ISOLATION OF TANNIN FROM SUMAC LEAVES

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Existing methods of obtaining tannin [1, 2] provide for the use of lyophobic organic solvents at the stage of its extraction from the diffusion uses. However, these solvents are capable of forming stable emulsions with tannin-containing extracts.

We have shown previously [3] that in the isolation of tannin from Turkish galls it is possible to use lyophilic solvents. In this case the process of extraction in the liquid–liquid system is replaced by the precipitation of the ballast substances while the tannin remains in the aqueous organic solution.

A domestic raw material – sumac leaves (industrial crop) – contains an average of about 15% of tannin. The diffusion juice obtained on its extraction is contaminated with a considerable amount of parasitic substances.

Studying the possibility of using lyophilic solvents (C_1–C_3 aliphatic alcohols, acetone, etc.), we have found that the best effect is achieved by the use of isopropanol, and there is a definite connection between the initial concentration of the diffusion juice, the amount of organic reagent, and the degree of purification. According to our findings, the optimum result is obtained with a thickish extract containing about 20-25% of tannin, with a ratio of water to organic phase of 1 : 6.

An investigation of the purification of a solution of sumac tannin on ion-exchange resins showed that these resins practically desalt the extract, simultaneously lowering the intensity of the coloration by 25-30%. The most effective pair of ion-exchange resins is the KU-2 (H^+ form)–ÉDÉ-10P (OH^- or CO_3^{2-} form) system.

The facts mentioned above have enabled us to develop the following method for obtaining tannin. The initial sumac diffusion juice is evaporated to the consistency of a thickish extract with a tannin content of 20-25%. To this extract is added sodium chloride (2.0-2.5% by volume) and, with vigorous stirring, the mixture is poured into isopropanol (six volumes). After half an hour of contacting, the mixture is allowed to settle for 6-8 h and is filtered from the precipitate, which is washed with 80% isopropanol at a phase ratio of 1 : 1. The alcohol is distilled off from the aqueous organic solution (under vacuum). The residual aqueous solution of tannin is diluted with water to a concentration of 10-12% with respect to the main substance and is passed through ion-exchange resins in the KU-2 (H^+ form) – ÉDÉ-10P (OH^- or CO_3^{2-} form) system at the rate of 8-10 ml/min. After this treatment the solution is evaporated to dryness under reduced pressure. The tannin obtained with an average yield of 50-55% of the initial tannin in the raw material, (which is 2-4% more than the corresponding yield when the method of butanol–butyl acetate extraction is used in a laboratory experiment) satisfies all the requirements of the State Pharmacocopeia of the USSR [4].

LITERATURE CITED

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