The Effectiveness of Carrot Seed Oil and Citronella as Repellents of Bean Beetles (*Callosobruchus maculatus*)

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Bean beetles, *Callosobruchus maculatus*, can cause problems with the harvesting of beans of farmers. These farmers need an effective repellent of bean beetles in order to protect their beans. Citronella is a natural product from plants that was found to be an effective repellent against insects, even some beetles. Thus it is hypothesized, that citronella will most likely repel bean beetles, also. Furthermore, citronella appeared to be harmless to human beings. Another plant substance commercially available and harmless for humans is carrot seed oil. Maxia A., *et al*. (2009) reported that carrot seed oil had beneficial anti-fungal activities. We wondered whether carrot seed oil also had repellent functions. To test the hypothesis, bean beetles were placed in containers with cow peas without any repellent (negative control) or with alternatively either citronella or carrot seed oil for several days. Over the time course of the experiment numbers of bean beetles were counted that were close to the beans, that were repelled from the beans with hypothetical repellent, found alive, dead or missing. Three trials showed, that citronella functioned as a repellent as hypothesized. Interestingly, citronella had also toxic side effects on the bean beetle. Furthermore, carrot seed oil was not showing repellent activities, it rather worked as an attractant. Thus, it is concluded that farmers could use citronella as a repellent, but not carrot seed oil. Future research can address the feasibility to use carrot seed as a decoy attractant to lure bean beetles away from threatened beans.

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