Studies on Wound Healing Effect of Flaveria trinervia Leaf in Mice

S. UMADEVI*, G. P. MOHANTA, V. K. KALAICHELVAN AND R. MANAVALAN
Department of Pharmacy, Annamalai University, Chidambaram, Tamil Nadu-608 002, India.

The methanol extract of Flaveria trinervia (Asteraceae) leaf was evaluated for its wound healing property by excision wound models. The wound contraction and epithelialisation was faster in the leaf paste applied mice when compared to povidone-iodine treated ones. The wound healing property may be attributed to the antioxidant activity of the extract.

*For correspondence
E-mail: umadevi_viji@rediffmail.com
**Flaveria trinervia** (Asteraceae) is a dichotomously branched herb. Leaves are opposite, oblong, auricled at base, and dentate. The plant is native to Australia and is widely distributed in Chengalpattu, Coimbatore, Dharmapuri, Salem, Tiruchirappalli and Tirunelveli (Tamil Nadu). It is reported that the leaf juice of the plant is used to overcome jaundice and the extract of the plant leaf is proved as hepatoprotective1,2. It is also claimed to be useful in skin diseases1. Patuletin-3-O-β-glucoside and sulfur compounds are reported in the plant3,4. **Flaveria trinervia** leaf extract consists of flavonoid and has proven hepatoprotective, antioxidant properties2. It is used in skin diseases. The present study was taken up to screen the wound healing activity of the methanol extract of **Flaveria trinervia** leaf.

The plant material was collected from Tirunelveli, Tamil Nadu, in January 2003 and authenticated by the Survey of Medicinal Plants unit (CCRAS), Palayamkottai, Tamil Nadu. A voucher specimen of the plant was deposited in the department of pharmacy for future reference. Dried and coarsely powdered plant leaves were extracted with methanol in the cold (72 h). The methanol extract was concentrated under reduced pressure and dried. The percentage yield of extract was 13.5% w/w. The leaf paste was prepared as 5% w/w with aqueous base (polyethylene glycol and emulsifying wax).

The wound healing activity was studied, as described by Udupa et al5. Experimental protocols were approved by the Institutional Animal Ethics Committee. Albino mice of either sex were used as animal model for the study. An excision wound was inflicted by cutting away approximately 500 mm² full thickness of shaved skin of a predetermined area on the anterio-dorsal side of each mouse. The wounded mice were divided into three groups of six each. They were kept in individual cage. The control group (group I) did not receive any treatment. In one of the experimental groups (group II), the leaf paste (5% w/w) was applied on the wound with a fine brush, daily, till the wound was completely healed. A positive control group (group III) of mice received topically 5% w/w povidone-iodine ointment (Betadine, Win Medicare Ltd.) in an identical manner. Wound contraction rate was monitored by planimetric measurement of the wound area once in 4 d. This was done by tracing the wound surface on a graph paper. Reduction in the wound area was expressed as percentage of original wound area. Epithelialisation time was noted as a number of days, after wounding, required for the scar to fall off leaving no raw wound behind.

The wound contraction and epithelialisation was faster in **Flaveria trinervia** leaf paste applied mice when compared to control (Table 1, Fig. 1). The leaf paste adhered to the wound as a covering. In the first two days after wounding, fluid was oozing from the untreated wounds (control), and to some extent, from povidone-iodine ointment treated wounds. But in the case of **Flaveria trinervia** leaf paste treated wounds, the drug adhered onto the wound and blocked the discharges from the wound within a few hours after the application. In the povidone-iodine treated mice, the wounds were completely healed in less than 18 d. The **Flaveria trinervia** leaf paste treated wound healed after 22 d, whereas in the control animals, it took more than 30 d. On d 18, the wound contraction was 90% in the extract treated mice, whereas it was only 76% in the control. On d 22, there was no raw wound behind in the extract treated group. The plant has moderate wound healing property, but it was less effective than povidone-iodine ointment. The wound healing activities of the extract may be attributed to the antioxidant activity of flavonoid present in the

**TABLE 1: EFFECT OF FLAVERIA TRINERVIA ON EXCISION WOUND CONTRACTION IN MICE**

<table>
<thead>
<tr>
<th>Wound area (mm²)</th>
<th>Postwounding days</th>
<th>Control*</th>
<th>Extract*</th>
<th>Povidone-iodine*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>524±10 (100)</td>
<td>534±9 (100)</td>
<td>520±11 (100)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>486±12 (93)</td>
<td>369±9 (69)</td>
<td>313±7 (60)</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>377±14 (72)</td>
<td>312±10 (58)</td>
<td>194±7 (37)</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>251±17 (48)</td>
<td>204±7 (38)</td>
<td>74±6 (14)</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>151±12 (29)</td>
<td>115±6 (22)</td>
<td>16±4 (3)</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>128±11 (24)</td>
<td>55±8 (10)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td>84±9 (16)</td>
<td>12±7 (2)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>52±14 (10)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>16±8 (3)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*All values are average of six determinations±standard deviation. % wound contraction is given within parenthesis

![Fig. 1: Results of % reduction of wound contraction in mice. Percentage reduction of wound contraction profile in mice after treatment with Control ( ), Extract (□) and Povidone-iodine ( ).](image-url)
Pharmacological Evaluation of 2-Substituted (1,3,4)Thiadiazolo Quinazolines

V. ALAGARSAMY*, A. THANGATHIRUPPATHY¹, S. C. MANDAL², S. RAJASEKARAN, S. VIJAYKUMAR, R. REVATHI¹, J. ANBURAJ¹, S. ARUNKUMAR¹ AND S. RAJESH¹

Medicinal Chemistry Laboratory, J. S. S. College of Pharmacy, Mysore-570 015. ¹Department of Pharmacology, S. B. College of Pharmacy, Sivakasi-626 130. ²Department of Pharmaceutical Technology, Jadavpur University, Kolkatta-700 032, India.

A series of 2-Substituted (1,3,4) thiadiazolo quinazolines were synthesized by the cyclocondensation of 3-amino-2-mercapto quinazolin-4(3H)-ones with various one-carbon donors and screened for their CNS activities (analgesic, anti-inflammatory, sedative-hypnotic and anticonvulsant). Compound III showed good CNS depressant activity, and it is comparable with the reference standard diazepam. While all the test compounds offered significant protection against strychnine-induced and hypoxic induced convulsion, compound III exhibited equivalent activity with the standard diazepam at the dose tested, and it was found to be significant when compared to control.

Quinazolines and condensed quinazolines are found to possess potent CNS activities like analgesic¹, anti-inflammatory², sedative-hypnotic¹ and anticonvulsant¹. The thiadiazoloquinazoline nucleus is associated with diverse pharmacological activities such as antibacterial⁵,⁶, antifungal⁷, phosphodiesterase inhibitory⁸, anti-inflammatory⁹, platelet aggregation inhibitory¹⁰ and antihypertensive¹¹,¹². In spite of the fact that a large number of condensed quinazolines have been prepared and studied extensively, the 1,3,4-thiadiazolo quinazoline nucleus is relatively unexplored. In fact, the first report on the synthesis of 1,3,4-thiadiazolo (2,3-b) quinazoline appeared in 1970, and very few reports have appeared since then. Prompted by these reports and to develop our earlier reported 2,3-disubstituted quinazolines¹,², herein we report the analgesic, anti-inflammatory, sedative-hypnotic and anticonvulsant activities of some 2-substituted (1,3,4) thiadiazolo (2,3-b) quinazolines.

Melting points were determined in open capillary tubes on a Thomas Hoover apparatus and are uncorrected. IR spectra were recorded in KBr on a Perkin Elmer-841 grating spectrometer (cm⁻¹); mass spectra on a Varian Atlas CH-7 mass spectrometer at 70 eV; and NMR spectra on a Varian A-60 or EM-360 spectrometer, using

REFERENCES