

# Efficacy and Acceptability of Chlorine Dioxide Water Disinfectant

Dear Editor,

Waterborne infections cause significant morbidity and mortality, particularly in developing countries like India. In such settings, the responsibility of ensuring the quality of drinking water frequently lies with the consumer.<sup>1</sup> Chlorination is used both for bulk disinfection and at the point-of-use, but many people object to its strong taste and smell.<sup>2</sup>

In this study we evaluated the efficacy and acceptability of a stabilized chlorine dioxide based water disinfectant (Xinix,

a gift from Brent Reider, Xinix DTI, UK) which has the advantage of being an easy-to-use liquid and fast-acting. Water seeded with  $10^6$  and  $10^7$  *Escherichia coli* per mL was treated with 2 and 15 minutes with two formulations of Xinix according to manufacturers' instructions. Efficacy was assessed by coliform counts on serial dilutions of treated water and control untreated seeded water.<sup>3</sup> Both forms of Xinix completely removed up to  $10^6$  coliforms/mL, but 15 minutes of incubation with Xinix2 was required for removal of  $10^7$  coliforms/mL.

**Table: Assessment of the colour, taste and smell of water treated with 2 different forms of chlorine disinfectant**

	Xinix1			Xinix2			Liquid chlorine			Untreated		
	Taste	Smell	Colour	Taste	Smell	Colour	Taste	Smell	Colour	Taste	Smell	Colour
Mean	7.8	8.8	9.1	5.4	6.8	8.2	5	5.9	8.7	5.8	7.2	8.5
Standard deviation	1.2	1.2	1.1	2.8	2.7	1.7	2.4	1.9	1.8	2.5	2.1	1.4

To test the acceptability of Xinix, we conducted a blinded taste test on 10 volunteers (3 male, 7 female, mean age 30.5 years) using mineral water of a popular brand which was treated with i) Xinix1 and ii) Xinix2 as per manufacturers' instructions, iii) liquid chlorine sufficient to achieve a chlorine concentration of 1 ppm and iv) untreated. Volunteers were asked to rank the water based on taste, smell and colour on a 10 point scale (Table).

In summary, Xinix1 had higher acceptability among volunteers although it was slightly less effective than Xinix2. Chlorine dioxide based disinfectants may be acceptable for wider use as disinfectants in specific settings, such as during outdoor adventure activities or emergency situations.

## References

1. Thompson T, Sobsey M, Bartram J. Providing clean water, keeping water clean: An integrated approach. *Int J Environ*

*Health Res* 2003;**13**:S89-94.

2. Bruchet A, Duguet JP. Role of oxidants and disinfectants on the removal, masking and generation of tastes and odours. *Water Sci Technol* 2004;**49**:297-306.
3. Brick T, Primrose B, Chandrasekhar R, Roy S, Muliyl JP, Kang G. Water contamination in urban south India: Storage practices and their implications for water safety and enteric infections. *Int J Hyg Environ Health* 2004;**207**:473-80.

A Jacob, S Ramani, I Banerjee, \*G Kang

Ida Scudder School (AJ), Vellore and Department of Gastrointestinal Sciences (SR, IB, GK), Christian Medical College, Vellore - 632 004, Tamil Nadu, India

\*Corresponding author (email: <gkang@cmcvellore.ac.in>)

Received : 31-05-06

Accepted : 07-07-06