# Comparison of Various Antimicrobial Products in preventing bacterial growth in humidifier water over a 3-week period.

David Collart, Ph.D., Sharifeh Mehrabi, Ph.D.

## ABSTRACT

Several products were evaluated for their ability to control bacteria growth in the water reservoir of humidifiers. For this test the following products were tested:

1. One Holmes® evaporative humidifier with Microban® incorporated into the bottom pan plastic.
2. One Kaz® evaporative humidifier without Microban® was tested as a control.
3. One Duracraft® model DF-1 containing a Protec® capsule was tested.
4. One Duracraft® model DF-1 containing the Ion Stick® was tested.
5. One Duracraft® model DF-1 was tested "as is" as a control.

**David Collart**
**Sharifeh Mehrabi**
Department of Biological Sciences,
Clark Atlanta University,
223 James P. Brawley Drive,
Atlanta, GA 30314, USA
Tel.: +014048806854
Fax: +014048806640
E-mail: dcollart@cau.edu



## EQUIPMENT

- One Holmes® Evaporative Humidifier Model HM1230 with Microban®.
- One Kaz® Evaporative Humidifier Model 3020 without Microban®.
- One Duracraft® DF-1 Humidifier containing the Ion Stick®.
- One Duracraft® DF-1 Humidifier containing a Protec® capsule.
- One Duracraft® DF-1 Humidifier operated without any additive.

## SAMPLE COLLECTION

Water was drawn from the Holmes® Model 1230 at two locations: 1) directly from the bottom collection pan (daily) and 2) from the water reservoir tank (weekly). For all other units water was drawn and tested daily from the water reservoir.

From each unit 0.5 ml of water was collected and plated onto a R2A agar plate and incubated at room temperature for 3-5 days. In addition, dilutions of water samples were prepared and plated on R2A agar plates and incubate as described above. Following incubation the colony forming units (CFUs) were counted and recorded.

Sample collection was identical for all test units.

## RESULTS AND DISCUSSION

After the first day of operation the Holmes® unit, Ion Stick® Unit, Kaz® Evaporative Unit, and control unit all showed a moderate level of bacterial growth. By the end of week one significant contamination was evident in both the bottom collection pan and the water reservoir in the Holmes® unit. Significant growth was also present in both the Ion Stick®, Kaz® Evaporative unit, and DF-1 control unit.

After week one by comparison the Duracraft® unit containing the Protec® capsule showed no growth present.

By week two bacterial levels in the Holmes® unit had reached over 240,000 cfu/ml. Bacteria growth in the Ion Stick® and Kaz® unit had reached 328,000 and 282,000 CFU/ml respectively. While the Duracraft® unit with Protec® still showed no bacterial growth.

By the end of week three, all units contained significant bacterial growth with the exception of the Duracraft® DF-1 unit containing the Protec® capsule, which showed only 6 cfu/ml present in the water. All data is exhibited in Figure 1 below.

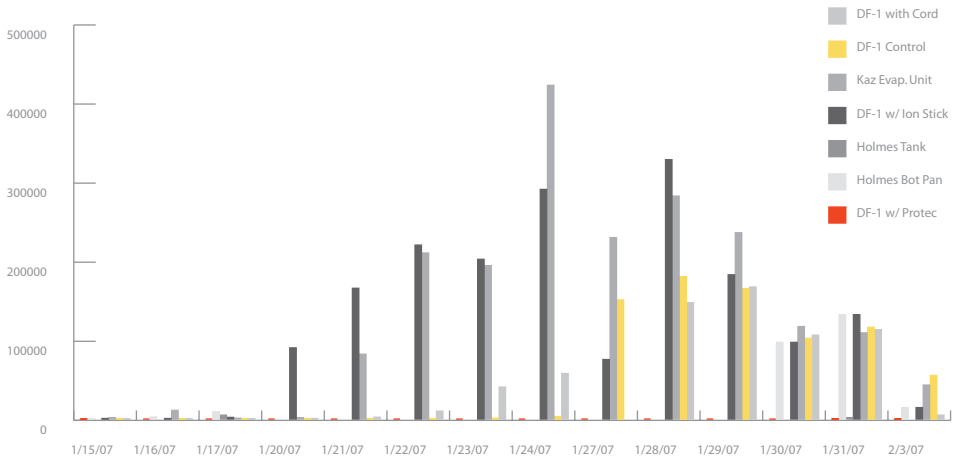


**Figure 1**