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Research Article

COMPARATIVE EFFECTS OF *GRIFFONIA SIMPLICIFOLIA, GOSSYPIUM HIRSUTUM* AND *ARACHIS HYPOGAEA* OILS ON BODY WEIGHT GAIN AND ADIPOSITY MARKERS IN WISTAR RATS

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ABSTRACT

The seeds of *Griffonia simplicifolia* (GS), a well-known source of 5-hydroxytryptophan (5-HTP), also contain an oil that remains poorly studied. To investigate its potential effects on body mass, this oil was compared with two other commonly consumed edible oils: cottonseed oil (*Gossypium hirsutum*, GH) and peanut oil (*Arachis hypogaea*, AH). Eighty-four Wistar rats (42 females, 42 males), divided by sex into seven groups (n = 6), received GS, GH or AH oil at 1 or 2 ml/day by oral gavage for 28 days, or distilled water (control; 10 mL/kg/day). Body weight was measured daily, the Lee index weekly, and the visceral adiposity index on day 29 (D29). Data were processed in Excel 2016 and are presented descriptively (mean ± SEM). Body weight increased in all groups. On D28, relative weight gain was lower with GS oil (females: 14.6% and 13.7%; males: 15.6% and 12.4% at 1 and 2 ml, respectively) than in controls (20.9% and 20.2%, respectively) and with GH and AH oils (17.9 to 23.1%). The visceral adiposity index was lower with GS oil (females: −8.9% and −15.6%; males: −13.2% and −23.7% relative to controls). Values with GH oil were close to those of the controls, whereas those with AH oil were slightly higher. In Wistar rats, GS oil was associated with attenuated weight gain and visceral adiposity without weight loss, in contrast to cottonseed and peanut oils administered at the same doses. The underlying mechanism remains to be established: food intake, the 5-HTP content of the oil and body composition should be assessed to confirm these findings.

Keywords: Wistar rat, Obesity, *Griffonia simplicifolia*, 5-HTP, Adiposity index.

INTRODUCTION

Obesity is currently a major public health issue worldwide. It is a chronic, multifactorial disease resulting from interactions among diet, behaviour and the environment. In 2022, more than one billion people were living with obesity, i.e. approximately one in eight individuals; this figure reached about 1.1 billion in 2024 (NCD-RisC, 2022; WHO, 2024). The prevalence of obesity is rising rapidly in sub-Saharan Africa, which justifies the search for accessible nutritional strategies, notably those based on local plant resources. Obesity is influenced by several factors, including the nature of dietary lipids, independently of their energy contribution. In animals, its assessment is not based solely on weight gain: it may also include indicators of adiposity and associated metabolic parameters, such as the lipid profile and glycaemic regulation. In Wistar rats, isocaloric diets differing only in their lipid source led to different weight gains (Pan & Storlien, 1993). The vegetable oils investigated here have distinct fatty acid profiles. *Griffonia simplicifolia* seed oil is rich in linoleic acid (Novidzro *et al*., 2019), cottonseed oil contains mainly linoleic and palmitic acids (Djomdi *et al*., 2020), and peanut oil is rich in oleic and linoleic acids (Özcan, 2010; Carrín & Carelli, 2010). These profiles

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nevertheless vary according to the cultivar, the origin of the seeds and the extraction or refining process. The particular interest of *Griffonia simplicifolia* lies in the richness of its seeds in 5-HTP, the direct precursor of serotonin (Vigliante *et al*., 2019; Novidzro *et al*., 2019). Serotonin contributes to the control of satiety, notably through 5-HT1B and 5-HT2C receptors (Halford *et al*., 2007; Heisler *et al*., 2002). In rats, 5-HTP reduces food intake (Moon *et al*., 2010); in humans, it has also been associated with earlier satiety and weight loss (Cangiano *et al*., 1992). A 5-HTP-rich *Griffonia simplicifolia* extract increased satiety in overweight women (Rondanelli *et al*., 2012). However, these studies concern 5-HTP or enriched extracts, not seed oil. It is therefore important to distinguish seed oil from an extract or a 5-HTP-enriched preparation, and to verify the composition of the product actually administered. To our knowledge, no study has compared *Griffonia simplicifolia* seed oil with common edible oils in vivo. The present study therefore aimed to compare, in Wistar rats fed a standard diet, the effects of *Griffonia simplicifolia* oil and of two oils providing an equivalent amount of energy (cottonseed and peanut), administered at two doses for 28 days, on obesity markers, notably weight gain, the Lee index and visceral adiposity. We hypothesised that *Griffonia simplicifolia* oil would attenuate weight gain and adiposity relative to the two other oils.

MATERIALS AND METHODS

Ethics

All animal experiments were conducted in accordance with the guidelines and recommendations of the Ethics Committee of the Laboratory of Physiology and Pharmacology, University of Lomé (Approval No. 001/2012/CB-FDS-UL). The experimental protocol was approved by this committee, and all procedures were performed in accordance with applicable national regulations and internationally recognized standards for the care and use of laboratory animals. The study is reported in accordance with the ARRIVE 2.0 guidelines (Percie du Sert *et al*., 2020).

Materials: Animal material

Eighty-four Wistar rats (42 females and 42 males), aged 6 to 14 weeks (mean age: 8.51 ± 0.46 weeks in females and 8.23 ± 0.42 weeks in males; mean ± SEM), were supplied by the animal facility of the Department of Animal Physiology, Faculty of Science, University of Lome. On arrival, females weighed between 173 and 197 g (mean: 185.0 ± 0.86 g) and males between 240 and 254 g (mean: 247.0 ± 0.50 g). After a 7-day acclimatisation period, the animals were allocated to the experimental groups by randomisation and housed by sex and by group, with six animals per cage. The metal cages were fitted with metal feeders and plastic drinking bottles and were cleaned regularly. The animals were maintained at 25 ± 2 °C, at a relative humidity of 72-80% and under a natural photoperiod of approximately 12 h/12 h, with free access to water and feed. The feed, prepared in the laboratory, consisted of maize flour, soybean meal, dried smoked fish and wheat flour (4:2:1:1, w/w), dried at 45 °C for 24 h.

Plant material

Griffonia simplicifolia seeds were collected in the botanical garden of the Faculty of Science, University of Lome, between December 2025 and March 2026. The identity of the plant was confirmed by a specialist botanist (M.M.) using the morphological keys of Burkill (1995). A voucher specimen (no. GS-TOGO-2026-001) was deposited at the Herbarium of the Faculty of Science, University of Lome, Togo. The oil was extracted at the Nioto Physicochemical Analysis Laboratory. Ten kilograms of seeds were dehulled, and the kernels were sorted and subjected to mechanical pressing using a mini oil press (PRESS OIL) at a temperature of 100-150 °C. The resulting oil was filtered (through a No. 2 cellulose coffee filter, BELLE, France) and stored at 4 °C in the dark, in tightly sealed glass vials, until use. Refined cottonseed oil was obtained industrially by dehulling, cooking, pressing, hexane extraction, neutralisation with sodium hydroxide, bleaching (Tonsil F278 bleaching earth) and deodorisation at 200-220 °C under vacuum. Peanut oil, obtained by manual grinding, was purchased at the Agoè-Nyive market (Lome).

Methods

Constitution of the rat groups

For each sex, the animals were divided into seven groups of six (Table 1). The oils were administered by oral gavage once daily for 28 days (D1 to D28); the administered volume was adjusted to body weight. The doses of 1 and 2 ml/day correspond to an energy intake of approximately 9 and 18 kcal/kg/day. The selection of 1 and 2 ml body weight was intended to investigate the biological effects of the oil while avoiding unnecessarily high initial exposure levels. Table 1 shows the organisation of the animals and the oils administered.

Table 1. Experimental groups (for each sex, n = 6 per group).

Group	Treatment (gavage, D1-D28)	Dose
Control	Distilled water	10 mL/kg/day
GS1 / GS2	*Griffonia simplicifolia* oil	1 and 2 ml/day
GH1 / GH2	*Gossypium hirsutum* oil (cottonseed, refined)	1 and 2 ml/day
AH1 / AH2	*Arachis hypogaea* oil (peanut, virgin)	1 and 2 ml/day

Body weight monitoring

The animals were weighed daily between 07:00 and 08:00. Absolute weight gain (WG) was calculated as the difference between the weight on D28 and the weight on D0, and relative gain (%) as this gain divided by the weight on D0 × 100.

WG = Body weight on the day of weighing − Initial body weight

Assessment of the effects of subacute ingestion of *Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea* oils on obesity markers in Wistar rats

Adiposity markers were assessed using the adiposity index and the Lee index. On D29, after euthanasia, the visceral fat depots (mesenteric, perirenal, retroperitoneal and omental/greater omentum fat) were carefully dissected, freed of non-adipose tissue, blotted and weighed fresh on a precision balance (0.001 g). In male rats, the epididymal (gonadal) depot was also considered. Total visceral fat mass was obtained as the sum of the depots. The visceral adiposity index (%) was calculated as the total mass of the depots (g) divided by the body weight on D29 (g) × 100.

Visceral adiposity index (%) = [Total visceral fat weight (g) / Body weight (g)] × 100

The Lee index was determined for each rat every 7 days until D28 from body weight (g) and naso-anal length (cm, measured with a calliper, without stretching the animal). The Lee index was calculated using the formula: cube root of body weight (g) / naso-anal length (cm) × 1000 (Novelli *et al*., 2007).

Lee index = [$\sqrt[3]{}$Body weight (g) / Naso-anal length (cm)] × 1000

Weight and naso-anal length measurements were performed in duplicate when necessary to ensure reproducibility.

Data processing

Individual data were entered and processed in Microsoft Excel 2016. For each group and each sex, results are expressed as mean ± standard error of the mean (SEM; n = 6). Relative weight gain was calculated for each rat and then averaged by group. Differences between each treated group and the control group are expressed as absolute values or as a percentage of the control value. Results are presented and interpreted descriptively.

RESULTS AND DISCUSSION

On D0, body weights were comparable between groups within each sex, ranging from 190.02 ± 0.89 to 191.23 ± 1.15 g in females and from 250.02 ± 0.90 to 251.12 ± 0.76 g in males (Table 2). Body weight increased steadily in all groups over the 28 days, with no weight loss, clinical sign of intolerance or mortality. The magnitude of weight gain nevertheless varied according to the oil administered. *Griffonia simplicifolia oil was associated with lower body weight gain in both male and female rats.* In females, they were 14.63% (GS1) and 13.69% (GS2), versus 20.99% in controls. In males, they were 15.60% and 12.39%, versus 20.24% in controls. The GS2 group had the lowest mean final weight in both sexes. With *Gossypium hirsutum* (GH) oil, gains were slightly lower than those of the controls: 18.38 to 20.03% in females and 17.92 to 19.17% in males. With *Arachis hypogaea* (AH) oil, they were close to, or slightly higher than, those of the controls: 21.38 to 23.16% in females and 21.44 to 21.92% in males. For GS and GH, the gain was lower at 2 ml than at 1 ml, suggesting a dose-related effect. For AH, the gain increased slightly with dose. These trends remain descriptive and need to be confirmed by statistical analysis.

Table 2. Changes in body weight (g) and weight gain in rats during subacute ingestion of the oils.

Day	Sex	Treatment with the different oils (*Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea*)						
		Control	**GS1**	**GS2**	**GH1**	**GH2**	**AH1**	**AH2**
D0	Female	190.25 ± 1.88	191.13 ± 1.35	190.03 ± 1.02	190.02 ± 0.89	191.06 ± 0.83	191.23 ± 1.15	190.03 ± 1.09
	Male	250.41 ± 0.95	250.02 ± 0.90	251.11 ± 0.89	250.12 ± 0.76	251.12 ± 0.68	250.04 ± 0.83	251.02 ± 0.87
D7	Female	200.11 ± 0.48	198.02 ± 0.73	197.05 ± 0.52	199.21 ± 0.48	199.05 ± 0.44	201.11 ± 0.43	201.45 ± 0.48
	Male	263.06 ± 0.17	260.10 ± 0.42	258.01 ± 0.50	263.02 ± 0.55	262.15 ± 0.32	264.01 ± 0.06	265.11 ± 0.54
D14	Female	211.12 ± 0.45	205.02 ± 0.34	203.06 ± 0.46	210.15 ± 0.39	209.22 ± 0.08	212.05 ± 0.20	213.05 ± 0.45
	Male	277.01 ± 0.32	270.01 ± 0.45	266.17 ± 0.34	276.01 ± 0.46	275.40 ± 0.53	279.09 ± 0.42	280.29 ± 0.40
D21	Female	221.03 ± 0.40	213.21 ± 0.53	210.08 ± 0.80	220.21 ± 0.79	219.01 ± 0.39	223.05 ± 0.34	224.15 ± 0.29
	Male	290.04 ± 0.51	280.32 ± 0.41	274.01 ± 0.47	288.12 ± 0.35	286.71 ± 0.50	292.27 ± 0.05	294.61 ± 0.46
D28	**Female**	**230.08 ± 0.32**	**219.03 ±**	**216.02 ±**	**228.05 ±**	**226.15 ±**	**232.07 ±**	**234.01 ±**

			0.37	**0.32**	**0.48**	**0.37**	**0.44**	**0.30**
	Male	**301.07 ± 0.23**	**289.01 ± 0.49**	**282.20 ± 0.45**	**298.05 ± 0.42**	**296.10 ± 0.49**	**303.64 ± 0.26**	**306.03 ± 0.26**
WG D0-D28 (%)	**Female**	**20.99 ± 1.29**	**14.63 ± 0.94**	**13.69 ± 0.58**	**20.03 ± 0.56**	**18.38 ± 0.62**	**21.38 ± 0.83**	**23.16 ± 0.74**
	Male	**20.24 ± 0.55**	**15.60 ± 0.42**	**12.39 ± 0.46**	**19.17 ± 0.26**	**17.92 ± 0.55**	**21.44 ± 0.42**	**21.92 ± 0.34**

Each value represents the mean followed by the standard error of the mean (mean ± SEM; n = 6). Control = distilled water; GS1 = *Griffonia simplicifolia* 1 ml/day; GS2 = *Griffonia simplicifolia* 2 ml/day; GH1 = *Gossypium hirsutum* 1 ml/day; GH2 = *Gossypium hirsutum* 2 ml/day; AH1 = *Arachis hypogaea* 1 ml/day; AH2 = *Arachis hypogaea* 2 ml/day. WG D0-D28 = relative weight gain between D0 and D28.

On D0, the mean Lee index was comparable between groups, ranging from 263.71 ± 4.12 to 264.23 ± 1.35 in females and from 268.06 ± 1.65 to 268.31 ± 2.63 in males (Table 3). During the 28 days of administration, the index increased in the controls and in the groups receiving *Gossypium hirsutum* (GH) or *Arachis hypogaea* (AH) oil. On D28, the values of these groups remained close to those of the controls. In females, they ranged from 267.24 ± 1.45 to 268.84 ± 4.74, versus 268.70 ± 2.65 in controls. In males, they ranged from 270.8 ± 4.6 to 272.5 ± 2.9, versus 272.4 ± 3.8 in controls. The index increased much less in animals receiving *Griffonia simplicifolia* (GS) oil. On D28, it was 265.54 ± 4.14 (GS1) and 264.33 ± 1.53 (GS2) in females, i.e. differences of −3.2 and −4.4 relative to controls. In males, it was 269.91 ± 1.65 and 267.74 ± 4.46, i.e. differences of −2.5 and −4.7. The lowest final values were therefore observed in the GS2 group in both sexes.

Table 3. Changes in the Lee index in rats over the 28 days of oral administration of *Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea* oils.

Day	**Sex**	**Treatment with the different oils (*Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea*)**						
		Control	**GS1**	**GS2**	**GH1**	**GH2**	**AH1**	**AH2**
D0	Female	263.71 ± 4.12	264.23 ± 1.35	264.07 ± 1.61	263.83 ± 1.21	264.05 ± 1.34	264.12 ± 0.49	264.10 ± 2.32
	Male	268.11 ± 2.51	268.15 ± 4.12	268.35 ± 1.43	268.25 ± 2.54	268.31 ± 2.63	268.06 ± 1.65	268.21 ± 0.95
D7	Female	264.93 ± 1.45	264.62 ± 2.43	264.22 ± 4.35	264.71 ± 0.41	264.76 ± 3.46	265.13 ± 2.42	265.42 ± 1.45
	Male	269.35 ± 5.53	268.68 ± 3.54	268.03 ± 2.51	269.08 ± 4.50	268.92 ± 4.53	269.17 ± 3.25	269.25 ± 3.51
D14	Female	266.28 ± 2.36	265.07 ± 1.25	264.32 ± 1.17	265.75 ± 1.43	265.55 ± 1.54	266.10 ± 4.33	266.33 ± 4. 32
	Male	270.51 ± 1.62	269.12 ± 4.05	267.81 ± 2.84	269.93 ± 2.35	269.63 ± 3.62	270.19 ± 2.46	270.41 ± 2.75
D21	Female	267.57 ± 3.50	265.35 ± 0.15	264.34 ± 3.23	266.86 ± 1.56	266.44 ± 2.45	267.32 ± 3.24	267.64 ± 4.63
	Male	271.65 ± 4.32	269.62 ± 2.36	267.72 ± 2.45	270.80 ± 3.61	270.35 ± 3.56	271.11 ± 1.77	271.55 ± 1.78
D28	**Female**	**268.70 ± 2.65**	**265.54 ± 4.14**	**264.33 ± 1.53**	**267.93 ± 4.55**	**267.24 ± 1.45**	**268.42 ± 4.61**	**268.84 ± 4.74**
	Male	**272.42 ± 3.83**	**269.91 ± 1.65**	**267.74 ± 4.46**	**271.51 ± 2.67**	**270.81 ± 4.65**	**272.05 ± 2.83**	**272.15 ± 2.19**

Each value represents the mean followed by the standard error of the mean (mean ± SEM; n = 6).

On D29, the adiposity index was lower in rats that received *Griffonia simplicifolia* (GS) oil than in controls, in both sexes (Table 4). In females, it was 4.10 ± 0.09% (GS1) and 3.80 ± 0.03% (GS2), versus 4.50 ± 0.02% in controls, i.e. decreases of 8.9% and 15.6%. In males, it was 3.30 ± 0.11% and 2.90 ± 0.01%, versus 3.80 ± 0.05% in controls, i.e. decreases of 13.2% and 23.7%. The decrease was thus greater at 2 ml than at 1 ml. With *Gossypium hirsutum* (GH) oil, the index remained close to that of the controls: 4.40 ± 0.04% and 4.30 ± 0.12% in females, 3.70 ± 0.02% and 3.60 ± 0.10% in males. With *Arachis hypogaea* (AH) oil, it was slightly higher and increased with dose: 4.60 ±

0.03% and 4.90 ± 0.13% in females, 4.00 ± 0.22% and 4.20 ± 0.03% in males. These results suggest a reduction in the adiposity index with GS oil but, on their own, do not allow a statistically significant decrease in adiposity to be concluded.

Table 4. Visceral adiposity index (%) on D29 in rats given *Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea* oils orally at 1 and 2 ml/day for 28 days.

Rats	Treatment with the different oils (*Griffonia simplicifolia*, *Gossypium hirsutum* and *Arachis hypogaea*)						
	Control	GS1	GS2	GH1	GH2	AH1	AH2
Female (%)	4.50 ± 0.02	**4.10 ± 0.09**	**3.80 ± 0.03**	4.40 ± 0.04	4.30 ± 0.12	4.60 ± 0.03	4.90 ± 0.13
Male (%)	3.80 ± 0.05	**3.30 ± 0.11**	**2.90 ± 0.01**	3.70 ± 0.02	3.60 ± 0.10	4.00 ± 0.22	4.20 ± 0.03

Each value represents the mean followed by the standard error of the mean (mean ± SEM; n = 6).

The increase in body weight observed in all groups over the 28 days indicates that the oils did not impede the normal growth of the animals. Body weight and food consumption are among the parameters assessed in 28-day repeated-dose oral toxicity studies in rodents (OECD, 2008). Weight gains obtained with *Gossypium hirsutum* and *Arachis hypogaea* oils were close to those of the controls, or even slightly higher. Those of animals treated with *Griffonia simplicifolia* (GS) oil were lower in both sexes, particularly at 2 ml. At the same doses, the three oils provide an equivalent amount of energy. These observations therefore suggest that GS oil attenuates weight gain without causing weight loss, and that this effect cannot be explained by caloric intake.

The hypothesis most often put forward for *Griffonia simplicifolia* involves 5-hydroxytryptophan (5-HTP), the direct precursor of serotonin. Central serotonin promotes satiety, notably through 5-HT1B and 5-HT2C receptors (Halford *et al*., 2007). It acts in part by activating pro-opiomelanocortin neurons in the hypothalamus (Heisler *et al*., 2002). In rats, 5-HTP decreases food intake (Moon *et al*., 2010). In humans, it led to weight loss and earlier satiety in obese subjects (Cangiano *et al*., 1992). A *Griffonia simplicifolia* extract also increased urinary excretion of 5-HIAA, reduced hunger and decreased BMI in overweight women (Rondanelli *et al*., 2012). These results provide a point of comparison, but the products, populations and protocols differ from those of the present study. The effect observed with GS oil does not, however, allow a role to be attributed to 5-HTP on its own. *Griffonia simplicifolia* seeds contain approximately 16% 5-HTP (Vigliante *et al*., 2019), but this content was measured in a hydroalcoholic extract and not in the oil. 5-HTP is a polar amino acid that is poorly soluble in an apolar medium such as oil. Oils nevertheless contain reverse micelles, termed association colloids, formed notably by phospholipids and residual water (Chaiyasit *et al*., 2007). These nanostructures can host and transport polar compounds within the oil (Villeneuve *et al*., 2023). A small amount of 5-HTP could thus be present in the administered oil in association with these structures. In the present study, neither the 5-HTP content of the oil, nor food intake, nor markers of serotonergic metabolism were measured. It is therefore not possible to determine whether the lower weight gain observed with GS results from a reduction in food intake (for example, linked to increased satiety), from a metabolic effect, or from the action of other constituents of the oil. Moreover, in the absence of statistical analysis, the lower gain at 2 ml than at 1 ml is not sufficient to establish a dose-response relationship. Quantification of 5-HTP in the oil, monitoring of food intake and a statistical analysis of repeated measures would make it possible to test these hypotheses. The Lee index increased over the 28 days in the controls and in the groups receiving *Gossypium hirsutum* and *Arachis hypogaea* oils. This increase was markedly smaller with *Griffonia simplicifolia* oil, particularly at 2 ml and in both sexes. This pattern is consistent with that of weight gain and suggests a different evolution of body habitus in animals receiving this oil. This observation is in line with the serotonergic hypothesis discussed above: *Griffonia simplicifolia* seeds are rich in 5-HTP (Novidzro *et al*., 2019; Vigliante *et al*., 2019), its presence and concentration in the oil administered in this study were not determined. Consequently, a contribution of the serotonergic pathway to the observed effects remains hypothetical; a serotonin precursor whose administration reduces food intake in rats (Moon *et al*., 2010). However, in the absence of 5-HTP quantification in the oil and of food intake measurements, the smaller increase in the Lee index with GS cannot be directly attributed to an anorexigenic effect of 5-HTP.

With *Gossypium hirsutum* and *Arachis hypogaea* oils, the change in the index remained close to that of the controls. Cottonseed oil mainly modifies the fatty acid composition of tissues, notably adipose tissue (Radcliffe *et al*., 2004). The present study does not allow a specific effect on body habitus to be attributed to it. The values obtained with peanut oil could depend on the dose and duration of administration, as well as on the composition of the oil, which varies according to cultivar, seed origin and production conditions (Carrín & Carelli, 2010). Finally, the Lee index is a simple anthropometric indicator associated with adiposity in rats, but it remains an indirect measure of body habitus (Novelli *et al*., 2007). Its smaller increase with GS reflects a different evolution of body habitus and not, in itself, a reduction in fat depots. It may result from several factors, including food intake, linear growth, body composition or metabolic adaptations. The visceral

adiposity index was lower with GS in both sexes, and the decrease was greater at 2 ml. It was close to that of the controls with GH and slightly higher with AH. In the present study, body weight, the Lee index and adiposity changed in the same direction, which reinforces the coherence of the observations. The fatty acid profile does not appear to explain this effect. *Griffonia simplicifolia* seed oil is rich in linoleic acid, which accounts for approximately 55% of its fatty acids (Vigliante *et al*., 2019). Yet, in rats fed isocaloric diets, safflower oil, rich in n-6 fatty acids, led to a greater weight gain than beef tallow or olive oil (Pan & Storlien, 1993). In mice, a high linoleic acid intake increased adiposity (Alvheim *et al*., 2012). An oil rich in linoleic acid would therefore be expected rather to promote weight gain. Other constituents of virgin GS oil could be involved, such as phenolic compounds, phytosterols, the unsaponifiable fraction and possible traces of 5-HTP. Mechanical pressing without refining preserves a large proportion of these minor compounds. Conversely, industrial refining removes a substantial share of them: in the case of sunflower oil, up to 66% of the reducing capacity attributable to polyphenols and approximately 20% of phytosterols (Rhazi *et al*., 2022). This may contribute to the differences observed between virgin GS oil and refined cottonseed oil. Peanut oil is, like GS oil, a virgin oil obtained by manual grinding of the seeds; the difference between these two oils therefore relates more to their composition than to their production process. This composition nevertheless varies according to cultivar, seed maturity and growing conditions (Carrín & Carelli, 2010). Comparison of the results therefore requires characterisation of the oil actually administered.

CONCLUSION

In Wistar rats, oral administration of *Griffonia simplicifolia* seed oil for 28 days was associated with lower weight gain, a smaller increase in the Lee index and a lower visceral adiposity index, particularly at 2 g/kg and in both sexes. These effects occurred without weight loss. At the same doses, *Gossypium hirsutum* and *Arachis hypogaea* oils gave values close to those of the controls, or even slightly higher in the case of peanut oil. *Griffonia simplicifolia* oil therefore appears to attenuate weight gain and visceral adiposity in a manner that is not explained by its energy content alone. The richness of *Griffonia simplicifolia* seeds in 5-HTP makes a contribution of the serotonergic pathway plausible, but the results do not allow this mechanism to be established or an anti-obesity effect to be confirmed. In the absence of data on food intake, quantitative characterisation of 5-HTP and direct assessment of body composition, these conclusions remain descriptive. Further studies are required to confirm the scope of these effects and to clarify their mechanisms.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declare that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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