A new live trap to catch blind mole rats (Spalax sp.)

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A new live trap to catch blind mole rats (*Spalax* sp.)

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Abstract. A design of a newly developed metal pipe-type trap for catching live mole rats is presented. In all field trials the trap was efficient and thus meaningful alternative to other types of live traps. This trap may prove to be useful also to catching the other subterranean mammal species.

Key words: live trapping, subterranean mammal

Fossorial and subterranean mammals are an interesting model of various biological studies (Nevo 1979, Nevo & Reig 1990, Bennet & Faulkes 2000, Lacey et al. 2000, Begall et al. 2007). However, the field work and data collection are usually difficult in this ecological group of mammals due to problems with their live-trapping. Here, I propose a new design of a trap for capturing subterranean mammals developed during our research on blind mole rats (Spalacinae). Blind mole rats are not only interesting subjects of bio-medical research but also important agricultural pests (cf. Nevo 1979, Nevo et al. 2001). According to Nevo (1961), except during the breeding season, the blind mole rats are solitary animals and each mound contains only one animal. Breeding mounds used by female mole rats consist of a nest chamber lined with plants, two or three storage chambers and a toilet chamber. The smaller mounds surrounding the breeding mound are inhabited only by males. The galleries under the mounds are round and their diameter varies according to the size of the animal, food source and the texture of the soil (Yağcı & Aşan 2007). Blind mole rat uses incisors and front paws to break the soil and kicks back the excavated soil with the hind feet. At intervals the animal turns 180° and rams the earth back along the tunnel. The head is used like a bulldozer blade during this activity (Nevo 1961).

Mursaloğlu (1964) described seven types of dead traps used in the fight against mole rats. Hickman (1979) and Yağcı & Aşan (2007) presented pipe-type trap to capture mole rats alive. Since our efforts to capture blind mole rats in Turkey with these traps were less successful, I developed a new and more effective kind of the pipe-type live mole rat trap.

The pipe-type of trap developed in this study is 7 cm in diameter, 65 cm long and is made of a metal pipe (p).

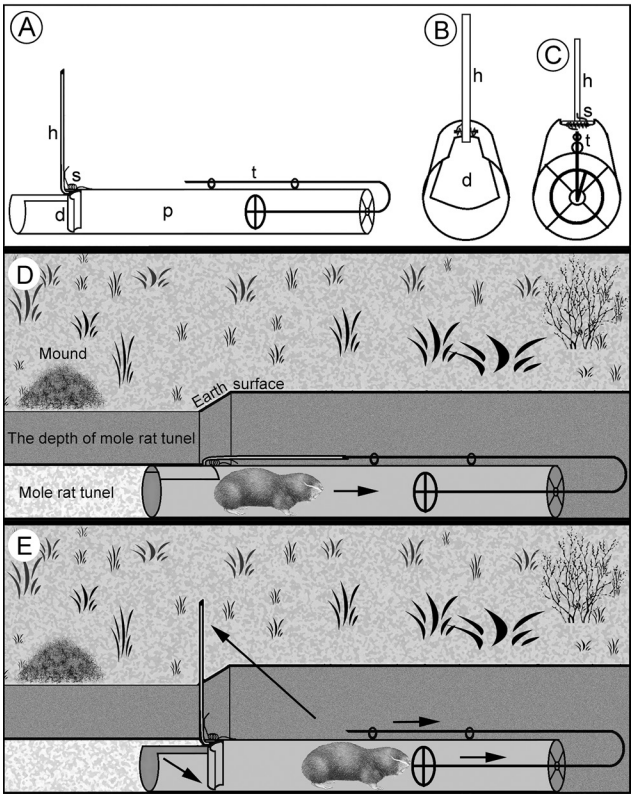

Fig. 1. Side (A), front (B) and behind (C) view of the trap in set position. p, pipe; d, door; h, handle of door; s, spiral springs; t, the trigger. (D) Working mechanism of the pipe-type trap. The trap can be placed in an underground tunnel and the mole rat approaches the trap and to touch the trigger. (E) The mole rat is captured alive after closing of the trap door.

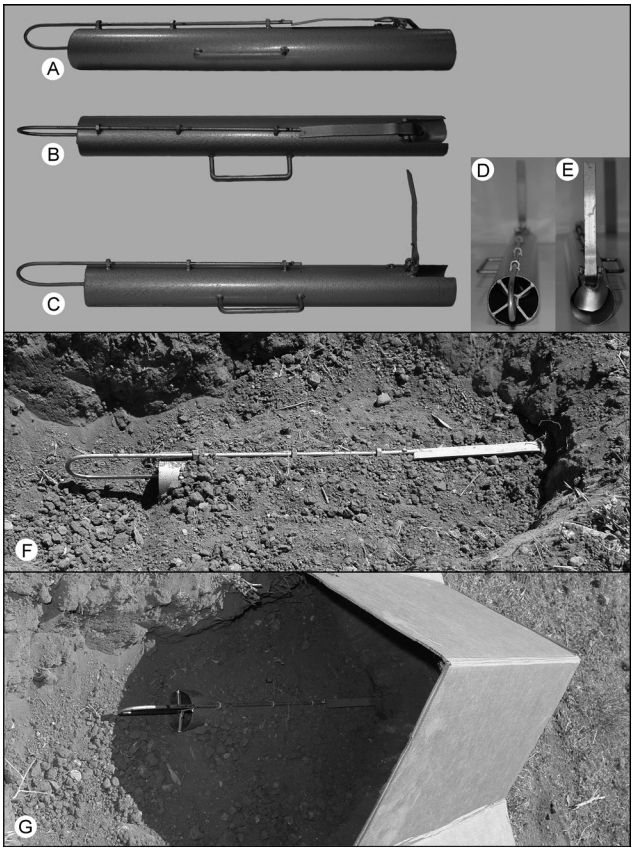

Fig. 2. (A, B, C, D, E) Design of the pipe-type trap to capture a live mole rats. (F, G) Use of the trap in the field.

At upper part of one end of the metal pipe a 7 cm long and 4.5 cm wide piece is removed by cutting. This piece will form the trap door later (d). At the short part of the door a 20 cm long handle (h) is welded and it is assembled with this part of the metal pipe by steel wire spiral springs (s) 2.5 mm in diameter with at least four coils. A 90 cm long metal trigger (t) is passed through the part closed in the form of X to prevent fires from the trap and is folded in half. The part of the trigger inside the trap is bent in circle so that the animal could push. The other part of the trigger is passed in bolt nuts on the door and thus the trap is completed (Figs. 1A, B, C and 2A, B, C, D, E). Fresh mole rat mound is found in the field. The tunnel of the mound is determined and opened. The tunnel is excavated to be longer than the trap. If the tunnel is not opened from the distal end (i.e. if the tunnel is opened in the middle or the area of near the middle), the tunnel is excavated twice longer than the trap. The mouth of two tunnels should be prepared for set up the trap since the direction that the animal may come from is not known. The bottom of the trap must be at the same level as the soil ground of the tunnel. The trap is placed in the tunnel with the door closed. If the diameter of the tunnel is smaller than that of the trap, the tunnel is expanded by moving the trap to the right and to the left and the trap is placed in the tunnel. At this stage in order to lift the door upward the handle is pressed down. The trigger is placed slightly on the handle. Thus the trap is set up precisely (Figs. 1D, 2F). The trap must be set up according to the slope of the tunnel on sloping land. Next, the top of the trap is covered with moist soil so that movement of the trigger is not hindered (Fig. 2F). The soil cover does not disable the operation of the trap since the spiral springs are strong. In addition, the trap is covered with a cardboard at the top to form the roof (Fig. 2G). Thus, the cardboard together with the moist soil will prevent heating of the trap in the summer. The mole rat enters the trap (Fig. 1D) and pushes the circular part of the trigger in the trap to the end. When the mole rat pushes the trigger, the upper extension of it will trigger the trap door. And thus by the help of spiral springs (s), the trap door will not open at the part of the mole rat and the animal will stay inside (Fig. 1E).

The microclimate conditions in the burrow systems of mole rats are surprisingly very stable. When the burrow systems are opened the microclimate conditions are disturbed. When this condition is detected by a mole rat it attempt to close the tunnel (Begall et al. 2007). Interestingly, the animals close the tunnels faster in windy weather conditions. Probably perception of vibrations and sound caused by the wind in the mouth of the tunnel stimulate the animals to close opening faster. Since the trap is made of metal pipe, the wind licking the outer part of the pipe increases the volume of the howling wind. Therefore it is advisable to place a triangular cardboard above the trap *in situ*. The edges of the cardboard must be open to create air flow. Besides that, the cardboard together with the moist soil covering the trap prevent its warming (Figs. 2F, G). According to our experience, the best time for trapping blind mole rats is early morning and afternoon.

Sometimes the diameter of a blind mole rat tunnel may be smaller than diameter of the trap. In this case, the mouth of the tunnel is expanded and the trap is set up. If the diameter of the tunnel is greater than the trap diameter after the set up gaps may be filled with mud. In either case it has been determined that blind mole rats enter the trap. This trap has been used in moist and hard soils of Turkey; Central Anatolia, the Mediterranean and Aegean regions which are land to blind mole rats. In each attempt, all of the 13 samples entering the trap along with soil were captured. Rarely

no mole rats entered the tunnel with trap during a day. This situation was not considered as failure.

The trap designed by Hickman (1979) works as the animal getting in the trap pulls the trigger out and the door connected to the trigger frees and closes the trap downward. Although the working principle of the trap proposed by Yağcı & Aşan (2007) is similar to other trap, it is a little more complicated. The trap in this study was designed since collecting of blind mole rats is time consuming and very difficult without traps. It is presented as an alternative to other traps. The working principle of this trap is simpler than those of other traps. In addition, there is not a hole at the top of the trap unlike the others. I believe that the lack of hole in the trap increases blind mole rats' chances of entering the trap and it may be used in trapping of other subterranean rodents.

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