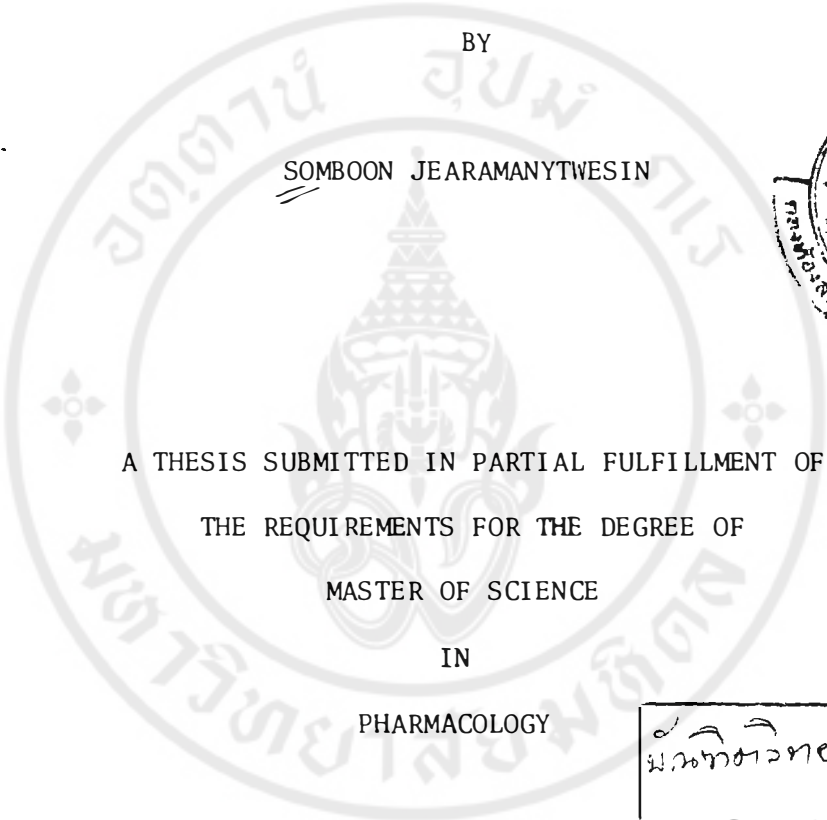


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A STUDY ON THE MECHANISMS OF  
CASTOR OIL-INDUCED DIARRHEA

BY

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CASTOR OIL-INDUCED DIARRHEA

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#### Abstract

Castor oil has been used since ancient time as a cathartic, but its mechanisms of action are remained unsettled. In the early days it was proposed that the increase in gastrointestinal motility, resulting from either local irritation or direct action on smooth muscle, was mainly responsible for its diarrheal action. However, recent evidences suggested that the diarrhea induced by ricinoleic acid, its active component, is mediated through prostaglandins. Serotonin which is found abundantly in the enterochromaffin cells of the GI-tract has also been known to produce diarrhea in both animals and human. From this study, it is postulated that serotonin, in addition to prostaglandin may be involved in castor oil-induced diarrhea. The precise interrelation between these chemical mediators remained unclear. In addition, acetylcholine may be involved in castor oil-induced diarrhea.

Mice of either sex having 9-10 weeks of age (30-40 gm) were used. They had been fasted over night and water ad libitum before the experiments were done. Castor oil at the dose of 0.3 ml/mouse produced 100 % diarrhea within 2 hrs. Indomethacin, cyproheptadine, morphine and atropine could delay the onset of castor oil-induced diarrhea. However, it was observed that castor oil did not increase the gastrointestinal motility as measured indirectly by percent transit time, but a significant increase in fluid accumulation was clearly observed. This effect of castor oil could be effectively reduced by atropine, indomethacin and cyproheptadine. In addition to its antihistamine and antiserotonin actions, cyproheptadine also has anticholinergic action. From the study using atropine as a control drug, it is possible that anticholinergic action attributes to the effectiveness of cyproheptadine in addition to its other actions.

We concluded that castor oil-induced diarrhea involved not only prostaglandin but also serotonin and acetylcholine. The interrelationship between these neurotransmitters and chemical mediators during diarrhea induced by castor oil has not been directly investigated. Based on the existing informations and the results of this study, it was

proposed that the increased  $\text{PGE}_2$  by ricinoleic acid increased the cholinergic activity which led to the release of 5-HT. All these chemicals were the known diarrhea-inducers, therefore, a drug like cyproheptadine which could affect at various sites is a potent antidiarrheal drug.



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