

A Glass Drinking Tube for Small Birds and Mammals

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Abstract | A drinking tube was fabricated with a piece of 8 or 10 mm O.D. glass tubing. It gives accurate measurement of the volume of liquid consumed by small birds and mammals. The tube can be readily cleaned and autoclaved.

In conducting drinking preference tests on the red-billed quelea (*Quelea quelea*), it was important to measure accurately the small volumes of the test solution the bird consumed. The red-billed quelea is a small bird (ca. 20g), and consequently, the common liquid containers and drinking tubes available commercially could not be used, because they are too large in volume. A drinking tube constructed from a small disposable syringe (1) could not be used because its spout was designed solely for mammals, which can drink by licking at the spout tip for the solution. To overcome the difficulty encountered, we fabricated a glass drinking tube.

A 16 cm long 8 or 10 mm O.D. borosilicate glass tubing was sealed on one end with a gas-oxygen flame. A small bulb was made on this end. The tubing was then bent about 85° at about 5 cm from the tip of the bulb. After that, the bulb was blown open to form a drinking cup. The other end of the tube was then smoothed in the flame and plugged with a stopper (Figure 1).

The capacities of the 8 mm and 10 mm O.D. tubes were about 5 and 8 ml, respectively. Volume consumed was determined by weighing. This was accomplished by pouring the solution to be tested into the tube from the cup end with the plugged end slanting downward. The filled tube was weighed before it was clipped onto the bird cage with the cup end intruding into the cage through the meshed wire. For accurate weighing with minimal tare weight, we used an inverted light weight plastic powder funnel (top diameter 65 mm) as the stand for the tube, the plugged end of which was inserted through the stem of the funnel.

The weight difference in grams between the tube alone and with solution gives the original volume of the test solution in millimeter, and the weight difference between the tube with solution before and after the drinking test gives an accurate measure of the volume of solution

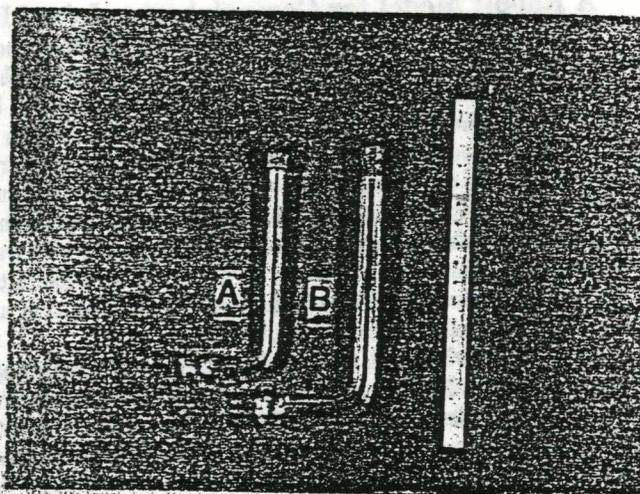


Figure 1. The miniature glass drinking tubes for small birds and mammals (magnification — X1/2) (a) 8 mm O.D. tube (b) 10 mm O.D. tube.

consumed by the bird, since the specific gravity of the generally dilute water solution deviates only slightly from 1.0. We found no loss of solution due to spilling by the bird.

Besides accuracy, several advantages of using this drinking tube are apparent. First, it can be readily cleaned after removal of the stopper. Also, it can be readily autoclaved or flame-sterilized, and it can be extended to any length local atmospheric pressure allows by connecting a length of glass tubing to the open end by means of a short piece of rubber tubing. Both birds and mammals can use the cup-shaped drinking end. For example, it can be used in feeding small quantities of drugs or other foreign compounds in solution in the study of xenobiotic metabolism (2). The status of the test solution can be observed easily by viewing the tube, and the glass resists absorbing undesirable tastes or odors. For use with other liquids,

the tube can be calibrated readily by weighing or by measuring with an automatic pipet or any other volumetric pipet.

References

1. Robbins, R.J. An accurate, inexpensive, calibrated drinking tube, *Lab Anim Sci* 1977;27:1038-9.
2. Pan, HP, Fouts, JR. Drug metabolism in birds. *Drug Metab Revs* 1978;7:1-253.

A Rabbit Model for *Campylobacter Jejuni* Enteritis

The Removable Intestinal Tie Adult Rabbit Diarrhea (RITARD) model, which has proven effective as an experimental model for *Vibrio cholerae* and enterotoxigenic *Escherichia coli* infections, was tested as a possible model for *Campylobacter jejuni* enteritis. The RITARD model is created by the surgical ligation of the cecum, placement of a slip knot at the terminal ileum and inoculation of test material into the small intestine. Ends of the slip knot are externalized, and the tie is released four hours post-inoculation. Temporary ligation of the intestine interrupts normal peristaltic clearance mechanisms which enhances mucosal colonization and provides an incubation period for bacterial proliferation.

Fifty-five surgically altered rabbits received *C jejuni* in the small intestine, and 16 received uninoculated medium as controls. Infected rabbits shed *C jejuni* in the feces for two weeks after inoculation. Sixty-four % of the infected rabbits developed mucus-containing diarrhea 1 to 6 days after inoculation as compared to none of the controls. Bacteremia was present in 96.3% of infected rabbits 24 hours after inoculation and fell to 26.3% after 96 hours. Death occurred in 53% of the infected rabbits while no control rabbits died.

An indirect whole-cell ELISA detected serum immunoglobulin responses to *C jejuni* as early as seven days after inoculation, peaking at 28 days after inoculation. Eight infected rabbits and two controls were necropsied. Infected rabbits had intestinal lesions ranging from mild inflammatory infiltrates to frank epithelial necrosis. Goblet cell proliferation, epithelial and crypt hyperplasia and submucosal edema were also noted. Lesions were restricted to the terminal ileum and the unligated portion of the cecum and the colon.

The RITARD procedure appears to be advantageous in that it not only enables *C jejuni* to colonize the small intestine, but also favors the development of frank disease with lesions similar to those seen in human infections.

Caldwell MB, Walker RI, Stewart SD *et al*. Simple adult rabbit model for *Campylobacter jejuni* enteritis. *Infect Immun* 1983, 42:1176-82. Abstracted by Susan V Gibson.