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(*To be continued.*)

COMPOUND SOLUTION OF CRESOL—THE VARIATION OF PHENOL COEFFICIENT WHEN DIFFERENT OILS ARE USED FOR SAPONACEOUS BASE.*,[1]

P. L. BURRIN, A. G. WORTON AND F. E. BIBBINS.[1]

The Bureau of Animal Industry of the United States Department of Agriculture has been very active in its supervision of the interstate shipment of domestic animals, and as a part of their duties they have described means for disinfecting cages as well as animals. Since such a procedure is common and within their control, it is only a natural sequence that they should be highly interested in the control of the material used in these prescribed methods of disinfecting. This department deviated from the standards which were laid down by the United States Pharmacopœia for compound solution of cresol as early as 1915 (1). They deemed it necessary, in view of their extensive recommendations for the use of soap solutions of cresol, to lay down requirements in many cases more stringent than those in the United States Pharmacopœia. The economy of manufacture was given due consideration when making these specifications as well as the effectiveness of the final product.

In the interest of improving compound solution of cresol U. S. P. the authors tried several oils which are available for use in the manufacture of such a product. Compound solutions of cresol were prepared, following the directions of the United States Pharmacopœia, tenth revision, using corn oil, peanut oil, sesame oil, cocoanut oil, and soy bean oil (2). In order to have a control sample, a solution was made

* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] From the Control Laboratories, Eli Lilly and Company.

from linseed oil. Comparison of the resulting finished preparations was then made, particular attention being given to the phenol coefficients.

The usual means of comparing the effectiveness of these cresol solutions has been the determination of their phenol coefficient. There has been considerable discussion about the actual worth of the phenol coefficient in the evaluation of compound solution of cresol. Every one agrees that there can be a variation in this determination due to the age and viability of the organisms used, the media, the test broth, and perhaps in the technique in running the test. Whatever may be the opinion as to the value of a phenol coefficient, it does seem that on a comparative basis it has value. In the following experiments the phenol coefficients were determined on all samples at the same time with the same cultures. Whether the phenol coefficient appears high or low, our only purpose in assigning numerical values is to show the ratio of the phenol coefficients in the experiments performed. As previously mentioned, the phenol coefficients were determined by the standard method. Although we did not attach a great deal of significance to the phenol coefficient as a true lethal index, we considered it of value in showing the comparative activity of the solutions prepared from the various oils. The results of these determinations are shown in the following table. It is interesting to note from the table that the sample made from cocoanut oil shows a phenol coefficient 100 per cent greater than the coefficients shown by samples made with other oils, when tested with *B. typhosus*, and 50 per cent greater when tested with *Staphylococcus aureus*.

It is customary in the manufacture of large quantities of compound solution of cresol to filter the liquid as a final step in order to obtain a brilliant product. Consequently, the ease with which the various solutions filtered was considered an advantage in selecting the oils which might be desirable. For this purpose the solutions were filtered, and the ease with which they ran through the filter paper is noted in the following table.

TABLE OF COMPARISON.

Oil Used.	Filterability.	Phenol Coefficient Using *B. typhosus*.	Phenol Coefficient Using *Staph. aureus*.	Solidifying Point Degrees Fahrenheit.
Corn	Good	1.5	1.0	−20
Peanut	Very poor (gelatinized)	1.0	1.0	Gelatinized
Sesame	Good	1.5	1.0	−15
Cocoanut	Good	3.0	1.5	−15
Soy bean	Good	1.5	1.0	−20
Linseed	Good	1.5	1.0	+ 5

The water content and excess alkali were determined in all samples, and found to be within the usual limits. It was at this point we discovered that compound solution of cresol made from sesame oil had a very poor solubility in alcohol.

In observing the several experiments it was noted that the samples made from peanut oil became very thick, and turned to a jelly when stored at room temperature. When the sample was shaken, it again returned to a liquid condition, but when allowed to stand undisturbed it again gelatinized. Since compound solution of cresol may be subjected to rather low temperatures, and since it is very necessary that a dispensable liquid which does not separate at these low temperatures be obtained, it was decided to determine the chill points of all experiments

as outlined in *Bulletin* No. 1308 of the Agriculture Department (3). The results of these tests are recorded in the following table.

It can be observed readily from the preceding table that there are several oils just as desirable as linseed oil for compound solution of cresol. The authors sought to eliminate any comparison of the oils on a price basis, so no experiments were made to ascertain just how low a grade of oil could be used for making the soap of the various products; consequently, all of the oils used were of high grade. Corn oil and sesame oil make a satisfactory product, which has a chill point somewhat lower than the product made from linseed oil. Cocoanut oil makes a satisfactory product which shows a phenol coefficient from 50 to 100 per cent higher than the coefficients shown by products made from other oils. The price of cocoanut oil is slightly higher than linseed oil, but it apparently makes a product that is decidedly more efficient.

CONCLUSIONS.

It may be said that there are several oils; namely, corn, soy bean, cocoanut and linseed that will make a satisfactory cresol compound. Peanut and sesame oils are not desirable for use in such a product. It appears from the above experiments that cocoanut oil is the only one of this group that can be used to manufacture a satisfactory product which at the same time shows an increased phenol coefficient. For this reason it may be desirable as a base for compound solution of cresol. Finally, it seems that there may be oils more desirable, for the manufacture of these soap cresol solutions, than linseed oil that is now prescribed by the United States Pharmacopœia.

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IMPROVEMENT IN TECHNIQUE IN THE PREPARATION OF THREE COMMON PRODUCTS.*

BY EDWARD D. DAVY.

There are distinct advantages in the modification of some of the commonly accepted formulas both as to the ease of preparation and the appearance of the finished product, and this without altering the value of the product in any way.

The three products used to illustrate improvement in technique are: Syrup of White Pine Compound, N. F., Elixir of Phenobarbital, and Soft Soap, U. S. P. IX.

Syrup of White Pine Compound when prepared by the N. F. formula without change yields a product which, upon aging, results in an oleaginous suspension which, after a few days, forms an oily layer on the surface of the syrup making an unsightly preparation. This condition may be corrected by siphoning or otherwise removing the clear liquid after aging. The directions for preparing the product do not provide for clarification.

The Oil of Sassafras which represents an excess over saturation is the chief offender, though the resin from the Balm of Gilead Buds also contributes to this

* Section on Practical Pharmacy and Dispensing, A. PH. A.