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A slimmer, more defined V-shaped face in four weeks

ABSTRACT

Slimming and skin-firming ingredient Slim-Excess lifts facial contours – helping consumers regain the slender V-shape of a youthful face. An inhibitor of lipogenesis and pre-adipocyte proliferation, as well as a lipolysis activator, Slim-Excess helps redefine the face's oval shape, decrease double chin surface area, and improve skin elasticity – all within just four weeks.

For many, forever young means forever beautiful. But as we grow older, our skin tissue gets tired and starts sagging and slacking. Our facial contours lose their definition. And gradually, the firm V-shape of a youthful face – with its slender jawline and sharp chin – transforms into a heavy U-shape, complete with puffy cheeks, double chin, and droopy eyelids.

A tightly contoured, well-defined face has long been associated with youth and beauty – even before 'Black Sun, Silver Moon', Japan's popular manga series, and 'Hallyu', the Korean wave of pop culture currently sweeping Asia. In China, and especially in South Korea, women and young girls will go to great lengths to slim down their facial contours: In fact, across Asia, a V-shaped face has become the third most coveted aesthetic feature after big eyes and fair skin.

The V-shape trend is fuelling consumers' fight against fatty deposits and superfluous tissue in the jowls and double chins that accompany ageing. It has also led to a sharp rise in demand for face-lifting serums, creams, and masks, which now even come with belts, facial massage rollers (Chinese spoon massages are the latest trend), face yoga, makeup with a face-lift effect, and flattering haircuts. So there can be no doubt that the market is calling for high-performance slimming and skin-firming ingredients.

Reshaping facial contours

In response, experts at BASF Beauty Creations have developed a slimming ingredient with proven efficacy on both the body and face. Slim-Excess® (INCI: Aqua (and) Butylene Glycol (and) Pentylene Glycol (and) Sodium Chloride (and) Hydrolyzed Rhodophyceae Extract (and) Xanthan Gum) redefines the face's oval shape in only four weeks, helps decrease double chin surface area, and improves the skin's overall elasticity. With its fast and clearly visible results, this hydrolysate of *Rhodophycea*, a red algae, beats caffeine as the number one skin slimming ingredient.

Trapping polyamines spermine and spermidine

Slim-Excess was developed based on studies on two polyamines which are found in adipose patients – spermine and its immediate precursor, spermidine. Over the past 30 years, a great deal of research has been conducted on these two polyamines, as they help regulate a number of enzymatic reactions and therefore play a key role in the metabolism of adipocytes (fat-storing cells). By impeding spermine and spermidine, Slim-Excess (now referred to as 'the *Rhodophycea* hydrolysate') controls fat production, combining three modes of action: It inhibits both lipogenesis

Figure 1: *Slim-Excess is a red algae hydrolysate.*

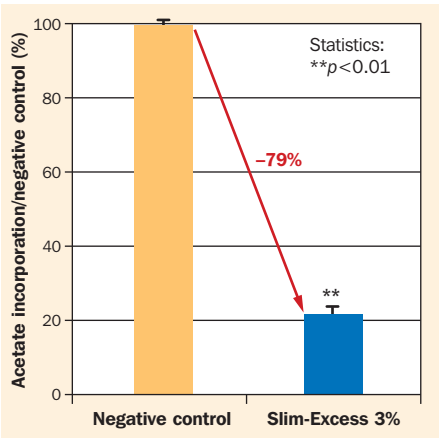

Figure 2: *Slim-Excess enables 79% inhibition of lipogenesis.*

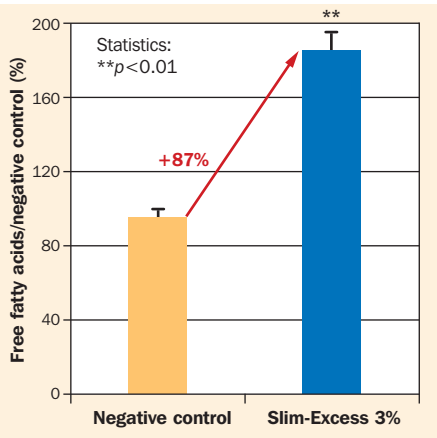

Figure 3: *Slim-Excess enables 87% stimulation of lipolysis.*

Figure 4: *Chin/cheek inflection angle.*

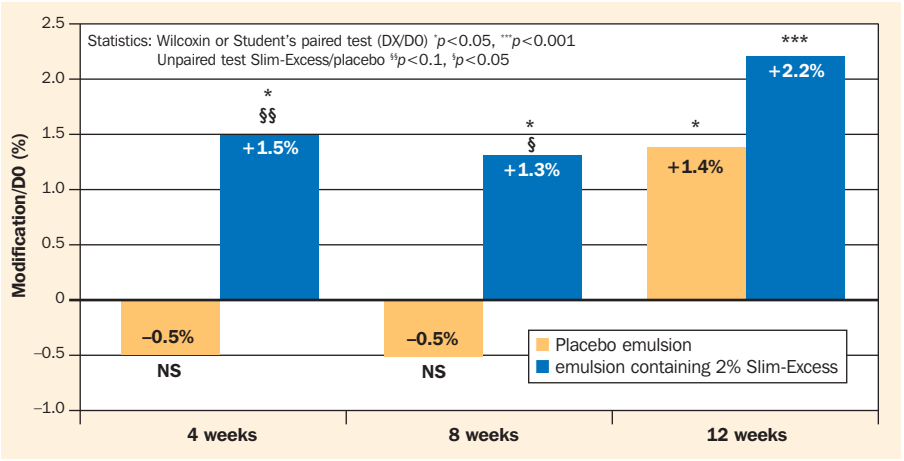

Figure 5: *Effect of Slim-Excess at 2% on cheek/chin inflection angle* vs. *placebo; percentage of modification compared to T0 – using 23 (Slim-Excess) and 26 (placebo) volunteers.*

and pre-adipocyte proliferation, while stimulating lipolysis.

Computer-aided molecular modelling has identified molecules with structures that allow them to form complexes with spermine and spermidine and subsequently deactivate them. Because of its affinity with both of our compounds, kappa-carrageenan (or sulfo-carrabiose), a disaccharide, has proven the most suitable for capturing spermine as well as spermidine. The red seaweed hydrolysate contained in the ingredient is rich in sulfo-carrabiose. This sulfo-carrabiose traps the polyamines directly at the heart of cells, allowing the *Rhodophycea* hydrolysate to inhibit their actions.

Proven efficacy

The efficacy of the *Rhodophycea* hydrolysate has been demonstrated *in tubo*, *in vitro*, and *in vivo*. The virtual results of the molecular modelling were first confirmed *in tubo*, where sulfo-carrabiose solution was shown to deactivate spermine and spermidine on a dose-dependent basis. *In vitro*, human adipocytes obtained through abdominal biopsy and cultured with sulfo-carrabiose exhibited significant results: After one hour of incubation at 37˚C, 3% *Rhodophycea* hydrolysate achieved 79% inhibition of lipogenesis (incorporation of acetate as compared to an untreated control group) and, after two hours of incubation at 37˚C and with slight agitation, 87% stimulation of lipolysis (release of free fatty acids as compared to an untreated control group). In summary, lipogenesis was five times lower than in untreated cells and lipolysis almost two times greater.

In vivo evaluation of facial contouring capabilities

Once the principles of action had been illustrated *in vitro*, two different *in vivo* studies were conducted to evaluate the efficacy of the *Rhodophycea* hydrolysate versus a placebo. The first study focused on the ingredient's facial contouring effect, which was evaluated by measurement of the cheek/chin inflection angle, double chin surface area, and skin biomechanical properties (viscoelasticity). The second study focused on the body slimming effect and is not presented here.

In the first clinical study, the *Rhodophycea* hydrolysate was tested on 49 female Chinese volunteers. All test participants were aged 45 or over and presented with sagging and slackening skin, ptosis in the lower half of the face, and a double chin. They had not undergone (plastic) surgery in the assessment zones, nor had they taken any injections in the previous six months. They also had not used any kind of product with an anti-ageing and/or firming effect on the face or neck during the 15 days preceding the study.

Over 12 consecutive weeks, the volunteers applied an emulsion containing 2% the *Rhodophycea* hydrolysate twice daily to their whole face and neck. At T0 and after 4, 8, and 12 weeks, front and profile photographs were taken of the volunteers' faces in normal light conditions, using a repositioning bench. The front photos were used to measure the cheek/chin inflection angle, while the profile photos were used to evaluate double chin surface area.

Figure 6: *Visible reduction in double chin.*

Effect on chin/cheek inflection angle (*in vivo*)

The signs of ageing can include soft tissue ptosis of the lower face. This causes the outline of the face to become less defined, and an angle to form. As ptosis in the lower face is reduced, this chin/cheek inflection angle grows closer to 180˚. The jawline becomes better defined and the contours smoother. The chin/cheek angle among volunteers had increased by a statistically significant (compared to

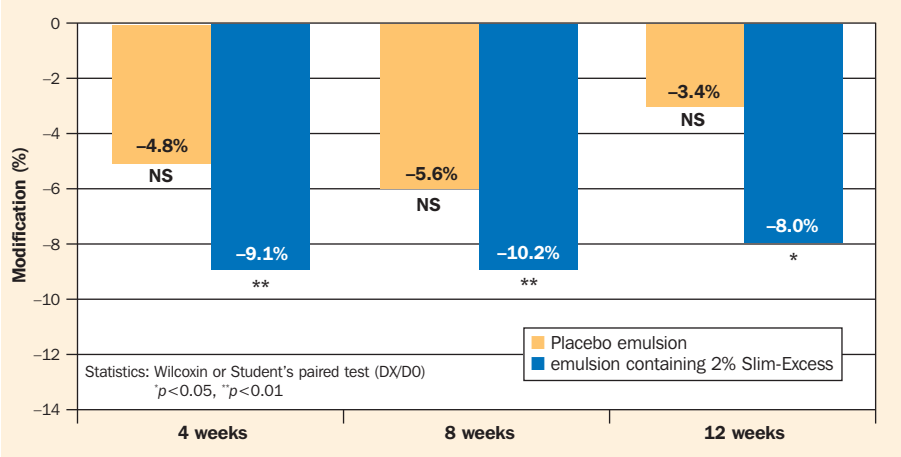

Figure 7: *Effect of Slim-Excess at 2% on double chin surface area vs. placebo; percentage of modification compared to T0 – using 23 (Slim-Excess) and 24 (placebo) volunteers.*

placebo) +1.3% after eight weeks of treatment with the *Rhodophycea* hydrolysate and by a statistically significant (compared to placebo) +2.2% after twelve weeks. After three months of treatment, 82.6% of the study participants showed positive effects.

Effect on double chin area surface (*in vivo*)

There was also a significant reduction in double chin surface area (mm^2) following application of the *Rhodophycea* hydrolysate, versus a placebo formulation: The average reduction was –9.1% after four weeks of treatment with the *Rhodophycea* hydrolysate, and –10.2% after eight weeks. After three months, the reduction in double chin area surface was up to –40% for some volunteers. These results can be clearly observed in volunteers' profile photographs.

At all points in time, the reduction in double chin surface area after placebo treatment was lower than with the *Rhodophycea* hydrolysate, and was not statistically significant compared to T0.

Effect on the skin's biomechanical properties

The skin's viscoelastic behaviour was evaluated with the help of Tonoderm, a non-contact instrument. This directs an airflow with a force of 4 g on to the left cheek, causing a local skin deformation. This deformation is recorded and analysed using a Laser Displacement Sensor Head. Based on the deformation curve, the Cr/Yf ratio is calculated (Cr/Yf = (Yf–Ye)/Yf) as a parameter for the viscoelastic behaviour of the skin. A decrease in the ratio indicates a reduction in the viscosity of the skin and an improvement in elasticity.

After 12 weeks of treatment, the Tonoderm measurement showed a significant reduction in the Cr/Yf ratio of -5.2%. The *Rhodophycea* hydrolysate improved skin elasticity more effectively versus the placebo.

Appearance and formulation data

The *Rhodophycea* hydrolysate is a water-soluble, pale yellow, viscous liquid that does not alter the color of formulations. It can be incorporated into formula at room temperature and is not affected by standard cosmetic processing. Thanks to its neutral behaviour, the *Rhodophycea* hydrolysate remains stable over a large pH range (optimal pH: 4–8). Recommended concentration is 1 to 3%.

The *Rhodophycea* hydrolysate is IECIC 2014 listed. Cosmetic formulations containing the ingredient can be imported to China.

Conclusion

Controlling adipocyte metabolism and, more specifically, reducing fat accumulation, represent key cosmetic challenges to those longing for the slender V-shape of a youthful face. Slim-Excess is a unique slimming ingredient which addresses these challenges. It redefines the oval shape of the face, decreases double chin area surface, and improves skin elasticity within four weeks. It achieves optimal efficacy by combining three modes of action: Slim-Excess inhibits both lipogenesis and pre-adipocyte proliferation, and stimulates lipolysis. In clinical trials, Slim-Excess has been proven to significantly reduce double chin area surface and increase cheek/chin inflection angle – decreasing ptosis in the lower face and redefining the jawline for a more youthful appearance. PC

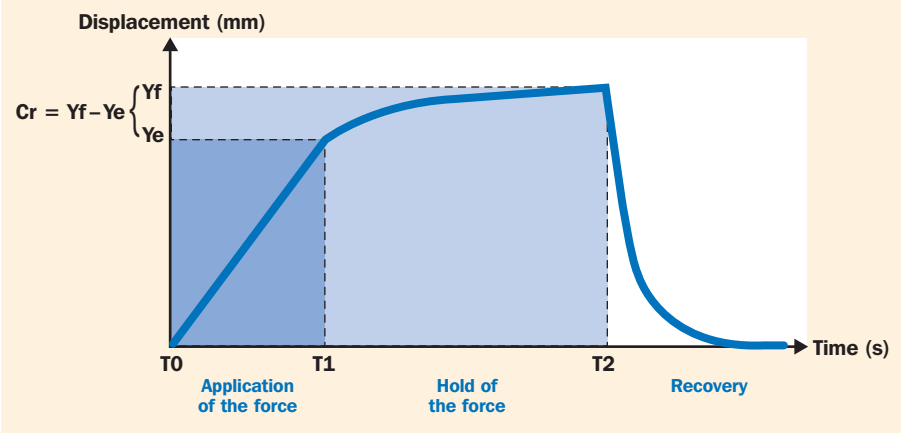

Figure 8: *Skin elasticity demonstrated by means of deformation curve obtained with Tonoderm.*

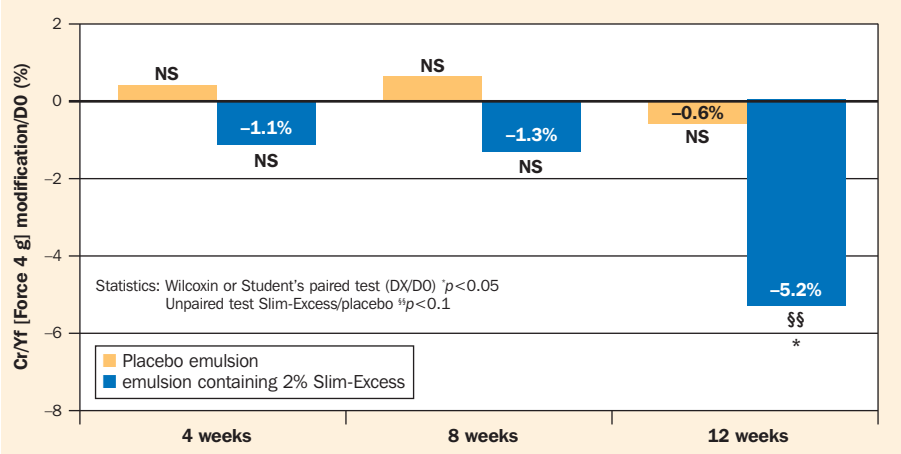

Figure 9: *Effect of Slim-Excess at 2% on biomechanical properties of the skin vs. placebo; percentage of modification compared to T0 – using 23 (Slim-Excess) and 26 (placebo) volunteers.*