

# 丝瓜藤提取物对机体和体外细胞的抗病毒感染效果\*

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**内容摘要** 本实验证明, 丝瓜藤提取物(ELcv)对小白鼠感染乙脑病毒以及对组织培养细胞感染滤泡性口腔炎病毒(VSV), 有很明显的预防作用; 并证明ELcv是核酸类的干扰素诱生剂。作者认为, 由于干扰素诱生剂是一种广谱的抗病毒物质, 民间用新鲜丝瓜藤的汁治疗慢性支气管炎, 可能与它能预防呼吸道病毒感染有关。

民间经验, 以新鲜丝瓜藤的汁可治疗慢性支气管炎。本实验从新鲜丝瓜藤制备的提取物, 在实验动物和组织培养细胞上测定了抗病毒感染活性, 并对其抗病毒作用机理等进行了初步研究, 现报道于下。

## 材料和方法

一、丝瓜藤提取物的制备: 取新鲜的嫩丝瓜藤(*Luffa Cylindrica* vine), 其长度从生长点算起约30~40cm, 剪成小段, 加STE (0.1M NaCl, 0.03M Tris, 0.001M EDTA, pH 7.2), 按文献<sup>(1)</sup>提取和定量。丝瓜藤提取物简称ELcv。

### 二、ELcv的抗病毒感染活性测定

1. 动物实验: 按文献<sup>(2)</sup>进行。所用ELcv以STE溶解, 使0.2ml STE中含0.4mg ELcv, 每鼠每次注射ELcv 0.4mg, 注射时间和次数见各实验。

2. 抑制组织培养细胞病变试验: 按文献<sup>(3)</sup>进行, 但以滤泡性口腔炎病毒(VSV)的病变程度判定结果。用乳兔肾以常规法消化、培养细胞, 每试管接种常规数量的细胞1ml, 当细胞生长成片后, 倒去培养液, 加入以Eagle's液倍比稀释的ELcv(其量从0.1mg/ml开始)1ml, 每稀释度接种3支细胞管, 18小时后(或实验中注明的时间)以VSV (10TCID<sub>50</sub>)攻击, 约48小时后当对照细胞管(不加ELcv)出现++++时, 观察结果, 使细胞管50%形成病变所需ELcv的最高稀释度为终点。计算方法按文献<sup>(4)</sup>进行。

3. 家兔体内诱生干扰素及其测定按文献<sup>(5)</sup>进行。

## 结 果

### 一、ELcv对小白鼠抗乙脑病毒感染活性的影响

1. ELcv对小白鼠感染乙脑病毒的预防作用: 实验鼠皮下感染乙脑病毒前18、12、4小时, 相应腹腔注

射ELcv 0.4mg(溶于0.2ml STE中), 对照组注射STE 0.2ml。结果ELcv组的保护率为66.7~80%(附表)。

附表 丝瓜藤提取物对小鼠皮下感染乙脑病毒的预防作用

实验号	存活率 (%)		保护率 (%)
	实验组	对照组	
1	80.0 (12/15)	0 (0/15)	80.0
2	66.7 (10/15)	0 (0/15)	66.7
3	73.3 (11/15)	0 (0/15)	73.3
4	80.0 (16/20)	10 (2/20)	70.0
5	80.0 (16/20)	0 (0/20)	80.0
6	75.0 (12/16)	0 (0/16)	75.0

注: 括号内分母为鼠总数, 分子为存活鼠数

2. 小白鼠感染乙脑病毒后注射ELcv的保护作用: 小白鼠皮下感染乙脑病毒3.5小时后, 腹腔注射ELcv

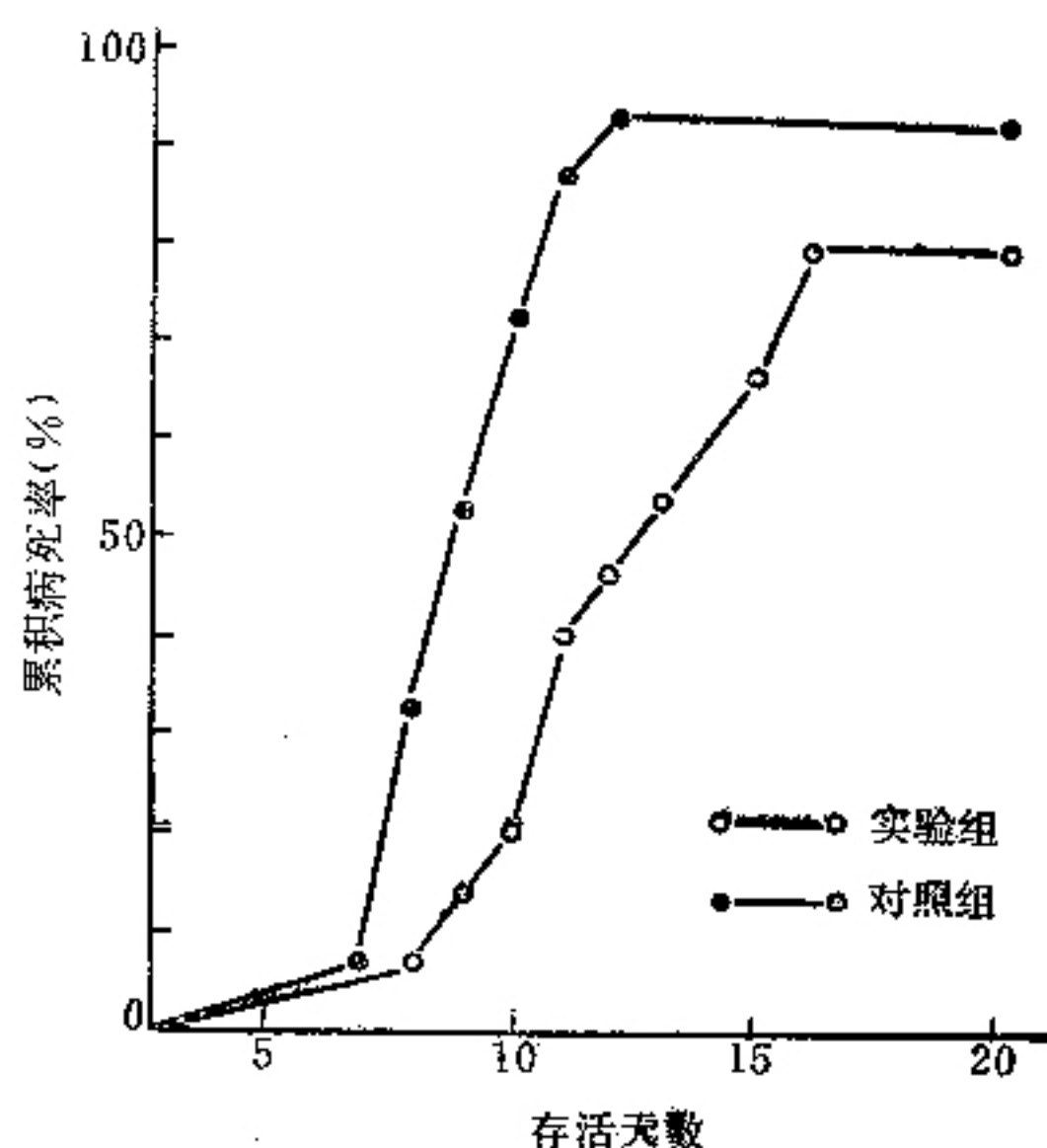


图1 丝瓜藤提取物对小鼠感染乙脑病毒后的保护作用

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3次(感染病毒后3.5、12和24小时;相应腹腔注射 ELcv 0.4mg),结果保护率仅13.4%,表明感染病毒后用药,其保护率低,但药物组小白鼠存活天数比对照组平均延长3天(图1)。

## 二、ELcv 对组织培养细胞的抗病毒感染活性的影响

兔肾细胞管分3组。第1、2组在VSV感染前18小时,分别以ELcv和经(100°C 30')加热过的ELcv处理;第3组在VSV感染前4小时,以ELcv处理;对照组仅加Eagle's液。结果第1组对VSV有抗感染作用,抑制病毒特异性病变所需的ELcv最小量为0.0125mg/ml;第2、3组即使ELcv量很大(0.1mg/ml)与对照组一样都不能抑制病毒特异性病变。

三、ELcv在家兔体内诱生干扰素:以5mg/kg ELcv注射家兔后,在2、4、6小时的干扰素滴度相应为340、180、100IU/ml,重复结果相似。

## 四、ELcv理化性质的初步探讨

ELcv经分光光度计测定,其紫外吸收曲线的特点与核酸相似(图2)。ELcv经RNase (20 µg/ml, 36°C, 30')处理后,其保护率略有降低,由80%降至65%。ELcv经100°C 45'处理后,其保护率由80%降至15%。

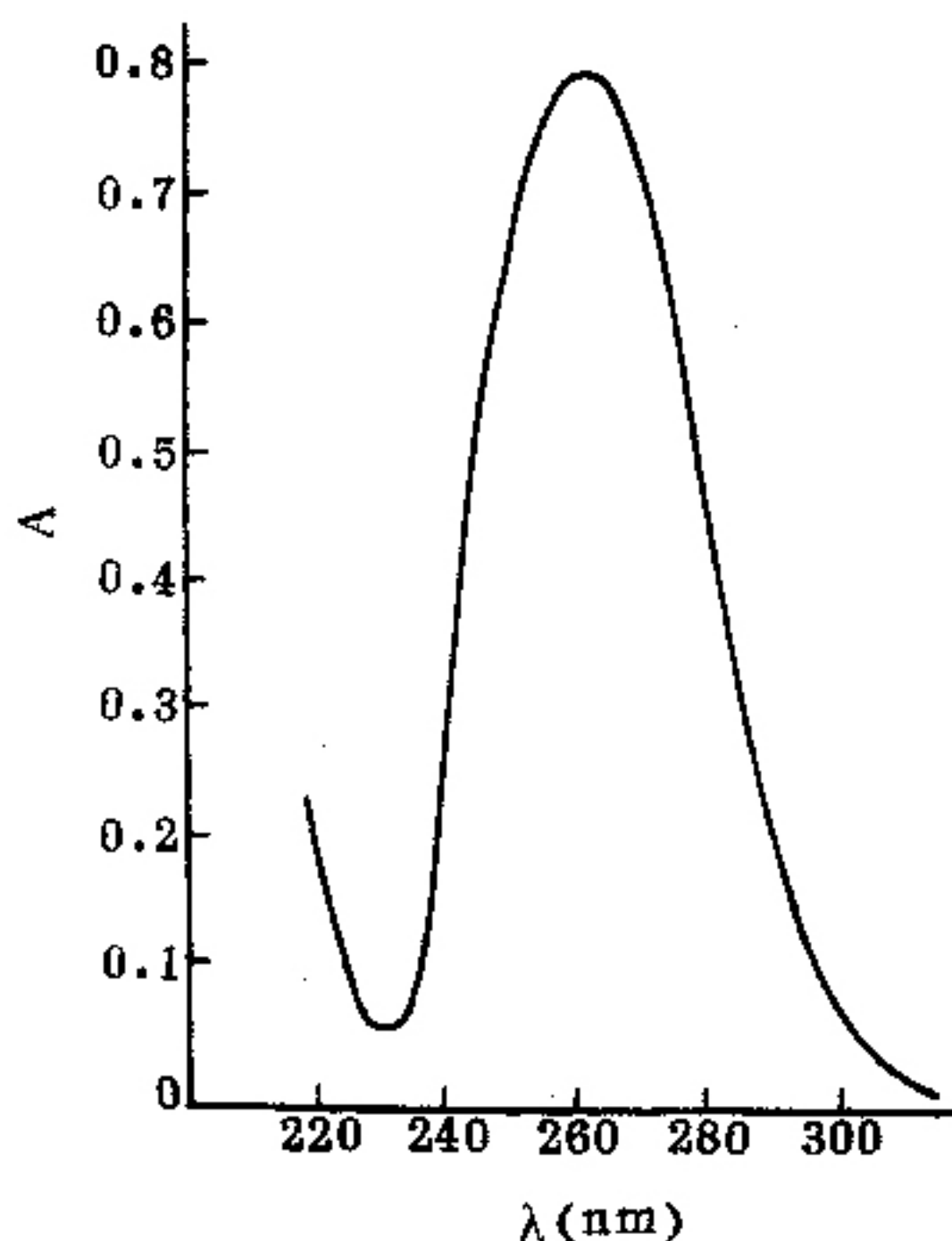


图2 丝瓜藤提取物的紫外吸收曲线

## 讨 论

本研究证明,新鲜的嫩丝瓜藤提取物(ELcv)在

小白鼠和组织培养细胞上都有很明显的抗病毒感染作用,并证明ELcv是一种对RNase有部分耐受性,对热(100°C, 45')不稳定的干扰素诱生剂。本研究与我们报道的丝瓜果实、丝瓜种籽芽的提取物<sup>(1,2,5)</sup>相似。

呼吸道感染是慢性支气管炎反复发作重要原因之一。民间用新鲜丝瓜藤的汁治疗慢性支气管炎,很可能通过与ELcv相似的干扰素诱生剂起作用,使慢性支气管炎患者减少了呼吸道感染的机会,从而使患者易于康复。另外,据报道,煎煮的丝瓜藤汤剂也可治慢性支气管炎<sup>(6)</sup>,这种汤剂的有效成份可能与ELcv不完全一样,因为ELcv的有效成份是对热不稳定的物质。

呼吸道感染首先是由上呼吸道局部感染开始的,在预防慢性支气管炎患者或正常人群的呼吸道感染时,用ELcv滴鼻,可能效果更为理想。

本实验和我们已经报道过的研究结果<sup>(1,2,5)</sup>说明,丝瓜植物的不同部位的组织含有类似的干扰素诱生剂,这现象是否与该植物的基因有关,我们正在研究中。

## 参 考 文 献

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## · 简 讯 ·

中国中西医结合研究会江苏分会第二届会员代表大会暨学术讨论会于1987年3月26~29日在南京市六合县召开。会议选举产生了第二届理事会,并选出理事会理事37名。会议收到学术论文195篇,大会交流论文34篇,小组交流论文69篇,并对34篇优秀论文的作者,学会工作的积极分子以及取得科研成果的会员同志给予了表彰。这次大会交流论文内容丰富,在学术上发扬民主,畅所欲言,各抒己见,达到了相互促进共同提高的目的。

(陈 虹 朱 闾 稿)

# Ultrastructural Observation on Experimental Fracture Treated with Principle of Promoting Blood Circulation and Relieving Stasis — A Transmission Electron Microscopic Study

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In the course of healing the standardized fracture of radius in 50 New Zealand rabbits, an expeditious effect on repairing was achieved as a result of administration of *Radix Salviae miltiorrhizae* which exerted the action of promoting the blood circulation and relieving the stasis. X-ray study of the radial fracture revealed that callus formation appeared earlier and was denser as compared with another series of 50 control rabbits. As judged from the transmission electron microscope (TEM) observation, the favourable effects could be reflected in five aspects. Firstly, there was an increase in both the site of distribution and the number of the osteogenic cells. Secondly, the fibroblasts, in addition to their change in configuration, showed very active protein synthesis. There was also an expedition of the normal process of fibroblast degeneration. Thirdly, there was appearance of increased number of osteoclasts in different localities of fracture callus to promote remodelling. Fourthly, there was exuberant amount of collagen fibril formation in enhancing the production of the organic matrix. Fifthly, there was numerous dense calcium granules in the swollen mitochondria of the fibroblasts so as to provide adequate supply of calcium for the calcification of the matrix vesicles and the collagen fibrils.

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## Antiviral Efficacy of the Extract of *Luffa cylindrica* Vine in Vivo and in Vitro

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The antiviral activity of the extract of *Luffa cylindrica* vine (ELCV) on virus infection in vivo and in vitro was studied. Results from the study indicated that: (1) The mice resulted in a 66.7 ~ 80 % protection when the ELCV was given to mice prior to infection with Japanese encephalitis virus, but only a weak protection of the treated mice could be observed when given after infection; (2) The ELCV was highly active in inducing resistance to cytopathic changes in primary rabbit kidney cell cultures challenged with vesicular stomatitis virus; (3) Interferon was induced in rabbit by intravenous injection with the ELCV. The circulating serum interferon level peaked at 2 hr after injection; (4) The antiviral activity of the ELCV was greatly lowered by heating at 100 °C for 45 min. and was partially resistant to RNase at concentration of 20 µg/ml; (5) Ultraviolet spectrum of the ELCV revealed a pattern of nucleic acids.

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## Effects of Kidney Yin (阴) Tonic on Calcium and Phosphorus Metabolism in Rickety Chickens

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100 chickens of 7 days after birth were divided into three groups randomly: The control group (I), the rickets group (II), the rickety chicken treated with kidney Yin tonic "Liuwei Dihuang decoction 六味地黄汤" (III) twice daily. All of them were fed with vitamin D-free diet. The group II and III were bred in darkroom except group I. Serum calcium and phosphorus concentration and alkaline phosphatase activity were determined once every two weeks. A significant reduction of mean calcium and phosphorus concentration and an increased alkaline phosphatase activity were observed in group II in comparison with group I and group III in certain periods. After two months, X-ray diagnosis also showed that the incidence of severe rickets in group II (65.5 %) was higher than that in group III (16.7 %). The mean calcium contents (mg/g of dry bone weight) in tibia of the three groups were 105, 92 and 97 respectively (I/II  $P < 0.01$ , II/III  $P < 0.05$ ) and the phosphorus contents were 45, 40 and 44 respectively (I/II  $P < 0.01$ , II/III  $P < 0.05$ ). The findings indicated that the tonic lowered the incidence of severe rickets might contain some natural anti-rickets components such as ergocalciferol or enhance the function of the kidney in regulating calcium and phosphorus balance.

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