

# THE EFFECT OF CELERY AND PHYLLANTUS NIRURY COMBINATION ON URIC ACID LEVEL IN HYPERURICEMIC RATS

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## THE EFFECT OF CELERY AND PHYLLANTUS NIRURY COMBINATION ON URIC ACID LEVEL IN HYPERURICEMIC RATS

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### ABSTRACT

**Background:** Hyperuricem Indonesian people. Hyperuricemia many research of natural uricemia is a symptom of gout. Gout is one of pemia is a condition in which blood uric acid is above normal. There are many of natural sources have been using celery herb (*Apium graveolens* L.) and meniran herb (*Phyllanthus niruri*, L.) as an alternative treatment of hyperuricemia.

**Objective:** This study was aimed to determine the effect of routine giving combination extract ethanol celery herb and meniran herb of uric acid in rats experiencing hyperuricemia.

**Methods:** The 36 rats divided into 6 groups. Group 1 were normal group, group 2 were a positive control, given allopurinol at dose of 5 mg/kgBW, and negative control 3 were induced potassium oxonate intraperitoneal and administrated at a dose of 125 mg/kgBW. Groups 4,5 and 6 were given orally the combination of ethanol extract of celery and *P. niruri* at ratio of 1:1; 1:3, (dose 20 mg/kgBW), respectively. After given by the extract, 1 hours later induced by potassium oxonate, and 1 hour afterward the blood was taken via orbital sinus. Determination of uric acid levels by enzymatic methods (Uric Acid TBHBA). The administration of the combination of ex extract ethanol of celery and *P. niruri* was given for 7 days at three ratio variation. Blood sampling performed on day 0, 1, 3 and 7. Differences between groups were analyzed statistically by Annova and LSD test ( $p < 0.05$ ).

**Outcome Measured:** Uric acid blood levels

**Result:** The results showed that the combination extract ethanol of celery and *P. niruri* at ratio 1-3 for 7 days could decrease uric acid levels  $1,655 \pm 0,08$ ; and  $1,713 \pm 0,27$ ,  $1,362 \pm 0,09$  in rats induced by potassium oxonate.

**Conclusion:** The combination of the ethanol extract of celery and *P. niruri* at ratio of 1:1 and 3:1 decrease the blood uric acid levels in rats.

**Keywords:** combination extract celery herb, *Phyllanthus niruri*, hyperuricemia, potassium oxonate.

## Introduction

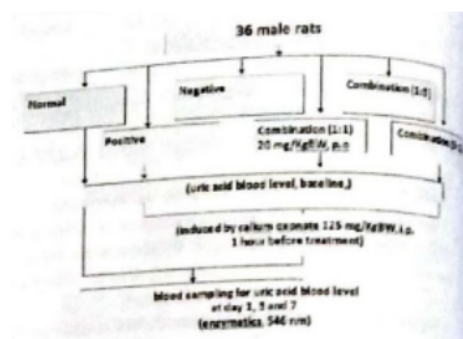
2 Uric acid is the end product of purine metabolism. Most of the uric acid is removed from the body in urine. But if too much uric acid is being produced, the level in the urine will increase. High levels of uric acid in the urine easily lead to deposition of urate crystals that can form kidney stones. Likewise, blood high levels of uric acid can cause urate crystals in the soft tissues, especially the joints. This causes a painful condition called gout. If it remains untreated, urate crystals can cause inflammation and swollen joints (Sacher and McPherson, 2004).

One of the medicinal plants that can be used as a traditional remedy for gout is celery (*Apium graveolens* L.). Celery has flavonoid compounds that are antioxidants and are widely used as anticancer and can lower uric acid levels (Mohamed and Okbi, 2008). In the previous studies mentioned that celery infusion (10%) at dose of 5 ml/kg decreased in blood uric acid levels significantly in monkeys, compared to probenecid 20 mg/kg after 3, 4, 5, and 6 hours of treatment (Ixonaret, 2007).

Another plant employed in the treatment of gout is *Phyllanthus niruri* L (Murugaiyah and Chan, 2006). Previous study reported that the ethanol extract of *P. niruri* at dose of 3.33 g/kg body weight reduced uric acid levels which is equivalent to the rats treated with allopurinol at dose of 10 mg/kg (Widayati, 2008).

If given alone, celery and *P. niruri* extracts have been proven to have considerable potential effects in the treatment of gout. In general, both of the extracts contains flavonoids which inhibit the synthesis of xanthine oxydase (Murugaiyah and Chan, 2009). This study is intended to study whether a combination of extracts of celery and *P. niruri* able more effect in lowering blood in levels.

## Method



## Results

Figure 1 shows the average levels of the blood uric acid of each group before and after treatment. Uric acid levels in the negative control increased from period 1 (day 0) to 3<sup>rd</sup> period 4 (day 7). The negative control had higher uric acid levels than the normal group which is due to the negative group was given potassium oxonate to raise up the uric acid levels, whereas the normal group received only a solvent.

The combination of celery and *P. niruri* at ratio 1:1 and 3:1 decreased significantly the blood uric acid levels compared to the negative control ( $p < 0,05$ ). The effect of combinations was equivalent to the rats which 1<sup>st</sup> treated with allopurinol as positive control. Allopurinol is a drug used primarily to treat hyperuricemia (excess uric acid in blood plasma). This result demonstrated that combination of ethanol extract of celery have antihyperuricemic effect. The most effective combination of celery and *P. niruri* was the combination of 3:1.

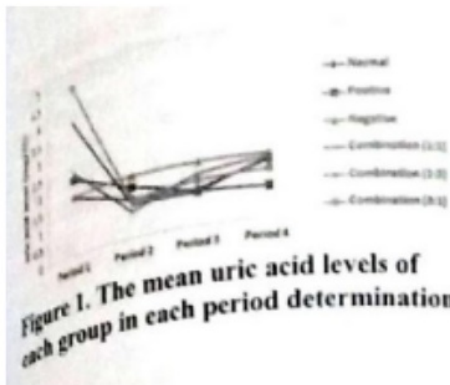


Figure 1. The mean uric acid levels of each group in each period determination

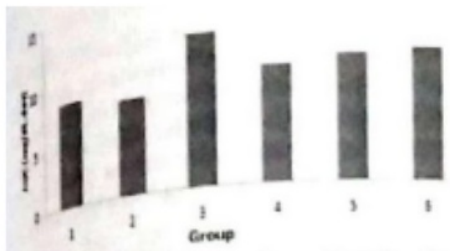


Figure 2. Total AUC values (levels of uric acid in the blood), 1: normal group, 2: positive control, 3: negative control, group 4, 5, 6 : combinations of celery and *P. niruri* at ratio of 1:1, 1:3, and 3:1.

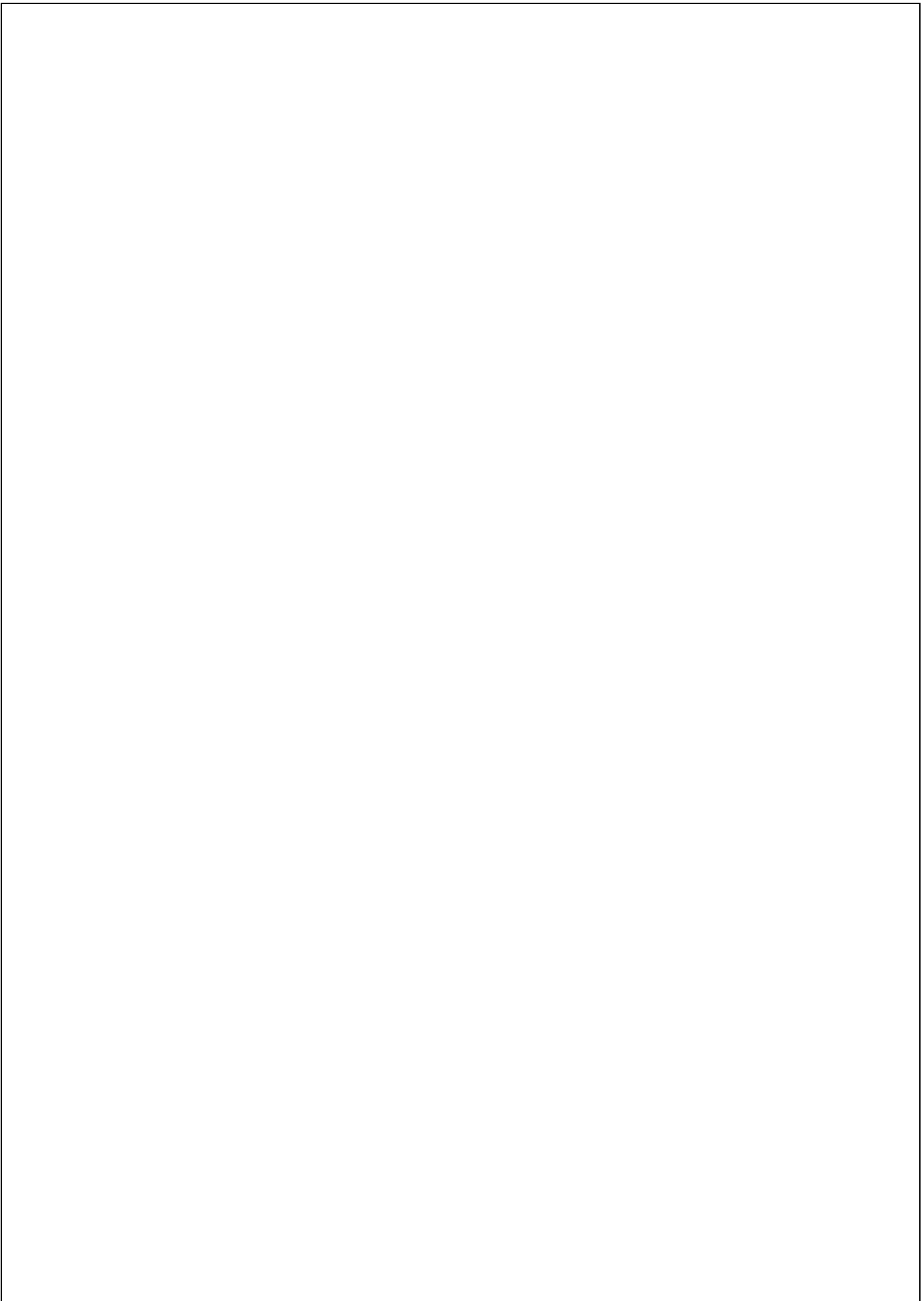
Figure 2 shows the uric acid levels on AUC value. The most high uric wels are shown in the negative control with a total value of 12.259 medl.day. This suggests that the induction of notassium oxonate can apparently elevate the unic acid levels. The AUC value of the mmbination at ratio of 1:1, 1:3, and 3:1 respectively decreased the uric acid levels with AUC value of 9.289, 10.009 and 10.436 mg/dL.day compared to the negative control. Based on the AUC value, the combination of ethanol extract at ratio of 1:1 showed the greatest hyperurecemic effect (AUC = 9.289 mg.L-1.hari), whereas allopurinol at dose of 5 mg/kg resulted the AUC value of 7.820 mg/dL day.

## Conclusion

The combination of the ethanol extract of celery and *P. niruri* at ratio of 1:1 and 3:1 has decreased the blood uric acid levels in rats.

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