Report on the antimicrobial activity of Graminex- NAX 7% Paste

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Graminex- NAX 7% Paste was examined *in vitro* for its ability to kill a selected group of skin bacteria and fungi. The following skin pathogens were examined:

Bacteria: Staphyloccus aureus (MRSA strain) ATCC
Staphylococcus epidermidis ATCC
Streptococcus pyogenes ATCC

Fungi: Trichpyton mentagrophytes ATCC
Epidermophyton floccosum ATCC
Candida albicans ATCC

S.aureus and S.epidermidis were grown and tested using Nutrient broth and agar plates. S.pyogenus was grown and tested using brain-heart Infusion broth sheep blood containing BHI plates.

Fungi were grown and tested using Sabouraud's glucose broth and agar plates.

One ml broth culture containing roughly one million test organisms along with varying amounts of NAX 7% paste (dissolved in 50% ethanol containing 20% tween 20), antibiotics such as Vancomycin, Methicillin, Griseofulvin, and Nystatin were incubated at 37°C in a rotary shaker. One hundred mcl aliquots were removed from bacteria and C.albicans (yeast) cultures materials at one hr and 24 hrs of incubation, plated on agar plates, incubated further at 37°C, to assess the growth of the organisms.

Filamentous fungi were plated out after 48 hrs and after 7 days, plates were incubated at 30°C for 5-7 days to assess growth.

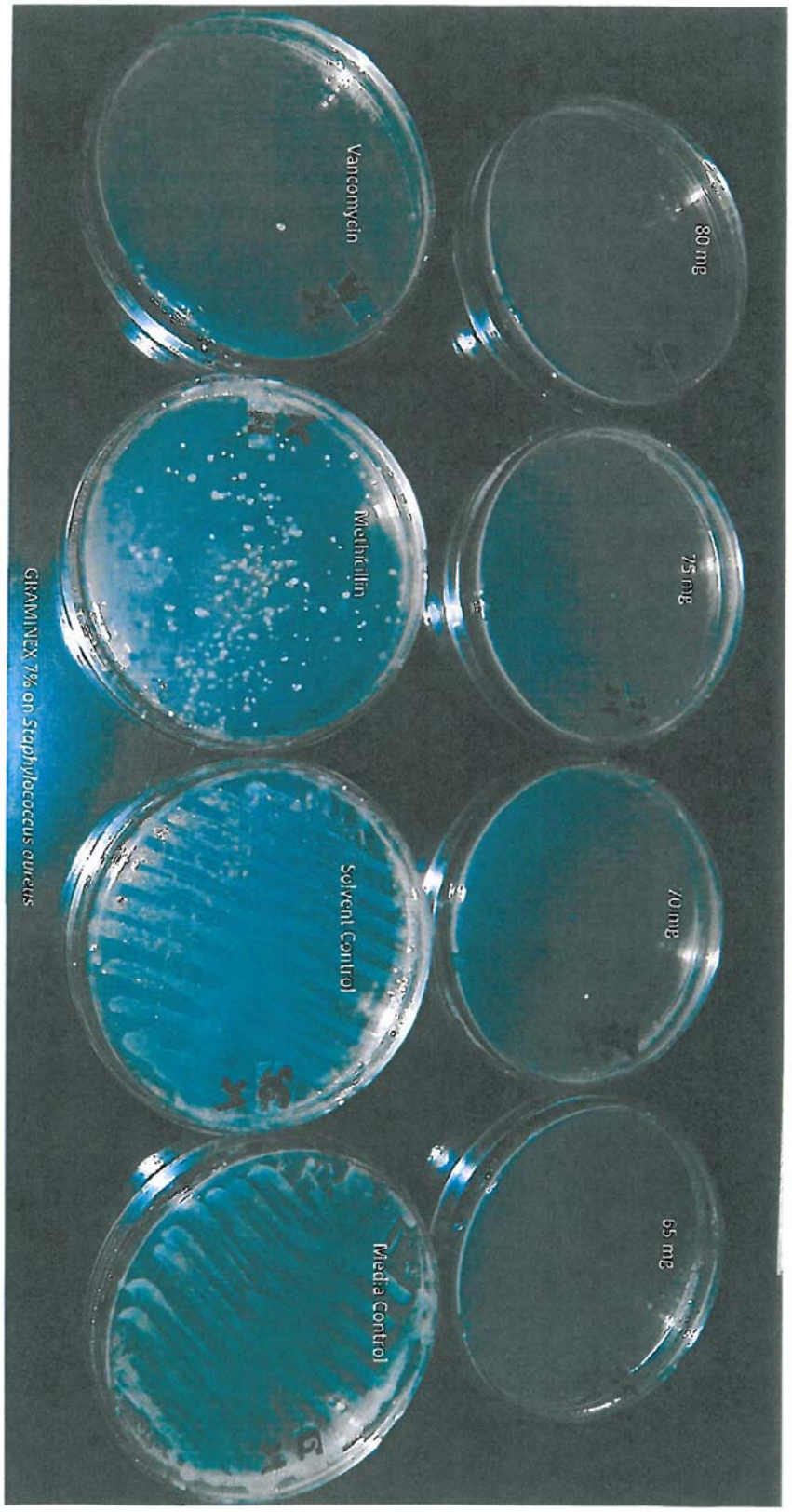
NAX 7% was tested in the range of 0.5 mg to 200 mg/ml. Antibiotics were tested at the following levels: Vancomycin (75.00 mcg), Methicillin (75.00 mcg), Griseofulvin (50.00 mcg) and Nystatin (75.00 mcg). Solvent controls were used as reference.

The MIC, required to completely kill the bacteria or the fungi at the end of 24 hrs of exposure for bacteria, yeast and 48 hrs for filamentous fungi is given below.

S.aureus ..... 65 mg/ml
S.epidermides..... 70 mg/ml
S.pyogenous..... 70 mg/ml
Candida albicans ..... 70 mg/ml
T.mentagrophytes.....200 mg/ml
E.floccosum.....100 mg/ml
H.pylori.....80 mg/ml
E.coli.....80 mg/ml
K.pneumonium.....80 mg/ml

The over the counter preparation being marketed is compounded to contain 0.3% of NAX-7. Based on our findings, we suggest the concentration be increased at least 10 times to arrive at least 3% NAX-7.

Important Note: flavonoids present in the NAX 7% preparation (both synthetic and natural) did not affect growth of these organisms. Nevertheless, flavonoids are known to have anti-inflammatory, antitumor, anti hyperplastic properties. Hence, they may indirectly contribute to the clinical cure of the skin lesions/wounds caused by unintentional nicks or by infectious agents or even skin melanoma.



GRAMINEX 7% on *Staphylococcus aureus*

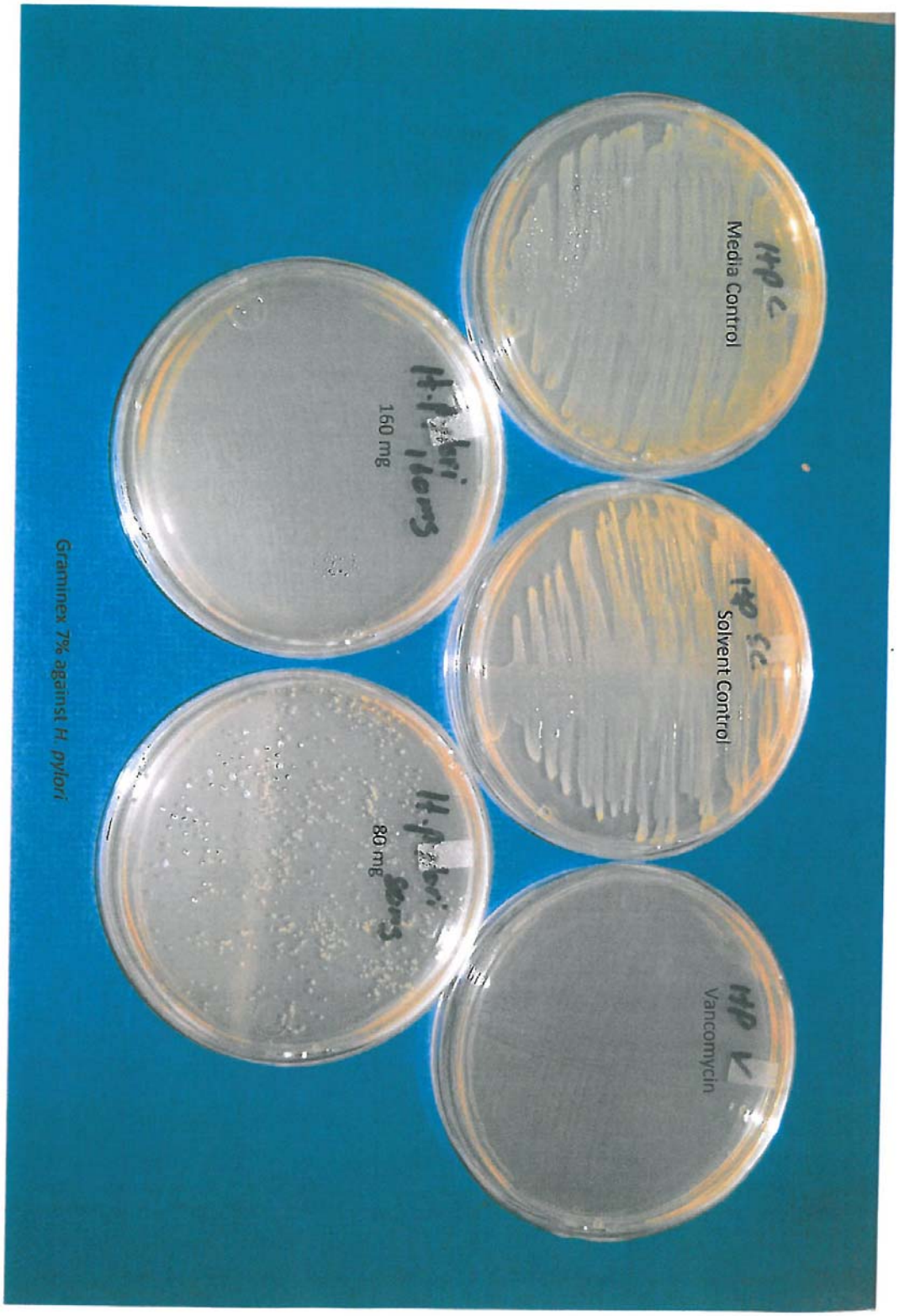

80 mg
75 mg
70 mg
65 mg
Media Control
Methicillin
Vancomycin
Graminex 7% on Staphylococcus epidermidis

Graminex 7% against *Streptococcus pyrogenes*

Graminex 7% against *Candida albicans*


Graminex 7% at Trichophyton mentagrophytes
Media Control
Solvent Control
Griseofulvin
200 mg


Graminex 7% against Epidermophyton floccosum
Media Control
Solvent Control
200 mg



Graminex 7% against *H. pylori*


Media Control
Solvent Control
Vancomycin
160 mg
80 mg
40 mg
20 mg
10 mg
Graminex 7% on E. coli

Graminex 7% on *Klebsiella pneumonia*

The Graminex 7% paste was investigated when placed in a base at concentrations of 3% and 4% w/w. Both were effective at a dose of 200 mg in killing bacteria (Staphylococcus aureus, MRSA in vitro).


Media Control
Solvent Control
Vancomycin
3%, 200mg
3%, 100 mg
3%, 50 mg
Graminex 3% against Staph. aureus