neopathic reference, one can find pages of confusing symptoms associated to taking Aloe; but in examining the known ingredients in Table 2, it is hard to project any serious symptoms other than mucous membrane irritation. It would appear the plant is quite safe to use externally, and the gel sent no obvious internal hazard. Caution is still needed when taken internally, the type of plant, part used, method of preparation, and toxicity are still unknown. Since the agent has not been shown to be effective given externally, use of the plant could delay appropriate treatment of an illness and indirectly harm the patient, further study is needed to prove its usefulness and safety for treatment of gut or peptic ulcers.

The "CC" has received a number of calls about external application and estol of both raw plant and commercial preparations. No serious toxications have been noted.

CONCLUSIONS

Aloe vera is used topically for treatment of burns and wounds and is now recommended for internal use. The existing data indicates it does some effect externally. The known properties of Aloe vera that seem to provide the desirable qualities include a moisturizing and emollient effect. The external use of these products is well established. The question about the role of other substances promoting or causing a healing effect is less clear. The results of most studies done in the past are in question because of a double-blended methodology or a control group. Even the studies that relate the properties of Aloe vera to no treatment completely overlook the beneficial effect that amphotol (a commercially prepared ointment containing cholesterol 30g, cottonseed oil 30g, and petrolatum 94g) may provide to an open burn. Internal use of Aloe is a place and claims for its beneficial effect have not been adequately questioned and it cannot be recommended for that use at this time.

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BRADYKININASE ACTIVITY OF ALOE EXTRACT

by Keri O. Furin and Ryan Terns from the Institute of Pharmacology, Fribourg University, Hasi, Japan; Toshishige Nakatani of the Department of Biochemistry, School of Dentistry, Aichi-Gakuen University, Nagoya, Japan.

EDITORIAL COMMENT: These two technical reports are from Japanese sources and are indicative of the major Aloe research being done in Japan. Aloe is creating intense interest in both Japan and Korea. This paper deals with the anti-inflammatory activity of Aloe. The tests were made on Aloe arborescens, the kind used in Russian medical practices. Bradykinin is a substance which is a powerful vasodilator and causes increased capillary permeability, constricts smooth muscles and stimulates pain receptors. The presence of this type of activity in Aloe Vera was taken as a very encouraging indication for reducing inflammation in wounds.

Aloe (Aloe arborescens Mill var. Natsun 지난) has been used as folk medicine for centuries, especially for skin injury and burns. However, clinical pharmacological evidence to justify its therapeutic use as an anti-inflammatory agent for the promotion of healing is still lacking. As pharmacological evidence for the anti-inflammatory action of Aloe, we have found that aloe extract contains bradykininase activity.

The extract from fresh leaves of Aloe was filtered through ultra-filtration membranes, and the fractions containing the components of molecular weights higher than 10,000 were hypothesized. The hypothesized powder was dissolved in water to make a concentration of 10 mg of the Aloe powder/mL. Synthetic bradykinin was purchased from the Protein Research Foundation, Osaka.

Bradykininase activity was estimated by biological assay on the guinea pig ileum as described by Takeya et al. Synthetic bradykinin (1.0 μg/mL in final concentration) was incubated in 10 mM phosphate buffer, pH 7.3, with aloe extract at 30°C. The reaction was terminated by boiling at 90°C for 10 min, and after centrifugation, 1 μL of the incubation mixture was added to the assay mixture for Bradykinin.

A 1-2 cm segment of guinea pig ileum was suspended in a water bath containing 9% of Tyrode solution. The contractile response of the segment was recorded by a mechanoelectrical transducer. The estimation of bradykinin in the reaction mixture was made by assaying the response against a standard solution of bradykinin.
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The other two ninhydrin-positive spots were eluted from unstained paper strips, hydrolyzed in acid, and the amino acid compositions were examined by paper chromatography. The fast-moving product was shown to be composed of Arg, Pro, and Gly, and thus corresponds to Arg" Pro" Pro" Pro" Gly", while the slow-moving product was shown to be composed of Phe, Ser, Pro, and Arg, and thus corresponds to Phe" Ser" Pro" Phe" Arg". The results indicate that some bradykininase may hydrolyze bradykinin mainly between Gly" and Phe".

Stem hommelina, a plant peptidase from the pineapple stem, was also reported to have bradykininase activity, and it hydrolyzed bradykinin between Gly" and Phe" and between Phe" and Arg". Thus the enzyme in pineapple may attack the peptide in a similar way as stem hommelina. The possible anti-inflammatory actions of the bradykininase in vivo remains for further investigation.

Keisuke Fujita, Ryōsuke Takeshita,
Institute of Pharmacology, Eijitsu College University, Hidaka, Mie 514-12, Japan; and Yoshinori Nagatsu,
Department of Biochemistry, School of Dentistry, Aichi-Gakuen University, Nagoya 464, Japan.

Bradykinin: A kinin composed of a chain of nine amino acids (arginine, proline, proline, phenylalanine, serine, proline, phenylalanine, and arginine), formed from kallikrein II by the action of kallikrein. It is a very powerful vasodilator and causes increased capillary permeability. In addition, it causes smooth muscle and stimulates pain receptors.