Herbal dentifrices are gaining in popularity as alternative therapy for gingivitis, periodontal disease and caries. Some of these products contain fluoride, others do not. The purpose of this study was to compare the anticaries efficacy of a number of herbal dentifrices sold in the Far East, relative to conventional fluoride controls. Products were evaluated using a well defined animal (rat) caries model (Francis, et al. Arch Oral Biol 1966;11:141). Crest® toothpaste: (a) containing 1100ppm F as NaF, (b) a reduced fluoride (dose response) product containing 250ppm F as NaF, and (c) placebo - 0ppm F - were used as controls in this study. Test products included: (d) Shanghai Specific (herbal, fluoride), (e) Sankezheng (herbal, fluoride), (f) Jie Yin (herbal, non-fluoride), (g) LMZ Normal (herbal, non-fluoride) and (h) Bamboo Salt (herbal, salt) toothpastes. All test products were from China, with the exception of Bamboo Salt, which was from Korea. Results, reported as average number of hypomineralized areas [x HMA] and concurrent % reduction in caries (relative to placebo) were as follows: a:52.7 (60); b:107.3(18); c:130.7 (0); d:124.6 (5 ); e:128.7 (2); f:126.2 (3); g:128.7 (2); and h:130.4 (0). These results demonstrate that NaF, when formulated with a compatible abrasive system such as silica, provides superior anticaries efficacy when compared to herbal dentifrices currently available in the Far East. Bioavailability of fluoride (rather than simply the presence of fluoride) appears to be the essential element toward determining anticaries efficacy. Any anticaries effects which might be attributable to the herbal component of these formulations is not apparent in this model system.

### Test Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Country</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest Toothpaste</td>
<td>U.S.</td>
<td>Sodium Fluoride</td>
</tr>
<tr>
<td>Shanghai Specific</td>
<td>China</td>
<td>Herbal, fluoride</td>
</tr>
<tr>
<td>Sankezheng</td>
<td>China</td>
<td>Herbal, fluoride</td>
</tr>
<tr>
<td>Jie Yin</td>
<td>China</td>
<td>Herbal, non-fluoride</td>
</tr>
<tr>
<td>LMZ Normal</td>
<td>China</td>
<td>Herbal, non-fluoride</td>
</tr>
<tr>
<td>Bamboo Salt</td>
<td>Korea</td>
<td>Herbal, salt</td>
</tr>
</tbody>
</table>

### METHODS AND MATERIALS

**Test Products**

- **Crest Toothpaste**: U.S., Sodium Fluoride
- **Shanghai Specific**: China, Herbal, fluoride
- **Sankezheng**: China, Herbal, fluoride
- **Jie Yin**: China, Herbal, non-fluoride
- **LMZ Normal**: China, Herbal, non-fluoride
- **Bamboo Salt**: Korea, Herbal, salt

**METHODS AND MATERIALS**

- **METHOD OF GRADING**: Each fissure was divided by an imaginary line through the middle of its bottom, and then each side of the fissure assigned a severity grade. Both halves of each quadrant were graded and the most severe grade recorded for each corresponding smooth surface or half-fissure. Severity was based on a 0-3 scale, with 0 representing no stain in the enamel or dentin, 1=dark brown stain in enamel only, 2=dark brown stain in enamel extending to the dentin/enamel junction, and 3=stain through the enamel and into the dentin.
- **TOTAL SEVERITY SCORE**: Smooth-surface and half-fissure grades for each animal in the group were totaled. A mean caries severity score (x HMA) was then calculated.
- **CALCULATION OF PERCENT REDUCTION**: Determined by subtracting the test group score from the placebo control group score, dividing by the placebo group score, and converting to percent.
- **STATISTICAL ANALYSES**: Standard ANOVA testing. Treatments were ranked by a Duncan's Multiple Range Test analysis.

**BACKGROUND**

Herbal toothpastes have been sold for a long time in Eastern cultures as a means of providing oral benefits. While some of the currently marketed herbal toothpastes contain fluoride, others do not. It was not known if the herbal component of these toothpastes would add to the anticaries activity of the formula. In order to test the relative anticaries efficacy of a sampling of currently available herbal toothpastes, a study was run in which these formulations were tested directly against a fluoride dose response using a well established animal caries model.
RESULTS

The results of this study demonstrate that a conventional sodium fluoride toothpaste provides significantly greater anticaries efficacy than the herbal (fluoride and non-fluoride) dentifrices tested in this study which are currently marketed in the Far East.

These results confirm the need for maintaining fluoride in a bioavailable form in the toothpaste in order to elicit anticaries activity upon use.

CONCLUSION