moment. One of the reasons is that old make up especially previously used make-up is associated as a breeding ground for bacteria that can cause minor or serious skin and eye infection. Although many forms of makeup contain preservatives that work to slow bacteria growth, it is still possible to experience a bacterial infection from old make-up. If make-up is discoloured, strange smelling or older than one yea, you should discard it. Make sure you are careful with your make-up products. Keep them clean and disinfected, and replace them before their expiration date. Most products have preservatives to help shave off an excess of bacteria growth, but to be on the safe side, you should always:
1. Throw away products over their expiration date or those more than a year old. Mascara should be changed even more often between 3 to 6 months.

2. Shave off the tip of your lipstick with a blade to eliminate bacteria especially if you have shared it with another person.

3. Keep all lids tightly closed; throw away any one without a lid.

4. Use disposable applicator

5. Purchase lipstick containers that restrict air contact, avoid lipsticks in jars or pots

Throw away any lipstick with a foul smell or if the ingredient is separated.

References


