Prevalent Phenomenon of Predation Observed Among Wild Chimpanzees of the Mehale Mountains

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Abstract I was engaged in the sociological and ecological study of wild chimpanzees in the Mahale Mountains in Western Tanzania for about two years from September, 1975 through October, 1977. It was made clear by the data I obtained concerning carnivorous behavior among wild chimpanzees that their predation happens intensively during only one or two months. It can be presumed that this intensity is distinct from seasonal periods of predation. Also coincidence of time of intensive predation was observed among neighboring group of wild chimpanzees.

INTRODUCTION
Carnivorous behavior among wild chimpanzees has been studied by Teleki (1973), Nishida et al. (1979) and others concerning the kinds of animals eaten by chimpanzees, frequency and seasons of being predatory, way of hunting, and other activities. Goodall (1971) alone touched briefly upon the intensive predation in short rather than seasonal periods of predation. I could study the phenomenon of this intensity of predation in detail and my report of the results is given here.

METHODS OF OBSERVATION
I was engaged in the study of the groups of wild chimpanzees for about two years from September 21, 1975 to October 31, 1977 in the Mahale Mountains in west Tanzania. M-Group, which is the main subject of this study, numbers about 80 individuals. The individuals of this group have been identified and studied continuously since 1968 by Japanese researchers and Tanzanians living in the area. This group is adjacent to K-Group of about 30 individuals on the north. Please refer to Nishida (1968) and Nishida & Kawanaka (1972) for details concerning these groups.

I took a leading role in the study of M-Group while I was there. When I was away during the study period, the staff of Kasoje Chimpanzee Research Center (KCRC), especially Ramadhani Nyundo, Mohamedi Seifu and Jumanne Kasuramenba continued the study systematically. Dr. T. Nishida and Mr. S. Uehara, the Japanese researchers, who were longer in the area, studied chiefly K-Group April, 1975 to May, 1976 and from November, 1976 to November, 1977 respectively. From June to October, 1976, I studied K-Group.

I obtained data of carnivorous behavior through direct observation and indirectly through analysis of the droppings.

Table 1 gives data concerning the days of this study; there were 404 days in total during a period of two years.

Since the members of KCRC continued the study while I was away, the study of M-Group was followed almost every day throughout the period. There were 374 days in total when other members of KCRC and I observed the individuals of M-Group directly (Table 1).
Table 1. Number of days per month spent in observing the M-Group and K-Group.

<table>
<thead>
<tr>
<th>Number of observed days</th>
<th>Number of day observed the individuals of M-Group directly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 21 20 20</td>
<td>17 15</td>
</tr>
<tr>
<td>Feb. 14 22 22</td>
<td>3 19</td>
</tr>
<tr>
<td>Mar. 17 15 15</td>
<td>2 11</td>
</tr>
<tr>
<td>Apr. 18 11 11</td>
<td>10 10</td>
</tr>
<tr>
<td>May 14 22 22</td>
<td>8 20</td>
</tr>
<tr>
<td>Jun. 21 19 19</td>
<td>18 17</td>
</tr>
<tr>
<td>Jul. 20 18 18</td>
<td>17 20</td>
</tr>
<tr>
<td>Aug. 22 10 10</td>
<td>21 22</td>
</tr>
<tr>
<td>Sep. 44 15 18</td>
<td>7 26 20</td>
</tr>
<tr>
<td>Oct. 10 15 11</td>
<td>7 23 12</td>
</tr>
<tr>
<td>Nov. 15</td>
<td>8 21</td>
</tr>
<tr>
<td>Dec. 22 9</td>
<td>6 19</td>
</tr>
<tr>
<td>Total 404</td>
<td>Total 374</td>
</tr>
</tbody>
</table>

We brought back all the droppings found during the regular observations. The analysis of their contents was useful in analyzing the eating habits of chimpanzees. We found vegetable food such as undigested seeds, leaves, stalks, and insects such as ants. In addition to these, we found fur, bones and bits of the flesh of animals, which enabled us to presume the presence of carnivorous behavior.

RESULT

As given in Table 2, there are 29 carnivorous cases, which are based on direct observations and indirectly through the analysis of the droppings. Included among the victims of predatory animals are both wild animals and geese bred domestically at the study base.

There are 15 cases where carnivorous behavior was observed directly. Each month I could find, gather and analyze on the average about 100 droppings of M-Group. There were 23 droppings in which I could find undigested animal remains such as fur, flesh, and bones. I excluded from Table 2 the cases in which only a little fur of chimpanzees was found in the droppings, because it is presumed that the fur belonged to the chimpanzees who defecate. These 23 samples of droppings were gathered in 10 days. One of the samples was gathered just after carnivorous behavior was directly observed. (Two cases lack confirmation.)

In a case where animal matter was found in several droppings gathered on the same day, it could be presumed that these droppings came from the result of more than one case of carnivorous behavior even if the droppings are of the same kind, but I regarded them as the result of one case of carnivorous behavior.

The recorded carnivorous behavior happened intensively during one or two months, not at random. Once carnivorous behavior was not observed, such behavior did not start again for a while. Consequently our observation of carnivorous behavior was limited to the following 6 time periods.

As for M-Group:
1) 4 times during 20 days between 1 and October 20, 1976
2) 3 times during 58 days between November 22, 1976 and January 18, 1977
3) 3 times during 69 days between May 10 and July 27, 1977
4) 5 times during 36 days between September 23 and October 28, 1977

As for K-Group
1) 5 times during 44 days between June 2 and
Table 2(a). Predation by chimpanzees on mammals and birds (M-Group).

<table>
<thead>
<tr>
<th>Date</th>
<th>Direct evidences</th>
<th>Fecal analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oct. 1</td>
<td><em>Gallus gallus</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 6</td>
<td><em>Colobus badius</em></td>
<td><em>Colobus badius</em></td>
</tr>
<tr>
<td>Oct. 8</td>
<td></td>
<td><em>Colobus badius</em></td>
</tr>
<tr>
<td>Oct. 20</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>Nov. 22</td>
<td><em>Platyrhini</em></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan. 13</td>
<td><em>Pan troglodytes</em></td>
<td></td>
</tr>
<tr>
<td>Jan. 14</td>
<td><em>Pan troglodytes</em></td>
<td></td>
</tr>
<tr>
<td>Jan. 18</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>May 10</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>Jul. 1</td>
<td></td>
<td><em>Tragelaphus scriptus</em></td>
</tr>
<tr>
<td>Jul. 27</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>Sep. 23</td>
<td><em>Tragelaphus scriptus</em></td>
<td></td>
</tr>
<tr>
<td>Sep. 24</td>
<td></td>
<td><em>Tragelaphus scriptus (?)</em></td>
</tr>
<tr>
<td>Oct. 3</td>
<td></td>
<td><em>Nesotragus moschatus</em></td>
</tr>
<tr>
<td>Oct. 6</td>
<td><em>Potamochoerus porcus</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 28</td>
<td><em>Colobus badius</em> (or <em>Tragelaphus scriptus</em>)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2(b). (K-Group).

<table>
<thead>
<tr>
<th>Date</th>
<th>Direct evidence</th>
<th>Fecal analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1976</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun. 2</td>
<td><em>Centropus superciliosus</em></td>
<td></td>
</tr>
<tr>
<td>Jun. 29</td>
<td><em>Heterohyrax brucei</em></td>
<td></td>
</tr>
<tr>
<td>Jul. 7</td>
<td><em>Nesotragus moschatus</em></td>
<td></td>
</tr>
<tr>
<td>Jul. 12</td>
<td><em>Gallus gallus</em></td>
<td></td>
</tr>
<tr>
<td>Jul. 17</td>
<td><em>Nesotragus moschatus</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 14</td>
<td><em>Heterohyrax brucei</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 22</td>
<td><em>Colobus badius</em></td>
<td></td>
</tr>
<tr>
<td>Nov. 11</td>
<td><em>Colobus badius</em></td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 23</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>Jul. 17</td>
<td></td>
<td>unidentified</td>
</tr>
<tr>
<td>Aug. 24</td>
<td><em>Nesotragus moschatus</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 17</td>
<td><em>Nesotragus moschatus</em></td>
<td></td>
</tr>
<tr>
<td>Oct. 18</td>
<td></td>
<td><em>Nesotragus moschatus</em></td>
</tr>
</tbody>
</table>

July 14, 1976
2) 3 times during 29 days between October 14 and November 11, 1976
Since the beginning of observation the periods when no carnivorous behavior was observed lasted in order, 375 days, 32 days, 112 days, and 56 days. The above figures show that carnivorous behavior was recorded three to five times intensively in one or two months. It was from May to November, 1976 that I could collect data on both K-Group and M-Group.

Out of two periods of intensive predation observed in K-Group during this observation, one overlapped that of M-Group.

Discussion
To begin with I want to analyze the intensive predation which I observed during this research in relation to seasonal periods of predation. Six time periods of predation were intensively observed between May and January. No predation was observed between Feb-
ruary and April. However, predation observed between May and January happened intensively at particular periods, not at random. This indicates that predation might happen intensively to a certain extent depending on the season, but at the same time the possibility of intensive predation at certain periods irrespective of the seasons cannot be denied.

The fact that M-Group's intensity of carnivorous behavior corresponds with that of K-Group indicates that carnivorous behavior is a somewhat prevalent phenomenon among wild chimpanzees and that it can be observed beyond the bounds of separate groups. This fact might be related to the chimpanzees' strong preference for raw flesh. GOODALL (1971) mentions this as a cause of their intensive carnivorous behavior. It can be suggested that coincidence of time periods of intensive predation between groups is due to the coincidence of seasons of being predatory between the groups but more information will be needed to clarify this question. According to personal communication with Mr. S. Uehara I learned that the times of K-Group's predation in 1977 coincided almost entirely with that of M-Group, except for January.

ACKNOWLEDGEMENTS
I am greatly indebted to Japan International Cooperation Agency (JICA) which sent me to Tanzania as an Expert of primatology, the Ministry of Natural Resources and Tourism, Tanzania Government, under which I worked as a Game Research Officer at Kasoje Chimpanzee Research Center (now the Mahale Mountains Wildlife Resarch Center). I must express my gratitude to prof. J. Itani for his constant encouragement; to Dr. T. NISHIDA and Dr. S. UEHARA for kind help and valuable suggestion; to prof. T. KITAHARA for his kind help in preparing this manuscript. I would like to deeply thank our colleagues and field assistants of KCRC.

REFERENCER

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野生チンパンジーにおける肉食行動の流行現象

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筆者は、1975年9月から1977年10月までの約2年間に、西部タンザニアのマハレ山脈において野生チンパンジーの社会・生態学的研究を行った。そこで得られた肉食行動の資料から、肉食行動が1、2ヶ月の間に集中して出現することを明らかにした。ここで得られた集中性は、それより長い季節性とは別の性質であると考えられる。また、隣接集団間で、この集中性の時期に同調性がみられた。

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