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Review Article

Pharmacognostic, Pharmacological and Pharmachemistrical Overview of Anti-Obesity Herbs

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ABSTRACT

From the world of herbs the present therapies are being originated which are acting as the best alternate for the conventional therapies. In the view of the same numerous researchers are working to highlight the present herbs of various regions. The present work tries to emphasize on the pharmacognostic, pharmachemistrical and pharmaco-economical aspects of anti obesity herbs. The obesity is considered to be the originator of many other diseases like diabetes, hypertension, asthma, osteoarthritis and cancer etc. This might have diverted the physicians and researchers to find an alternate along with the ongoing therapies. However, these alternates must be economical and easily assessable.

INTRODUCTION

Obesity is a global epidemic that has shown a steady increase in morbimortality indicators; it is considered a social problem and entails serious health risks [1-7]. One of the alternatives in the treatment of obesity is the traditional use of medicinal plants, which supports the research and development of obesity phytotherapy [8-11]. Pharmacological strategies are recommended for the treatment of obesity, mainly because they are non-invasive. Recommended pharmaceuticals include sibutramine, fluoxetine, sertraline, orlistat and topiramate [12-13]. These medicines should be used with caution, especially in patients with cardiovascular disorders, because they possible may aggravate the clinical picture. Among the available therapies plant-based medications may contribute to satiety, increased metabolism and accelerated weight loss [14]. The present work, focus on some of the herbal plants which are proven to be efficacious in the treatment of obesity.

1. ***Tripterygium wilfordii***

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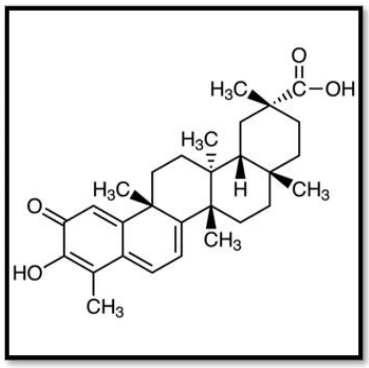
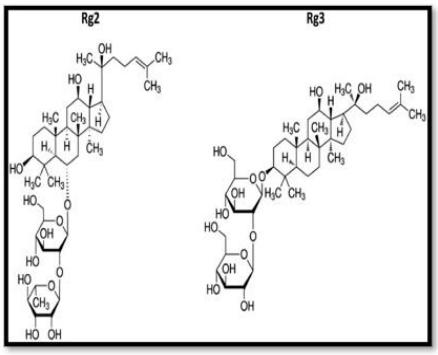


The active chemical constituent in the plant is celastrol which suppresses food intake, blocks reduction of energy expenditure and leads up to 45% weight loss in hyperleptinemic diet-induced obesity in mice by increasing sensitivity of leptin [15].

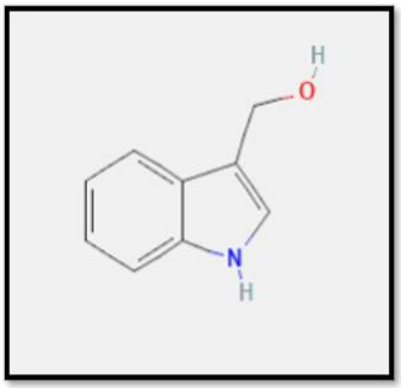
2. Panax ginseng



Numerous researches have reported that ginsenosides including Rg3, Rg2 can effectively inhibit the adipogenesis in 3T3-L1 preadipocytes. In addition, they can also decrease lipid accumulation, adipocyte size and adipose weight, and prevent triglyceride deposition. The molecular regulation of ginsenosides on adipogenesis may be related with the down-regulation of the protein expression of adipogenesis-related transcription factors and the key lipogenic enzymes in 3T3-L1 cells. It was observed that ginsenosides play an anti-adipogenic role mainly by activating the adenosine monophosphate-activated protein kinase (AMPK) pathway and down-regulating PPAR γ related pathways [16].

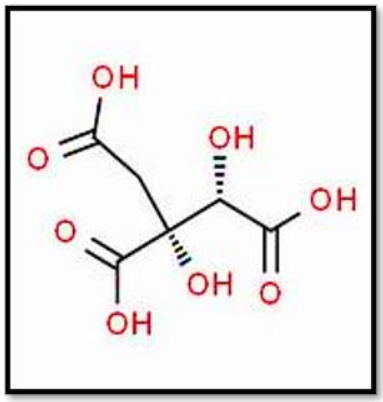
3. *Ilex paraguariensis*

Indole-3-carbinol (I3C) has shown to exhibit anti-obesity activity by reducing body weight and fat in animals fed a high-fat diet and by inhibiting the differentiation of 3T3-L1 preadipocytes . Being an activator of the aryl hydrocarbon receptor (AhR), a ligand-activated transcription factor crucial in adipogenesis and angiogenesis, we considered that I3C executes its activities through the AhR. Although I3C has been shown to inhibit the differentiation of preadipocytes, knowledge regarding its effects on lipid accumulation in matures adipocytes and on adipocyte-associated angiogenesis is limited. Because increased triglyceride (TG) accumulation in mature adipocytes is positively associated with obesity and associated metabolic disorders, compounds that reduce the TG content in adipocytes may have therapeutic roles in obesity and related pathological disorders [17].

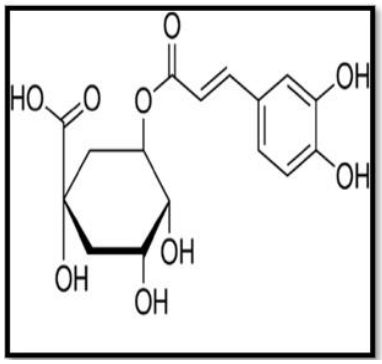


4. *Hibiscus sabdariffa*:

HSE (or tea) inhibited the activity of α-amylase, blocking sugars and starch absorption, which may assist in weight loss. The ability of HSE to reduce body weight was attributed to *H. sabdariffa* polyphenols and flavonoids, through the inhibition of fat accumulation. Moreover, it also inhibits lipid accumulation and suppression of adipogenesis through the PPARγ pathway [18].



5. Coffee:

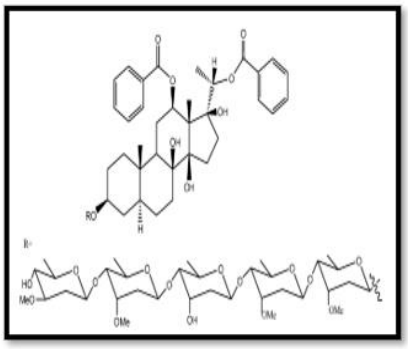


Caffeine, and other polyphenolic compounds in green coffee bean extract (GCBE) act to suppress body weight gain and visceral fat accumulation. The CGA is possibly effective against weight gain and fat accumulation by inhibition of fat absorption and activation of fat metabolism in the liver. Oral administration of CGA in dose of 30 and 60 mg/kg/day for 2 weeks dramatically reduced the level of hepatic triglycerides. The suppressive effect of CGA on hepatic triglycerides accumulation was more potent than that of GCBE. Chlorogenic acid significantly inhibited fatty acid synthase, 3-hydroxy-3-methylglutaryl CoA reductase, and acyl-CoA cholesterol acyltransferase activities, while they increased fatty acid beta-oxidation activity and peroxisome

proliferator-activated receptors alpha expression in the liver compared to the high-fat group and results suggested that CGA can improve body weight, lipid metabolism, and obesity-related hormones level [19].

6. *Caralluma fimbriata*:

The exact mechanism of action of this effect is not well established. Pregnane glycosides present in CFE may act via multiple mechanisms. The decline in food intake may reflect direct intervention in appetite control at the level of the hypothalamus, where the pregnane glycosides are known to act. There is also evidence that they act directly on adipose tissue, by inhibiting adipocyte proliferation and differentiation. Carallumafimbriata contains pregnane glycosides which are believed to block the activity of citrate lyase. By blocking this enzyme, Carallumafimbriata may block the formation of fat by the body. Further, Carallumafimbriata also blocks another enzyme called Malonyl Coenzyme A. By blocking this enzyme, fat formation is further blocked and the body is forced to burn its fat reserves. This might accelerate the rate of fat loss by the body. An alternative hypothesis is that CFE may down regulate ghrelin synthesis in the stomach and subsequently neuropeptide-Y in the hypothalamus, with ultimately the same effect of appetite suppression [20].



Economical aspects of Anti-obesity Drugs:

The economical aspects of the anti obesity drugs are very important as these medicines are to be taken by the patients for the long duration of time. According to a current medical research the anti obesity treatment may takes from several months to year or so. Moreover, severity of condition also directly affects the time period of treatment. The additional problem arises when the maintaince of the same is to be carried out to prevent the reoccurrence of this problem. Hence a lot of finance is being engaged while treating and managing the obesity. It has also been reported that herbal anti-obesity products are highly prevalent in the commercial market than the allopathic formulations [21-22].

CONCLUSION:

Nowadays a lot of research is going on globally involving the use of herbs. Most of the diseases in the present scenario is being treated and managed with the use of herbal medicines. Keeping all this into consideration it becomes necessary for the researchers all over the world to clarify the chemistry of the herbal based products. This will also helps in overcoming the adverse drug reactions. At the same time the economical aspects of the herbal formulation are too very important. The market scenario will suggest that the formulations with good quality along with affordable price will have better chances of survival in the market.

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