Reprinted from ENTOMOLOGICAL NEWS, Vol. LXV, No. 2, February, 1954
Printed in U. S. A.

A Modification of Hopkins' Technique for Collecting Ectoparasites from Mammalian Skins [1]

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In the course of a study on the populations of Anoplura on wild mice Hopkins' (1949)[2] technique of dissolving the hair of the mammalian host skins in caustic potash has been employed. By this means one can readily recover the total louse population of an individual skin. Other procedures that have been employed in the past—brushing, searching and the use of detergents—were considered but discarded; the first two procedures because too many parasites are overlooked and the latter because it is too time-consuming in addition to being unlikely to yield the total population of parasites. A comparison of the searching and brushing technique with the caustic potash

[1] Paper No. 2981, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul 1, Minn.

[2] HOPKINS, G. H. F. 1949. Host associations of the lice of mammals. Proc. Zoo. Soc. London 119: pp. 396–397.

method was made by first removing those parasites that could be seen upon a careful examination and then carefully brushing the specimen to remove any additional parasites. Following both of these treatments the skins were dissolved in caustic potash, and in all instances many additional parasites were recovered.

Hopkins' procedure involves initially soaking the skin of the mammalian host in cold 5% KOH for 15 minutes, after which the hair is scraped from the skin and the skin discarded. This particular step is rather tedious and some parasite specimens are likely to be lost by adhering to the skin. With over 400 dried skins to examine in the investigation noted above, the amount of time spent in scraping the hair from the skin became excessive. The following modification was then adopted with excellent results. Further, this procedure eliminates one of the possible sources of error in sampling the population of the ectoparasites. It should be noted, of course, that these results were obtained with the dried skins of small rodents: *Clethrionomys, Microtus* and *Peromyscus*. Whether or not it would be effective with larger animals is uncertain.

Dried skins are cut into small pieces (1 to 2 inches square) and placed in a 125 ml. Erlenmeyer flask with 50 ml. of ~~5%~~ 1% trypsin (4 × U. S. P. pancreatin) buffered to a pH 8.3 ± with .2 molar Na_2HPO_4. This is placed in an oven at 37° C. for 36 to 48 hrs. Following this initial digesting period, 10 gm. KOH and 50 ml. H_2O are added, and the resulting mixture is boiled for several minutes or until all of the hair and the skin have dissolved. This liquid is then strained through an 80 mesh bronze screen (folded to a conical form). The small amount of debris remaining on the sieve is washed gently with tap water and the screen inverted into a petri dish. The specimens are washed off the screen into the dish by a small stream of water from a washing bottle or the tap. Any parasite specimens still adhering to the screen are found by examination of the screen under a dissecting microscope. The specimens, now in the dish with very little debris, can be readily discerned at 15 × with a dissecting microscope. First instar nymphs of

the Anoplura as well as all larger instars are retained completely by the screen. Mites are also recovered by this process; even the Listrophoridae although these are so small that some do pass through the 80 mesh screen. With this modification 20 or 30 skins can be brought through their initial digesting with much less time and effort than that involved in skin scraping, and no lice are lost in the process.

The parasite specimens are largely cleared by this process, and aside from some manipulation to remove the dissolved body contents, they are ready for staining and mounting in appropriate media. Lice and mites prepared in this fashion are undamaged and make excellent mounts. The latter is not the case where prolonged boiling of the skins in caustic potash has been attempted nor where heat and pressure have been used to digest the skins.