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THE LEVELS OF BILIRUBIN, MICROICTERICITY, GOT AND
ACID PHOSPHATASE IN RABBITS FED FIVE
VARIETIES OF LANTANA (Lantana camara L)

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ABSTRACT

Lantana camara L is a poisonous plant which grows and is widely distributed in many regions of Indonesia, and poisoning cases in domesticated ruminants have occurred. The experiment is to study the toxicity of five varieties of Lantana camara L in rabbits. Twenty four male rabbits were used in this study. They were divided into 6 groups (A,B,C,D,E,F) of 4 animals each at random. Animals in groups A,B,C,D, and E were given lantana leaf powder (6 g/kg body weight) of the red, pink, dark yellow, bright yellow, and white varieties of lantana respectively. The treatment were given as a single dose (for about 24 hours) and after dosing the animals were fed normal diet (drinking water ad lib). Animals in group F were fed normal diet as control. The results showed that all animals fed lantana leaf of the red variety and 3 out of 4 animals fed lantana leaf of the pink variety became icteric 24 hours after treatment, and almost all the rest of animals fed lantana of the dark yellow, bright yellow and white varieties became icteric at 48 hours. The animals fed lantana leaf (especially red and pink varieties) had elevated the levels of bilirubin in the plasma ($P<0,05$). Plasma acid phosphatase activity and plasma glutamate oxaloacetate transaminase (GOT) activity in animals fed lantana leaf (especially red and pink varieties) were also significantly increased ($P<0,05$).

INTRODUCTION

Grass and forages are the main source of nutrient for ruminants, especially in tropical countries including Indonesia. In the dry season, in which forages and grass are very limited, the animals quite often died due to poisoning of poisonous plants consumed by them. Lantana (Lantana camara L) is one of the many poisonous plants in Indonesia, which is poisonous to most grazing livestock, especially in ruminants.

The disease is characterized by photosensitization, jaundice, icteric, depression, loss of appetite, hyperbilirubinaemia, cholestasis and hepatomegaly (Seawright, 1963; Yadava and Verma, 1978; Sharma, et al., 1990).

Lantana camara L consisted of a lot of varieties which are shown in the difference of colour of the flowers such as red, violet, pink, yellow or white flowered (Everist, 1974). Although there are a number of varieties of the plant, only some of them are toxic (Seawright, 1965). In Australia, there are 29 varieties of Lantana camara which were identified, and 15 of them were known to be toxic to livestock.

In Indonesia, Lantana camara L grows and is widely distributed in many regions which has differences of local names. There are many varieties of lantana in Indonesia, and their toxicity of most of them are not known yet, but lantana poisoning cases of 51 Bali cattle in the district of Donggala, the province of Central Sulawesi were reported by Sobari (1980). Later, Dharma et al (1982) have studied lantana poisoning in Bali cattle, related to Bali ziekte cases in Bali cattle at the province of Bali. Further, Bahri and Yuningsih (1991) have reported that lantana camara L of the violet variety (which grew in Bogor of West Java) was toxic to guinea pigs.

In order to review the toxicity of Lantana camara L which grow in Indonesia, here is reported a study on the toxicity of 5 varieties of L. camara L to rabbits.

MATERIALS AND METHOD

Preparation of Lantana leaf Powder

In this study was used 5 varieties of lantana leaf, i.e. the red, pink, dark yellow, bright yellow, and white varieties. The plants were collected from certain areas in West Java, Indonesia. The leaves were separated, dried and milled to a fine powder.

Animals and Treatment

The principle procedure of this experiment is based on the method that was done by Sharma et al (1988). Twenty four male rabbits ($1498,4 \pm 366,1$ g body weight) housed individually were divided into 6 groups (A,B,C,D,E,F) of 4 animals each. All the animals were starved for 24 hours (water ad lib) before treatment were given. Animals in groups A,B,C,D, and E were given lantana leaf powder (6 g/kg body weight) of red, pink, dark yellow, bright yellow and white varieties respectively. The lantana leaf powder (6 g/kg body weight) which was mixed with 10 g of feed were given for about 24 hours and then the animal fed normal diet (drinking-water ad lib). Animals in group F were fed normal diet as control. All of the animals were killed at four days (96 hours) after treatment for the collection of blood samples. The blood was centrifuged and plasma was separated for biochemical assays.

Animals in all of the 6 groups were monitored every 24 hours (up to 96 hours) by microictericity test for the appe-

arance of icterus. In this case nearly 10 ul of blood was drawn from the ear veins into heparinized capillaries (hematocrite tube). The capillaries were centrifuged at 2000 rpm for 10 minutes. Colour of plasma was observed, and any yellowness in the plasma indicated icterus.

Biochemical assays

Total bilirubin was determined in the blood plasma by using reagent and guideline from kit Biomerieux products. The detection method used a spectrophotometer DMS 80 with 550 nm wave length.

Glutamate oxaloacetate transaminase (GOT) activity was also assayed by using reagent and guideline from kit Biomerieux products according to the colorimetric method of Reitman and Frankel (1957). The analysis method used a spectrophotometer DMS 80 with 340 nm wave length.

Acid phosphatase activity was assayed in the blood plasma for presence of tartrate. The analysis was done by using reagent and guideline from kit Merck products (3305 acid phosphatase). The detection method used a spectrophotometer DMS 80 with 400 nm wave length.

RESULTS AND DISCUSSION

Microictericity test

The result of the effects of the leaf powder of 5 varieties of lantana to rabbits on microictericity is shown in Table 1. All animals fed lantana leaf powder of the red variety, 3 out of 4 animals fed lantana leaf powder of the

pink variety and 2 out of 4 animals fed lantana leaf powder of the bright yellow variety became icteric 24 hours after the treatment, and all animals fed lantana leaf powder of the yellow variety, 2 out of 4 animals fed lantana leaf powder of the bright yellow variety and 2 out of 4 animals fed lantana leaf powder of the white variety became icteric at 48 hours (Table 1). One out of 4 animals fed lantana leaf powder of the white variety exhibited no ictericity during the experimental period. The ictericity of animals fed lantana leaf powder of the red and pink varieties increased with time (at 72 hours and 96 hours). So, the red and pink varieties of lantana were more toxic than the yellow and white varieties. This results were similar to the results reported by Sharma, et al (1988; 1989).

Bilirubin

The effect of the leaf powder of 5 varieties of lantana to rabbits on bilirubin content is shown in Table 2. In this case, the animals fed lantana leaf powder of the red and pink varieties had elevated levels of total bilirubin in the plasma ($P < 0.05$). An increase of plasma bilirubin has been observed in livestock and other laboratory animals with lantana intoxication (Sharma, et al., 1980; 1981; and Gopinath and Ford, 1969). The changes of bilirubin content in plasma of animals fed lantana leaf powder of the dark yellow, bright yellow and white varieties were not significant compared with the control. This results showed that

the yellow and white varieties of lantana were less toxic than the red and pink varieties.

Glutamate Oxaloacetate Transaminase

The effect of the leaf powder of 5 varieties of lantana to rabbits on glutamate oxaloacetate transaminase (GOT) activity is shown in Table 2. There was a significant increase in plasma GOT activity in rabbits fed leaf powder of 5 varieties of lantana ($P < 0,05$). An increase in plasma GOT activity in lantana-intoxicated rabbits, guinea pigs and sheep has been reported by Sharma, et al (1982 and 1988), and Gopinath and Ford (1969). However, Seawright (1963) observed no increase in GOT activity in lantana-intoxicated sheep. There were large variations in GOT activities in different varieties of lantana-intoxicated rabbits. Glutamate oxaloacetate transaminase activity in rabbits fed lantana leaf powder of the red variety was the highest compared to the other 4 varieties of lantana ($P < 0,05$).

Acid Phosphatase

The effect of the leaf powder of 5 varieties of lantana to rabbits on the activity of plasma acid phosphatase is shown in Table 2. The acid phosphatase activity in plasma of rabbits fed lantana leaf powder of 5 varieties are significantly increased ($P < 0,05$). An increase in plasma acid phosphatase activity with lantana toxicity has been observed in rabbits and guinea pigs (Sharma et al., 1982; 1988). Acid phosphatase activity in rabbits fed lantana of the red and pink varieties was more elevated compared to acid phos-

phatase activity in rabbits fed the 3 other varieties of lantana ($P < 0,05$). This result also showed that the red and pink varieties of lantana were more toxic than the yellow and white varieties.

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