

Distribution of Essential Oil-¹⁴C from the Rhizome of Turmeric (*Curcuma domestica* Val.) in White Rat Organs (*Rattus norvegicus*)

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ABSTRACT

The "back to nature" mindset has pushed the natural product use for healthcare even though their effectiveness and safety have not been fully proven. There is a need for a long and strict scientific review for them to be qualified as "potent drugs". One technique to solve this problem is to label a substance from natural drug as a tracer. Kumolowati (2004) has successfully made a labeled essential oil-¹⁴C of turmeric (*Curcuma domestica* Val.) using biosynthesis method. In an effort to establish a knowledge principal from natural product usages, the distribution of essential oil of turmeric has been studied *in vivo*.

One hundred micro liters labeled essential oil of turmeric (623,873 dpm) was applied orally to Wistar strain of white rats (*Rattus norvegicus*). Twenty four hours after the administration, the chosen organs were taken off then extracted using ethyl alcohol. Radioactivity of these extracted organs was determined by using liquid scintillation counter. The highest radioactivity was found on liver 2,400 dpm/g followed by lymph 2,042 dpm/g, small-intestine 1,569 dpm/g, gastric 1,197 dpm/g, femur 255 dpm/g, colon 210 dpm/g, heart 128 dpm/g, and kidney 52 dpm/g. The results show that the highest accumulation was found in liver, which supports evidence turmeric works as hepatoprotector, whereas accumulation in lymph supports evidence that turmeric also works as immunomodulator. More turmeric essential oil was accumulated in colon rather than in kidney, it suggests that turmeric essential oil was eliminated through feces.

These results also need to be followed up by further pharmacokinetics studies including (1) blood level curves, (2) cumulative urinary and feces excretion, and (3) how the body metabolizes this substance. All of these are possible to accomplish because a labeled substance is easy to track without disturbing a body system, and also can be detected specifically even with a small concentration.

Keywords: a labeled substance, essential oil-¹⁴C, *in vivo*, turmeric