

Blood Serum Proteins of the genus *Mesocricetus* Nehring, 1898 (Mammalia: Rodentia) in Turkey

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Abstract: In this study, 18 live specimens collected from six localities in the distribution areas of *Mesocricetus brandti* and *Mesocricetus auratus* were examined using SDS-PAGE (sodium dodecyl sulphate-polyacrylamide gel electrophoresis). The findings showed that there is no difference in globulin and albumin proteins of *M. brandti* and *M. auratus*, and supported the claim that *M. auratus* is very closely related to *M. brandti*.

Key Words: *Mesocricetus brandti*, *Mesocricetus auratus*, SDS-PAGE, Globulin, Albumin, Turkey.

Türkiye'deki *Mesocricetus* Nehring, 1898 (Mammalia: Rodentia) Cinsinin Kan Serum Proteinleri Üzerinde Araştırmalar

Özet: Bu çalışmada, altı lokaliteden toplanan 18 *Mesocricetus brandti* ve *Mesocricetus auratus* örneği SDS-PAGE (sodyum dodesil sülfat-poliakrilamid jel elektroforezi) tekniği kullanılarak incelendi. Bulgular *M. brandti* ve *M. auratus*'in globulin ve albumin proteinlerinde herhangi bir farklılığın bulunmadığını ortaya koydu ve *M. brandti*'nin *M. auratus*'a yakın akraba olduğu fikrini desteklemiştir.

Anahtar Sözcükler: *Mesocricetus brandti*, *Mesocricetus auratus*, SDS-PAGE, Globulin, Albumin, Türkiye.

Introduction

According to Ellerman and Morrison-Scott (1), *M. raddei*, *M. newtoni*, *M. brandti*, and *M. nigriculus* are subspecies of *M. auratus* which is distributed in Romania, Bulgaria, Caucasia, Transcaucasia, Anatolia, Syria, Palestine and Iran. Hamar and Shutowa (2), Radjabli (3), Lyman and O'Brien (4), and Corbet (5) stated that *auratus*, *raddei*, and *newtoni* are valid species. According to Doğramacı and Kefelioğlu (6), *auratus* and *brandti* are two different species. Also, Corbet (5) reduced *brandti* to subspecific status below *M. auratus*. Furthermore, Lyman and O'Brien (4) noted chromosomal variation of $2n=42-44$ in populations of *M. brandti* in Anatolia. These show the presence of taxonomic problems in the specific status of *M. brandti* and *M. auratus*. This study focused on the blood serum proteins of specimens of the genus *Mesocricetus*.

Materials and Methods

Electrophoretic analysis was performed on 18 live specimens collected from six localities in the distribution areas of *M. brandti* and *M. auratus* in Turkey (Fig. 1). Globulin and albumin (postalbumin and prealbumin) proteins of both species were evaluated.

Blood was taken by cardiac puncture from the animals anaesthetised with ether. After blood clotting the separated sera were centrifuged at 12000 rpm for 3 min. The sera were mixed with a sample buffer containing 0.0625 M Tris Cl, pH 6.8, 2 % SDS, 10 % Glycerol, 5 % 2-Mercaptoethanol and 0.01 % bromphenol blue (7), and the final concentration of sera was adjusted to 5 %. Samples were boiled for 3 min and stored at -70° C until electrophoresis. Amount of protein loaded to gel was semiquantitatively determined by the method of Esen (8). Samples of 10 to 15 µl were applied to gels in different experiments. Electrophoresis was carried out using Consort E 863 model vertical slab gel electrophoresis apparatus. SDS-polyacrylamide denaturing gels, separating gels (7.5 %) and stacking gels (4 %) were prepared as described by Sambrook *et al.* (7). Electrode buffer solution contained 0.025 M Tris, 0.192 M Glycine, 0.1 % SDS at pH 8.3 (9). Molecular Weight Marker (Sigma MW-SDS-200) consisted of carbonic anhydrase (29,000), egg albumin (45,000), bovine albumin (66,000), phosphorylase B (97,400), β-galactosidase (116,000), myosin (205,000).

Constant voltage (8 V/cm) was applied to the stacking gel. After tracing the dye attained the separating gel, the voltage was adjusted to 15 V/cm. After electrophoresis, gels were stained with 0.25 % Coomassie Brilliant Blue R250 in 90 ml of methanol: water (1: 1 v/v) and 10 ml glacial acetic acid and destained in methanol: water: acetic acid (45: 45: 10) (7).

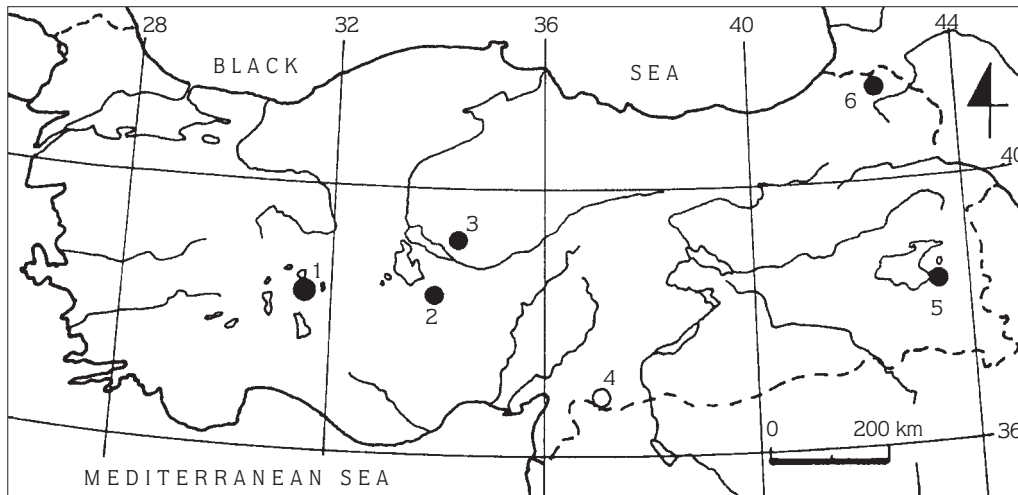


Figure 1. Map showing recorded localities of *Mesocricetus brandti* (●) and *Mesocricetus auratus* (○) 1. Akşehir, 2. Aksaray, 3. Kırşehir, 4. Kilis, 5. Van, 6. Ardahan.

Results and Discussion

Blood serum proteins of 14 specimens of *M. brandti* collected from Ardahan, Aksaray, Akşehir (Konya), Kırşehir, and Van were examined. Specimens of *M. brandti* from five localities gave the same electrophoretic pattern with respect to globulin, postalbumin, albumin, and prealbumin aspects. There were seven electrophoretic bands in the globulin region, one band in each postalbumin and albumin zone, and two bands in the prealbumin zone of which the first was weak (Fig. 2). According to Lyman and O'Brien (4), there are different karyotypes of $2n=$

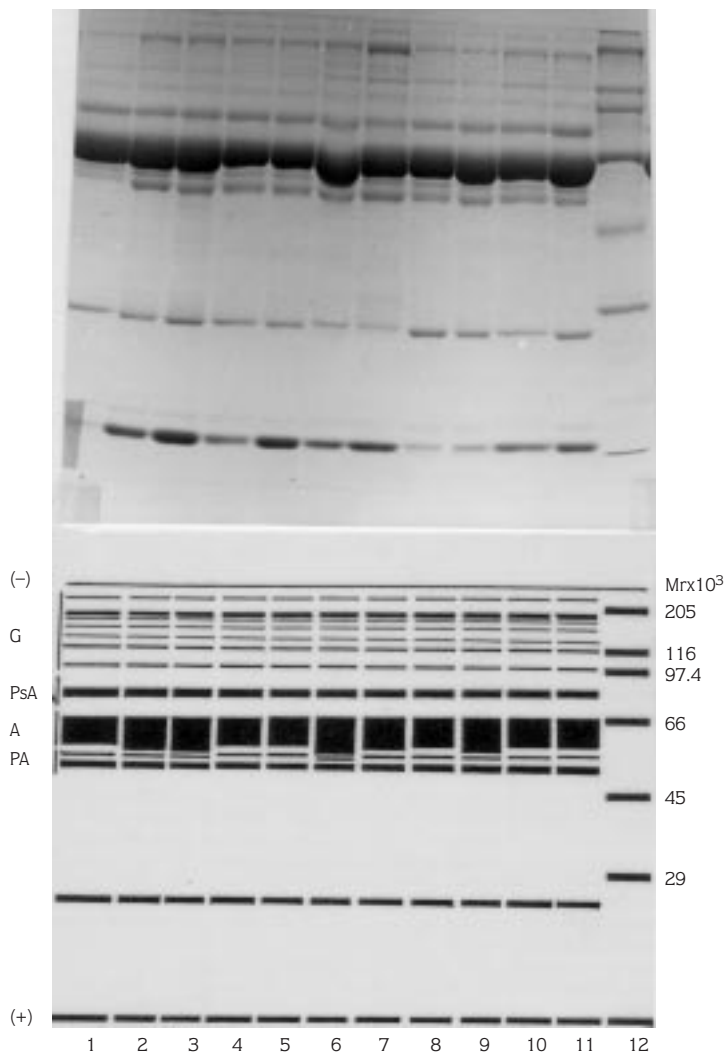


Figure 2. Electrophoretic patterns of blood serum proteins of *Mesocricetus brandti* (1, 2, 3, 4, 5, 8, 9, 10, and 11) and *Mesocricetus auratus* (6, 7). G: Globulin, PsA: Postalbumin, A: Albumin, PA: Prealbumin, Mr (12): Marker.

42-44 in populations in Anatolia of *M. brandti*. Also, we examined 282 skins of *M. brandti* from 48 localities, and determined geographical variations in coloration. However, the present study gave a stable electrophoretic pattern of globulin and albumin proteins in populations of *M. brandti*.

Electrophoretic patterns of globulin and albumin proteins of 4 specimens of *M. auratus* were the same as in *M. brandti* (Fig. 2). *M. brandti* and *M. auratus* were evaluated as different species by Hamar and Shutowa (2), Lyman and O'Brien (4), and Dođramacı and Kefeliođlu (6) based on karyology, morphology, and coloration. However, Harrison and Bates (10) reduced *M. auratus* to subspecific status below *M. brandti*. This study shows that there is no difference in globulin and albumin proteins of *M. brandti* and *M. auratus*, and supports the claim that *M. auratus* is very closely related to *M. brandti*.

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