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"ВЕРБЛЮДЫ ШЕЛКОВОГО ПУТИ: ИССЛЕДОВАНИЯ КАМЕЛИДОВ ДЛЯ УСТОЙЧИВОГО РАЗВИТИЯ"

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GENETIC DIVERSITY OF IRANIAN BACTRIAN CAMEL BASED ON HAPLOTYPE FREQUENCIES ON MITOCHONDRIAL GENOME

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Abstract

In order to studying of genetic diversity within Iranian Bactrian camel population using single nucleotide polymorphisms (SNP) and their haplotypes on a region of mitochondrial genome, 51 Iranian domestic Bactrian camels were sampled from Ardebil province. A 804 bp fragment including cytochrome b gene and control region were amplified, sequenced and successfully aligned on a reference sequence for 41 samples. Finally, 38 SNPs were discovered on resulted contig that grouped as 5 distinct haplotypes. Heterozygosity (gene diversity) was estimated 0.593 from haplotype frequencies. It indicates an adequate and desirable genetic diversity within a population that has recently experienced a dramatically reduced size. It can be a conservative opportunity for reconstructing of this valuable animal genetic resource. However, the additional studies using microsatellite markers and also Y chromosome specific variations are needed to support our conclusion.

Key words: Iranian domestic Bactrian camel, Genetic diversity, Mitochondrial genome, Single Nucleotide Polymorphisms (SNP), Haplotype frequencies.
In Human, vitamin D which derives from the action of sunlight in the skin and dietary intake is of great importance for health, and may be influenced by season. In arid and semi-arid regions, camel meat is a good source of high-quality nutrition with less fat and significant health benefits. The aim of this investigation was to analyze the seasonal variation of the 25-hydroxyvitamin D3 (25-OH-D3) amounts in meat and serum of camels. In municipal slaughterhouse of Casablanca, samples of blood, Musculus obliquus externus abdominis, liver and kidney were collected in winter and summer from twelve 4–7-year-old male camels. Levels of 25-OH-D3 were analyzed by radioimmunoassay method in the National Center of Science and Nuclear Technical Energy in Maâmoura, Morocco. It was observed that the 25-OH-D3 amounts in serum were significantly higher in summer when compared to those measured in winter, while, tissue levels of 25-OH-D3 showed no seasonal variation.

Key words: 25-hydroxyvitamin D3, Dromedary camel, Meat, Morocco, Season.
As shown in table 1, we found that the 25-OH-D3 amounts in serum were significantly (P<0.05) higher in summer when compared to those measured in winter, while, tissue levels of 25-OH-D3 showed no seasonal variation. The higher circulating levels of 25-OH-D observed in our camels in summer may be explained by the increasing daylight during this season. Circulating 25-OH-D is considered as a biomarker of vitamin D status and it is closely linked with the consumption of foods and exposure to sunlight (Zerwekh, 2008).

Table 1. Levels of 25-hydroxyvitamin D during winter and summer in tissues (ng/g) and serum (ng/mL) of camels (Mean±ET, *P<0.05, comparison between the two seasons).

<table>
<thead>
<tr>
<th></th>
<th>Obliquis</th>
<th>Diaphragma</th>
<th>Liver</th>
<th>Kidney</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>2.68 ± 0.63</td>
<td>2.38 ± 0.81</td>
<td>5.21 ± 0.62</td>
<td>3.52 ± 0.23</td>
<td>304 ± 22</td>
</tr>
<tr>
<td>Summer</td>
<td>3.50 ± 0.78</td>
<td>2.97 ± 0.63</td>
<td>5.33 ± 1.65</td>
<td>4.23 ± 1.19</td>
<td>395 ± 25</td>
</tr>
</tbody>
</table>

Circulating levels of 25-OH-D in camel are very higher than those of bovine species (Table 2). However, the amounts of 25-OH-D in camel meat were similar to those measured in bovine meat (Table 2). The content of vitamin D in meat is generally low, difficult to measure and is rarely indicated at the beginning of food composition in any meat. According to Schmid and Walther (2013), the content of vitamin D in muscle meat is generally much lower (up to 10 μg/g). It concluded that camel meat may contribute with no negligible exposure to sun to provide 25-OH-D in order to satisfy the seasonal demand of individuals living in desert environments.

Table 2. Circulating and tissue levels of 25-hydroxyvitamin D in bovine and camel

<table>
<thead>
<tr>
<th>Circulating levels (ng/mL)</th>
<th>Tissue levels (ng/g)</th>
<th>Species</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 ± 6.7</td>
<td>4.2 ± 2.0</td>
<td>Kidney</td>
<td>Cho et al., 2006</td>
</tr>
<tr>
<td>40 - 50</td>
<td>1.83 ± 0.24</td>
<td>Muscle</td>
<td></td>
</tr>
<tr>
<td>143.14 ± 20.08</td>
<td>1.68 ± 0.37</td>
<td>Muscle</td>
<td>Heifer</td>
</tr>
<tr>
<td></td>
<td>2.59 ± 0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>395 ± 25</td>
<td>3.50 ± 0.78</td>
<td>Muscle</td>
<td>Camel</td>
</tr>
<tr>
<td></td>
<td>4.23 ± 1.19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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References

Reduction of thread formation in llama semen and its effects on sperm quality.

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Laboratorio de Teriogenología “Dr. Héctor H. Morello”. Facultad de Ciencias Agrarias. Universidad Nacional del Comahue. Cinco Saltos (RN). Argentina. Email: medinavh@gmail.com

Abstract
One of the most important attributes of llama semen is its high viscosity. This characteristic is usually evaluated subjectively by measuring the thread formed when a sample of semen is pipetted. The viscous seminal plasma is currently the major impediment to the development of artificial insemination technologies in South American camels. The aim of this study was to evaluate the use of mechanical techniques to reduce thread formation, avoiding the use of enzymes. Semen obtained by artificial vagina from *Lama glama* was treated by means of: A) a needle (0.5 mm) attached to a syringe; B) a straw (0.5 ml); C) dilution (4:1 with blood serum from female llama); D) control (without treatment). All the treatments assayed reduced the thread formation (*p*<0.001), technique A being the most effective with respect to the control treatment (2.4± 0.28 cm vs. 7.0±0.29 cm, respectively).

Sperm motility, viability (CFDA-PI), acrosome integrity and morphology were assessed. None of the cell parameters evaluated showed significant differences when compared to the control.