



Lipophilic fractions of the studied species are obtained by exhaustive extraction of raw materials with chloroform in the Soxhlet apparatus. Determination of qualitative composition and quantitative content of fatty acids in the investigated medicinal plant material is carried out by the gas-liquid chromatographic/mass spectrometric method of fatty acids methyl esters on the gas chromatographic/mass spectrometric system Agilent 6890N/5973inert (Agilent Technologies, USA). The identification of fatty acid methyl esters in the test mixture is carried out by comparing the retention time of fatty acids methyl esters standard mixture (Supelco, USA). The NIST 02 mass spectrum library is used.

The isolated lipophilic fraction from yacon root tubers is a thick oily homogeneous mass of brown colour with a pleasant specific odor; not soluble in water and ethanol, but readily soluble in chloroform. Lipophilic fractions of stevia leaves are of dark green colour; cat's paw herbs – light green colour; according to other physical indicators, the obtained substances do not differ. It is established that the yield of lipophilic substances from yacon and stevia leaves are almost the same –  $(9.55 \pm 0.09)$  % and  $(9.05 \pm 0.07)$  %, from yacon roots - in 2.4 and 2.2 times smaller than leaves, respectively. The yield of the lipophilic fraction from cat's paw herbs is  $(8.25 \pm 0.09)$  %. 9 fatty acids are detected in the lipophilic extract of yacon leaves and cat's paw herbs, 2 of which are polyunsaturated (linoleic and linolenic). 8 fatty acids are detected in the lipophilic extract of stevia leaves, where linolenic acid is present in the largest number. The lipophilic extract of stevia leaves and cat's paw herbs contains the saturated palmitic acid. The content of unsaturated fatty acids in the studied lipophilic extracts predominates over saturated ones. Their ratio in yacon leaves is 55.35:8.63; stevia leaves – 3.04:1.87; cat's paw herbs – 29.09:20.26, respectively. Only the linoleic and linolenic acids are identified in the lipophilic extract of yacon root tubers.

The fatty acid composition of the lipophilic fractions of stevia leaves, yacon root tubers and leaves, and cat's paw herbs is determined by the gas-liquid chromatographic/mass spectrometric method for the first time. The content of unsaturated fatty acids in stevia and yacon leaves, and cat's paw herbs predominates over saturated ones. Polyunsaturated fatty acids (linoleic and linolenic) are dominant in the investigated objects. Only linoleic and linolenic acids are identified in yacon root tubers.

**Kopchuk T.G.**

### **STATE OF THE GLOMERULAR-TUBULAR AND TUBULAR-TUBULAR BALANCE DURING THE FIRST STAGE OF FEVER**

*Department of Pharmacology  
Higher State Educational Establishment of Ukraine  
«Bukovinian State Medical University»*

The performance by the kidney of osmotic, volume-, acid-, and ion-regulating functions to ensure homeostasis of the organism substantially depends on the maintenance of glomerular-tubular and tubular-tubular balance. In the first stage of fever (temperature rise) changes in the functional state of the kidneys were characterized by a decrease in glomerular filtration, and, accordingly, diuresis, the development of retention azotemia, proteinuria, and an increased excretion of sodium ions against the background of inhibition of absolute and proximal reabsorption. Such kidney function disorders are accompanied by disorders of the glomerular-tubular and tubular-tubular balance. The purpose of the work is to find out the state of the glomerular-tubular and tubular-tubular balance under the conditions of the development of the first stage of fever.

In experiments on 30 male white nonlinear rats weighing 0.16-0.20 kg, aseptic fever was investigated, which was modeled by a single intraperitoneal injection of pyrogen at a dose of 25  $\mu\text{g}/\text{kg}$ . The state of glomerular-tubular and tubular-tubular balance was evaluated by correlation analysis between the processes of glomerular filtration, absolute, proximal, distal reabsorption of sodium ions and relative reabsorption of water.

In the first stage of fever (temperature rise), positive correlations between glomerular filtration and absolute ( $r = 0.981$ ,  $p > 0.001$ ) and proximal reabsorption of sodium ions ( $r = 0.981$ ,  $p > 0.001$ ) were found with the introduction of the pyrogen. Absolute reabsorption of sodium ions



directly correlated with its proximal reabsorption ( $r = 0.999$ ,  $p > 0.001$ ). The presence of positive correlation relationships indicates the functional capacity of nephrocytes in the first stage of fever to ensure the mechanisms of the glomerular tubular balance. At the same time, there was a loss of correlation relationship between diuresis and glomerular filtration ( $r = 0,621$ ,  $p < 0.05$ ), absolute and distal reabsorption of sodium ions ( $r = 0,604$ ,  $p < 0,05$ ), proximal and distal reabsorption of the investigated  $r = 0.711$ ,  $p < 0.05$ ) and between glomerular filtration and distal reabsorption of sodium ions ( $r = 0.642$ ,  $p < 0.05$ ). Disruption of the relationship in the first stage of fever under the conditions of hyponatremic diet is explained by the fact that hypoxia with energy deficiency of the renal tubules was caused by the ischemic effect of angiotensin II on the cortical area of the kidneys. At the same time, damage to the proximal nephron had to compensate for the activation of sodium ions in the distal tubule via the tubular-feedback mechanism. However, in pathology conditions, inhibition of processes as proximal and, to a greater extent, distal transport of sodium ions was observed, probably because the reabsorption in the distal nephron is more energy dependent, which is due to the high activity of succinate dehydrogenase and  $\text{Na}^+\text{-K}^+\text{-ATPase}$ . As a result, disorders of the tubular-tubular balance are due to the dominant dysfunction of the distal nephron. A positive correlation between distal reabsorption of sodium ions and diuresis was also established ( $r = 0.981$ ,  $p > 0.001$ ), since a significant decrease in distal reabsorption of sodium ions resulted in the fact that part of the primary urine was not reabsorbed in the pathological conditions and was, in fact, the volume of secondary urine with adequate loss of sodium ions.

These pathological mechanisms contribute to the establishment of negative correlation between the relative water reabsorption and diuresis, and distal reabsorption of sodium ions, as well as positive correlation between the relative water reabsorption and glomerular filtration rate, absolute, and proximal reabsorption.

**Korovenkova O.M.**

## **THE EFFECT OF THIO CETAM ON RENAL FUNCTION IN ACUTE RENAL FAILURE**

*Department of Pharmacy*

*Higher State Educational Establishment of Ukraine*

*«Bukovinian State Medical University»*

The clinical usage of new medicines must take into consideration possible renal effects. Tioacetam is a newly created Ukrainian drug which consists of piracetam (not proven nephrotic influence) and tiotriazolol (statistically significant renal effects).

Tioacetam influences not only on nervous, cardiovascular system or metabolism as its components but on the kidneys and water-salts metabolism. Therefore, the objective of our study was the assessment of tioacetam influence on renal functions during acute renal insufficiency after mercury chloride induced nephropathy. 12 male rats were examined and divided into 2 groups: with 250 mg/kg tioacetam and without (control group). The experimental and case-control design was used. Biochemical methods were used with blood and urine examination. Renal sodium transport was calculated into 2 hours and body mass. The kidney functions were estimated in 5% body mass water loading. According to our results, a positive tioacetam impact on sodium renal transport was determined. Sodium excretion was not significantly changed but potassium excretion 1,4 times decreased ( $p < 0,05$ ). The blood/urine sodium ratio 1,7 times decreased. The distal and proximal sodium transport 2,1 and 3,3 times increased accordingly ( $p < 0,001$ ). Sodium clearance was not significantly changed but water sodium clearance 2,1 times increased ( $p < 0,001$ ).

Thus, based on our results, we can suggest that tioacetam statistically significant influences on sodium renal transport in acute renal insufficiency. Therefore, in the clinical use of new drugs possible renal effects must be considered.