

# First record of a cave maternity roost of *Rhinolophus hipposideros* (Bechstein, 1800) in Slovenia

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**Abstract.** The first cave maternity roost of *Rhinolophus hipposideros* in Slovenia was discovered in the summer of 2011 in the »Pod kevdrom« cave. The cave is located in the Idrijca River canyon, SSW of the town of Idrija (Western Slovenia). Here, we present information on preliminary observations as to the number of adult and juvenile animals, along with temperature statistics and cave morphology.

Key words: *Rhinolophus hipposideros*, cave, maternity roost, Slovenia

**Izveček. PRVO JAMSKO KOTIŠČE MALIH PODKOVNJAKOV (*RHINOLOPHUS HIPPOSIDEROS* (BECHSTEIN, 1800)) V SLOVENIJI** – V jami Pod kevdrom v kanjonu reke Idrijce JJZ od Idrije (zahodna Slovenija) smo poleti 2011 odkrili prvo jamsko kotišče malih podkovnjakov (*Rhinolophus hipposideros*). V prispevku predstavljamo predhodna opažanja o številu odraslih in mladičev, o temperaturi in oblikovanosti jame.

Ključne besede: mali podkovnjak *Rhinolophus hipposideros*, jama, kotišče, Slovenija

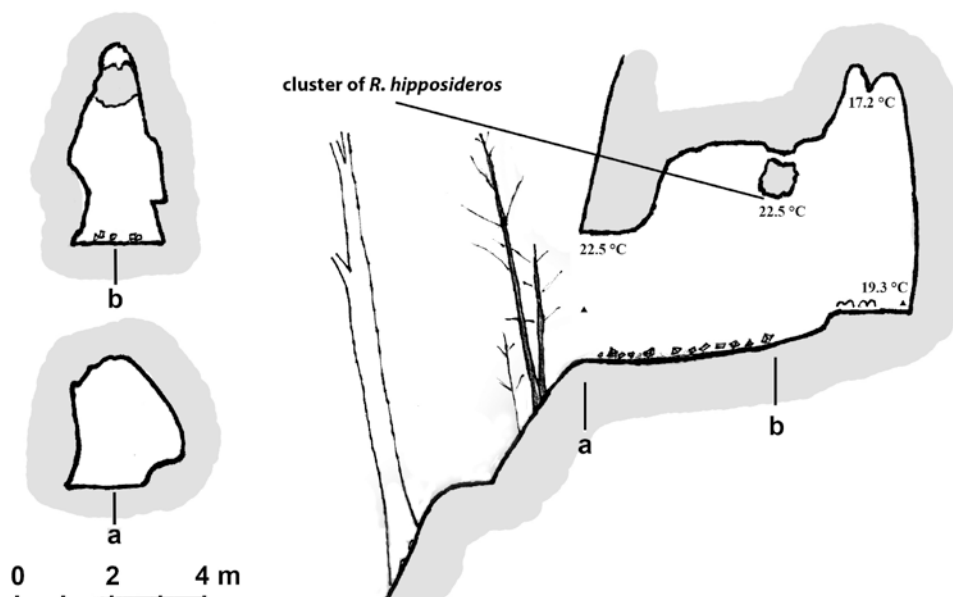
*Rhinolophus hipposideros* is a common bat species found in most of Slovenia. With a single exception, all known maternity roosts of *R. hipposideros* are situated in the attics of buildings (Presetnik et al. 2009). This is in contrast to the two other rhinolophid species present in Slovenia (*R. ferrumequinum* and *R. euryale*) that are known to establish their maternity roosts regularly in caves. An exceptional type of *R. hipposideros* maternity roost, used by a small group (2-6 adult animals) was found under a bridge in Črni Kal. By morphology, this artificial underground roost resembled entrance parts of natural caves and therefore indicated the possibility that in the warmest parts of Slovenia this species could also form their maternity colonies in the warmer entrance parts of caves (Presetnik 2005, Petrinjak 2009).

This hypothesis was confirmed by the finding of a cave maternity roost of *R. hipposideros* in the Pod kevdrom cave (cave cadastre number 1169) located in the narrow canyon of the Idrijca River approximately 4 km SSW of the town of Idrija (lat. 45.96, long. 14.01, 390 m above sea level). During a herpetological inventarisation conducted by the second author on June 29<sup>th</sup> 2011, this small cave was examined and a tight cluster of more than 50 adult (including subadults) *R. hipposideros* was seen just 4.5 metres inside the cave. Subsequent visits made on July 1<sup>st</sup> and July 14<sup>th</sup> proved that the colony used the cave as a permanent maternity roost site. On July 1<sup>st</sup>, 65 grown up animals with a minimum of 12 small juveniles were counted. And on July 14<sup>th</sup>, a minimum of 29 females had a pup attached to them, with

one additional juvenile already able to fly and another 26 grown up animals roosting in the cave. Since young *R. hipposideros* generally take their first flight in the third week of their lives (Dietz et al. 2009), we could assume that the first births took place in the beginning of the last week of June, and were probably not seen on the first visit, due to bats hanging in tight cluster and very short observation time. The temperature at the roosting location of the bats (Fig. 1) was 15.3°C on the afternoon (at c. 19:00) of July 1<sup>st</sup>, and 22.5°C on the afternoon (again at c. 19:00) of July 14<sup>th</sup> (Fig. 1). Interestingly, Savnik & Gantar (1959) report a similar temperature (17.4°C) for this cave on July 20<sup>th</sup> 1955, but do not mention bats. During all our three visits, bats were hanging in a tight cluster, 4.5 m from the cave entrance and 3 m above the floor (Fig. 1), just slightly sheltered from full daylight. Clustering behaviour was not surprising, since at temperatures lower than 22°C *R. hipposideros* females in maternity roosts form a tight group as a method of temperature regulation called social thermoregulation (Roer & Schoeber 2001). However, since this clustering behaviour can be only observed during cold weather and consequently at low roost temperatures in attic roosts of central Europe or caves of the Mediterranean, the temperatures of the cave and the permanent clustering behaviour could be an indication for suboptimal temperature conditions of the roost.

The cave is situated 30 m above the bottom of the canyon on a steep, northeast facing and forest covered riverbank. It is just 7 m long, with an entrance measuring 2.3×2.7 m (Fig. 1) and an estimated volume of 50 m<sup>3</sup>. The floor and ceiling rise upwards slightly towards the back of the cave. In the ceiling is a small dome 1.5 m from the entrance, and the cave ends with an approximately 5 m high chimney (Fig. 1). With this kind of morphology, the cave could be a textbook example of a cave that accumulates warm air during the day and preserves it during the night (Gams 2004), the so-called »oven-cave«. However, lower temperature in the chimney in comparison with other temperatures (Fig. 1) advocate caution and additional research before the hypothesis in the previous sentence could be confirmed. Nevertheless, temperatures regime in the cave made it obviously suitable as a maternity roost for the bats. Additional favourable factors for heat accumulation are that the cave entrance faces south, and that the cave lies at the end of an approximately 10 m long and equally high bare rock wall that also accumulates heat during the day.

Cave maternity roosts of *R. hipposideros* are known in warmer regions of Europe, in the Balkan peninsula, for example in Bulgaria (Dietz et al. 2009) and Serbia (personal observation). Although *R. hipposideros* forms, in the »Pod kevdrom« cave the northern cave maternity roost in the Balkan Peninsula, it is not the northernmost roost of this type of the species. According to the available literature and personal information from chiropterologists, no such cave roost exists in Austria (Spitzenberger & Bauer (2001), Slovakia (Uhrin 1996, in litt.), Bavaria (Zahn 2012, in litt.). However, several cave maternity roosts of *R. hipposideros* are known from warmer karst parts of Thuringia (IFT 2002, Biedermann et al. 2006, Dietz et al. 2009).



**Figure 1.** Map of the Pod kevdom cave – the first recorded finding of a cave maternity roost of *Rhinolophus hipposideros* in Slovenia, and temperature recordings taken on 14.7.2011 (map made by Primož Presetnik).

**Slika 1.** Načrt jame Pod kevdom, prvega znanega jamskega kotišča malega podkovnjaka (*Rhinolophus hipposideros*) v Sloveniji, in temperature, zmerjene 14.7.2011 (načrt: Primož Presetnik).

## Povzetek

Dne 29.6.2011 je bila v komaj 7 m dolgi jami Pod Kevdrom (številka jamskega katastra 1169, Sl. 1) v dolini reke Idrijce, JJV od Idrije, opažena in 1.7. ter 14.7. potrjena prva jamska porodniška skupina malih podkovnjakov v Sloveniji. Jama zaradi tipične oblike spada med jame, ki lahko podnevi akumulirajo toploto in jo zadržujejo prek noči ter s tem omogočajo ustrezne razmere za kotišče netopirjev. 1.7. je bila tik pod visiščem gruče izmerjena temperatura 15,3 °C, 14.7. pa 22,5 °C, zato so verjetno živali ob vseh obiskih visele v tesni gruči, kar je značilno za socialno termoregulacijo, ki jo uporablja ta vrsta pri nižjih temperaturah na kotiščih. 1.7. je bilo opaženih 62 odraslih živali in 12 mladičev, 14.7. pa je mladiče na sebi imelo 29 samic, dodatno je en mladič že lahko letel, v jami pa se je zadrževalo tudi ostalih 26 odraslih živali. Prvi skoti so bili leta 2011 verjetno na začetku zadnjega tedna junija. S tem opazovanjem so potrjena predhodna predvidevanja, da imajo lahko mali podkovnjaki v Sloveniji tudi jamska kotišča.

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