

LITTER SIZE IN MARKHOR

by

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Summary. Litter size in markhor was determined in Chitral Gol game sanctuary during the first fortnight of July, 1977, one month after the birth of young ones. A kid/female ratio of 1.2 was observed. Percentage of younger age gradations in the population was more except one year and 2-year-age classes which indicated mortality in the previous 2 years. Kid/female ratio in various age gradations showed that the reproductive activity was less in younger age classes. Twinning was a rule in females more than 8 years, whereas the frequency of twinning was more in females older than 5 years.

Introduction. From June 29, 1977 to July 13, 1977 Chitral Gol was surveyed to determine the litter size in markhor (*Capra falconeri falconeri*).

The reports on the young/female ratio have so far been made for the winter season when the rut was on (Schaller, 1971; Aleem, 1977) and the time when the rut was just over (Schaller, 1973, 1974 unpublished and Aleem, 1976) and the kids had already grown 6-8 months old. Schaller reported a ratio of 1.2:1, 1.3:1, 1.4:1, for different years whereas Aleem reported the ratio 0.56 (1976) and 0.25 (1977). No definite reason could be advanced to explain the low ratios reported for the previous two years.

It was decided to carry out periodic surveys within the period, markhor give birth to their young and the rut season to determine the litter size and also the possible causes of mortality (if it is occurring). The paper is a report on the first trip made in this regard.

The markhor give birth to their young during May-June (Prater, 1973) and like other goats and sheep keep their young in secluded places after they are born upto a time when they start foraging independently. This period has been determined as a month in the least. The first trip of the series was thus made in the first fortnight of July with a view to attain maximum possible sightings of female markhor with the young.

Method. Chitral Gol was visited during the study period. Binoculars (7 × 50) were used for spotting the animals and their categorizing by age and sex. Number of kids per female was determined by observing the young following the mothers. The age of females was determined by comparing the body size, mainly based on the personal experience. Weather throughout remained quite fair and spotting was possible five to six thirty in the morning and late in the evening from five to seven. Because of the large area, all the population, however could not be observed.

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Population. Number of adult females and kids seen in different localities is as under:

| Locality | Females | Kids |
|------------------|---------|------|
| Shadehar | 1 | 1 |
| Thok Jal | 1 | 1 |
| Thusi | 9 | 12 |
| Daleem Dehar | 4 | 5 |
| Tongogh | 5 | 7 |
| Ishpe dher | 7 | 9 |
| Chhat | 32 | 32 |
| Dudi Pahar, Duni | 14 | 20 |
| | 73 | 87 |

Thus the average kid/female ratio observed was 1.2.

Jarvis (1965-68) and Lucas (1969-70) (cf. Schaller, 1971) reported a 0.95:1 kid/female ratio (93/98) amongst markhor of unspecified race born in various zoos. Rudge (1969) while studying shot samples of feral goats (*Capra hircus* L.) from various forests near Wellington, New Zealand reported 33 embryos from 38 pregnant females, a ratio of almost 0.87:1. Rudge (1970) also reported a population of 36 females of all age classes in Rimutake Range, New Zealand, observed for 909 'goat months' (3-5 years), giving birth to 72 kids, during the period, which reached sexual maturity i.e., 6 months age (a ratio of 0.95 kids/female/year).

The ratio of 1.2 obtained in this study tallied with that of Schaller: 1.2, 1.3, and 1.4 for 1970, 1972 and 1974.

Percentage of female age classes: The percentage of age classes (mainly determined on the basis of personal experience) of the females in a population of 73 was as follows:

| Age class year | Number in population | Percentage in population |
|----------------|----------------------|--------------------------|
| 1 | 7* (Yearling) | 11 |
| 2 | 8 | 19 |
| 3 | 14 | 16 |
| 4 | 12 | 15 |
| 5 | 11 | 12 |
| 6 | 9 | 10 |
| 7 | 7 | 07 |
| 8 | 5 | 06 |
| 9 | 4 | 03 |
| 10 | 2 | 01 |
| 11 | 1 | |

*Not included in the female population with kids.

The age structure showed a gradual decline in percentage from younger to older age gradations suggesting a normal life structure, except that the number of one and 2 year old females was lower than expectation indicating possible heavier than normal mortality in the young in 1975 and 1976.

Young/female/age class ratio. The number of young per female in the various age classes was as follows:

| Age class years | Number of females | Number of kids | Kid/female ratios |
|-----------------|-------------------|----------------|-------------------|
| 1 | 7 (Yearlings) | — | — |
| 2 | 8 | 3 | 0.38 |
| 3 | 14 | 12 | 0.86 |
| 4 | 12 | 11 | 1.00 |
| 5 | 11 | 12 | 1.83 |
| 6 | 9 | 15 | 1.80 |
| 7 | 7 | 11 | 1.80 |
| 8 | 5 | 9 | 1.80 |
| 9 | 4 | 8 | 2.00 |
| 10 | 2 | 4 | 2.00 |
| 11 | 1 | 2 | 2.00 |

The above data indicate an increase in litter size with increase in age.

Sexual maturity. The following age classes were observed without kids:

| Age class | Number of females | Number without kids | Percent |
|-----------|-------------------|---------------------|---------|
| 1 | 7 | 7 | 100 |
| 2 | 8 | 5 | 63 |
| 3 | 14 | 2 | 13 |
| 4 | 12 | 2 | 17 |
| 7 | 7 | 1 | 15 |

Five of the shot female feral goats were pregnant or had been so under one year old (Rudge, 1969). Three females—7.5, 9 and 10 months old contained embryos of 100,680 and 1,760 gm whereas two others of 12 and 13 months were lactating. A female in the live population mated at the age of 138 days and was seen with a kid after 156 days when less than 10 months old. Williams and Rudge (1969) observed that female feral goats less than one year old showed no signs of reproductive activity in Macauley Island, New Zealand. Those older were divided into two age groups, '1-2 years' and 'two years plus'. Within these age groups only 7.6% showed no reproductive activity, and 28.6% were lactating only. Fewer females were in non-breeding condition in the two year plus (4%) than in the 1-2 year class (27%). Samples consisted of 360 and 70 animals respectively.

Out of 7 one-year old females encountered during the study not a single one was seen accompanied by kids suggesting sexual maturity at the age of at least 1-1/2 years at the time of rut season. Even at this age, they fail to find their mates i.e., sexual activity remains suppressed as is obvious by the minimum kid female ratio in the 2 year age class where out of 8 females only 3 females were observed with the young, suggesting thereby a low frequency of pregnancy (38%). The failure to find their mates (or loss of young) was also seen to a lesser extent in the older females i.e., age 3 years where 2 females out of 14 were seen without any kids (14%) and age 4 years where two female out of 12 were seen

without kids (16%). No female more than 4 years old was seen without kids except one seven year old. This could be due to various other reasons including mortality.

Twinning rate. The kid births (single or twin) were categorised according to age classes as follows:

| Age, years | Total in age group | Number with twins | % | Number with single | % |
|------------|--------------------|-------------------|-----|--------------------|----|
| 2 | 8 | Nil | — | 3 | 37 |
| 3 | 14 | Nil | — | 12 | 87 |
| 4 | 12 | 1 | 8 | 9 | 75 |
| 5 | 11 | 1 | 9 | 10 | 91 |
| 6 | 9 | 6 | 66 | 3 | 34 |
| 7 | 7 | 5 | 70 | 1 | 15 |
| 8 | 5 | 4 | 80 | 1 | 20 |
| 9 | 4 | 4 | 100 | Nil | — |
| 10 | 2 | 2 | 100 | Nil | — |
| 11 | 1 | 1 | 100 | Nil | — |

24 females (33%) were observed with twins. Rudge (1969) reported a frequency of 52% twin embryos in shot samples of feral goats in forests near Wellington. He also reported 25% twin births in the live population (15 out of 60 recorded births) and indicated that the twins are subject to a substantial mortality late in development or at parturition. Williams and Rudge (1969) reported a higher proportion of single embryos in the 1-2 year old class (98%) than in the 2 year plus class (61%) in feral goat populations in Macauley Island, New Zealand. They reported the occurrence of twins—as 39% of females older than 2 years but only 2% of younger females.

Single births were recorded in females less than 4 years old whereas only two 4-year old and one 5 year old were observed with twins. The frequency of single births was more in 4 and 5 year age classes (87%) whereas the balance was shifted towards twinning in 6-8 year age classes (75%). No single births were observed in females older than 8 years.

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