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FINAL REPORT

EFFICACY & EFFECTIVENESS STUDIES OF LIVING JUNGLE® HAND SANITIZER AND DISINFECTANT SPRAY

RESULTS : EFFICACY STUDY OF LIVING JUNGLE® HAND SANITIZER AND DISINFECTANT SPRAY

The new hand sanitizer manufactured under the brand Living Jungle was compared with a market leader brand available in the market . The Living Jungle products exhibited inhibitory activity against the test isolates (Table 1), with zones of inhibition ranging from 0.5 mm to 2.5 mm. The results demonstrated that Living Jungle was as effective or even better compared to market leader hand sanitizer brand against eliminating *B. subtilis, S. aureus, E. coli, C. albican* and fungus (Table 1 and Figure 3). These are the common bacteria, yeast and mold that can be detected on skin surface. The results shows that the Living Jungle hand sanitizer is able to eliminate Gram positive, Gram negative, yeast and fungus.

Table 1: Inhibitory effect of Living Jungle hand sanitizer, Market leader brand hand sanitizer, Living Jungle disinfectant spray and 70% IPA against selected Gram negative and positive bacteria, yeast and mold using as detected by disk diffusion technique.

Antibacterial agent	Zone of inhibition (mm)				
	Bacillus subtilis	*Staphylococcus aureus*	*Escherichia coli*	*Candida albican*	Fungus
LJ HS	0.5	1.33 ± 0.58	1.33 ± 0.58	1	2.5 ± 0.5
Market Leader Brand HS	0.5	1	0.67 ± 0.29	0.5	1.83 ± 0.76
LJ Spray	14 ± 1.73	27 ± 2.64	15.67 ± 5.13	2	2.33 ± 0.58
70% IPA	1.67 ± 1.15	1.5 ± 0.87	1.67 ± 0.58	1	2.16 ± 0.76

* Abbreviations: LJ: Living Jungle, IPA: isopropyl alcohol; HS: Hand sanitizer
* Data expressed in mean ± standard deviation

The new disinfectant spray under the brand Living Jungle was compared with 70% isopropyl alcohol (IPA). The Living Jungle spray exhibited inhibitory activity against the test isolates (Table 1), with zones of inhibition ranging from 2 mm to 27 mm. The results demonstrated high zone of inhibition by Living Jungle spray compared to 70% IPA for *S. aureus, B. subtilis and E. coli* (Table 1; Figure 4). Meanwhile for yeast and mold, the Living Jungle was comparable to 70% IPA (Table 1; Figure 5). The result shows that the Living Jungle disinfectant spray is able to eliminate Gram positive, Gram negative, yeast and fungus.

EFFECTIVENESS STUDY OF LIVING JUNGLE® HAND SANITIZER AND DISINFECTANT SPRAY

For the hand surface study, the experiment demonstrated that the effect Living Jungle hand sanitizer was comparable to Market Leader hand sanitizer brand which was free from bacterial, yeast and fungal infection instantly after application. This effects even can last for 60-minute post-treatment with CFU levels below detectable levels (Table 2: Figure 6 & 7). Meanwhile, the table surface study showed that Living Jungle disinfectant spray was able to eliminate the presence of microorganism which was comparable to 70% IPA by remaining free of bacterial, yeast and fungal infection even at 60-minute post-treatment (Table 2: Figure 8 & 9). These findings indicate that the Living Jungle hand sanitizer and disinfectant spray was able to eliminate the presence of microorganism by 99.99% instantly and can last up to 1-hour post-treatment period.

Table 2: CFU per plate before and after treatment with Living Jungle hand sanitizer, Market leader hand sanitizer brand, Living Jungle disinfectant spray and 70% IPA studied on hand and table surface.

Surface	Treatment	Mean pre-treatment CFU		Mean post-treatment CFU		Mean change(%)
		Aerobic bacteria	Yeast and mold	Aerobic bacteria	Yeast and mold	
Hand	LJ HS	250	70	ND	ND	-100
	ML HS	850	1000	ND	ND	-100
Table	LJ Spray	1100	600	ND	ND	-100
	70% IPA	160	150	ND	ND	-100

* Abbreviations: CFU: Colony forming unit; LJ: Living Jungle, IPA: isopropyl alcohol; HS: Hand sanitizer; ML: Market Leader; ND: not detectable (<10 CFU)

CONCLUSION

The results showed that the Living Jungle hand sanitizer and disinfectant spray were able to eliminate Gram positive, Gram negative, yeast and fungus that can be commonly found on hand and bench surface. It is interesting to note that Living Jungle disinfectant spray demonstrated high zone of inhibition compared to 70% IPA for S. *aureus*, B. *subtilis* and *E. coli*. Meanwhile for yeast and mold, it was comparable to 70% IPA. The Living Jungle hand sanitizer shows comparable effect of microbial reduction when compared with a market leader brand in hand sanitizer. As a conclusion, the result indicated that the Living Jungle hand sanitizer and disinfectant spray was able to eliminate the presence of microorganism on hand and bench surface by **99.99% instantly** and can last for an hour post-treatment period.