

# Red Oxalis: *Oxalis triangularis*

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The plant goes by many names including Wood Sorrel and Purple Shamrock. It grows in slightly acid soil in deep shade in gardens in Thailand. We were given a plant in a pot.



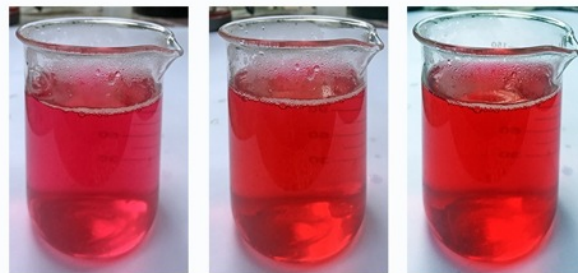
We picked leaves, extracted red dye (anthocyanins) with boiling water in a Chinese tea pot, and tested it for activity as an acid/base indicator.

A half molar sodium hydroxide solution (pH close to 12.7) was diluted to 1% (pH 10.7), and to 0.1% (pH 9.7) and 0.01% (pH 8.7). These solutions were used as a weak base.

Half molar HCl was added with a dropper to increase the pH slowly to less than 2.0. The results were compared to the reddish colour of the dye in bottled water (pH 7).

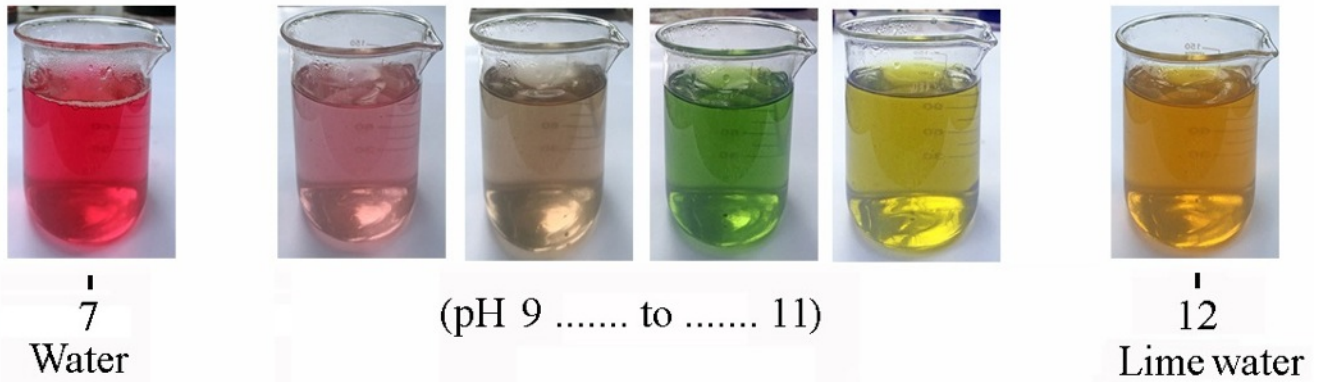
## Red Oxalis as an acid/base indicator

The water soluble dyes (Anthocyanins) were a slightly mauve shade of red in bottled water that had been purified by reverse osmosis. The red intensified very gradually as acid was added, until in a solution with a pH approaching 1 it was a clear bright red.



Water (pH 7) HCL (pH 3) ..... (pH 1-2)

The intensification of the red from water (pH 7) ... to HCl (pH 2) was barely discernible but consistent.



A range of colours was observed in alkaline solutions.

The addition of just three drops of half molar HCl to the 150 ml beaker initiated a change to mauve, which at close to pH 9 changed to grey and then abruptly as more acid was added to green and then a clear yellow.

Lime water (pH 12)) changed the yellow to a deeper shade. This indicator has good discrimination in the pH 9-11 range.

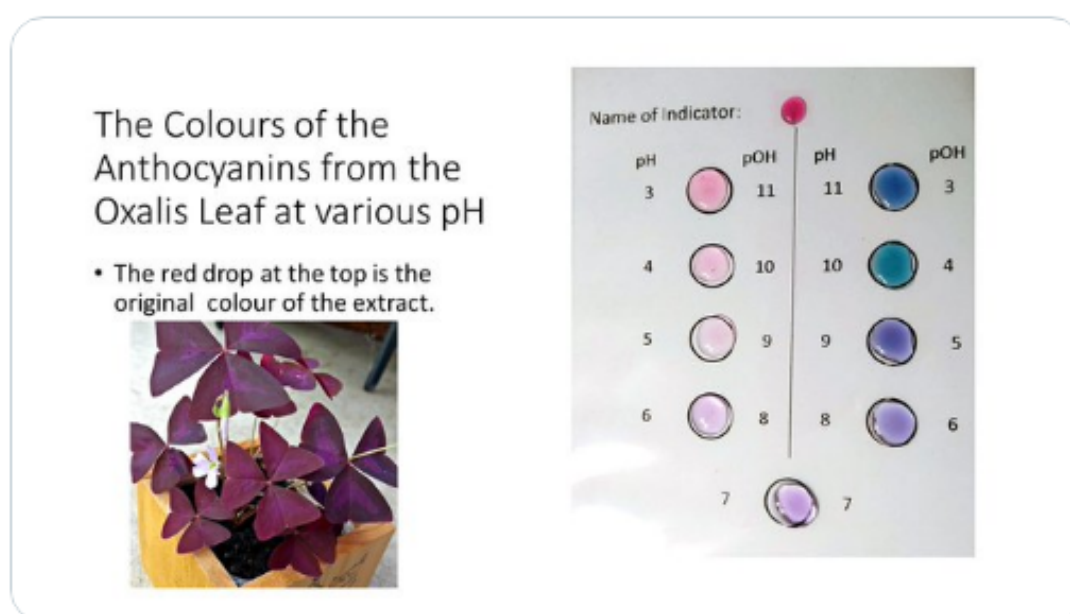
A web search for Red Oxalis as an acid/base indicator returned an interesting result from “Uncle Bob” on Twitter. His post is shown as a screenshot below.



**UncleBob** @UncleBo80053383 · Jun 30, 2020

...

Sometimes a picture of beauty arrives in chemistry. I decided to compare the colours of anthocyanins from leaf extracts at various pH/pOH. Berberis and Oxalis are in the garden. Just look at the Oxalis leaf. The original colour is in the red puddle at the top. [#chemchat](#) [#ASEChat](#)



We agree that red is present from pH 6-3. We find the reported mauve coloration to pH 9 followed by grey and then green. The abrupt change to yellow at pH 11-12 is not shown in Uncle Bob’s chart which ends at pH 11.

## Further work

The report above matches approximately what we find.

A pH meter would provide more precise pH values the colour changes.