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Antidiabetic Study of Suaeda Maritima

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The genus *Suaeda* includes widely distributed polymorphic species such as *S. maritima, S. calceoliformis,* and *S. nigra*. Much of the variation in these taxa appears to be due to environmental factors, but some of it is probably due to genetic differences. Infraspecific taxa and presumed related species have been described, and these are mentioned in the discussions following the descriptions. However, no infraspecific taxa are recognized here. All three of these species show much variation in morphology and growth-form characteristics, but no qualitative characters could be found that could be used to reliably separate distinct taxa below the species level. Future chromosomal and genetic studies may enable the recognition of distinct infraspecific taxa or even species within these three polymorphic entities (FNA,1776).

- In folklore medicine, the *Suaeda* group of plants are used as fodder against rheumatism, paralysis, asthma, snake bites, skin disease and ulcer [1,2]. Again, leaves of such plants are used as antiviral, antibacterial and wound healing activities, besides as insecticide and antiplasmodial against Plasmodium falciparum [3-6]. The different species belonging to the genus *Suaeda, viz. Suaeda maritima (L) Dumort, Suaeda monoica Forssk. ex J.F.Gmel., Suaeda pruinosa Lange, Suaedamaritima* subsp. salsa (L.) Soó, and, *Suaeda vermiculata* Forssk. ex J.F.Gmel although widely available in Indian coastal regions but have seldom been studied.

Suaeda maritima has been used as an ethnomedicine for curing various ailments. The juice of the plant has been used for treating hepatitis and has been reported to have antiviral, hepatoprotective, anti-inflammatory, and antioxidant activities [6]. The leaves are known for curing liver, heart, and lipid disorders.

As for a long period of time, plants have been a valuable source of natural products for maintaining human health, certain plant extracts can be a cure for infections caused by MDR. Along with different herbs, seaweeds, and higher plants, many workers have suggested the usefulness of mangroves in traditional medicines.

A preliminary screening of the plant extract showed the presence of many active phytoconstituents including tannins, saponins, flavonoids, phenols, terpenes, and carbohydrates. GC-MS analysis showed the presence of 14- methylpentadecanoic acid, methyl hexadecenoate, and methyl-11-octadecenoate.

The Acute Toxicity of *Suaeda* on Mice:

The Body Weight Change of Suaeda (10.0g/Kg) On Mice (Mean±SE)

Group	Dosage And Route	n	Body weight change before and 2-7 days after extracts were given (g)						
			Initial	24 hrs			7 days		
				B.W	% of intial	% of Died	z	Diff.	% of Died
Control	0.4ml/10g,	10	32. 95± 0.71	31.1 2±0.73	94.62± 0.02	0	32.6 0±0.53	99.20±0.02	0
Suaeda	10.0 g/kg, p.o	10	31.57±0.94	27.50±1.12*	89.58±0.02	40	29.9 6±1.48	97.50±0.02	50

*P<0.05, **P<0.01, ***P<0.001 vs control group.

Animals: T/O mice, both of male and female were used.

Extracts: Suaeda (70% alcohol-extract, Code:), dissolved in dissolute water used.

Dosage And Routine: 10.00 g/kg, the control group was treated with equal volume solvent.

Signs And Symptoms of Observation: 30 minutes after extracts were given orally, the signs and symptoms of animal behavior were checked, such as locomotor activity, aggressive behavior, diarrhea, ataxia, string, platform and pole test, continue to 4 hrs, then 24 hrs and 7 days. The changes of body weight in each group were checked and compared.

Results: The experimental results showed less movement and sensitivity, urination, and tremor. The test of ataxia, string, platform, and pole failed 60 minutes after 10 g/kg was given orally. mice died starting 60 minutes, peak time 2 hrs. 50% mice died 48 hrs after extracts were given orally once. The body weight was still less tha1 week after extracts were given orally once.

Conclusion: There was toxicity when *Suaeda* 10.00 g/kg was given p.o once, the LD50 was around 10 g/kg p.o, once.

The Effects of Suaeda on Body Weight in Mice										
S.N	**Contral Group**					**Suaeda 10.0 g.kg-1 p.o**				
	Initial	24 hrs	%	7days	%	Initial	24 hrs	%	7days	%
1	30.8	31.6	1.026	33.4	1.0844	34.3	Died	Died	Died	Died
2	32.5	33.6	1.0338	32.5	1	34.3	30.2	0.88047	34.7	1.0117
3	32.1	33.5	1.0436	35.6	1.109	30.1	28.9	0.96013	30	0.9967
4	32.5	31.8	0.9785	31.9	0.9815	30.5	27.6	0.90492	27.9	0.9148
5	31.7	30.4	0.959	31.5	0.9937	27.8	died	Died	Died	Died
6	29.9	26.2	0.8763	29.8	0.9967	32.5	Died	Died	Died	Died
7	32.9	28.8	0.8754	31.3	0.9514	36.9	Died	Died	Died	Died
8	35.1	30.6	0.8718	33.6	0.9573	27.5	23.9	0.86909	26	0.9455
9	34.4	31.2	0.907	32.2	0.936	31	30	0.96774	31.2	1.0065
10	37.6	33.5	0.891	34.2	0.9096	30.8	24.4	0.79221	Died	Died
n	10	10	10	10	10	10	6	6	5	5
X	32.95	31.12	0.9462	32.6	0.992	31.57	27.5	0.89576	29.96	0.975
SD	2.2352	2.3227	0.0705	1.6533	0.0626	2.96612	2.75971	0.06493	3.3141	0.0427
SE	0.7068	0.7345	0.0223	0.5228	0.0198	0.93797	1.12665	0.02651	1.4821	0.0191
						0.25645	0.02421	0.17214	0.1536	0.5497
Animal: T/O mice both of female and male were used										

Anti-Diabetic Activity of *Suaeda* in Streptozotocin Diabetic Mice

As no experimental study has been reported in the past to confirm its claimed activity, the present investigation was carried out to study the anti-diabetic activity in mice, following the acute and sub-acute treatment of a 10 % ethanolic plant extract. Hyperglycaemia was induced in mice by intraperitoneal injection of stretozotocin at the dose of 80 mg/kg. In acute study a single dose (400 mg/kg) of 10% ethanolic extract of saueda was administered orally. The blood samples were taken at 0hr (before treatment) and 2hr, 4hr and 6hr after treatment. In sub- acute study the animals were administered with 10 % ethanolic extract of *Sauaeda* at the dose of 200 mg/kg,

orally per day for 9 days. Blood samples were taken at 2 days intervals. The oral glucose tolerance test (OGTT) was also carried out on a group of mice loaded with glucose (1.5 g/kg) orally (data not given). The plant extract was administered at the dose of 200 mg/kg p.o., per day for 7 days. In all studies, blood samples were taken from the orbital sinus puncture technique using heparinized microheatocrit capillary tubes. The plasma was separated by centrifugation and glucose was determined using an Analox glucose analyzer. Students' t-test was used to compare the significance of the difference between control and treated groups.

Table 1: Effect of Acute Treatment of Suaeda Extracts on Blood Glucose Level (%) of STZ-diabetic mice

Treatment	Dose mg/k g	Treatment hr 2hr			
		0h	2hr	4hr	6h
Control	-	100.0 ± 2.83	114 ± 6.80	106. 2 ± 2.70	102.6 ± 4.30
Suaeda	400	100.0 ± 3.98	82.2 ± 4.19*	89. 2 ± 4.34*	73.3 ± 2.28 *

* Significantly different from control values; P< 0.05

Table 2: Effect of Sub Acute Treatment of Suaeda Extract on Blood Glucose Level (%) of STZ-diabetic mice

Treatment	Dose Mg/kg	Treatment days				
		Day 0	Day 1	Day 3	Day 5	Day 9
Control	-	100.0 + 2.28	110.0 + 3.42	113.8 + 6.26	119.9 + 11.5	132.7 + 13.4
Suaed	200	100.0 + 3.62	88.4+ 3.62*	88.1 + 7.93*	113.7 + 10.6	112.5 + 10.0

Significantly different from control values; P< 0.05.

Our data showed that a single oral dose of Suaeda produced a significant fall in blood glucose level in STZ-diabetic mice at all the hours tested (Table 1). In a group of animals treated sub-acutely the maximum fall in glucose level of STZ-diabetic mice was up to the third day. On days 5 and 9 the fall in glucose level was also observed. However, statistically not significant (Table 2). The OGTT of diabetic mice showed significant glucose utilization in the group of animals treated with *Suaeda*. The study demonstrates that acute or sub-acute treatment of 10 % ethanol extract of Suaeda produced a significant reduction in blood glucose levels in STZ-diabetic mice and caused significant glucose utilization in OGTT mice.

References

1. Ishnava K, Ramarao V, Mohan J S S, Kothari I L (2011) Ecologically important and life supporting plants of little Rann of Kachchh, Gujarat. J. Ecol. Nat. Environ 3: 33-38.
2. Muthazhagan K, Thirunavukkarasu P, Ramanathan T, Kannan D (2014) Studies on phytochemical screening, antimicrobial and antiradical scavenging effect coastal salt marsh plant of a Suaeda monoica. Res. J. Phytochem 8: 102-111.
3. Manivachagam C, Kannathasan K, Venkatesalu V (2008) Antimicrobial activity of fatty acid methyl esters of some members of chenopodiaceae. Z. Naturforsch 63: 331-336.
4. Ravikumar S, Gnanadesigan M, Inbaneson S J, Kalaiarasi A (2011) Hepatoprotective and antioxidant properties of Suaeda maritima (L.) dumort ethanolic extract on concanavalin-A induced hepatotoxicity in rats. Indian J. Exp. Biol 49: 455-460.
5. Fahmy A K, Ibrahim A M H, El-Shazly A M, El-Sayed A M, et al. (2003) Plant derived pest control agents: III- insecticidal and biochemical studies of different plant extracts against Culex pipiens larvae. J. Agric. Environ. Sci 2 : 56-68.
6. Suaeda Forsskål ex J F, Gmelin (2011) Onomat Bot. Compl 8: 797-1776.