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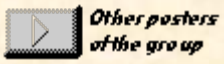
Isolation and biological activity of the oligostilbenes of Cyphostemma crotalarioides

Bala, A. ; Delorme, R. ; Kollmann, A. ; Kerhoas, L. ; Einhorn, J. ; Ducrot, P.-H.*

Unité de Phytopharmacie et Médiateurs Chimiques, INRA, Route de Saint-Cyr F-78026 Versailles Cedex, France
Fax 01 30 83 31 19 E-mail ducrot@versailles.inra.fr



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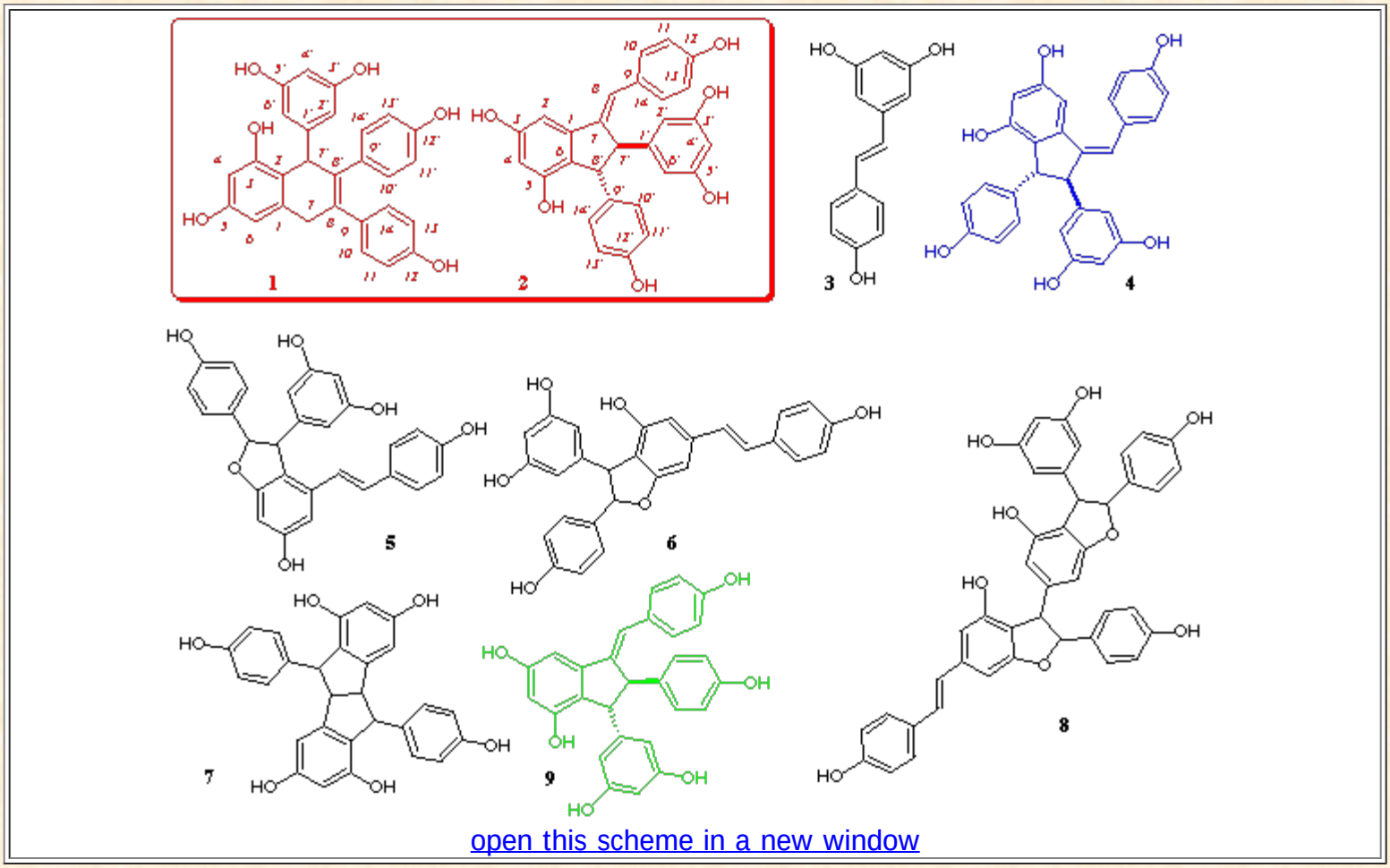
Introduction :

In our on-going programs aimed to the discovery of new pesticides of plant origin, we have extensively studied the composition in secondary metabolites of various indigenous plants from the Sudan, known for their promising biological activity and sometimes even used in traditional agriculture for pest management purposes.
One of our extracts, obtained from *Cyphostemma crotalarioides*[1] exhibited a very promising antifungal activity against Fusarium nivale. In a previous report [2], we have described the isolation and the identification of resveratrol and some of its known natural oligomers from the roots of this plant. This type of compounds was known to be produced by numerous plant species [3] and proved to exhibit cancer chemopreventive, antifungal and antibacterial activities [4].

The air-dried, ground roots were macerated with methanol. This extract showed antifungal activity. The dried extract was then dissolved in water and partitioned against ethyl acetate. The last fraction was chromatographed on a reversed phase preparative column packed with silinised silica gel (Kieselgel). For elution, a chromatography gradient started with H2O 70% / MeOH 30% and ended with MeOH 100%, was used. Fifteen fractions were collected. Each biologically active fraction was further purified by HPLC on a reversed phase silica gel (packing material C-18, 5 µm, pressure 2150 PSI, temperature 40°C) eluted with water/acetonitrile (solvent gradient, flow rate 1.5 ml/min). Manual collection led to the obtention of 8 major homogeneous fractions identified as **cyphostemmin A 1** (35 mg/kg), **cyphostemmin B 2** (22 mg/kg), resveratrol **3** (85 mg/kg), parthenocissin A [5] **4** (12 mg/kg), e-viniferin **5**[6] (90 mg/kg, trans -viniferin although, in some chromatography fractions, a substantial amount of the corresponding cis isomer was also

observed, which has not been earlier described in the literature and has to be related to another cis dehydrodimer of resveratrol recently obtained by incubation of resveratrol in culture filtrates of B. cinerea [7] ; moreover, a slow transformation of this isomer into trans -viniferin was observed on standing in solution), gnetin C **6** [8] (90.3 mg/kg), pallidol **7** [9] (10.32 mg/kg) and a trimeric compound, gnetin E **8** [10] (64.50 mg/kg). For economical reasons, we have worked on a small quantity of crude-extract and the amount of material used for the identification was thus about 1 mg for each compound ; therefore, we have not been able to collect the 13C NMR data for all compounds.
The purified compounds were then subjected to classical spectroscopic methodologies. First of all, the MS analysis allowed the rapid characterization of resveratrol (M 228), of the various dimeric compounds (M 454) and of the trimer (M 680).



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Results :

Structures of the two new compounds, cyphostemins A and B were inferred from their spectroscopic data (NMR) through extensive NOE experiments and through comparison with the spectroscopic data obtained for parthenocissin A and Ampelopsin D **9** [11]. Antifungal activity and cytotoxicity of this compounds have been evaluated as well as the biological activities of an other resveratrol dimer obtained by enzimatic oligomerisation of resveratrol (horse raddish peroxidase, H2O2).

- Spectroscopic data of cyphostemmins
- Antifungal acivity
- Bioconversion and cytotoxicity

References : follow this link

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