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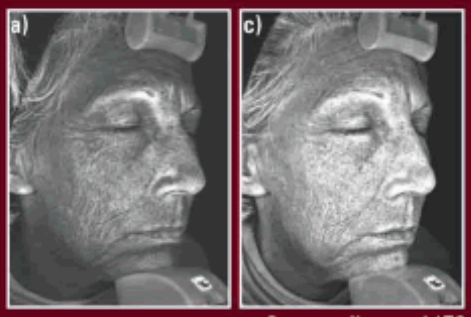

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A Double-blind, Randomized, Controlled Clinical Trial Evaluating the Efficacy and Tolerance of a Novel Phenolic Antioxidant Skin Care System Containing *Coffea arabica* and Concentrated Fruit and Vegetable Extracts

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ABSTRACT

Objective: This 12-week, double-blinded, randomized, controlled clinical usage study was conducted to evaluate the efficacy and tolerance of a novel topical, multi-ingredient, polyphenol, high antioxidant skin care system (facial wash, day lotion, night crème and eye serum) to reduce the appearance of photoaging.

Methods: A total of 40 Caucasian female participants were randomly assigned to apply the test regimen or control regimen for 12 weeks. One group washed with the test antioxidant facial wash twice daily, applied the test antioxidant day lotion each morning and the test antioxidant night creme and eye serum each evening. The second group washed with a control facial wash twice daily and applied a control moisturizer each morning and evening. Clinical evaluations for efficacy were made by a board-certified dermatologist at baseline and after six and 12 weeks of product use. Efficacy was also measured by subjects' self-assessments and via photography and instrumentation.

Results and Conclusion: Overall, the results of the study showed that the test regimen produced statistically significant improvements in the appearance of photodamaged skin. Most impressive was the significantly greater improvements produced by the test regimen over the control regimen for nearly every grading parameter. The results from this study demonstrate that this high Total ORACsc scoring antioxidant skin care system was well tolerated, with no adverse events reported by the participants during the course of the study, and improved, significantly greater than a control regimen, the appearance of wrinkles, firmness, hyperpigmentation, blotchy redness, tactile roughness and clarity in photodamaged skin. Post-baseline clinical grading scores, silicone replica parameters, cutometer and corneometer scores were statistically compared to baseline using a paired *t* test at the $P \leq 0.05$ significance level.

INTRODUCTION

Background

The processes of photodamage of the skin are related to oxidative stress caused by reactive oxygen species.[1–3] Oxidative damage occurs because of both intrinsic and extrinsic mechanisms.[1–3] The skin uses a series of intrinsic antioxidants to protect itself from free radical damage. It has been demonstrated that topical antioxidant use can provide additional protection from oxidative damage, retard skin aging and improve skin appearance.[4,5]

Polyphenols are the primary components responsible for antioxidant capacity of fruits, herbs, vegetables, grains, tea, coffee, propolis and red wine.[6–14] They make up one of the most numerous groups of substances in the plant kingdom.[15,16] Polyphenol antioxidants function to neutralize free radicals by donating a hydrogen atom to the radicals.[15] They also act as chelators of transition metals that are involved in free radical production and oxidative reactions.[15,17,18]

Coffee fruit extract is a product derived from the un-ripened fruit of the coffee plant, *Coffea arabica*. The extract contains a variety of active polyphenol compounds.[3,18–21] Preliminary evidence suggests that this extract has potential in improving fine lines and wrinkles, erythema, hyperpigmentation and overall appearance.[20,22]

Total Oxygen Radical Absorbance Capacity (ORAC) is a standardized test adopted by the U.S. Department of Agriculture to measure the antioxidant potency of foods, Total ORACfn and skin care, Total ORACsc. This novel antioxidant skin care system underwent Total ORACsc testing and scored over 18,000 micromole TE/g for the day lotion, over 49,000 umole TE/g for the night creme and over 79,000 umole TE/g for the eye serum. Total ORACsc testing was also performed on 12 other leading physician and over the counter antioxidant skin care products and these scores averaged 6,970 umole TE/g. It is because of the significantly higher Total ORACsc score of the test regimen that interest for this study developed to investigate

TABLE 1.

Inclusion and Exclusion Criteria for Clinical Trial
Inclusion Criteria
1. Caucasian females age 4–60 who are in general good health as determined by reported participant history.
2. Fitzpatrick skin type I, II, III or IV and Modified Glogau score of II or III as determined by the study investigator.
3. Self perceived dry facial skin and willingness to undergo two to five days of washout of facial moisturizer use, depending on each individual's degree of dry skin.
4. Willingness to cooperate and participate by following study requirements and to report any adverse symptoms immediately.
5. Individuals who typically moisturize the face twice daily and who are willing to replace their facial regimen with the assigned test materials.
6. Individuals who use a UVA/UVB facial sunscreen daily of at least SPF 30.
7. Willingness to remove all facial makeup at least thirty minutes prior to every visit.
8. Individuals who are taking hormones must have been on a stable regimen for at least one month prior to the study start and are willing to maintain their current routine of hormone use for the duration of the study.
Exclusion Criteria
1. Individuals having any disease or condition of the skin that the examining investigator deemed inappropriate for participation, due to potential interference with the study.
2. Individuals with uncontrolled metabolic disease such as diabetes, hypertension, hyperthyroidism or hypothyroidism as determined by the health questionnaire.
3. Women known to be pregnant, nursing or planning to become pregnant within the next six months as determined by the participant reported history.
4. Individuals who have used Retin-A®, Renova® or other prescription facial treatments within the past six months or Accutane® within the past year and agree not to begin using these or similar treatments during the course of the study.
5. Women who had a mid-depth or superficial facial chemical peel, microdermabrasion, Botox®, filler or laser treatments within one year of the study start additionally, subjects will agree to refrain from having any of the procedures listed above (or similar procedures) performed during the course of the study.
6. Individuals who have routinely used any anti-aging, anti-wrinkle, skin lightening products or any other product or topical or systemic medication known to affect skin aging or dyschromia (products containing alpha/beta/poly hydroxy acids, vitamin C, soy, Q-10, hydroquinone; systemic or topical retinoids, etc. [including antioxidant supplements]) at least 30 days prior to the study entry.
7. Willingness to refrain from sun exposure for the duration of the study, especially from the peak hours of 10:00 am to 6:00 pm. Short-term (20-minute) exposure is acceptable during off-peak hours if a UVA/UVB sunscreen of SPF 30 or higher is used.
8. Current participation on any facial usage study and willingness not to begin any other facial study.
9. Individuals having an allergy or strong sensitivity to any personal care product.

the link between the use of a potent, multi-ingredient, polyphenol topical antioxidant product and the clinical reduction of the signs of photoaging.

Objective

To evaluate the efficacy and tolerance of a multi-ingredient, polyphenol, high antioxidant skin care system for treating wrinkles, firmness, hyperpigmentation, blotchy redness, tactile roughness and clarity.

Methods

Multiple polyphenol antioxidant actives have been incorporated into a novel skin care system that was tested for tolerance and efficacy on a group of 40 Caucasian female participants with self-perceived dry facial skin and mild to moderate facial photodamage, who regularly use a moisturizer at least twice daily and a UV-A/UV-B facial sunscreen of SPF 30 or greater daily. Specific inclusion and exclusion criteria are provided in Table 1. Table 2 shows a demographic summary. Participants had a Fitzpatrick skin type of I–IV and a Glogau score of II or III (Tables 3 and 4). At baseline, prospective participants read and signed an informed consent agreement and a HIPAA agreement. Participants arrived at the clinic having undergone a two to five day washout period from moisturizers and having removed all facial makeup at least 30 minutes prior to the visit. There was also a 30-day wash out period from anti-aging products including topical antioxidants or skin lightening products such as hydroquinone, vitamin C, soy and alpha/beta/poly hy-

TABLE 2.

Summary of the Demographic Information of the Study Participants*		
Demographic Summary		**All Subjects (n=34)**
Age (Years)	Mean Age±Standard Deviation	53.65±4.11
	Minimum Age	45.76
	Maximum Age	60.49
Fitzpatrick Skin Type	II	28 (82.4%)
	III	6 (17.6%)
Glogau Score	II	15 (44.1%)
	III	19 (55.9%)

*For Fitzpatrick skin type and Glogau score, the number of participants in each category is listed, followed by the percentage of the participant sample in parentheses.

TABLE 3.

Categories Fitzpatrick Skin Types*	
I	Always burns easily; never tans
II	Always burns easily; tans minimally
III	Burns moderately; tans gradually
IV	Burns minimally; always tans well
V	Rarely burns; tans profusely
VI	Never burns; deeply pigmented

*The Fitzpatrick skin classification is based on the skin's unprotected response to the first 30–45 minutes of sun exposure after a winter season without sun exposure.

TABLE 4.

Modified Glogau Classification	
I	Slight to Mild: No keratoses or scarring; little wrinkling
II	Mild to Moderate: Early actinic keratoses; slight yellow skin; discoloration; early wrinkling; parallel smile line
III	Moderate to Advanced: Actinic keratoses; obvious yellow skin; discoloration with telangiectasia; wrinkling; present at rest
IV	Severe: Actinic keratoses; skin cancers have occurred; wrinkling; much cutis laxa of actinic, gravitational and dynamic origin

droxy acids. In addition, there was a six-month wash out period from topical retinoids and other prescription antiaging topical treatments. There was a one-year wash out period for cosmetic procedures such as chemical peels, microdermabrasion, Botox®, dermal fillers and laser treatments.

Participants were randomly assigned to apply the test regimen or control regimen, in accordance with a randomization scheme, for 12 weeks. One group washed with the test antioxidant facial wash twice daily, applied the test antioxidant day lotion each morning and the test antioxidant night creme and eye serum each evening. The second group washed with a control facial wash twice daily and applied a control moisturizer each morning and evening. Table 5 shows usage instructions. Clinical evaluations for efficacy (wrinkles, firmness, hyperpigmentation, blotchy redness, tactile roughness and clarity) were made at baseline and after six and 12 weeks of product use. Efficacy was also measured by subjects' self-assessments and via photography (digital photography and VISIA imaging) and instrumentation (silicone replicas, cutometer and corneometer measurements).

This 12-week double-blinded, randomized, controlled study evaluated participants clinically, by a board-certified dermatologist, by participants' self-assessments and via photography and instrumentation.

TABLE 5.

Study Instructions
Test Regimen Usage Instructions*
Facial Wash: – Use twice a day: morning and evening. – Gently cleanse the entire face, rinse with cool or tepid water and pat dry. – Avoid getting cleanser in the eyes, and do not use it to remove mascara or other eye makeup.
Day Lotion: – Use once daily in the morning after cleansing. – Smooth enough product into the skin to cover the entire face and neck. – After well absorbed (5–10 minutes), follow with your regular brand of UVA/UVB sunscreen (at least SPF 30).
Eye Serum: – Use in the evening daily after cleansing. – Gently smooth the eye serum onto the upper and lower eyelids and the crow's feet areas.
Night Creme: – Use once daily in the evening after cleansing. – Smooth enough product into the skin to cover the entire face and neck.
Control Regimen Usage Instructions:
Facial Wash: – Use twice a day, in the morning and evening. – Wet hands and face. Mix cleanser with water and work into a creamy lather. Cleanse face with gentle massaging motion. Rinse thoroughly.
Facial Lotion: – Use once or twice a day, as desired, after cleansing. – Smooth enough product into the skin to cover the entire face and neck.

Subjects were distributed a unit of the assigned test material, a calendar of future visits, a daily diary, and the following detailed verbal and written usage and study instructions

TABLE 6.

Clinical Grading*
Wrinkles: 0=none and 9=severe
Firmness: 0=firm, taught and 9=loose, lax
Hyperpigmentation: 0=none and 9=severe
Blotchy redness: 0=none and 9=severe
Tactile roughness: 0=smooth feel and 9=rough feel
Clarity: 0=dull, matte appearance and 9=bright radiant skin

TABLE 7.

Guidelines Used to Assess Any Adverse Event Related to the Use of the Test Regimen, Based Upon Available Information	
0=Unlikely	No temporal association, or the cause of the event has been identified, or the test article cannot be implicated
1=Possible	Temporal association, but other etiologies are likely to be the cause; however, involvement of he test article cannot be excluded.
2=Probable	Temporal association, other etiologies are possible, but not likely.
3=Definite	Clear-cut temporal association

Clinical Grading

At baseline, week 6 and week 12, participants' faces were visually graded for wrinkles, firmness, hyperpigmentation, blotchy redness, tactile roughness and clarity. Table 6 shows the clinical grading scale used.

At week 6 and week 12 the test materials and diaries were returned and inspected for usage compliance. New test material units were distributed, as needed.

Instrumentation

Qualified participants rested quietly for at least 15 minutes to acclimate to ambient temperature and humidity conditions. During the course of the study, the waiting and instrumentation rooms were maintained at a temperature of 20–22°C with a relative humidity of 41–52 percent. Subjects participated in the procedures.

Photography

One digital image using a Nikon 300 camera with visible lighting was taken of each subject at baseline, week 6 and week 12 (on the right or left side of the face, as selected by the grader) to document visible changes in the skin. Photographs taken at each post-baseline time point were compared to the baseline photographs to ensure consistent focus, lighting, placement and color. Color standards were photographed prior to beginning each photography session.

VISIA

One visible light, cross-polarized, UV reflective and UV fluorescent digital VISIA image was taken of each participant at baseline, week 6 and week 12 (on the right or left side of the face, as selected by the grader). Each participant's eyes were held gently shut, and the hair was restrained from the face with a black headband.

Silicone Replica

One silicone replica, which are negative impressions of the skin's surface features, was taken on each subject's right or left crow's foot area at baseline, week 6 and week 12 to document changes in the total wrinkle area, percent wrinkle area and average wrinkle depth. Replicas were created by mixing a silicone base with a catalyst and then placing the material in a foam ring or other template, which was centered in the selected test site area. Once the silicone base was mixed with the catalyst, the silicone hardened to create a negative impression of the topography of the skin.

Corneometer Measurements

Corneometer CM 825 (Courage + Khazaka, Germany) measurements were taken at baseline and week 6 on each subject's right or left ocular bone, directly below the center of the eye. The corneometer quantifies the moisture content in the stratum corneum by an electrical capacitance method. The measurements have no units but are related to the change in capacitance of the surface layers of the skin and increase as the skin becomes more hydrated.

Cutometer

A single cutometer MPA 580 measurement was taken on the center of each subject's right or left cheek, in line with the center of the eye on the ocular bone at baseline, week 6 and week 12 to measure the resiliency and extensibility of the skin. The instrument applied a vacuum to a small area of skin, and the elastic response of the skin was measured by an optical technique. A vacuum of 300 millibar was applied to the skin through an 8-millimeter probe for a 30-second measurement, in two repetitions of five seconds on (vacuum) time and 10 seconds off (skin release) time. Scores for resiliency and recoil increase as the skin becomes more elastic.

Self Assessment Questionnaires

At week 12, subjects completed questionnaires to evaluate their skin condition.

Adverse Events

Adverse events were evaluated as to their severity and relation to the test article (Table 7). The severity of adverse events were graded as follows: mild=awareness of a sign or symptom but easily tolerated; moderate=discomfort sufficient to cause interference with usual activity or to affect clinical status; and severe=incapacitating with inability to do usual activity or to significantly affect clinical status.

FIGURE 1. Digital photographs at baseline and week 12. **a)** Baseline: Forehead wrinkling at rest. **b)** Week 12: Forehead wrinkling improved at rest. Photos taken by Thomas J. Stephens & Assoc., Inc.

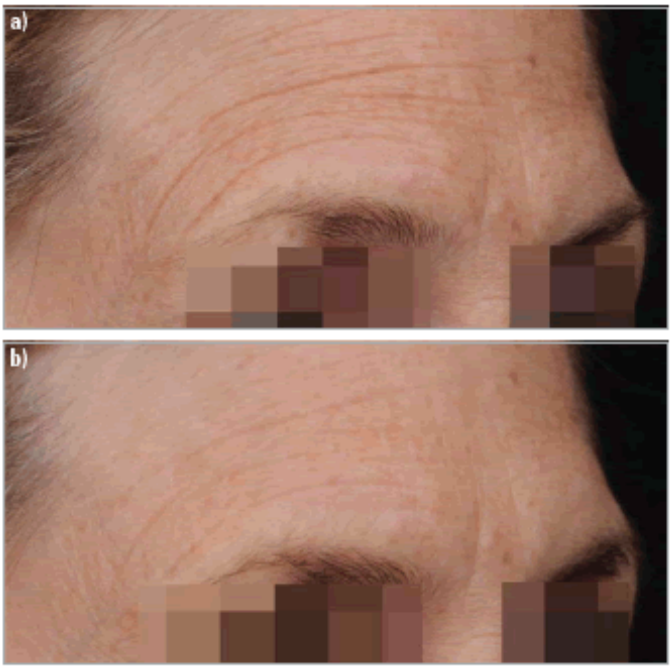


FIGURE 2. Digital photographs at baseline and week 12. **a)** Baseline: Lateral chin and jowl wrinkling and laxity. **b)** Week 12: Lateral chin and jowl wrinkling and firmness improved. Photos taken by Thomas J. Stephens & Assoc., Inc.

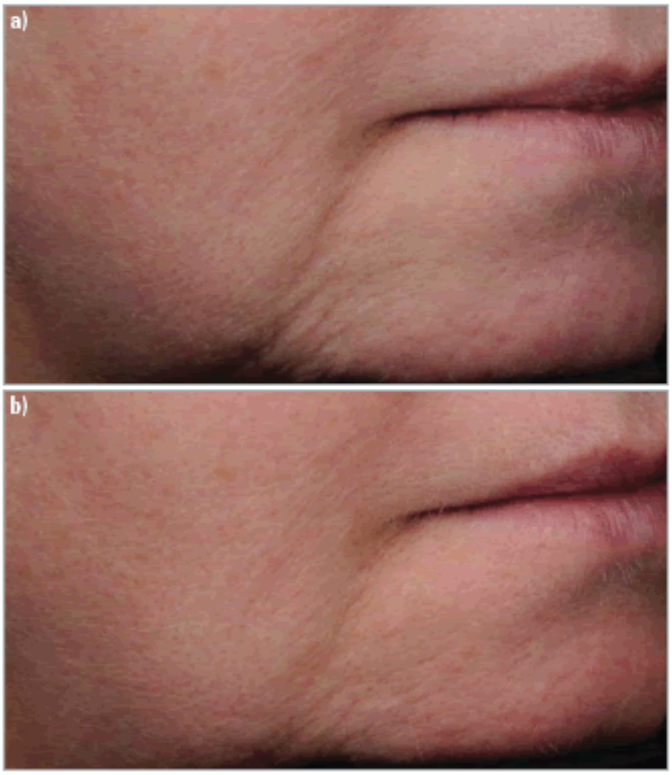
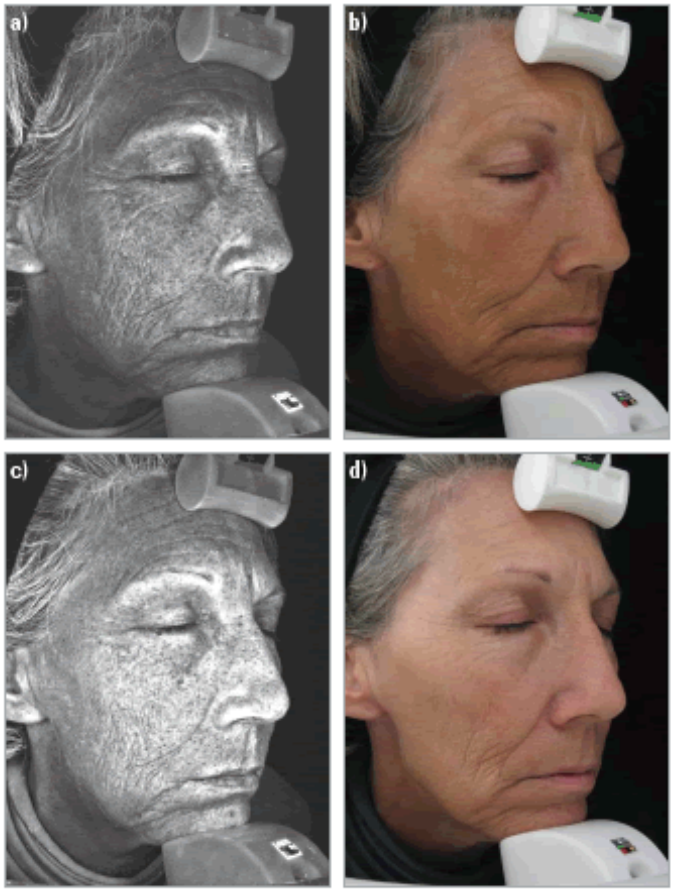


FIGURE 3. VISIA imaging and digital photography at baseline and week 6. **a)** VISIA Image at baseline. **b)** Digital Photography at baseline. **c)** VISIA image at week 6. **d)** Digital photography at week 6.



Participant Disposition

Of the 40 participants enrolled in the study, 34 participants completed the 12-week clinical trial. Four of the participants were dropped from the study because they missed their scheduled study visit, and two participants were dropped from the study because the investigators were unable to obtain cutometer readings.

Adverse Events

No adverse events were reported by the participants during the course of the study.

Statistical Methods

Post-baseline clinical grading scores, silicone replica parameters, cutometer scores and corneometer scores were statistically compared to baseline using a paired *t* test at the $P \leq 0.05$ significance level. Mean percent change and incidence of improvement were calculated for each attribute for each visit. Self-assessment questionnaires were tabulated and a top/bottom box analysis was performed. Comparisons between the test regimen and control regimen were conducted using analysis of variance (ANOVA).

Clinical Results

Overall, results of the study showed that the test regimen produced statistically significant improvements in the appearance of photodamaged skin. The results are supported by clinical grading, instrumentation, subjects' self-assessment questionnaires and digital and VISIA imaging (Tables 8, 9 and 10 and Figures 1, 2 and 3). Most impressive was the significantly greater improvements produced by the test regimen over the control for nearly every grading parameter. Additionally, subjects using the test regimen reported a much greater number of significant improvements than those using the control regimen. By week 12, a significantly greater number of subjects using the test, but not the control regimen, reported positive benefits for wrinkles, skin feeling softer, brightness/radiance, elasticity/resilience, skin tone more even and more youthful look. Results of the corneometer measurements showed that participants using the test and control regimens showed a 15 and 19 percent decrease in skin hydration at week 6, respectively, when compared to baseline. The fact that both groups produced nearly the same decrease suggests that it was caused by an external factor such as drier weather at week 6 compared to baseline. Results of the cutometer measurements showed that the test, but not control, regimen significantly improved skin extensibility at week 6 and week 12, when compared to baseline.

TABLE 8.

Clinical Photoaging Parameters							
			Baseline	Week 6	PΔ	Week 12	PΔ
Clinical Grading	Wrinkles	Test Regimen (n=23)	5.04	56.5%	**<0.0001**	69.5%	**<0.0001**
		Control Regimen (n=11)	3.91	0%	0.3409	9%	1.0000
	Firmness	Test Regimen (n=23)	5.72	73.9%	**<0.0001**	100%	**<0.0001**
		Control Regimen (n=11)	5.73	27.2%	0.0816	81.8%	**0.0004**
	Hyperpigmentation	Test Regimen (n=23)	4.04	39.1%	**0.0023**	78.2%	**<0.0001**
		Control Regimen (n=11)	3.41	0%	0	36.3%	0.0531
	Blotchy Redness	Test Regimen (n=23)	3.09	52.1%	**0.0085**	82.6%	**<0.0001**
		Control Regimen (n=11)	2.68	9%	1.0000	45.4%	**0.0261**
	Tactile Roughness	Test Regimen (n=23)	5.07	100%	**<0.0001**	100%	**<0.0001**
		Control Regimen (n=11)	5.77	63.6%	**0.0046**	81.8%	**0.0008**
	Clarity	Test Regimen (n=23)	5.43	95.6%	**<0.0001**	100%	**<0.0001**
		Control Regimen (n=11)	5.00	36.3%	**0.0379**	81.8%	**0.0004**
Irritation Grading	Scaling/Dryness	Test Regimen (n=23)	0.09	8.6%	0.1619	4.3%	1.0000
		Control Regimen (n=11)	0.27	27.2%	0.0816	9%	1.0000
	Burning/Stinging	Test Regimen (n=23)	0.00	0%	0.1619	0%	0.3282
		Control Regimen (n=11)	0.00	0%	0.0000	0%	0.0000
	Tight/Dry Feeling	Test Regimen (n=23)	0.70	43.4%	0.1187	47.8%	**0.0005**
		Control Regimen (n=11)	0.64	27.2%	0.2767	45.4%	0.816
Cutometer	Extensibility	Test Regimen (n=23)	1.34	22.7%	**<0.0001**	21.7%	**0.0460**
		Control Regimen (n=11)	1.32	27.2%	0.0973	45.4%	0.7240
Replicas (Total Wrinkles)	Total (Sum) Wrinkle Area	Test Regimen (n=22)	5.17	70%	0.1892	77.2%	**0.0165**
		Control Regimen (n=11)	5.85	63.6%	0.2099	72.7%	0.0576
	Percent Wrinkle Area	Test Regimen (n=22)	0.19	70%	0.1892	77.2%	**0.0165**
		Control Regimen (n=11)	0.22	63.6%	0.2099	72.7%	0.0576
	Average Wrinkle Depth	Test Regimen (n=22)	0.04	60%	0.4114	81.8%	**0.0046**
		Control Regimen (n=11)	0.04	63.6%	0.6250	72.7%	**0.0356**
Corneometer		Test Regimen (n=23)	57.59	26%	**0.0050**		
		Control Regimen (n=11)	61.16	18.1%	0.0694		

Percent of participants with improvement.
P values in bold are statistically significant with a value of ≤0.05.

TABLE 9.

Mean Values For Visual Grading and Instrumentation

			Baseline	Week 6		Week 12	
Clinical Grading	Wrinkles	Test Regimen (n=23)	5.04	4.70 ⇩	(-6.8%)	4.48 ⇩	(-11.2%)
		Control Regimen (n=11)	3.91	3.95	(1.1%)	3.91	(0.0%)
	Firmness	Test Regimen (n=23)	5.72	5.33 ⇩	(-6.8%)	4.70 ⇩	(-17.8%)
		Control Regimen (n=11)	5.73	5.59	(-2.3%)	5.23 ⇩	(-8.7%)
	Hyperpigmentation	Test Regimen (n=23)	4.04	3.80 ⇩	(-5.9%)	3.46 ⇩	(-14.5%)
		Control Regimen (n=11)	3.41	3.41	(0.0%)	3.18	(-6.6%)
	Blotchy Redness	Test Regimen (n=23)	3.09	2.67 ⇩	(-13.3%)	2.17 ⇩	(-29.5%)
		Control Regimen (n=11)	2.68	2.68	(0.0%)	2.36 ⇩	(-11.8%)
	Tactile Roughness	Test Regimen (n=23)	5.07	3.50 ⇩	(-30.9%)	2.28 ⇩	(-54.9%)
		Control Regimen (n=11)	5.77	5.32 ⇩	(-7.8%)	4.68 ⇩	(-18.8%)
	Clarity	Test Regimen (n=23)	5.43	4.72 ⇩	(-13.2%)	3.83 ⇩	(-29.6%)
		Control Regimen (n=11)	5.00	4.82 ⇩	(-3.6%)	4.41 ⇩	(-11.8%)
Irritation Grading	Scaling/Dryness	Test Regimen (n=23)	0.09	0.00	(-100%)	0.09	(0%)
		Control Regimen (n=11)	0.27	0.00	(-100%)	0.27	(0%)
	Burning/Stinging	Test Regimen (n=23)	0.00	0.09	(0%)	0.04	(0%)
		Control Regimen (n=11)	0.00	0.00	(0%)	0.00	(0%)
	Tight/Dry Feeling	Test Regimen (n=23)	0.70	0.35	(-50%)	0.09 ⇩	(-87.5%)
		Control Regimen (n=11)	0.64	0.36	(-42.8%)	0.09	(-85.7%)
Cutometer	Extensibility	Test Regimen (n=22)	1.34	1.50 ⇧	(12.2%)	1.43 ⇧	(6.1%)
		Control Regimen (n=11)	1.32	1.42	(7.5%)	1.30	(-1.8%)
Silcone Replicas (Total Wrinkles)	Total (Sum) Wrinkle Area	Test Regimen (n=22)	5.08	4.71	(-9.7%)	4.08 ⇩	(-21.1%)
		Control Regimen (n=11)	5.85	4.93	(-15.6%)	4.71	(-19.4%)
	Percent Wrinkle Area	Test Regimen (n=22)	0.19	0.18	(-9.7%)	0.15 ⇩	(-21.1%)
		Control Regimen (n=11)	0.22	0.19	(-15.6%)	0.18	(-19.4%)
	Average Wrinkle Depth	Test Regimen (n=22)	0.04	0.04	(-4.0%)	0.03 ⇩	(-11.4%)
		Control Regimen (n=11)	0.04	0.04	(-2.9%)	0.03 ⇩	(-9.1%)
Corneometer		Test Regimen (n=23)	57.59	48.86 ⇩	(-15.1%)		
		Control Regimen (n=11)	61.16	49.49	(-19.0%)		

⇧ Indicates a statistically significant ($P \leq 0.05$) increase compared to baseline.
⇩ Indicates a statistically significant ($P \leq 0.05$) decrease compared to baseline.

DISCUSSION AND CONCLUSION

This 12-week, double-blinded, randomized, controlled clinical usage study was conducted to evaluate the ability of a novel topical, multi-ingredient, polyphenol, high antioxidant facial regimen to reduce the appearance of photoaging. The results from this study demonstrate that this high Total ORACsc scoring antioxidant skin care system was well tolerated and improved, significantly greater than a control regimen, the appearance of wrinkles, firmness, hyperpigmentation, blotchy redness, tactile roughness and clarity in photodamaged skin. No adverse events were reported by the participants during the course of the study. These results support the link between topical antioxidant use and the improvement of the clinical signs of photoaging. Further studies on a larger scale are warranted.

DISCLOSURES

Presented in part at the International Society of Antioxidants in Nutrition and Health 6th International Conference on Skin Aging and Antioxidants, October, 2009, Malta.

This study was sponsored by Dr. Palmer's LLC, www.replere.com.

TABLE 10.

Self-Assessment Questionnaires	Control Regimen		Test Regimen	
	Top Box	*P* Value	Top Box	*P* Value
Periorbital wrinkles improved	54.5%	1.0000	82.6%	**0.0026**
Skin feels softer	81.8%	0.0654	100.0%	**<0.0001**
Improved skin brightness/radiance	72.7%	0.2266	86.9%	**0.0005**
Increased periorbital elasticity/resilience	54.5%	1.0000	78.2%	**0.0106**
Products are mild and did not irritate my skin	90.9%	**0.0117**	95.6%	**<0.0001**
Products are mild and did not irritate my eyes	90.9%	**0.0117**	95.6%	**<0.0001**
Skin is healthier	72.7%	0.2266	86.9%	**0.0005**
Skin feels more moisturized	72.7%	0.2266	73.9%	**0.0347**
More even skin tone	45.4%	1.0000	82.6%	**0.0026**
Skin more youthful	36.3%	0.5488	78.2%	**0.0106**

P values show significance at a value of ≤0.05 and are shown in bold.

Dr. Palmer is an educator for Allergan and Intendis, but has no financial interests in these companies.

Dr. Palmer is a managing member of Dr. Palmer's LLC.

Dr. Kitchin has no relevant conflicts of interest to disclose.

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