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SHORT COMMUNICATION

THE TROPHY POTENTIAL OF HIMALAYAN THAR *(HEMITRAGUS JEMLAHICUS)* IN NEW ZEALAND

Summary: The horn length of male thar *(Hemitragus jemlahicus)* increased significantly with age, especially from birth to 5 years. Age, time of year, and body weight all influenced adult male horn length, but locality did not. Fewer than 1% of males produced horns of sufficient length to qualify as hunting trophies.

Keywords: Thar; tahr, *Hemitragus jemlahicus;* wildlife management; hunting; horns.

Introduction

Himalayan thar *(Hemitragus jemlahicus)* were introduced to New Zealand in 1904 (Donne, 1924) and now live in an area of about 5000 km' in the Southern Alps (Parkes and Tustin, 1985). The species is sexually dimorphic; adult males are up to twice as heavy as adult females, and their horns are up to twice as long (Tustin, *in press)*. The horns of males are valued by hunters as trophies.

We investigated some of the factors that influence horn length of male thar, with emphasis on those which might influence the ability to grow horns of trophy length. We calculate how many trophy animals are likely to be available and discuss whether the proportion of trophies could be increased by management practice.

Methods

In the winters (May - September) of 1971 to 1976, 1695 male thar were autopsied during commercial game meat recovery operations. For each animal, the length of one horn was measured from its tip along the top edge to the point closest to the skull, and age was calculated from the annual growth rings in the horn (Caughley, 1965). Animals were grouped into annual age classes from kids upwards, and those 10 years old and older were pooled, giving II age classes. The weights of 157 unskinned but gutted, hocked, and beheaded carcasses of adult males (i.e., those at least 5 years of age) were recorded. We considered two classes of trophies; those with horns 330 mm and longer (the New Zealand Record Book criterion - Holden, 1987), and those with horns 305 mm or longer.

The catchments in which animals were shot were grouped into four areas (Fig. 1), reflecting the different lengths of time for which they had been occupied by thar (Caughley, 1970a; Parkes and Tustin, 1985).

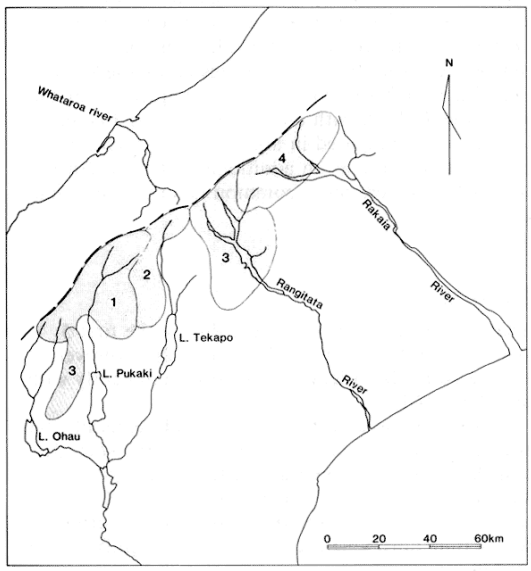

Figure *1*: *Locations from which 1695 male thar were sampled. Areas* 1 *to* 4 *are based on history of colonisation, with 1 being first and* 4 *being last occupied.*

Area 1. Murchison.
The area around the liberation site has been occupied by thar for about 40 to 70 years. Peak densities were reached about 20 years after females first colonised it.

Area 2. Godley.
This area was colonised about 1945, and the population reached peak density in the 1960s. Our sample came from the headwaters and true right of the Godley valley, but not from Lilybank Station.

Area 3. Rangitata - Ben Ohau.
The Rangitata valley and the southern end of the Ben Ohau range were colonised in the early 1950s, and we sampled in this area when thar were close to peak density.

Area 4. Rakaia.
This area includes the catchments colonised by thar since the late 1950s. When sampled, the population was still increasing in its initial eruption.

Four factors were tested by analysis of variance for effect on the horn length of adult male thar: *age* in six 1-year classes (5, 6, 7, 8, 9, and 10+); *month shot* (May-September); *body weight* in six 10 kg classes from 20 kg to 80 kg; and *area* (see above). Differences between mean horn lengths for each independent variable class were tested by the Least Significant Difference (LSD) test. Frequencies of thar 4-years and older, with and without horns 305 mm or longer, were compared in areas 1-4 by paired 2 x 2 contingency tables as an additional test of whether trophy horns were more common in some areas than in others.

Results

Thar's horns grow most rapidly during the first 5 years of life, then growth slows (Fig. 2). However, among adults horn length increases significantly with age ($P<0.001$).

Also among adults, lighter animals generally had shorter horns than heavier ones ($P<0.001$) (Fig. 3), and those shot in September had, age for age, significantly ($P<0.005$) longer horns ($\bar{x}$ = 306 mm) than those shot between May and August, during which time horn length did not change significantly ($\bar{x}$ = 279 mm).

Horns of trophy length are only produced by animals at least 4 years old (for 305 mm horns) or 5 years old (for 330 mm horns), but in no age-class did the horns of the average male reach even the 305 mm standard.

Of the 1695 thar shot, 247 (14.6%) were at least 5 years old, but of these only 15 had horns equal to or longer than 330 mm (Table 1). Three hundred and eighty-nine (22.9%) were at least 4 years old, of which 55 had horns equal to or longer than 305 mm.

When these 4+ year old animals were divided according to area, the only significant difference in the proportion of trophies was between Area 2 and Area 3 ($\chi^2 = 6.09$, $P<0.05$; Table 2).

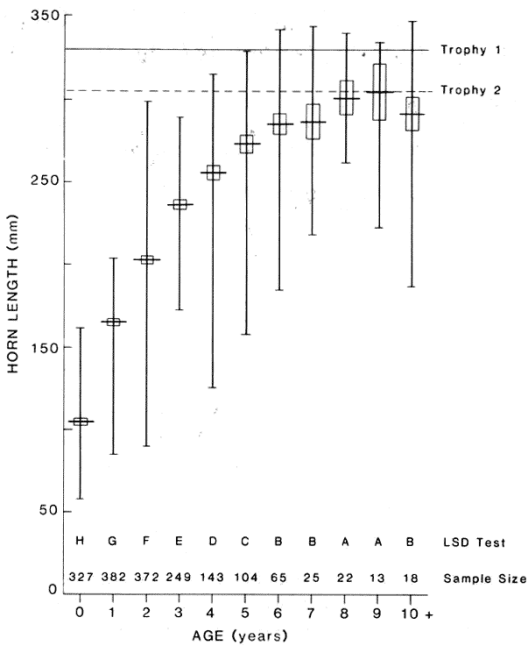

Figure 2: *Mean± S.E. and range of horn lengths for 11 age classes of male thar. Age classes with different letters have significantly different mean horn lengths. Includes 25 thar shot in Westland.*

. Table 1: *Catchment, horn length, and age of* 15 *trophy thar shot between* 1971-1976.

Catchment/ Station	Area No. (see methods)	Horn length (mm)	Age (years)
Hooker	1	330	5
Clyde	3	330	12
Lawrence	4	331	6
Mesopotamia	3	331	8
Murchison	1	331	9
Havelock	3	331	12
Dobson	1	331	13
Mesopotamia	3	334	9
Mesopotamia	3	337	11
Mesopotamia	3	338	6
Murchison	1	338	8
Erewhon	3	340	8
Mesopotamia	3	342	6
Mesopotamia	3.	344	7
Mesopotamia	3	347	11

Table 2: *Number of male thar* 4 *years and older with horns 305 mm and longer in* 4 *areas in New Zealand. Areas are grouped from the first colonised (area 1) to the last colonised (area* 4).

Area N	o. thar sampled (a)	No.4+ years (b)	% of (b) with horns 305 mm and over
1. Murchison	665	136	14.0
2. Godley	236	51	3.9
3. Rangitata-Ben Ohau	615	146	20.0
4. Rakaia	179	56	8.9
TOTALS 1	695	389	14 .1

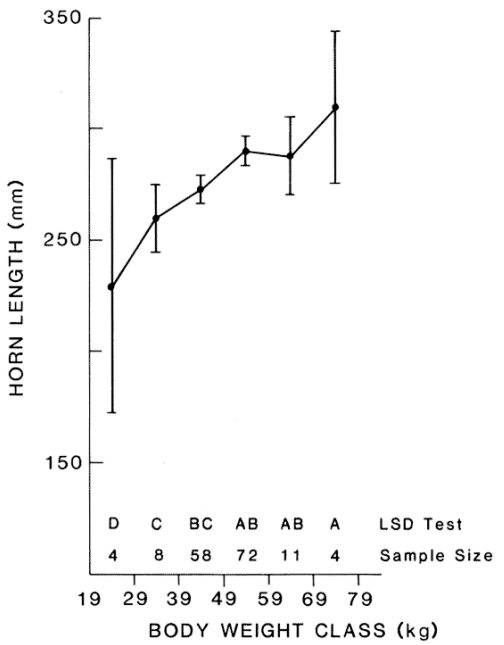

Figure 3: *Mean ± S.E. of horn lengths for six body weight classes of adult male thar. Classes with different letters have significantly different mean horn lengths.*

Discussion

Thar horns grow throughout the individual's life and have clear annual rings each of which represents quiescent phases during winters (Caughley, 1965). Age is therefore an obvious factor in determining horn length. Horn growth is most rapid during the first 4 years of life. It might be expected that the length of these annual increments would reflect the quality of the animal's habitat. Caughley (1970b) showed that the condition of female thar (measured by the amount of kidney fat, mortality and fecundity) was related in part to the population's phase of colonisation and growth. Thar living in areas recently colonised were in better condition than those from areas longer colonised. If horn length also reflected condition, we would have expected horns from the most recently colonised area (4) to be longer, age for age, than those from animals shot further south, particularly from around the liberation point (area 1). Although heavier thar did, on average, have longer horns, there was no clear relationship between area and horn length. The frequency of trophy-class animals also showed no differences that could be related to length of occupation. We cannot explain the apparent lack of trophy thar in the Godley catchment (area 2).

There is some evidence that the winter quiescent phase in horn growth did not last past August as adults shot in September had longer horns than those shot earlier in the winter. However, contradictory evidence is provided by Caughley (1965) who noted that horns of thar shot in early September in the 1960s were still quiescent and by Tustin and Parkes (1988) who showed that female thar did not increase their feeding activity from winter anorexia until November.

Trophy quality horns are, by definition, always going to be uncommon. Even our estimate of 0.9% for males with horns over 330 mm is an overestimate as our sample is biased against kids and young animals (see sample sizes in Fig. 2). The only practical way to increase the number of trophy-class bulls in the wild is to increase the number of adult males. Parkes (1988) guessed that about 6500 thar were present in New Zealand. From a population of this size, hunters can expect that about 750 animals will be adult males, of which up to 105 and 29 will have horns longer than 305 mm and 330 mm respectively.

Acknowledgements

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