Scientific Name: *Cynomorium coccineum* L.

Local Name(s): Tarooth; Tartooth

Arabic Name(s): Tarooth, Halook Malta, Marswsus, Zob alard

Common Name(s): Red Thumb, Maltese Mushroom

Family: Cynomoriaceae

Description:
Fleshy, reddish, club-shaped leafless perennial herb, to c. 30 cm high, parasitic on the roots of desert shrubs or trees and visible above ground only during its spring flowering period. Stem simple, erect, cylindrical, succulent, c. 2cm in diameter, covered below with overlapping scales imbricate below, distant and deciduous above. Inflorescence spadix, terminal thicker than the stem, 10-20 cm long, 3-6 cm wide, with flat-topped peurate bracts scattered over the surface; maroon in color with monoecious or dioecious flowers or mixed in the same plant; flowers c. 5mm long, densely packed over the surface of the obtuse spadix, perianth segments 1-5, ribbon or spatulate shape, with a single anther in the staminate and bisexual flowers. The spadix is mildly fetid and appears to attract flies, which may act as agents of pollination. Fruit nut-like.

Habitat & Distribution:
Found in alkaline soils throughout Mediterranean and South West Asia; in UAE it is found in sandy habitats with moderate salinity or sabkhas; in roadsides and under plantations; it is parasitic on e.g. *Prosopis, Haloxylon, Phoenix, Zygophyllum*, etc.

Part(s) used:
Aerial parts
Traditional & Medicinal Uses:
Aphrodisiac, laxative, tonic, astringent, spermatopoietic, used to treat constipation, dysentery, bleeding during pregnancy, impotence in men.
In U.A.E the aerial parts grilled and eaten fresh as a tonic and nutritive.

Pharmacognosy and Phytochemistry

Parts Studied: Stem

Microscopic Description
Transverse section of the stem shows a number of layers of collapsed cells some of which represent a part of the cortex. The cells are filled extensively with reddish-brown to dark brown pigments. The inner layers of the cortex consist of a little curved rectangular cells filled with light reddish-brown pigments. There is no definite endodermis but the pith is very wide and it consists of large parenchyma cells with various shapes having slightly wavy cell walls and they are compactly packed together. Generally they have a light brown colour. The middle part of the pith encloses scattered vascular tissues that consist of phloem and xylem tissues with their longitudinal parenchyma cells. Vessels which are gray in colour are annularly thickened and they are heavily lignified. The central part of the pith consists of light coloured parenchyma cells. No calcium oxalate crystals or starch granules are detected. ( DPS ZCHRTM Unpub. Results).

(a). TS of the stem showing the outer (dark coloured) and the inner (red and orange colored) layers of cortex. (b). Compactly packed parenchyma cells of the pith, oblong to rounded with slightly wavy cell walls containing light brown pigment material. (c). Isolated cells of the stem; some containing resinous matter (top right) and others containing colouring matter. ( Magnifications: x 100, x 100 and x 400, respectively)

Organoleptic characteristics:

Appearance: Solid powder
Colour: Pinkish brown
Odour : Odorless
Taste: Tasteless

Physicochemical constants:
Loss in weight on drying at 105°C (%): 8.20-8.40

Solubilities (%)
- Alcohol solubility: 2.40-3.20
- Water solubility: 14.80-15.20
- 10% ethanolic extractive: 45.60

Ash values (%)
- Total ash: 12.40-12.80
- Water soluble ash: 0.20-0.40
- Acid-insoluble ash: 1.60-2.0

Successive extractive (%)
- Petroleum ether (60-80°C): 1.70
- Chloroform: 0.60
- Absolute alcohol: 5.80
- Distilled water: Not done

pH values
- pH of 1% solution: 6.08
- pH of 10% solution: 5.58

The above results are under process of publication (DPS ZCHRTM Unpub. Results).

Chemical constituents:
- Triterpenoid saponins. No chemical analysis is reported in literature. (Shahina, 1994; DPS, ZCHRTM Unpub. results).

Pharmacological and Toxicological studies:

The effect of lyophilized aqueous extract of *Cynomorium coccineum* and *Withania somnifera* on testicular development and on serum levels of testosterone, ICSH and FSH were studied in immature male Wistar rats. Extracts of both plants have a direct spermatogenic influence on the seminiferous tubules of immature rats presumably by exerting a testosterone-like effect (Abdel Magied et. al., 2001). The effects of water extracts of *Cynomorium coccineum* and *Withania somnifera* on ovarian follicular development elicited significant changes in gonadotrophin levels coupled with a significant increase in ovarian weight and profound folliculogenesis (Qarawi et. al., 2000).

An aqueous extract of *Cynomorium coccineum* was administered by stomach tube to ten mature male Wistar rats, at a dose of 47mg/100 kg body weight/day for 14 consecutive days. Showed increased spermatogenesis and somniferous tubules full of sperm in the treated group compared with the controls (Abdel Rehman et. al., 1991). The Iranian plant *Cynomorium coccineum* was investigated and found to possess significant blood pressure lowering activity in the dogs (Ikrarn and Fakouhi, 1978).
The pharmacological and toxicological studies carried out in our laboratory and the results in brief, on Cynomorium coccineum (70% ethanolic extract) have been given below.

The results presented without references showed unpublished data (UPD, ZCHRTM, DBMS):

1-70% Ethanolic Extract:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-inflammatory activity-Rat paw oedema</td>
<td>Not found effective.</td>
</tr>
<tr>
<td>Anti-inflammatory activity-Cotton pellet</td>
<td>Not found effective.</td>
</tr>
<tr>
<td>Antinociceptive activity-Writhing</td>
<td>Reduced onset time and increased no. of writhings.</td>
</tr>
<tr>
<td>Studies on gastric ulcers-Indomethacin induced</td>
<td>Gastroprotective activity reported.</td>
</tr>
<tr>
<td>Studies on gastric ulcers-Phenylbutazone</td>
<td>Gastroprotective activity reported.</td>
</tr>
<tr>
<td>Anti-hypertensive activity-Anesthetic rats</td>
<td>No significant effect on BP &amp; HR observed.</td>
</tr>
<tr>
<td>Effect on GIT smooth Muscle-Isolated rabbit jejunum</td>
<td>Slightly reduced amplitude noted.</td>
</tr>
<tr>
<td>Effect on GIT smooth Muscle-Isolated rat fundus</td>
<td>An increase in resting tension observed.</td>
</tr>
<tr>
<td>Hepatoprotective activity/ Hepatotoxicity activity</td>
<td>Results found not consistent.</td>
</tr>
<tr>
<td>Gross behavioral studies-Tremor/Twitches</td>
<td>No toxic signs observed.</td>
</tr>
<tr>
<td>Gross behavioral studies-Writhing</td>
<td>No toxic signs observed.</td>
</tr>
<tr>
<td>Gross behavioral studies- Diarrhea, Urination</td>
<td>No change observed.</td>
</tr>
<tr>
<td>Mortality</td>
<td>No death reported.</td>
</tr>
<tr>
<td>Motor co-ordination (String &amp; Platform test)</td>
<td>Motor coordination not affected.</td>
</tr>
<tr>
<td>Anti-asthmatic activity-Isolated</td>
<td>Slight relaxation in histamine contracted</td>
</tr>
</tbody>
</table>
Tracheal chain observed.

Acute toxicity studies
No abnormal signs and symptoms found.

LD$_{50}$ evaluation (Oral) >6.4 g/kg.

**Summary of the results:**
*Cynomorium coccineum* (70% ethanolic extract) showed gastroprotective and anti histamine activity. No abnormal signs and symptoms were recorded on acute administration of the extract. LD$_{50}$ 6.4 g/kg, p.o.)

Aqueous Extract:

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<th>ACTIVITY</th>
<th>RESULTS</th>
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</thead>
<tbody>
<tr>
<td><strong>Anti-inflammatory activity-Rat paw oedema</strong></td>
<td>Extract failed to produce any change.</td>
</tr>
<tr>
<td><strong>Anti-inflammatory activity -Cotton pellet</strong></td>
<td>Extract failed to produce any change.</td>
</tr>
<tr>
<td><strong>Anti-nociceptive activity-Writhing</strong></td>
<td>Showed mild analgesic activity.</td>
</tr>
<tr>
<td><strong>Anti-hypertension activity-Anesthetic rats</strong></td>
<td>No significant effect on BP &amp; HR observed.</td>
</tr>
<tr>
<td><strong>Vasorelaxant activity-Isolated aortic strip</strong></td>
<td>Produced no contraction on pre-contraction aortic strip.</td>
</tr>
<tr>
<td><strong>Skeletal muscle relaxing activity-Phrenic nerve-diaphragm</strong></td>
<td>Did not show any effect.</td>
</tr>
<tr>
<td><strong>Effect on GIT smooth Muscle-Isolated guinea pig ileum</strong></td>
<td>Increase in resting concentration at higher dose.</td>
</tr>
<tr>
<td><strong>Effect on GIT smooth Muscle-Isolated rat fundus</strong></td>
<td>Produced contraction.</td>
</tr>
<tr>
<td><strong>Gross behavioral studies-Tremor/Twitches</strong></td>
<td>No toxic symptoms observed.</td>
</tr>
<tr>
<td><strong>Gross behavioral studies-Writhing</strong></td>
<td>No toxic symptoms observed.</td>
</tr>
<tr>
<td><strong>Gross behavioral studies-Diarrhea, Urination</strong></td>
<td>No diarrhea observed.</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>No death recorded.</td>
</tr>
<tr>
<td><strong>Motor co-ordination (String &amp; Platform test)</strong></td>
<td>Motor coordination not affected.</td>
</tr>
</tbody>
</table>
Tonic activity – Tread mill (Physical endurance studies) Did not show adaptogenic activity (tonic activity).

Anti-asthmatic activity - Guinea pig Tracheal chain
Produced significant relaxation in histamine-contracted tracheal chain

Acute toxicity studies
Produced no toxicity.

LD₅₀ evaluation
>6.4 g/kg.

Summary of the results:
*Cynomorium* (Aqueous extract) did not show significant activity against the parameters (Anti-inflammatory activity, antinociceptive activity, anti-hypertension activity) studied. No toxicity was observed on acute administration.

References:
- Department of Biomedical Sciences, Zayed Complex for Herbal Research and Traditional Medicine, Unpublished results.
- Department of Pharmacognostic Sciences, Zayed Complex for Herbal Research and Traditional Medicine (ZCHRTM), unpublished results.