Historical Aspects of Antitumor Compounds from Plants, Including Homoharringtonine (Omacetaxine mepesuccinate, Synribo™)

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Sesbania Drummondii
Cephalothrys Harringtonia
Trewia Nudiflora
**Cephalotaxine**

**Harringtonine**: $R^1 = H$, $R^2 = OH$, $n = 1$

**Isoharringtonine**: $R^1 = OH$, $R^2 = H$, $n = 1$

**Homoharringtonine**: $R^1 = H$, $R^2 = OH$, $n = 2$

**Deoxyharringtonine**: $R^1 = H$, $R^2 = H$, $n = 1$
<table>
<thead>
<tr>
<th>Alkaloid</th>
<th>Dose (mg/kg)</th>
<th>Survivors</th>
<th>Survival Time (Days, T/C)</th>
<th>T/C × 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harringtonine</td>
<td>1.0</td>
<td>6/6</td>
<td>36.5/9.0</td>
<td>405</td>
</tr>
<tr>
<td>Isoharringtonine</td>
<td>7.5</td>
<td>6/6</td>
<td>24.5/9.0</td>
<td>272</td>
</tr>
<tr>
<td>Homoharringtonine</td>
<td>1.0</td>
<td>6/6</td>
<td>30.5/9.0</td>
<td>338</td>
</tr>
<tr>
<td>Deoxyharringtonine</td>
<td>2.0</td>
<td>6/6</td>
<td>18.0/10.0</td>
<td>180</td>
</tr>
</tbody>
</table>

* CCNSC data for maximum T/C dose.*
Homoharringtonine
NSC 141633, CAS number 26833-87-4,
HHT, sHHT, Omacetaxine mepsuccinate,
Synribo
Taxol \[ R = Ac, R_1 = C_6H_5 \]

Cephalomannine \[ R = Ac, R_1 = \begin{array}{c} \text{CH}_3 \\ \text{CH}_3 \end{array} \]


On October 26, 2012, the United States Food and Drug Administration (FDA) approved Synribo® (omacetaxine mepesuccinate) to treat adults with chronic myelogenous leukemia (CML).

Homoharringtonine and Omacetaxine for Myeloid Hematological Malignancies. Lu, S.; Wang, J. *J. Hematol. Oncol.* 2014, 7:2 (http://www.jhoonline.org/content/7/1/2)


Trewiasine, $R^1 = CH(CH_3)_2; R^2 = CH_3$

Dehydrotrewiasine, $R^1 = C(CH_3)\equiv CH_2; R^2 = CH_3$

Demethyltrewiasine, $R^1 = CH(CH_3)_2; R^2 = H$
SUMMARY

Plant seeds can be rich sources of potential antitumor active compounds.

Thorough literature searches and accurate botanical identifications are essential before beginning studies of plant collections. (*Cephalotaxus Mannii* collection re-identified as *Taxus wallichiana* as an example)

Voucher specimens are critical to confirm identity of original samples and to assist in recollections. GPS coordinates as to location of the collection should also be reported.

Possibility of endophytes should be considered.