

# การศึกษาพิษวิทยาเฉียบพลันของนมผึ้ง

วิไล รัตนตaylorมณ, วท.ม. (พิษวิทยา), Dr. rer. nat.\*  
สุภาภรณ์ พงศกร, วท.ม. (เภสัชวิทยา)\*\*

**บทคัดย่อ** ทำการศึกษาพิษเฉียบพลันของนมผึ้ง โดยการป้อนนมผึ้งในหนูถีบจักร และหนูขาว ขนาด 1, 2.5, 5 กรัมต่อกิโลกรัม โดยการตรวจวัดน้ำหนักสัตว์ทดลอง และสังเกตพฤติกรรมเป็นเวลา 1 สัปดาห์ ไม่พบความผิดปกติของน้ำหนักและพฤติกรรมที่เปลี่ยนไป จากนั้นผ่าหนูแล้วชันสูตร และตรวจวัดขนาดของอวัยวะต่าง ๆ ได้แก่ ปอด, หัวใจ, ตับ, ไต และม้าม ไม่พบว่ามีแตกต่างจากกลุ่มควบคุม โดยเฉพาะตับถูกนำมาศึกษาทางด้านจุลกายวิภาคด้วยการย้อมสีเอซ แอนด์ อี ไม่พบว่ามีโครงสร้างเปลี่ยนแปลงไปจากกลุ่มควบคุม จึงอาจสรุปได้ว่านมผึ้งที่ขนาดสูง 5 กรัมต่อกิโลกรัม ซึ่งเป็นขนาดที่สูงที่สุดในการทดลองนี้ ไม่แสดงพิษเฉียบพลันในสัตว์ทดลองหนูถีบจักร และหนูขาว

**Abstract** **The study on acute toxicity of royal jelly**  
**Wilai Rattanatayaron, M.Sc. (Toxicology), Dr. rer. nat.\***  
**Supaporn Pongsakorn, M.Sc. (Pharmacology)\*\***

The study on acute toxicity of royal jelly was done with mice and rats at dose 1, 2.5, 5 g/kg by measuring weight gain and observing behavior for 1 week. All these three doses did not change both body weight and behavioral sign of animals. Necropsy finding was done for examination of the morphological changes and organ weight including heart, lung, liver, kidney and spleen. They were not significant difference from the control group. The liver was cut and stained with H & E for histopathological study. There was no structural change when compared with the control group. It is suggested that royal jelly at 5 g/kg did not show the acute toxic effect on both rats and mice in this experiment.

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## บทนำ

Honey royal jelly is secreted from the hypo-pharyngeal glands of the workerbees. It is

fed for all kinds of bee larvals which are not more than three days of age and for the larva destined to grow up as the queen cell<sup>1,2,3,4</sup>. In Japan, it has been used topically as a nutrient, incorporated in

\* ภาควิชาเภสัชวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยศรีนครินทรวิโรฒ  
Department of Pharmacology, Faculty of Medicine, Srinakharinwirot University.

\*\* ภาควิชาเภสัชวิทยา คณะเภสัชศาสตร์ มหาวิทยาลัยมหิดล  
Department of Pharmacology, Faculty of Pharmacology, Mahidol University.

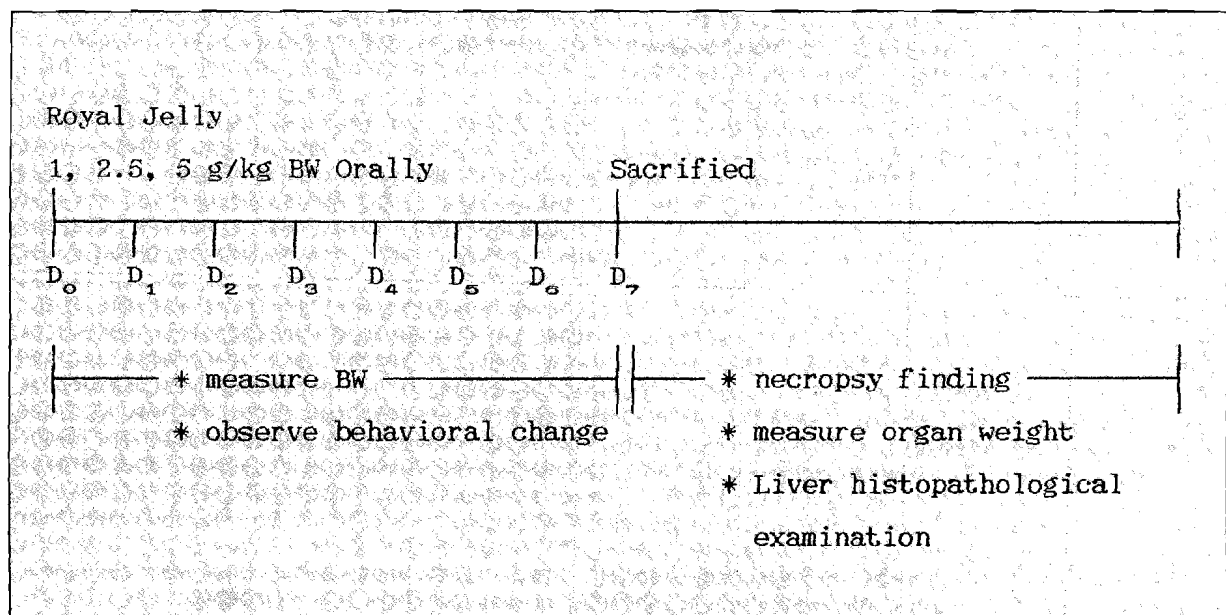
cosmetics, or used as a topical drug for some skin diseases. The contents of this royal jelly are carbohydrate 10-12 % , protein 14-15 % , lipid 3-5 % and more than 26 free fatty acid, many trace elements and high amount of vitamin B<sup>5,6,7,8,9,10,11,12</sup>. The most important and interesting ingredient is an unsaturated fatty acid 10-hydroxy-2-decenoic acid possesses many pharmacological effects eg. antitumor, antibacterial and antiradiation<sup>13,14,15</sup>. Royal jelly are effective for endocrine system, cardiovascular system<sup>1,2</sup> and augmentation of wound healing<sup>16</sup>. Although many papers referred to the useful properties a few papers reported the toxic effects of this substance. In 1956 Decourt reported that one man swallowed about 5 g of royal jelly. For the next few days, he felt full of virality and energy and was unable to sleep. He felt warm although his temperature was not raised. After a few days he made a complete recovery and did not show any ill effects during the next 4 years<sup>17</sup>. Later, Takahashi M, et al reported in 1983 that one women who had ingested honeybee royal jelly as a nutrient, showed an exacerbation of dermatitis when it was applied

to her feet<sup>18</sup>. Therefore, this research works has been decided to answer the question whether royal jelly as a fairly large dose would be showed any acute toxic effect in animal model or not.

### Material and method

Both sex of Swiss-albino mice weight between 25-28 g (n=10) and both sex of Wistar-rat weight between 150-180 g. (n=8) were used in this experiment. Lyophilized royal jelly was used by suspending of distilled water. Then a single royal jelly (only once) 1, 2.5, 5 g/kg BW was given to each animal orally. These animals were collected weight gain for 7 days. Each day the behavioral sign was observed. On the day seventh these animals were killed, necropsy finding was done for examining the morphological changes. Then the organ weight of each animal including heart, lung, liver, kidney, and spleen were compared to the control group. Especially, liver was fixed with 10 % buffer formalin for section and staining with H&E to observe the histopathological change by light microscope.

### Schedule proposal

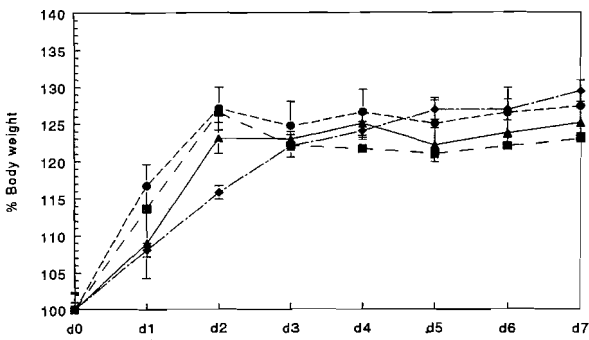


Statistic used unpaired t test.

**Results**

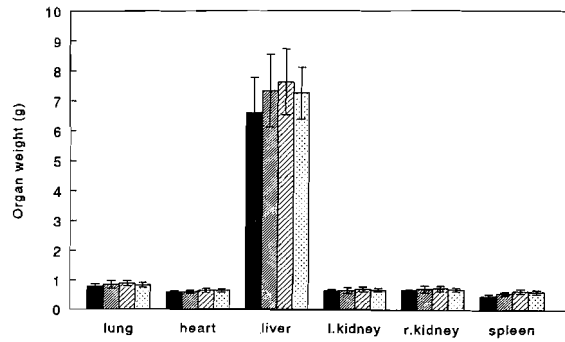
Royal jelly dose 1, 2.5, 5 g/kg BW orally did not significantly change the body weight of mice (fig 1). This result shows that royal jelly did not change the food consumption and feed conversion rate of mice. In both rat and mice there were no behavioral changes after royal jelly on each dose treatment. Necropsy findings were done and without

**The body weight change after Royal Jelly treatment in mice**

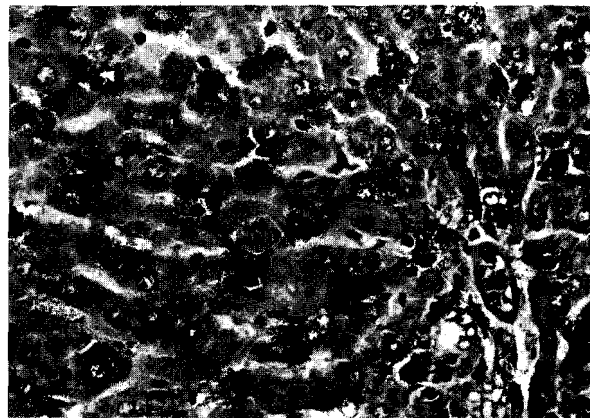


**Fig 1** The effect of varying doses of royal jelly on growth of mice, normal growth of rats (—▲—) n=4, Per oral of royal jelly dose 1g/kg (—●—) n=5, 2.5 g/kg (—◆—) n=5, 5 g/kg (—■—) n=5.

**The organ weight change of Rat Rx with Royal jelly**

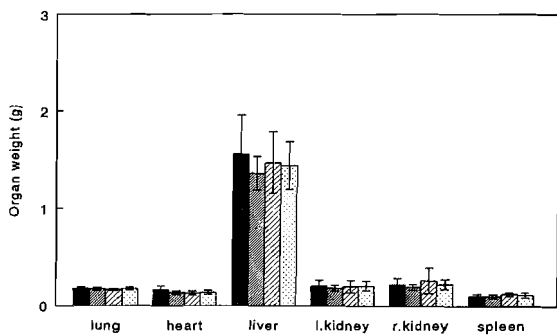


**Fig 3** The effect of royal jelly on organ weight of rats, control (■) n=8, Per oral of royal jelly dose 1 g/kg (▨) n=8, 2.5 g/kg (▧) n=8, 5 g/kg (▩) n=8.

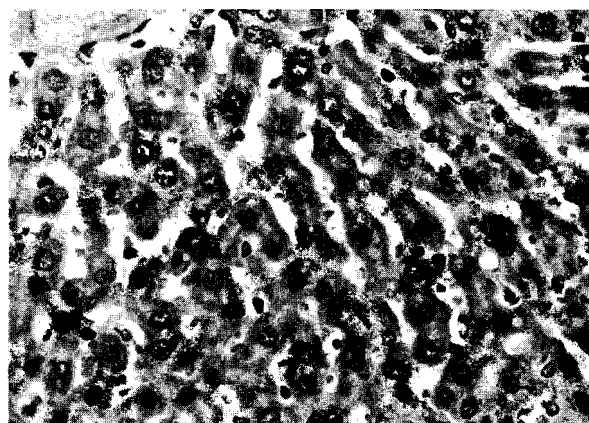


**Fig 4** Histopathological study of liver stained with H&E of control group of rat. Magnification 400x.

**The organ weight change of mice Rx with Royal jelly**



**Fig 2** The effect of royal jelly on organ weight of mice, control (■) n=8, Per oral of royal jelly dose 1 g/kg (▨) n=8, 2.5 g/kg (▧) n=8, 5 g/kg (▩) n=8.



**Fig 5** Histopathological study of liver stained with H&E of rat treated with royal jelly per oral dose 5 g/kg. Magnification 400x.

any morphological changes. The organs, lung, heart, liver, kidney and spleen weight changes of mice and rats treated with royal jelly were compared with that of the control group. There were no significant differences from the control group (fig 2,3). The histopathological study of the liver of rat treated with royal jelly dose 5 g/kg shows normal structure (fig 4,5).

### Discussion

In these investigations the dosages of royal jelly 1, 2.5 and 5 g/kg were used in rat and mice.

The dosage 1-5 g/kg BW rat and mice are equivalent to dosage in human 7-35 g/person and 4-20 g/person respectively. The 5 g/kg of royal jelly given to rats and mice did not show the acute toxic effect. These levels were higher dosages than the case reported by Decourt in 1956 which royal jelly was used 5 g in one man<sup>17</sup>.

### Summarized

Royal jelly as a fairly large dose as 5 g/kg was not showed the acute toxic effect on both rats and mice.

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