

Ficusanolide A and Ficusanolide B, two new cinnamic acid derivative stereoisomers and other constituents of the stem barks of *Ficus exasperata* Vahl. (Moraceae)

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Background

Ficus exasperata Vahl., a medicinal plant belonging to the Moraceae family, is well known for its uses in the treatment of tuberculosis, tumors, malaria, ringworm, dysentery, stomach ache and many other diseases [1;2]. Previous phytochemical investigation of the stem barks of *F. exasperata* reported the isolation of a new sphingolipid and furanocoumarins, flavonoid and pyrimidine derivatives [3].

Faced to the need to find new therapeutic models easily accessible to the population, plant of *Ficus* genus can appear as a good source of secondary metabolites with interesting biological activities.



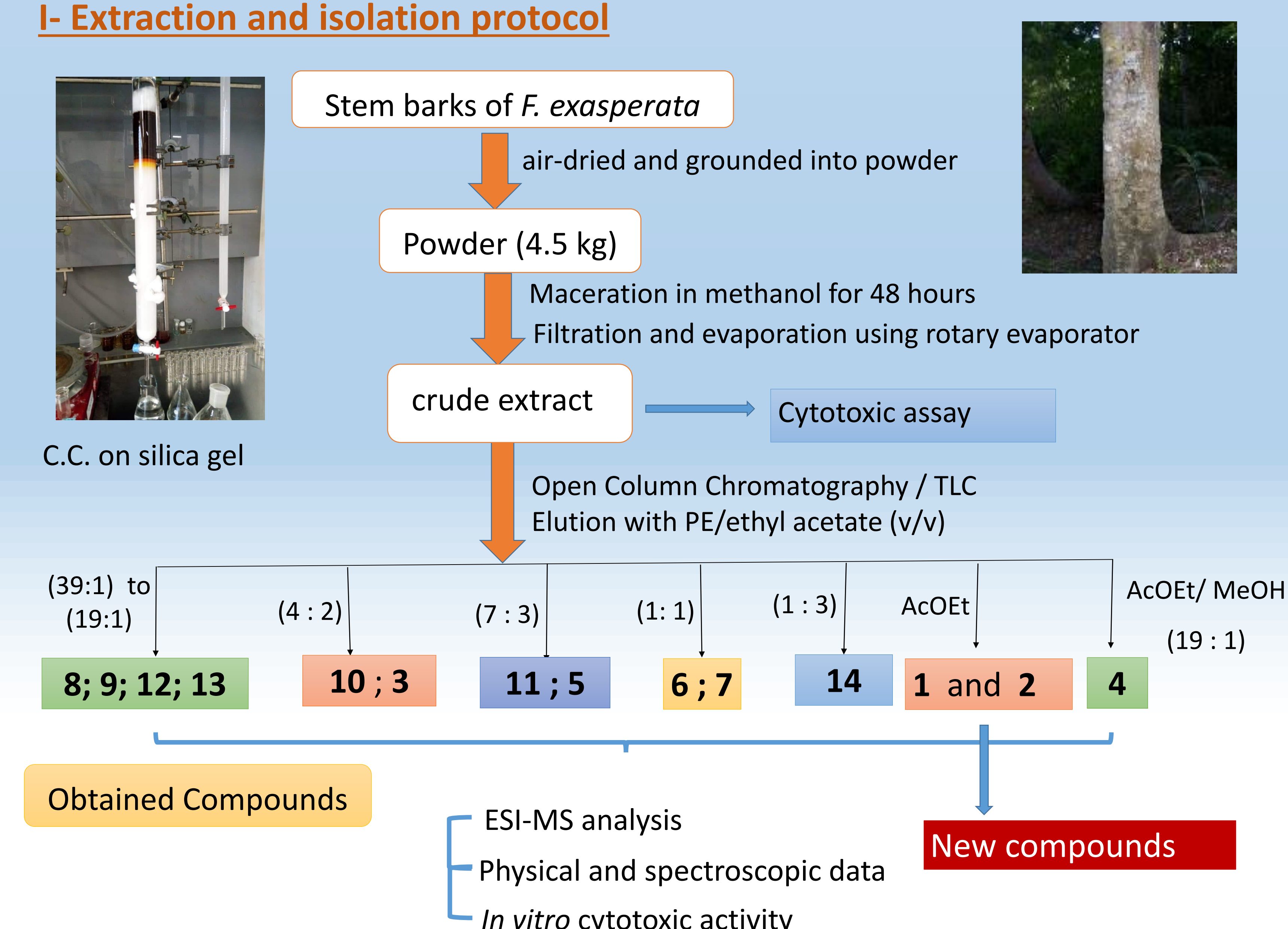
F. exasperata Vahl.

Objective

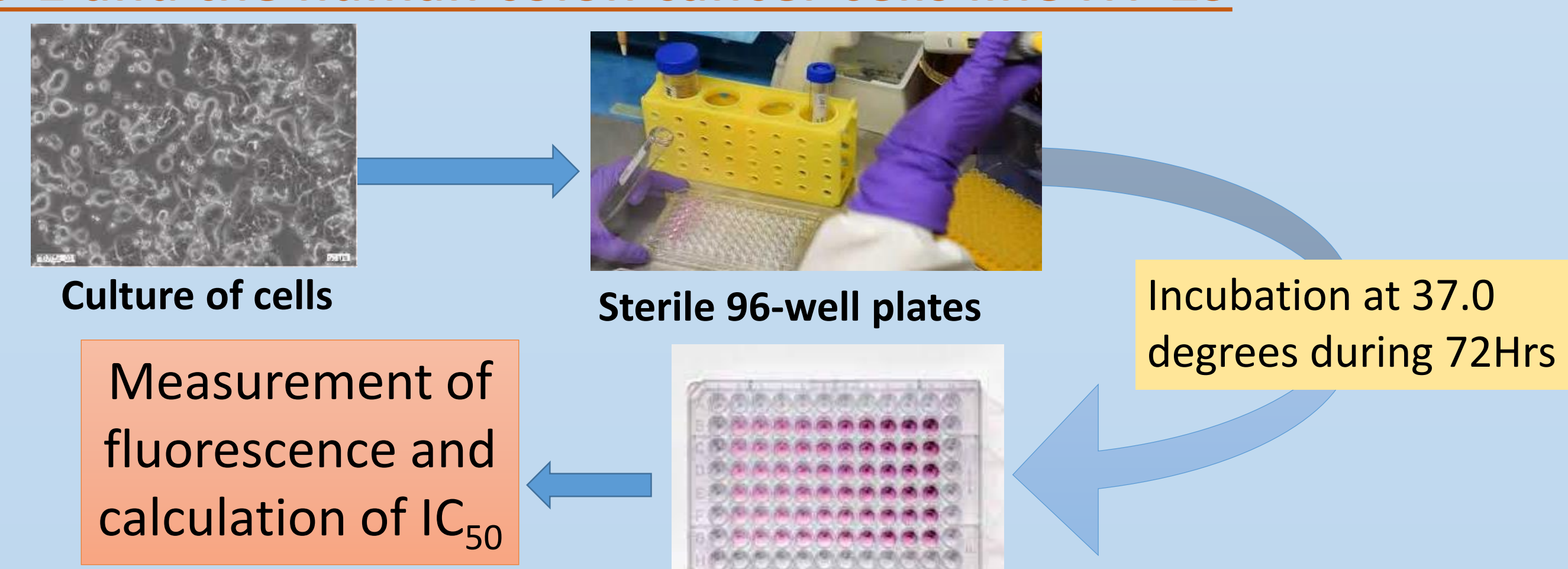
Our main objective being the isolation of new therapeutic models with small side effects.

Experimental design

I- Extraction and isolation protocol



I- Evaluation of cytotoxicity against the human cervix carcinoma cells line KB-3-1 and the human colon cancer cells line HT-29



Results

I- Phytochemical investigation and structural elucidation

Two new cinnamic acid derivatives stereoisomers 1 and 2 together with twelve known compounds as ficusanol (3), umbelliferone-6-carboxylic acid (4), oxypeucedanin hydrate (5), marmesin (6), decursinol (7), β -amyrin acetate (8), lupeol (9), betulinic acid (10), ursolic acid (11), a mixture of stigmaterol (12) and β -sitosterol (13), and sitosteryl-3-*O*- β -D-glucopyranoside (14).

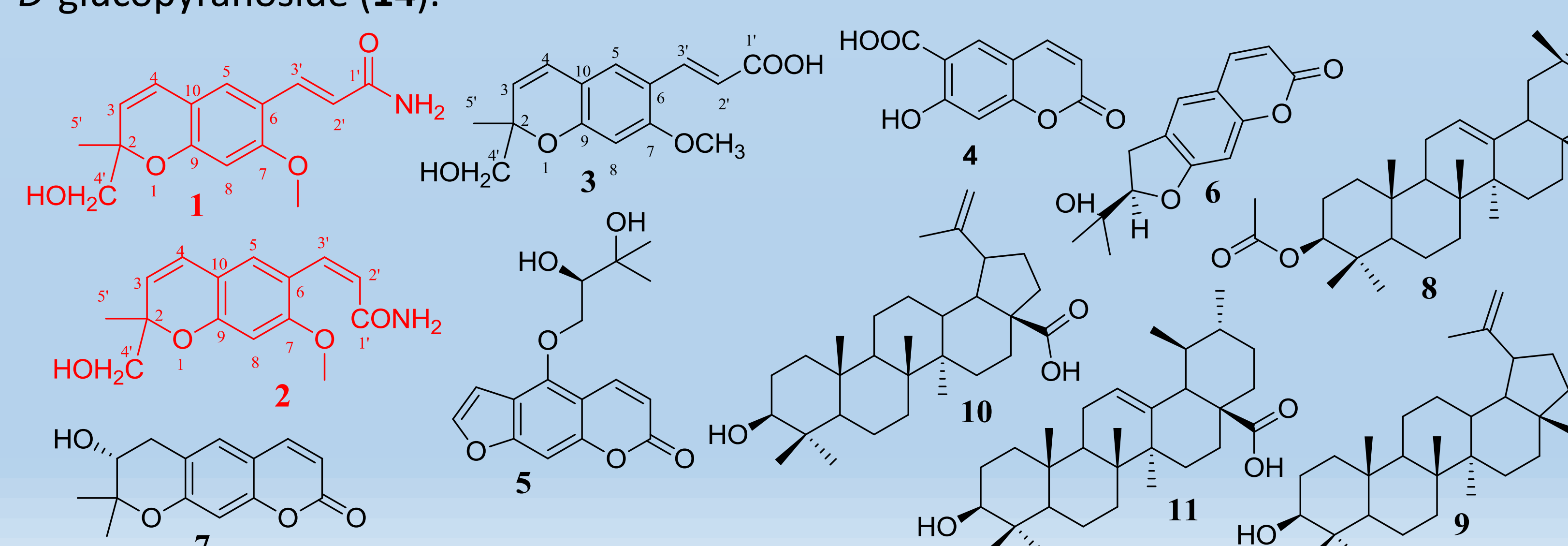


Fig. 1: Structure of isolated compounds

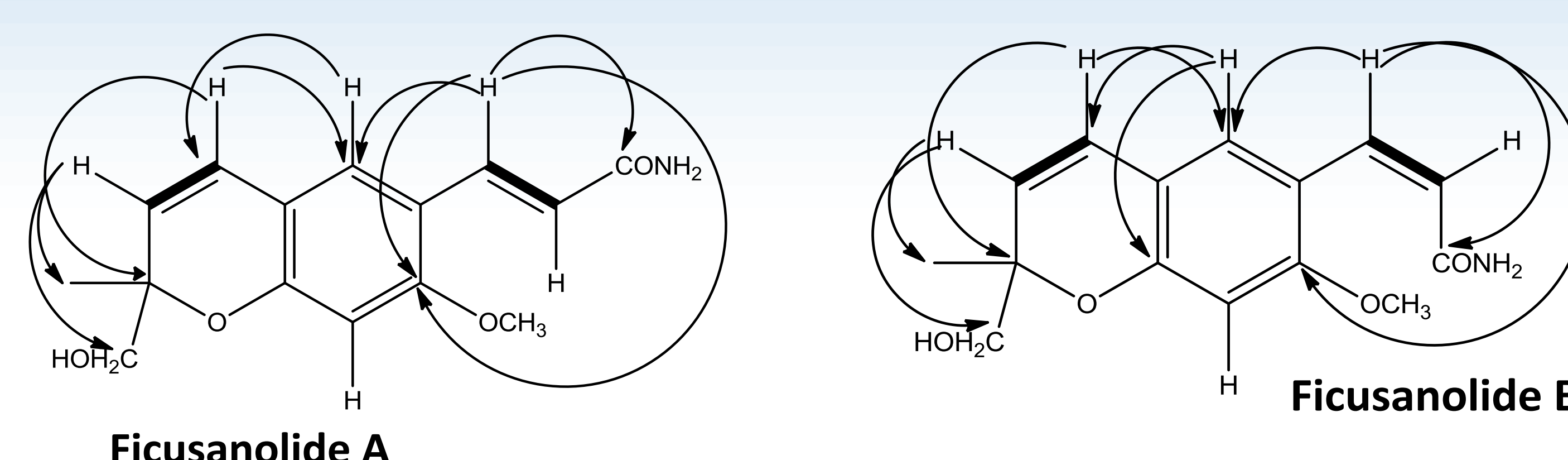


Fig. 2: Some correlations of ficusanolide A and ficusanolide B HMBC COSY

Table 1: informations on Ficuanolide A and Ficusanolide B

	Ficusanolide A	Ficusanolide B
Aspect	Pale yellow amorphous powder	Pale yellow amorphous powder
Rotatory power	$[\alpha]_D^{20}$: +25 (c= 0.35; MeOH)	$[\alpha]_D^{20}$: -6,8 (c= 0.36; MeOH)
(+)-ESI HRMS	m/z = 298.1050 [M+Na] ⁺	m/z = 298.1050 [M+Na] ⁺
Molecular formula	C ₁₅ H ₁₇ O ₄ N	C ₁₅ H ₁₇ O ₄ N
Spectroscopic data	IR, UV, 1D NMR: ¹ H (600 MHz; CD ₃ OD) and ¹³ C (150 MHz, CD ₃ OD); 2D NMR: COSY, HMBC, HSQC	IR, UV, 1D NMR: ¹ H (600 MHz; CD ₃ OD) and ¹³ C (150 MHz, CD ₃ OD); 2D NMR: COSY, HMBC, HSQC

II- Cytotoxicity on KB-3-1 and HT-29 cell line

Table 2: cytotoxicity results

Compounds	IC ₅₀ (μM)	
	KB-3-1	HT-29
Ursolic acid	50.9	34.4
Reference (Griseofulvin)	17.0	21.0

Compounds (1); (2); (3); (6); (11); (9); (10); (15); (5); (7), were evaluated on the two cancers cell lines. The results revealed that only ursolic acid exhibited a moderated activity on both tested cells.

Conclusion

The phytochemical investigation of methanol extract of the stem barks of *F. exasperata* have been reported and it led to the isolation and structural elucidation of ficusanolide A and ficusanolide B, two new cinnamic acid derivative stereoisomers, as well as twelve known compounds by the means of usual spectroscopic methods. Cytotoxic activity was also carried out on some isolated compound. These compounds can be further investigated for the development of new therapeutic models.

Acknowledgement:

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Reference:

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