Uses and Chemical Composition of Mistletoe (Viscum album) Obtained From Different Species of Trees

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ABSTRACT
Mistletoe plays an important role in the life of rural people as it has nutritional and medicinal values for livestock and human respectively. In Nigeria, mistletoe is used as a remedy for several health ailments and as animal feed. Ruminants and local fowls do relish it without any reported digestive disorder. Feed has remained a major constraint in animal production, hence the need to search for alternative protein sources that are cheap. Mistletoe is a promising plant since it is an evergreen, perennial and semi-parasitic shrub available when other multipurpose tree species shade their leaves. The study was conducted to explore the utilization and nutrient composition of mistletoe obtained from different species of trees. A total of 120 questionnaires were administered to obtain information about the nutritional as well as the medicinal importance of mistletoe. It can be seen from the result that 87.5% of the respondents were male and 90% were married. The result also indicated that 82.5% of the respondents use mistletoe as feed for livestock especially during the dry season as it is known to be an ever green plant. For medicinal purpose, 94.2% of the respondents believe that mistletoe served as a cure to some diseases. Samples were collected from five different trees infested with mistletoe. The proximate composition revealed no significant difference (p>0.05) in terms of crude protein (CP) among all the treatments (Feidherbia albida, Psidium guajava, Parkia biglobosa, Vitallaria paradoxa, pilostigma reticulatum), while Feidherbia albida and Psidium guajava shows significant difference (p<0.05) in terms of crude fibre (CF) over other treatments. Ether Extract (EE) is also significantly higher in Feidherbia albida while Nitrogen free extract (NFE) is higher in Parkia biglobosa. In terms of Ash content, Parkia biglobosa, Feidherbia albida, and Vitallaria paradoxa shows significant difference over others. The study concluded that the parasitic plant played an important role in the life of rural people as it is used for medicinal purposes by humans and it is a good source of feed for ruminants especially during the dry season period since it is an evergreen parasitic plant.

Keywords: mistletoe, utilization, chemical composition, livestock feed

INTRODUCTION
Mistletoe is a general term for woody shoot parasites in several plant families, especially in Loranthaceae and Viscaceae families (Ogunmefun et al., 2013; Begho et al., 2007). It is popularly called “Kauchi” and “ewe afomon” among the Fulani and Yoruba speaking people of Nigeria, respectively. It is an obligate semi-parasitic evergreen tropical plant, normally found growing on a variety of trees, including palm fruit, mahogany and other tropical plants. Birds feed on the fruit of the plant and the undigested seeds from the bird droppings are spread on tree branches and thus germinate on the host plant (Adesibi et al., 2013). Mistletoe is always produced by seed and cannot be cultivated in the soil like other plants, hence the ancients considered it to be an excrescence of the tree. By rubbing the berries on the smooth bark of the underside of the branches of tree till they adhere, or inserting them in clefts made for this purpose, mistletoe could be grown quite successfully (Grieve, 2010).

In Nigeria, mistletoe is used as a remedy for several human and animal ailments that include stomach ache, diarrhoea, dysentery, wound and cancer. Ruminants and local fowls do relish it without any reported digestive disorder (Egbewande et al., 2011). Mistletoe has been analyzed and observed to contain lecithin, viscosotxin, polysacchardies and many phytochemicals as an active ingredient (Adesibi et al., 2013). It has been reported to have hypoglycaemic properties; since it decreases the blood glucose level and has effects in controlling the loss of body weight which occurs in person with diabetes mellitus (Obatomi et al., 1994). Mistletoe has also been used in the treatment of problems, such as epilepsy, infertility in men and women, menopausal syndrome and rheumatism (Bonnia et al., 1998). According to Gammon (1999), one of the most important limitations to beef production is poor performance of livestock during the dry season. The use of protein-rich leguminous trees and shrubs
appears to be one sustainable solution for dry season ruminant supplementation in the tropics. Feed supply, according to Amaefule et al., (2004), has remained a major constraint in animal production due to the ever increasing cost of conventional feedstuffs occasioned by the competition between man and livestock for cereal grains and protein sources; hence the need to search for alternative protein sources that are cheap, readily available and less competed for by man and the industry (Akinmutimi, 2004). Many multipurpose tree species are used in feeding livestock especially at critical period such as during the dry season. Mistletoe is a promising plant since it is an evergreen, perennial and semi-parasitic shrub and is available when other multipurpose tree species shade their leaves. The use of mistletoe as animal feed is of greater benefit to farmers as it improves and supplements animals feed at scarce period and hence reduces cost of production. In view of the contribution by this parasitic plant, the study is aimed at documenting the uses and nutritive value of Mistletoe (Viscum album).

MATERIALS AND METHODS

Study Area
The study was carried out in Kiyawa one of the 27 Local Governments in Jigawa State covering a total land area of 925km² according to Jigawa state statistical year book (2005). It is one of the densely populated areas in Jigawa state. It is located at 11°47'05"N and 09°36'30"E, with an estimated population of 172,952 as of 2006 (NPC 2006). Majority of the people are Hausa and Fulani; Islam is the dominant religion practiced in the area.

Questionnaire design and administration
A total of 120 questionnaires were used and was designed to collect information on the nutritional and medicinal values of African mistletoe. Three settlements were randomly selected from each of the eight (Andaza, Balago, Fake, Katuka, Kiyawa, Kwanda, Maje, Shuwarin) out of eleven wards of the local government, and five people were purposively selected from each ward to fill the questionnaire.

RESULTS AND DISCUSSION
The personal characteristics of the respondents are presented in Table 1. It shows that about 87.5% of the respondents are males. Greater percentage of the respondents (40%) belonged to the 30-34 age bracket; 11.67% are in the 20-24 age group, while about 32.5% are aged between 25 and 29 years. Smaller percentage (5% and 10.8%) of the respondents are less than 20 years and above 35 years respectively. Furthermore, about 94.17% of the respondents are of the Islamic faith, while 5.83% did not indicate their religious leanings. None of the respondents was a Christian because Islam is the predominant religion of practice in the area and as well Christians in the study area are not into farming activities, but are mostly civil servants and traders. Also 90% of the respondents are married, while the remaining 10% are single. It is not surprising that majority are married as Hausa/Fulani are known to marry early (Friday, 2008).
The result from table 2 shows that 82.5% of the respondents use mistletoe as animal feed while 94.2% uses it for medicinal purpose. All the respondents believed that the plant can be used as a cure for charm 'sammu'. This has also been reported by Egbewande et al., (2011) that mistletoe could be use as feed and as well medicine. Egbewande et al., (2011) replaced Groundnut cake with mistletoe leaf meal and observed no deleterious effect on the birds, it stimulate feed intake and increase feed gain ratio. In Nigeria, the Hausa and Fulani tribes of Northern Nigeria use mistletoe in the treatment of cancers and inflammations (Abubakar et al., 2007). Animal consume it with relish provably because of high nutritional quality of mistletoe tissues (Watson et al., 2008).

Table 3 showed the distribution of the respondents according to diseases cured by mistletoe. Some believed that it can be used for treatment of cancer, while others believed that it can be used to heal wounds as well cure ulcer. It is not surprising that all the respondents believed that the parasitic plant can cure many other diseases because they believed mistletoe can be used to treat unknown diseases. The result showed that 65.48% of the respondent used mistletoe as medicine to treat disease and it worked. However, only 34.5% believed that it could be used for treatment of diseases.
Table 4: percent farmers that use mistletoe to treat disease

<table>
<thead>
<tr>
<th>Option</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>74</td>
<td>65.48</td>
</tr>
<tr>
<td>No</td>
<td>39</td>
<td>34.51</td>
</tr>
</tbody>
</table>

Table 5: Chemical Composition of mistletoe from different tree species

<table>
<thead>
<tr>
<th>Parameter (%)</th>
<th>Parkia biglobosa</th>
<th>Feidherbia albida</th>
<th>Treatments pilostigma reticulatum</th>
<th>Psidium guajava</th>
<th>Vitallaria paradoxa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude protein (CP)</td>
<td>6.33</td>
<td>7.15</td>
<td>8.09</td>
<td>6.50</td>
<td>7.48</td>
</tr>
<tr>
<td>Crude fibre (CF)</td>
<td>28.19&lt;sup&gt;b&lt;/sup&gt;</td>
<td>37.77&lt;sup&gt;b&lt;/sup&gt;</td>
<td>30.10&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>33.11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>29.0&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ether Extract (EE)</td>
<td>4.13&lt;sup&gt;c&lt;/sup&gt;</td>
<td>8.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.72&lt;sup&gt;c&lt;/sup&gt;</td>
<td>6.28&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.50&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nitrogen free extract (NFE)</td>
<td>56.48&lt;sup&gt;a&lt;/sup&gt;</td>
<td>41.92&lt;sup&gt;b&lt;/sup&gt;</td>
<td>53.09&lt;sup&gt;a&lt;/sup&gt;</td>
<td>49.98&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>51.86&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ash</td>
<td>4.87&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5.16&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.13&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.16&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

The result presented in Table 5 showed no significant difference (p<0.05) in terms of CP among all the treatments, while Feidherbia albida and Psidium guajava shows significant difference (p<0.05) in terms of CF over other treatments. EE is also significantly higher in Feidherbia albida while NFE is higher in Parkia biglobosa. In terms of Ash content, Parkia biglobosa, Feidherbia albida, and Vitallaria paradoxa shows significant difference over others. The crude protein content of the mistletoe obtained from the present study indicates a range of 6 to 8%. These values are within the value range of most tropical grasses (Le Houerou, 1980). This therefore is an indication that mistletoe could serve as a good source of feed for ruminants. The crude fibre value range of 28 to 36% obtained in the study corresponds with the values of Le Houerou (1980) who reported high values of crude fibre on browse plants in the tropical environment especially during the dry season.

**CONCLUSION**

It is a well known fact that feeding ruminants in the semi-arid environment of Nigeria becomes very critical especially during dry season. In this regard, mistletoe has been used and in the present study, it is found that it can be used as animal feed and for medicinal purposes. In this way, mistletoe can help in livestock health improvement, and production. However, to use mistletoe effectively as medicine, knowledge of its chemical properties and the specie to be used is needed.

**REFERENCES**


