

## A Long-Haul Transport Container with Water Provision for Individually Caged Rats<sup>1,2,3,4</sup>

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**Summary** | An 11-compartment container for air transport of highly aggressive wild rats was constructed from perforated sheet steel. Each animal compartment contained an integral water system.

**Key Words** | Transportation — Water supply — Agonistic behavior — Rodentia

A research program was initiated involving the use of wild-trapped lesser bandicoot rats (*Bandicota bengalensis*). These animals inhabit a wide range of areas in Southern Asia and often show a high degree of intraspecific aggression when housed in small groups in captivity. To obtain this species for research studies, an individual housing arrangement was needed for air transport caging. The shortest shipping route between their destination (Denver, Colorado) and the point of origin (Dacca, Bangladesh) required at least 37 hours. Because of the relatively long flight time and the possibility of dehydration when animals were caged, the use of a watering system for the individually caged rats during transport was considered to be important.

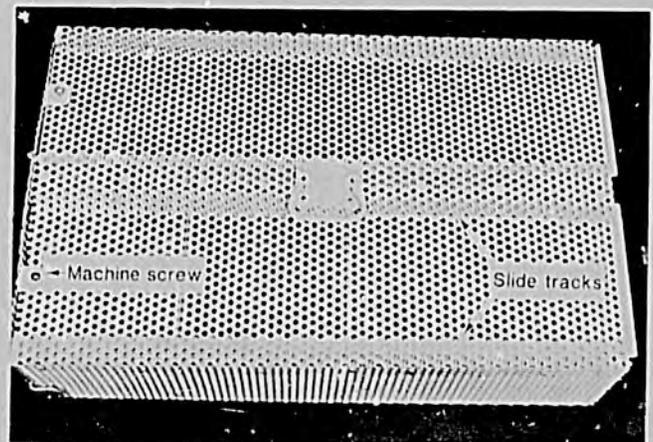
Disposable plastic water containers with drinking valves for transporting rodents in small groups (10–30) are a relatively new development in the field of laboratory animal care. A test of a disposable water system was conducted a few years ago (1). The study showed the water system led to less body weight loss in groups of rats and mice during both long (72–88 hours) and short (26 hours) air trips when compared with other water sources (potatoes and canned gel diet). The solution to our particular rat transport problem thus involved the adaptation of a water system to a shipping container with individual rat compartments so that mortality resulting from either aggression or dehydration would be minimized.

### Description and Use

A shipping container with spot-welded, 22-gauge perforated sheet steel (6.3-mm diameter holes at 1

hole/cm<sup>2</sup>) was constructed. This allowed about 20% ventilation space which exceeded current standards (2) for ventilation of animal shipping containers. The external dimensions of the container were 60 x 37.5 x 14 cm. For current International Air Transport Association Standards, the height dimension should be increased to 15 cm (3). A metal carrying handle was welded to the center of the top (Figure 1). Two 10 x 24 machine screws at the left end of the container were used to secure two sliding covers over the individual rat compartments. The floor of the container was constructed of flattened expanded metal, and a 60 x 36 x 1.5-cm litter tray was located under the floor.

The 11 compartments for individual rat caging are shown in Figure 2. Compartment size was about 18 x 10 x 11 cm which allowed room for some movement by the animals. The water system reservoir was a 1.2-liter plastic freezer container. Water was ducted through a 48-cm length of 2-cm (outer diameter) aluminum pipe (schedule 40) that was tapped, sealed, and bolted with a pipe cap. The individual disposable water valves<sup>4</sup> were staggered along the aluminum pipe (Figure 3) and were



**Figure 1**  
Top view of rodent transport container with covers secured.

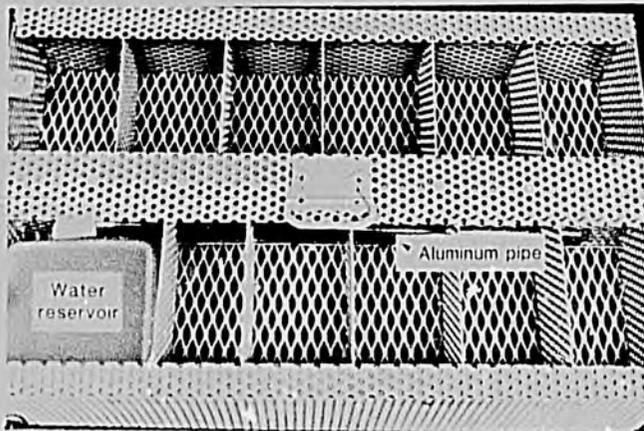
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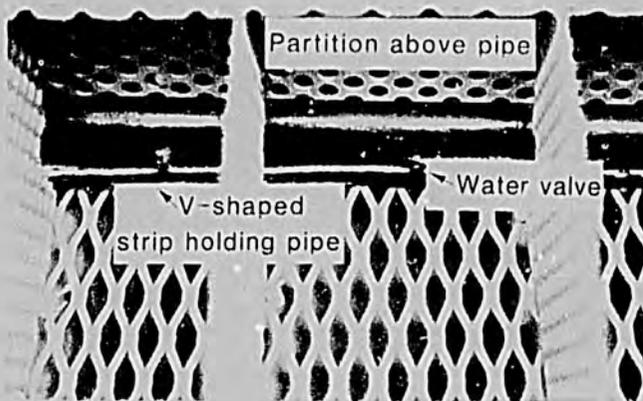
<sup>3</sup>The authors thank Michael W. Fall and Richard M. Poche of the Denver Wildlife Research Center as well as personnel of the Vertebrate Pest Division of the Bangladesh Agricultural Research Institute for their suggestions, technical assistance, and cooperation.

<sup>4</sup>Reference to trade names does not imply endorsement of commercial products by the Federal Government.

<sup>5</sup>Transit Kit<sup>®</sup> water valve, Cold Spring Products, Stanfordville, NY.



**Figure 2**  
View of container showing individual compartments and water system.



**Figure 3**  
Location of pipe and water valves in compartments.

inserted after drilling 4.76-mm diameter holes that centered on the individual rat compartment widths. The valves were held in place with a small amount of quick drying cement.<sup>6</sup> If damaged after a shipment, the valves could be removed easily with slip joint pliers and replaced. The right-angle tubing was a 2.54-cm polyvinyl chloride 90° elbow and a 2.54-cm coupler (water sprinkler pipe)

<sup>6</sup>Super Glue<sup>®</sup>, Loctite Corporation, Cleveland, OH

<sup>7</sup>Weld-on<sup>®</sup> PVC Cement (No. 711), Industrial Polychemical Service, Gardena, CA

that was attached to the reservoir with washer, O-ring, and plastic pipe joint cement to form a watertight seal.

The water system could be refilled easily in transit at airport terminals by sliding the metal cover about 15 cm to the right. In the event of airline delays or animal transfer problems at the airport, animal shelter personnel could provide water for the wild rodents with a minimum of animal security problems.

The water pipe rested in a slightly inclined position (5–10 degrees) on a V-shaped strip of perforated steel welded lengthwise in the center of the cage so that the water would feed all valves by gravity. Above the pipe was a length of perforated sheet steel which physically isolated the rats on the opposite side of the container.

After receiving a shipment of animals, the entire water system could be removed from the transport container. One-half of one end of the transport container was hinged to allow removal of the reservoir, water pipe, and water valves for cleaning, valve replacement, or bench testing before the next rat shipment. Hinged door dimensions were 21 x 12 cm. A 4.5 x 5.0 cm- scrap of perforated steel stock was welded to the door to form a stub to prevent rats from gnawing on the plastic water reservoir during transit. The door was held in place by a 10 x 24 x 12.7-mm round-head screw threaded through one of the side perforations.

In 1980, 33 live-trapped juvenile lesser bandicoot rats were shipped by air from Dacca to Denver using three of the transport containers described above. The animals had been held in laboratory cages for several weeks in Dacca before shipment. All rats were alive upon arrival after 96 hours; however, three died within 2 weeks presumably due to shipment or caging stress. We believe that for this rat species, such low mortality during and after shipment testifies to the utility and practicality of the transport container design. The container design could be adapted for use in transporting other species over long distances.

## References

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