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Urease inhibitory activity of simple alpha,beta-unsaturated ketones.

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A variety of alpha, beta-unsaturated ketones were evaluated for their effect on the jack bean urease. Of 35 compounds tested, 2-cyclohepten-1-one (**1**), 2-cyclohexen-1-one (**2**), 2-cyclopenten-1-one (**3**), and 5,6-dihydro-2*H*-pyran-2-one (**4**) showed potent inhibitory activities against the enzyme. The most potent compound (**1**) ($IC_{50}=0.16$ mM) showed similar inhibitory potency to hydroxyurea ($IC_{50}=0.095$ mM). The inhibitory effects of **1**, **2**, **3**, and **4** were significantly reduced by 2-mercaptoethanol or dithiothreitol. These data suggest that alpha,beta-unsaturated ketones inhibited the urease activity, possibly by a Michael-like addition of a protein SH group to the double bond of the alpha,beta-unsaturated carbonyl group.