Macroanalytical Procedures Manual (MPM)

V-12. Cosmetic Products

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https://www.fda.gov/food/laboratory-methods-food/macroanalytical-procedures-manual-mpm

A. Method for Cosmetic Brushes with Natural Animal Bristles (V-119)

(1) Scope

This method provides a procedure for the visual examination of cosmetic brushes containing natural hog bristles which may be contaminated with eggs (nits) of the hog louse (*Haematopinus suis* (L.)).

(2) Applicable Documents

- CPG Sec 590.400 Natural Bristle Brushes (i.e., Hairbrushes, Shaving Brushes) - Nit Contamination

3) Defects

Natural fiber brushes can be broken down into two main categories: bristle brushes and soft hairbrushes (Hardy & Hardy 1949). Brush bristles come exclusively from swine, Suidae, where the bristles are modified hairs. Bristles have the additional characteristics of being very stout with a uniform diameter. Their cross section is circular to somewhat elliptical (Brunner & Coman1974). Soft hairbrushes can be made with hair from other animals (Anonymous 1923). Often these hairs are called fibers or animal fibers (Friesen1994) to separate them from bristles. Different species of lice may be found on these natural soft hairbrushes.

Hog bristles incorporated into cosmetic brushes may contain eggs (nits) of the hog louse. The hog louse is found on hogs throughout the world and passes its entire life cycle on the body of the hog. The eggs may be attached to the bristles on any part of the hog's body. They are individually glued to the bristles by means of an encircling band. As many as six eggs may be attached to a single bristle (Figure V-12-A-1, 2). The free end of lice eggs has an operculum. The operculum has pores or tubercles in a specific pattern for each species (Kim, et. al.1986). When the eggs are laid near the body, they take anywhere from 5 to 7 days to hatch (Kim, et. al.1986).

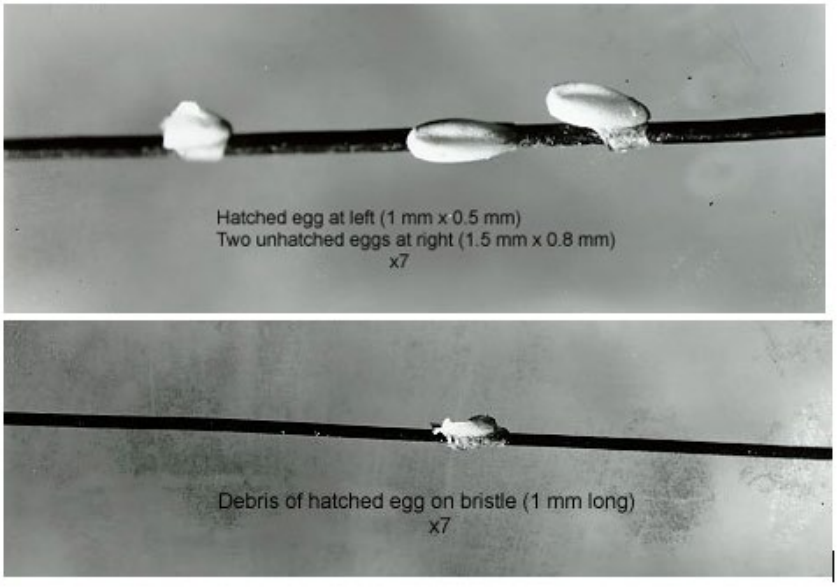

Figure V-12-A-1. Eggs (nits) of the hog louse adhering to hog brush bristles. (Source: MPM 1984; Electronic Version 1998).

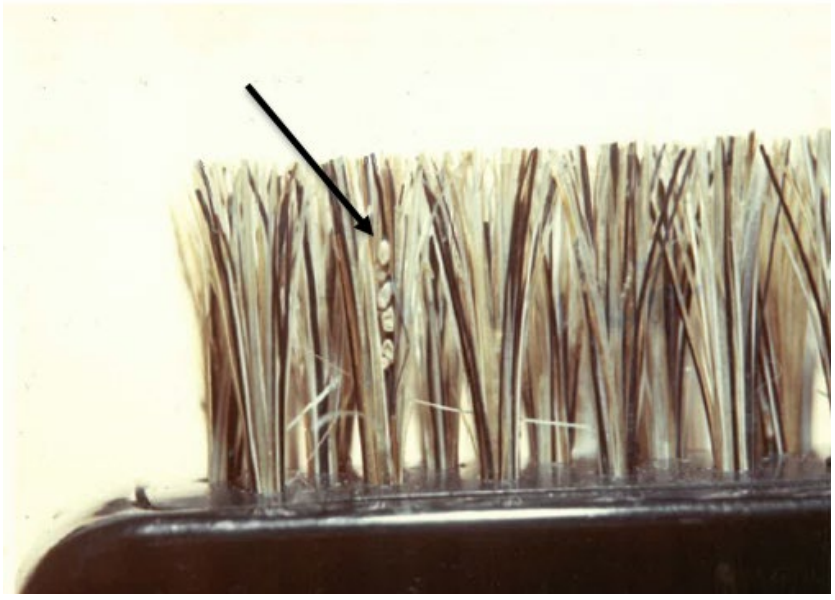

Figure V-12-A-2. Nits attached to a boar bristle brush, indicated by the arrow. (Source: Photo courtesy of L. Farina, FDA).

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Anoplura or sucking lice, range in size from 1.0-6.0 mm in length. Sucking lice are ectoparasites of mammals, with the majority being host specific (Furman & Catts 1982). The immature stages and adults feed on blood from the host. They have a hemimetabola development, incomplete metamorphosis, where the life stages consist of egg-immature-adult. The claws are adapted to holding onto the hairs of the host. The adult female attaches her eggs (nits) to the hairs of the host. For detailed collecting and preserving techniques see (Kim, et. al.1986).

(4) Field Examination

Generally, the sample comes to the laboratory based on the results of a field examination. In the field, at least six brushes from each lot are examined. Samples are collected for laboratory examination if**:**

- Nits are observed on bristles of two or more brushes
- Nits are observed on ten or more bristles on any brush of the six examined

(5) Procedure: Determination of Nit-Contaminated Bristles in Cosmetic Brushes

a. Visual Examination and Classification of Reject Bristles

Examine at least six brushes. Determine the number of bristles contained in a representative number of tufts, and calculate the total number of bristles for the entire brush. See (Figure V-12-A-3) for an example of a tuft of bristles. Count the number of bristles contaminated with nits and nit fragments in the entire brush. A nit-contaminated bristle is one which has one or more hatched or unhatched nits attached, or one which bears fragments of the hatched egg (Figure V-12-A-1). If the contamination is heavy, count the contaminated bristles in a representative portion of the brush and calculate the total number of bristles with nits. These observations may be confirmed using a 7-10X hand lens. Note, if the brush contains no tufts, count all the bristles on the brush.

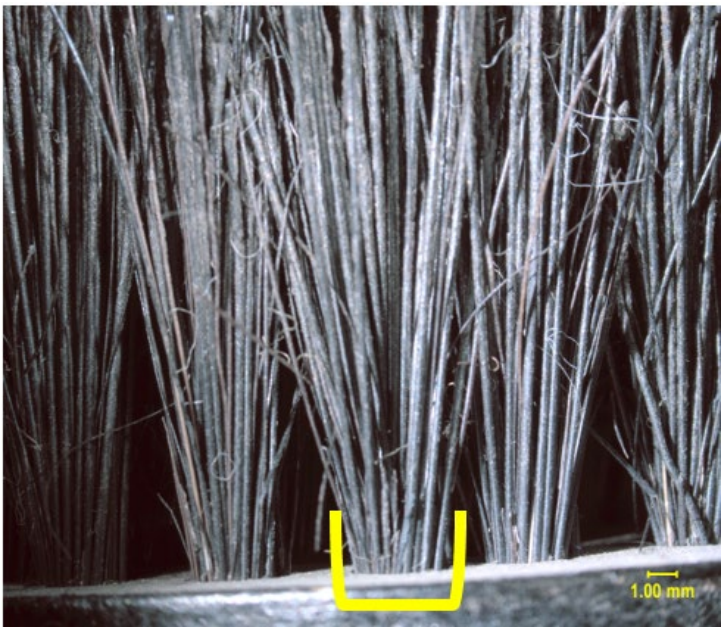

Figure V-12-A-3. Bracket indicates one tuft of bristles. (Source: Photo courtesy of H. Loechelt-Yoshioka, FDA).

b. Report

For each brush examined, report total number of bristles examined, total representative number of tufts examined for bristle count, total bristles found in representative tufts, average number of bristles per representative tufts, total tufts in one brush, total tufts in examined brushes, the total number of bristles in the examined brushes, report the number of nit and nit fragments-contaminated bristles, and the percentage of contaminated bristles. Also calculate and report the average percentage of contaminated bristles for all brushes examined in each sample. See example of reporting format (Table V-12-A-1).

Reporting Table

Table V-12-A-1 Recommended format for reporting results.

Filth in Cosmetic Brushes:	SUB NO.							
	1	2	3	4	5	6	TOTAL	AVG
Number of Brushes Examined (minimum of 1/sub) (A)								
Total representative number of tufts examined for bristle count * (B)								
Total bristles found in representative tufts (C)								
Average number of bristles per representative tufts (C) / (B) = (D)								
Total number of tufts found in one brush** (E)								
Total tufts in examined brushes (A) x (E) = (F)								
Total number of bristles found in examined brushes (D) x (F) = (G)								
Total count of bristles with nits and nit fragments (H)								
Contaminated bristles with nits (H) / (G) x 100% =%								
Total Rejects								
% Rejects								

Note: If the contamination is heavy, count the contaminated bristles in a representative portion of the brush and calculate the total number of bristles with nits.

Environmental Blank (open wetted Petri dish) Results:

Equipment Used:

☐ scopes inspected/fit for use prior to use.

*Brushes without defined tufts, count all bristles and place in row (G).

** Use average number of tufts if more then 1 brush/sub is examined.

References Cited in Section:

Anonymous (1923). *Glass, Paints, Varnishes and Brushes: Their History Manufacture and Use.* Pittsburgh Plate Glass Company: Pittsburgh. 432 pp.

Brunner, H. and Coman, B. J. (1974). *The Identification of Mammalian Hair.* Inkata Press: Melbourne. 176 pp.

Friesen, P. L. (1994). *Natural Fibers: Information Guide.* The Arbidar Co.: Montana. 158 pp.

Furman, D. P. and Catts, E. P. 1982. *Manual of Medical Entomology, 4th ed.* Cambridge University Press: New York. 207 pp.

Hardy, T. M. P. and Hardy, J. I. (1949). *Animal Fibers Used in Brushes*. USDA Circular #802, pp. 1-15.

Kim, K. C., Pratt, H. D., and Stojanovich, C. J. (1986) *The Sucking Lice of North America: An Illustrated Manual for Identification.* Pennsylvania State University: Pennsylvania. 241 pp.

Additional Information:

Informational articles not cited in the above section, but still useful:

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Harwood, R. F. and James, M. T. (1979). *Entomology in Human and Animal Health, 7th ed.* Macmillan Publishing Co., Inc.: New York 548 pp.

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Mullen, G. R. and Durden, L. A. (2019). *Medical and Veterinary Entomology, 3rd ed.: Chapter 7 Lice (Phthiraptera).* Elsevier: London. pp. 79-106.

Smith,V. S., Broom,Y., and Dalgleish, R. (2022). *Phthiraptera.info (web resource).* Accessed 03-02-2022, http://phthiraptera.myspecies.info/

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U.S. FDA (2020). *Cosmetics.* https://www.fda.gov/cosmetics

Revision History

Version No.	Purpose of change	Date
V0	New process	1984; Electronic Version 1998
V1	Added 'natural animal' to title and scope, updated table of contents, added CPG sec 590.400, changed wharf exam to field exam to match IOM, updated and clarified method and reporting table, added photos, references and Additional Information.	March 2023