

BACTERIOSTATIC PROPERTY OF ALOE VERA

Lorenzetti, Lorna J., Salisbury, Rupert, Beal, Jack L., & Baldwin, Jack N. (1964, October). Bacteriostatic property of *Aloe vera*. *Journal of Pharmaceutical Science*, 53(10), p. 1287.

Abstract: Freeze-dried juice obtained from *Aloe vera* and heated for 15 minutes at 80 degrees inhibited several test microorganisms.

Species of *Aloe* have had a long history as drug plants. This was pointed out by Morton (1) in a recent comprehensive review of *Aloe* from the standpoint of folk use and commercial exploitation. Fly and Kiem (2) recently carried out an investigation to ascertain whether *Aloe vera* exhibits antimicrobial activity. They reported that macerates of the central gelatinous portion, of the green vascular portion, and of the complete leaf of *A. vera* did not exhibit, within the limits of their experiment, antimicrobial effect against *Staphylococcus aureus* and *Escherichia coli*.

Since it has been established definitely in this laboratory that the fresh juice of *A. Vera L.* contains a principle(s) which is inhibitory to certain microorganisms, the results are reported in this note.

EXPERIMENTAL

Leaves of *A. Vera L.* were cut at the base and stood upright so that the juice could drain from the leaves into receptacles. If tested immediately, the fresh juice exhibited a marked zone of inhibition of *S. Aureus 209*. However, the principle responsible for the inhibitory activity was found to be unstable. Preservatives such as sodium bisulfite, sodium benzoate, and methylparaben were ineffective; however, the principle could be temporarily preserved by refrigeration and preserved for an even longer period by heating the juice for 15 minutes at 80 degrees. In all instances, the juice would gradually turn black. Once the juice became dark, the inhibitory property was lost. If the juice that had been heated for 15 minutes at 80 degrees was freeze-dried, a buff-colored product resulted which was stable.

A solution of the freeze-dried juice (20mg/ml of distilled water) was tested by the agar diffusion technique for bacteriostatic activity against the following organisms: *S. Aureus 209*, *E. coli*, *Streptococcus pyogenes*, *Corynebacterium xerose*, *Shigella paradysenteriae*, *Salmonella typhosa*, *Salmonella schoitmuelleri*, and *Salmonella paratyphi*.

The whole leaf minus the juice, the leaf mesophyll, and the leaf epidermis were each separately freeze-dried and successively extracted with petroleum ether (b.p. 30-60 degrees), ether, chloroform, ethanol, and distilled water. None of the extracts exhibited inhibitory activity against the test organisms.

Since the juice of *Aloe* is known to contain anthraquinone-type compounds, aloe emodin, emodin, and chrysophanic acid were tested for inhibition of *S. aureus 209*. The results were negative.

CONCLUSIONS

While the freeze-dried whole-leaf minus the juice, the leaf mesophyll, and the leaf epidermis of *A. Vera L.* did not exhibit bacteriostatic properties, the freeze-dried juice previously heated for 15 minutes at 80 degrees did inhibit *S. aureus 209*, *S. pyogenes*, *C. zereose*, and *S. paratyphi* using the agar diffusion test method.

REFERENCES

- (1) Morton, J. F. (1961). *Econ. Botony*, 15, 311.
- (2) Fly, L. B., & Keim, I. (1963). *Econ. Botony*, 17, 48.