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Blood Serum Proteins of *Apodemus flavicollis* and *Apodemus hermonensis* (Mammalia: Rodentia) in Turkey

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Abstract: The globulin, albumin, postalbumin, and prealbumin proteins of *Apodemus flavicollis* and *Apodemus hermonensis* were examined by SDS-PAGE.

In *A. flavicollis* and *A. hermonensis* respectively, 6-9 and 7-9 electrophoretic bands were determined in the globulin region, respectively. Both species have one band in the postalbumin zone, and two bands in the prealbumin zone. *A. flavicollis* differs from *A. hermonensis* in terms of postalbumin.

Key Words: *Apodemus flavicollis*, *Apodemus hermonensis*, serum proteins, SDS-PAGE.

Introduction

The genus *Apodemus* is found throughout the Palaearctic region (1). Four species of the genus *Apodemus* (*Apodemus mystacinus*, *Apodemus sylvaticus*, *Apodemus flavicollis*, and *Apodemus agrarius*) are distributed in Turkey (1). *Apodemus hermonensis* was described by Filippucci et al. (2) from Mount Hermon (Israel). Recently, on the basis of morphological, biometric and allozymic aspects, *Apodemus hermonensis* and *Apodemus uralensis* were recorded by Filippucci et al. (3) from western Anatolia.

The aim of the present study is to examine blood serum proteins, help clarify the status of *A. hermonensis*, and to compare it with *A. flavicollis*.

Material and Method

Electrophoretic analysis was performed on 43 specimens of *A. flavicollis* and *A. hermonensis* collected from various localities in Turkey (Fig. 1). Globulin, postalbumin, albumin and prealbumin proteins of both species were evaluated.

Blood was taken by cardiac puncture from the animals, which were anaesthetised with ether. SDS-PAGE (sodium dodecyl sulphate-polyacrylamide gel electrophoresis) was performed in accordance with Sambrook et al. (4). The electrode buffer solution contained 0.025 M tris, 0.192 M glycine, and 0.1 % SDS at pH 8.3 (5). The 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), and myosin (205,000).

Results

The blood serum proteins of 21 specimens of *A. hermonensis* collected from Bayındır (İzmir), Burdur, Kemalpaşa (İzmir), and Samsun were examined. In 21 specimens of *A. hermonensis*, 7-9 bands were observed in the globulin region, 1 band in the postalbumin zone, and 2 bands in the prealbumin zone (Fig. 2).

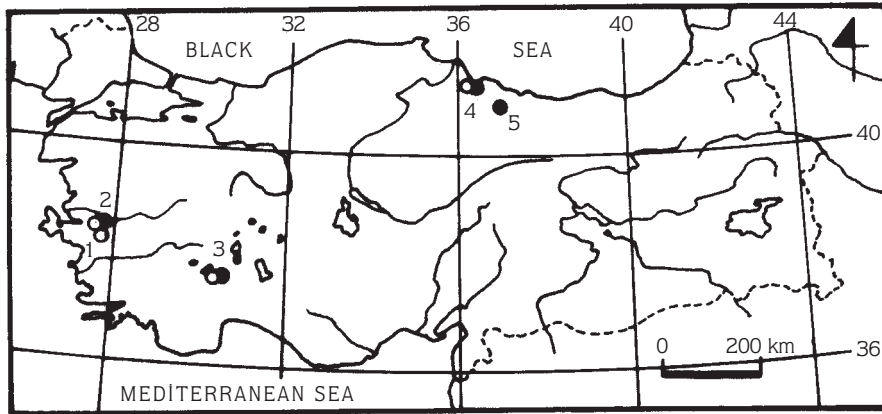


Fig. 1. Map showing recorded localities of *Apodemus hermonensis* (○) and *Apodemus flavicollis* (●)
1. Bayındır. 2. Kemalpaşa. 3. Burdur. 4. Samsun. 5. Akkuş.

Blood serum proteins of 22 specimens of *Apodemus flavicollis* collected from Akkuş (Ordu), Burdur, Kemalpaşa (İzmir), and Samsun were examined. Six to nine electrophoretic bands were determined in the globulin region, 1 band in the postalbumin zone, and 2 bands in the prealbumin zone (Fig. 2).

Discussion

In order to differentiate *A. flavicollis* from *A. hermonensis*, we used morphological characters described by Filippucci et al. (2) and Filippucci et al. (3). Electrophoretic comparison of *A. hermonensis* with *A. flavicollis* showed that these species have different patterns of globulin and postalbumin. In particular, the postalbumin band in *A. flavicollis* is slower than that in *A. hermonensis*. Thus, *A. flavicollis* differs from *A. hermonensis*. These results are consistent with those of Debrot and Mermod (6) and Gemmeke (7) who stated that the field specimens of *Apodemus* can be identified by electrophoretic methods based on serum albumin. Fragedakis-

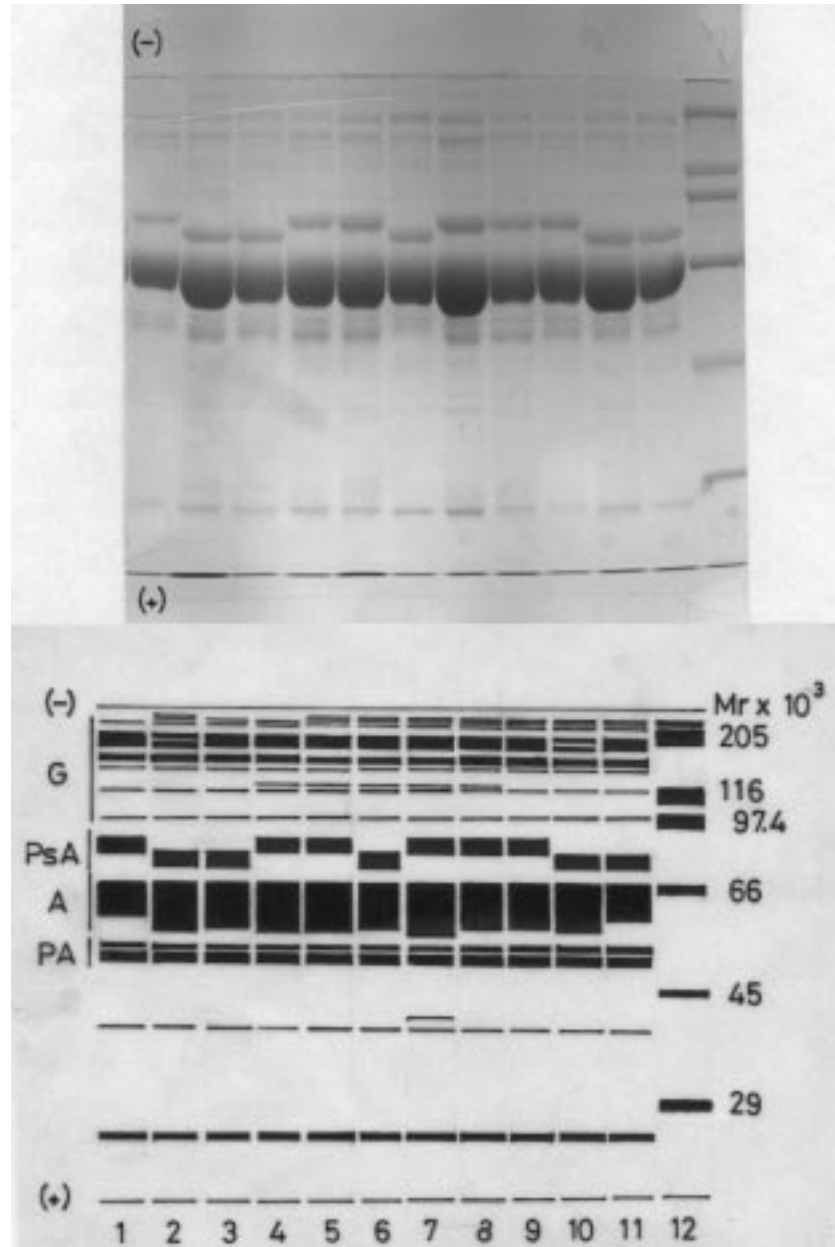


Fig. 2. Electrophoretic patterns of blood serum proteins of *Apodemus hermonensis* (2, 3, 6, 10 and 11) and *Apodemus flavicollis* (1, 4, 5, 7, 8 and 9). G: Globulin, PsA: Postalbumin, A: Albumin, PA: Prealbumin, Mr: Marker. Numbers indicate the molecular weight of marker proteins.

Tsolis et al. (8), and Fragedakis-Tsolis and Chondropoulos (9) distinguished *A. sylvaticus* from *Mus musculus* and *Pitymys taticus* in Greece, noting electrophoretic differences in blood serum proteins. This shows that the electrophoretic patterns of blood serum proteins vary between species. The findings obtained in this study support other evidence that *A. hermonensis* is a valid taxon.

Acknowledgements

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References

1. Corbet, G.B., The mammals of Palaearctic region: a taxonomic review. London: British Mus.(Nat. Hist.), 1978.
2. Filippucci, M.G., Simson, S., Nevo, E., Evolutionary biology of the genus *Apodemus* Kaup, 1829 in Israel. Allozymic and biometric analyses with description of a new species: *Apodemus hermonensis* (Rodentia, Muridae). Boll. Zool. 56, 361-376, 1989.
3. Filippucci, M.G., Storch, G., Machalon, M. Taxonomy of the genus *Sylvaemus* in western Anatolia- morphological and electrophoretic evidence (Mammalia:Rodentia:Muridae). Senckenbergiana biologica 75,1-14, 1996.
4. Sambrook, J., Fritsch, E.F., Maniatis, T., Molecular cloning, a laboratory manual. Second edition. New York: Cold Spring Harbor Laboratory Press, 1989.
5. Laemmli, U. K., Cleavage of structural proteins during the assembly of the head of Bacteriophage T4. Nature 227, 680-685, 1970.
6. Debrot, S., Mermod, C., Chimiotaxonomie du genre *Apodemus* Kaup, 1929 (Rodentia, Muridae). Rev. Suisse Zool. 28, 521-526, 1977.
7. Gemmeke, J., Proteinvariation und Taxonomie in der Gattung *Apodemus* (Mammalia: Rodentia). Z. Säugetierkunde 45, 348-365, 1980.
8. Fragedakis-Tsolis,S.E., Chondropoulos, B.P., Lykakis, J.J., and Ondrias, J.C., Taxonomic problems of woodmice, *Apodemus* ssp., of Greece approached by electrophoretic and immunological methods. Mammalia, 47 (3):333-334, 1983.
9. Fragedakis-Tsolis,S.E., and Chondropoulos., Electrophoretic patterns of serum proteins and lactate dehydrogenase (LDH) of three rodent species. *Mus musculus*, *Apodemus flavicollis* and *Pitymys taticus* (Mammalia:Rodentia). Biologia Gallo-Hellenica, 11 (2): 249-258, 1986.