

## Natural Products to Slow Down Obesity

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### ABSTRACT

*Obesity has become an international health problem. Obesity could be a unique health issue for affluent populations, but its correlations with chronic diseases like diabetes and cardiovascular problems are facing a rising trend.*

*Treatment for the control of obesity has been confined to different ways of change of life-styles: careful food intake and bodily exercises. For the very severe presentations, gastric operations to facilitate the passage of food intake have been advocated. Likewise, the use of specific medication to artificially reduce the neuro-psychological yearn for food is available. These drastic measures are subject to criticism.*

*Using natural products like medicinal plants to control obesity could be a favorable choice once proven effective.*

*In Traditional Chinese Medicine records, many herbal items have been described to be effective against obesity: from simple prescriptions recommended for slim body-build in ancient times, to more sophisticated formulations in modern times against over-weight or more specific presentation like Metabolic Syndrome.*

*We have gained solid experience on the creation of an evidence-based health drink and another 4 herbs formula against Metabolic Syndrome. Clinical evidences have been gathered through standard platform studies, followed by pilot clinical trials. The two items have been found safe to consume and are indicated for further in-depth studies to up-grade the clinical quality.*

### Keywords

Obesity, Natural Products, Health Supplement.

### Introduction

Getting obese could have been taken as a sign of affluency and physical satisfaction. However, the association between obesity and chronic diseases like diabetes mellitus, hypertension and cardiovascular problems has awakened a universal concern. Indeed obesity, with its rising trend among different populations [1,2], has been considered as a major public health risk [3].

It has been estimated that at least 12 billions of the world population are suffering from obesity and in China 5.4% (over 70 millions)

belong to the obese category. The bitter facts are: these figures have been rising with time [4].

Treatment for the control of obesity has mostly confined to different ways of change of lifestyle: control of food intake, specific abstinence to certain nutritional stuff, and exercises to prevent over-storage of catalogues, etc. [5,6]. Efficacy of such measures, expectedly is variable. Different ways of surgical intervention are available for the extreme presentations of obesity which could hardly be popularized [7,8].

Control of obesity using pharmaceutical means are available for those cases where disease complications have become threatening.

Two directions of therapeutic approach are chosen to stop the over-eating leading to over-accumulations of fatty material. The first involves control of the central nervous system: cutting down the desire for food intake. As expected, the result of such attempt could either be over-drastic or adversities prone [9]. The other therapeutic option relates to the upward stimulation of innate digestive and metabolic ability so that excessive intake of nutritional products could be assimilated fully instead of being deposited as fatty material [10]. One example of a pharmaceutical already in market is “Orlistat” which interferes with the digestive enzymes for fat absorption in the stomach and pancreas, resulting in markedly decreases in the intake of fat [11,12].

### Prevention against Obesity – Early Experiences

Our Institute of Chinese Medicine (ICM) has been working hard on the use of Medicinal plants for preventive purposes in support of established clinical practices. In the obesity areas ICM would attempt to offer simple oral supplements to the early obesity-conscious individuals so that they could safely avoid progressively getting over obese which might lead to further specific metabolic or cardiovascular problems [13].

We have accumulated early experiences on the control of Metabolic Syndrome which is closely related to obesity perse.

### Metabolic Syndrome

Metabolic Syndrome (MS): Overweight, Obesity, Hypertension, Hyperglycemia and Hypercholesterolemia, are generally accepted today as clinical signals leading to cardiovascular diseases. Control of MS is therefore a common health concern. While drug treatment is yet not available or may not be creditable, developing an effective health supplement against MS is highly justified, particularly for the aging group of people [14].

A herbal formula composed of four herbs known to have anti MS biological effects was used for *in vivo* and *in vitro* biological research platforms to verify its pharmacological effects, and to prepare for subsequent pilot clinical trial (Table 1).

**Table 1:** Four edible herbal items selected for the control of MS.

| Herbal Item  | Traditional Use                              |
|--|--|
| <i>Crataegus pinnatifida</i> Bge (a tree berry)      | To reduce obesity                            |
| <i>Schisandra chinensis</i> (Turcz.) (a scrub berry) | To reduce obesity and protect liver function |
| <i>Momordica charantia</i> (bitter melon)            | To reduce blood sugar                        |
| <i>Silymarin Marianum</i> (Milk thistle)             | To protect liver function                    |

*In vitro* studies included: using bench models of Adipocytes for viability and cholesterol uptake; liver cells for viability and anti-glycaemia effects: all gave positive results of good control. *In vivo* studies testing the herbal formula’s effects on obese mice also showed very promising results. In the clinical trial, measurements of body weight, body circumferences, BMI, as well as liver fibrosis,

all showed good responses after the herbal consumption [15].

Thus, our efforts on the creation of an Evidence-Based Specific Supplement for the control of Metabolic Syndrome have harvested highly positive data in the laboratory. A subsequent 3 months’ pilot clinical trial showed promising data on the control of blood lipids, general body measurements and liver steatosis. This specific supplement has been out-sourced for marketing [16].

The anti-Metabolic Syndrome supplement might be able to serve a special group of people worrying with good reasons about their blood sugar level and liver function. There is another large group of people who are under the constant threat of high blood cholesterol which predisposes to heart diseases. They might have already been prescribed with cholesterol lowering drugs, yet the earnest desire of self-help via the consumption of supplements prevails.

Basing on an extremely common belief among the general household people on a South China fruit called “Shan-ja” (i.e., *Crataegus* or hawthorn), as being “fat removing” [17].

We plan to create a special drink, based on *Crataegus* to help.

In our research on Metabolic Syndrome just described, hawthorn (*Crataegus*) has been widely used in cooking, drinks, confectionaries and supplements. People appreciate its taste and flavor, particularly its pleasant digestive effects. Our platform study indicated hawthorn’s restrictive effects on cholesterol absorption in the guts, giving us confidence, using it as a major component in a freshening, tasty, anti-cholesterol digestive drink.

A Hong Kong based beverage provider and owner of over 100 chain shops of special food and health supplements HFT was interested to pursue with our research team to create a “Hawthorn to control Fat” drink. The research requirements included a further confirmation of the anti-cholesterol effects, the quality control of the product, and its absolute safety [18].

Table 2 gives the details of the hawthorn formula. The main hawthorn component is matched with supporting herbal partners to establish a pleasant beverage.

**Table 2:** Components of the Hawthorn Drink.

|                     |       |
|---------------------|-------|
| Hawthorn extracts   | 48.8% |
| Flaxseed extracts   | 6.0%  |
| Vegetable extracts  | 40.0% |
| Sugar               | 4%    |
| Homanizer           | 0.2%  |
| Total Caloric value | 54    |

### Current Planning

Indeed, *Crataegus* is a well-known healthy drink to “remove fat”. There are many other medicinal plants that are being studied and applied in herbal formulations in China. We need to study published data carefully and make proper choices to fulfill our aspirations on the creation of supplements to be proven effective

on the prevention of obesity.

The clinical experts of Traditional Chinese Medicine have interpreted obesity as weakness of “Qi”, caused by the same problem in the “Lungs, and “Kidneys”, followed by a series of further postulations. Treatment therefore tends to be rather complicated, starting with standard approaches, raising steadily to complex levels. Under such traditional designs, one expects varieties of herbal combinations which do not favor our desire of simple modifications. We need to identify the most popular herbs involved under various special situations in our creation of a safe, effective combination, to be put on evidence-based efficacy proven study platforms before its clinical trial [19,20].

Our extensive literature searches have allowed us to identify the following herbs to be included in our Obesity Prevention project. They are *Crataegus Pinnatifida* Bye; *Schisandra Chinensis* (Turcz), *Momordica Charantia*; *Nelumbo Nucifera*; and *Camelia Sinensis* [21,22].

The first three herbal materials viz, *Crataegus*, *Schisandra* and *Momordica*, have been tested thoroughly in our Metabolic Syndrome study and proven non-toxic and “fat removing”, demonstrated in serological investigation and fatty liver clinical measurements. *Momordica* has been particularly well known for being effective in rapid blood sugar level control [23].

*Nelumbo* leaves have been reported to be effective controlling blood cholesterols, lipids and in experimental obese rats. It removes fat contents and improves longevity [21]. As far as *Camelia Sinensis* is concerned, the catechins have been well-known as “fat controlling” molecules [24].

### Expected Procedures

The five selected herbs will be put on research platforms to verify their joint effects on obesity prevention which refers to the blocking of carbo-hydrate-fat conversion mechanisms and treatment effects on obese rats.

The current interests on *Letin*, secreted normally in the gastrointestinal tract in the digestive process, going up through the blood-brain barrier to initiate the neurological control against over-energetic activities of appetite, thus achieving a primary prevention of obesity.

Ideally, the *Letin* study will be included in our study plan.

### Conclusion

The Anti-obesity project under planning is expected to put the traditional wisdom to scientific study platforms: first to explore and confirm their direct effects on carbohydrate-fat mechanism, thence moving further to the neuro-gastrointestinal link related to appetite generation and food taking.

Traditional clinical experts in China have been happy with their observations on the favorable results treating obesity problems.

Our current attempt choosing among reported herbal formulations 5 popular items, to be put on biological platforms before clinical trials is expected to be a logical step to help solving this international problem of obesity. The conventional approach will expectedly produce an evidence-based supplement specific to the prevention and control of obesity. The highly ambitious exploration on the neuro-gastrointestinal connection related to obesity, once proven, will lead to further in-depth explorations.

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