



Good Quality Comes  
From Qualified Materials

# SpecKare<sup>®</sup> Resveratrol and Its Derivative Solution SpecPure<sup>®</sup> PTB (Resveratrol Dimethyl EtherPterostilbene)

- Enhanced mitochondrial activity & cell viability
- Potent antioxidant capability
- Reduce cell apoptosis/Apoptotic Levels, as skin protectant

Spec Chem Group  
2020.9.29

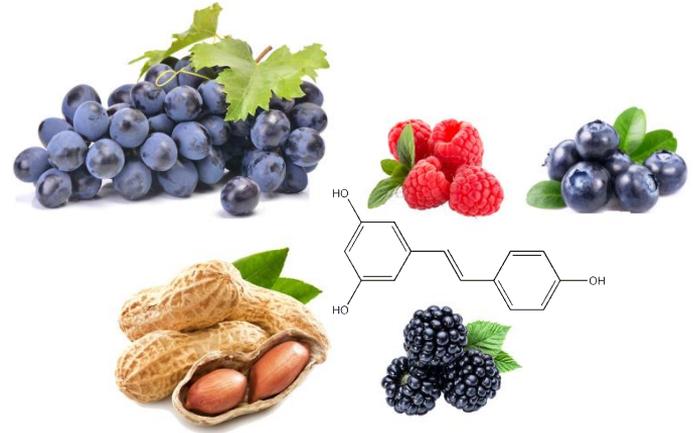
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# 1. Brief Introduction of Resveratrol and Its Derivative

- Resveratrol (3,5,4'-trihydroxy-trans-stilbene) is a **stilbenoid**, a type of **natural phenol**, and a **phytoalexin** produced by several plants in response to injury or when the plant is under attack by pathogens, such as bacteria or fungi.
- Sources of resveratrol in food include the skin of **grapes, blueberries, raspberries, mulberries, and peanuts**.
- Thus Resveratrol is commonly used as a **dietary supplement** and studied
- in laboratory models of human diseases.



# 1. Brief Introduction of Resveratrol and Its Derivative

## Resveratrol in Common Foods

Beverage	Resveratrol (mg/100 ml)	
	mean	range
Red wine	0.27	0-2.78
Rosé wine	0.12	$5.0 \times 10^{-3}$ -0.29
White wine	0.04	0.0-0.17
Sparkling wine	0.009	$8.0 \times 10^{-3}$ - $1.0 \times 10^{-2}$
Green grape juice	0.00508	$0.0-1 \times 10^{-2}$

Food	Serving	Total resveratrol (mg)
Peanuts (raw)	1 cup (146 grams)	0.01-0.26
Peanut Butter	2 cup (258 grams)	0.04-0.13
Red grapes	3 cup (160 grams)	0.24-1.25
Cocoa Powder	4 cup (200 grams)	0.28-0.46

In general, wines made from grapes of the *Pinot noir* and *St. Laurent* varieties showed the highest level of trans-resveratrol, though no wine or region can yet be said to produce wines with significantly higher concentrations than any other wine or region. Champagne and vinegar also contain appreciable levels of resveratrol.



# 1. Brief Introduction of Resveratrol and Its Derivative

## Pharmacodynamics

As of 2015, many specific biological targets for resveratrol had been identified, including NQO2 (alone and in interaction with AKT1), GSTP1, estrogen receptor beta, CBR1, and integrin  $\alpha V\beta$ . It was unclear at that time if any or all of these were responsible for the observed effects in cells and model organisms.

In vitro studies indicate resveratrol activates sirtuin 1, although this may be a downstream effect from its immediate biological target(s). It appears to signal through PGC-1 $\alpha$ , thereby affecting mitochondria. In cells treated with resveratrol, an increase is observed in the action of MnSOD (SOD2) and in GPER activity. In vitro, resveratrol was shown to act as an agonist of Peroxisome proliferator-activated receptor gamma, a nuclear receptor under pharmacological research as a potential treatment for type 2 diabetes.

# 1. Brief Introduction of Resveratrol and Its Derivative

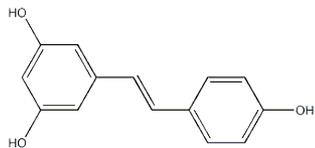
## Pharmacokinetics

One way of administering resveratrol in humans may be buccal delivery by direct absorption through the saliva. However, the viability of a buccal delivery method is unlikely due to the low aqueous solubility of the molecule. The bioavailability of resveratrol is about 0.5% due to extensive hepatic glucuronidation and sulfation.

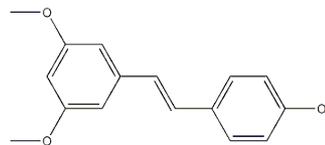
In a year-long preliminary clinical trial in people with Alzheimer's disease, the most frequent adverse effects were diarrhea, weight loss, and nausea.

A 2018 review of resveratrol effects on blood pressure found that some people had increased frequency of bowel movements and loose stools, and one person taking a 1000 mg daily dose developed an itchy rash.

## 2. Product information of Resveratrol and Its Derivative



SpecKare® Resveratrol  
SpecKare® Resveratrol (Natural)  
**Resveratrol**



SpecPure® PTB  
Resveratrol Dimethyl Ether  
(Pterostilbene)

# 1. Brief Introduction of Resveratrol and Its Derivative

## Resveratrol: challenges in analyzing its biological effects

**Table 1. Reported biological effects of resveratrol**

1	Modulation of cell proliferation and apoptosis
2	Modulation of angiogenesis
3	Inhibition of metastasis
4	Modulation of redox status
5	Suppression of adipogenesis and stimulation of adipocyte lipolysis
6	Stimulation of osteogenesis
7	Modulation of mitochondria activity
8	Modulation of proinflammatory signaling pathways
9	Modulation of DNA damage
10	Modulation of xenobiotic metabolism
11	Modulation of glutamate metabolism
12	Estrogenic activity/antiestrogenic activity
13	Enhanced endothelial function
14	Modulation of autophagy

NOTE: From the working group of the Resveratrol2012 conference in Leicester, UK, December 2012.

- Box 1. Identification of the primary point of resveratrol in the cellular action
- Box 2. The combinatory effects of resveratrol and other dietary components
- Box 3. The inhibition of cell proliferation in vitro by resveratrol
- Box 4. In vivo exposure to resveratrol: what is the relevant or actual dose?
- Box 5. How to prove the disease-preventive potential of resveratrol

2015. *Ole Vang. Ann. N.Y. Acad. Sci. ISSN 0077-8923*

## 2.1 Product information of Speckare® Resveratrol

Product No.:	120036-1
Trade Name:	<b>Speckare® Resveratrol (Natural, polygonum cuspidate)</b>
INCI Name:	Resveratrol
CAS No.:	501-36-0
EC No:	610-504-8
Application:	Anti-aging, anti-inflammatory, whitening, repairing, radiation protection and etc.
Daily care:	0.5-1.0%
Special care:	1.0-5.0%
Storage:	Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
Shelf life:	2 years
Package:	1kg, 25kg, Customization

Items	Specification
Assay(HPLC)	≥98.0%
Appearance	White fine powder
Odor & Taste	Characteristic
Loss on Drying	≤1.0%
Sulphated Ash	≤0.5%
Bulk Density	35.0~50.0g/100ml
Particle Size	100% through 80mesh
Ethyl acetate	≤10ppm
Heavy metals	≤10ppm
Arsenic, Mercury, Cadmium, Lead	≤2ppm, ≤0.1ppm, ≤1ppm, ≤3ppm
Total Plate Count	≤1,000cfu/g
Yeasts & Molds	≤100cfu/g
E.coli	Negative
Salmonella	Negative
Staphylococcus	Negative

## 2.1 Product information of Speckare® Resveratrol

Product No.:	120036
Trade Name:	<b>Speckare® Resveratrol</b>
INCI name:	Resveratrol
CAS No.:	501-36-0
EC No:	610-504-8
Application:	Anti-aging, anti-inflammatory, whitening, repairing, radiation protection and etc.
Daily care:	0.5-1.0%
Special care:	1.0-5.0%
Storage:	Store in cool place. Keep container tightly closed in a dry and well-ventilated place.
Shelf life:	2 years.
Package:	Customization

Item	Specifications
Appearance	white or off white powder
Melting Point	258~263℃
Assay	≥99%
Loss on drying	≤0.5%
Water content	≤0.5%
Heavy metals	≤10ppm
Aerobic platecount	≤100cfu/g
Yeast & mould	≤100cfu/g
Escherichia coli	Negative
Staphylococcus aureus	Negative

## 2.2 Product information of SpecPure® PTB

Product No.: 160032

Trade Name: **SpecPure® PTB**

INCI Name: Resveratrol Dimethyl Ether

CAS No.: 537-42-8

EC No.: 611-041-4

Application: Antioxidant, anti-tumor, anti-inflammatory, repairing and etc.

Dosage: 0.1-0.5%

Storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

Shelf life: 2 years

Package: 25kg

Items	Specification
Appearance	Off white or white powder
Melting Point	92~96°C
Assay(HPLC)	≥99.0%
Loss on drying	≤0.2%
Moisture content	≤0.2%
Heavy Metals	≤10ppm

## 2. Product information of Resveratrol and Its Derivative

### Features of SpecKare® Resveratrol & SpecPure® PTB

- Improves skin elasticity, firmness and radiance, suitable for stressed skin
- Provides strong UV radiation protection.
- Increases the Aerobic Capacity, potent antioxidant capability
- RSV enhanced mitochondrial enzymatic activity and convert nutrients into energy through cellular respiration.
- Decrease Pro-inflammatory cytokines : TNF- $\alpha$  and IL-1 $\beta$ , increase anti-inflammatory cytokine IL-10, diminish p38 MAPK protein activation
- Suitable for skin-lightening products
- Restore antioxidant function
- Reduce cell apoptosis/Apoptotic Levels, as protectant and detoxicant



### 3 Efficacy Test of Resveratrol and Its Derivative

#### Stability (2 years, long-term stability) :

\* Regular: at 60% humidity and 25 ° C; accelerated stability: at 75% humidity and 40 ° C

TABLE 1. STABILITY OF PURE *TRANS*-RESVERATROL AND *TRANS*-PICEID AS DETERMINED BY HPLC

Sample	3 months	24 months	42 months
<i>trans</i> -Resveratrol (99%)	94.4%	95.5%	102.7%
<i>trans</i> -Piceid (96%)	96.3%	94.3%	103.3%

TABLE 2. CONTENT OF RESVERATROL COMPLEX (*TRANS*-RESVERATROL AND *TRANS*-PICEID) (MINIMUM OF 10%) BY HPLC IN A MIXTURE WITH WHOLE GRAPE EXTRACT

Sample	0 month	24 months
First	10.7%	10.6%
Second	10.9%	10.8%
Third	11.2%	10.7%
Resveratrol complex (minimum of 50%)	59.1%	58.85% <sup>a</sup>

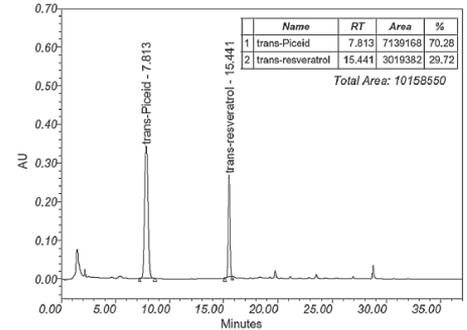
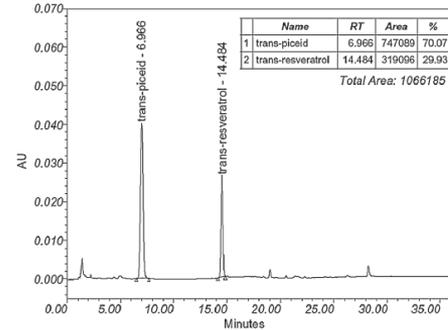


FIG. 1. HPLC chromatogram of whole grape extract mixture with 10% resveratrol complex at time-zero (left) and after 24 months (right). AU, arbitrary units; RT, retention time.

**Therefore unlikely that exposure of resveratrol and/or its glycosides as solids to atmospheric oxygen alone could cause any significant oxidation and/or degradation.**

### 3 Efficacy Test of Resveratrol and Its Derivative

#### Resveratrol (RSV) Increases the Aerobic Capacity of the Muscle (Anti-aging, Anti-oxidant)

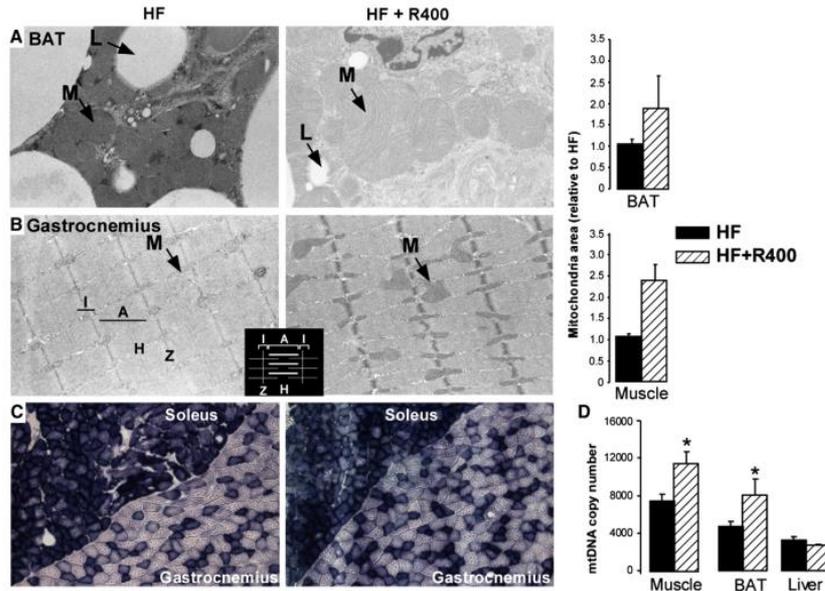
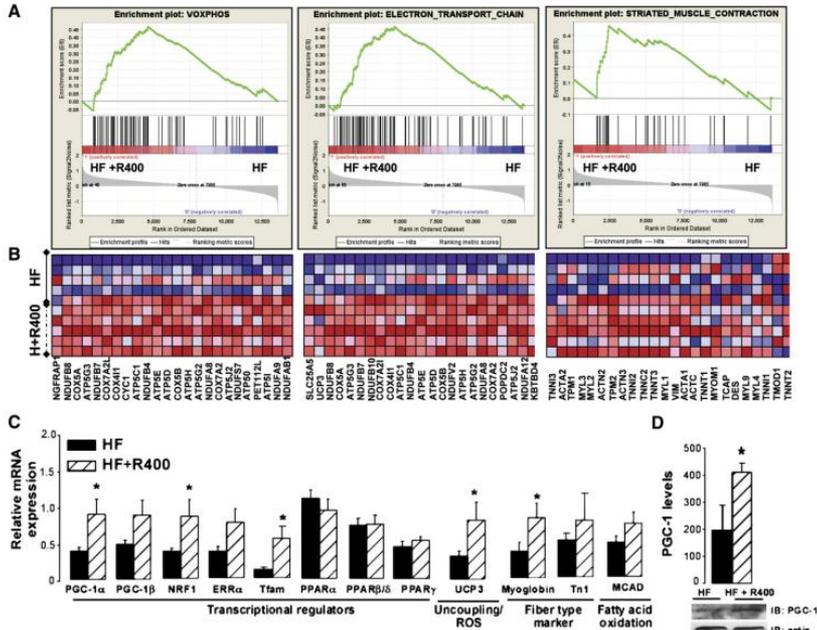


Figure 1. RSV Increases Mitochondrial Activity in the BAT and Muscle (A and B) Transmission electronic microscopy (magnification of 20,000) image and corresponding quantification of mitochondria size in BAT (A) and nonoxidative fibers of gastrocnemius muscle (B) from RSV-treated (HF+R400) and nontreated HF-fed animals. Arrows indicate the position of mitochondria (M) and lipid droplets (L), and the inset shows the schematic organization of muscle fiber anatomy. Quantification was performed on 2 animals/group and is expressed relative to HF controls. (C) SDH staining of gastrocnemius and soleus muscle from RSV-treated and nontreated HF-fed animals. (D) mtDNA copy number of gastrocnemius muscle, BAT, and liver from RSV-treated and nontreated HF-fed mice (n = 4 animals/group). Values represent means  $\pm$  SEM.

- **Mitochondrial expansion** was evidenced by increased **mitochondrial size** (Figure 1B, right panel) and **mtDNA content** (Figure 1D). Histological sections of muscle stained for the presence of the mitochondrial enzyme, succinate dehydrogenase (SDH, Figure 1C), and the increase in citrate synthase activity in muscle homogenates, furthermore indicates that: **RSV enhanced mitochondrial enzymatic activity.**
- **Mitochondria are the principal energy sources of the cell**
- **that convert nutrients into energy through cellular respiration.**
- **Resveratrol help increasing cell viability!**

## 3 Efficacy Test of Resveratrol and Its Derivative

### Resveratrol (RSV) Induces PGC-1 $\alpha$ Activity through SIRT1 (Anti-aging, Anti-oxidant)



- Three representative GSEA-scoring plots and their corresponding heat maps are shown in (Fig 2A)
  - After RSV treatment, gene expression increased. Individual genes in the enriched pathways were related to muscle contraction (e.g., troponins) as well as **enhanced oxidative metabolic status**, including components of the **respiratory apparatus** (e.g., NDUFB8), **oxidative enzymes** (e.g., CoxVa), and **ATPases** (e.g., ATP5G3).
  - **These could provide a slow but stable, long-lasting supply of ATP, which would explain the increased muscle endurance associated with RSV.**
  - **PGC-1 $\alpha$  mRNA was significantly induced upon RSV treatment, which also translated into an increase in PGC-1 $\alpha$  protein. (Fig 2C&D)**
- \* **peroxisome proliferator-activated receptor g coactivator, PGC-1 $\alpha$ .** PGC-1 $\alpha$  is a coactivator with pleiotropic functions. Most importantly, **PGC-1 $\alpha$  controls mitochondrial biogenesis and function**, which in the muscle can contribute to fiber-type switching and, in the brown adipose tissue (BAT), to adaptive thermogenesis.

Figure 2. The Gene-Expression Profile of Skeletal Muscle from RSV-Treated Mice Is Enriched in Pathways Related to Mitochondrial Biogenesis and Function (A) Gene-set enrichment analysis (GSEA) of gene-expression profile in gastrocnemius muscles isolated from HF-fed male C57B/6J mice treated with or without RSV (400 mpk, HF + R400). N = 5 animals/group. Three plots are shown where the FDR was <10% for both oxidative phosphorylation pathway and electron transport chain and <33% for striated muscle contraction. The top part of each plot shows the progression of the running enrichment score and the maximum peak therein. The middle part shows the genes in the gene set as "hits" against the ranked list of genes. The lower part shows the histogram for the ranked list of all genes in the expression data set. See Experimental Procedures and Results for more detailed description. (B) The corresponding heat maps show the expression values for the top subset of genes of each pathway, which contributes most to the enrichment score in the five mice of each group. Results are transformed into colors, where red indicates a high and blue a low expression value. (C) Relative mRNA expression levels of key genes related to mitochondrial function as measured by Q-RT-PCR in the gastrocnemius muscle of HF or HF + R400 mice. N=5-6 animals/group. Data represent mRNA levels relative to cyclophilin and are given as means  $\pm$  SEM. (D) Quantification and representative western blot of PGC-1 protein in nuclear extracts from the gastrocnemius muscle of RSV treated and nontreated HF fed animals. Values represent arbitrary density units  $\pm$  SEM (n = 3 animals/group), and actin serves as loading control. \* = P < 0.05.

### 3 Efficacy Test of Resveratrol and Its Derivative

#### Anti-Inflammation of Resveratrol (RSV)

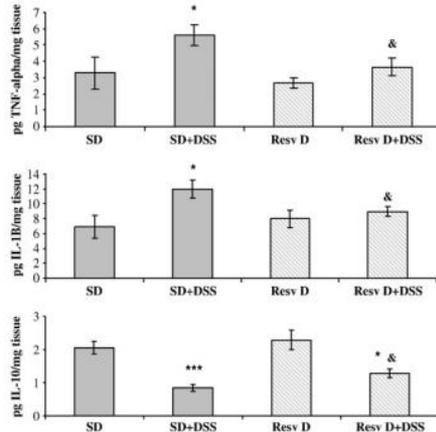


Fig.3 Effect of resveratrol supplemented diet (Resv D) on factor of necrosis tumoral alpha (TNF-α) (A), interleukins (IL-1β) (B) and IL-10 (C) in the colon tissue after 3% of dextran sodium sulphate (DSS) for 5 days followed by 3 weeks of water. Data are expressed as the means  $\pm$  S.E.M. (\*) Pb0.05 and (\*\*\*) Pb0.001 vs. sham group; (&) Pb0.05 vs. standard diet (SD)+DSS group.

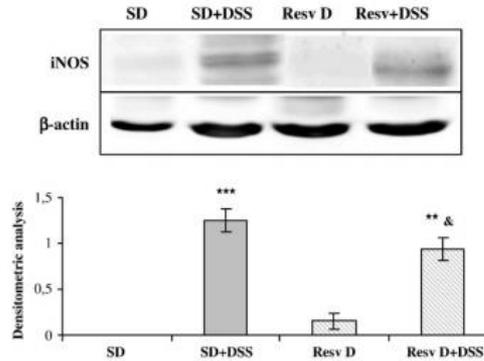


Fig. 4. Effect of resveratrol supplemented diet (Resv D) on expression of inducible nitric oxide synthase (iNOS) enzyme in the colon tissue after 3% of dextran sodium sulphate (DSS) for 5 days followed by 3 weeks of water. Western blotting with antibodies against iNOS has been described in Material and methods section. Data are expressed as the means  $\pm$  S.E.M. (\*\*\*) Pb0.001 and (\*\*\*) Pb0.001 vs. sham group; (&) Pb0.05 vs. standard diet (SD)+DSS group.

- **Pro-inflammatory cytokines** were modified after resveratrol-enriched diet, **TNF-α and IL-1β** were significantly reduced ( $P \leq 0.05$ ) and **anti-inflammatory cytokine IL-10** significantly augmented ( $P \leq 0.05$ ) compared with the effects observed for DSS standard diet group.(Fig.3)
- In the same way **iNOS** was significantly expressed in DSS group fed with standard diet ( $P \leq 0.001$ ) and resveratrol diet significantly reduced its expression ( $P \leq 0.05$  vs. standard diet). (Fig 4)
- **Resveratrol (RSV) shows strong anti-inflammatory ability.**

### 3 Efficacy Test of Resveratrol and Its Derivative

#### Anti-Inflammation of Resveratrol (RSV)

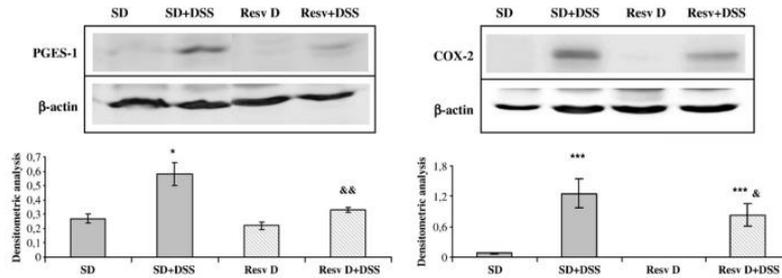


Fig. 5. Effect of resveratrol supplemented diet (Resv D) on prostaglandin E<sub>2</sub>-synthesizing enzymes in the colon tissue after 3% of dextran sodium sulphate (DSS) for 5 days followed by 3 weeks of water. Western blotting with antibodies against prostaglandin E synthase (PGES)-1 (A) and cyclooxygenase-2 (COX-2) (B) has been described in Material and methods section. Data are expressed as the means  $\pm$  S.E.M. (\*) Pb0.05 and (\*\*\*) Pb0.001 vs. sham group; (&&) Pb0.05 and (& &) Pb0.01 vs. standard diet (SD)+DSS group.

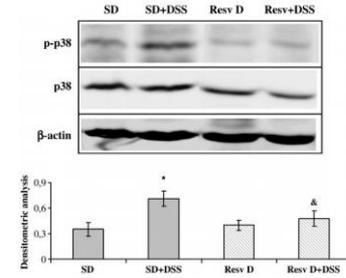


Fig. 6. Effect of resveratrol supplemented diet (Resv D) on expression and activation of the p38 MAPK using phosphospecific MAPK antibodies in the colon tissue after 3% of dextran sodium sulphate (DSS) for 5 days followed by 3 weeks of water. Data are expressed as the means  $\pm$  S.E.M. (\*) Pb0.05 vs. sham group

- The levels of protein expression were measured by western blotting of cytosolic extracts from colonic mucosa. As shown in Fig. 5, DSS exposure caused significant expression of PGES-1 and COX-2 in animals fed with standard diet ( $P \leq 0.05$  and  $Pb0.001$  respectively), on the contrary resveratrol diet induced downregulation of both proteins in DSS group ( $P \leq 0.01$  and  $P \leq 0.05$  respectively vs. standard diet-DSS group).
- the p38 MAPK protein activation could be induced at the chronic stage of colonic lesion caused by DSS. Interestingly, administration of resveratrol was able to **diminish p38 MAPK protein activation** ( $P \leq 0.05$ ) (Fig.6).



### 3 Efficacy Test of Resveratrol and Its Derivative

#### Pterostilbene (PT) restore antioxidant function

Table 3. Effect of dietary pterostilbene supplementation on hepatic antioxidant ability and lipid peroxidation of 21-day-old broilers challenged with diquat. (n 5 6). a-cMean values within a row with unlike letters were significantly different (P, 0.05) among groups. Abbreviations: BCL2, B cell lymphoma/leukemia 2; CASP3, caspase 3; CON, broilers received a basal diet from 1 to 21 D of age; DQ, broilers were injected with diquat solution at 20 D of age; PT, broilers received a pterostilbene-supplemented diet from 1 to 21 D of age; SS, birds were injected with sterile saline at 20 D of age; TUNEL, terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling.

Items <sup>1</sup>	SS		DQ		SEM	Stress effect		Diet effect		P-value		
	CON	PT	CON	PT		SS	DQ	CON	PT	Stress	Diet	S × D
T-AOC (U/mg protein)	1.75 <sup>a,b</sup>	1.83 <sup>a</sup>	1.40 <sup>b</sup>	1.92 <sup>a</sup>	0.06	1.79	1.66	1.57	1.88	0.213	0.007	0.041
SOD (U/mg protein)	188.95	203.52	206.21	222.52	3.70	196.24	214.36	197.58	213.02	0.006	0.016	0.884
GSH-Px (U/mg protein)	19.14	21.13	24.71	23.18	0.60	20.14	23.95	21.93	22.16	<0.001	0.800	0.063
T-GSH (nmol/100 mg wet weight)	129.29	138.74	91.73	120.93	5.45	134.01	106.33	110.51	129.83	0.004	0.037	0.266
GSH (nmol/100 mg wet weight)	116.72	128.85	75.15	109.91	5.72	122.78	92.53	95.93	119.38	0.002	0.011	0.194
GSSG (nmol/100 mg wet weight)	6.29	4.94	8.29	5.51	0.45	5.61	6.90	7.29	5.23	0.121	0.017	0.374
GSH:GSSG (nmol:nmol)	19.11	27.94	10.53	20.79	1.83	23.53	15.66	14.82	24.37	0.010	0.003	0.800
MDA (nmol/mg protein)	0.74 <sup>b</sup>	0.75 <sup>b</sup>	1.39 <sup>a</sup>	0.77 <sup>b</sup>	0.08	0.75	1.08	1.07	0.76	0.007	0.012	0.011

<sup>a,b</sup>Means within a row with different superscripts are different at P < 0.05.

<sup>1</sup>Mean values with pooled SEMs, n = 6.

Abbreviations: CON, birds received a basal diet from 1 to 21 D of age; DQ, birds were injected with diquat solution at 20 D of age; PT, birds received a pterostilbene-supplemented diet from 1 to 21 D of age; SS, birds were injected with sterile saline at 20 D of age; S × D, the interaction of stress and diet effects; GSH, reduced glutathione; GSH-Px, glutathione peroxidase; GSH:GSSG, the ratio of reduced glutathione to oxidized glutathione; GSSG, oxidized glutathione; MDA, malondialdehyde; SOD, superoxide dismutase; T-AOC, total antioxidant capacity; T-GSH, total glutathione.

Administration of DQ dramatically increased the activities of SOD, superoxide dismutase (P=0.006) and GSH-Px, glutathione peroxidase (P<0.001) and the content of MDA, malondialdehyde (P=0.007), whereas it decreased Total GSH (P=0.004) and GSH (P=0.002) concentrations as well as the ratio of GSH to GSSG (P=0.010) in the liver (Table 3).

**The total antioxidant capacity (P=0.007) and SOD (P=0.016) activities; T-GSH (P=0.037) and GSH (P=0.011) contents; and GSH:GSSG ratio (P=0.003) were all robustly improved because of supplementation with PT.**

Moreover, feeding a PT-supplemented diet to broilers obviously **decreased the concentrations of GSSG (P=0.017) and MDA (P=0.012)** in the liver compared with those fed with a basal diet.

**Pterostilbene (PT) can increased antioxidant actives and decreased oxidative actives and bu-products , showing potent antioxidant capability.**

### 3 Efficacy Test of Resveratrol and Its Derivative

#### Pterostilbene (PT) Reduce cell (Hepatic) apoptosis/Apoptotic Levels, protectant, detoxicant

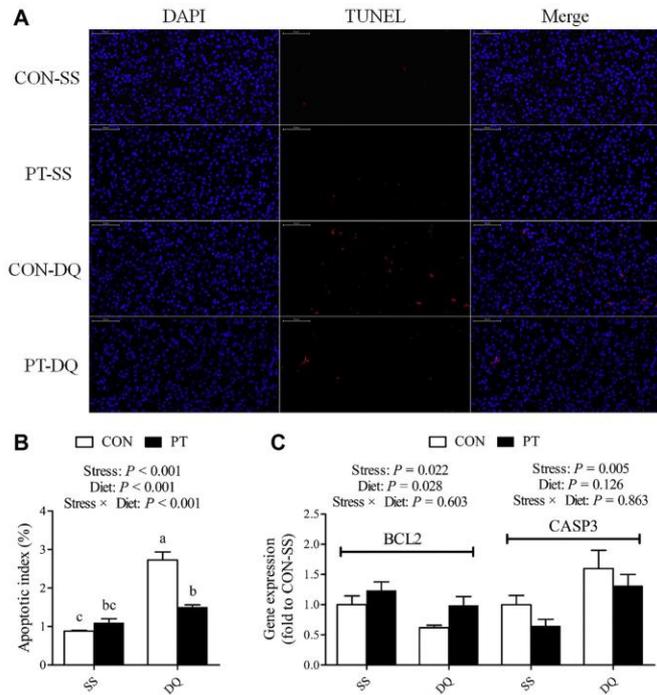


Figure 10. Effect of dietary pterostilbene supplementation on hepatic apoptotic status of 21-day-old broilers challenged with diquat. (A) Representative micrographs of TUNEL staining carried out on paraformaldehyde-fixed sections from the liver samples (400 × magnification). (B) The percentage of hepatocyte apoptosis. (C) Real-time polymerase chain reaction analysis of hepatic mRNA expression of BCL2 and CASP3. Values are means with their SEs represented by vertical bars (n = 5/6). a-c Mean values within a row with unlike letters were significantly different ( $P < 0.05$ ) among groups. Abbreviations: BCL2, B cell lymphoma/leukemia 2; CASP3, caspase 3; CON, broilers received a basal diet from 1 to 21 D of age; DQ, broilers were injected with diquat solution at 20 D of age; PT, broilers received a pterostilbene-supplemented diet from 1 to 21 D of age; SS, birds were injected with sterile saline at 20 D of age; TUNEL, terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling.

Compared with the untreated controls, the broilers' exposure to DQ (diquat, herbicide) showed a sharp rise in the percentage of hepatocyte apoptosis ( $P < 0.001$ ; Figures 10A and 10B). Diquat challenge significantly decreased the mRNA abundance of BCL2 (B cell lymphoma/leukemia 2) ( $P = 0.022$ ; Figure 10C) but increased the mRNA abundance of CASP3 (caspase 3) ( $P = 0.005$ ; Figure 10C). However, **PT supplementation exerted an opposite effect on the hepatic apoptotic percentage** ( $P < 0.001$ ), whereas it effectively attenuated the DQ-induced higher apoptotic index in the liver of broilers ( $P < 0.001$ ). In addition, the BCL2 expression was up-regulated by PT treatment ( $P = 0.028$ )

**Pterostilbene (PT) works as protectant and detoxicant to reduce apoptosis.**

## 4. Application Guide of Resveratrol and Its Derivative

### SpecKare® Resveratrol

- Poorly soluble in water (3 mg/100mL), almost insoluble in water and lipophilic components, while can be dissolved in PEG/PPG containing solubilizers.
- Soluble in ethanol (50 mg/mL), DMSO (16 mg/mL), DMF (~65 mg/mL), PBS (pH 7.2), methanol, and acetone (50 mg/mL).
- Long term solubility and stability is dependent on the whole cosmetic formulation.
- Recommended for use in o/w, w/o or Si/W formulations, toners, as well as in gel product forms up to 10%. It is heat stable, and can be effectively used over a broad pH range (3 – 6.5).
- Avoid sun exposure. The addition of UV filters is recommended for day care products.



## 4. Application Guide of Resveratrol and Its Derivative

### SpecPure® PTB-Resveratrol Dimethyl Ether

- Insoluble in water
- Pre-dissolve SpecKare® PTB (0.1-0.5%) in butylene glycol and propanediol
- If preparing clear aqueous solution when we incorporate the pre-mixture of PTB + BG or PTB + Propanediol into water, you need add some solubilizer.
- we try below formula:PTB 0.1%+ BG/Propanediol 4-10%+ Water To 100+PEG-40 Hydrogenated Castor Oil 2.5-5.0%



## 4. Application Guide of Resveratrol and Its Derivative



### *L'Oréal Professionnel*

#### *Serioxyl Denser Hair Treatment for Thinning Hair*

L'Oréal Professionnel Serioxyl Denser Hair Treatment is a professional super serum suitable for female and men who have very fine or thinning hair, or suffer from hair loss.

#### **Ingredients overview**

Alcohol Denat, Aqua/Water, Diethyllutidinate, **Resveratrol**, Ethyl Ester Of Pvm/Ma Copolymer, Linalool, Geraniol, Citronellol, Benzyl Salicylate, Benzyl Alcohol, Limonene, Parfum/Fragrance

## 4. Application Guide of Resveratrol and Its Derivative



### ***SkinCeuticals Resveratrol B E***

"A concentrated night face serum with pure antioxidant-rich resveratrol to reveal visible radiance and firmness"

### **Ingredients overview**

Aqua / Water / Eau, Dimethicone, Propylene Glycol, Dipropylene Glycol, Niacinamide, Alcohol Denat, Glycerin, Caffeine, Sodium Chloride, Peg/Ppg-18/18 Dimethicone, Tocopherol, **Resveratrol**, Scutellaria Baicalensis Extract / Scutellaria Baicalensis Root Extract, Disodium Edta

## 4. Application Guide of Resveratrol and Its Derivative



### *Estée Lauder*

Perfectionist Pro Instant Resurfacing Peel with 9.9% AHAs + BHA  
An at-home "micro-facial" peel for instantly soft, radiant skin.

### Ingredients overview

Water/Aqua/Eau, Dimethicone, Citric Acid, Glycolic Acid, Sodium Hydroxide, Butylene Glycol, Tartaric Acid, Algae Extract, Decyl Oleate, Polyacrylate Crosspolymer-6, Polyacrylamide, Salicylic Acid, Polysilicone-11, **Resveratrol**, Sodium Hyaluronate, Hordeum Vulgare (Barley) Extract / Extrait D'Orge, Caffeine, Triticum Vulgare (Wheat) Germ Extract, Phospholipids, Hydrogenated Lecithin, Pantethine, Sucrose, Tocopheryl Acetate, Biosaccharide Gum-1, PEG-11 Methyl Ether Dimethicone, C13-14 Isoparaffin, Propylene Glycol Caprylate, Squalane, Oleth-10, Stearamidopropyl Dimethylamine, Caprylyl Glycol, Laureth-7, Stearic Acid, T-Butyl Alcohol, Hexylene Glycol, Fragrance (Parfum), Disodium EDTA, Phenoxyethanol

## 4. Application Guide of Resveratrol and Its Derivative



### **Mary Kay**

#### **Age Minimize 3D Night Cream | Canada**

This effective, moisture-replenishing cream re-energizes skins natural, youthful glow and helps reduce the look of fine lines and wrinkles. This soothing formula moisturizes for 12 hours. You'll love the improvement you see each morning as skin feels rejuvenated.

#### **Ingredients overview**

Water, Dimethicone, Glycerin, Aluminum Starch Octenylsuccinate, Caprylic/Capric Triglyceride, Cetearyl Alcohol, Glyceryl Stearate, Cetearth-33, Niacinamide, Ammonium Acryloyldimethyltaurate/VP Copolymer, Prunus Mume Leaf Extract, Oligopeptide-1, **Resveratrol**, Acrylamide/Sodium Acryloyldimethyltaurate Copolymer, Isohexadecane, Butylene Glycol, Dipotassium Glycyrrhizate, Jojoba Esters, Tocopheryl Acetate, Isopropyl Palmitate, Sucrose Palmitate, Dimethiconol, Cyclopentasiloxane, Cyclohexasiloxane, Polysorbate 80, Hydroxypropyl Cyclodextrin, Glyceryl Linoleate, Ethoxydiglycol, Methyl dihydrojasmonate, Ethylene Brassylate, Tetramethyl Acetyloctahydronaphthalenes, Ethyl Linalool, Isobutyl Methyl Tetrahydropyranol, Methylene dioxyphenyl Methylpropanal, Phenylisohexanol, Trimethylbenzenepropanol, Methyl Benzodioxepinone, Triethanolamine, Disodium EDTA, Hydroxyacetophenone, Ethylhexylglycerin, Phenoxyethanol, Iodopropynyl Butylcarbamate

## 4. Application Guide of Resveratrol and Its Derivative

### **HANHOO**

#### ***Watermelon Illuminator Daytime Facial Oil***

Hanhoo's Watermelon Illuminator Daytime Facial Oil provides all-day hydration for a bright, glowing complexion. Made with nourishing fruit extracts like watermelon and grapefruit and without parabens or sulfates, this facial oil leaves skin moisturized, soft, and glowing.



#### **Ingredients overview**

Water, Cyclopentasiloxane, Isopropyl Myristate, Methylpropanediol, Cetyl Ethylhexanoate, Cyclohexasiloxane, Polyglyceryl-3 Methylglucose Distearate, Niacinamide, Citrullus Lanatus (Watermelon) Fruit Extract, Ficus Carica (Fig) Fruit Extract, Malus Domestica Fruit Extract, Ananas Sativus (Pineapple) Fruit Extract, Citrus Paradisi (Grapefruit) Fruit Extract, Cucumis Melo (Melon) Fruit Extract, Solanum Lycopersicum (Tomato) Fruit Extract, **Resveratrol**, Biota Orientalis Leaf Extract, Zanthoxylum Piperitum Fruit Extract, Methyl Glucose Sesquistearate, Cetearyl Glucoside, Butylene Glycol, Tocopheryl Acetate, Sodium Hyaluronate, Glycolic Acid, Illicium Verum (Anise) Fruit Extract, Scutellaria Baicalensis Root Extract, 1,2-Hexanediol, Ci 16255, Fragrance

## 4. Application Guide of Resveratrol and Its Derivative



*elf cosmetics*

### ***Ride Or Die Lip Balm (Tough Cookie)***

An intense lip balm treatment that gives you the ultimate hydrated and plumped lips. This balm is your lips' 100% vegan and cruelty-free, ride or die bestie!

### **Ingredients overview**

Bis-Diglyceryl Polyacyladipate-2, Ricinus Communis (Castor) Seed Oil, Microcrystalline Wax (Cera Microcristallina), Hydrogenated Castor Oil, Fragrance (Parfum), Tocopheryl Acetate, Simmondsia Chinensis (Jojoba) Seed Oil, Soluble Collagen, **Resveratrol**, Phenoxyethanol  
Caprylyl GlycolMAY CONTAIN: Titanium Dioxide (Ci 77891), Red Iron Oxide (Ci 77491), Yellow Iron Oxide (Ci 77492), Black Iron Oxide (Ci 77499), Red 6 Lake (Ci 15850)

## 4. Application Guide of Resveratrol and Its Derivative



### **SKIN ALPHABET**

#### **1% Resveratrol | De-Red Facecream**

the cream helps to reduce signs of skin redness

#### **Ingredients overview**

Aloe Barbadensis Leaf Juice (Organic), Olea Europaea Fruit (Olive) Oil (Organic), Pentylene Glycol (Humectant, Natural), Hydrogenated Phosphatidylcholine (Lecithin, Natural), Glycerin (Humectant, Natural), **Resveratrol (Natural)**, Caprylic/Capric Triglyceride (Mct Oil, Natural), Propanediol (Natural), Butyrospermum Parkii (Shea) Butter (Organic), Leontopodium Alpinum (Edelweiss) Extract (Natural), Equisetum Arvense (Horsetail) Extract (Natural), Laminaria Ochroleuca (Algae) Extract (Natural)

## 4. Application Guide of Resveratrol and Its Derivative



### ***Paula's Choice***

#### ***Resist Ultra-Light Super Antioxidant Concentrate Serum***

An extraordinary blend of antioxidants in a feather-light serum that gives skin a brighter, hydrated appearance while resisting environmental stress and promoting firmer-looking skin.

#### **Ingredients overview**

Water (Aqua), Cyclopentasiloxane, Butylene Glycol, Dimethicone, Glycerin, Polysorbate 20, Polysilicone-11, Lauryl Peg-9 Polydimethylsiloxyethyl Dimethicone, Hyaluronic Acid, **Resveratrol**, Niacinamide, Quercetin, Adenosine, Tetrahexyldecyl Ascorbate, Tocopherol, Phospholipids, Ubiquinone, Epigallocatechin Gallate, Sea Whip Extract, Bisabolol, Beta-Glucan, Phytic Acid, Xanthan Gum, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Sodium Hydroxide, Disodium Edta, Ethylhexylglycerin, Phenoxyethanol

## 4. Application Guide of Resveratrol and Its Derivative



### *Paula's Choice*

#### ***Resist Anti-Aging Serum Foundation - Matte***

RESIST Anti-Aging Serum Foundation goes on smooth for a clear complexion that lasts all day and night. With the help of powerful amino acids and antioxidants, this serum foundation effectively diminishes troublesome signs of aging. Its buildable formula blends easily and delivers softer-looking skin with a matte finish.

#### **Ingredients overview**

Isododecane, Water (Aqua), Hydrogenated Polydecene, Tricaprylin, Nylon-12, Quaternium-90 Bentonite, Butylene Glycol, Dimethicone, Cetyl Peg/Ppg-10/1 Dimethicone, Polyglyceryl-3 Diisostearate, Magnesium Sulfate, **Resveratrol**, Glycyrrhetic Acid, Retinyl Palmitate, Adenosine, Camellia Sinensis Leaf Extract, Palmitoyl Hexapeptide-12, Tribehenin, Ceramide Ng, Tremella Fuciformis Sporocarp Extract, Allantoin, Montmorillonite, Propylene Carbonate, Boron Nitride, Dimethicone Crosspolymer-3, Betaine, Glycerin, Glycereth-12, Glyceryl Cocoate, Triethoxycaprylylsilane, Citric Acid, Xanthan Gum, C12-15 Alkyl Benzoate, Peg-10 Phytosterol, Potassium Sorbate, Phenoxyethanol, Caprylyl Glycol, Sodium Benzoate  
May Contain: Titanium Dioxide (CI 77891), Iron Oxides (CI 77491, CI 77492, CI 77499).

## 4. Application Guide of Resveratrol and Its Derivative

### *African Botanics*

#### *Infinité Resurfacing Mask*

Fresh from eco-luxe leaders African Botanics, this multi-tasking powerhouse has a phenomenal retexturising action. Enriched with potent AHAs (alpha-hydroxy acids) and BHAs (beta-hydroxy acids), this miraculous mask clarifies decongested complexions and increases cellular turnover, to enhance elasticity and restore luminosity.



#### **Ingredients overview**

Aqua (Water), Butylene Glycol, Glycerin, Malva Sylvestris (Mallow) Extract, Lactic Acid, Mentha Leaf Extract, Melissa Officinalis Leaf Extract, Achillea Millefolium (Yarrow)\* Extract, Speedwell (Veronica Officinalis) Extract, Primula Veris Extract, **Resveratrol**, Arctostaphylos (Uva-Ursi) Leaf Extract, Glycolic Acid, Saccharide Isomerate, Ananas Sativus (Pineapple) Fruit Extract, Carica Papaya Extract, Bulbine Frutescens\*, Xanthan Gum, Hyaluronic Acid, Fucus Vesiculosus (Sea Kelp) Extract, Myrothamus Flabellifolius (Resurrection)\*\* Plant, Sorghum Bicolor Stalk Juice, Panicum Miliaceum (Millet) Seed Extract, Tannic Acid, Hydrolyzed Rice Protein (Di- And Tripeptides), Glycine Soja (Soybean) Protein, Superoxide Dismutase, Niacinamide (Vitamin B3), Sodium Ascorbyl Phosphate (Vitamin C), Aloe Ferox Leaf Extract\*, Acetamide Mea, Panthenol (Pro Vitamin B5), Hydrolyzed Wheat Protein, Phytic Acid, Triticum Vulgare (Wheat) Germ Oil, Linoleic Acid, Simmondsia Chinensis (Jojoba)\* Seed Oil, Butylene Glycol, Sorbitol, D-Alpha Tocopherol (Vitamin E), Ascorbyl Methylsilanol Pectinate, Urtica Dioica (Nettle) Extract, Equisetum Arvense (Horsetail) Extract, Cucumis Sativus (Cucumber) Fruit Extract, Hydrocotyl (Centella Asiatica)\* Extract, Chamomile Matricaria\* Extract, Chlorella Vulgaris (Green Algae) Extract, Hydrolyzed Algin, Salix Alba (White Willow Bark), Sclerocarya Birrea (Marula)\*\* Seed Oil, Magnesium Sulphate, Tetrasodium Glutamate Diacetate, Citrullus Lanatus (Kalahari Melon)\*\* Seed Oil, Copper Gluconate, Arnica Cordifolia (Arnica) Extract, Aspalathus Linearis (Green Rooibos)\* Tea Extract, Vitis Vinifera (Grape)\* Seed Oil, Ethanol, Jasminum Grandiflorum (Jasmine) Flower Oil, Rosa Mosqueta (Rosehip)\* Seed Oil, Ethylhexylglycerin, Phenoxyethanol

\*Organic, \*\*Wild-Harvested Ingredients. Responsibly sourced. Never tested on animals. Formulated without silicones, mineral oils, parabens, allergens, phthalates, synthetic fragrances, PEGs and SLSs.

## 4. Application Guide of Resveratrol and Its Derivative



### **Sesderma** **Factor G Renew Serum**

A powerful anti-aging concentrate to stimulate cellular regeneration and improve the appearance of your skin. Ideal as a base treatment.

### **Ingredients overview**

Water, Glycerin, Bis-PEG-18 Methyl Ether Dimethyl Silane, Propanediol, Lecithin, Alcohol, Polysorbate 20, PEG-40 Hydrogenated Castor Oil, Tocopheryl Acetate, Malus Domestica Fruit Cell Culture Extract, **Pterostilbene**, Centella Asiatica Extract, Palmitoyl Tripeptide-3, Caprooyl Tetrapeptide-3, Quercetin, Ergothioneine, Nicotiana Benthamiana Sh-Tgf-Beta2, Nicotiana Bethaniana Sh-Polypeptide-7, Nicotiana Bethamiana Sh-Polypeptide-45, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Triethanolamine, Sodium Chloride, Disodium EDTA, Ethylhexylglycerin, Sodium Cholate, Xanthan Gum, Dextran, Tromethamine, Hydrochloric Acid, Dipotassium Phosphate, Potassium Phosphate, Phenoxyethanol, Fragrance

## 4. Application Guide of Resveratrol and Its Derivative



### *Allies of Skin*

#### **1A Overnight Mask**

Packed with an abundance of cell-energising, reparative actives like Indian Ginseng and Pterostilbene, our 1A™ Overnight Mask works while you sleep to boost your skin's immunity and accelerate skin cell renewal, giving new life to dull, sallow skin.

#### **Ingredients overview**

Aqua (Water), Glycerin, Caprylic/Capric Triglyceride, Propanediol, Argania Spinosa Kernel Oil (Organic), Sodium Acrylates Copolymer, Hydrolyzed Candida Saitoana Extract, Sodium Stearoyl Glutamate, Albizia Julibrissin Bark Extract, Dimethyl Isosorbide, Galactoarabinan, Palmitoyl Tetrapeptide-7, Palmitoyl Tripeptide-1, Caprooyl Tetrapeptide-3, Cassia Angustifolia Seed Polysaccharide, Sodium Hyaluronate (L), Oxycoccus Palustris (Arctic Cranberry) Seed Oil, Rubus Chamaemorus (Cloud Berry) Seed Oil, Niacinamide, Withania Somnifera (Indian Ginseng) Root Extract, Citrus Aurantium Dulcis (Orange) Callus Culture Extract, Retinal (Retinaldehyde), **Pterostilbene**, Ellagic Acid, Phenyl T-ButylNitron (Spin Trap), Ergothioneine (L), Glutathione (L), Mirabilis Jalapa Flower/Leaf/Stem Extract, N-Hydroxysuccinimide, Chrysin, Glutamylamidoethyl Imidazole, Lonicera Caprifolium (Honeysuckle) Flower Extract, Lonicera Japonica (Honeysuckle) Flower Extract, Lavandula Hybrid (Lavandin) Oil, Pentylene Glycol, Butylene Glycol, Cyclodextrin, Caprylyl Glycol, Steareth-20, Citric Acid, Xanthan Gum, Dextran, Acetyl Tributyl Citrate, Potassium Sorbate, Phenoxyethanol

## 4. Application Guide of Resveratrol and Its Derivative



### *Allies of Skin*

#### **1A Retinol + Peptides Overnight Mask**

A multitasking overnight mask (pH 5.2-5.7) supercharged with a time-release Retinaldehyde, 13.5% Peptide Complex, 9 Antioxidants, 5 Brighteners, to hydrate and brighten stressed-out skin, as it repairs all signs of premature ageing.

#### **Ingredients overview**

Aqua (Water), Glycerin, Caprylic/Capric Triglyceride, Propanediol, Argania Spinosa Kernel Oil (Organic), Sodium Acrylates Copolymer, Hydrolyzed Candida Saitoana Extract, Sodium Stearoyl Glutamate, Albizia Julibrissin Bark Extract, Dimethyl Isosorbide, Galactoarabinan, Palmitoyl Tetrapeptide-7, Palmitoyl Oligopeptide, Caprooyl Tetrapeptide-3, Cassia Angustifolia Seed Polysaccharide, Sodium Hyaluronate (L), Oxycoccus Palustris (Arctic Cranberry) Seed Oil, Rubus Chamaemorus (Cloud Berry) Seed Oil, Niacinamide, Withania Somnifera (Indian Ginseng) Root Extract, Citrus Aurantium Dulcis (Orange) Callus Culture Extract, Retinal (Retinaldehyde), **Pterostilbene**, Ellagic Acid, Phenyl T-Butylnitron (Spin Trap), Ergothioneine (L), Glutathione (L), Mirabilis Jalapa Flower/Leaf/Stem Extract, N-Hydroxysuccinimide, Chrysin, Glutamylamidoethyl Imidazole, Lonicera Caprifolium (Honeysuckle) Flower Extract, Lonicera Japonica (Honeysuckle) Flower Extract, Lavandula Hybrida (Lavandin) Oil, Pentylene Glycol, Butylene Glycol, Cyclodextrin, Caprylyl Glycol, Steareth-20, Citric Acid, Xanthan Gum, Dextran, Acetyl Tributyl Citrate, Potassium Sorbate, Phenoxyethanol, Geraniol, Limonene, Linalool

*Thank you for your attention!*



**Spec-Chem Group**

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