

## THE PRESENT STATUS AND RESEARCH ON WILD CAPRINAE IN CZECHOSLOVAKIA

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### ABSTRACT

At present, populations of three wild species of Caprinae occur in the territory of Czechoslovakia (Europe): Ovis musimon, Capra aegagrus and Rupicapra rupicapra. Only subspecies R. r. tatrica is autochthonous, the remaining species including R. r. rupicapra were introduced into this territory.

O. musimon, the most abundant of the species, inhabits almost all of Czechoslovakia. In relation to the quality of its trophies it is the world's best population. In this species the variability of cranial characters and horn growth dynamics are being studied in order to establish criteria for the selection of prospective breeding individuals. Cytogenetic examinations of individuals from various localities revealed no deviations from the standard chromosome complement. In R. rupicapra, of both the autochthonous and introduced subspecies, craniometry, horn growth dynamics and epigenetic variability of discrete cranial characters were studied to ascertain incidental changes due to introduction, and to specify the taxonomic differentiation of ssp. tatica. A herd of C. aegagrus occurs in a single locality.

### INTRODUCTION

At present, three species of wild Caprinae inhabit the territory of Czechoslovakia: The mouflon sheep, Ovis musimon Pall., the wild goat, Capra aegagrus Erx., and the chamois, Rupicapra rupicapra Linn. Populations of these species (except C. aegagrus) are the object of zoological and game ranching investigations which will provide base data for their management. Except for the autochthonous population of R. r. tatrica, the species under study were introduced into Czechoslovakia. For that reason attention has been paid, in recent years, to their ecology, systematics and, incidentally, racial purity. The results obtained so far have been summarized, e.g. by Solinova et al (1973), Blahout (1976) and Lochman et al (1979). Most of the introduced populations originated from small groups of individuals. For that reason we have concentrated on studies of the craniometric, cytogenetic and epigenetic

characteristics of the chamois and the mouflon in order to find out whether or not their populations show any deviations from the autochthonous ones due to inbreeding and genetic drift. In the case of the mouflon, moreover, the cytogenetic investigations are aimed at determining the presence, if any, of chromosome transformations (e.g., Robertsonian translocations) which could negatively affect the reproductive capacity of the species. We also compared the cytogenetic characteristics of mouflon and domestic sheep.

## RESULTS AND DISCUSSION

### a) The Current Status of Caprinae in Czechoslovakia

The mouflon populations of Czechoslovakia originated from introductions of autochthonous animals from Corsica and Sardinia in the middle of the 19th century. At present, the Czechoslovakian mouflon population is the world's best in regard to trophy quality. Besides, the mouflon of Czechoslovakia are considered to be least affected by possible previous hybridizations with both various wild caprines and domestic sheep. Mouflon live in suitable localities throughout the country (Figure 1) both in the wild and in game enclosures (Lochman et al 1979). The upper limit of their vertical distribution lies at 1,100 m above sea level. The development in their numbers is characterized by a continuous increase.

Table 1. Population size and hunting pressure of mouflon in Czechoslovakia (data from the statistics of the Czech. Hunters' Union)

<u>Year</u>	<u>Numbers of Individuals</u>	<u>Numbers Shot</u>
1970	9,350	1,150
1975	12,550	3,000
1980	14,900	6,000
1983	16,000	6,500

The second most abundant species is the chamois. An autochthonous population of *R. rupicapra tatrica* occurs in the territory of the Tatra National Park (Figure 1). Since World War II, the numbers of this population have shown considerable variation, slightly increasing only in recent years. At present, the population is comprised of some 900 head and is protected year round.

Table 2. Population size and hunting pressure of chamois in Czechoslovakia (data from the statistics of the Czech. Hunters' Union)

<u>Year</u>	<u>Numbers of Individuals</u>	<u>Numbers Shot</u>
1970	395	-
1975	737	10
1980	1,012	79
1983	1,123	96

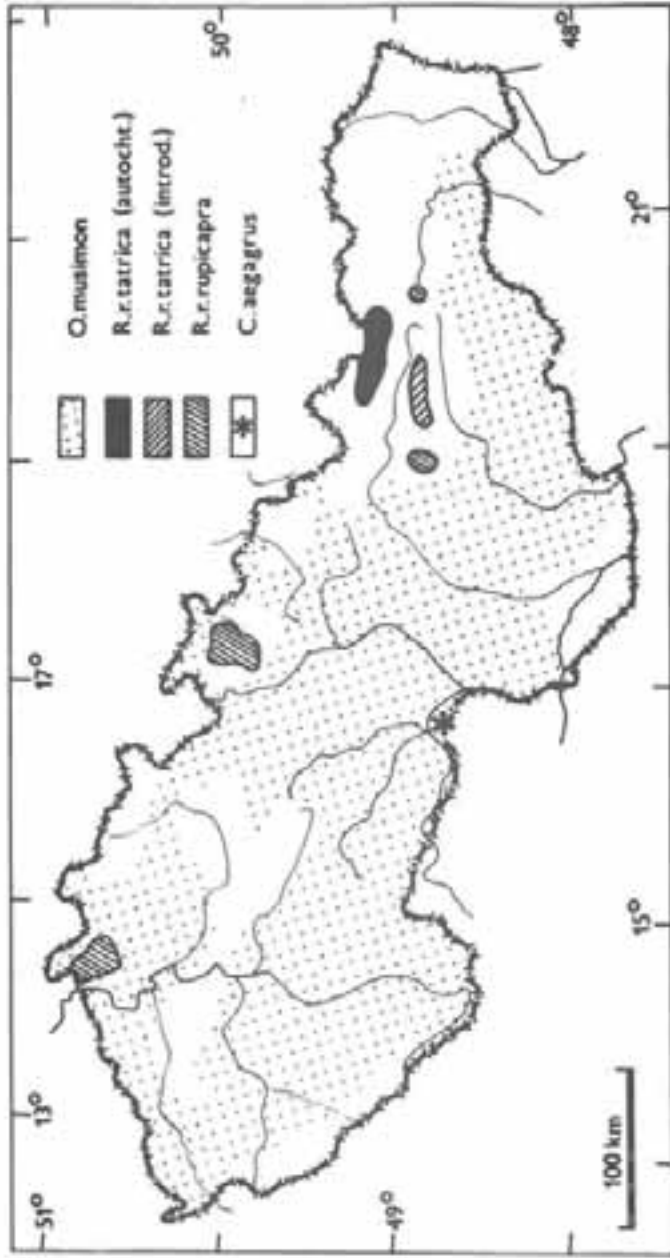


FIG. 1. Present distribution of wild caprines in Czechoslovakia.

The mountain ranges at the northern border of the country (the Luzické hory Mts., the Jeseníky Mts.) are inhabited by introduced populations of the nominate Alpine subspecies, *R. r. rupicapra*, their origin going back to the beginning of the 20th century. Since the development of their numbers has been favorable during recent years and no further increase is desirable, hunting of these chamois has been permitted.

To complete the listing of chamois populations in Czechoslovakia, one must mention also those populations, though small in numbers, of the autochthonous subspecies which has recently been introduced into the Low Tatra Mts. National Park, and those of the nominate subspecies introduced into the Velká Fatra Mts. and the Slovenský Raj area.

The third local species is the wild goat. In the fifties of the 20th century, it was introduced into an enclosure, 300 hectares in size, on the Pavlovské vrchy Hills, a xerothermic limestone locality in southern Moravia (Figure 1). The individuals which originated this population came from zoological gardens and their exact origin is unknown. In their morphology these wild goats are closest to ssp. *cretica* (Lochman et al 1979). In Czechoslovakia this species is of no economic importance, the value of its gene pool is low and thus an increase in population size is undesirable. Therefore, it is not the object of specialized investigations.

#### b) Management and hunting of Mouflon.

The management of mouflon populations has attained the highest level, as indicated not only by their increasing numbers and by the size of individuals harvested, but first of all by the production of trophies of good quality. In the production of medal trophies, particularly of gold medals (205.0 or more points C.I.C.), there is no match for the Czechoslovakian mouflon management at present. Thus, for example, of the 30 foremost mouflon trophies exhibited at the last World Trophy Exhibition in Plovdiv in 1981, 23 came from Czechoslovakia. In all, 325 gold trophies were exhibited from Czechoslovakia. The present world record (240.65 points C.I.C.) comes from a Czechoslovakian mouflon population.

The present status of mouflon management in Czechoslovakia is the result of long-term culling of individuals unsuitable for further breeding, that is, of such individuals whose exterior morphological features fall short of the standard for the Central European mouflon. The criteria of this cull are primarily based on knowledge of the architectonics and coloration of horns and of the dynamics of their growth in successive years. The cull is also aimed at stabilizing the age structure of the populations. For that reason, the harvest of mouflon is realized in three age groups (age group I, 1-3 years; age group II, 4-6 years; age groups III, 7 years and over). The optimum sex ratio of 1:1 is maintained by culling a corresponding number of females. The principles of selection are also applied in the culling of kids.

In Czechoslovakia, mouflon are hunted between 1 September and 31 December. Most of the mouflons are shot by local hunters but part of the trophy rams are assigned to foreign hunters. The price depends upon the demand and is determined by the point value of each trophy. The following are the prices of mouflon rams as specified in the 1984 catalogue of the CEDOK Travel Agency:

Table 3. Prices to be paid by foreign hunters, for bagging trophy class mouflon rams.

<u>C.I.C.Points (trophy quality)</u>	<u>Price in DM (German currency)</u>
up to 175	910.-
175.01 - 180	1 250.-
180.01 - 185	1 610.-
185.01 - 190	2 170.-
190.01 - 200	3 045.-
200.00 - 205	145.- per point
205.01 - 210	165.- per point
210.01 - 220	240.- per point
220.01 and over	405.- per point

### c) Selected Research

Selected mouflon populations are the subject of long-term studies of their morphology and craniometry, aimed primarily at the variability of skull characteristics. Besides, a study is in progress of mouflon horn growth dynamics for the purpose of selecting prospective breeders. Our aim has been to contribute to the description of the exterior standard of central European mouflon populations by establishing the range of variations of basic cranial dimensions. Our cytological examinations involved several dozen individuals from various localities. No deviations from the standard chromosome complement ( $2n = 54$ ,  $FN = 60$ ) were found. The karyotypes of mouflon and domestic sheep were compared using various chromosome banding techniques, but no differences were documented that would permit identification of hybrid individuals.

Similar problems are being studied in the chamois. We have concentrated on studies of craniometry and horn growth dynamics in individuals of both autochthonous and introduced chamois populations in Czechoslovakia (Hrabe and Koubek 1982, 1983, 1984; Koubek and Hrabe 1983 a, 1984). These studies were primarily motivated by endeavours to detect incidental changes in skull dimensions of individuals from introduced populations, but also by the fact that the raising and management of this ungulate has almost no tradition in this country. Hence, a need has been felt for basic information on management and also on hunting that would be in harmony with the ecological requirements of this species. For this study we measured a total of 450 chamois skulls of different origins, taking a total of 53 different skull and horn measurements. Having compared the skull dimensions of individuals from chamois populations introduced into Czechoslovakia with those from the autochthonous ones in the Alps, we found most characters investigated to be significantly larger in the introduced populations. Also most skull dimensions of the autochthonous ssp. *tatica* were larger than those of the Alpine chamois. This fact leads us to study the same skull dimensions in additional subspecies of *R. rupicapra* (i.e., *caucasica* and *carpatica*, Koubek and Hrabe 1983 b) in order to assess the hitherto used differentiating subspecific characters.

The difference between the introduced and autochthonous chamois populations was also demonstrated by a study of epigenetic variability of discrete cranial characters. Using this method, a characteristic variation pattern was found in *R. r. tatica*. The karyotypes of the introduced chamois

populations do not differ from the chromosome complements of individuals from the Alps or from the Tatra Mts. (Zima and Holubova 1983).

#### CONCLUSION

The pattern of the present distribution of wild Caprinae in Czechoslovakia resembles a mosaic comprising island-like occurrences of both autochthonous and introduced populations, having originated at different times. The introduced populations inhabit habitats which, in some cases, only remotely resemble those in their original ranges and often are quite different. This creates a suitable model situation to study various general problems of the effects of introduction upon wild ungulates and on the course and rate of changes in their biological properties. So far, we have endeavoured to tackle these problems by methods of classical morphology and craniometry and by studying epigenetic and cytogenetic characteristics. The methods used provided certain data on the divergence between autochthonous and introduced populations as well as between different introduced populations. In future it will be necessary to supplement these data by further ecological, behavioural and more detailed genetic studies.

The data obtained are of importance for proper management of these populations. Thus, based on an age structure determination of the introduced chamois population in the Jesenky Mountains, we recommended that changes be made in regard to the open season and the optimum size and structure of the annual harvest. Considering the inbred character of the introduced chamois populations and the assumed decrease in genetic variability it is recommended to exchange breeders between the individual localities.

A unique position among Czechoslovakian caprine populations is that of the autochthonous Tatra Mountains chamois population, *R. r. tatrica*. Due to its numerous typical characters, confirmed and supplemented by our study, and due to its comparatively small size, this relict population deserves strict protection to preserve its gene pool. In this connection it is essential to prevent contact between this autochthonous population and individuals from the introduced populations of Alpine origin to avoid incidental hybridization. Also in the case of mouflon it is necessary to prevent any possible hybridization of free-living populations with domestic sheep, which might result in a deterioration of the gene pool of this wild sheep species.

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