Product introduction

Mealworms Essential Oil

This product is prepared from mealworm by subcritical extraction and refining. It is rich in α-linoleic acid, α-linolenic acid and other essential fatty acids, and the unsaturated fatty acid content is more than 75%.

It has remarkable effect on delaying senescence and inhibiting the aging of the body.

It can prevent the body from losing water and moisturizes skin cells.

It has the health care effect of preventing atherosclerosis and cardiovascular diseases

It has a quick repair effect on skin damage.

It has obvious whitening effect

It can prevent cosmetic irritation, allergy and other reactions.

It is rich in α-linoleic acid, α-linolenic acid and other essential fatty acids, and the unsaturated fatty acid content is more than 75%.

This product can meet the needs of pharmaceutical, healthcare, cosmetics and other industries.

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CMA 171500114311 ilac-MRA CNAS 中国认可 国际互认 检测 TESTING CNAS L10449

Analytical Report

Sample Code	128-2022-00041027	Report date	29-Jul-2022
Certificate No.	AR-22-VV-040297-02		

This report is translated from report AR-22-VV-040297-01

Shanxi Dingxin Biological Technology Co., LTD

Yunzhou Modern Agricultural Industry Demonstration

Our reference:	128-2022-00041027/ AR-22-VV-040297-02
Client Sample Code:	20220723
Sample described as:	Yellow mealworm extract refining oil
Sample Packaging:	Sealed plastic bottle
Sample reception date:	23-Jul-2022
Analysis Starting Date:	23-Jul-2022
Analysis Ending Date:	28-Jul-2022
Arrival Temperature (°C)	24.2
Sample Weight	1.005kg
Sample Type	Liquid

		Results	Unit	LOQ	LOD
▵□ VV1TJ	Total Arsenic(As)(HG-AFS) Method: GB 5009.11-2014 Chapter one,Second method				
	Total Arsenic(As)	<0.04	mg/kg	0.04	
▵□ VV1TG	Lead (Pb) (GF-AAS) Method: GB 5009.12-2017 First method				
	Lead (Pb)	<0.04	mg/kg	0.04	

		Results	Unit	LOQ	LOD
▵□ VV15F	Benzo(a)pyrene Method: GB 5009.27-2016				
	Benzo(a)pyrene	5.7	μg/kg	0.5	

		Results	Unit	LOQ	LOD
▵□ VV151	Total fat Method: GB 5009.6-2016 Second method				
	Total fat	100	g/100 g	0.1	
▵□ VV1T6	Acid value Method: GB 5009.229-2016 First Method				
	Acid value	1.4	mg KOH/g	0.05	
▵□ VV1T7	Peroxide value Method: GB 5009.227-2016 First method				
	Peroxide value	0.075	g/100 g	0.0006	
□ VV6CC	Fatty acid Method: GB 5009.168-2016 1st method				
	C10:0 Capric acid	0.0211	g/100 g	0.0066	
	C11:0 Undecanoic acid	<0.0033	g/100 g	0.0033	
	C12:0 Lauric acid	0.242	g/100 g	0.0066	
	C13:0 Tridecaonic acid	0.0583	g/100 g	0.0033	
	C14:0 Myristic acid	2.11	g/100 g	0.0033	
	C14:1 Myristoleic acid	<0.0033	g/100 g	0.0033	
	C15:0 Pentadecanic acid	0.218	g/100 g	0.0033	
	C15:1 Pentadecenoic acid	<0.0033	g/100 g	0.0033	
	C16:0 palmitic acid	17.0	g/100 g	0.0066	
	C16:1 palmitoleic acid	1.29	g/100 g	0.0033	
	C17:0 margaric acid	0.217	g/100 g	0.0066	
	C17:1 Margaroelic acid	<0.0033	g/100 g	0.0033	
	C18:0 stearic acid	2.81	g/100 g	0.0066	
	C18:1n9c Oleic acid	29.5	g/100 g	0.0066	
	C18:1n9t Elaidic acid	<0.0033	g/100 g	0.0033	

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	Results	Unit	LOQ	LOD
C18:2n6 Linoleic acid	35.2	g/100 g	0.0033	
C18:2n6t Linoleaidic acid	<0.0033	g/100 g	0.0033	
C18:3n3 alpha-Linolenic Acid	2.56	g/100 g	0.0033	
C18:3n6 gamma-Linolenic acid	<0.0066	g/100 g	0.0066	
C20:0 arachidic acid	0.0983	g/100 g	0.0066	
C20:1 Eicosenoic acid	0.189	g/100 g	0.0033	
C20:2n Eicosadienoic acid	0.0780	g/100 g	0.0033	
C20:3n3 Eicosatrienoic acid	<0.0033	g/100 g	0.0033	
C20:3n6 Eicosatrienoic acid	<0.0033	g/100 g	0.0033	
C20:4n6 Arachidonic acid	<0.0033	g/100 g	0.0033	
C20:5n3 Eicosapentaeonic acid	<0.0033	g/100 g	0.0033	
C21:0 Heneicosanoic acid	<0.0033	g/100 g	0.0033	
C22:0 behenic acid	<0.0066	g/100 g	0.0066	
C22:1n9 Erucic acid	<0.0033	g/100 g	0.0033	
C22:2n6 Docosadieonic acid	<0.0033	g/100 g	0.0033	
C22:6n3 Docosahexaenoic acid	<0.0033	g/100 g	0.0033	
C23:0 Tricosanoic acid	<0.0033	g/100 g	0.0033	
C24:0 lignoceric acid	<0.0066	g/100 g	0.0066	
C24:1 Nervonic acid	<0.0033	g/100 g	0.0033	
C4:0 Butyric acid	0.0434	g/100 g	0.0033	
C6:0 Caproic acid	<0.0033	g/100 g	0.0033	
C8:0 Caprylic acid	<0.0033	g/100 g	0.0033	
mono-unsaturated fatty acids total	31.0	g/100 g	0.0066	
poly-unsaturated fatty acids total	37.8	g/100 g	0.0066	
saturated fatty acids total	22.8	g/100 g	0.0066	
□ VV6D2 Vitamin E Method: GB 5009.82-2016 First method				
Alpha-Tocopherol	2.22	mg/100 g	0.12	
Beta-Tocopherol	1.40	mg/100 g	0.12	
Delta-Tocopherol	<0.12	mg/100 g	0.12	
Gamma-Tocopherol	<0.12	mg/100 g	0.12	
Vitamin E(α-TE)	2.92	mg/100 g	0.12	

SIGNATURE

Kevin Fu
Authorized Signatory

EXPLANATORY NOTE

LOQ: Limit of Quantification
< LOQ: Below Limit of Quantification
N/A means Not applicable
△ CNAS □CMA
☆ means the test is subcontracted within Eurofins group
◎ means the test is subcontracted outside Eurofins group

Sum compounds results are calculated from the results of each quantified compound as set by regulation
The uncertainty has not been taken into account for standards that already include measurement uncertainty or on explicit request of client.
The sample description and information are provided by the Client. Eurofins is not responsible for verifying the accuracy, relevancy, adequacy and/or completeness of the information provided by the Client.
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For and on behalf of Eurofins Technology Service (Qingdao) Co., Ltd.

END OF REPORT

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Shanxi Dingxin Biotechnology Co., Ltd

Test report

Report No.: SHA01-24041280-JC-04En

Sample Name: Mealworms essential oil

Applicant: Shanxi Dingxin Biotechnology Co., Ltd.

Sample Origin: Applicant Sample Delivery

Shanghai WEIPU Testing Technology Group Co., LTD.

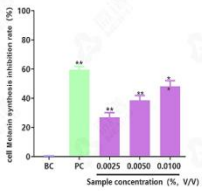

Fig. 2 Histogram of the rate of inhibition of cellular melanin synthesis

In the cell melanin synthesis inhibition test, the inhibition rate of melanin synthesis in PC group was significantly increased compared with that in BC group ($p<0.01$), indicating that the positive control detection was effective.

The inhibition rate of melanocyte synthesis was significantly increased after treatment with 0.0025%, 0.0050% and 0.0100% (V/V) samples, and the difference was statistically significant compared with the blank control ($p<0.01$).

6 Conclusion

Based on the human melanoma cell model of G361, the inhibition rate of melanin synthesis was significantly increased when the concentration of the essential oil was 0.0025%, 0.0050% and 0.0100% (V/V), and there was a statistical difference compared with the blank control ($p<0.01$), indicating that the essential oil of the sample had whitening effect.

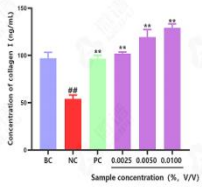

Figure 2 Collagen I Content Histogram

Compared with BC group, Human fibroblasts in NC group received 9 J/cm^2 UVA radiation, Collagen Ⅰ content decreased significantly ($p<0.01$), indicating that the model was successful.

Compared with NC group, VC and VE in PC group can significantly increase the content of Collagen Ⅰ ($p<0.01$), which indicates that this positive control test is effective.

Compared with the NC group, the sample Mealworms essential oil showed a significant increase in Collagen I content in human fibroblasts at concentrations of 0.0025%, 0.0050%, and 0.0100% (V/V) ($p<0.01$).

6 Conclusion

Based on the UVA stimulated human fibroblast model, the Mealworms essential oil sample showed a significant increase in collagen type I content in human fibroblasts at concentrations of 0.0025%, 0.0050%, and 0.0100% (V/V), with statistical differences compared to the NC group ($p<0.01$), indicating that the sample has anti-wrinkle and tightening effects.

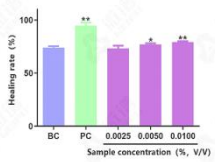

Fig. 2 Histogram of cell healing rates, the

In cell migration test, The level of cell healing in PC group was significantly higher than that of BC group ($p<0.01$), indicating that this positive control test was effective.

Compared with BC group, the cell healing rate was significantly increased after treatment with 0.0050% and 0.0100% (V/V) concentration samples ($p<0.05$).

6 Conclusion

Based on the human fibroblast model, the cell healing rate of human fibroblasts was significantly improved after 24 h treatment of sample Mealworm essential oil at 0.0050% and 0.0100% (V/V) concentrations. And there was a statistical difference compared with BC group ($p<0.05$), indicating that sample Mealworm essential oil could promote the cell healing of human fibroblasts, and has a repairing effect.

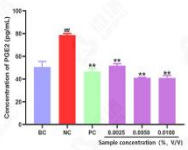

Fig. 3 PGE2 Content Histogram

Compared with the BC group, the secretion of macrophage RAW264.7 inflammatory factor PGE2 in the NC group was significantly increased ($p<0.01$), indicating that the LPS stimulated modeling was successful in this experiment.

Compared with NC group, the secretion of macrophage RAW264.7 inflammatory factor PGE2 was significantly decreased in PC group at dexamethasone administration concentration of 100 μg/mL ($p<0.01$), indicating that the positive control detection was effective.

Compared with NC group, the secretion of macrophage RAW264.7 inflammatory factor PGE2 in macrophages was significantly decreased when the concentration of the essential oil was 0.0025%, 0.0050% and 0.0100% (V/V) ($p<0.01$).

6 Conclusion

Based on LPS stimulated macrophage RAW264.7 model, the secretion of macrophage RAW264.7 inflammatory factor PGE2 and TNF-α were significantly reduced when the concentration of sample Mealworms essential oil was 0.0025%, 0.0050% and 0.0100% (V/V), and

there was a statistical difference compared with NC group ($p<0.01$). These results indicate that the essential oil of Mealworm can inhibit the secretion of TNF-α and PGE2 of macrophage RAW264.7, and has a soothing effect.

7 References to standards and literature

[1] T/SHRH 034-2021 Cosmetic Soothing Efficacy Test-Determination of TNF-α Inflammatory Factor Content in Vitro LPS induced Macrophage RAW264.7 Test Method

[2] Yao Ru Anti inflammatory and antioxidant effects of liensinine and its mechanism [D]. Shanxi Medical University, 2018

End of Report