

Supplemental Results

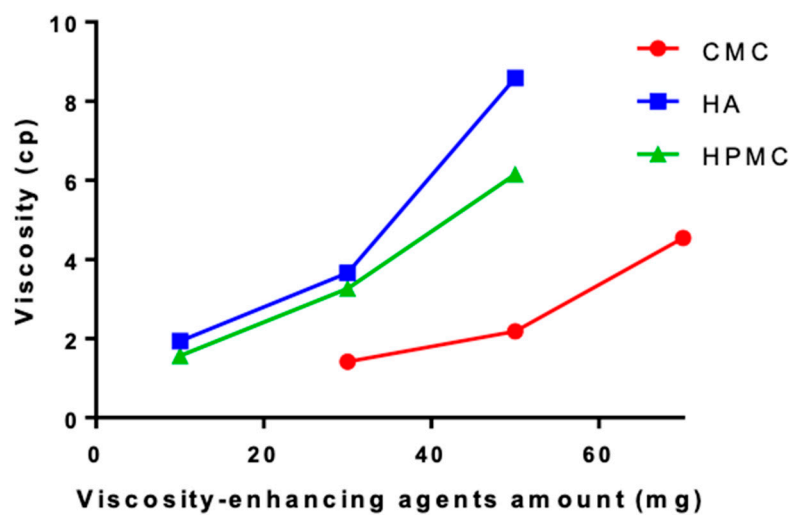


Figure S1. Effect of amount and type of lubricants on viscosity.

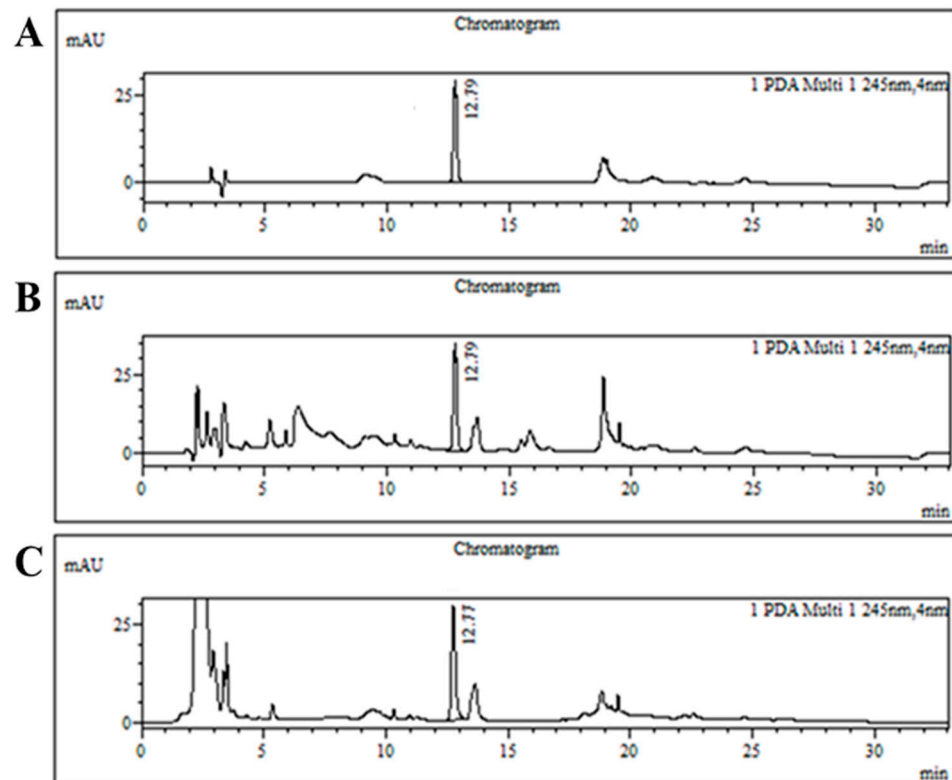


Figure S2. HPLC chromatograms of (A) ecdysterone marker compound, (B) USL 1% solution, and (C) F1.

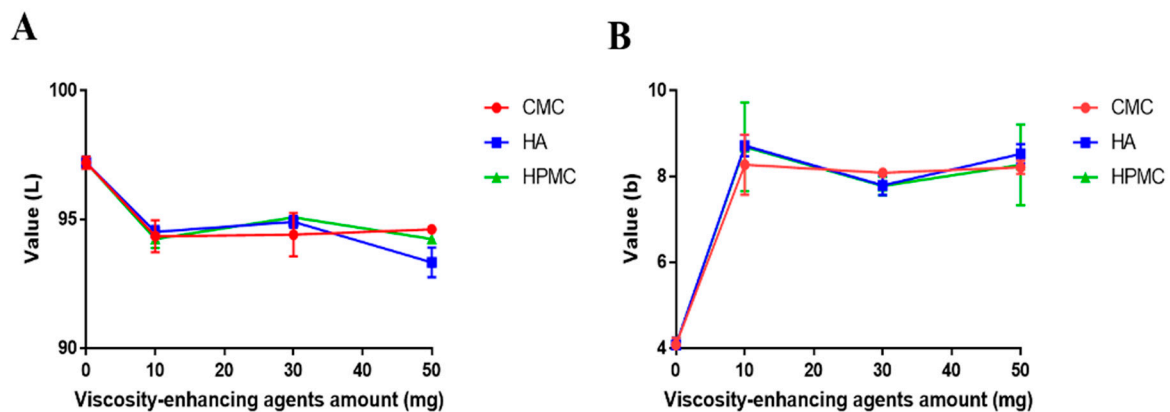


Figure S3. Pigmentation evaluation by measuring the color change on the egg shell membrane according to lubricants amount (A) L^* value, (B) b^* value.

Table S1. The compatibility with additives data and stability evaluation of formulations in 40°C oven storage for 3 weeks

	Ecdysterone content	Transmittance (600 nm)
1% USL and 0.3% HA	100.3 ± 0.4%	98.8 ± 0.1%
1% USL and 0.3% HPMC	99.8 ± 0.2%	98.8 ± 0.5%
1% USL and 0.5% CMC	99.9 ± 0.8%	98.8 ± 0.3%
1% USL and 0.9% NaCl	99.1 ± 0.3%	98.6 ± 0.2%
1% USL and 0.5% phosphate buffer	99.8 ± 0.6%	99.2 ± 0.3%
1% USL and 0.01% BZK	99.3 ± 0.2%	82.2 ± 1.6%
F1	99.6 ± 1.3%	99.5 ± 0.2%
F2	100.3 ± 0.5%	98.7 ± 0.2%
F3	99.5 ± 1.0%	99.1 ± 0.2%
F4	99.1 ± 0.2%	99.3 ± 0.2%

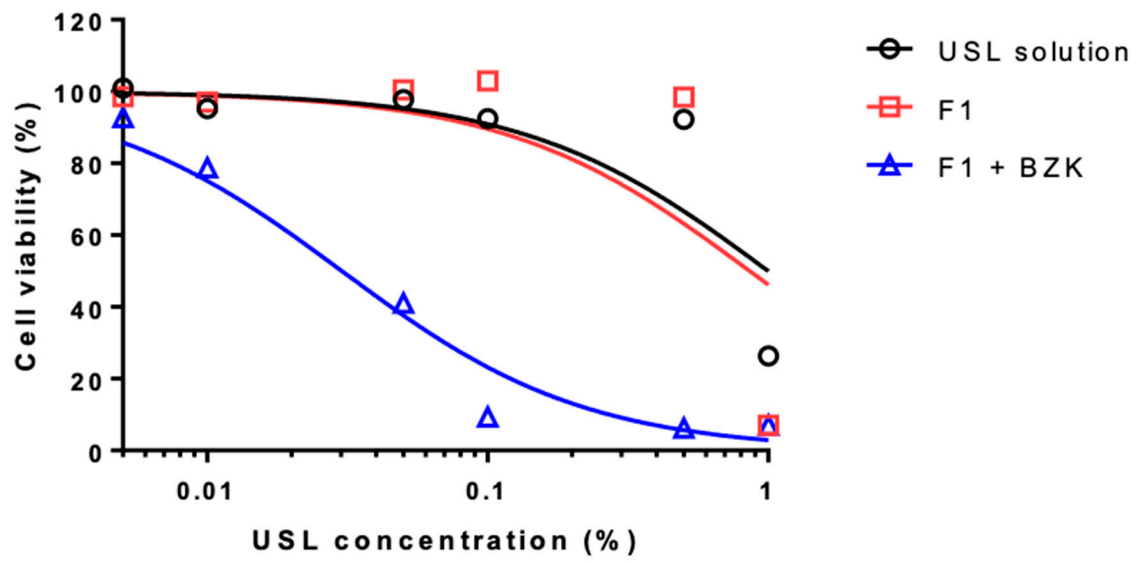


Figure S4. Cytotoxicity of USL, F1 and F1 + BZK in conjunctival epithelial cell for 12 h.

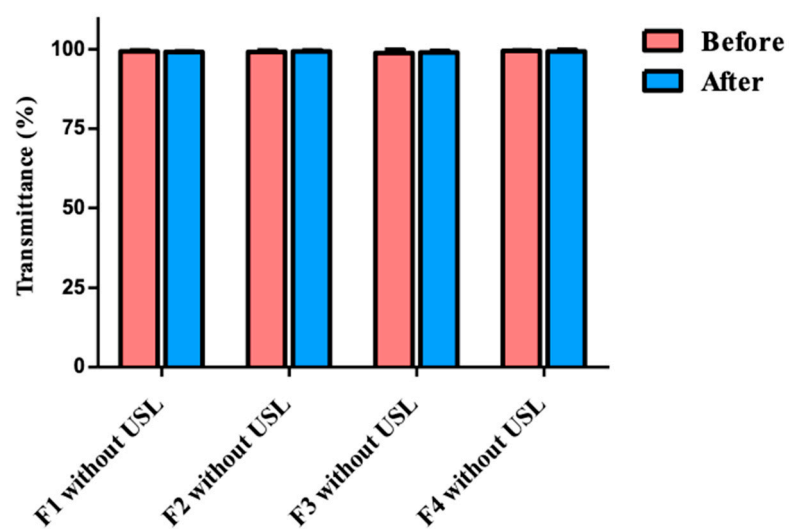


Figure S5. Stability evaluation of precipitation after thermal condition (121°C, 30 min) of each formulation without USL (n=3).