

A Brief Report on the Isolation and Determination of Three New Compounds: Celangulin II, III and IV*

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Abstract Three new dihydroagarofuran sesquiterpene esters, celangulin II, III and IV, were isolated from the root bark of *Celastrus angulatus*. These compounds showed strong poisonous action and narcotic action against the larvae of *Mythimna separata*. Their structures were determined mainly by NMR and mass spectrometry.

Key words botanical insecticides, separation, molecular structure, *Celastrus angulatus*

The root bark of the insecticidal plant, Chinese bittersweet (*Celastrus angulatus*, Max), contains several kinds of bioactive components. From the extract of this plant, a novel insect antifeedant, celangulin I, has been isolated and determined. In this paper, we report the isolation and determination of three new compounds, celangulin II, III and IV, which have strong poisonous action and narcotic action against the armyworm (*Mythimna separata*).

The new compounds were isolated from the petroleum ether extract of Chinese bittersweet root bark following the procedure of Fig. 1. To guide the isolation, the trail of

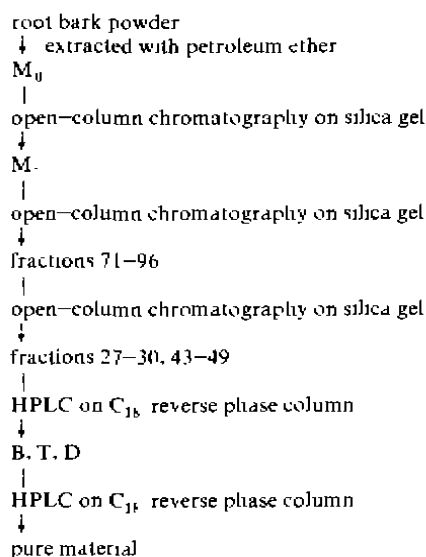


Fig. 1 Isolation procedure for celangulin II, III and IV

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the bioactivity was followed by means of bioassay in which the 5th-instar larvae of the armyworm were fed with the wheat leaf discs administrated quantitatively by the samples.

The structures of these new compounds were determined mainly by NMR and mass spectrometry. The results showed that they were dihydroagarofuran sesquiterpene esters. The results also showed that compounds B and T were a pair of isomers, and the difference was the configuration of benzoxy at C-9; a α configuration for B, a β configuration for T (Fig.2). Literature retrieval has confirmed that little has been reported on these compounds named as celangulin II, III and IV respectively.

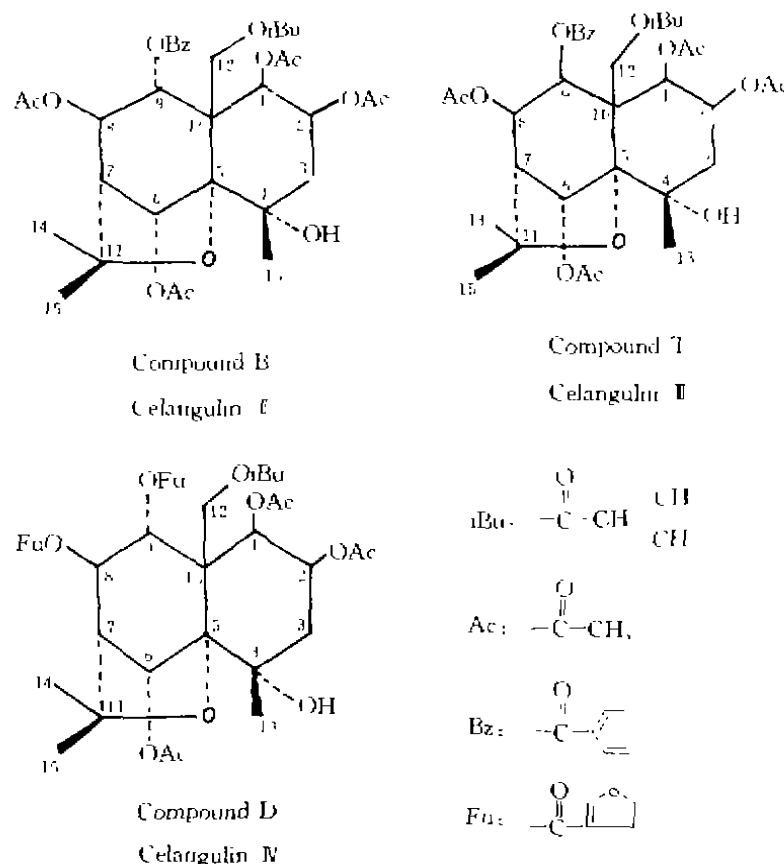


Fig 2 Structure of celangulin II, III and IV

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新化合物苦皮藤素 II, III, IV 的分离和结构鉴定简报

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摘 要 以叶碟定量载毒饲虫的方法追踪活性, 经 3 次硅胶柱层析及反相高效液相色谱半制备, 从杀虫植物苦皮藤(*Celastrus angulatus* Max.) 根皮的石油醚提取物中分离出 3 个对粘虫(*Mythimna separata*) 幼虫具有强烈毒杀作用和麻醉作用的化合物 B、D、T。利用高分辨质谱及核磁共振波谱鉴定了 3 个化合物的分子结构。结果说明, 这些化合物都属于二氢沉香呋喃倍半萜酯类。其中 B 和 T 为一对异构体, 不同之处在于 C-9 位的苯甲酰氧基的构型, B 为 α 构型, T 为 β 构型。经文献检索, 这 3 个化合物都是从未报道过的新化合物, 分别命名为苦皮藤素 II、III、IV。

关键词 植物性杀虫剂, 分离, 分子结构 / 苦皮藤

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