SchoolSmart

Report/ SchoolSmart Sciences, Inc.: Mortality Bioassay of Human Head Louse, Pediculus capitis, to SchoolSmart Pediculicide Formulation.

Joseph Strycharz § , Kyong Sup Yoon § and J. Marshall Clark §
§ Department of Veterinary and Animal Science, University of Massachusetts, Amherst,
Massachusetts 01003

Objective: Determine mortality of SchoolSmart against permethrin-resistant head lice (SF-HL).

Materials and Methods

Louse Strains: Permethrin-resistant human head lice (SF-HL) were collected from infested children in Plantation and Homestead, FL and maintained on an artificial feeding system at the University of Massachusetts at Amherst, MA [1,2]. The SF-HL strain has previously been determined to be susceptible to Ovide® treatments [3].

Bioassays and Chemicals: Mortality bioassays were performed to determine lethal time 50 (LT50) values of the SchoolSmart formulation compared to LT50 values of the formulated pediculicides (Nix® and Ovide®). SchoolSmart dilutions were prepared from concentrate in distilled deionized water (ddH2O) at the instructed dilution of 1 part SchoolSmart concentrate for every 16 parts ddH2O (1:16) and a 1% (v/v) SchoolSmart dilution in ddH2O for comparison. Ovide® formulation containing 0.5% malathion, Nix® formulation containing 1% permethrin (v/v), and ddH2O were used as positive and negative controls, respectively, for comparison. All lice used in experiments were newly hatched first instars, randomly taken from the artificial feeding system and were fully satiated with blood meal prior to treatment.

Individual lice (15 lice/treatment) were gently handled using sterile forceps, submerged into a 1 ml aliquot of treatment for 5 sec then transferred to filter paper. After ten minutes, lice were individually washed by dipping them into three different water baths, each for 5 sec, containing ~10 ml of ddH2O. Washed lice were placed into labeled Petri dishes lined with filter paper and moved to an incubator (30 C, 75-85 % RH) for the remainder of the assay. For each treatment, the numbers of dead lice were counted under a dissecting microscope at hourly time intervals until 100% mortality was reached. A louse was considered dead if it could not right itself when inverted and legs had ceased all movement. Log time versus logit percent mortality regressions were generated to determine LT50 values and maximum log-likelihood ratio tests were performed to test the equality (slope and intercept) of the regression lines (Polo PC, LeOra Software, 1987)

Results

The mortality responses to all three of the SchoolSmart treatments (undiluted, 1:16, and 1%) were significantly faster compared to the ddH2O treatment ($\chi 2$ = 54.7, df = 2, P <0.001; $\chi 2$ = 13.6, df = 2, P = 0.001, $\chi 2$ = 7.1, df = 2, P <0.029, respectively). The mortality responses to all three of the SchoolSmart treatments were significantly slower compared to the Ovide® treatment ($\chi 2$ = 18.2, df = 2, P <0.001; $\chi 2$ = 36.1, df = 2, P <0.001; $\chi 2$ = 43.8, df = 2, P <0.001, respectively). The mortality response of the undiluted SchoolSmart treatment was significantly faster compared to the Nix®, 1% SchoolSmart and 1:16 SchoolSmart treatments ($\chi 2$ = 17.6, df = 2, P <0.001, $\chi 2$ = 32.5, df = 2, P <0.001; $\chi 2$ = 17.8, df = 2, P = 0.001, respectively). The mortality responses of the 1:16 and 1% SchoolSmart treatments were not statistically different than the Nix® treatment ($\chi 2$ = 0.5, df = 2, P = 0.779; $\chi 2$ = 4.8, df = 2, P = 0.091, respectively).

Discussion

The results determined that SchoolSmart treatment had a significantly faster mortality
response than treatment with ddH2O, indicating that SchoolSmart is pedicucidal on permethrin-resistant head lice. Additionally, undiluted SchoolSmart treatment elicited faster mortality response compared to 1:16 and 1 % dilution of SchoolSmart treatments, indicating that the undiluted SchoolSmart is more potent than 1:16 and 1 % dilutions. Ovide® had the fastest mortality response of all treatments tested indicating that Ovide® is a faster acting pediculicide than any of the SchoolSmart treatments using current formulations. Diluting SchoolSmart according to the recommended 17 fold dilution did not work significantly faster than a 1% dilution, and both were statistically the same as Nix®. It has been proven that Nix® is not 100% effective at killing treated head lice using the hair tuft bioassay system [1]. Similar experiments need to be carried out for SchoolSmart treatments. Also, further investigation is necessary to determine whether SchoolSmart is ovicidal.

References

1. Yoon, K.S., Strycharz, J.P., Gao, J.-R., and Clark, J.M. (2005) Improved artificial rearing system for the human head louse allows the determination of resistance to formulated pediculicides. Pest Manag. Sci. (Submitted)

2. S.H.Lee, K.S. Yoon, M.S. Williamson, S.J. Goodson, M. Takano-Lee, J.D. Edman, A.L. Devonshire and J.M. Clark, Molecular analysis of kdr-like resistance in permethrin- resistant strains of head lice, Pediculus capitis, Pestic. Biochem. Physiol. 66 (2000) 130-143.

3. K.S. Yoon, J.-R. Gao, S.H. Lee, J.M. Clark, L.Brown and D. Taplin, Permethrin-resistant human head lice, Pediculus capitis, and their treatment, Arch. Dermatol. 139 (2003) 994-1000.

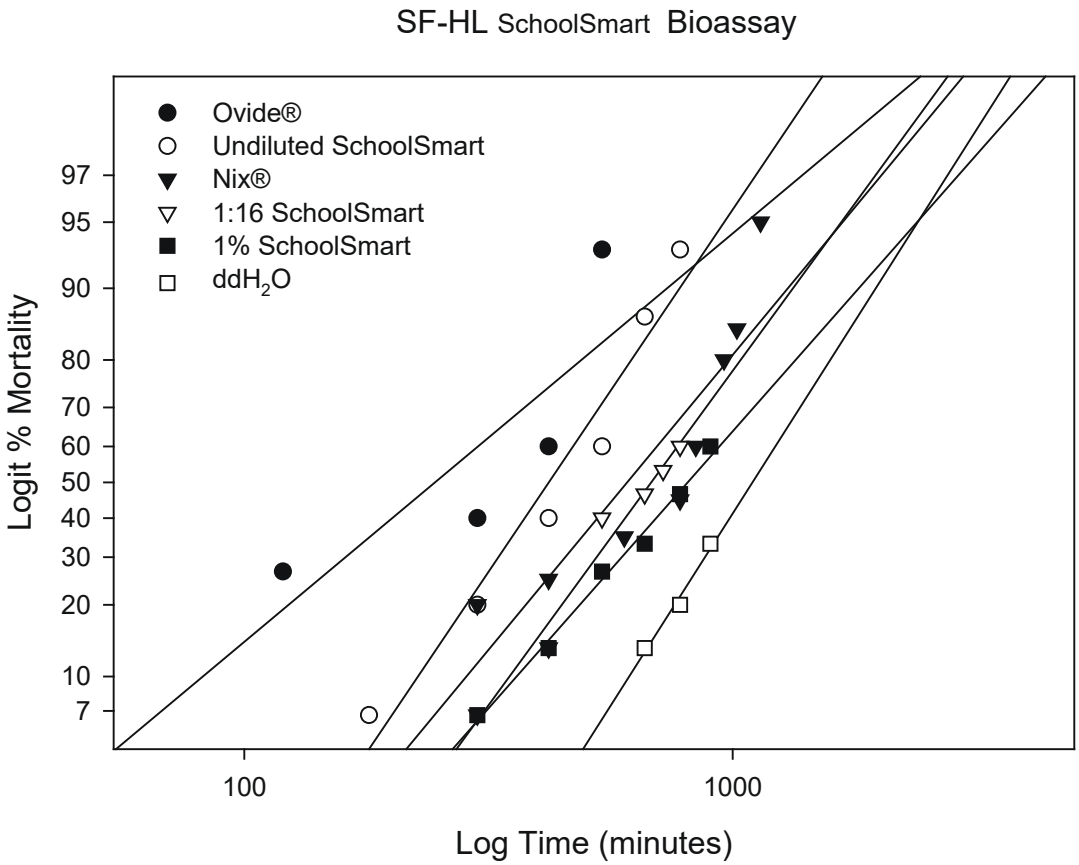

Figure 1.

Log time versus logit percent mortality responses of SchoolSmart-, Nix®-, and Ovide®-treated human head lice from south Florida (SF-HL). Median lethal time (LT 50, min) values and slope from the south Florida (SF-HL) head lice population treated with SchoolSmart, Nix ® , and Ovide ® .

Treatment	LT_{50} (CL)[a]	Slope
1% SchoolSmart	805.8 [b] (675.7-1202.2)	6.4 ± 1.9
1:16 SchoolSmart	678.7 [b] (586.2-871.0)	7.5 ± 2.1
Undiluted SchoolSmart	437.3 [bc] (370.6-499.6)	9.3 ± 1.7
Nix ®	634.7 (467.1-769.6)	7.4 ± 0.96
Ovide ®	236.1 (106.3-388.6)	9.3 ± 1.7

[a] CL, 95% confidence interval limit.

[b] Logit regression is significantly slower compared to that of Ovide ® treatment.

[c] Logit regression is significantly faster compared to that of Nix ® treatment.

NOTICE: OVIDE COSTS $210.99 FOR 2 OZ AT CVS; ITS GENERIC VERSION COSTS $198.99. 2011.

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I am a school nurse in the Cleveland Municipal School District with 13 years' experience with lice. In March of this year, I was given a large quantity of the Colloidal Soap to use as a lice remedy. After a full school lice screening of 684 students, we found 44 cases of lice. Each parent who came to pick up their child was given enough of the soap to shampoo the child and any other child in the household. Those whose parents could not come were given a permission slip to take home.

The first day after the screening, I had 25 students return & ALL were clean of lice and nits. This was unprecedented as, with past lice screenings, only a few children were clean the first day. Within 5 days, all the children sent home the first day were back, and all were free from lice and nits.

I was especially happy to use this product as a number of our children have special problems, ie., asthma, severe allergies, cerebral palsy and seizure disorders. Conventional lice shampoo and treatments can aggravate many of these conditions. As the Colloidal Soap is a non-toxic product, I had no trepidation abut recommending it to the parents of my special needs children.

I am recommending to my fellow CMSD nurses that they also try the soap on their school populations. As of this writing, at least 9 other Cleveland schools are planning on purchasing it. Thank you for the opportunity to try a really save and efficient product.
Deborah Aloshen, Rn, B/S.N., C.S.N., M.Ed.

Cleveland City School Nurse
Cleveland, Ohio

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I am writing in regards to SchoolSmart. When my daughter contracted lice a few times in the past, I tried Nix, RID and Pronto, which eventually diminished the problem, but burned her scalp, had an unpleasant smell and was most costly to say the least. SchoolSmart, where have you been? Fantastic! I am impressed that it worked so well. It was a breeze combing the comb through her hair. If it cost $10.00, I AM A BELIEVER! I'm convinced this is a definite Positive Solution for the outbreak of SchoolSmart in our schools, as well as homes.
Thank You.
D.H., Cleveland, OH.

I used the SchoolSmart, and as far as I can see, it removes the nits a lot easier. Without the odor!
Thank You.
L.L., Cleveland, OH.

Thank you for the lice product. It worked great!"
Thanks again. Sincerely,
L.A., Cleveland, OH

I used the Colloidal Soap on my daughter's hair for a lice remedy. I was pleased with the results. It worked fast, and the nits came out easier than any treatment I've tried before.
Thank You.
B.T., Cleveland, OH

SchoolSmart helps unglue unhatched eggs. It makes it faster to comb and easier to pick eggs out. I like the fact that it didn't have the strong odor like RID or Nix. It made hair nice and soft, you could feel it cleanse as you rinsed it out. I hope this product is available if the problem arises again.
Thank You!
Mr. & Mrs. Robert, Cleveland, OH

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SchoolSmart works pretty good and it doesn't leave hair tough and tangled. I would use it again!
M. M., Cleveland, OH

What I liked about SchoolSmart was that it got out the lice quicker. No harsh odors, less tangles and no scalp irritations.
Sincerely,
M. C., Cleveland, OH

I have used the SchoolSmart on both daughters' heads. I really liked the way it lathered up. The girls said they could feel them running, then it stopped. I finished their heads and the results were much better. I had used RID twice and had no results at all!
Thank You,
M. W., Cleveland, OH

Dr. Clarence E. Norris, M.D. (North Carolina) recommends this product to his patients for SchoolSmart treatment. He specializes in Chelation Therapy & Family Practice with a couple of years of general surgery.

Dr. Darick Nordstrom, DDS, uses this product on his patients because many of them are chemically sensitive.