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A Transparent Burrow System for the Study of Fossorial Mammals

Sztuczna nora do obserwowania ssaków ryjących

Graham C. HICKMAN

Hickman G. C., 1978: A transparent burrow system for the study of fossorial mammals. Acta theriol., 23, 30: 443—445 [With 1 Fig.].

A transparent burrow system constructed of perspex tubing and sheeting was easily constructed and modified to suit a number of species and experimental situations, simple to keep clean and odourless, and useful for photographing and monitoring all aspects of the behaviour of fossorial mammals.

[Dept. Zool., Univ. Natal, Pietermaritzburg, South Africa].

Maintaining animals in captivity under conditions conducive to behavioural study can be difficult, particularly for fossorial forms whose activities are almost exclusively subterrestrial.

Most simply, various wooden box cages have been used successfully for talpids (Henning, 1952; refer to the discussion in Rudge, 1966; Mellanby, 1967), and bathyergids (Bateman, 1960).

Direct observation has been expedited by »moleariums« (narrow, glass fronted observation chambers which limit tunnel construction against glass). Genelly (1965) mentions a 30×16 inch chamber for bathyergids; Jarvis & Sale (1971) mention a 135×45×15 cm wide chamber for bathyergids and rhizomyids; and Hendricksen & McGaugh (1975) describe a chamber based on a 5.5×1.2×076 m wide unit by Hickman (1974). Sherman & Barrington (1941) and Haneley (1944) maintained geomyids for several months in wire-mesh cages. Skoczeń (1961) pioneered the use of wire-mesh tunnels connected to wooden box chambers, later used successfully by Rudge (1966) and Rozmus (1973).

Discovery of transparent pipe in a plumbing fixture motivated the construction of the totally transparent burrow system described herein. Flexibility of design and construction was possible by having lengths of straight tube connected to various chambers, t-junctions, and deadends by »blacelet« clamps (Fig. 1).

Two meter lengths of perspex tubing measuring 54 mm inside × 60 mm outside diameter were used for straight tunnelways. Six cm lengths of tube cut longitudinally through one wall formed the bracelet clamps which spliced together burrow components.

Six mm thick perspex sheeting was used for construction of nest-boxes and t-junctions. Sixty mm diameter holes were drilled on three sides of a box and six mm lengths of tube glued into place with Tensol (a perspex glue which can be substituted for by a less adequate mixture of perspex chips and chloroform). Tops were hinged.

Right angle components permitted the turning of the burrow systems around the perimeter of a room, and were clamped to t-junctions to simulate laterals (short tunnels which branch from the main runways to the surface mounds). Ends of tubes were cut at a 67.5° angle and glued together. Although the inner surface of the tube is slippery, *Cryptomys* were able to reach the top of a lateral by backing upwards. Rubber cement may be applied along the floor of the tube to increase traction, but this is not necessary.

Dead-ends barricaded all openings leading to the outside of the burrow system. A six cm length of tube was cut twice (crosswise) to accomodate

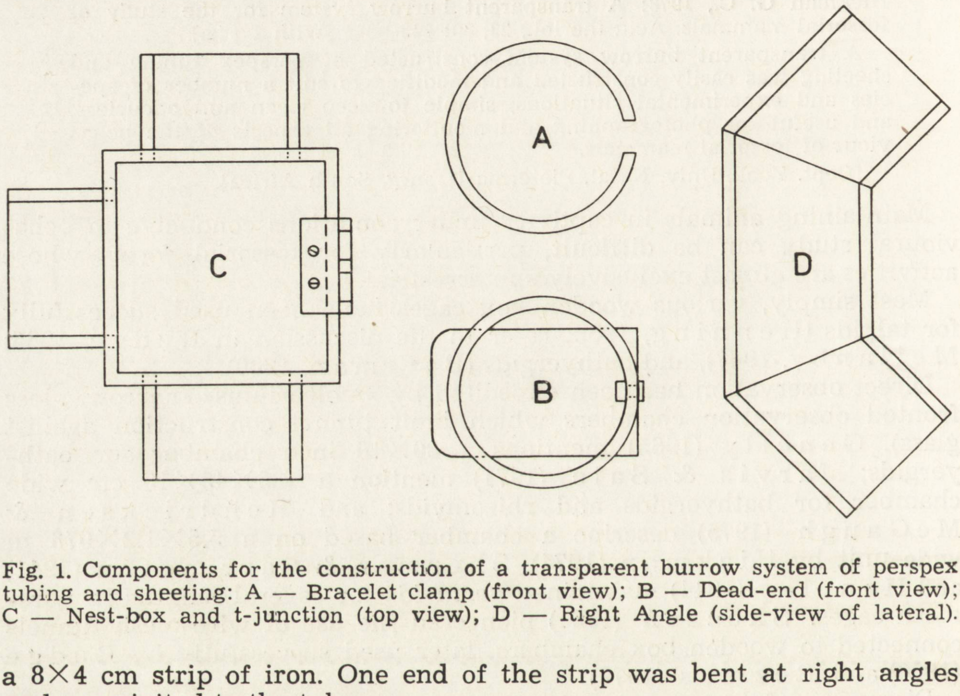

Fig. 1. Components for the construction of a transparent burrow system of perspex tubing and sheeting: A — Bracelet clamp (front view); B — Dead-end (front view); C — Nest-box and t-junction (top view); D — Right Angle (side-view of lateral).

a 8×4 cm strip of iron. One end of the strip was bent at right angles and pop-rivited to the tube.

In arranging the burrow components into a system, care should be made in consulting the literature on excavated burrow systems (as an example, refer to Hickman, 1977).

The entire burrow system was supported at chest level by ring-stands to facilitate access to nest boxes and t-junctions, observation, and photography. Since *Cryptomys* is insensitive to light, the amount of light for photography was controlled by adjusting window shades. For sighted forms such as geomyids, observation would require ultra-violet light in a darkened room (refer to Hickman, 1974).

Temperature was maintained at 23°C by room thermostat. Air circulation within tunnels was increased by leaving the tubes partially apart at bracelet clamp splices, or decreased by slipping plastic over the outside of dead ends. A high level of humidity was attained by *ad libitum* addition of potato and carrot into the tunnels.

Several handfuls of sawdust and mixed seed served as soil which absorbed urine and enabled mole-rats to plug all burrow entrances. Since the large burrow system of plastic tubing was easily assembled and disassembled, cleaning the system was very simple and was, in fact, not necessary (14 meters of tunnelway were not cleaned in six months). Portions of soiled sawdust and seed were removed periodically, but because of the large dimensions of the system, the activities of the animals were not disrupted.

Animals pushing dirt and excretory products would cause microswitches to jam and malfunction within a tunnel. To avoid this problem photoswitches and an event recorder outside the burrow, leaving only a beam of light blocking the tunnel, monitored periods of activity.

A pair of *Cryptomys hottentotus* (*Bathyergidae*) were maintained for six months in the transparent burrow system in which many activities, including copulations, were photographed. This apparatus may help enlighten aspects of natural history, such as care of the young, which are totally unknown for almost all species of fossorial mammals.

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