100 (243)

Alkaloidal compounds of mucoids, nucleoproteins and other proteins.

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In continuation of our studies of protein compounds we have observed that nucleoprotein, mucoid, caseinogen and alkali albuminate form water-soluble products with alkaloids. By intimately mixing samples of the purified moist protein and the pure alkaloid, especially with the latter in considerable excess, soluble products are formed, which may be precipitated by alcohol or alcohol-ether, and which, after purification and drying, readily dissolve in water. Such aqueous solutions are neutral to litmus, and the proteins may be readily precipitated from the solutions by slightly acidifying them.

Many such protein-alkaloid products have been made. The purest thus far obtained was prepared from mucoid and strychnin by the following general process: After thoroughly mixing moist mucoid with an excess of strychnin, the viscid mass was extracted several times with water and the centrifuged extracts were filtered and combined. The filtrates were faintly opalescent and neutral to litmus. They were evaporated nearly to dryness at 40° C. in shallow dishes in the presence of toluol, which was frequently renewed in small amounts. The protein-alkaloid product was precipitated from the concentrated solution by alcohol-ether added in large excess. The resultant precipitate was dissolved in water and the solution subjected to the previous evaporation process. The abundant dry residue thus obtained was finely pulverized and repeatedly extracted with large proportions of chloroform until no more strychnin could be removed, even after exposure to fresh chloroform for several days.

The resultant product possessed a very bitter taste, gave the common color reactions for protein, responded sharply to the oxidation test (with sulfuric acid and dichromate) for strychnin and dissolved readily in water, forming a clear solution. The aqueous

solution, which was neutral in reaction, yielded on acidification a bulky flocculent precipitate of mucoid; on rendering it alkaline, however, crystalline strychnin was immediately deposited in relative abundance.

Our observations suggest thus far that this preparation was a definite strychnin-mucoid salt, although we have not yet excluded the possibility that it was an adsorption product. Preliminary experiments indicate that it required from about three to four times as much of this product as of strychnin sulfate to produce tetanus promptly in dogs and frogs.

The purification of such products, and their chemical and pharmacological study, is under way.