

## ON THE WATER BAT (*MYOTIS DAUBENTONII*) IN TURKEY

İrfan Albayrak\*

\* University of Kırıkkale, Faculty of Sciences and Arts, Department of Biology, 71450, Kırıkkale, TURKEY. E-mail: iralbayrak@hotmail.com

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**ABSTRACT:** Of 5416 mammal species in the world, 1116 are bat species. Bats belong to the order Chiroptera, which has the meaning of hand winged. Bats feed on insects, fruits, nectar, blood, some invertebrate and vertebrate. It is determined that 36 bat species live in Turkey, one of which is frugivorous and others insectivorous. Water bat, *Myotis daubentonii* which was recorded first time from Bolu province generally feeds on water insects. Water bat is often located near bodies of water, because they hunt insects flying over water. It can be said that the distribution areas of this species changes with existing of water. This species was encountered inside small cracks and hollows on cave wall and ceiling, located adjacent to a small waterfall. Diagnostic characters, habitat, fur colour, morphometric data and distribution of this species in Turkey are given depending on one female and five male specimens. Bats feeding on insects, laying their eggs on water are affected adversely because of irregularity of water regimen.

**KEY WORDS:** Water bat, *Myotis daubentonii*, bioecology, distribution, Turkey.

*Myotis daubentonii* is an Eurasian bat which distributes from Britain to Japan. This species occurs in the woods and lives about 20 years. It prefers the areas near water sources such as rivers and water channels for roosting. Summer colonies occur in tunnels, vaults, mines, caves and underbridges, near sources of water. It usually hibernates between september and april. *Myotis daubentonii* is a kind of insectivorous bat and it gets out at dusk to hunt insects on the surface of water (Richarz & Limbrunner, 1993). Its main food is composed of flies, midges, mayflies and moths. This bat feeds during flying and returns to the roost after its weight increases of 60% in an hour. Mating happens in fall and fertilization occurs in following spring. Infants begin to fly after 3 weeks and they leave their parents at 6-8 weeks of age.

The purpose of this study is to emphasize the relationship between water resources and the distribution of *Myotis daubentonii*.

### MATERIAL AND METHOD

This research is based on taxonomic characters and some biological features of *Myotis daubentonii* recorded in 1986 for the first time in Turkey. Six specimens which was captured using by arial net were prepared according to the traditional museum-type sample in the field by recording the weight and four standard external measurements according to Mursaloğlu (1965) (Figure 1).

Diagnostic characters, habitat, fur colour, some measurements and distribution of the species in Turkey were recorded.

### RESULTS

Megachiroptera is only represented by family Pteropodidae and Microchiroptera family Emballonuridae, Rhinolophidae, Vespertilionidae and Molossidae. Until now, 36 bat species were recorded in Turkey. Ten species

belong to the family Vespertilionidae have been identified in Turkey. *Myotis daubentonii* is known as one of the rare species in Turkey.

Diagnostic characters: There is a little notch at posterior border of ear, wing membrane extending to side of metatarsus, last caudal vertebra free, interfemoral membrane has densely scattered dots (Albayrak, 1988).

Habitat: Six specimens, one of which is female, were encountered inside hollows and cracks on walls and ceilings of little cave near a small waterfall on a slope (Figure 2).

Fur colour: Dorsal colour of six subadult specimens varies from brown to slightly dark brown. Ventral colour is pale yellowish gray. Base of hair on dorsal and ventral is blackish brown, hair tip is similar to general colour tone.

Measurements and distribution: Some external and cranial measurements together with the weight of water bat were recorded (Table).

Water bat has been mostly recorded in the northern regions of Turkey (Albayrak, 1988, 1993; Helversen, 1989; Benda and Horáček, 1998) (Figure 3).

## CONCLUSION

Some studies pointed out the resource limits and competition in bat communities. A bats are defined as successful desert mammals (Findley, 1995). In the deserts of North America and Australia, despite of an equal number of bats and rodents, the number of rodents is twice of bat numbers in the most arid regions of the Sahara and three times recorded in Namib desert also. There is a certain relationship between the degree of bat residence and kidney structure and function in arid environment (Findley, 1995).

It is determined that there is a correlation between the ratio of the inner medulla to renal cortex and urea concentration ability. Bats, such as *Pipistrellus hesperus* and *Antrozous pallidus*, which have the most developed inner medulla can make more concentration of urea. These species represent the most common species in southwestern region of America (Findley, 1995).

Arid western regions of America where surface water is limited, a very large number of bat have been seen at the same time on the water ponds. In these cases, it is stated that although it is reasonable that the physical access to the water supply is limited, there is a little evidence for temporal partitioning of watering (Findley, 1995). Jones (1965) reported that there is a few important differences in a study, concerning watering time of 19 bat species in New Mexico. It is reported that in many parts of the world it is not determined that water restricts bats in a way of affecting the community structure (Findley, 1995).

It is possible to classify the Turkish bats in point of habitat preferences. Taking into consideration of summer and winter roost sites, the species generally inhabit caves, trees, buildings and cracks in rock. It has been determined that *Myotis daubentonii* lives in the areas which are close the water. In these regions some insect species show reproductive activity by leaving egg. Water bat hunts mainly mosquitoes and some insects like moths and flies by flying very close the water surface (Richarz & Limbrunner, 1993). As a result, water is one of the most important factors, which limits the distribution areas of the species. It is determined that roost sites of water bat were found to be very close to water resources (Figure4).

The water balance in animals is provided with relationships of variables such as humidity, body surface and diet (Rivera-Marchand and Rodriguez-Duran, 2001). It has not been encountered that the water bat lives in any ecosystem far

away from water resources. Thus, water bat is specialized to feed on aquatic insects.

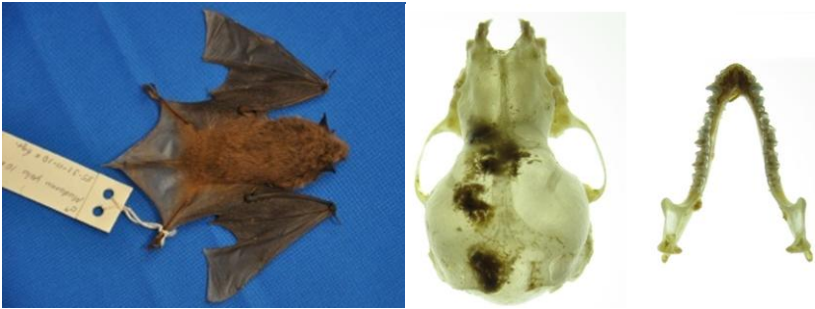


Figure 1. A museum material and head skeleton of *Myotis daubentonii*.



Figure 2. Habitat of *M. daubentonii* and its roost sites in a cave.

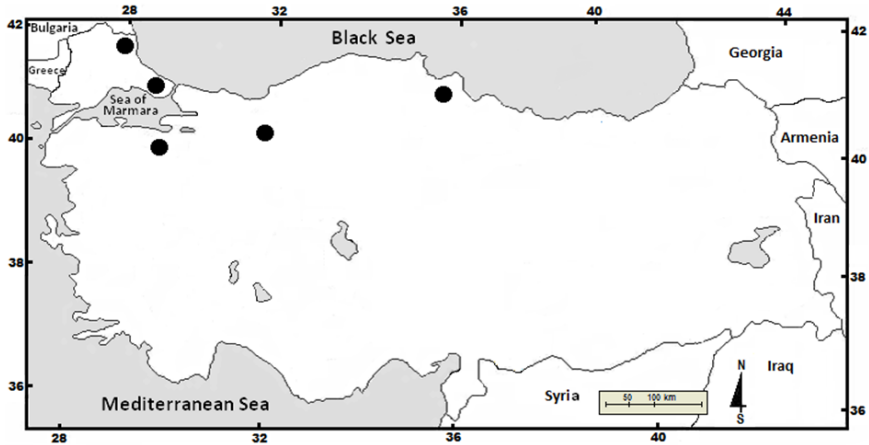


Figure 3. Distribution of *Myotis daubentonii* in Turkey.



Figure 4. A pond on which the aquatic insects are occurred in water bat habitat.

Table. Some external measurements and weights of *M. daubentonii* specimens from Bolu province (n: sample size, r: range, m: mean, sd: standart deviation).

Measurements (♂♂, ♀)	n	r	m	±sd
Total length	6	83-85	84.8	1.32
Forearm length	6	33.0-35.6	34.5	0.95
Condylbasal length	4	12.3-13.2	13.0	0.12
Zygomatic breadth	1	8,9	-	-
Weight	6	5.5-6.0	5.6	0.40

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