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OXIDATIVE COMPOUNDS IN ONION
(*ALLIUM CEPA L. ONION*). ISOLATION AND DEMONSTRATION OF
THEIR OXIDATIVE DAMAGE TO ERYTHROCYTES

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Onions have been known to cause Heinz-body hemolytic anemia in the dog and many other domestic animals. Onions contain n-propylsulfide, which has been considered to be one of the causative agents of hemolytic anemia. In the present study, we demonstrated that the onion (*Allium cepa L. Onion*) contains at least three oxidants which are different from n-propylsulfide.

Ethanol extracts from onions were treated with ether followed by extraction with ethyl acetate. Both ether- and water-soluble fractions showed oxidative damage to canine erythrocytes *in vitro*. The ether extract was separated into three oxidative fractions, A, B, and C, on a silica gel column. The incubation of dog erythrocytes with A, B, and C independently caused rapid decreases of the methemoglobin concentration and the formation of Heinz bodies in erythrocytes. The Heinz-body formation in HK dog erythrocytes associated with a high concentration of reduced glutathione (GSH) was more prominent than that observed in normal dog erythrocytes. These results indicate that at least three oxidants were present in the onion, and suggest that the oxidants might produce oxidative damage to erythrocytes via a redox reaction with GSH.

Further purification of compounds A and B was carried out with a combination of silica gel chromatography, Sephadex LH-20 chromatography, and reversed-phase high-performance liquid chromatography. It was demonstrated that both A and B are different from n-propylsulfide by comparing the profiles of their nuclear magnetic resonance spectra.