University of Khartoum
Faculty of Animal Production
Department of Animal Nutrition

Effect of Maturity Stage On The nutritive value of

Ischaemum afrum

Supervisor: Dr
Alsamani Omer Amasaib

Submitted by:
Sana Ibrahim Mohamed
Introduction

Native grass species are important forage sources for grazing ruminants because they are well adapted, drought-resistant, provide dependable forage production, have an extensive root system, increase soil fertility and require low input costs. These characteristics make them very suitable for inclusion in a balanced and sustainable grazing system, particularly in low rainfall areas. (Ramirez et al., 2004).
Grasses are the C4 plants which contain most extensive, much needed and familiar component of range vegetation especially in extreme climates of the range areas. Grasses are more easily accessible, better in taste and quicker in digestion than shrubs and trees (Quraishi, 1999).
The present study was undertaken in attempt to:

- Determine the variation in chemical composition of Ancouj (*Ischaemum afrum*) in different stage of maturity.

- Determine the mineral in these varieties.

- Determine the effect of different stage of maturity on digestibility.
Taxonomy and Botany:

Taxonomy:

Family: Gramineae
Scientific name: Ischaemum afrum
Local name: Ankouj

Botany:

*Ischaemum afrum* “Ankouj” perennial, caespitose, Rhizomes elongated, scaly, culms 20-200cm long, Lique an eciliatr membrane, Leaf blade 10-50 cm long; 3-10 wide. It is wide spread through Africa, tropical areas, India and Asia (Clayton et al, 2006).
MATERIAL AND METHOD
Samples and preparation:

Three different maturity stage samples of ancouj (Ischaemum afrum) were collected.

The samples were dried and thoroughly mixed and ground in hummer mill with stainless steel knives to pass through a 1mm screen.
Laboratory analysis:

Proximate composition:

All samples were analyzed for their proximate analysis to dry matter (DM), ash, crude protein (CP), ether extract (EE), crude fiber (CF) and nitrogen free extract were determined according to AOAC (1990).
In vitro gas production:

All samples of ancouj (*Ischaemum afrum*) in different cuts were incubated invitro with rumen fluid in calibrated glass syringes of 100ml following the procedures of Menke and Steigass (1988).
Mineral determination:

Mineral content was determined as described in the AOAC (1990). Ash was dissolved in Hcl, worm to dissolve soluble constituents and filtered through an acid-washed filter paper and any residue with hot water. Diluted to volume, mixed and saved for analysis’ K was determined by flame photometer and Mg, Ca was determined by titration and P by atomic absorption spectrophotometer.
Statistical analysis:

Data were subjected to analysis of variance using (ANOVA) according to Steel et al., (1997). The Differences between means done by least significant difference (LSD).
RESULT
**Table 1: Chemical composition of different cuts of Ischaemum afrum:**

<table>
<thead>
<tr>
<th>Sample</th>
<th>DM</th>
<th>CP</th>
<th>CF</th>
<th>ASH</th>
<th>EE</th>
<th>NFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut1</td>
<td>93.43b</td>
<td>3.008a</td>
<td>26.57b</td>
<td>11.50c</td>
<td>2.053a</td>
<td>50.29a</td>
</tr>
<tr>
<td>Cut2</td>
<td>96.44a</td>
<td>2.894b</td>
<td>34.42a</td>
<td>12.95b</td>
<td>1.906b</td>
<td>44.27b</td>
</tr>
<tr>
<td>Cut3</td>
<td>98.27a</td>
<td>2.568c</td>
<td>36.51a</td>
<td>13.69a</td>
<td>1.40c</td>
<td>44.09b</td>
</tr>
<tr>
<td>SEM±</td>
<td>0.7</td>
<td>0.033</td>
<td>5.48</td>
<td>0.038</td>
<td>0.033</td>
<td>4.414</td>
</tr>
</tbody>
</table>


a b c Mean on the same column with different superscripts differ significantly at P<0.05.
Table 2: Macro minerals content (g/kg) in *Ischaemum afrum*:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Ca</th>
<th>Mg</th>
<th>K</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut1</td>
<td>0.417&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.683&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.248&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cut2</td>
<td>0.333&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.18&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.863&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.165&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cut3</td>
<td>0.317&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.065&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.246&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.211&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>SEM±</td>
<td>0.024</td>
<td>0.025</td>
<td>0.343</td>
<td>0.046</td>
</tr>
</tbody>
</table>
Table 3: Effect of different cuts of *Ischaemum afrum* on *in vitro* Dry Matter Digestibility:

<table>
<thead>
<tr>
<th>Sample</th>
<th>a</th>
<th>b</th>
<th>C</th>
<th>a+b</th>
</tr>
</thead>
<tbody>
<tr>
<td>stage1</td>
<td>0.396(^b)</td>
<td>60.75(^a)</td>
<td>0.0128(^b)</td>
<td>61.146(^a)</td>
</tr>
<tr>
<td>stage2</td>
<td>0.1966(^b)</td>
<td>46.44(^{ab})</td>
<td>0.0177(^b)</td>
<td>46.24(^{a+b})</td>
</tr>
<tr>
<td>stage3</td>
<td>2.653(^a)</td>
<td>40.28(^b)</td>
<td>0.0281(^a)</td>
<td>42.932(^{b})</td>
</tr>
<tr>
<td>SEM(\pm)</td>
<td>0.408</td>
<td>3.48</td>
<td>1.29</td>
<td>3.53</td>
</tr>
</tbody>
</table>

*(a) = Gas produced from soluble fraction (ml/200 mg DM); (b) = gas produced from insoluble fraction but fermentable fraction (ml), the potential gas production \((a+b)\) (ml); and (c) = rate of gas production during incubation (ml/ h\(^{-1}\)).
Figure: Illustrate the volume of gas production from different cuts of *Ischaemum afrum*.
Conclusion:

With advancing maturity in *Ischaemum afrum* from the first cut through the last cut, a downward trend in Protein, EtherExtrat and Ash content was accompanied by upward trend in the content of crude fiber. All the three cuts are meeting minerals requirement Ca, Mg, K and P). In General there was a decrease in the digestibility with increasing maturity.
THANK YOU