

# Efficacy of *Hypericum* and *Calendula* oils in the epithelial reconstruction of surgical wounds in childbirth with caesarean section<sup>☆</sup>

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## Abstract

Following studies on the properties of spontaneous plants in Sardinia we have evaluated the tissue regenerating action of a mixture of oily extracts of *Hypericum perforatum* and *Calendula arvensis* on surgical wounds from childbirth with caesarean section. © 2001 Éditions scientifiques et médicales Elsevier SAS

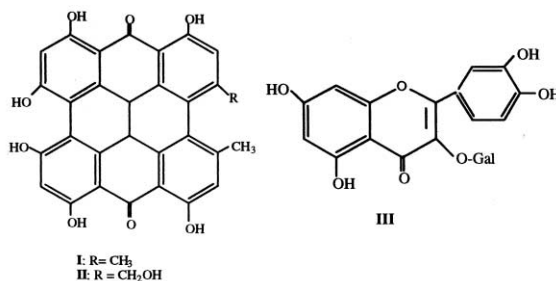
**Keywords:** *Hypericum*; *Calendula*; Tissue regeneration

## 1. Introduction

*Hypericum perforatum* L. is a perennial plant of the Hypericaceae family, which is found in uncultivated fields in continental and insular Italy. The flowering tops contain a resinous substance, hypericine **I** and pseudohypericine **II**, a flavonoid, hyperoxide **III**, essential oil, tannic and mucilaginous substances, etc. Thanks to the resin and the essence, the plant has vulnerary and epithelising properties. For this reason, in folk phytotherapy it is used as a topical remedy against ulceration and burns.

In his “Précis de phytothérapie” [1] Leclerc states: “For over 20 years I have used this remedy to treat burns, and allow me to attest that its advantages may be summarised as follows: thanks to a light but constant local anaesthetic action, it alleviates the painful symptoms; it protects damaged tissues without compromising their vitality, and without causing retention or

suppuration of excreted fluids; it favours the reparation of the epidermal lining” showing extensively the properties of this plant.



*Calendula arvensis* L. is a herbaceous plant of the Asteraceae family and is found in both cultivated and uncultivated fields in the centre-south of Italy and in the islands. Its flowers contain an essential oil, flavonoids, tannins, malic and salicylic acid, mucilages, etc.

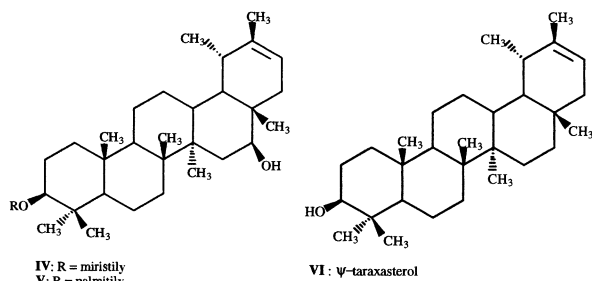
A rich bibliography includes studies on the properties of preparations of *Calendula* (infusions, tinctures, fluid extracts) in folk medicine. Particular attention has been dedicated to the application of these preparations on wounds, ulcers, eczemas, burns, etc. [2–4]. Some of the

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compounds to which the topical activity of *Calendula* could be attributed are the myristic and palmitic esters of faradiol **IV** and **V**, and  $\psi$ -taraxasterol **VI** [5].



Following our studies on the properties of spontaneous plants in Sardinia [6,7], we have studied the tissue regenerating action of a mixture of oily extracts of *H. perforatum* and *C. arvensis* on surgical wounds from childbirth with caesarean section in a group of 24 patients.

## 2. Experimental

### 2.1. Materials and methods

The plants were collected during the months of May–July in rural areas in the countryside of Cagliari (Sardinia) and identified according to Pignatti [8].

The oily extracts were prepared starting from the flowering tops of fresh plants, washed under running water first and then with mono-distilled water to remove dust and other impurities, by crushing and maceration in wheat germ oil in a proportion of 320:1000 (g

flowering tops/g oil). The macerate was placed in a thermostatic bath at 50°C for 60 min to obtain a red liquid in the *Hypericum* oily extract and an ochre yellow liquid in the *Calendula* oily extract. After cooling the extracts were filtered under vacuum, placed into 50 ml glass bottles and sterilised at 121°C for 60 min.

Our experiment was carried out on 24 female patients of a mean age of  $33 \pm 3$  years, who had undergone caesarean section during childbirth. The patients were subdivided into two groups of 12 subjects of a matching mean age.

The first group was treated with local therapy made up of a mixture of 70% oily extract of *Hypericum* and 30% oily extract of *Calendula*. The treatment was carried out as follows:

1. Disinfecting and cleaning the wound with hydrogen peroxide 12 vol.
2. Application of sterile gauzes impregnated with the oily mixture directly on top of the surgical wound.
3. Application of an occlusive dressing held in position.

The second control group was similarly treated except that wheat germ oil was used instead of the mixture of *Hypericum* and *Calendula* oily extract.

The two groups were treated twice daily for 16 consecutive days with an interval of 8 h between the first and the second application.

The results were assessed based on quantifiable objective parameters such as the area of the surgical wound at the surface perimeter, which we named Surface Perimeter Area (SPA) and expressed in cm<sup>2</sup>. In order to determine the SPA, we followed a method found in the literature, which consists of moistening the

Table 1

Area of surgical wounds before and after treatment with the *Hypericum*–*Calendula* oily extract (treated group)

Patients	SPA <sup>a</sup> (cm <sup>2</sup> )		% Wound reduction
	Before treatment	After treatment	
1	13.8	9.4	31.9
2	14.9	8.7	41.6
3	11.6	7.2	37.9
4	17.3	11.2	35.2
5	12.5	9.1	27.2
6	13.7	7.8	43.1
7	16.6	6.6	60.2
8	12.2	8.4	31.1
9	19.3	10.2	47.1
10	11.7	8.3	29.0
11	15.6	8.6	44.9
12	10.2	7.5	26.5
Mean	13.58 $\pm$ 2.71	8.16 $\pm$ 1.40	37.6 $\pm$ 9.9
t	7.96	5.22	11.6

<sup>a</sup> Area enclosed by surface perimeter.

Table 2

Extension of the wound before and after treatment with wheat germ oil (control group)

Patients	SPA <sup>a</sup> (cm <sup>2</sup> )		% Wound reduction
	Before treatment	After treatment	
1	10.2	8.5	16.6
2	13.1	10.1	22.9
3	12.5	10.6	15.2
4	14.3	11.4	20.3
5	15.4	13.5	5.8
6	19.1	15.1	20.9
7	17.1	14.6	14.6
8	17.2	14.7	14.5
9	16.2	13.8	14.8
10	20.2	17.7	12.4
11	16.6	13.2	20.4
12	18.3	14.9	18.6
Mean	15.75 $\pm$ 2.13	12.66 $\pm$ 2.49	15.83 $\pm$ 4.64
t	14.67	7.22	6.67

<sup>a</sup> Area enclosed by surface perimeter.

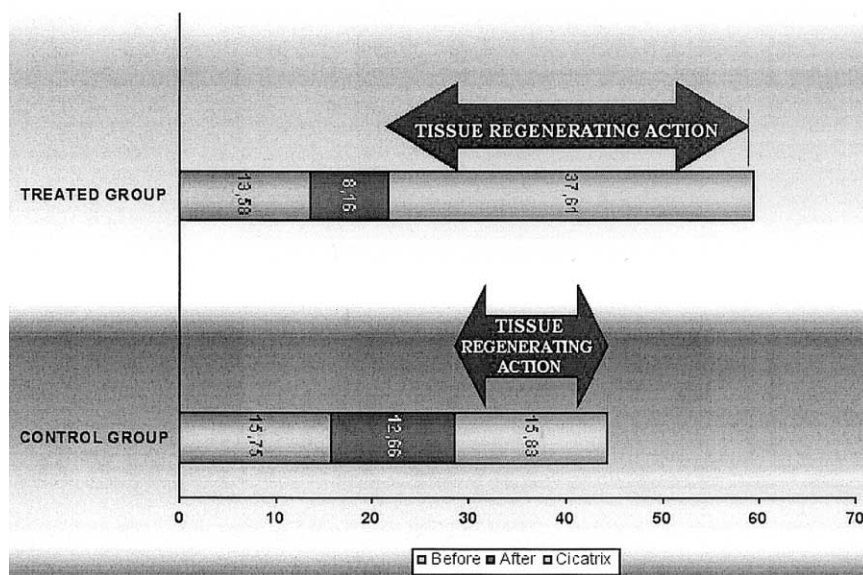


Fig. 1.

edges of the wound with hydrogen peroxide first, and then applying a 'blotting' paper soaked in a solution of 5% potassium permanganate to highlight the margins of the wound, which appear as a lighter line drawn by the decolourised paper. The obtained area is then cut identical with an aluminium foil and determined by weighing, knowing the weight per cm<sup>2</sup> of the aluminium foil.

In order to assess the efficacy of the therapy, we calculated the percentage variation in SPA obtained in each patient at the end of the treatment. On the average of these variations between the group of patients treated with the *Hypericum–Calendula* oily mixture and the control group, we carried out a Student's *t*-test, which is used for medium and small samples extracted from a Gaussian population with less than 30 individuals.

### 3. Results

In the group of patients treated with the *Hypericum–Calendula* mixture, we obtained better results than in the control group.

The SPA area of the surgical wound in the group treated with the *Hypericum–Calendula* mixture was reduced by  $37.6 \pm 9.9\%$  compared to a reduction of

$15.83 \pm 4.64\%$  in the control group. Application of the Student's *t*-test confirmed the validity of the obtained results (Tables 1 and 2).

Fig. 1 shows an explanatory graph.

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