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ISOLATION OF A NEW PHENOLIC COMPOUND FROM
THE ONION (*ALLIUM CEPA L. ONION*)
AND ITS OXIDATIVE EFFECT ON ERYTHROCYTES

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Onions have been known to cause Heinz-body hemolytic anemia in the dog and many other domestic animals. However, the causative agents of the hemolytic anemia have not been confirmed, though n-propyldisulfide has been thought to be one of the agents. In the present study, we have found a new phenolic compound in the onion (*Allium cepa L. onion*), which showed oxidative damage to erythrocytes *in vitro* and *in vivo*.

Ethanol extracts from onions were treated with ether followed by extraction with ethyl acetate. The ether extract, which was most effective in increasing the methemoglobin concentration in canine erythrocyte, was used subsequently to purify the oxidants. Using a series of chromatographic techniques, we isolated an oxidative agent with high purity. Structural analysis with proton nuclear magnetic resonance and a mass spectrometer showed that the oxidant is a new phenolic compound with the molecular formula $C_{30}H_{18}C_{14}$ (molecular weight=602).

The incubation of dog erythrocytes with the compound resulted in an increase of the concentration of methemoglobin and the formation of Heinz-bodies in erythrocytes. On the other hand, dog erythrocytes with hereditary high concentrations of reduced glutathione (GSH), high-GSH erythrocytes, showed increased protection against the oxidative damages induced by the compound as compared with normal dog erythrocytes. In addition, the administration of the compound to rats caused similar oxidative damage to their erythrocytes.

Based on these observations, we concluded that the new phenolic compound was the main causative agent of onion-induced hemolytic anemia.