A STUDY OF PHYTOCHEMICAL SCREENING AND ANTICONVULSANT ACTIVITY OF PALM LEAVES PHOENIX DACTYLIFERA

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ABSTRACT
The present study aimed to evaluate the anticonvulsant activity of leaves plant extract of phoenix dactylifera L. using PTZ-induced seizure models. The leaves of date-palm was subjected to extraction in methanol (99.9%). The phytochemical screening of the extract revealed the presence the alkaloids, falvonoids, glycosides, saponin, steroids, tannins, and gum. The methanolic activity of the extract of the leaves of date-palm was observed for their anticonvulsant activity induced by pentylenetetrazole test using Albino Westar rats. The extract in doses (100, 200, 400 mg/kg, intraperitoneal) for 5 successive days. Complete protection against Tonic–clonic convulsion and mortality were observed. We concluded that phoenix dactilifera leaves pose anticonvulsant properties and further investigation and phytochemical screening are needed to find out the much action.

KEY WORDS: Phoenix Dactylifera, Leaves, Date Palms, Epilepsy, Convulsion, PTZ.

INTRODUCTION
Epilepsy is the second most common neurological disorder after stroke, affecting at least 50 million persons worldwide, it shows a prevalence rate of 1-2% of the world population [1]. It is a chronic and often progressive disorder characterized by the periodic and unpredictable occurrence of epileptic seizures, and involuntary contraction of striated muscle repeatedly. Seizures are characterized by an excessive, hyper-synchronous discharge of cortical neuron activity, which can be measured by the electroencephalogram [2]. Seizures of Epilepsy are classified into; Partial seizures which may be (a) Simple partial seizures [3] or (b) Complex partial seizures [4] and Generalized seizures in the form of (a) Absence [petit mal] seizures, (b) Myoclonic seizures, (c) Clonic seizures, (d) Tonic seizures, (e) Tonic-clonic [grand mal] seizures, (f) Atonics seizures or drop attacks [4-6]. These seizures can be chemically induced, electrically induced and genetically induced seizures [7]. Treatment of Epilepsy is helpful in up to 70% of patients. However, in developing countries, 75% of people with epilepsy do not receive treatment [8]. The problem of antiepileptic drugs (AEDs) arises from their inability to control seizures efficiently and adverse effects which have not been circumvented completely. Many people living in developing countries still rely on herbal medicine for the management of epilepsy [9]. The clinical effectiveness, minimal side effect profile and relatively low costs of herbal drugs are the reasons for their various application in traditional medicine. Traditional medicine, especially medicinal plants, has been practiced for a long
time in most parts of the world. Medicinal plants used for the therapy of epilepsy in traditional Medicine have been shown to possess promising anticonvulsant activities in animal models and can be invaluable sources of new antiepileptic compound [1]. About 8 million date palm trees are cultivated in Libya distributed in the desert as well as in the eastern and western coastal belt regions where about 4 varieties are recognized. In Libya, the phoenix dactylifera is an important tree for humans, animals and birds [11]. This study aims to study the Phythochemical screening of Phoenix dactylifera leaf and to estimate the anticonvulsant activity of the Phoenix dactylifera leaf.

**RESULTS**

Phytochemical investigation of the methanolic extract of phoenix dactylifera leaf (date palm) contains bioactive compounds (Saponins, Flavonoids, glycosides, steroids, Phenolic compounds), but our investigation does not reveal the presence of amino acid (Table: 1).

<table>
<thead>
<tr>
<th>NO</th>
<th>Phytochemicals</th>
<th>Results</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alkaloids</td>
<td>+</td>
<td>Cream with Mayer’s reagent</td>
</tr>
<tr>
<td>2</td>
<td>Flavonoids</td>
<td>+</td>
<td>A yellow coloration that disappears on standing</td>
</tr>
<tr>
<td>3</td>
<td>Saponins</td>
<td>+</td>
<td>Formation of emulsion</td>
</tr>
<tr>
<td>4</td>
<td>Tannins</td>
<td>+</td>
<td>Brownish</td>
</tr>
<tr>
<td>5</td>
<td>Terpenoids</td>
<td>+</td>
<td>Green or Blue- black colouration</td>
</tr>
<tr>
<td>6</td>
<td>Anthraquinones</td>
<td>+</td>
<td>Colour changed</td>
</tr>
<tr>
<td>7</td>
<td>Steroids</td>
<td>+</td>
<td>Blue or Bluish-green</td>
</tr>
<tr>
<td>8</td>
<td>Gum</td>
<td>+</td>
<td>Red violet ring</td>
</tr>
<tr>
<td>9</td>
<td>Phenolic compound</td>
<td>+</td>
<td>Greenish – Black</td>
</tr>
<tr>
<td>10</td>
<td>Iridoids</td>
<td>+</td>
<td>Black precipitate</td>
</tr>
<tr>
<td>11</td>
<td>Free quinolones</td>
<td>+</td>
<td>Yellow</td>
</tr>
<tr>
<td>12</td>
<td>Amino acid</td>
<td>-</td>
<td>No change colour to red</td>
</tr>
</tbody>
</table>

(+): Presence, (-): Absence.

**Effects of phoenix dactylifera leaves and diazepam on pentylenetetrazol induced convulsions in rats:**

In control animals, intra-peritoneal administration of PTZ caused clonic-tonic convulsion (140 ± 90.33 sec) after administration as well as lethality in all rats after tonic seizure. Normal saline did not show any protection against PTZ incident of convulsion and mortality (Table 2). Surprisingly phoenix dactylifera L. leaf (100, 200, and 400 mg/kg, I.P.)

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for five successive days produced 100% protection against clonic-tonic convulsion and mortality induced by PTZ 100mg/kg I.P (Table 3).

In addition, pretreatment with phoenix dactylifera L. leaf extract (200 mg/kg, I.P.) 30 minutes before injection of PTZ produced complete protection against mortality and prevented clonic tonic convulsions in 50% of the animals while the other animals appeared only clonic convolution with significant delayed in onset time. Whereas the standard drug diazepam (4mg/kg, I.P.) completely abolished the convulsion and mortality (Table 2).

Table (2): Acute effect of the extract of phoenix dactylifera leaf and diazepam on pentylenetetrazol-induced seizures in rats.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean onset of seizures (sec)</th>
<th>No. convulsions / No. used drug</th>
<th>protection %</th>
<th>Mortality (% delay)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTZ 100mg/kg</td>
<td>140± 90.33</td>
<td>6 out of 6</td>
<td>0.00</td>
<td>6/6 (100%)</td>
</tr>
<tr>
<td>Extract 200mg/kg</td>
<td>560± 192.87</td>
<td>3 out 6</td>
<td>50</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table (3): Chronic effect of phoenix dactylifera leaf on PTZ-induced seizures in rats.

<table>
<thead>
<tr>
<th>Treatment P</th>
<th>Mean onset of seizures [sec]</th>
<th>No. convulsions / No. used drug</th>
<th>Protection %</th>
<th>Mortality (% delay)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTZ 100 mg/kg, I.P</td>
<td>140 ± 90.33</td>
<td>6 out of 6</td>
<td>0.00</td>
<td>6/6 (100%)</td>
</tr>
<tr>
<td>Extract 100 mg/kg, I.P</td>
<td>-</td>
<td>0 out of 6</td>
<td>100</td>
<td>0/6 (0.00%)</td>
</tr>
<tr>
<td>Extract 200 mg/kg, I.P</td>
<td>-</td>
<td>0 out of 6</td>
<td>100</td>
<td>0/6 (0.00%)</td>
</tr>
<tr>
<td>Extract 400 mg/kg, I.P</td>
<td>-</td>
<td>0 out of 6</td>
<td>100</td>
<td>0/6 (0.00%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Epilepsy is a symptom of a variety of conditions and is the most common of chronic neurological disorders. Where the patient’s death may be due to epilepsy [15]. The convulsant action of PTZ, involves the disruption of GABAergic neurotransmission in the central nervous system. It has been reported that PTZ inhibits glutamic acid decarboxylase (GAD) [16]. PTZ is an antagonist of GABA at the GABA receptor which has been widely implicated in epilepsy [17]. The effect of phoenix extract in this model can therefore suggest its involvement in the GABAergic or noradrenergic pathway and its efficacy against generalized tonic-clonic and partial seizure in animals. Prevention of seizures induced by PTZ and maximal electroshock in laboratory animals is the most commonly used preliminary screening test to characterize potential anticonvulsant drugs. PTZ test represents a valid model for human generalized myoclonic and also absence seizures [18]. Furthermore; drugs which protect animals against the...
generalized clonic seizure induced by
PTZ are effective in the protection and
management of petit mal epilepsy [19].
The data obtained in this study dem-
onstrated Phytochemical studies revealed
that the methanolic extract of phoenix
dactylifera L. leaf contains alkaloids, fla-
vonoids, steroids, glycosides, quinones,
gum, iridoids, phenolic compounds, ter-
penoids, tannins, saponins and steroids.
It seems that these phytochemical con-
stituents of date palm leave present in
methanolic extract might be responsible
for the observed anticonvulsant activity.
The observed anticonvulsant activity of
one of its constituents the methanolic ex-
tract of phoenix dactylifera L. leaf sug-
gests that it can one or more easily cross
the Blood-brain barrier. In agreement
with this suggestion the anticonvulsant
activity of flavonoids [20,21]. saponins
alkaloids and steroids in experimental
animals have been demonstrated. One of
these components might act by increas-
ing the synthesis and release of GABA
which affords allosteric receptor facilita-
tion or reduce inactivation. Therefore,
we postulate that methanolic extract
might have a definite impact on the GA-
BAAergic system so, the anticonvulsant
activity may be due to the presence of
steroidal compounds in the extracts.
Herbal medicine represents one of the
most important fields of traditional med-
icine all over the world. Over the past 20
years, there has been an increased inter-
est in the investigation of natural materi-
als as sources of new drugs. Different ex-
tracts from traditional medicinal plants
have been tested to identify the source of
the therapeutic effects.

CONCLUSION
This study concluded that Date palm leaf
[Type Abel ( EL-ammi)] contains many
phytoconstituents such as saponins, fla-
vonoids, glycosides, steroids, and phe-
nolic compounds. Methanolic extract of
this plant can cross blood-brain barriers
because it has CNS effects such as anti-
convulsant activity.
The metabolic extract of palm leaves
Phoenix dactylifera Is considered a
promising Sources the anticonvulsant
activity There this plant needs further
pharmacological and pharmacognosy
studies for the discovery of new natural
anticonvulsant drugs.

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