

Zone of Inhibition Test Against Riva Star Aqua

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Purpose:

To verify the antimicrobial properties of **Riva Star Aqua** in comparison to an antimicrobial cavity cleanser.

Experimental Design:

TEST SUBSTANCE:

1. **Riva Star Aqua (SDI)**
2. **FiteBac Antimicrobial Cavity Cleanser (FiteBac Dental)**

CHALLENGE MICROORGANISM:

1. *Streptococcus mutans* ATCC™ 25175™
2. *Actinomyces odontolyticus* ATCC™ 17929™
3. *Lactobacillus acidophilus* ATCC™ 4356™
4. *Candida albicans* ATCC™ 90029™

TEST METHODS:

Each freshly cultured challenge microorganism was spread over an entire agar plate. Each test substance was bored into the center of the inoculated agar plate according to the manufacturer's instructions, which included the use of properly combining both steps of **Riva Star Aqua** during preparation. For control plates, the same volume of phosphate buffered saline was applied as the control substance. Each test substance was replicated three times per challenge microorganism. Plates were then incubated aerobically at 37°C for 48-72 hours. After incubation, zone of inhibition was measured and recorded for each plate.



Results:

In this study, two products were evaluated to compare their antimicrobial properties. Often times in clinical practice, areas in need of desensitizing are also vulnerable to oral bacteria, such as exposed root surfaces. A desensitizer that also helps to protect against bacteria can be quite advantageous.

Riva Star Aqua, a silver fluoride system that uses a breakthrough formulation of silver fluoride (AgF) without the ammonia base of traditional SDF systems, was compared to **Fitebac Antimicrobial Cavity Cleanser**. Once exposed to the bacteria, each product established a zone of inhibition which measured the ability of each test substance to inhibit the growth of a microorganism. The size of the zone of inhibition is typically related to the level of antimicrobial activity present in the test substance product. Therefore, a larger zone of inhibition generally means that the antimicrobial effects are more potent.

When the zones of inhibition were compared, **Riva Star Aqua** created a zone of inhibition that was, on average, nearly double the size of that created by **Fitebac Antimicrobial Cavity Cleanser** for each challenge microorganism (Fig.1 and Fig. 3).

Fig. 1: The observed zone of inhibition for testing of two test substances and one control against four challenge microorganisms

ZONE OF INHIBITION (mm)					
Test Substance	Replicate	<i>S. mutans</i>	<i>A. odontolyticus</i>	<i>L. acidophilus</i>	<i>C. albicans</i>
Riva Star Aqua	1	30.6	25.2	29.6	10.9
	2	52.0	29.9	20.5	11.1
	3	25.5	27.6	38.7	12.0
Fitebac	1	14.5	16.3	23.4	7.2
	2	13.8	15.6	11.0	6.0
	3	12.6	16.8	17.3	5.0
PBS (Control)	1	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0

Fig. 2: Zone of inhibition (outlined) created by each test substance when challenged to S. mutans.

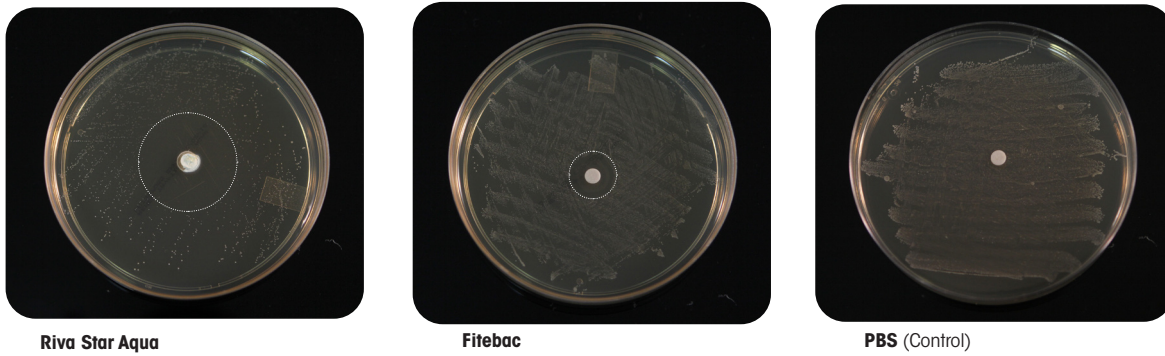
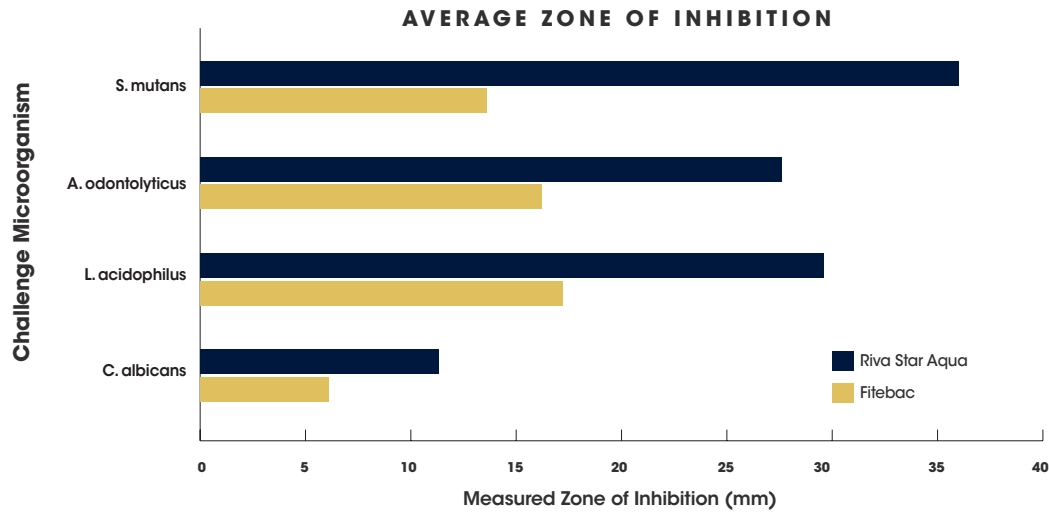


Fig. 3: The average observed zone of inhibition for each testing substance against each challenge microorganism.



Conclusion:

The results of this investigation showed that **Riva Star Aqua** caused a larger zone of inhibition for all four of the challenge microorganisms when compared to **Fitebac Antimicrobial Cavity Cleanser**. Although more clinical studies are needed, this demonstrates that **Riva Star Aqua** could have significant impact on inhibiting bacterial growth in addition to desensitizing.