Is watering our houseplants with washed rice water really that effective? Here’s the scientific evidence

Our friends, our neighbors, even strangers we meet swear by it. They claim watering our household plants with water from our washed rice is effective, as good as or even better than using fertilizers. My neighbor, for instance, says her house orchids have never failed to bloom because she feeds her plants with that one “special ingredient”: the water from her washed rice.

But where is the *scientific* evidence that washed rice water is effective?

Surprisingly, there has been no research done on the effectiveness of using water from washed rice specifically on the growth of any plant. Most studies have been about the potential use of washed rice water as a beauty product or about the loss of human nutrients when rice is washed. Studies such as by Malakar and Banarjee (1959) and those reviewed by Juliano (1985, 1993) have reported that washing rice can cause up to half of the water-soluble vitamins and minerals to be lost from the rice.

The exact amount of these nutrient losses would depend on the type of rice, how much water was used in washing of the rice, and how rigorous was the washing done. But generally, washing rice causes rice to lose up to 7% protein, 30% crude fiber, 15% free amino acids, 25% calcium (Ca), 47% total phosphorus (P), 47% iron (Fe), 11% zinc (Zn), 41% potassium (K), 59% thiamine, 26% riboflavin, and 60% niacin.

But what was lost from the rice is now gained by the water. Perhaps these leached nutrients now in the washed rice water could be beneficial to our houseplants.

Let’s find out. I asked one of my final year agriculture students to conduct such an experiment to answer this burning question “once and for all”.

Methodology

Water spinach (*Ipomoea reptans*), or more widely known as kangkung, was used a test crop. Kangkung was planted in 150-mm wide and 200-mm tall polybags, so each polybag had only one plant. Each polybag was filled with 9 kg of soil (Bungor soil series, which has a rather coarse texture, about 50-60% sand and 20-40% clay).

The treatments were: 1) washed rice water (RIC), 2) NPK 15:15:15 fertilizer (NPK), and 3) control (CON).

The RIC treatment meant that the kangkung plant in each polybag was watered daily with 200 ml of water from washed rice, whereas the NPK treatment was where 5 g of NPK 15:15:15 fertilizer was applied per polybag once (before planting) onto the soil, and the kangkung plants in this treatment were watered daily with 200 ml of tap water per polybag. The CON treatment is the control, where the kangkung plants were only watered daily with 200 ml of tap water per polybag, without any application of fertilizer or washed rice water. Each treatment had five replications.

The RIC and NPK treatments would determine whether washed rice water is as good as or more effective than applying fertilizer in increasing plant growth. The CON treatment is the baseline upon which the kangkung growth in the RIC and NPK treatments will be compared when kangkung is grown without any fertilizer or washed rice water applications.

In this experiment, my student always used the same white rice, and the rice to water ratio was 1.0 : 1.5 L (in other words, for every 1 L of white rice, she used 1.5 L of water to wash the rice). The washing of rice was always maintained in the same way.

The experiment continued for five weeks, after which several plant growth parameters (leaf number, plant height, fresh and dry plant weight, leaf area, and specific leaf area or leaf thickness) and plant nutrient content (N, K, Ca, and Mg) were measured. Additionally, soil properties such as pH, K, Ca, and Mg were measured. Unfortunately, due to faulty equipment, plant P, soil N, and soil P content could not be measured.

Results

Statistical analysis revealed that of all the plant growth parameters measured, only the number of leaves and fresh plant weight (Fig. 1 and 2) were significantly affected ($p < 0.10$) by the treatments. Fig. 1 and 2 show that there was a 90% chance that kangkung grown in both RIC (washed rice water) and NPK (fertilizer) treatments were equal with each other and both of them being higher than that in the control (CON) treatment in terms of their number of leaves produced and fresh plant weight.

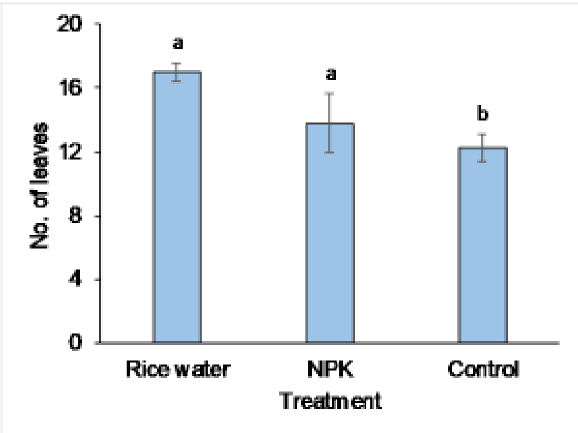

Fig. 1. Mean (± standard error) of the number of leaves for the three treatments. Means with same letter are not significantly different from one another ($p>0.10$) according to SNK test.

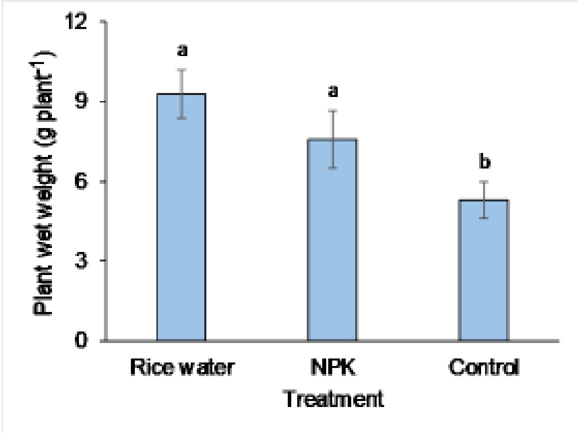

Fig. 2. Mean (± standard error) of the fresh (wet) plant weight for the three treatments. Means with same letter are not significantly different from one another (p>0.10) according to SNK test.

On average, kangkung grown in both RIC and NPK treatments had 26% more leaves and were 59% heavier than the kangkung grown in the CON treatment.

The better plant growth in the RIC and NPK treatments were due to additional supply of N and K by the washed rice water and NPK fertilizer. This was reflected in the higher N and K content in the plant and soil in the RIC and NPK treatments (Fig. 3 to 5). Fig. 6, for instance, shows that washed rice water had about twice the amount of K than tap water.

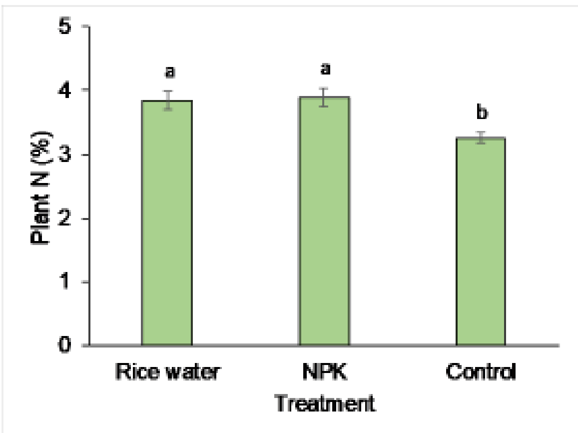

Fig. 3. Mean (± standard error) of the plant N for the three treatments. Means with same letter are not significantly different from one

another (p>0.05) according to SNK test.

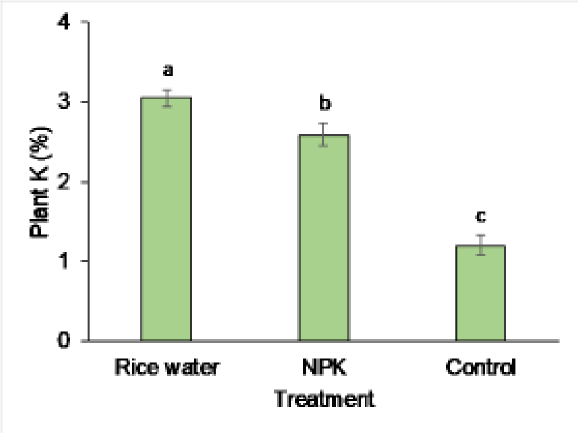

Fig. 4. Mean (± standard error) of plant K for the three treatments. Means with same letter are not significantly different from one another (p>0.05) according to SNK test.

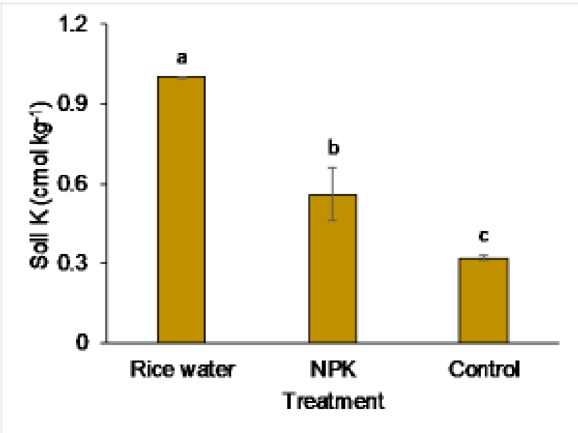

Fig. 5. Mean (± standard error) of the soil K for the three treatments. Means with same letter are not significantly different from one another (p>0.05) according to SNK test.

Kangkung has a high demand for N and even higher for K nutrient (Susila et al., 2012). Consequently, the supply of additional N and K nutrients from either washed rice water or fertilizer would be beneficial to kangkung and result in better plant growth such as producing more leaves and heavier plant biomass, as observed in this study.

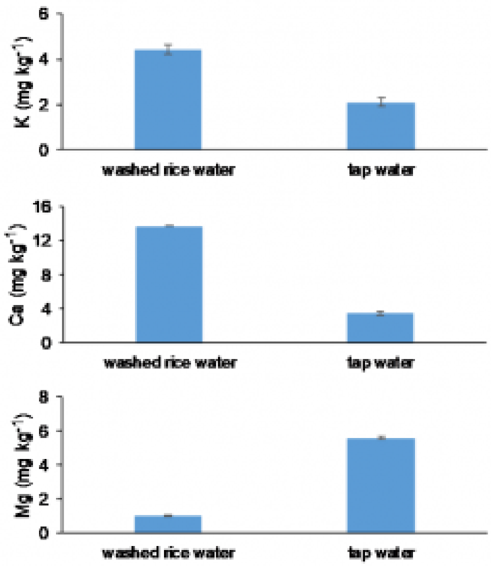

Fig. 6. Mean (± standard error) of the K, Ca, and Mg content in the washed rice water and tap water.

Fig. 7 and 8 show an interesting trend, that in the RIC treatment, soil Ca was the highest but plant Mg was the lowest. This is because Ca and Mg are antagonistic with each other: high Ca content would suppress the plant intake of Mg. Fig. 6 shows that, compared to tap water, washed rice water had four times more and nearly six times less Ca and Mg, respectively.

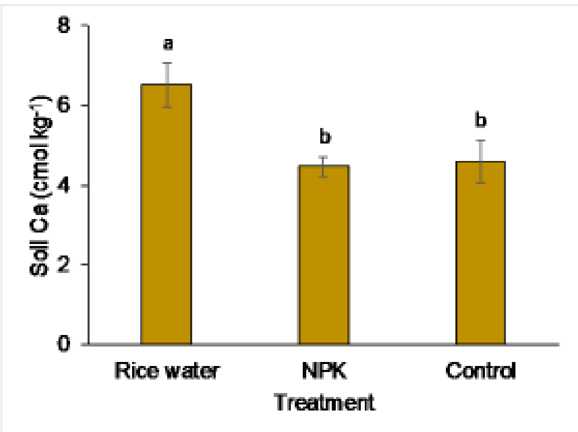

Fig. 7. Mean (± standard error) of the soil Ca for the three treatments. Means with same letter are not

significantly different from one another (p>0.05) according to SNK test.

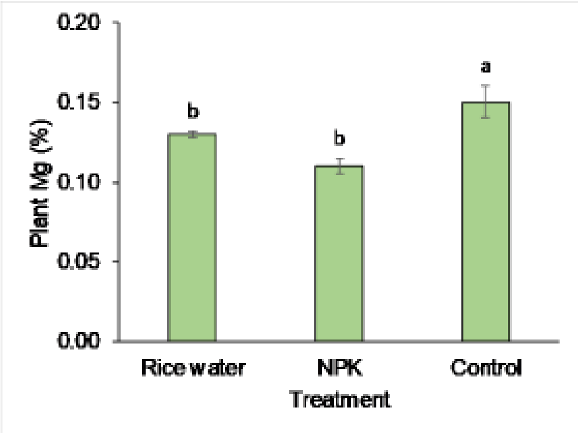

Fig. 8. Mean (± standard error) of the plant Mg for the three treatments. Means with same letter are not significantly different from one another (p>0.05) according to SNK test.

Lastly, soils in RIC treatment showed higher pH (less acidic) by about 19% than the soils in the NPK and CON treatments (Fig. 9). The consequence of this pH increase is minimal because soil pH in the RIC treatment still remained rather low, below 5. But perhaps over a longer run with regular additional watering with washed rice water, soil pH could further increase, making more soil nutrients available to the plant as the soil becomes increasingly less acidic over time.

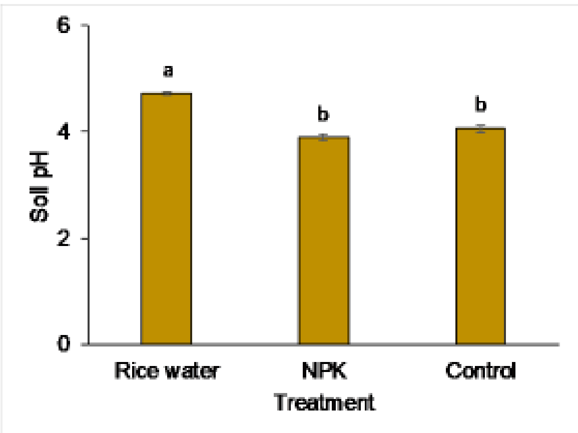

Fig. 9. Mean (± standard error) of

the soil pH for the three treatments. Means with same letter are not significantly different from one another ($p>0.05$) according to SNK test.

So, what do all of these results mean?

Results showed that using water from washed rice is as effective as NPK fertilizer in promoting plant growth, at least in terms of the number of plant leaves produced and the higher plant biomass (fresh).

The implication from this study means washed rice water can replace NPK fertilizer. This study adds credence that, rather than discarding the water after we wash our rice, we can recycle or reuse the water by watering our houseplants with it, and this water is generally as effective as applying NPK fertilizer; thus, we save on fertilizer and energy use and money.

The level of confidence in this study for the plant growth parameters was 90%, not the usual 95% or 99% in most scientific studies. But perhaps with a larger sample size, these results would be statistically significant at a higher level or more plant growth parameters would be found to be statistically significant from using washed rice water.

Nonetheless, the belief that higher plant growth can be encouraged by using washed rice water is supported by the findings of higher N and K content in the plant (as well as in the soil for K). Their level of significance was 95%. Washed rice water do supply the essential nutrients of N and K, which are very much needed by the kangkung plant. With the additional supply of N and K nutrients, it can be expected that kangkung as well as other plants would respond favorably by having increased plant growth and yield.

Potential problems of using washed rice

water

Admittedly, using water from washed rice will always be for domestic, household use. Using such enriched water for large-scale or commercial farming production systems would be impractical as it would require too much washing of rice! Nonetheless, domestic use of washed rice water, as stated earlier, is a good way to recycle water in the household rather than just discarding it down the drain.

Reusing water from washed rice can be a part of household campaign to save energy and water and to reduce wastages. (c) Stockgiu @ fotolia.com

The second potential problem is the washed rice water will have to used almost immediately. Leaving the water out in the open would encourage fermentation and create unwanted sour-like smell, though it would interesting to compare between fermented and unfermented rice water on our houseplants.

The third potential problem is whether prolonged use of washed rice water on our plants would encourage the incidence and spread of pests (like rodents) and diseases. This kangkung experiment was only carried out over a period of five weeks, too short to see any potential incidence of pests and diseases.

At the end, I am encouraged by the results of this study – the first perhaps to study in a more scientific rigorous manner if using washed rice water is really that effective in promoting plant growth. This should be a start of more experiments: testing on more plant/crop types (such as fruit or flower plants) and the inclusion of more plant growth and soil parameters.

I like to thank my student, Syuhaibah, for her hard work in this experiment.

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