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Phytotherapy as an adjunctive tool in the treatment of anorexia nervosa: a review of potential neuroregulatory and appetitogenic plants

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Abstract

Introduction: Anorexia nervosa (AN) is a serious eating disorder. Globally, eating disorders affect 2-5% of the population over the course of a lifetime and occur significantly more often in women than in men. AN is associated with high mortality, complications. The comorbidity of AN and depression highlights the need for a holistic therapeutic approach.

Material and methods: This literature review was conducted on the basis of scientific articles published from 2013 to 2025. As sources were used:PubMed, Scopus, Google Scholar using the following keywords: anorexia nervosa, phytotherap, cannabinoids, Angelica archangelica, Artemisia absinthium.

Results: Phytotherapy may support recovery and improve quality of life in patients with AN, which remains a therapeutic challenge despite the growing treatment options. This article explores phytotherapy as an adjunct to conventional therapy, offering clinicians guidance on natural supplements. Cannabinoids can stimulate appetite and mood, Angelica archangelica may help manage anemia and cognitive impairment, while Artemisia absinthium alleviates anorexia-related symptoms caused by zinc deficiency. These approaches highlight phytotherapy's potential role in enhancing treatment effectiveness and supporting patient outcomes.

Conclusions: Phytotherapy including cannabinoids, A. archangelica, and A. absinthium offers promising support in the treatment of AN. Cannabinoids may improve appetite and mood, A. archangelica supports the treatment of anemia and cognitive impairment, while A. absinthium helps alleviate symptoms of anorexia resulting from zinc deficiency.

Keywords: anorexia, cannabinoids, phytotherapy, *Angelica archangelica, Artemisia absinthium*

Streszczenie

Wstęp: Anorexia nervosa (AN) to poważne zaburzenie odżywiania. Na świecie zaburzenia odżywiania dotyczą 2-5% populacji w ciągu całego życia i występują znacznie częściej u kobiet niż u mężczyzn. AN wiąże się z wysoką śmiertelnością oraz powikłaniami zdrowotnymi jak osteoporoza, zaburzenia sercowe, niepłodność czy atrofia mózgu. Współwystępowanie AN i depresji podkreśla konieczność holistycznego podejścia terapeutycznego.

Materiał i metoda: Dokonano przeglądu recenzowanych artykułów naukowych z lat 2013-2025. Podstawę stanowiły bazy danych PubMed, Scopus, Google Scholar. Wykorzystano słowa kluczowe: anoreksja, kannabinoidy, fitoterapia, Angelica archangelica, Artemisia absinthium.

Dyskusja: W obliczu rosnącej liczby przypadków fitoterapia może odegrać istotną rolę w poprawie jakości życia pacjentów i wspomaganiu procesu zdrowienia. Pomimo coraz szerszej gamy dostępnych metod leczenia, AN pozostaje poważnym wyzwaniem terapeutycznym, nawet dla doświadczonych specjalistów. Celem niniejszego artykułu jest rozważenie zastosowania fitoterapii jako dodatkowego narzędzia wspierającego skuteczność terapii. Może on stanowić pomoc dla klinicystów,

rozważających włączenie naturalnych suplementów jako uzupełnienia leczenia klasycznego. Fitoterapia, obejmująca m.in. zastosowanie kannabinoidów, Angelica archangelica i Artemisia absinthium, stwarza obiecujące możliwości wspomagania leczenia AN. Kannabinoidy poprawiają apetyt i nastrój, A. archangelica wspiera leczenie anemii i zaburzeń poznawczych, a A. absinthium łagodzi objawy związane z niedoborem cynku.

Dyskusja i wnioski: Podsumowując, fitoterapia obejmująca zastosowanie kannabinoidów, A. archangelica i A. absinthium stanowi obiecujące wsparcie w leczeniu AN. Kannabinoidy mogą poprawiać apetyt i nastrój, A. archangelica wspiera leczenie anemii i zaburzeń poznawczych, natomiast A. absinthium łagodzi objawy anoreksji związane z niedoborem cynku.

Słowa kluczowe: fitoterapia, anoreksja, kannabinoidy, *Angelica archangelica, Artemisia absinthium*

1. Introduction

Anorexia nervosa (AN) is a type of eating disorder. The peak incidence of occurrence is during adolescence, at the age of 15-16 years. AN causes the highest mortality rates of all mental illnesses. Between 15-20% of diagnosed cases end in death [1]. According to the Diagnostic and Statistical Manual of Mental Health Disorders, Fifth Edition (DSM-5), the diagnosis of AN requires each of three key diagnostic criteria to be met: persistent self-restriction of energy intake leading to significant weight loss, intense fear of weight gain or persistent behaviour that interferes with weight gain, disturbed self-perception of weight or shape of a body [2]. As the disease progresses, numerous health complications develop. Some of these resolve with nutritional rehabilitation while others can lead to permanent damage. Examples include osteoporosis, cardiomyopathies, arrhythmias, infertility, tooth loss or brain atrophy and the general mental retardation seen in patients with more severe forms of the disease.

In addition, AN is accompanied by psychiatric disorders such as depression and obsessive-compulsive disorder (OCD). The multifaceted picture of the disease poses a huge medical problem for doctors of many specialities. This provides motivation to optimise therapy to reduce the life-threatening and long-term side effects of patients suffering from AN [3]. Nutritional rehabilitation is the therapeutic gold standard for such a complex pathology. Nutritional treatment and psychotherapy in some cases require the additional support of pharmacotherapy. Despite many attempts to treat AN with antidepressants, little is still known about their long-term efficacy. On the other hand, there is optimism about the effectiveness of second-generation neuroleptics. Olanzapine has been shown to cause weight gain. Cyproheptadine is sometimes used to stimulate appetite, although it does not always have an effective treatment result,, which is why it is important to look for other ways to help patients. Relapse rates (AN) remain high, which justifies the search for further methods of treatment [4]. According to WHO reports, approximately 80% of the world's population still relies on herbal medicines. Today, many medicines owe their origin to medicinal plants. Natural substances have long served as sources of therapeutic drugs. Natural sources require a multifaceted approach, combining botanical, phytochemical, biological and molecular techniques. Consequently, plant-based drug discovery remains an important area, hitherto unexplored, in which a systematic search can certainly provide important clues to various pharmacological targets for treatment in prevention of the development or relapse of anorexia and its consequences [5].

However, phytotherapy remains a relatively underexplored area, and its use in treatment may appear controversial. Therefore, the aim of this article is to analyse the role of phytotherapy as an adjunctive tool in the management of anorexia nervosa (AN). The authors focus on evaluating the potential of selected plant-based substances of cannabinoids, *Angelica archangelica*, and *Artemisia absinthium*, in improving appetite, mood, hematological parameters, and in alleviating symptoms associated with zinc deficiency. The article is intended to serve as a reference point for clinicians considering the incorporation of natural supplements as support for conventional therapy. It also highlights the need for further research on this highly intriguing subject.

2. Material and methods

This literature review was conducted on the basis of scientific articles published from 2013 to 2025. As sources were used PubMed, Scopus, Google Scholar databases, using the following keywords:'anorexia','cannabinoids','phytotherapy', '*Angelica archangelica*', '*Artemisia absinthium*'. Among the 1882 articles in the available database, 50 publications were included in this study after detailed analysis.

3. Results

3.1 Cannabinoids

Cannabis is an effective substance for the treatment of a variety of psychiatric disorders, some of which also occur in people with AN. The rationale, therefore, is to

thoroughly test the correlation between cannabis use and the pathology that is AN. The two best known cannabinoids biochemically are Δ9-tetrahydrocannabinol (Δ9-THC) and cannabidiol (CBD) . While Δ9-THC is the substance responsible for stimulation of mood, appetite, memory and reduction of pain. CBD instead reduces anxiety, inflammation and nausea, and may protect neuronal cells that are degraded under reduced caloric supply from death. Both Δ9-THC and CBD bind to cannabinoid (CB) receptors located in the endocannabinoid system (ECS).

CB receptors are located in the hypothalamus where there are nerve centres responsible for the sensations of hunger and satiety. Consequently, stimulation of the ECS affects appetite and pleasure associated with eating. There is evidence to suggest that appetite signalling in AN is dysregulated by the decreased reactivity of the ECS. Thus, external supply of cannabinoids that stimulate CB receptors stimulates the ECS system. Such treatment, in addition to stimulating the silenced ECS, may modify abnormalities, ultimately improving appetite regulation and calorie intake [6,7,8]. A study on the efficacy of dronabinol, which stimulates the CB1 receptors of the ECS systems, led to a sustained weight gain of 0.25 kg per week in the study group compared to the placebo group [9,10]. This study tested the effect of the substance as an adjunct to standard psychotherapy and nutritional rehabilitation by synergistically combining these actions for a better therapeutic effect. The doses administered were low 2.5 mg twice daily to prevent side effects, which did not appear in any of the 35 tested individuals, providing evidence of the safety of dronabinol treatment.

Dr Jatoi and colleagues conducted a randomised clinical trial with 469 patients who had anorexia along with oncological disease, randomly assigning them to three groups. They were successively given substances such as megestrol acetate (800 mg daily), dronabinol (synthetic THC, 2.5 mg daily) or anxiolytics, without a placebo-controlled group. Patients' appetite and weight improved in all study groups. However, the improvement was to a greater extent with megestrol acetate (75% versus 49%) and (11% versus 3%), for megestrol acetate and dronabinol respectively. This indicates the positive effects of dronabinol but not as strong as megestrol, but given the numerous side effects such as delaying the return of menstruation in patients with AN, drobinabinol may be a better therapeutic choice [11]. In the study from 2023 participated 144 patients with advanced cancer and anorexic symptoms. They were randomly allocated to two study groups: one received CBD oil and the other a matched placebo. Participants in the CBD group received a titrated oil of 100 mg/ml, initially 0.5 ml once a day, with the option to increase to 2 ml three times a day for 28 days. The primary endpoint was the total symptom stress score using the Edmonton Symptom Assessment Scale (ESAS) after 14 days. Response to treatment was defined as a decrease in the TSDS score of at least six points. When analysing the results, it was found that there was no significant difference between the group taking CBD and the placebo group. The change in TSDS was -6.2 for placebo and -3.0 for CBD. Although both groups showed improvement in all components of the ESAS, statistically there was no difference between the two groups. It is noteworthy, however, that patient-reported overall improvements in wellbeing were noted in the CBD group.

In conclusion, CBD oil did not show a significant benefit in relieving symptoms in patients with advanced cancer compared to standard palliative care. Nevertheless, its potential to reduce stress and anxiety remains an area of interest [12]. The chapter on cannabinoids highlights their therapeutic potential in the treatment of anorexia, particularly through effects on the endocannabinoid system and appetite regulation. The two main cannabinoids, Δ9-THC and CBD, show beneficial effects with minimal side effects, making them attractive therapeutic options. Studies have shown that dronabinol can lead to weight gain in patients with anorexia, and its use in combination with psychotherapy and nutritional rehabilitation can have synergistic effects. Although the results for CBD oil did not show a significant difference compared to placebo, patients reported an improvement in overall wellbeing, suggesting that cannabinoids may have a positive impact on quality of life. In the context of phytotherapy for anorexia, cannabinoids appear to be a promising alternative that deserves further research.

Both Δ9-tetrahydrocannabinol and cannabidiol are metabolised by cytochrome P450 isoenzymes. For example, Δ9-tetrahydrocannabinol is primarily metabolised by CYP2C9 and CYP3A4, while cannabidiol is metabolised by CYP2C19 and CYP3A4. Cannabinoids may also inhibit or induce these enzymes, which can affect the plasma concentrations of psychotropic drugs. For instance, cannabidiol is considered a strong inhibitor of CYP3A4 and CYP2C19, whereas Δ9-tetrahydrocannabinol may act as an inducer of CYP1A2 [52].

In practice, this means that the use of antidepressants or antipsychotics metabolised via these pathways (e.g., certain SSRIs, SNRIs, or antipsychotics such as risperidone) may be modified by the presence of cannabinoids—drug levels may either increase or decrease, which can respectively lead to enhanced adverse effects or reduced therapeutic efficacy.

In addition to metabolic interactions, pharmacodynamic interactions are also clinically relevant. Cannabinoids, particularly Δ9-tetrahydrocannabinol, have psychoactive effect and, in some cases, anxiogenic effects; They may cause perceptual alterations,

exacerbate paranoia, or intensify intrusive thoughtsso effects that can be especially risky in individuals with psychiatric or anxiety disorders, such as AN. Regarding antipsychotics, observational studies suggest that cannabis use is associated with higher hospitalisation rates, poorer treatment response, and more frequent changes of antipsychotic medication—findings that may indicate interference of cannabis with treatment efficacy [53]. For example, an animal experiment conducted by Brzozowska et al. demonstrated that THC can reduce brain concentrations of risperidone and its active metabolite by influencing the P-gp (P-glycoprotein) transporter in the blood–brain barrier, which may diminish the drug's effectiveness [54].

3.2 Angelica archangelica(A. archangelica)

A. archangelica is an herb found in tropical and subtropical regions of the world. In Chinese and Indian medicine, it is used to treat the underlying effects of anorexia associated with hematopoietic disorders. Anaemia and mild neutropenia are found in almost a third of AN patients. The exact mechanism of these symptoms is still unclear, but 50% of AN patients with haematological changes have morphological signs of partial bone marrow atrophy, which is a serious health detriment [13, 14]. The method to effectively treat anaemia may be a synergistic therapy of two phytotherapeutics. The results of a study conducted on animals living at different altitudes differdramatically in haemoglobin concentration parameters suggest that functional Hb levels can be recovered by oral administration of A. archangelica and Glinco biloba. This is why the described compressed therapy fills us with hope for the effective treatment of the huge problem in anorexia that is anaemia [15].

In accordance with the German Medicinal Code, the German Pharmacopoeia officially recognised the roots of the plant in the Commission E monographs. These monographs listed the clinical usage of the plant as a bitter aromatic tonic and in various disorders of the gastrointestinal tract and bile ducts. The therapeutic guide to herbal medicine published by the 'German Commission E' Monographs, detailed the use of the fruits and roots of A. archangelica plant during the treatment of anorexia and indigestion [16].

People with anorexia often experience cognitive disturbances that affect their body perceptions and beliefs about food. They may have distorted ideas about their appearance, leading to excessive weight control and restrictive eating habits. In addition, these disorders may include difficulties in decision-making and reduced ability to concentrate, which affects daily functioning. A multicentre, randomised, double-blind, placebo-controlled study was conducted involving 56 patients with mild cognitive impairment (MCI) who were divided into two groups:the study group with A. archangelica extract and placebo. Participants took the supplement for 48 weeks, with a dose of 200 mg ferulic acid and 40 mg A. archangelica extract daily. The results of the study showed significant improvements in Mini-Mental State Examination (MMSE) and Alzheimer's Disease Assessment Scale-Cognitive Subscale (ADAS-Jcog) scores in the active group after 24 and 48 weeks, suggesting that A.archangelica extract may support therapy for people with MCI.

In addition, analysis of the results showed that ferulic acid and A. archangelica extract may have beneficial effects on patients' cognitive function, which is important in the context of potential use in the treatment of anorexia where cognitive impairment is present. This study provides an argument for further research into the use of these substances in the treatment of cognitive impairment associated with anorexia [17].

Anorexia and depression often co-occur, posing a significant therapeutic challenge. Studies indicate that as many as 50-70% of people with anorexia also struggle with depressive symptoms. Such dual problems complicate the treatment process, as both disorders affect each other. Patients require an individualised approach that addresses both nutritional and mental health aspects. Effective therapeutic support is crucial to help them overcome these difficult challenges.

The study on the antidepressant activity of isolated coumarins from the Angelica archangelica plant included 40 mice that were divided into five groups: a control group, a reserpine group and three treatment groups (extract, angelicin and bergapten). Mice in the control group received no treatment, while the reserpine group was subjected to subcutaneous administration of reserpine at a dose of 0.5 mg/kg for three days, which induced depressive symptoms. The extract of A. archangelica (400 mg/kg) and isolated coumarins (angelicin and bergapten at 10 mg/kg each) were administered for five days. The study results showed that both the extract and coumarins significantly reduced the immobilisation time of mice in the forced swim test (FST) compared to the reserpine group, suggesting their potential for alleviating depressive symptoms. Additionally, biochemical studies indicated that angelicin and bergapten decreased MAO A activity in the brain, which may be a mechanism for their antidepressant effects. Scopoletin did not show the same efficacy, suggesting that its low permeability across the blood-brain barrier may influence its ineffectiveness [18].

Another species of the same plant genus is Angelica glauca (A. glauca). It has been used for centuries by traditional medical practitioners to treat diseases related to the reproductive health of infertile women or menstrual

cycle disorders. An important part of the treatment of AN is the assessment and treatment of endocrine complications, including functional hypogonadotropic hypogonadism. The consequence of this condition is secondary menstrual loss. This is a common phenomenon resulting from a woman's poor nutritional status and low levels of body fat. This symptom has a long-term impact on the lives of patients and their families [19,20]. A deeper understanding of the mechanism of action in the body is a driver for further research on this plant with important implications for the future of female AN patients.

3.3 Artemisia absinthium (A. absinthium)

Zinc deficiency is associated with a significant decrease in food intake occurring in patients with severe AN [21]. This mineral plays an important role in the regulation of appetite and taste perception. Its deficiency can disrupt this mechanism which can lead to a worsening of the AN condition. Zinc deficiency also affects the synthesis and secretion of hormones involved in the regulation of appetite. This altered hormonal balance, particularly concerning ghrelin, leptin and insulin, contributes to reduced food intake in patients with AN. A. absinthium, also known as wormwood, has been used in traditional medicine for its various therapeutic properties such as the anti-inflammatory action that characterises antihistamine substances. Itis known that histamine inhibits hunger and reduces appetite, which can motivate the development of AN. Consequently, the study was carried out on rats with anorexia and pronounced zinc deficiency. The substances administered were A. absinthium extract and cyproheptadine, which is an antihistamine drug used to increase appetite. Biochemical studies have shown that antihistamine extracts and A.absinthium extracts have an anorexogenic effect in zinc deficiency [22,23].

An innovative study of the effect of A. absinthium has been conducted on haemodialysis (HD) patients who very often develop anorexia. A randomised controlled clinical trial was designed to investigate the effect of Artemisia supplementation on anorexia in HD patients. The study group consisted of 58 patients aged 55-56 years. Participants were randomly divided into two groups. One group received 250 mg/day capsules of A. absinthium supplementation for six weeks. The other group received a placebo for the same duration and at the same dose. Serum urea, creatinine, albumin and haemoglobin concentrations were measured enzymatically using commercially available kits. Anorexia score was measured using the Simplified Nutrition Appetite Questionnaire (SNAQ). Independent t-test analysis was used to evaluate the data. The results showed that A.absinthium supplementation significantly improved anorexia in HD patients for six weeks ($p<0.05$). However, it did not significantly affect albumin, haemoglobin, urea, creatinine, arm circumference and body mass index ($p>0.05$). In conclusion, Artemisia intake significantly improved nutritional status and relationship with food in HD patients. According to the study, A.absinthium supplementation may be effective as an adjunctive therapy for the treatment of anorexia in HD patients [24,25].

However, in the rat study, A. absinthium did not show a significant effect on energy supply.The test procedure used an alcoholic extract of A.absinthium, which was macerated for 2-4 days. The extract was then dried in an oven at temperatures below 40°C. The dried extract was dissolved in distilled water to prepare relative concentrations before daily administration by probe to rats. Thirty male Wistar rats were randomly selected and divided into five groups of six. Prior to the study intervention, the 24-hour food intake of each rat was measured for 10 consecutive days while the animals had unrestricted access to food and water. To investigate the relationship between the administration of A. absinthium extract and the effect on increased appetite, three concentrations of 50, 100 and 150 mg/kg were prepared. The substances were administered to the respective groups for 7 days. Food intake in grams by each rat was measured 1, 2, 4, 6 and 24 hours after administration of

A. absinthium extract. The averaged food intake of each rat was converted into kcal/day. The results of the experiment showing the positive effect on food supply in the study groups compared to the control group are shown in Table 1.

Consequently,it can be concluded that A.absinthium water-alcohol solution intervention cannot dramatically increase the level of food and energy intake in rats but subtly raises this rate which makes researchers hopeful.

Table 1. Effect of A. absinthium on cumulative food intake (g) in different time intervals.

Experimental Group	0–1 h	1–2 h	2–4 h	4–6 h	6–24 h
A.absinthium 50 mg/kg	1.50 ± 0.17	5.50 ± 0.20	4.60 ± 0.62	4.20 ± 0.62	38.70 ± 3.13
A.absinthium 100 mg/kg	1.60 ± 0.18	5.50 ± 0.53	4.70 ± 0.91	4.30 ± 0.82	38.30 ± 4.53
A.absinthium 150 mg/kg	1.90 ± 0.23	5.80 ± 0.11	5.00 ± 0.65	4.40 ± 0.98	40.20 ± 3.67
Vehicle (placebo)	1.40 ± 0.12	5.80 ± 0.16	4.70 ± 0.23	4.80 ± 0.14	37.40 ± 3.23
Control	1.50 ± 0.11	5.90 ± 0.15	4.50 ± 0.31	5.10 ± 0.17	37.60 ± 3.34

A. absinthium - Artemisia absinthium

In conclusion, more research needs to be done on this topic to confirm the mechanism of action on the malnutrition and appetite status of the plant under study and possible enzymatic pathways or interfering hormones [26,27,28]

The natural sesquiterpene dimer, caruifolin, obtained by extraction of A. absinthium L. clearly inhibits free radical production. Therefore, it has documented neuroprotective properties which is an incredibly valuable support in people with anorexia, in whom the starvation process induces inflammation and the production of free reactive oxygen molecules. What is worth noting, in addition to antioxidant activity, antidepressant activity has been demonstrated extremely useful in patients with severe AN symptoms in whom depressive states or full-blown depression are very common. In studies, A. absinthium extract had the same antidepressant efficacy as imipramine, which is a drug belonging to the group of tricyclic antidepressants. The mechanism of action includes inhibition of MAO and selective inhibition of serotonin reuptake, which provides tremendous efficacy of the phytotherapeutic [29,30,31].

4. Discussion and conclusions

Globally, eating disorders affect between 2% and 5% of the population during their lifetimes and are much more common in women than in men [32]. Anorexia, which is one of the main disorders of this type, occurs in 30% to 80% of patients with advanced malignancies, whose condition may be worsened by chemotherapy[33]. Anorexia nervosa is a serious mental disorder of unknown exact etiology,

Table 2. Summary of results of presented studies.

Author / Year	Model	Intervention	Control	Duration	Main Outcomes	Conclusions
[15] – Angelica archangelica + Ginkgo biloba	Animal model (altitude-dependent Hb levels)	Oral administration of A. archangelica and G. biloba	No treatment	Several weeks	Restoration of functional Hb levels in animals with anemia	Synergistic therapy shows potential for treating anemia associated with AN
[18] – A. archangelica coumarins	40 mice, reserpine-induced depression	Extract (400 mg/kg), angelicin and bergapten (10 mg/kg)	Control and reserpine-only groups	5 days	Reduced immobility in Forced Swim Test; decreased MAO-A activity	Coumarins exhibit antidepressant-like activity, potential role in AN with comorbid depression
[22,23] – Artemisia absinthium	Rats with zinc deficiency and anorexia	A. absinthium extract; compared with cyproheptadine	Control group	Several days	Extract showed anorexigenic effects, modulating histamine pathway	May modulate appetite in zinc-deficient AN patients
[Rat study, Tab. 2] – A. absinthium	30 male Wistar rats	Alcoholic extract (50, 100, 150 mg/kg)	Vehicle	7 days	Subtle increase in food intake vs. control; no dramatic effect	Suggests potential appetite-modulating effect, requires further research
[29–31] – A. absinthium (caruifolin)	Rodent models	Extract compared with imipramine	Control / standard antidepressant	Varies	Inhibition of MAO; reduced immobility in depression models; neuroprotection against oxidative stress	Demonstrated antioxidant and antidepressant effects, relevant for AN with comorbid depression

A. archangelica - Angelica archangelica; G. biloba - Ginkgo biloba; Hb - Hemoglobin; AN - Anorexia nervosa; MAO-A - Monoamine oxidase A; A. absinthium - Artemisia absinthium

characterised by an obsession with one's weight and figure, while denying the seriousness of low body weight. Due to the multifaceted nature of this disorder, which can co-occur with genetic, social, hormonal and psychiatric factors, non-pharmacological interventions can play a key role in alleviating or reducing the symptoms of this condition [34]. The summary of the results of studies can be found in Table 2.

Cannabinoids such as Δ9-THC and CBD have shown therapeutic potential in the treatment of eating disorders, including anorexia [35]. Dronabinol, which is a synthetic THC, may contribute to weight gain and improved appetite in patients with AN, especially when combined with psychotherapy and nutritional rehabilitation. CBD, on the other hand, may have anti-anxiety and neuroprotective effects, although studies have not yet confirmed its significant efficacy in alleviating cachexia-induced symptoms [36]. Both cannabinoids affect the endocannabinoid system, which regulates the sensation of hunger and satiety, which is crucial in the treatment of anorexia. Although the results of some studies are promising, further research is needed to fully confirm their safety and efficacy as support for the treatment of eating disorders [37]. Studies indicate that A.archangelica is effective in the treatment of anemia in patients with anorexia, especially when combined with G.biloba, which improves hemoglobin levels. Additionally, studies on the effects of this plant extract on cognitive function suggest that it can support therapy for people with mild cognitive impairment by improving scores on tests such as the MMSE and ADAS-Cog [38,39]. Studies conducted on mice have also shown antidepressant effects of coumarins (angelicin and bergapten) from A. archangelica, which may be helpful in treating co-morbid depression in patients with anorexia. In addition, A. glauca may support the treatment of menstrual disorders, which is important for women with anorexia. Synthesising these findings, phytotherapy using A. archangelica offers a multifaceted approach to the treatment of anorexia, combining benefits in hematology, cognitive function and mental health [40,41].

Studies indicate that zinc deficiency is closely linked to anorexia, leading to dysregulation of appetite and taste perception, which can exacerbate patients' conditions. Changes in hormonal balance, particularly involving ghrelin, leptin and insulin, further affect reduced food intake in anorexic patients [42,43,44]. Furthermore, A. absinthium extracts have been shown in studies to have anorexigenic potential, particularly in the context of zinc deficiency, and may also aid in the treatment of anorexia, as seen in dialysis patients. Studies in rats have shown that A. absinthium can subtly increase food intake, although it does not produce dramatic changes, suggesting the need for further research to more fully understand its mechanisms of action [45,46]. What is more, the antioxidant and antidepressant effects of A. absinthium associated with the presence of caruifolin may provide important therapeutic support, especially for the depressive symptoms accompanying anorexia.

Phytotherapy is a promising alternative in the treatment of eating disorders, offering a natural approach to support mental and physical health and improve appetite. Plants such as A. archangelica and A. absinthium have shown potential in combating anorexia, while supporting improved cognitive function and treating comorbid depression [47,48]. Thanks to the properties of cannabinoids such as THC and CBD, it is possible to effectively increase body weight and improve patients' mood, providing valuable support in the treatment of this complex disorder [49,50]. With the rising incidence of anorexia, phytotherapy is emerging as an important component of treatment that can provide real benefits in the recovery process.

Conflict of interest

The authors have declared no conflict of interest.

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