

ANALGESIC EFFECT OF DIOCLENOL AND DIOFLORIN ISOLATED FROM *DIOCLEA GRANDIFLORA*

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ABSTRACT

The analgesic activity of dioflorin and dioclenol, two constituents of *Dioclea grandiflora* Mart., has been studied in mice. It was found that dioclenol (10 mg/kg, i.p.) and dioflorin (10 mg/kg, i.p.) were effective in the acetic acid-induced writhing and tail immersion tests. These observations suggest that dioflorin and dioclenol possesses central antinociceptive activity.

INTRODUCTION

Dioclea grandiflora Mart. Ex. Benth (Leguminosae) is a vine that grows in the "caatinga" and "cerrado" regions of northeastern Brazil. An infusion of the roots of this plant has been used in traditional medicine to treat kidney stones and prostate gland disorders (Batista, 1993). The aim of the present study was to evaluate the analgesic effect of dioflorin (DFL) and dioclenol (DCL), two minor constituents from the root bark of *Dioclea grandiflora*, occurring in 0.001 and 0.006% yields, respectively (Bhattacharyya et al., 1997, 1998).

Keywords: Analgesic activity, *Dioclea grandiflora*, dioflorin, dioclenol, CNS activity.

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MATERIALS AND METHODS

Plant Material

The root-bark of *Dioclea grandiflora* was collected in Santa Rita, Paraíba, Brazil, in January 1997 and a voucher specimen prepared (MFA) in the Botany Section of our laboratory is deposited in the Lauro Pires Xavier (JPB) Herbarium of the Universidade Federal da Paraíba (4440 – JPB, MO).

Animals

Male Swiss albino mice (25–35 g) were used. The animals were kept in polypropylene cages at a room temperature of 21 ± 2 °C with 12 h light and dark cycles and had free access to food and water. The experiments were always conducted between 11:00 and 17:00 h.

Biological Evaluation Procedures

The analgesic effect of dioflorin and dioclenol was evaluated in mice employing two methods: *Acetic acid-induced writhing*. Mice were divided into 4 groups of 10 each. Vehicle (controls), DFL (10 mg/kg), DCL (10 mg/kg) and morphine (6 mg/kg) were administered intraperitoneally (i.p.). Sixty min after treatment, acetic acid (0.8% v/v solution) was injected i.p. at a dose of 10 mg/kg. The number of writhings was counted and recorded for 15 min (Biswas et al., 1991; Almeida et al., 1996). *Tail immersion test*. Mice were held in position in a suitable restrainer with the tail extending out. The tail (up to 5 cm) was then dipped into a beaker containing water at 50 °C. The time (sec) for the tail to clear out of water was taken as the reaction time. Forty male mice were divided into 4 groups of 10 each and the vehicle (control), DFL (10 mg/kg), DCL (10 mg/kg) and morphine (6 mg/kg) were injected (i.p.). The readings were taken immediately after the drug

Table 1. Effect of dioflorin and dioclenol (10 mg/kg, i.p.) evaluated using acetic acid-induced writhing in mice.

Treatment	Dose (mg/kg)	Writhings (mean \pm S.D.)
Vehicle (Control)	-	31.8 \pm 3.8
Dioflorin	10	4.8 \pm 2.1*
Dioclenol	10	11.2 \pm 6.0*
Morphine	6	5.2 \pm 2.7*

$n = 10$ animals

* $p < 0.05$, relative to control group value.

Table 2. Effect of dioflorin and dioclenol (10 mg/kg i.p.) on tail-immersion test.

Treatment	Dose (mg/kg)	Reaction time(s) mean \pm S. D.				
		Basal	1 h	2 h	3 h	4h
Vehicle (Control)	-	130 \pm 24	102 \pm 27	114 \pm 22	126 \pm 32	140 \pm 26
Dioflorin	10	160 \pm 32	306 \pm 24**	168 \pm 48	180 \pm 41	150 \pm 46
Dioclenol	10	158 \pm 48	198 \pm 12*	180 \pm 21*	210 \pm 30*	234 \pm 24**
Morphine	6	152 \pm 30	184 \pm 26*	168 \pm 16*	150 \pm 18	231 \pm 14**

$n = 10$ animals

* $p < 0.05$, relative to control group value.

** $p < 0.01$, relative to control group value.

administration (basal) and at 60, 120, 180 and 240 min intervals (Grotto & Sulman, 1967). *Statistical analysis.* The data obtained were evaluated by one-way analysis of variance (ANOVA) and Dunnett multiple comparisons test. The results were considered significant when $p < 0.05$.

RESULTS AND DISCUSSION

The data of the analgesic tests are reported in Tables 1 and 2. The results of this study show that both dioflorin and dioclenol, the minor constituents of *Dioclea grandiflora* root-bark, have good acute analgesic activity. Dioflorin produced a near maximal inhibition of the writhing response similar to morphine, and in the tail-immersion method, both compounds (10 mg/kg, i.p.) were effective. The tail-immersion test is reported to be specific for agents producing central antinociceptive activity. These findings demonstrate that dioflorin and dioclenol exhibit central analgesic effects in mice.

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