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USE OF WHOLE PLANT *ARTEMISIA ANNUA* L. AS AN ANTIMALARIAL THERAPY

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Abstract

Anti-malarial drugs are primary weapons for reducing *Plasmodium* transmission in human populations. Successful drugs have been highly efficacious and inexpensive to synthetically manufacture. Emergence of resistant parasites reduces the lifespan of each drug that is developed and deployed. Currently, the most effective anti-malarial is artemisinin (AN), which is extracted from the leaves of *Artemisia annua*. Because of its poor pharmacokinetic properties and prudent efforts to curtail emergence of resistance, AN is prescribed only in combination with other anti-malarials composing an Artemisinin Combination Therapy (ACT). Low yield in the plant and the added cost of secondary anti-malarials in the ACT, make AN in the developing world a costly treatment. Here we show that dried leaves of *A. annua* administered orally are more effective at killing malaria parasites than a comparable dose of purified drug in a rodent malaria model (*P. chabaudi*). A single dose of whole plant (WP) *A. annua* containing 24 mg/kg AN clears 99% of parasites, where a comparable dose of pure drug has half that effect. This is consistent with findings that blood levels of AN are 40 times greater in mice receiving WP versus those given pure drug. We hypothesize that in addition to increasing bioavailability of AN, administration of WP alone may constitute a combination therapy because it contains other anti-malarial compounds that have been shown to synergize with AN. Inexpensive, efficacious, and resilient treatment for malaria based upon WP *A. annua* that can be grown and processed locally would be an effective addition to the global effort to reduce malaria morbidity and mortality.