EFFECT OF ELYTRARIA ACAULIS EXTRACTS ON FERTILITY IN MALE ALBINO RATS

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ABSTRACT: Surgeries like vasectomy, tubectomy and medication (contraception) for the population control are not fully restraining the population growth. Medicine available to control birth rate carrying side effects. The attempt of exploring the importance of Ayurveda the present work was carried out. The methanol extract of the plant Elytraria acaulis was prepared by maceration technique. Extract effects the fertility by reducing the sperm count and motility in the albino rats. The male albino rats were divided into three groups of eight animals in each. The first group was considered as control and Group II, III were treated with dose 200mg/kg and 300mg/kg extracts respectively. The treatment of the extract was carried out by gastric gavage for 21 days through oral. On 22nd day all rats were sacrificed to study sperm count and motility. The blood samples were centrifuged to separate serum. The serum samples used for the serological parameters. The reduced levels of vital reproductive organs weights and sperm count, motility were observed in the treated rats compare to control. The cholesterol, triglycerides increased and glucose levels were decreased in the serum of treated rats. The glycogen and protein levels of testes and liver were decreased in the treated groups than to the control group. The histological sections of testes in treated groups were observed that loss of interstitium and degenerated germinal cells were also observed in the treated groups. The effect of the extract was more in group –III compare to group- II.

INTRODUCTION: Indian ayurveda explored in treating several ailments by using natural products derived from the medicinal plants. Using synthetic drugs to cure many diseases are adversely effecting immune system of the body. The commercially available contraceptives for both men and women are causing side effects. Since, they are harmful the scientific community putting efforts to find out non side effecting contraceptives. In that attempt researchers of pharmacology trying to find out the medicinal plants which have the contraceptive property for both male and female. Among them many plants have been screened for antifertility like Sesbania sesbain 1, Trygonella poenungacum 2, Ballota undulata, 3 Mentha arevensis 4, Ocimum gratissium, 5,6 etc. The present approach is to screen the extract of Elytraria acaulis for antifertility activity in male albino rats.

MATERIALS AND METHODS: Elytraria acaulis plants were brought from the village Gudur, Warangal district. The whole plants were dried under shade. Then the dried parts were powdered. The powder passed through sieve plate No.20 to collect the fine powder. The powder was used for preparation of extract.

50gr of powder was mixed in the 250ml of methanol shaking randomly, then left for 24hrs. Then the solution was filtered off to collect filtrate and marc was added to 250ml of methanol...
by shaking. After 24hrs, the solution was again filtered to get the filtrate. Then the both filtrates were mixed and allowed to distillation to get the extract and preserved in refrigerator prior to use.

Male albino rats weighing about 170-230 gr were selected for the study. The rats were brought from the Mahaveer Enterprises, Hyderabad. The rats were acclimatized to lab conditions with 25±5°C temperature and 35 to 50% humidity, with the approved Institutional Ethical committee (IAEC/03/UCPSc/KU/10). The rats were kept in polypropylene cages and given standard rat pellet (Hypro, Pune) as diet and water ad libitum. The male albino rats were divided in to 3 groups. The group –I was control, group- II and group –III were treated. The group –II rats were treated with the dose of 200mg/kg and group–III rats were treated with 300mg/kg of methanol extract. The administration of extract was done for 21days through oral.

Blood samples were collected on 22nd day through retro orbital puncture. Then the rats were sacrificed and dissected and vital organs were separated. The vital organs were weighed and cauda epididymis was teased finely in 20ml of normal saline for collection of sperms. 1ml of the saline was placed on Neubauer chamber and covered with cover slip to count sperms. The sperm motility was calculated by

\[
\text{Sperm motility (%) } \times 100
\]

The number of sperms were in millions/ml. The blood samples were centrifuged to separate serum and serum samples were used for serological tests. The serological tests were performed by using commercially available kits. Glycogen, proteins were estimated in liver and testis by modified Anthrone and Lowry methods respectively. The testes were processed for the histological studies. The results were assessed by performing one way ANOVA, Dunnet multiple comparison test with significance p<0.05.

**RESULTS:**

Final body weights of all rats were increased in the control and treated groups. Testis and cauda epididymis, seminal vesicle, weights were decreased in the treated groups compare to control group (Table: 1).

**TABLE-1: EFFECT OF ELYTRARIA ACUALIS EXTRACTS ON TOTAL BODY AND VITAL ORGAN WEIGHTS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Body weights</th>
<th>Seminal vesicle (mg)</th>
<th>GSI (Gonado Somatic Index)</th>
<th>Cauda epididymis (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial b.wt (gr)</td>
<td>Final b.wt (gr)</td>
<td>Testis (gr)</td>
<td>806±76.34</td>
</tr>
<tr>
<td>Control</td>
<td>177.5±22.5</td>
<td>228.12±39.99</td>
<td>1.535±0.10</td>
<td>819.37±17.81</td>
</tr>
<tr>
<td>Group-II</td>
<td>170.62±13.21 b</td>
<td>228.75±18.27 b</td>
<td>1.385±0.12</td>
<td>740±202.41 b</td>
</tr>
<tr>
<td>Group-III</td>
<td>171.25±13.82 b</td>
<td>212.5±11.64 b</td>
<td>1.290±0.06</td>
<td>740±202.41 b</td>
</tr>
</tbody>
</table>

All values expressed in mean ± SD With n=8, *p<0.05, **p<0.01, b=p>0.05 Compare to control

The sperm count was decreased in the group-II and group-III rats compare to the control. The sperm motility was also decreased in the treated groups (Table: 2). Serum protein levels were decreased in the both treated groups. The serum cholesterol, triglycerides values were elevated in the treated groups compare to the control (Table: 3). The serum parameters like SGOT, SGPT levels were increased and glucose levels were decreased in the group-II and group-III than to the control (Table – 4). Glycogen content of testis and liver was decreased in the treated groups compare to control.

The protein content also decreased in the group-II and group-III rats (Table: 5).

**TABLE 2: EFFECT OF ELYTRARIA ACUALIS EXTRACTS ON SPERM COUNT AND MOTILITY**

<table>
<thead>
<tr>
<th>Group</th>
<th>Sperm Count (mil/ml)</th>
<th>Sperm motility (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>45.95±9.01</td>
<td>70.25±0.18</td>
</tr>
<tr>
<td>Group-II</td>
<td>35.67±2.99 **</td>
<td>61.45±0.36 **</td>
</tr>
<tr>
<td>Group-III</td>
<td>34.26±3.46 **</td>
<td>54.64±0.23 **</td>
</tr>
</tbody>
</table>

All values expressed in mean ± SD With n=8, *p<0.05, **p<0.01, b=p>0.05 Compare to control
TABLE 3: EFFECT OF ELYTRARIA ACUALIS EXTRACTS ON SEROLOGICAL PARAMETERS

<table>
<thead>
<tr>
<th>Group</th>
<th>Triglycerides (mg/dl)</th>
<th>Cholesterol (mg/dl)</th>
<th>Protein (g/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>75.64±0.61</td>
<td>121.16±1.44</td>
<td>7.33±0.40</td>
</tr>
<tr>
<td>Group- II</td>
<td>81.17±1.20**</td>
<td>130.60±0.47**</td>
<td>6.55±0.24**</td>
</tr>
<tr>
<td>Group- III</td>
<td>82.67±0.67**</td>
<td>133.59±0.81**</td>
<td>6.49±0.25**</td>
</tr>
</tbody>
</table>

All values expressed in mean ± SD With n=8, *p<0.05, **p<0.01, b=p>0.05 Compare to control

TABLE 4: EFFECT OF ELYTRARIA ACUALIS EXTRACTS ON SEROLOGICAL PARAMETERS

<table>
<thead>
<tr>
<th>Group</th>
<th>SGPT (IU/L)</th>
<th>SGOT (IU/L)</th>
<th>Glucose (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>31.83±0.40</td>
<td>20.28±0.25</td>
<td>85.56±0.35</td>
</tr>
<tr>
<td>Group- II</td>
<td>32.76±0.57**</td>
<td>22.62±0.24**</td>
<td>82.52±0.29**</td>
</tr>
<tr>
<td>Group- III</td>
<td>35.57±0.30**</td>
<td>26.25±0.08**</td>
<td>81.40±0.55**</td>
</tr>
</tbody>
</table>

All values expressed in mean ± SD With n=8, *p<0.05, **p<0.01, b=p>0.05 Compare to control

FIGURE 1: CROSS SECTION OF RAT TESTIS (CONTROL), SHOWING THE WELL DEVELOPED GERMINAL CELLS IN SEMINIFEROUS TUBULES AND INTEGRITY AMONG THE SEMINIFEROUS TUBULES

FIGURE 2: CROSS SECTION OF RAT TESTIS (GROUP-II) SHOWS THE DISARRANGED SEMINIFEROUS TUBULES

FIGURE 3: CROSS SECTION OF RAT TESTIS (GROUP-III) SHOWS THE LACK OF INTEGRITY AMONG THE SEMINIFEROUS TUBULES AND LOSS OF INTERSTITIUM

CONCLUSIONS: The decreased sperm count, motility and vital reproductive organs weights revealing the effect of extracts on fertility. The biochemical parameters like tissue glycogen, protein in liver and testis were decreased where as serum cholesterol, triglycerides, SGOT, SGPT were increased in the treated groups. The results were explaining the antifertility activity of the plant. Though the histological sections also supporting the results still there is a need of further studies to confirm the antifertility activity of Elytraria acaulis.
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REFERENCES: