PLANTS WITH SKELETAL MUSCLE RELAXANT ACTIVITY: A REVIEW

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Introduction

• Skeletal muscle relaxants are of two different groups

• **Centrally acting muscle relaxants** - used to reduce spasticity in a variety of painful conditions (chronic back pain and painful fibromyalgic conditions)

• **Neuromuscular blockers** - used during surgical procedures and in the intensive care unit (ICU) to produce muscle paralysis
• Skeletal muscle relaxants are used to treat muscle spasm and spasticity.

• Muscle sprains & muscle strains.

• The antispasticity agents baclofen, tizanidine, dantrolene, and diazepam-aid in improving muscle hypertonicity and involuntary jerks.

• Antispasmodic agents, such as cyclobenzaprine, are primarily used to treat musculoskeletal conditions.

• The side effects of antispasmodic & antispasticity agents cause them to be used with caution.
Viola Betonicifolia

- **Common Name**
  - Arrowhead violet,
  - Showy violet,
  - Mountain violet

- **Traditional use**
  - Epilepsy, insomnia, astringent, antipyretic, purgative
  - Roots & flowers used in asthma, cough & cold

- **Other activity**
  - anxiolytic, sleep induction analgesic, antipyretic, anti inflammatory, anti convulsant
Part used for SMR activity

- Whole plant

Extraction: Methanol; Maceration

Active principal: 4HC

Animal used:

- Albino mice

Animal Models used

- Traction test
- Chimney test

Dose: VBME-300,400,500mg/kg i.p

4HC-10,20,30mg/kg i.p

Possible MOA:

Centrally acting skeletal muscle relaxant activity by interfering with GABA_A complex.
### Effects of VBME (%) on muscle relaxation (Chimney test and Traction test).

<table>
<thead>
<tr>
<th>Group</th>
<th>Dose/kg</th>
<th>Chimney test (%)</th>
<th>Traction test (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30 min</td>
<td>60 min</td>
</tr>
<tr>
<td>Control</td>
<td>10 mL</td>
<td>0 ± 0.00</td>
<td>0 ± 0.00</td>
</tr>
<tr>
<td>Diazepam</td>
<td>1 mg</td>
<td>100 ± 0.00***</td>
<td>100 ± 0.00***</td>
</tr>
<tr>
<td></td>
<td>0.3 g</td>
<td>10.12 ± 0.88</td>
<td>14.11 ± 0.97</td>
</tr>
<tr>
<td>VBME</td>
<td>0.4 g</td>
<td>55.13 ± 1.23*</td>
<td>61.56 ± 0.65*</td>
</tr>
<tr>
<td></td>
<td>0.5 g</td>
<td>77.08 ± 0.11**</td>
<td>80.76 ± 0.02**</td>
</tr>
</tbody>
</table>

### Effects of 4HC (%) on muscle relaxation (Chimney test and Traction test).

<table>
<thead>
<tr>
<th>Group</th>
<th>Dose/kg</th>
<th>Chimney test (%)</th>
<th>Traction test (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>30 min</td>
<td>60 min</td>
</tr>
<tr>
<td>Control</td>
<td>10 mL</td>
<td>0 ± 0.00</td>
<td>0 ± 0.00</td>
</tr>
<tr>
<td>Diazepam</td>
<td>1 mg</td>
<td>100 ± 0.00***</td>
<td>100 ± 0.00***</td>
</tr>
<tr>
<td></td>
<td>10 mg</td>
<td>0 ± 0.00</td>
<td>0 ± 0.00</td>
</tr>
<tr>
<td>4HC</td>
<td>20 mg</td>
<td>15.13 ± 1.34*</td>
<td>20.21 ± 1.35*</td>
</tr>
<tr>
<td></td>
<td>30 mg</td>
<td>30.34 ± 1.54**</td>
<td>37.33 ± 1.57**</td>
</tr>
</tbody>
</table>
Vicia Faba

- Common Name
  - Fava bean,
  - Broad bean,
  - Bell bean
  - Field bean, tic bean

- Traditional use
  - As Food

- Other activity
  - anti-parkinsonian
• Part used for SMR activity
  ✓ Leaves, Seeds
• Extraction: Methanol; Soxhlet
• Phytochemicals: Tanins, saponins, steroids, alkaloids
• Animal used:
  ✓ Albino mice
• Animal Models used
  ✓ Rotarod
• Dose: VFME 400mg/kg p.o.
  leaves + seeds 600mg/kg p.o.
• Possible MOA: -
### CONTROL: DISTILLED WATER

<table>
<thead>
<tr>
<th>S.NO</th>
<th>BODY WEIGHT (g)</th>
<th>BODY WEIGHT (g)</th>
<th>VOLUME OF DISTILLED WATER TO BE ADMINISTERED (ml)</th>
<th>FALL OFF TIME IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>8.8</td>
<td>0.22</td>
<td>19</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>9.2</td>
<td>0.23</td>
<td>07</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
<td>8.8</td>
<td>0.22</td>
<td>09</td>
</tr>
</tbody>
</table>

**AVERAGE = 11.6 (Sec)**

### TEST: METHANOLIC EXTRACT 400mg/kg

<table>
<thead>
<tr>
<th>S.NO</th>
<th>BODY WEIGHT (g)</th>
<th>DOSE (mg/kg)</th>
<th>VOLUME OF EXTRACT TO BE ADMINISTERED (ml)</th>
<th>FALL OFF TIME IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>8.8</td>
<td>0.22</td>
<td><strong>06 ±0.14</strong>*</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>10.8</td>
<td>0.27</td>
<td>05±1.04</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>8.4</td>
<td>0.21</td>
<td>02±0.74*</td>
</tr>
</tbody>
</table>

**AVERAGE = 4.33 (Sec)**

### STANDARD: DIAZEPAM 4mg/kg

<table>
<thead>
<tr>
<th>S.NO</th>
<th>BODY WEIGHT (g)</th>
<th>DOSE (mg/kg)</th>
<th>VOLUME OF SELINE TO BE ADMINISTERED (ml)</th>
<th>FALL OFF TIME IN SECONDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>0.084</td>
<td>0.21</td>
<td><strong>04±0.61</strong>*</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>0.096</td>
<td>0.24</td>
<td>02±0.15**</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>0.080</td>
<td>0.20</td>
<td>02±0.42*</td>
</tr>
</tbody>
</table>

**AVERAGE = 2.66 (Sec)**
Tridax procumbens

- **Common Name**
  - Coat buttons,
  - Mexican daisy,
  - Hindi: Gavpattha
  - Telugu: Ravanapuruditalakai

- **Traditional use**
  - Bronchial catarrh,
  - dysentery, diarrhoea,
  - restoring hair

- **Other activity**
  - Wound healing, anti microbial, anti diabetic, hepatoprotective
Part used for SMR activity

- Leaves

Extraction: Aqueous; (Maceration; Percolation)

Phytochemicals: luteolin, quercetin, glucoluteolin, isoquercetin

Animal used:

- Albino mice & wistar rats

Animal Models used

- Rotarod/ Inclined plane.

Dose: 4.2, 8.2 & 12.6mg/kg i.p

Possible MOA: -
<table>
<thead>
<tr>
<th>Treatment (mg/kg)</th>
<th>Fall off time (sec)</th>
<th>% Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>Diazepam (0.3)</td>
<td>67.4±3.53</td>
<td>11.2±3.08***</td>
</tr>
<tr>
<td>TP (4.2)</td>
<td>63.6±2.94</td>
<td>23.2±1.14***</td>
</tr>
<tr>
<td>TP (8.4)</td>
<td>115.8±1.53</td>
<td>68.6±3.17***</td>
</tr>
<tr>
<td>TP (12.6)</td>
<td>54±2.38</td>
<td>35.4±3.82***</td>
</tr>
</tbody>
</table>
Senna occidentalis

- Common Name
  - Stinking weed,
  - Coffee senna,
  - Coffee weed

- Traditional use (powdered leaves)
  - Analgesic, antimicrobial,
  - Insecticidal, febrifuge,
  - Vermifuge, purgative,
  - Epilepsy

- Other activity (leaves)
  - Anti carcinogenic, anti mutagenic,
  - Anti inflammatory, anti rheumatic,
  - Anti plasmodial.
Part used for SMR activity
  ✔ Seeds
Extraction: Ethanol; Maceration
Phytochemicals: Anthraquinones, cardiac glycosides, alkaloids, saponins, tannins, flavanoids.

Animal used:
  ✔ Wistar rats
Animal Models used
  ✔ Rotarod
  ✔ Actophotometer

Dose: 50, 100, 200mg/kg p.o
Toxicity study: LD$_{50}$: 3250mg/kg bw

Possible MOA:
<table>
<thead>
<tr>
<th>S.No</th>
<th>Treatment</th>
<th>Dose (mg/kg)</th>
<th>Mean fall-off time in min</th>
<th>% Decrease in fall-off time in 10 mins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Before Treatment</td>
<td>After Treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Diazepam</td>
<td>4</td>
<td>15.23±2.14</td>
<td>4.01±0.76*</td>
</tr>
<tr>
<td>2</td>
<td>ESES0</td>
<td>250</td>
<td>14.13±3.88</td>
<td>4.13±0.65*</td>
</tr>
<tr>
<td>3</td>
<td>ESES0</td>
<td>500</td>
<td>13.80±1.34</td>
<td>4.26±0.79*</td>
</tr>
</tbody>
</table>
Saraca indica

- **Common Name**
  - ✓ Ashoka
  - ✓ Sita ashoka

- **Traditional use**
  - ✓ Digestion, Antimicrobial, Astringent, Menorragia.

- **Other activity**
  - ✓ CNS depressant, diuretic, antimicrobial, cytotoxic, oxytocic, antiulcer, antidiabetic, antioxidant
Part used for SMR activity
  ✔ Leaves

Extraction: Methanol; soxhlet

Phytochemicals: Flavanoids, saponins, triterpinoids, tanins, glycosides, steroids, alkaloids.

Animal used:
  ✔ Albino mice

Animal Models used
  ✔ Rotarod

Dose: 200mg/kg p.o.

Possible MOA: Flavanoids, saponins & triterpinoids are thought to potentiate GABAergic inhibition.
<table>
<thead>
<tr>
<th>S.No</th>
<th>Treatment</th>
<th>Dose mg/kg body weight</th>
<th>Locomotion test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control (Distilled water)</td>
<td>5ml/kg</td>
<td>93.35±4.07</td>
</tr>
<tr>
<td>2</td>
<td>Diazepam</td>
<td>4</td>
<td>50.86±2.88***</td>
</tr>
<tr>
<td>3</td>
<td>Methanolic Extract</td>
<td>200</td>
<td>74.75±1.73**</td>
</tr>
<tr>
<td>4</td>
<td>P value</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>5</td>
<td>F value</td>
<td></td>
<td>48.69</td>
</tr>
</tbody>
</table>
Parthenium hysterophorus

- **Common Name**
  - Congress grass

- **Traditional use**
  - Tonic, febrifuge, emmenagouge, analgesic in neuralgia.
  - Root decoction used for dysentery.

- **Other activity**: Antiamebic, antitumor, trypanocidal, antimalarial
Part used for SMR activity
  ✓ Leaves
Extraction: Methanol; Soxhlet
Phytochemicals: anthraquinones, saponins, steroids, tanins, reducing sugars

Animal used:
  ✓ Albino mice
Animal Models used
  ✓ Rotarod
  ✓ Traction test

Toxicity study: LD_{50} 50-300mg/kg
Dose: 3, 5mg/kg p.o

Possible MOA: Depolarizing neuromuscular junction blocking effect
## DURATION OF TIME SPEND ON ROTAROD

<table>
<thead>
<tr>
<th>Group</th>
<th>Dose</th>
<th>0 minutes</th>
<th>30 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Saline soln.</td>
<td>328.17 ± 1.62</td>
<td>322.7±24.85</td>
</tr>
<tr>
<td>Diazepam</td>
<td>10 mg/kg i.p.</td>
<td>340.50 ±18.93</td>
<td>104.8±2.85**</td>
</tr>
<tr>
<td>MEPH</td>
<td>5 mg/kg p.o.</td>
<td>342.23 ±18.60</td>
<td>189.5±41.57*</td>
</tr>
<tr>
<td>MEPH</td>
<td>3mg/kg p.o.</td>
<td>342.50 ±12.23</td>
<td>201.00±32.45*</td>
</tr>
</tbody>
</table>
Nerium oleander

- **Common Name**
  - Kaner, Arali

- **Potentially toxic in all parts**

- **Traditional use**
  - Variety of skin disorders, herpes, leprosy, tumors, abortifacient
  - Leaves: cardiotonic, antibacterial, cutaneous eruptions, diuretic, snakebite

- **Other activity: Anti tumor**
  - inhibit FGFR2
Part used for SMR activity

- Leaves, flower

Extraction: Aqueous; Soxhlet

Phytochemicals: anthraquinones, saponins, steroids, tannins, flavonoids

Animal used:

- Albino rats

Animal Models used

- Rotarod
- Actophotometer

Toxicity study: safe up to 2000mg/kg

Dose: 100, 200mg/kg p.o

Possible MOA: Augmenting GABA, CNS depressant action.
### Effect of AENOF on locomotor activity in actophotometer and muscle coordination on the Rotarod apparatus

<table>
<thead>
<tr>
<th>Group (n=5)</th>
<th>Actophotometer score in 5 min before</th>
<th>After 60 min of administration</th>
<th>Percentage of reduction</th>
<th>Time spent on revolving rod in Rotarod apparatus (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (control) -NS 10 ml/kg</td>
<td>153.2±2.58</td>
<td>-</td>
<td>0</td>
<td>318±17.72</td>
</tr>
<tr>
<td>Group II (standard) -Diazepam10 mg/kg</td>
<td>217.8±7.67</td>
<td>13.33±2.17**</td>
<td>93.87</td>
<td>15.17±2.24**</td>
</tr>
<tr>
<td>Group-III -AENOF 100 mg/kg</td>
<td>194.5±4.66</td>
<td>41±1.58**</td>
<td>78.86</td>
<td>186.8±8.04**</td>
</tr>
<tr>
<td>Group-IV -AENOL 200 mg/kg</td>
<td>180±5.78</td>
<td>25.4±2.07**</td>
<td>86.11</td>
<td>35.4±3.84**</td>
</tr>
</tbody>
</table>

**P<0.000, All values are expressed as mean±SD. SD=Standard deviation, AENOF=Aqueous extract of Nerium Oleander flowers**

### Effect of AENOF on locomotor activity in actophotometer after giving the extract directly into the muscle

<table>
<thead>
<tr>
<th>Group (n=3)</th>
<th>Actophotometer score before 5 min</th>
<th>Actophotometer score after 5 min</th>
<th>After 30 min of administration</th>
<th>Percentage of reduction after 30 min</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (control) -distilled water 10 ml/kg</td>
<td>167.2±3.38</td>
<td>166.8±3.32</td>
<td>164.6±3.28</td>
<td>1.55</td>
<td>0.613</td>
</tr>
<tr>
<td>Group-II -AENOF 100 mg/kg</td>
<td>191.8±4.36</td>
<td>190.2±4.29</td>
<td>188.8±4.20</td>
<td>1.57</td>
<td>0.706</td>
</tr>
<tr>
<td>Group-III -AENOL 200 mg/kg</td>
<td>182.1±4.19</td>
<td>180.8±4.06</td>
<td>179.1±3.92</td>
<td>1.65</td>
<td>0.680</td>
</tr>
</tbody>
</table>

P>0.05, all values are expressed as mean±SD. SD=Standard deviation, AENOF=Aqueous extract of Nerium Oleander flowers
Cinnamomum zeylanicum

- **Common Name**
  - Cinnamon

- **Traditional use**
  - Cookery-condiment
  - Musculoskeletal disorders
  - Cinnamon oil used for cold flu, aching muscles.

- **Other activity:**
  - Nrf2 – ARE pathway-Antioxidant action.
  - Anti melanoma activity.
  - NFKB/ NF-KB
Part used for SMR activity
- Bark (Inner bark)

Extraction: Aqueous; Soxhlet

Phytochemicals: volatile oils, cinnamonaldehyde, eugenol, transcinnamic acid, proanthrocyanidins

Animal used:
- Albino rats

Animal Models used
- Rotarod
- Actophotometer

Toxicity study: safe up to 2000mg/kg

Dose: 50, 100, 200mg/kg p.o

Possible MOA: -
### Effect of AECZB on the locomotor activity on the actophotometer and muscle Coordination on the rotarod apparatus

<table>
<thead>
<tr>
<th>Groups</th>
<th>Actophotometer score</th>
<th>Time spent on revolving rod in Rotarod apparatus (in seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 minutes Before administration</td>
<td>60 minutes after administration</td>
</tr>
<tr>
<td>Group I (control) NS 10 ml / kg</td>
<td>158.3 ± 60.89</td>
<td>----</td>
</tr>
<tr>
<td>Group II (standard)</td>
<td>215.7 ± 70.12</td>
<td>9.33 ± 8.45***</td>
</tr>
<tr>
<td>Diazepam10 mg / kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group-III AECZB 50 mg / kg</td>
<td>163.5 ± 1.72</td>
<td>45.5 ± 1.25***</td>
</tr>
<tr>
<td>Group-IV AECZB 100 mg / kg</td>
<td>203.2 ± 1.79</td>
<td>32.83 ± 1.30***</td>
</tr>
<tr>
<td>Group-V AECZB 200 mg / kg</td>
<td>193.5 ± 1.60</td>
<td>14.67 ± 1.06***</td>
</tr>
</tbody>
</table>

AESCZB-Aqueous extract of *Cinnamomum Zeylanicum*. All values are Mean ± SD, n = 6, "P < 0.05, ""P < 0.01, "***P < 0.000 when compared with the control.
Hibiscus rosa-sinensis

- **Common Name**
  - Red hibiscus
  - China rose
  - Japapushpam

- **Traditional use**
  - Hair care preparation
  - Shoe shining
  - Anti solar agent

- **Other activity**: Abortifacient, Dentifrice, expectorant, antipyretic, anti-inflammatory, analgesic, anti-estrogenic.
Part used for SMR activity

- Leaves

Extraction: Methanol; Soxhlet

Phytochemicals: Flavanoids (hibiscitin), phenolic content, terpinoid like sitosterol, campesterol

Animal used:

- Albino rats

Animal Models used

- Rotarod

Dose: 200mg/kg p.o

Possible MOA: -
### Skeletal Muscle Relaxant effect of MEHR on rat using Rota-rod model

For Skeletal muscle relaxant:  Rota rod model (time required to fall down)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Group</th>
<th>Control (seconds)</th>
<th>Standard (seconds)</th>
<th>Test (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Head</td>
<td>240</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>Tail</td>
<td>250</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Back</td>
<td>260</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>head tail</td>
<td>250</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>back tail</td>
<td>240</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>No mark</td>
<td>240</td>
<td>4</td>
<td>17</td>
</tr>
</tbody>
</table>

Average:  

- Control: 246.66 seconds  
- Standard: 5.83 seconds  
- Test: 17.5 seconds

**SD:**  
- Control: 8.16  
- Standard: 1.47  
- Test: 1.97

**SEM:**  
- Control: 3.34  
- Standard: 0.60  
- Test: 0.80

**Variance:**  
- Control: 66.66  
- Standard: 2.16  
- Test: 3.9
Mikania scandens

- **Common Name**
  - Climbing hempwood
  - Climbing hempvine
  - Louse plaster

- **Traditional use**
  - Cover crop, livestock fodder, butterfly garden
  - Gastric ulcer, wounds, Insect bites & stings
Part used for SMR activity
  ✓ Ariel parts

Extraction: Hydroalcoholic.
Phytochemicals: flavonoids, steroids, tanins, saponins, sugar

Animal used:
  ✓ Albino mice

Animal Models used
  ✓ Rotarod

Toxicity study: safe upto 2000mg/kg p.o
Dose: 250, 500mg/kg i.p

Possible MOA: -
### Effect of HAMS on muscle relaxant activity in mice

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Dose (mg/kg)</th>
<th>Mean fall off time (seconds)</th>
<th>% decrease in fall off time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before treatment</td>
<td>After treatment</td>
</tr>
<tr>
<td>Diazepam</td>
<td>4</td>
<td>15.23 ± 2.14</td>
<td>4.01 ± 0.76*</td>
</tr>
<tr>
<td>HAMS</td>
<td>250</td>
<td>14.13 ± 3.88</td>
<td>4.13 ± 0.65*</td>
</tr>
<tr>
<td>HAMS</td>
<td>500</td>
<td>13.80 ± 1.34</td>
<td>4.26 ± 0.79*</td>
</tr>
</tbody>
</table>

Data are expressed as mean ± SEM (n=6); *P<0.001 compared with control (mice before treatment), assessed by paired Student’s ‘t’ test.
Moringa oleifera

- **Common Name**
  - Drumstick tree
  - moringa
  - Horse radish tree

- **Traditional use**
  - Purification of water
  - Handwashing
  - Forage for livestock
  - anthelminthic

- **Other activity:** Anti inflammatory, antioxidant, antimicrobial, hypocholestrol, antiobesity, CNS depressant action
Part used for SMR activity
- Leaves

Extraction: Ethanol; Soxhlet

Phytochemicals: Flavonoids, saponins, tanins, phenolic acids.

Animal used:
- Albino rats

Animal Models used
- Rotarod

Dose: 50, 100, 200, 400mg/kg p.o

Possible MOA: -
• EEMO showed significant (p<0.05) progressive decrease in time of fall from rotarod with increase in dose.
Phyllostachys bambusoides

- **Common Name**
  - Giant timber bamboo
  - Japanese timber bamboo

- **Traditional use**
  - Anti inflammatory,
  - Anti pyretic,
  - Diuretic

- **Other activity:** Hypertension, antioxidant, antimicrobial, anticancer
  Used for treating cardiovascular disorders & arteriosclerosis.
Part used for SMR activity
  ✔ Leaves

 Extraction: Chloroform; Soxhlet
 Phytochemicals: Flavanoids glycosides, tannins, proteins, carbohydrates

Animal used:
  ✔ Wistar rats

Animal Models used
  ✔ Rotarod
  ✔ Inclined screen test
  ✔ Climbing test

Toxicity studies: toxicity at 2000mg/kg p.o
Dose: 200mg/kg p.o
Sapindus trifoliatus

- **Common Name**
  - Soap nut
  - Soap berries
  - Ritha/ reetha, phenil

- **Traditional use**
  - Fruits/ berries natural surfactant-soap, kill lice
  - Spermicidal, emetic, expectorant, epilepsy

- **Other activity**: antiepileptic, used in migraine.
Part used for SMR activity

- Pericarp

Extraction: Aqueous; Soxhlet

Phytochemicals: Saponins, anthraquinones, tannins, isoflavanoids

Animal used:

- Albino mice

Animal Models used

- Rotarod
- Actophotometer

Toxicology: non toxic upto 2000mg/kg p.o

Dose: 200mg/kg p.o

Possible MOA: Possibly Isoflavanoids bind to GABA/BZD receptor complex in brain.
# Effect of AEST on locomotor activity in actophotometer and muscle coordination in rotarod apparatus

<table>
<thead>
<tr>
<th>Groups</th>
<th>Actophotometer score in 5 min before</th>
<th>After 60 min of administration</th>
<th>% of Reduction</th>
<th>Time spent on revolving rod in rotarod apparatus(sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I(control)</td>
<td>158.3 ± 60.89</td>
<td>----</td>
<td>0</td>
<td>100 ± 10.54</td>
</tr>
<tr>
<td>NS 10ml/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group II(standard)</td>
<td>215.7 ± 70.12</td>
<td>9.33 ± 8.45***</td>
<td>96.06</td>
<td>12.2 ± 3.58**</td>
</tr>
<tr>
<td>Diazepam 10mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group-III</td>
<td>165.3 ± 13.98</td>
<td>47.33 ± 9.13***</td>
<td>71.37</td>
<td>82.8 ± 22.14*</td>
</tr>
<tr>
<td>AEST 50mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group-IV</td>
<td>218 ± 25.04</td>
<td>33 ± 22.57***</td>
<td>85.11</td>
<td>32.3 ± 15.07**</td>
</tr>
<tr>
<td>AEST 100mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group-V</td>
<td>198.3 ± 76.2</td>
<td>14.67±14.14***</td>
<td>87.73</td>
<td>20.3 ± 2.94**</td>
</tr>
<tr>
<td>AEST 200mg/kg</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

AEST-Aqueous extract of Sapindus trifoliatus. All values are Mean±SD, n = 10, *P<0.05, **P<0.01, ***P<0.000 when compared with control.
Conclusion

• Many traditional plants with significant SMR activity.

• Traditional medicine--screening and bio prospecting large number of new drug leads.

• Active principle and its mechanism of action.

• More studies needed in this direction.
References


THANK YOU