The Antifibrotic Effect of Isolate Tagitinin C from *Tithonia diversifolia* (Hemsley) A. Gray on Keloid Fibroblast Cell

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Unggul & Islami

Terakreditasi A No.061/SK/BAN-PT/Ak-IV/PT/II/2013

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Background: keloids characterized by fibroblast hyperproliferation and depositions of collagen which similar to cancer cells. Tagitinin C is a class of sesquiterpene lactones (SL_S) was isolated from the leaves of the moon flower [*Tithonia diversifolia* (Hemsley) A. Gray]. The study aim is to evaluate the effects of tagitinin C from *T.diversifolia* to keloid fibroblasts (KF).

Methods: monolayer cultures of keloid fibroblast (three passages) were treated with 8 serial concentration of tagitinin C (0.015 to 2) µg/mL during 72 and 120 hours. A positive control using mitomycin C. Cellular viabilities were measured by MTT assay. Collagen depositions were measured by Sirius Red assay for nonsoluble collagen. the reading of the result was conducted by ELISA reader. Data were analyzed by probit regression with SPSS 19 for Windows.

Results and Discussion: The result showed that tagitinin C can inhibit keloid fibroblasts (KF) viability with IC_{50} 0.122 µg/mL (incubation 72h) and 0.039 µg/mL (120h), whereas mitomycin C IC_{50} 0.120 µg/mL (72h) and IC_{50} of 0.100 µg/mL (120h) (Table 1). Similar study that standardized ethanol extract of T. diversifolia inhibit keloid fibroblast proliferation with IC_{50} of 7.932 µg /mL (72 hours) and 3.624 µg /mL (120 hours) [Wahyuningsih, 2015].

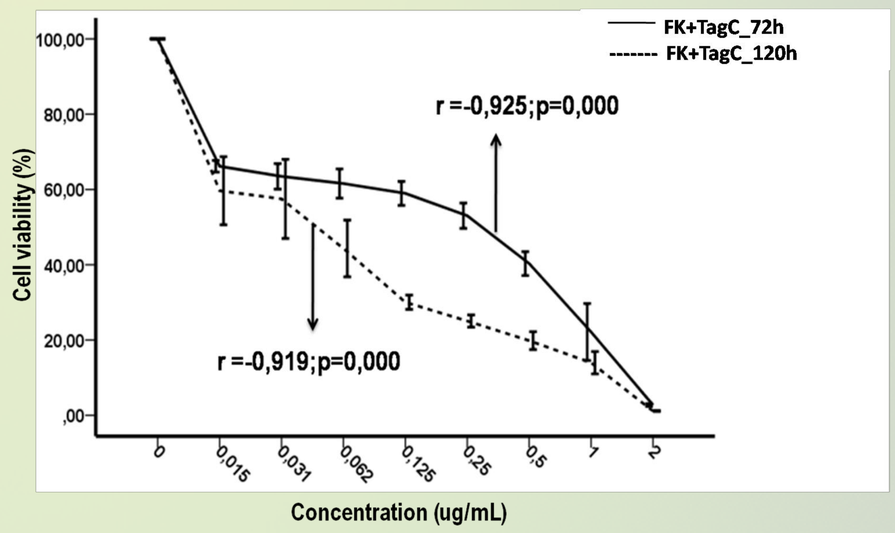

Fig 1: Correlation between concentration of tagitinin C isolates from *T. diversifolia* on the keloid fibroblasts cell viability with 72 hours and 120 hours incubation times

Table 1: IC_{50} value of tagitinin C isolates from *T. diversifolia* and mitomycin C in keloid fibroblasts cells

Material	IC_{50} Value (µg/mL)		
	72 hours	120 hours	*P*
Tagitinin C	0,122 ± 0,026	0,039 ± 0,028	0,024
Mitomycin C	0,120 ± 0,034	0,100 ± 0,051	0,621

At IC_{50} concentration of tagitinin C on keloid collagen deposition 53.1% (72h) and 44.3% (120h), whereas the IC_{50} concentration of mitomycin C on keloid collagen deposition 60.4% (72h) and 52.1% (120h) (Table 2). Another research on standardized ethanol extract of *T. diversifolia* inhibit on keloid collagen deposition with IC_{50} 5.498 µg/mL (72 hours) and 2.280 µg/mL (120 hours) [Wahyuningsih, 2015]

Table 2: Average of keloid collagen deposition after the administration tagitinin C isolates from *T. diversifolia* and mitomycin C in keloid fibroblast cells

Material	Percentage of Keloid Collagen Deposition (Mean±SD)		
	72 jam	120 jam	*p*
Tagitinin C	53,1 ± 2,39	44,3 ± 1,04	0,004
Mitomycin C	60,4 ± 0,85	52,1 ± 2,38	0,005

Selectivity index tagitinin C on normal fibroblasts (NF) is 287 for 72h incubation and 791 for 120h incubation. Based on the Sjogren *et al.* (2000) criteria, tagitinin C of *T. diversifolia* was classified into low toxicity category against the NF cells with a high index of selectivity.

Conclusion: it can be concluded that the ability of tagitinin C inhibits KF viability and decreasing keloid collagen deposition is consistent with the concentration (concentration-dependent) and incubation time (time-dependent) (fig.1). Tagitinin C has a low toxicity level on NF with high selectivity index.

References

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