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Analgetic Activity of Papaya (*Carica papaya* L.) Leaves Extract

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Abstract

The analgetic activity of Carica papaya leaves (CPL) extracts (n-hexane, ethyl acetate, ethanol) was investigated in mice model using acetic acid induced pain (Siegmund method). Experimental animals were divided into 11 groups and received n-hexane, ethyl acetate, and ethanol extracts at doses of 0.175, 0.35, 0.70 mg/kg bw orally; CMC-Na 0.5% (control group); 50 mg/ kg bw of aspirin. The results showed that all extracts at the doses of 0.175, 0.35 and 0.70 mg/kg bw gave significant analgetic activity ($p<0.05$) compared to control group. Ethanol extract of CPL dose of 0.70 mg/kg bw showed the best analgetic activity that was comparable to aspirin .

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Keywords:Carica papaya;Siegmund method; aspirin, analgetic, ethanol extract

1. Introduction

Papaya leaves (*Carica papaya* L,) is belongs to Caricaceae family allied to the Passifloraceae. It has been used empirically as food or as medication for kidney stones, hypertension, urinary tract disorders, abdominal pain during menstruation, analgesic, dysentery, diarrhea, fever[1]. Its contains carpain alkaloids, papain enzyme, pseudocarpain, glicoside, carposide, saponins, sucrose, dextrose and levulose[2].Pain is a symptom of disease or damage that occurs most frequently. Pain serves to remind and protect and facilitate the diagnosis of disease. Pain is a protective mechanism for the body that would arise if there is a damaged body tissues[3]. If it is disturbing activity of the body, an analgesic drug used for the relief of pain without losing consciousness. This study aimed to determine the analgesic activity of n-hexane, ethyl acetate, and ethanol extracts of CPL at three variation doses (0.175 mg/kg bw,

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0.35 mg/kg bw, and 0.70 mg/kg bw) for each extract. Analgesic activity was evaluated in animal models of pain induced by glacial acetic acid.

2. Experiments

2.1. Materials

Carica papaya leaves (CPL) were collected from Manoko, Lembang, Bandung, West Java, Indonesia and botanically identified at Biology Laboratory, Padjadjaran University, Bandung, West Java. The fresh leaves were cut into small pieces, dried, and powdered. The powdered of CPL were macerated by n-hexane, and continued byethyl acetate and ethanol 96% respectively each for three days. The extractswere filtered and concetrated by rotary evaporator. Phytochemical analysis carried out on the dry extract.

2.2. Methods

Animals were placed separately into a cage and allowed to acclimate for at least 10 days. Fifty five of mice were randomly divided into 11 groups of five animals each and set to receive orally: (1) vehicle (control group); (2) aspirin (50 mg/kg bw); n-hexane extract at doses of 0.175, 0.35 and 0.70 mg/kg bw (group of 3-5); ethyl acetate extract at doses of 0.175, 0.35 and 0.70 mg/kg bw(group of 6-9); and ethanol extract at doses of 0.175, 0.35 and 0.70 mg/kg bw (group of 10-11). All groups were injected intraperitoneally by 0.1 mLof 1% glacial acetic acid solution in normal saline to induced visceral pain. Animals were placed on metabolic cage and observed for writhing behavior which indicated by stretching of the abdomen. The number of writhing responses was counted every 5 minutes for 60 minutes, starting directly after the acid injection.Data were analyzed statistically. Differences among means were considered significant at $P< 0.05$.

3. Results and Discussion

Phytochemicaly analysisof extracts showed that all extracts(CPLof n-hexane extract, ethyl acetate extract, and ethanol extract) contained alkaloids, tannins and saponins.

Table 1. Writhing Numbers of Treatment Groups for 60 Minutes

Treatment group	Writhing numbers of each mice for 60 min					Σ	Average±sd
	1	2	3	4	5		
0,175 mg/kg bw dose of n-hexane extract	83	86	84	99	95	447	89.4 ± 7.2*
0,35 mg/kg bw dose of n-hexane extract	91	95	76	79	76	417	83.4 ± 9.0*
0,70 mg/kg bw dose of n-hexane extract	64	79	70	69	65	347	69.4 ± 5.9*
0,175 mg/kg bw dose of ethyl acetate extract	95	91	76	75	77	414	82.8 ± 9.4*
0,35 mg/kg bw dose of ethyl acetate extract	65	62	68	64	75	334	66.8 ± 5.1*
0,70 mg/kg bw dose of ethyl acetate extract	59	56	56	58	63	292	58.4 ± 2.9*
0,175 mg/kg bw dose of ethanol extract	72	74	77	77	75	375	75.0 ± 2.1*
0,35 mg/kg bw dose of ethanol extract	67	65	64	63	59	318	63.6 ± 3.0*
0,70 mg/kg bw dose of ethanol extract	43	50	41	48	42	224	44.8 ± 4.0*
Aspirin dose of 50 mg/kg bw	46	40	46	39	38	209	41.8 ± 3.9*
Control group (vehicle drug)	103	110	86	99	103	501	100.2 ± 8.9

* indicated significant compared tocontrol group

The acetic acid-induced writhing method was used to evaluate the effect of analgesics drugs on visceral pain[4]. Acetic acid induced pain by releasing endogenous mediators that stimulate nociceptive neurons such as prostaglandins into peritoneum[5]. The analgetic effect of CPL extracts in the acetic acid-induced writhing model was shown in table 1. The number of writhing responses were significantly reduced in mice treated with dose of 0.175, 0.35, 0.70 mg/kg bw of n-hexane, ethyl acetate and ethanol CPL extracts compared to control group. There were increasing analgetic activity by increasing doses. The analgetic activity of CPL ethanol extract at dose of 0.70 mg/kg bw were compared to asetosal (50 mg/kg bw). This result in line with Bamidele V. Owoyele et al (2008) report that CPL showed anti-inflammatory activity[6].

4. Conclusion

In conclusion, the n-hexane, ethyl acetate and ethanol of *Carica papaya* leaves extracts dose of 0.175; 0.35; 0.70 mg/kg bw for each extract offered some protection against acetic acid induced visceral pain. Ethanol extract of *Carica papaya* leaves showed the best analgetic activity that was compararable to aspirin. The present study revealed that ethanol extract of *Carica papaya* leaves is a promising candidate for the development of phytomedicine against visceral pain, and further studies are needed in this direction.

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