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## Safety and efficacy of citrus aurantium for weight loss

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### CRD summary

This review assessed the safety and efficacy of the herbal remedy citrus aurantium for weight loss. The authors concluded that they found no evidence that citrus aurantium is effective for weight loss and that safety information is extremely limited. The authors' conclusion is justified given the paucity of evidence in this area. This was a reasonably well-conducted review.

### Authors' objectives

To assess the safety and efficacy of the herbal remedy citrus aurantium for weight loss.

### Searching

MEDLINE, EMBASE, BIOSIS Previews and the Cochrane CENTRAL Register were searched from 1966 to 2004. No language restrictions were applied.

### Study selection

#### Study designs of evaluations included in the review

Randomised controlled trials (RCTs) were eligible for the review. The included study was a 6-week, placebo-controlled RCT.

#### Specific interventions included in the review

Studies of citrus aurantium (also known as 'bitter orange' and 'sour orange') used alone or with other ingredients, compared with placebo, were eligible for the review. Studies that examined citrus aurantium in combination with ephedrine alkaloids, a weight loss product banned by the Food and Drug Administration in 2004, were excluded. The participants in the included study were randomised to one of three groups: the intervention group received a herbal mixture containing citrus aurantium, St. John's Wort and caffeine; the placebo control group received a maltodextrin placebo; and the third group was a no-placebo control. The participants in all three groups also received dietary counselling and participated in a 3 days per week exercise programme.

#### Participants included in the review

The only inclusion criteria stated for the participants was that they had to be human. The participants in the included study were healthy but with a body mass index of over 25 kg/m<sup>2</sup>.

#### Outcomes assessed in the review

Studies that reported the outcome of change in weight were eligible for the review. The outcomes assessed in the included study were change in weight, percentage body fat, fat mass and basal metabolic rate, measured at baseline and 3 and 6 weeks.

#### How were decisions on the relevance of primary studies made?

Two reviewers independently assessed studies for inclusion in the review.

### Assessment of study quality

The studies were assessed for quality based on the 5-point Jadad scale. Two reviewers independently assessed studies for quality.

### Data extraction

The authors did not state how the data were extracted for the review, or how many reviewers performed the data

extraction. Data were extracted on the baseline weight, weight at 6 weeks, percentage change and P-value, as reported in the study, from tests of within-group changes in weight.

### **Methods of synthesis**

#### **How were the studies combined?**

Only one study was included in the review.

#### **How were differences between studies investigated?**

Only one study was included in the review.

### **Results of the review**

One RCT with 23 participants was included in the review.

The study was given a quality score of 3 out of a possible 5, because the randomisation procedure was not reported and reasons for the withdrawal of three participants were not stated.

The participants receiving the herbal mixture containing citrus aurantium lost an average of 1.4 kg in 6 weeks, dropping from 90.9 to 89.5 kg (a 1.5% change), which was a statistically significant within-group change from baseline ( $P=0.05$ ). Participants receiving the placebo lost an average of 0.9 kg, dropping from 83.6 to 82.7 kg (a 1.1% change). Participants who were in the no-placebo control group lost an average of 0.4 kg, dropping from 78.1 to 77.7 kg (a 0.5% change).

The authors stated that although the study reported no significant changes in laboratory tests, blood-pressure, heart rate or electrocardiograms, these data were not presented. They also stated that no data on adverse events were presented.

### **Authors' conclusions**

There was no evidence that citrus aurantium is effective for weight loss. Information on safety was extremely limited.

### **CRD commentary**

The review question was clear in terms of the study design, interventions and outcomes of interest. Four electronic databases were searched for relevant studies, with no language restrictions applied. However, the authors made no attempt to search for unpublished data, thus increasing the potential for publication bias. The study selection and quality assessment processes were carried out in duplicate, which reduces the potential for errors and reviewer bias. The authors did not, however, state how the data were extracted from the primary study, therefore the potential for errors and reviewer bias cannot be assessed. The included study was assessed for quality using an appropriate validated quality assessment instrument. The study was described in adequate detail. This was a reasonably well-conducted review and the authors' conclusion is justified given the paucity of evidence in this area, although relevant unpublished studies might have been missed.

### **Implications of the review for practice and research**

The authors did not state any implications for practice or further research.

### **Bibliographic details**

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