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**Bitter Orange – Ephedra in Disguise ? So Why Do People Still Take It ?**

**By Jenny Mathers**

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The facts about Bitter Orange are out. More research is being called for, but for the most part this is what we know so far:

1. Bitter Orange has been shown in some studies to be associated with weight loss, increased thermogenesis, metabolism and loss of fat mass. The results of some of these studies are questioned by some authorities;
2. Documented reports are starting to come in of cardiovascular events occurring associated with the use of products containing bitter orange (citrus aurantium, zhi-shi or whatever you want to call it);
3. The two major components of bitter orange are synephrine and octopomine. Synephrine is structurally similar to the ephedra extract which is now banned in many countries due to its adverse side effects and synephrine has been shown to cause cardiovascular events in animals.

So why are people still using it. It is easy to make the conclusion that they are unaware of it's ingredients and their effects, however, this is perhaps naive. Some people that take these types of fat burners are aware of the possible adverse effects that they may have on their bodies, however, sometimes go from one fat burner to the other, trying the different concoctions of herbs – hoping that it will cause rapid weight loss.

While the motivation for purchasing fat burning herbal products is obviously to lose weight – there is an extra pressure to lose weight fast, which is what these fat burners offer to their customers who may in some cases be grossly overweight and in risk categories for heart problems in the first place due to obesity issues. Fast weight loss is hardly ever permanent weight loss and never healthy weight loss.

There seems to be a common misconception that it is not as bad as ephedra. Over the past six years Health Canada received 16 reports of serious side effects involving tachycardia, cardiac arrest and

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black outs after products containing bitter orange were taken. Two of the patients concerned in these reports had died and had taken a combination of herbal supplements containing bitter orange, caffeine and ephedra. While 16 reports over six years does not sound like a whole heck of alot – these are only those from Canada, and are only those that were able to be linked to the herbal supplements.

It is plain that this perceived "need" for herbal preparations containing either bitter orange or ephedra is an emotional one. In some cases some people are so desperate to get rid of their excess weight, and have tried just about every diet under the sun and have battled with it for years, with no good success and then finally found these products that quite obviously do have an effect – but unfortunately do have significant side effects, even if it is just jitteriness.

So what's the answer, well, there is no easy answer. The truth is that no fat burner should make you jittery. Weight loss, can be achieved without products containing bitter orange and those with persistent weight issues need to be consulting a doctor or dietitian. In the end, it will probably end up costing less

in the long run.

1. Preuss HG, DiFerdinando D, Bagchi M, Bagchi D. Citrus Aurantium as a thermogenic, weight-reduction replacement for ephedra: an overview J Med. 2002;33(1-4):247-64.

2. Fugh-Berman A, Myers A. Citrus aurantium, an ingredient of dietary supplements marketed for weight loss: current status of clinical and basic research. Exp Biol Med (Maywood). 2004 Sep;229(8):698-704.

3. Nykamp DL, Fackih MN, Compton AL. Possible association of acute lateral-wall myocardial infarction and bitter orange supplement. Ann Pharmacother. 2004 May;38(5):812-6. Epub 2004 Mar 16.

4. Penzak, S R : Jann, M W : Cold, J A : Hon, Y Y : Desai, H D : Gurley, B J Seville (sour) orange juice: synephrine content and cardiovascular effects in normotensive adults J-nat-prod. Washington, D.C. : American Society of Pharmacognosy. Jan 2001. v. 64 (1) p. 111-113.

5.

Feel jittery – Xenadrine EFX

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**Amended Bitter Orange – Ephedra in disguise ?**

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If you read my last article about bitter orange or citrus aurantium, it was pretty clear how I felt about the herb. I'd read the available research concerning bitter orange, and while there was some evidence supporting bitter orange, the overall picture did not look good.

So that's the picture I painted, however, there were some facts that I was unaware of at the time, which I felt you might be interested in if you're researching bitter orange.

In order to lay these out, I want to answer four questions:

1. What Is Bitter Orange (Citrus Aurantium) Really ?
2. So does Bitter Orange act similarly to ephedrine ?
3. What about the reports of adverse ill effects of bitter orange ?
4. Is bitter orange safe to use and does it work ?

It's a bit long, but what the heck !

What Is Bitter Orange Really ?:

The Bitter Orange extract found in popular fat burners, is made from the unripe fruit of the citrus aurantium tree. The fruit is picked when they are a dark green in color, halved, dried and then milled into a powder. This makes the herb Zhi Shi[1]. Bitter orange is the western name for Zhi Shi.

The bitter orange herb contains five alkaloids (see alkaloid definition[5]), the most dominant of which is Synephrine (the compound I referred to in my last article), structurally similar to ephedrine. However, while they are similar, they're not the same.

Chemically, both synephrine and ephedrine stimulate the sympathetic nervous system and at a cellular level, affect classes of cells called alpha cells, and to a lesser extent, beta cells[6]. Alpha and beta cells can then be divided into classes of beta and alpha cells. Beta(1) and beta(2) cell receptors are believed to be responsible for cardiac and pulmonary functions. Beta(3) cell receptors are believed to be responsible for fat burning or thermogenesis. Ephedrine will affect beta(1), beta(2) and beta(3) cell receptors, however, of the beta-cell receptors, synephrine appears to only affect beta(3) cells.[7].

So does Bitter Orange act similarly to ephedrine ?

Does it ? While previously, I've presented a very black and white view of whether it acts similarly to ephedrine, I am now not so sure.

Generally speaking because synephrine stimulates beta(3) cells but not beta(2) and beta(1) cells, it can provide the thermogenic effects without the undesirable cardiac side effects that ephedrine did.

What about the reports of adverse ill effects of bitter orange ?

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The American Herbal Products Association has found that there were errors by the FDA in the reported adverse event reports attributed to the use of bitter orange in September 2004[3]. The association found that numbers reported in the media were in fact duplicates for adverse event reports for ephedrine, and when all was said and done, there was really only one report of an adverse reaction attributed to a bitter orange supplement, where no other ingredient was included in the supplement. In this particular case, it involved a 74 year old woman who had been taking prescription medication and two other herbal preparations simultaneously. This one case occurred more than five years ago[3].

What about the 55 year old woman reported by Nykamp DL, Fackih MN, Compton AL (2004), who experienced chest pain after consuming a supplement containing bitter orange. Researchers in this case study had commented "Based on the Naranjo probability scale, *C. aurantium* is possibly associated with this cardiovascular event"[4], however, as bitter orange was not the only ingredient in the supplement, it cannot be known whether in this case, that bitter orange was the herb responsible.

Is bitter orange safe to use and does it work ?

Now there are many others, who felt as I did, that bitter orange is another Ephedra waiting to happen, and will have the same consequences. However, when bitter orange is taken in isolation, it does not have adverse side effects.

In fact, when it is combined with other selected herbs, it may have benefits for health and weight loss. Research performed with 20 individuals over six weeks found no adverse reactions occurred when citrus aurantium was combined with caffeine and St. Johns Wort[2]. They also found that the individuals who were given the supplement (group A) lost an average of 2.9% body fat. "In terms of actual fat loss, group A lost a significant amount (3.1 kg), whereas the control group demonstrated a tendency toward fat loss." So, this study has demonstrated that there are weight loss benefits involved here, but also the control group who received nothing exhibited a tendency towards fat loss, suggesting that if the study had been extended beyond 6 weeks, the control group would have lost body fat as well.

Conclusions:

2004 was not a great year for bitter orange in the media. The extract has successfully battled reports of adverse events alleged to be a result of consuming bitter orange or citrus aurantium. These numbers proved to be incorrect.

While synephrine the main alkaloid of bitter orange or citrus aurantium extract, is chemically similar to ephedrine, it is not the same as ephedrine and differs in the way it reacts pharmacologically within the human body.

Although at first look at the research, bitter orange or citrus aurantium presented with dangers that I wanted to warn against, a more in-depth look has revealed that bitter orange by itself is not dangerous. The citrus aurantium extract standardized for synephrine (3–6%) is accepted as safe[7].

But hang on, before you click off this page, to go and find a fat burner with citrus aurantium in it, I do also want to say, that they can't be used as an alternative to good food and exercise.

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Herbal supplements such as those containing bitter orange can be helpful but only when used within a weight loss strategy of balanced eating and exercise, and while they may benefit some, it may not benefit others and only your doctor will be able to make that decision for you[6]. The results may be slower, but a balanced diet and exercise are the keys to permanent and healthy weight loss. So while bitter orange may be helpful, you can obtain the same results without it. What–ever stage you are at with your health and fitness, diet and exercise are the two most important aspects.

If you do decide you'd like to try a supplement containing bitter orange, please consult your doctor before purchasing a bitter orange or citrus aurantium product.

Essentially if you consult your doctor about bitter orange, as we say in Australia – you can't go wrong, mate. Your doctor will be able to refer you to your nearest dietician and will recommend the best weight loss strategy for your situation.

### References:

[1]Jones, D., "Bitter Orange or Citrus Aurantium: same difference ?"

[2]Colker et. al., (1999) Effects of Citrus Aurantium extract, caffeine, and St. John's Wort on body fat loss, lipid levels, and mood states in overweight healthy adults. *Curr. Ther. Res.* 60, 145 – 153.

[3]

[4]Nykamp DL, Fackih MN, Compton AL. Possible association of acute lateral–wall myocardial infarction and bitter orange supplement. *Ann Pharmacother.* 2004 May;38(5):812–6. Epub 2004 Mar 16.

[5]

– any of hundreds of compounds found in plants with a nitrogen atom

connected to two carbon atoms, and often formed in a ring structure. Many commonly known chemicals and drugs are alkaloids, including nicotine, cocaine, quinine, morphine, and ephedrine.

[6]Dharmananda, S.,

Institute for Traditional Medicine,

Portland, Oregon. See the schematic diagram for synephrine at the bottom of the page.

[7]

Other Sites of Interest:

Supplement Watch Newsletter

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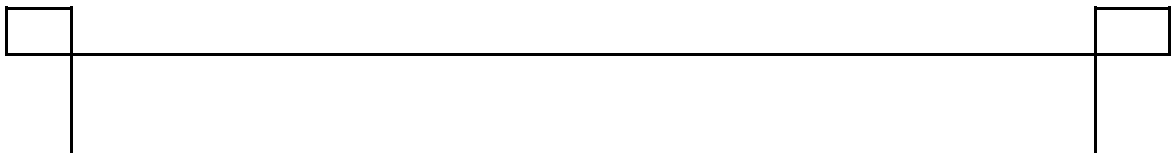
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