Selection of pastel mink

Wu Xiaomin, Li Baoshan, Geng Xiaoyuan

Used one pastel cross mink, applied fur colour heredity low, selected mating and breeding carefully. There were 120 royal pastel mink, which have pure type twin latent gene separated and recombinated successfully. Meanwhile, get the pastel cross mink carrying gene of pastel with important value of breeding (bbSs bbSS), and get black cross mink (BbSS), the basic animal crowd. Expond the 7 kinds selection plan of breeding pastel mink.

Journal of Economic Animal 1 (3), pp. 1-4, 1997. 6 refs. In CHIN, Su. ENGL. Authors' abstract.

Intraspecific variation of mitochondrial cytochrome b gene sequences of the Japanese marten Martes melampus and the sable Martes zibellina (Mustelidae, Carnivora, Mammalia) in Japan

N. Kurose, R. Masuda, M.C. Yoshida

To assess genetic variations of two Japanese species of the genus Martes, the Japanese marten M. melampus and the sable M. zibellina, the whole regions (1,140 base pairs) of the mitochondrial cytochrome b gene were sequenced. Intraspecific variable sites were different between these two species, and most substitutions were transitions resulting in synonymous mutaions. Molecular phylogenetic trees exhibited genetic differentiation between the two species. Genetic variations among M. melampus from Honshu, Shikoku, and Kyushu were larger than those among M. zibellina from Hokkaido. Genetic distance between cytochrome b haplotypes did not correlate to geographic distance between sampling localities. This result suggests the introgression of mitochondrial DNA haplotypes between local populations, probably resulting from incomplete geographic isolation, and/or their recent expansion on each island during a short period.

Zoological Science 16, pp. 700-708, 1999. Only abstract received. Authors' abstract.

On the circadian rhythm of some components of melatonin biosynthesis in the silver fox Vulpes fulvus after domestication

L.A. Kolesnikova, L.I. Serova, O.N. Kozlova

In epiphysis of relatively wild and domesticated adult females of the silver fox Vulpes fulvus, circadian rhythms were studied of several parameters characterizing intensity of melatonin biosynthesis such as concentrations of its precursor, serotonin, and of one of serotonin metabolites, 5-hydroxyindolacetic acid, as well as of neurotransmitters, dopamine and noradrenaline. No cyclic changes in the 5-hydroxyindolacetic acid content were revealed. There was a higher circadian rhythmicity in the serotonin, dopamine, and noradrenaline contents in the domesticated animals.

Journal of Evolutionary Biochemistry and Physiology 34, pp. 413-418, 1998. Only abstract received. Authors' abstract.

A polymorphic mink (*Mustela vison*) dinucleotide repeat

K. Brusgaard, S.N. Malchenko, K. Christensen, O. Lohi, T. Kruse

The microsatellite, designated Mvi248, was isolated from a mink genomic DNA library by screening with a (GT)9 oligonucleotide probe. Seven alleles were detected at the microsatellite locus by polymerase chain reaction analysis of DNA from 5 populations of unrelated mink. The alleles were shown to segregate in an autosomal codominant fashion in a Danish full-sib mink pedigree. Mvi248 was localized to mink chromosome 10p-terminal using fluorescence in situ hybridization.

Animal Genetics 29 (6), pp. 467, 1998. Only abstract received. Authors' abstract.

Two polymorphic mink (*Mustela vison*) dinucleotide repeat loci

K. Brusgaard, L.E. Holm, O. Lohi

The microsatellites, designated Mvi389 and Mvi355, were isolated from a mink cosmid library by screening with a (GT)9 oligonucleotide probe. The 2 microsatellite loci were shown to be polymorphic by PCR analysis, the number of alleles at the 2 loci being 2 and 3, respectively. Autosomal codominant inheritance of the alleles was demonstrated in a Danish full-sib mink pedigree. The 2 microsatellites were mapped to chromosomes 8q1.2 and 12q1.2 by fluorescence in situ hybridization.

Animal Genetics 29 (6), pp. 468-469, 1998. Only abstract received. Authors' abstract.

Incidence of disomy in mink sperm by strong centromere repeat probes for the chromosome 2, 5, 8, 9, 11 and Y.

K. Christensen, K. Bruusgaard

Cosmid probes containing repeat sequences which detect sperm disomy of mink chromosomes by fluorescence in situ hybridization were developed. Disomy of chromosomes 8, 9 and 11 was detected, the percentages of affected spermatozoa being 0.51, 0.54 and 0.27, respectively.

13th European Colloquium on Cytogenetics of Domesticated Animals, 2-5 June, 1998. Allattenyeztes es Takarmanyozas, 1999, 48: 1, 125-127, 179, 11 refs. In ENGL, Su. HUNG. Only abstract received. Authors' abstract.

Variation of coat colour in red foxes

G. Jezewska

Data were obtained in 1993-1996 on 386 vixens and their offspring. Litter size was 4.0-5.1 at birth and 2.9-4.6 at weaning. For 233 offspring from red X red matings and for 598 young from red X silver matings respectively, the percentage of straw-coloured young was 21.0 and 33.9, of red young 43.8 and 41.6, of copper young 32.3 and 17.7, and of bronze young 3.0 and 6.7; the percentage of young ith a light grey belly was 56.6 and 17.2, with mid-grey belly 39.9 and 73.9, and with dark grey belly 3.4 and 8.9.

Annales Universitatis Mariae Curie Sklodowska. Sectio EE Zootechnica 16, pp. 243-247, 1998, 4 refs. In POLH. Only abstract received. Author's abstract.

Results of crossbreeding different colour varieties in chinchillas

G. Jezewska, J. Tarkowski, G.A. Niezgoda, A. Jakubczak, B. Sadowska-Burlita

Colour segragation data were obtained at 1 farm over the period 1973-91. 1582 litters comprising 2913 young were considered. Colour types used in crossbreeding were standard, velvet black ("Gunnings"), dominant beige ("Towers"), dominant white ("Wilson's") and velvet beige. Colour segregation data are tabulated. It was concluded that genes controlling the beige, velvet beige, velvet black and white colours are dominant to standard colouring, and that the expression of standard, dominant beige and velvet beige colours was not genetically consolidated: both homozygous and heterozygous chinchillas were found within these colour types.

Annales Universitatis Mariae Curie Sklodowska. Sectio EE Zootechnica 15, pp. 197-201, 1997, 6 refs. In POLH. Only abstract received. Authors' abstract.

The effect of crossbreeding colour mink on performance traits

M.O. Lorek, A. Gugolek, M. Lasikowska

30 platinum (Bbpp) mink females were mated with Pastel (bbPP) males, and 30 crossbred (BpPp) "Demibuff" females were mated with similar (Demibuff) males. For the 2 groups respectively, the percentage of females mated was 100 and 100, whelping rate 84 and and 97%, and the percentage suckling their litter 77 and 90. Litter size averaged

4.23 and 5.27 in the 2 groups at birth and 4.10 and 5.23 at weaning, body weight at 22 weeks of age 2210 and 2251 g for males and 1190 and 1203 g for females. All the young in the first group were Demibuff, and the percentages of Demibuff, Royal Pastel, Silverblue (platinum) and Pastelsilver young in the second group were 57, 17, 19 and 7 respectively for males and 55, 19, 20 and 6 for females.

Acta Academiae Agriculturae ac Technicae Olstenensis Zootechnica, No. 47, pp. 57-63, 1997, 12 refs. In POLH. Only abstract received. Authors' abstract.

A new approach to analysis of complex chromosomal rearrangements in cell hybrids

N.B. Rubtsov, E.V. Plyusnina, N.A. Serdyukova, N.M. Astakhova, L.S. Biltueva, S.B. Kuznetsov, A.S. Grafodatski, N.S. Zhdanova

The chromosome complement of pig X mink somatic cell hybrids was determined by a new method that involved microdissection of metaphase chromosomes, generation of chromosome and region-specific DNA libraries, and fluorescence in situ hybridization of these libraries with pig lymphocyte chromosomes. The hybrid cells were shown to contain 2 small acrocentric chromosomes and a microchromosome of pig origin. Identification of these chromosomes by differential GTG staining was impossible. Chromosome isolation by a micromanipulation technique followed by DNA amplification using TOPODOP PCR provided chromosome-specific DNA libraries of the rearranged chromosomes. Based on these libraries, the labelled DNA probes were prepared and hybridized to pig chromosomes. This made it possible to determine the origin of the material contributing to the hybrid cell chromosomes. One of these chromosomes contained the 5 pig chromosome regions 15cen-q2, 6q21-q23, 13q22, and 7q25-qter, and the other contained the 4 pig chromosome regions 4p12-p13, 16q12-q14 and 12pter-p15. The microchromosome contained the Xp11-Xq11 region. The minimum size of the chromosomal regions revealed was about 3 X 106 to 4 X 106 bp. Segregation analysis of the thymidine kinase gene 1 (TK1), which had been mapped to the pig 12p region, and the hybrid cell pig chromosomes in the hybrid subclones suggested that TK1 can be assigned to 12p15pter.

Genetika Moskva 34 (2), pp. 240-247, 1998, 21 refs. In RUSS. Only abstract received. Authors' abstract.

Structure and evolution of complex tandem Bsp repeats in the fox genome. 1. Structure and internal organization of a BamHI dimer

V.A. Potapov, V.V. Solovev, A.G. Romashchenko, S.V. Sosnovtsev, S.V. Ivanov

A 1468-b.p. BamHI fragment homologous to the Bsp repeat was isolated from the fox genome. The BamHI fragment was found to consist of a dimer with a hierarchial structure. The 734-b.p. monomers consisted of three 245-b.p. subrepeats. The subrepeats consisted of overlapping imperfect tandem repeats, which are rich in short direct repeats of 4-7 b.p. The latter consist predominantly of the dinucleotides AG and TG, along with their complements CT and CA. All subrepeats in the BamHI dimer are flanked by motifs homologous to Jeffreys sites. In some cases, these sites are duplicated. These results show that the complex structure of the Bsp repeats resulted from prolonged multistep evolution of relatively simple DNA repeats, which arose de novo. The evolution of the Bsp repeats has, for the most part, consisted of point substitutions, small insertions and deletions, along with numerous duplications and recombinations. The distribution of point substitutions, small insertions and deletions, along with numerous duplications relative to the consensus, varied along the sequences. The wave-like nature of the order in which the variable and conserved regions occurs shows the non-random nature of the distribution of point substitutions in the subrepeats. A relationship was found between the conserved regions of the sub-repeats and the presence within them of functional motifs homologous to the binding sites of known regulatory proteins.

Molecular Biology 24:6, pp1318-1332, 1990. Only abstract received. Authors' abstract.

Sexual maturation of silver fox (*Vulpes vulpes*) males: Investigation of spermatogenesis and levels of sexual steroid hormones

L.V. Osadchuk

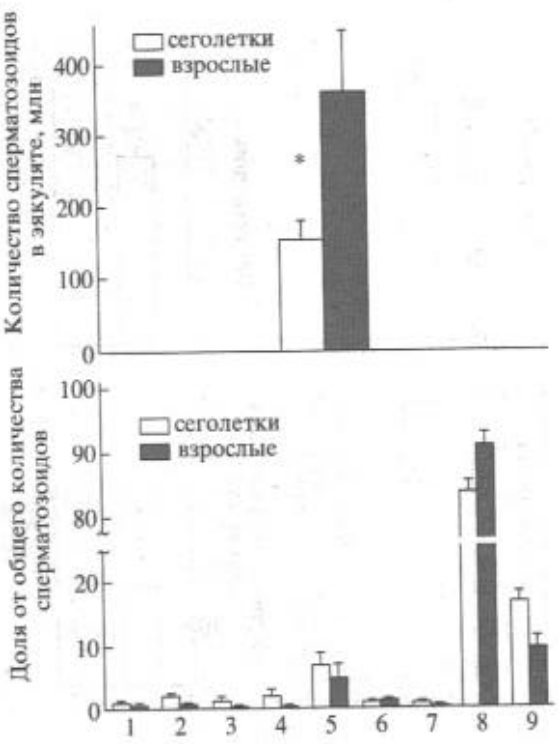

Рис. 1. Аномальный сперматогенез у молодых и взрослых самцов серебристо-черных лисиц в сезон размножения: *1* – цитоплазматические капли, *2* – аномалии головки; *3* – отдельная головка (без хвостовой части), *4* – дефекты средней части, *5* – дефекты хвоста, *6* – агглютинировавшие сперматозоиды, *7* – множественные дефекты, *8* – сперматозоиды без морфологических аномалий, *9* – суммарная доля аномальных сперматозоидов (%). В скобках – количество животных в группе.

Silver fox males reach functional sexual maturity at the age of about 9-10 months. They are strict seasonal breeders and exhibit consistent seasonal changes in testicular morphology and function. Some parameters of the reproductive function in yearling and adult males to elucidate peculiarities of sexual development in silver fox males were compared. The number of spermatozoa in the ejaculate is shown to decrease in yearling males compared to adult ones during the mating season. A tendency of an increasing number of spermatozoa in abnormal forms in yearling males was revealed. Before the reproductive season, yearling males did not differ from adults in the plasma level of testosterone, while the body and testes weights and the level of estradiol decreased. At the end of the reproductive season, yearlings did not differ from adults in hormonal levels and morphometric parameters. The obtained data suggest that the constitution and hormonal activity of testes in fox yearling males might be immature before the first breeding season.

Zoologichesky Zhurnal 78, pp. 480-484, 1999.3 figs., 20 refs. In RUSS, Su. ENGL.

A study on the technique of electro-ejaculation with arctic fox (*Alopex lagopus*)

Wu Xiaomin, Li Baoshan, Geng Xiaoyuan

From 1995 to 1997, 97 sperm extraction tests with 41 male arctic fox were performed, and succeeded in 96 tests. The efficiency was up to 98.9%. The male fox was anesthetised by injection ketamine hydrochloride. The electro-ejaculation frequency range was 20 - 30 Hz, and the time between each volt was7 seconds, starting from 2 volts. After 30 seconds, the voltage was increased by 2 volts until it reached 30 to 32 volts. The semen quality was very good. The appetite and spirit of the foxes from which semen collected were normal.

Journal of Animal Economics 1 (4), pp. 1-3, 1997. 1 table, 8 refs. In CHIN, Su. ENGL. Authors' summary.

Comparison of two breeding systems for timing of whelpings in farmed silver foxes

Mikko Harri, Jaakko Mononen, Teppo Rekilä

Two principally different mating systems are practised for farmed silver foxes. In the traditional system the breeding females are kept all the time in cages well separated from each other. In the Nordic system, on the other hand, the breeding females are transferred prior to mating time into a separate shed where they are placed close to each other and sometimes males are put among them. After

artificial insemination (Al) or natural matings, the females are transferred in the mating order to new cages.

The condensed premating grouping is assumed to enhance the effect of air-borne male and female pheromones leading to a more intense and synchronised heat development. In this study these two systems were compared for timing and synchrony of parturitions. In contrast to the working hypothesis, date of whelpings was positively skewed with a great kurtosis in the traditional system, an indication that the majority of deliveries occurred during a short period and at the beginning of the season. On the other hand, in the Nordic system the whelpings were more uniformly distributed over the whole season and the peak was later.

The results show that the most recent system, although widely used, is not necessarily the only possible alternative but other alternatives should also be considered.

Agricultural and Food Science in Finland, vol. 8, pp. 3-8, 1999. 2 tables, 1 fig., 11 refs. Authors' summary.

Evaluation of spermatozoa motility in male fox (*Vulpes vulpes*) using computer technique

P. Massányi, J. Trandzik, A. Lukac, R. Toman, J. Slamecka, J. Kovácik

In this study a commercially available computer automated semen analyzer (Hamilton Thorn Research Motility Analyzer) was used for evaluation of parameters of spermatozoa motility in four fox ejaculates and comparison of these results with those obtained from the usual microscopic analysis is reported.

The ejaculate volume ranged from 0.7—1.3 ml and pH was 6.63. A routine analysis determined that the spermatozoa activity was 50-80% before freezing and 10-25% after freezing. The thermic test reached the value of 5-15%**.** The computer analysis determined 61.31% motile spermatozoa after refreezing, but only 4% with progressive motility. The average path velocity of fox spermatozoa is 31.77 $\mu m.s^{-1}$ and straightness is 64.69%**.**

Slov. Vet. Cas., 23, 6, pp. 306-308, 1998. 1 table, 15 refs. In SLOVAK, Su. ENGL. Authors' summary.

Nonsurgical collection and nonsurgical transfer of preimplantation embryos in the domestic rabbit (*Oryctolagus cuniculus*) and domestic ferret (*Mustela putorius* furo)

J.D. Kidder, P.J. Roberts, M.E. Simkin, R.H. Foote, M.E. Richmond

The objective of this study was to develop nonsurgical methods of embryo collection and transfer in domestic rabbits (O*ryctolagus cuniculus*) and domestic ferrets (*Mustela putorius* furo) to serve as models for use in mammals in which surgical procedures are the usual means for applying embryo transfer technology. Specially designed transcervical catheters were used together with a fibre optic endoscope to visualize and then catheterize the rabbit and ferret cervices. Five consecutive transcervical uterine flushes in each of eight superovulated female rabbits 78-89 h after an ovulatory injection of LH resulted in the retrieval of 187 embryos, for an average of 23 embryos per rabbit. A total of 116 embryos were nonsurgically transferred to the uteri of ten recipients, and resulted in 23 young 20%). Eight rabbits (80%) produced young with an average litter size of 2.88 (range 1-7).

Ten consecutive transcervical uterine flushes in each of 37 female ferrets 145-178 h after an ovulatory injection of hCG resulted in the retrieval of 324 embryos, an average of 8.76 embryos per ferret. A total of 251 embryos from 27 donors were nonsurgically transferred to the uteri of 31 recipients, and resulted in 65 young (26%). Twenty-eight of the recipients (90%) were initially pregnant, as indicated by

postpartum necropsies, and twenty-two ferrets (71%) produced young. The average litter size was 2.95 (range 1-7). This is the first report of live births resulting from the nonsurgical collection of embryos from a donor followed by nonsurgical transfer of those same embryos to a synchronous recipient. The methods reported here can serve as models for use in other mammals in which direct visualization and manipulation of the cervix are not possible, and will be particularly useful in endangered species.

Journal of Reproduction and Fertility, pp. 235-242, 1999. Only abstract received. Authors' abstract.

Testicular mitosis, meiosis and apoptosis in mink (*Mustela vison*) during breeding and non-breeding seasons

S. Blottner, H. Roelants, A. Wagener, U.D. Wenzel

Testes of mink were compared between the breeding (March) and non-breeding seasons with the start (November) and cessation (May) of spermatogenic activity. Testicular mass and spermatozoa per gram testis were assessed. Percentages of haploid (1C), diploid (2C) and tetrapoloid (4C) cells were monitored using DNA flow cytometry and the proportions of somatic and spermatogenetic cells were determined after selective labelling of somatic cells with a vimentin antibody. Apoptosis was examined by cell death detection ELISA, and testosterone concentrations were measured with an enzyme-immunoassay. The significantly higher testis mass during the breeding period coincided with higher numbers of testicular spermatozoa per gram testis and peak of testicular testosterone concentration in comparison with non-breeding periods. The proportions of 1C, 2C and 4C cells showed corresponding strong differences between these periods with the maximum of 1C cells during breeding. The proportions of testicular cells in G2-M phase of mitosis were very low during the period of peak spermatogenesis; they were markedly increased in the time of autumnal resumption in November but were even higher during testis involution in May. However, the meiotic transformation (1C:4C ratio) is maximal in March. The total as well as the relative proportions of spermatogenic and somatic cells differed significantly not only between breeding and non-breeding periods but also between the periods at the start and at the end of active spermatogenesis. The intensity of apoptosis was also seasonally dependent. The highest level in March indicates a stimulated apoptosis even during the breeding period. In conclusion, the production of spermatozoa in mink is intensified by enlargement of gonads as well as enhanced efficiency of spermatogenesis during breeding. In this time, the testosterone concentration and the meiotic transformation show high levels, but the mitotic activity of spermatogenic cells is already significantly diminished and an intensified apoptosis seems to precede the forthcoming testis involution after breeding. The results suggest that the regulation of seasonal testicular activity is characterised by co-ordinated shifts in the relationships between mitosis, meiosis, apoptosis and testosterone production.

Animal Reproduction Science 57, pp. 249-262, 1999. Only abstract received. Authors' abstract.

Reproduction of chinchillas of different colour types

J. Jezewska, J. Tarkowski, B. Slaska, A. Jakubczak

Data were obtained in 1973-91 on 506 female chinchillas and their 1589 litters comprising 2923 young. Over the period, litter size averaged 1.84 (1.64-2.17). 984 litters were Standard, 300 were black velvet, 205 were dominant beige, 42 were beige velvet and 58 were Wilson white. For the 5 colour types respectively, litter size averaged 1.83, 1.74, 2.15, 1.50 and 1.69. For the 1st, 2nd-4th, 5th-8th, 9th-11th and 12th-17th litters, litter size averaged 1.78, 1.91, 1.82, 1.81 and 1.66, respectively.

Annales Universitatis Mariae Curie Sklodowska, Sektio EE Zootechnica 16, pp. 249-253, 1998, 5 refs. In POLH. Only abstract received. Authors' abstract.

The spermatogenic cycle in the silver fox (*vulpes vulpes*): frequency of the differetn stages prior to and during the breeding season

K.A. Berg, H. Paulenz, E. Ropstad

In the silver fox, the cycle of the seminiferous epithelium could be classified into eight characteristic stages defined on the basis of different, well-defined cell associations. The main criteria for the staging were the type of spermatogonia, the appearance of primary spermatocytes, the occurence of meiotic figures and secondary spermatocytes and the shape and location of spermatids. In some cases more than one stage could be found within the same transverse tubular section. The average frequency of stages I to VIII was 25.2, 8.2, 9.0, 4.9, 16.2, 8.3, 10.7, adn 17.5%, respectively. No significant difference was found between individuals sampled before and at the beginning and end of the breeding season. However, late in the season the migration of old spermatids and release of spermatozoa tended to be somewhat retarded, causing a slight increase in the duration and frequency of thel ast two stages of the cycle.

International Journal of Andrology, pp. 377-382, 1998. Only abstract received. Authors' abstract.