



# Lexical Modeling of *Yamabuki*, Japanese Kerria in Classical Japanese Poetry

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**Figure 1:** The picture of “Yamabuki To Kahazu” (kerria and frog) by Hiroshige Utagawa (<http://www.gekkanbijutsu.co.jp/shop/goods/030761011.htm>).

## Introduction

- We conduct a lexical study of classical Japanese poetry using network modeling.
- The terms *yamabuki* (kerria), *kahazu* (frog), and *Ide* (place name) are contained in some poetic dictionaries as entry items or collocations, and we have confirmed that they have strong relationships with each other.
- We have discovered the hub node term *yahe* in network models. The term *yahe* is, however, not recorded in any poetic dictionaries even as a single term.

### Material: *Hachidaishū*

the eight anthologies compiled by the order of Emperors (ca. 905–1205), which contains about 9,500 poems.

### Calculation methods:

$$w(t, d) = (1 + \log tf(t, d)) \cdot idf(t)$$

$$cw(t_1, t_2, d) = (1 + \log ctf(t_1, t_2, d)) \cdot cidf(t_1, t_2)$$

$$cidf(t_1, t_2) = \sqrt{idf(t_1) \cdot idf(t_2)}$$

$$idf(t) = \log \frac{N}{df(t)}$$

## Result

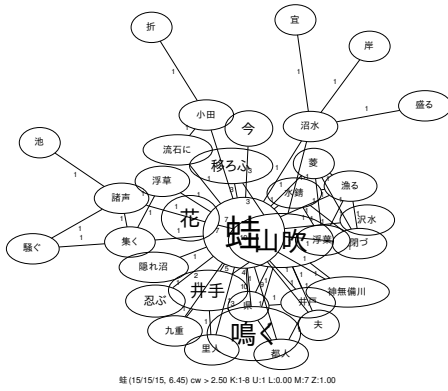


Figure 2: Graph model of *kahazu* (蛙, frog) before pruning node 蛙.

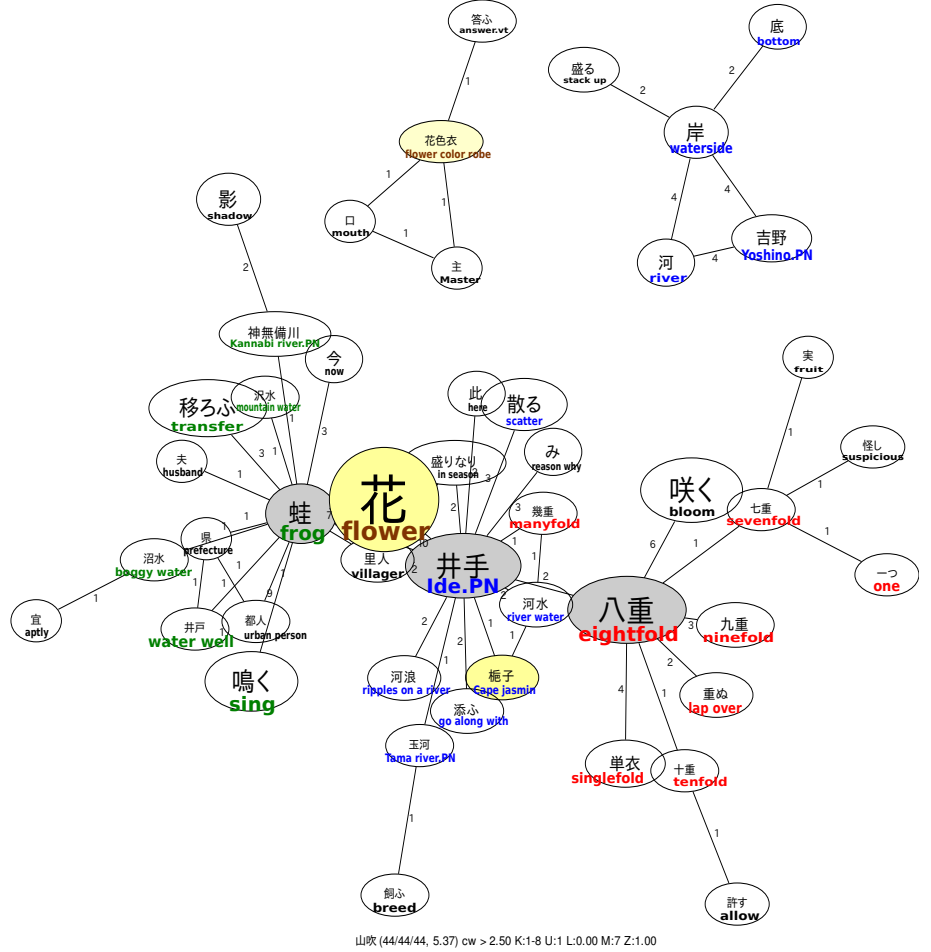


Figure 3: Graph model of *kahazu* (蛙, frog) after pruning node 蛙.

Figure 4: Graph model of *Yamabuki*: a core node, *山吹* *yamabuki*, is pruned. *kahazu* (蛙, frog), *Ide* (井手, place name, proper name), and *yahe* (八重, eightfold or double flower) are observed as hub nodes.

A minor term *yahe* (eightfold) can be shown as a hub node which plays a major role in connecting a topic word with other peripheral words which support/demonstrate poem stories. These minor words are not seen in poetic term dictionaries.

## Conclusion

1. Discern not only patterns described by experts but also patterns yet undescribed, and
2. Identify not only specific or tangible words but also abstract or conceptual words which have a tendency to be left out of dictionaries.



Figure 5: Single petal (left), white petal (center), and plena petal (right) of *yamabuki*. (<http://mkfarm.blog118.fc2.com/blog-entry-27.html>)