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## CLICK BEETLES (COLEOPTERA, ELATERIDAE) FROM TWO AREAS WITH HOLLOW OAKS AND PLANE TREES IN TURKEY

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**Abstract:** A total of 23 species of Coleoptera Elateridae were collected. Three of them, two belonging to the genus *Ampedus* Dejean, 1833 and one to the genus *Cardiophorus* Eschscholtz, 1829, are described as new.

**Key words:** Coleoptera, Elateridae, *Ampedus*, *Cardiophorus*, new species, Turkey.

**Elatéridos (Coleoptera, Elateridae) de dos áreas con robles huecos y plátanos de Turquía**

**Resumen:** Se colectaron 23 especies de Coleoptera Elateridae. Se describen como nuevas tres de ellas, dos pertenecientes al género *Ampedus* y una al género *Cardiophorus*.

**Palabras clave:** Coleoptera, Elateridae, *Ampedus*, *Cardiophorus*, especies nuevas, Turquía.

**Taxonomy/Taxonomía:** *Cardiophorus kovadai* Platia, n. sp.; *Ampedus karesiensis* Platia n. sp.; *Ampedus erdeki* Platia n. sp.

### Introduction

When trees become old, structures serving as microhabitats for many organisms begin to develop (Jansson, 2009; Sverdrup-Thygeson *et al.*, 2010). Forestry and changes in land management have reduced the number of old trees (Kirby & Watkins, 1998; Eliasson & Nilsson, 2002; Nieto & Alexander, 2010). One group with a high diversity on old hollow trees is the saproxylic beetles. In northern Europe this fauna is richest on oaks (*Quercus robur*) in comparison with other tree species (Palm, 1959). The old hollow oaks (*Quercus* spp.) in Turkey are even richer than for example Swedish oaks (Jansson & Coskun, 2008).

This study is a part of a larger project aiming to describe the saproxylic beetle fauna on old trees in Turkey (Schillhammer *et al.*, 2007; Novak *et al.*, 2011, 2014; Sama *et al.*, 2011; Atay *et al.*, 2012; Mazur *et al.*, 2013) and compare the results with neighbouring countries. One beetle family with a high diversity in our studies is the click beetles (Elateridae) and many new species have been found (Platia *et al.*, 2011; 2014). In total more than 495 click beetle species are known from Turkey. Most of the species are predators in their larval stage and in the habitat we are studying many of the species have their larval development in dead wood or in the wood mould in cavities in the trunks and branches on the old trees. Three new species (*Ampedus karesiensis* Platia n. sp., *Ampedus erdeki* Platia n. sp. and *Cardiophorus kovadai* Platia n. sp.) from Turkey, are presently described, illustrated and compared with related species of Turkey and adjacent regions.

### Material and methods

**Trapping.** Two stands with old hollow trees were studied in Turkey. One site in Kovada National Park in the province of Isparta old Plane trees (*Platanus orientalis*) were studied and in another site at Kapıdağ Peninsula in the province of

Balıkesir old oaks were studied (fig. 11). In total five hollow oaks were studied in Kapıdağ and 10 hollow plane trees in Kovada. The studied oaks in Kapıdağ are growing in a shady situation in forest condition (1,8-1,9 m in stem circumference) and in Kovada the Plane trees (1,8-9,3 m in stem circumference) are growing on flat land around a lake in open or semi open situation with bushes and some scattered trees of other trees like *Quercus cerris* and *Pinus brutia*. The trees were examined by using two different trap types for sampling the saproxylic beetles: window traps on the tree trunk and pit fall traps placed in the wood mould inside the trunk cavities. The traps were in field from mid-April to mid-November over the season 2012 in Balıkesir and from end of April to end of October in 2015 in Isparta. The studied site in Balıkesir is situated at an altitude of 340 m and the studied site in Isparta at an altitude of 920 m. Individual trees used for trapping were randomly selected from the pool of suitable trees found. The window traps (W-trap) consisted of a 30 x 60 cm wide transparent plastic plate with a tray underneath (Jansson & Lundberg, 2000). They were placed near the trunk (<1 m), beside or in front of a cavity entrance. Their positions were 1.5-4.0 m from the ground, depending on where the cavity entrance was situated on the studied tree. The pitfall traps (P-trap) were plastic cups with a top diameter of 6.5 cm. They were placed in the wood mould at the bottom of the cavity, with their openings on level with the wood mould surface.

**Measurements** – Body length is measured along the midline from the anterior margin of frons to apex of the elytra; width is measured across the broadest part of the body. Pronotal length is measured along the midline; the width is at the broadest part, usually at hind angles.

**Abbreviations.** The names of institutions, museums and collections providing material for this study are abbreviated as follows: **CJL**, collection of N. Jansson, Linköping University (Sweden). **CPG**, collection of G. Platia, Gatteo (Italy).

The subfamilial and tribal placement of genera listed below follows Bouchard *et al.* (2011).

## List of species

### Kovada National Park

#### Tribe **Dendrometrini** Gistel, 1856

*Stenagostus zuercheri* (Reitter, 1909) - 1 spcm. ♀ - W trap 5, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CPG).

*Elathous emrei* Platia 2011 - 10 spcms ♂ ♀ - W trap, 5, 6, 7, 10, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Elathous nurayae* Platia, 2011 - 4 spcms ♂ ♀ - W trap 7, 10, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Nothodes parvulus* (Panzer, 1799) - 10 spcms ♂ ♀ - W trap 1, 4, 7, 12, 6.VII.2015, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

#### Tribe **Elaterini** Leach, 1815

*Elater turcicus* Platia 2011 - 2 spcms. ♂ ♀ - W trap 7, W trap 12, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG). Fig. 9.

*Mulsanteus schaumii* (Candèze, 1882) - 14 spcms. ♂ ♀ - W trap 2, 5, 7, 9, 10, 12, 6.VII.2015, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

#### Tribe **Physorhinini** Candèze, 1859

*Porthmidius drymogenes* Platia, 2010 - 3 spcms ♀ - W trap 1, 11, 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

#### Tribe **Synaptini** Gistel, 1856

*Peripontius omissus* (Buysson, 1889) - 4 spcms ♂ ♀ - W trap 2, 5, 7, 10, 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

#### Tribe **Agriotini** Champion 1906

*Agriotes lundbergi* Platia, 1989 - 1 spcm. ♀ - W trap 1, 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL).

#### Tribe **Ampedini** Gistel, 1856

*Ampedus ocellatus* (Buysson, 1891) - 1 spcm. ♀ - W trap 1, 6.VII.2015 Hollow *Platanus* sp. M. Avci & N. Jansson. (CJL).

*Haterumelater fulvago* (Marseul, 1870) - 8 spcms ♂ ♀ - W trap 4, 5, 9, 12, 19.VIII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Reitterelater dubius* Platia & Cate, 1990 - 11 spcms ♂ ♀ - W trap 4, 6, 6.VII.2015, Hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

#### Tribe **Melanotini** Candèze, 1859

*Melanotus crassicollis* (Erichson, 1841) - 10 spcms. ♂ ♀ - W trap 1, 2, 5, 7, 11 6.VII.2015, 19.VIII.2015, hollow *Platanus* M. Avci & N. Jansson. (CJL, CPG).

*Melanotus balikesirensis* Platia 2014 - 2 spcms ♂ ♀ - W trap 4, 3.X.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Melanotus fusciceps* (Gyllenhal, 1817) - 7 spcms ♂ ♀ - W trap 1, 5, 7, 9, 11, 19, 19.VIII.2015, 3.X.2015, hollow *Platanus* sp. M. Avci & N. Jansson. (CJL, CPG).

## Subfamily **Cardiophorinae** Candèze, 1860

### **Cardiophorus kovadai** Platia n. sp.

Fig. 3, 3a, 6, 10.

**MATERIAL EXAMINED.** Holotype ♂ - Turkey: Isparta Province, Kovada National Park, W trap 12, 6.VII.2015, hollow *Platanus* sp. M. Avci & N. Jansson. (CPG).

**DIAGNOSIS.** Among the unicoloured species of *Cardiophorus* from the Turkish fauna can be compared with *C. picinus* Platia & Gudenzi, 2002 for the general shape and colour but can be separated for the pronotum more arcuate and particularly for the paramera of aedeagus strongly arcuate before the apex.

#### **DESCRIPTION.**

**Male.** Shiny; entirely black with legs lighter, brownish with ferruginous articulations; covered with dense and short yellowish pubescence.

Frons flat, anterior margin regularly arcuate and just protruding above the clypeus, punctures approximately of the same size, deep, simple with very short intervals.

Antennae, left mutilated, right with four articles slightly serrated from the third article on, reaching the apices of the posterior angles (estimated); second article subcylindrical, 1.6x longer than wide, third conical, 1.66x longer than second, second and third, taken together, 1.55x longer than fourth, fourth subtriangular, 1.8x longer than wide.

Pronotum long as wide, widest at the middle, strongly and regularly convex, sides arcuate, slightly sinuate before the posterior angles, the latter short, truncate, not divergent at the extremity, very shortly carinate; lateral suture-like margins obsolete after the middle; punctuation uniformly distributed, punctures approximately of the same size, deep, simple with intervals on the disk equal on average to their own diameters, a little denser towards the sides.

Scutellum heart-shaped, long as wide, very slightly impressed at the middle and finely punctured.

Elytra 2.58x longer than pronotum and just wider than it, oviform, sides widest at the middle, striae regularly marked and punctured, interstriae flat, densely and finely punctured.

Aedeagus as in the fig. 3, 3a (length 1.0 mm).

**Female** unknown.

**Size.** Length 7.2 mm; width 2.0 mm.

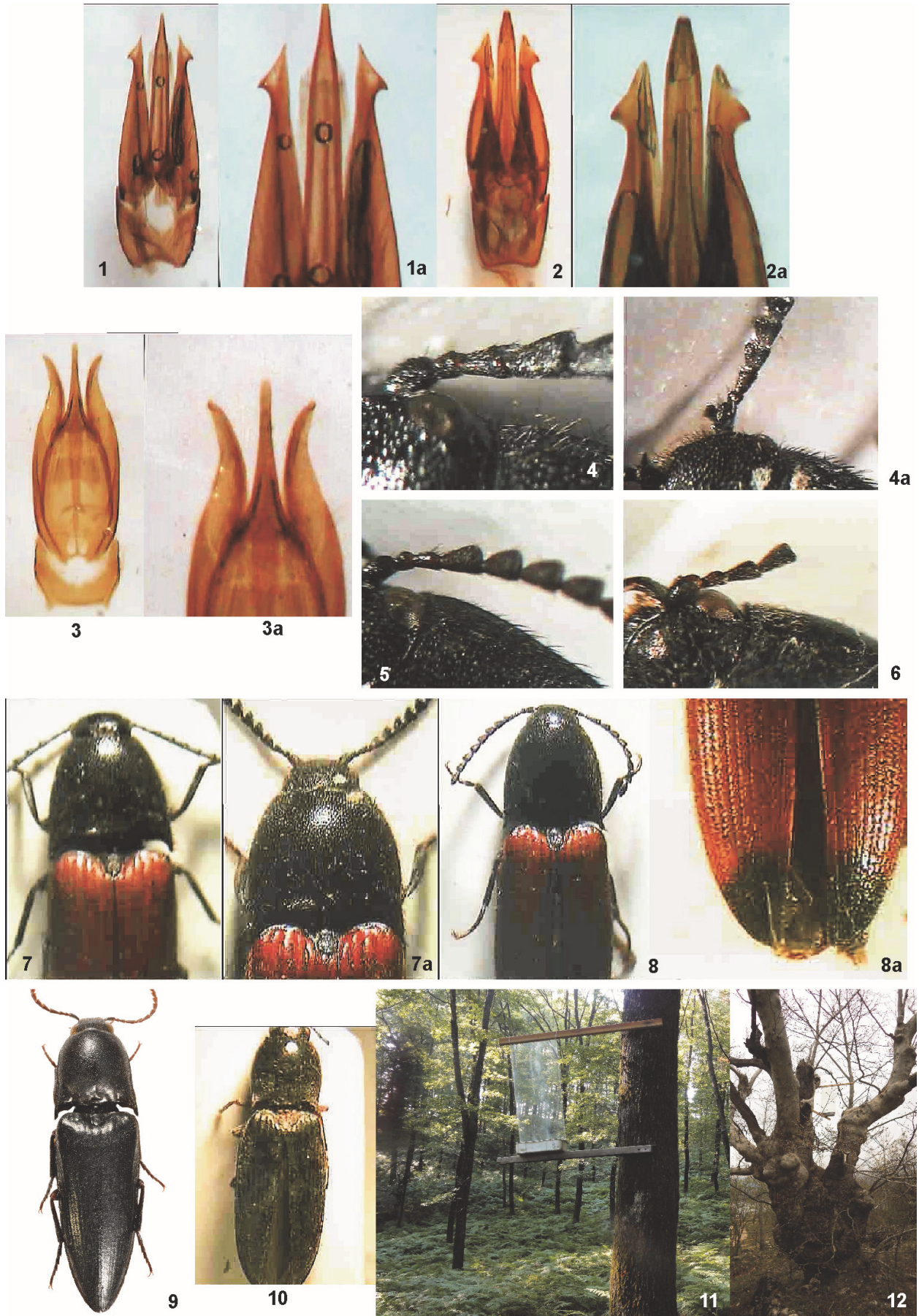
**ETYMOLOGY.** The name is derived from Kovada National Park where the species was collected.

*Cardiophorus anticus* Erichson, 1840 - 5 spcms. ♂ ♀ - W trap 2, 5, 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Cardiophorus frequens* Platia & Gudenzi, 2002 - 1 spcm. ♂ - W trap 2, 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL).

*Cardiophorus parvulus* Platia & Gudenzi 2000 - 40 spcms. ♂ ♀ - W trap 1, 2, 4, 7, 8, 11, 6.VII.2015, 19.VIII.2015, 3.X.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL, CPG).

*Dicronychus merkli* (Pic, 1910) - 2 spcms ♂ ♀ - W trap 5, 11 6.VII.2015, hollow *Platanus* sp., M. Avci & N. Jansson. (CJL).



**Fig. 1-3.** Male genitalia in dorsal view. **1, 1a.** *Ampedus karesiensis* n.sp.; **2, 2a.** *Ampedus erdeki* n.sp.; **3, 3a.** *Cardiophorus kovadai* n. sp. **Fig. 4-6.** First articles of antennae. **4, 4a.** *Ampedus karesiensis* n.sp. ♂♀; **5.** *Ampedus erdeki* n. sp.; **6.** *Cardiophorus kovadai* n. sp. **Fig. 7-10.** Habitus total or partial. **7, 7a.** *Ampedus karesiensis* n.sp. ♂♀; **8, 8a.** *Ampedus erdeki* n. sp.; **9.** *Elater turcicus* Platia (22 mm); **10.** *Cardiophorus kovadai* n.sp. **Fig. 11-12.** **11.** Hollow oak (*Quercus* sp.) with window trap (Erdek County); **12.** Plantree (*Platanus orientalis*) in Kovada National Park.

Tribe **Dendrometrini** Gistel, 1856

*Stenagostus rhombeus* (Olivier, 1790) – 3 spcms ♀ -. W trap 3, 15.VIII.2012, hollow *Quercus sp.*, A. Tuven, S. Varli, N. Jansson. (CJL, CPG).

Tribe **Ampedini** Gistel, 1856

***Ampedus karesiensis* Platia n. sp.**

Fig. 1, 1a, 4, 4a, 7, 7a.

**MATERIAL EXAMINED.** Holotype ♂- Turkey: Balıkesir Province, Kapıdağ Peninsula, 12 km NE Erdek, W-trap 4, 2, 16.VII.2012, hollow *Quercus sp.*, A. Tuven, S. Varli, N. Jansson. (CPG). 1 Paratype ♀ - same data as Ht. (CPG).

**DIAGNOSIS.** For the general shape, colour, punctuation of pronotum can be compared to *A. camillae* Platia, 2011 but can be separated by the slenderer third article of antennae and acuminate apices of paramera of aedeagus.

**DESCRIPTION.**

**Male.** Shiny; bicoloured; entirely black with reddish elytra and brownish legs; covered with short, semi-erect on pronotum and sides of elytra, blackish pubescence.

Frons convex, punctures strongly umbilicate, with shortest intervals.

Antennae reaching and just exceeding the apices of the posterior angles of pronotum, strongly serrated from the fourth article on; second article subcylindrical, long as wide, third subconical 1.7x longer than wide; second and third, taken together, 1.26x longer than fourth; fourth-tenth triangular, on average just a little longer than wide, last longer than the penultimate, sub-ellipsoidal, asymmetrically slightly constricted immediately before the apex,

Pronotum 1.25x wider than long, widest at the apices of the posterior angles, regularly convex; sides from middle slightly tapering to apex, subparallel forwards to the posterior angles, the latter not divergent at apex, with a strong and short carina directed inside; punctuation not uniformly distributed, punctures on the disk deep, simple with shiny intervals on average equal to a little smaller than their own diameters, gradually sparser to the basal slope and denser towards the sides, more superficial and umbilicate always with shortest intervals also at the lateral extremities.

Scutellum shield-shaped, flat, just longer than wide, slightly sinuate at sides in the first half, punctured.

Elytra 2.9x longer than pronotum, convex; sides very gradually and regularly tapering from the base to the apices; striae regularly marked and punctured, interstriae flat more finely punctured.

Aedeagus as in the fig. 1, 1a (length 1.37 mm).

**Female.** Very similar to the male but with larger body, shorter antennae, more convex and arcuate sides of pronotum with denser punctuation.

**Size.** Length 10.7 mm; width 3.18 mm (male); length 12.9 mm; width 4.06 mm (female).

**ETYMOLOGY.** The name is derived from Karesi, the old and historical name of the Balıkesir city.

***Ampedus erdeki* Platia n. sp.**

Fig. 2, 2a, 5, 8, 8a.

**MATERIAL EXAMINED.** Holotype ♂- Turkey: Balıkesir Province, Kapıdağ Peninsula, 12 km NE Erdek, W trap 2, 15.VIII.2012, hollow *Quercus sp.*, A. Tuven, S. Varli, N. Jansson (CPG).

**DIAGNOSIS.** For the general shape and colour the new species can be compared with *Ampedus pulcher* (Baudi, 1871) but is separated by the lighter pronotal punctures, the shorter second article of antennae compared with the third, shape of aedeagus.

**DESCRIPTION.**

**Male.** Shiny; bicoloured; entirely black with elytra red-orange, black only before the apices; legs with ferruginous tarsi; covered with dense and fine blackish pubescence.

Frons convex, punctures umbilicate with very short intervals or contiguous.

Antennae not reaching for about one articles the apices of the posterior angles of pronotum, serrated from the fourth article on; second article subcylindrical long as wide, third subconical 1.6x longer than second and about twice longer than wide, second and third, taken together, long as the fourth; fourth-tenth triangular, sculptured, fourth a little longer than the following, fifth-tenth on average just longer than wide, last longer, regularly ellipsoidal.

Pronotum 1.06x wider than long, widest at the apices of the posterior angles, convex, with a vestige of narrow mid-longitudinal impressed line on the basal slope; sides from the middle regularly tapering forwards, subparallel in the second half, posterior angles acute, just divergent at the extremities, carinate with a sharp and short carina directed inside; lateral margins apparent in a dorsal view only in the first half; punctuation rather uniformly distributed; punctures on the disk slightly umbilicate with shortest, shiny intervals gradually denser and clearly umbilicate towards the sides where can be contiguous at the lateral extremities.

Scutellum shield-shaped, flat, a little longer than wide, slightly sinuate at the sides in the first half, punctured.

Elytra 2.6x longer than pronotum, convex, sides widest at the middle; striae regularly punctured, interstriae flat, finely punctured.

Aedeagus as in the fig. 2, 2a (length 1.18 mm).

**Female** unknown.

**Size.** Length 8.9 mm; width 2.62 mm.

**ETYMOLOGY.** The name is derived from Erdek, the county where is situated the Kapıdağ Mount.

**Acknowledgement**

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