Countries where Moringa grows

Fig. A1 *Moringa oleifera* grown in different countries around the world

Source: Koul and Chase, (2015)
Fig. A2 Drumstick (Moringa oleifera) (a) Fresh leaves (b) seeds
Fig. A3 Crust view of sponge cake prepared with different replacement level of DLP
Fig. A4 Crumb view of sponge cake prepared with different replacement level of DLP
Table A1 Geographical distribution of Moringa species

<table>
<thead>
<tr>
<th>Species</th>
<th>Geographical location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slender trees</strong></td>
<td></td>
</tr>
<tr>
<td><em>M. concanensis</em> Nimmo</td>
<td>India, Pakistan</td>
</tr>
<tr>
<td><em>M. oleifera</em> Lam.</td>
<td>India, Pakistan</td>
</tr>
<tr>
<td><em>M. peregrina</em> (Forssk) Fiori</td>
<td>Fiori Red Sea, Arabia, Horn of Africa</td>
</tr>
<tr>
<td><strong>Bottle trees</strong></td>
<td></td>
</tr>
<tr>
<td><em>M. drouhardii</em> Jum.</td>
<td>Madagascar</td>
</tr>
<tr>
<td><em>M. hildebrandtii</em> Engl.</td>
<td>Madagascar</td>
</tr>
<tr>
<td><em>M. ovalifolia</em> Dinter and A. Berger</td>
<td>Namibia and S.W. Angola</td>
</tr>
<tr>
<td><em>M. stenopetala</em> (Baker f.) Cufod</td>
<td>Kenya and Ethiopia</td>
</tr>
<tr>
<td><strong>Tuberous shrubs and herbs of North Eastern Africa</strong></td>
<td></td>
</tr>
<tr>
<td><em>M. arborea</em> Verdc.</td>
<td>North Eastern Kenya</td>
</tr>
<tr>
<td><em>M. borziana</em> Mattei</td>
<td>Kenya and Somalia</td>
</tr>
<tr>
<td><em>M. longituba</em> Engl.</td>
<td>Kenya, Ethiopia, Somalia</td>
</tr>
<tr>
<td><em>M. pygmaea</em> Verdc</td>
<td>North Somalia</td>
</tr>
<tr>
<td><em>M. rivae</em> Chiov.</td>
<td>Kenya and Ethiopia</td>
</tr>
<tr>
<td><em>M. ruspoliana</em> Engl.</td>
<td>Kenya, Ethiopia, Somalia</td>
</tr>
</tbody>
</table>

Source: Arora et al., (2013)
Table A2 Common names used for recognizing *Moringa oleifera*

<table>
<thead>
<tr>
<th>Language</th>
<th>Common names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin</td>
<td><em>Moringa oleifera</em></td>
</tr>
<tr>
<td>Sanskrit</td>
<td>Subhanjana</td>
</tr>
<tr>
<td>Hindi</td>
<td>Saguna, Sainjana</td>
</tr>
<tr>
<td>Punjabi</td>
<td>Sainjana, Soanjana</td>
</tr>
<tr>
<td>Bengali</td>
<td>Sojne danta</td>
</tr>
<tr>
<td>Gujarati</td>
<td>Suragavo</td>
</tr>
<tr>
<td>Marathi</td>
<td>Shevga</td>
</tr>
<tr>
<td>Tamil</td>
<td>Morigkai</td>
</tr>
<tr>
<td>Telugu</td>
<td>Mulaga, Munaga,</td>
</tr>
<tr>
<td>Malayalam</td>
<td>Muringa, Sigru</td>
</tr>
<tr>
<td>Ayurveda</td>
<td>Haritashaaka Tikshnagandhaa,</td>
</tr>
<tr>
<td></td>
<td>Raktaka, Akshiva</td>
</tr>
<tr>
<td>Unani</td>
<td>Sahajan</td>
</tr>
<tr>
<td>Arabian</td>
<td>Rawag</td>
</tr>
<tr>
<td>French</td>
<td>Moringe à graine ailée, Morungue</td>
</tr>
<tr>
<td>Spanish</td>
<td>Àngela, Ben, Moringa</td>
</tr>
<tr>
<td>Portuguese</td>
<td>Moringa, Moringueiro</td>
</tr>
<tr>
<td>Chinese</td>
<td>La Ken</td>
</tr>
<tr>
<td>English</td>
<td>Drumstick tree, Horseradish tree, Ben tree</td>
</tr>
</tbody>
</table>

*Source: Koul and Chase, (2015)*
Table A3 Nutritional composition of dried *Moringa oleifera* leaf powder

<table>
<thead>
<tr>
<th>Elements</th>
<th>WHO standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture (%)</td>
<td>7.4 ±2.89</td>
</tr>
<tr>
<td>Lipid (%)</td>
<td>6±2.5</td>
</tr>
<tr>
<td>Ash (%)</td>
<td>9 ±7.45</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>24±5.8</td>
</tr>
<tr>
<td>Carbohydrates (%)</td>
<td>17.6</td>
</tr>
<tr>
<td>Energy value(Kcal/100 g)</td>
<td>36±9.2</td>
</tr>
</tbody>
</table>

**Trace elements (mg/100g)**

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium (Ca)</td>
<td>1897 ±748.4</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>473 ±429.4</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>1467 ±636.7</td>
</tr>
<tr>
<td>Sodium (Na)</td>
<td>220 ±180</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>32.5 ±10.78</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>2.4 ±1.12</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>0.9 ±0.48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of fatty acid</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myristic/Tetradecanoic acid (C14:0)</td>
<td>0.13</td>
</tr>
<tr>
<td>Palmitic/Hexadecanoic acid (C16:0)</td>
<td>6.46</td>
</tr>
<tr>
<td>Palmitoleic/Hexadecenoic acid (C16:1)</td>
<td>1.36</td>
</tr>
<tr>
<td>Stearic/Octadecanoic acid (C18:0)</td>
<td>5.88</td>
</tr>
<tr>
<td>Oleic/Octadecenoic acid (C18:1)</td>
<td>71.2</td>
</tr>
<tr>
<td>Linoleic/Octadecadienoic acid (C18:2)</td>
<td>0.65</td>
</tr>
<tr>
<td>Linolenic/Octadecatrienoic acid (C18:3)</td>
<td>0.18</td>
</tr>
<tr>
<td>Arachidic/Eicosanoic acid (C20:0)</td>
<td>3.62</td>
</tr>
<tr>
<td>Gadoleic/Eicosaenoic acid (C20:1)</td>
<td>2.22</td>
</tr>
<tr>
<td>Behenic/Docosanoic acid (C22:0)</td>
<td>6.41</td>
</tr>
<tr>
<td>Arachidic/Eicosanoic acid (C24:0)</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Source: Manzoor et al., (2007)
Table A5 Characterization of fats and oils in terms of peroxide value (PV) and thiobarbituric acid (TBA)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Sample</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PV (meq/kg sample)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>Low oxidation</td>
<td>O’Brien, 2004</td>
</tr>
<tr>
<td>5-10</td>
<td>Medium oxidation</td>
<td></td>
</tr>
<tr>
<td>Above 10</td>
<td>High oxidation</td>
<td></td>
</tr>
<tr>
<td>Under 15</td>
<td>Acceptable</td>
<td>Codex, 2001</td>
</tr>
<tr>
<td><strong>TBA value (mg malonaldehyde /kg sample)</strong></td>
<td></td>
<td>Ke at al., 1984</td>
</tr>
<tr>
<td>Less than 0.576</td>
<td>Not rancid</td>
<td></td>
</tr>
<tr>
<td>0.65–1.44</td>
<td>Rancid but still acceptable</td>
<td></td>
</tr>
<tr>
<td>greater than 1.5 mg</td>
<td>Rancid and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>unacceptable</td>
<td></td>
</tr>
</tbody>
</table>