Attachment 1

Report on toxicity test of Xiwang capsule

Xiwang capsule is a new selenium-contained functional food, the chemical form of its selenium, which is called nanometer selenium, is different from inorganic selenium and organic selenium. Comissioned by the Department of Leaf Protein, Hefei Economy and Technology College, an acute toxicity test and a subchronic toxicity test in rats using Xiwang capsule were conducted. In addition, the toxicity of Xiwang capsule, sodium selenite (inorganic selenium) and selenoprotein (organic selenium) was compared.

Materials and Methods

1. Materials

1.1 Test samples

Xiwang capsule was provided by the Department of Leaf Protein, Hefei Economy and Technology College. The compound was in powder form with orange color, and its selenium concentration was 188 mg/kg (the analytical data was provided by the Department of Leaf Protein, Hefei Economy and Technology College). Selenoprotein was prepared from selenium rich soybeans produced in Enshi, Hubei Province; the protein concentration was 52.6% (the analytical data was provided by the Department of Trace Element, Institute of Nutrition and Food Hygiene, Chinese Academy of Preventive Medicine and determined by the 2.3-diaminonaphtholin method). Sodium selenite was purchased from Beijing Chemical Factory and its selenium concentration was 45.7%.

1.2 Animals and diets

Wistar rats and basal diets were obtained from the Institute of Experimental Zoology, Chinese academy of Medical Sciences.

2. Experimental methods: The tests were conducted according to the"Procedures and Methods for Toxicological Assessment on Food Safety"(GB 15193.1-15193.19-94).

2.1 Acute toxicity test in rats

The Horn's method was used. One hundred and twenty healthy adult Wistar rats were randomly divided into twelve groups, 10 rats per group (5 males and 5 females), to test the acute toxicity of selenoprotein, Xiwang capsule or sodium selenite. The mean weight of females in the selenoprotein, Xiwang capsule and sodium selenite-treated groups was 192 (182-203), 193 (180-208) or 190 (181-200) g, respectively. The mean weight of males was 191 (182-204), 193 (180-202) or 192 (182-200) g, respectively. Samples were prepared with tap water and given to rats by gavage, the tested dosages were determined according to the results of preliminary test. The dosages for

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selenoprotein and Xiwang capsule were 10.00, 4.64, 2.15, and 1.00 g/kg.bw, and the dosages for sodium selenite were 0.064, 0.0215, 0.01, and 0.00464 g/kg.bw. The amount was 1ml/100g.bw. The animals were examined for the abnormal reaction and death daily for 7 days.

2.2. Subchronic toxicity test

Ninty-six healthy weaning Wistar rats, 52-76 g body weight, were randomly divided into 4 groups. Each group consisted of 12 males and 12 females. Group 1, the negative control group, was given basal diets; Groups 2-3 were treated with selenoprotein, Xiwang capsule or sodium selenite. Samples were added to the basal diet to reach the same selenium concentration (6 mg/kg). The measured selenium concentration in diets were 1.087 mg/kg in the basal diet, 5.791 mg/kg in the selenoprotein diet, 5.639 mg/kg in the Xiwang capsule and 5.639 mg/kg in the sodium selenite diet. Rats were kept in individul cages and free access to food and water. The animals were examined daily for 90 days. The parameters examined were as follows:

2.2.1 Body weight and food efficiency: Food consumption and body weights were measured weekly to calculate food efficiency.

2.2.2 Hematology tests: The tests were performed in the middle of the study and at the end of the study. Blood samples were withdrawn from the tail vein. The hematological tests carried out included: hemoglobin, red cell count, total white cell count and white cell differential count, and platelet count.

2.2.3 Clinical chemistry tests: In the middle of the study and at the end of the study, blood was obtained from femoral artery and serum was separated by centrifugation (4,000 rpm/minute for 7 minutes). Model 700S autoanalyzer (Beckman) was used to analyze alanine aminotransferase (ALT), aspartate aminotransferase (AST), total protein (TP), albumin (ALB), glucose (GLU), urea nitrogen (BUN), total cholesterol (T-Che), high density lipoprotein chrolsterol (HDL) and triglyceride (TG) using tests kits from Chinese Biology Engineering Hitech Company.

2.2.4 Organ weights and body weight ratio: At the end of the experiment, animals were sacrificed after recording the body weights. Liver and kidneys were measured to calculate the organ and body weight ratio.

2.2.5 Histopathological examination:

At the end of the experiment, animals were sacrificed. Rats were dissected for macroscopic examination first, then, tissues including heart, liver, kidney, stomach and intestine, testicle (ovary) were fixed in formaldehyde solution, and embedded in paraffin wax. Tissue sections were stained with Hematoxylin-Eosin and examined under microscope.

Results

1 Acute toxicity test: The results were shown in Tables 1, 2, 3, 4, and 5.The animals in the selenoprotein and Xiwang capsule-treated groups were in good condition. No abnomal effects were observed and no animal died during the study. The final body weights of females in the selenoprotein and Xiwang capsule-treated groups were 246 (233-248) g and 237 (228-247) g, respectively. The final body weights of males were 246 (230-251) g and 243 (236-256) g, respectively. LD50 of males and females in selenoprotein and Xiwang capsule-treated groups were more than 10 g/kg.bw. In the sodium selenite-treated group, rats of both sexes were all dead at the dose of 0.0464 g/kg, 4 males and 4 females were dead at the dose of 0.0215 g/kg, and 1 female rat was dead at the dose of 0.01g/kg. Toxicity symptoms such as diarrhea, arcuate back and so on were observed in all groups. According to the reference table, LD50 of sodium selenite was 0.0171 g/kg.bw in males and 0.0147 g/kg.bw in females. Therefore, selenoprotein and Xiwang capsule fall into the category of "virtually non-toxic", and sodium selenite falls into "strong toxic", based on the classification of acute toxicity.

2. Subchronic toxicity test:

2.1 General conditions: The animals in all groups were in good condition. No overt toxic effects were observed. The results were shown in Tables 6-11. The body weight gain of males in the selenoprotein and sodium selenite-treated groups was significantly lower than the controls and Xiwang capsule-treated group at the second and fifth week ($p<0.05$), the body weight gain of males in Xiwang capsule-treated group was also lower than the controls, but no significant differences were observed ($p>0.05$). The body weight gain of females in selenoprotein and sodium selenite and Xiwang capsule-treated groups was significantly lower than the controls at the second and fifth week ($p<0.05$), the body weight gain in Xiwang capsule-treated group was significantly higher than the sodium selenite-treated group ($p<0.05$). Food efficieny in selenium-treated groups was significantly lower than the controls (Tables 12-17). The results showed that rats in all the three experimental groups decreased the body weight gain, however, the body weight of Xiwang capsule-treated rats was higher than the sodium selenite and selenoprotein-treated rats.

2.2 Hematology: Results in the middle of the study were shown in Tables 18 and 19, and results at the end of the study were shown in Tables 20 and 21. The results showed that hemoglobin and red cell count in males of sodium selenite-treated group were significantly lower than the controls, selenoprotein and Xiwang capsule-treated groups ($p<0.05$). At the end of the study, lymphocyte counts in the three selenium-treated groups were significantly lower than the controls and neutrophil was significantly higher than the

controls ($p<0.05$). No significant differences were found in other parameters. The results demonstrated that sodium selenite may cause anemia in rats.

2.3 Clinical chemistry:

The results in the middle of the study were shown in Tables 22 and 23. ALT activities of males and females in the sodium selenite-treated group were significantly higher than the controls and the other two treated groups; ALB levels of males and females in the selenoprotein and sodium selenite-treated groups were significantly lower than the controls ($p<0.05$). The results at the end of the study were shown in Tables 24 and 25. ALT activities of males in three selenium-treated groups were significantly higher than the controls ($p<0.05$), and ALT of females in the selenoprotein and sodium selenite-treated groups was significantly higher than the controls ($p<0.05$). ALB and TP levels of females in the three selenium-treated groups were significantly lower than the controls, and ALB and TP levels of males in the selenoprotein and sodium selenite-treated groups were significantly lower than the controls ($p<0.05$). T-Che and TG levels of males and females in the three selenium-treated groups were significantly lower than the controls. No significant differences in AST activities, and GLU, HDL and BUN levels were found among the four groups. The results showed that the three seleniums-treated groups had some toxic effects on rat liver by increasing ALT activities, and decreasing liver protein synthesis ability. The toxicity of sodium selenite was higher than selenoprotein and Xiwang capsule.

2.4 Organ weight and body weight ratio (the relative weight)

The results were shown in Tables 26 and 27. The relative liver weight of males in selenoprotein and sodium selenite-treated groups was significantly higher than the controls and Xiwang capsule-treated group ($p<0.05$), and the relative liver weight of females in three selenium-treated groups was higher than the controls, but no significant differences were observed. The results demonstrated that organic selenium and inorganic selenium caused hepatomegaly in male rats. The relative kidney weight in males and females of the three selenium-treated groups was lower than the controls, but no significant differences were observed, which showed that the decrease of kidney was not associated with the toxicity of selenium, but the body weight decrease.

2.5 Histopathology

The results were shown in Tables 28 and 29. Grossly, no abnormalities were found in organs of the controls, various grades of hepatic nodules were observed in the males and females of the three selenium-treated groups, but no significant differences were observed among the three groups. No abnomal observations were found in the other organs. Histopathologically, early changes of hepatocirrhosis including different grades of

fibroplastic proliferation in liver portal area, biliary duct proliferation and inflammatory cell infiltriton were observed in some rats of three selenium-treated groups, but no significant differences were observed among the three groups. In addition, two rats in the selenoprotein-treated group had liver abscess formation with liver cell necrosis and inflammatory cell infiltriton. No histopathological changes were found in other organs.

Conclusions:

1. Oral LD50s of male and female rats in the selenoprotein and Xiwang capsule-treated groups were all more than 10 g/kg.bw, therefore, selenoprotein and Xiwang capsule fall into the category of "virtually non-toxic"; LD50s of sodium selenite were 0.0171 g/kg.bw in males and 0.0147 g/kg.bw in females, and sodium selenite falls into the category of "strong toxic"based on the classification of acute toxicity.
2. Selenoprotein, sodium selenite and Xiwang capsule decreased body weight gain in rats, the decrease caused by Xiwang capsule was less than selenoprotein and sodium selenite.
3. Sodium selenite decreased hemoglobin and red cell count in males, while selenoprotein and Xiwang capsule had no effects on hemoglobin and red cell count.
4. Selenoprotein, sodium selenite and Xiwang capsule showed some toxic effects on rat liver by increasing ALT activities, and decreasing liver protein synthesis ability. In addition, sodium selenite and selenoprotein caused hepatomegaly. The toxicity of Xiwang capsule to liver was lower than selenoprotein and sodium selenite.
5. Histopathologically, early symptoms of hepatocirrhosis were observed in all three selenium-treated groups, but no significant differences were observed among the three selenium- treated groups.
6. The selenium concentrations in this study were very high. The toxicity of Xiwang capsule was similar to sodium selenite and selenoprotein according to the liver histopatological lesions, while the toxicity of Xiwang capsule was lower than selenoprotein according to body weight gain, hematology and serum liver function, and the toxicity of sodium selenite was the highest. Significant differences in subchronic toxicity among the three selenium-treated groups may be observed if a medium-dosage and a low-dosage groups were added to each of the three treatment groups.

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Chinese Academy of Preventive Medicine
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Table 1. Results of acute oral toxicity of selenoprotein in rats-number of death

Sex	Dose (g/kg)			
	1.00	2.15	4.64	10.00
Males	0	0	0	0
Females	0	0	0	0

Table 2. Body weight (g) of rats treated with selenoprotein during the oral acute toxicity test

Sex	Dose (g/kg)			
	1.00	2.15	4.64	10.00
Males	243.6±9.71	248.4±4.03	250.2±6.37	240.4±4.70
Females	238.8±3.34	244.4±8.47	238.8±6.45	236.2±5.31

Table 3. Results of acute oral toxicity of Xiwang capsule in rats-number of death

Sex	Dose (g/kg)			
	1.00	2.15	4.64	10.00
Males	0	0	0	0
Females	0	0	0	0

Table 4. Body weight (g) of rats treated with Xiwang capsule during the acute oral toxicity test

Sex	Dose (g/kg)			
	1.00	2.15	4.64	10.00
Males	241.6±6.26	238.6±3.36	245.4±8.64	246.4±8.70
Females	235.8±7.26	238.6±6.10	234.8±5.70	240.0±4.63

Table 5. Results of acute toxicity of sodium selenite in rats-number of death

Sex	Dose (g/kg)				
	0. 00464	0. 01	0. 0215	0.0464	LD50(g/kg)
Males	0	0	4	5	0.0171
Females	0	1	4	5	0.0147

Table 6. Effects of different seleniums compounds on body weight (g) in male rats (mean±SD)

Groups	Week 0	Week 1	Week 2	Week 3	Week 4
Control	63.0±8.2	89.1±13.6	136.4±21.9	176.2±26.9	204.0±28.5
Selenoprotein	62.9±7.2	79.7±9.9	108.4±20.34[a]	140.1±24.0[a]	174.9±36.6[a]
Xiwang capsule	62.0±8.3	87.1±11.9	125.3±13.9	162.8±17.3	207.8±19.4
Sodium selenite	63.3±6.8	85.3±14.7	126.2±12.1	159.3±20.2	195.3±24.0

a: $p<0.05$, as compared with the other groups

Table 7. Effects of different seleniums compounds on body weight (g) in male rats (continued)(mean±SD)

Groups	Week 5	Week 6	Week 7	Week 8	Week 9
Control	260.3±25.8	292.7±27.5	311.6±34.3	328.0±32.8	354.5±38.0
Selenoprotein	222.7±27.6[b]	244.7±19.7[c]	268.8±30.5[c]	288.0±29.1[c]	291.4±30.6[c]
Xiwang capsule	248.0±22.9	287.8±24.2	301.4±27.9	325.3±29.2	339.5±30.9
Sodium selenite	200.7±24.4[a]	235.3±31.2[c]	246.3±27.3[c]	266.9±33.4[c]	288.5±34.6[c]

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls
c: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 8. Effects of different seleniums compounds on body weight (g) in male rats (continued)(mean±SD)

Groups	Week 10	Week 11	Week 12	Week 13
Control	366.8±36.6	403.1±47.3	426.0±37.4	446.8±31.2
Selenoprotein	325.8±21.3[c]	340.6±39.2[c]	353.3±42.4[c]	375.3±40.1[b]
Xiwang capsule	360.8±28.1	386.3±36.2	387.8±50.6	403.1±50.3
Sodium selenite	315.9±30.7[c]	339.2±27.8[c]	342.2±43.2[c]	354.7±35.7[a]

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls
c: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 9. Effects of different seleniums compounds on body weight in female rats (mean±SD)

Groups	Week 0	Week 1	Week 2	Week 3	Week 4
Control	63.7±7.3	96.5±11.3	133.3±12.3	163.8±11.5	192.5±11.5
Selenoprotein	64.7±6.2	85.8±5.9	103.5±8.5[a]	122.3±11.5[a]	145.7±35.5[c]
Xiwang capsule	64.7±6.8	92.0±14.0	121.7±19.3	151.6±21.9	171.8±34.6
Sodium selenite	64.3±6.7	87.3±14.8	119.1±20.9[b]	146.1±20.8[b]	159.0±22.2[c]

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls
c: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 10. Effects of different seleniums compounds on body weight in female rats (continued) (mean±SD)

Groups	Week 5	Week 6	Week 7	Week 8	Week 9
Control	216.5±11.7	238.0±14.5	245.2±15.4	260.3±15.8	268.8±17.7
Selenoprotein	166.9±26.3[b]	180.8±27.7[b]	193.6±28.8[b]	207.6±24.4[b]	218.9±27.4[b]
Xiwang capsule	179.5±23.0[b]	195.0±29.8[b]	209.7±26.3[b]	224.3±24.4[b]	227.1±23.2[b]
Sodium selenite	149.0±23.1[a]	163.2±28.8[a]	168.7±28.2[a]	174.4±23.4[a]	190.0±20.6[a]

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls

Table 11. Effects of different seleniums compounds on body weight in female rats (continued) (mean±SD)

Groups	Week 10	Week 11	Week 12	Week 13
Control	271.7±24.9	273.6±26.1	280.1±18.9	283.8±22.0
Selenoprotein	222.3±27.4[b]	225.8±19.8[b]	229.0±23.9[b]	233.2±26.1[b]
Xiwang capsule	233.3±22.7[b]	239.3±22.9[b]	238.4±25.9[b]	238.7±26.1[b]
Sodium selenite	197.8±21.5[a]	206.3±24.1[a]	206.4±25.7[a]	207.9±22.2[a]

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls

Table 12. Effects of different seleniums compounds on food efficiency[a] in male rats (mean±SD)

Groups	Week 1	Week 2	Week 3	Week 4
Control	35.3±11.1	37.3±11.0	26.5±8.9	24.7±10.7
Selenoprotein	26.6±11.9	27.0±9.6	24.8±6.8	25.9±12.1
Xiwang capsule	32.3±8.8	33.6±4.3	25.4±6.6	28.1±3.7
Sodium selenite	27.4±11.1	32.6±8.7	20.6±10.2	23.7±6.6

a: g of weight increase/100 g food

Table 13. Effects of different seleniums compounds on food efficiency[a] in male rats(continued) (mean±SD)

Groups	Week 5	Week 6	Week 7	Week 8
Control	33.5±17.0	25.7±9.6	19.9±7.2	10.2±3.0
Selenoprotein	18.4±12.3[c]	14.4±8.8[b]	16.8±6.8	5.2±4.7
Xiwang capsule	25.1±14.2	20.6±7.1	17.3±6.3	9.2±6.2
Sodium selenite	14.4±9.2[c]	10.3±4.9[c]	14.2±10.3	10.4±7.7

a: g of weight increase/100 g food
b: $p<0.05$, as compared with the controls
c: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 14. Effects of different seleniums compounds on food efficiency[a] in male rats(continued) (mean±SD)

Groups	Week 9	Week 10	Week 11	Week 12	Week 13
Control	16.2±4.4	12.0±7.9	17.0±7.5	14.3±7.9	10.9±4.0
Selenoprotein	8.8±4.1[b]	7.9±6.9[b]	6.3±3.6[b]	6.7±2.8[b]	4.9±3.2[b]
Xiwang capsule	11.4±4.3	10.5±3.0	11.3±4.5	4.5±4.1[b]	8.6±4.4
Sodium selenite	8.7±5.4[b]	6.7±5.2[b]	7.0±4.1[b]	1.3±2.8[a]	4.7±3.4[b]

a: g of weight increase/100 g food
b: $p<0.05$, as compared with the other groups
c: $p<0.05$, as compared with the controls

Table15. Effects of different seleniums compounds on food efficiency[a] in female rats (mean±SD)

Groups	Week 1	Week 2	Week 3	Week 4
Control	39.7±9.2	21.8±6.4	20.4±4.6	20.4±4.6
Selenoprotein	27.6±2.5[b]	14.0±9.7	10.9±9.7[b]	11.4±3.3[b]
Xiwang capsule	36.1±8.3	16.2±7.1	16.2±7.1	17.1±7.0
Sodium selenite	27.1±7.6[b]	20.1±5.3	15.4±9.8	10.3±6.1[b]

a: g of weight increase/100 g food
b: $p<0.05$, as compared with the controls

Table16. Effects of different seleniums compounds on food efficiency[a] in female rats (continued) (mean±SD)

Groups	Week 5	Week 6	Week 7	Week 8
Control	16.1±3.4	13.2±3.0	10.8±4.4	7.7±3.1
Selenoprotein	12.1±3.4	8.0±3.5[b]	4.9±11.1	7.1±7.5
Xiwang capsule	8.5±4.1[b]	9.4±4.0[b]	10.8±8.6	8.0±5.5
Sodium selenite	8.4±5.0[b]	7.1±2.7[b]	6.1±10.9	7.4±3.2

a: g of weight increase/100 g food diet
b: $p<0.05$, as compared with the controls

Table17. Effects of different seleniums compounds on food efficiency[a] in female rats (continued) (mean±SD)

Groups	Week 9	Week 10	Week 11	Week 12	Week 13
Control	8.4±4.2	5.9±4.5	4.7±2.1	5.3±1.2	3.7±2.7
Selenoprotein	7.7±4.1	2.2±2.6[b]	1.3±4.1[b]	1.6±2.4[b]	3.2±3.8
Xiwang capsule	5.1±2.3	2.5±2.7[b]	2.0±2.4[b]	1.8±3.1[b]	1.0±2.4[b]
Sodium selenite	4.1±3.9[b]	3.8±2.8	1.5±4.9[b]	2.2±3.4[b]	1.0±2.2[b]

a: g of weight increase/100 g food diet
b: $p<0.05$, as compared with the controls

Table18. Effects of different seleniums compounds on hematology variables of male rats in the middle of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Red cell (10^{12}/L)	6.43±0.42	6.19±0.62	6.18±0.37	5.76±0.40[a]
Hemoglobin (g/L)	126.2±10.9	124.1±7.4	122.6±6.1	115.3±11.2[a]
Total white cell (10^9/L)	15.8±1.6	14.3±2.2	14.7±3.0	14.2±8.7
White cell differential count				
Lymphocyte %	73.4±10.7	69.1±5.1	66.2±15.5	70.9±8.7
Neutrophil %	24.5±5.9	29.5±5.3	27.6±7.8	26.9±8.1
Monocyte %	1.17±1.3	0.75±0.9	0.91±0.9	1.08±0.79
Eosinophil %	0.91±1.08	0.67±0.65	1.00±1.12	1.08±1.4
Basophilic%	0.0	0.0	0.0	0.0
Platelet (10^9/L)	999.5±56.9	976.0±95.5	969.7±48.5	984.0±62.2

a: $p<0.05$, as compared with the controls

Table19. Effects of different seleniums compounds on hematology variables of female rats in the middle of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Red cell (10^{12}/L)	6.87±0.39	6.85±0.50	6.50±0.56	6.53±0.46
Hemoglobin (g/L)	134.3±11.8	132.1±9.8	134.0±9.7	132.5±12.2
Total white cell (10^9/L)	17.7±2.9	16.7±3.0	17.0±1.9	16.9±0.9
White cell differential count				
Lymphocyte %	62.0±6.2	65.2±10.1	63.1±5.5	66.3±6.6
Neutrophil %	36.1±5.7	32.2±10.1	34.4±6.5	32.2±7.1
Monocyte %	0.9±1.1	1.0±1.5	1.1±1.3	0.7±0.7
Eosinophil %	1.00±1.04	1.67±1.30	1.41±1.31	0.75±1.13
Basophilic%	0.0	0.0	0.0	0.0
Platelet (10^9/L)	956.8±57.2	966.0±48.8	965.2±59.3	942.5±46.7

Table20. Effects of different seleniums compounds on hematology variables of male rats at the end of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Red cell (10^{12}/L)	7.55±0.32	7.58±0.52	7.24±0.38	6.87±0.48[a]
Hemoglobin (g/L)	180.3±12.2	187.6±8.1	176.9±23.6	168.6±13.9[a]
Total white cell (10^9/L)	17.2±1.5	17.0±1.8	16.7±2.7	16.0±1.9
White cell differential count				
Lymphocyte %	66.8±6.7	65.2±10.4	61.8±8.5	60.1±8.5
Neutrophil %	29.4±7.0	32.2±11.0	35.2±8.5	37.4±8.1
Monocyte %	0.4±0.7	0.5±0.7	0.3±0.5	0.2±0.4
Eosinophil %	2.08±1.3	1.25±1.13	1.41±1.4	1.2±1.1
Basophilic%	0.0	0.0	0.0	0.0
Platelet (10^9/L)	1000.9.2±43.1	991.0±34.8	999.2±63.9	959.7±64.3

a: $p<0.05$, as compared with the controls

Table21. Effects of different seleniums compounds on hematology variables of female rats at the end of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Red cell (10^{12}/L)	6.70±0.84	7.05±0.6	6.99±0.65	7.09±0.39
Hemoglobin (g/L)	175.9±14.7	182.9±18.9	172.4±18.0	177.7±16.5
Total white cell (10^9/L)	16.7±2.8	16.0±2.9	16.3±2.1	15.6±2.5
White cell differential count				
Lymphocyte %	71.9±5.1	64.7±7.7[a]	61.7±6.4[a]	65.0±4.3[a]
Neutrophil %	26.8±5.3	33.0±7.2[a]	34.5±6.9[a]	31.4±5.5
Monocyte %	0.3±0.5	0.3±0.5	0.4±0.4	0.2±0.4
Eosinophil %	1.25±1.45	1.16±1.46	1.67±1.23	2.45±1.50
Basophilic%	0.0	0.0	0.0	0.0
Platelet (10^9/L)	988.5±35.6	970.2±37.5	960.2±53.8	966.9±54.4

a: $p<0.05$, as compared with the controls

Table 22. Effects of different seleniums compounds on clinical chemistry assays of male rats in the middle of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
ALT (U/L)	50.8±4.3	57.6±6.6	56.3±6.0	63.4±7.4[a]
AST (U/L)	152.6±18.0	158.2±12.2	152.3±18.4	155.9±12.0
TP (g/L)	78.5±3.7	75.0±5.7	77.5±4.2	75.1±3.8
ALB(g/L)	38.3±2.1	36.8±2.1[a]	38.4±3.7	35.5±1.5[a]
GLU(mmol/L)	5.21±0.58	5.16±0.60	5.28±0.64	5.60±0.40
BUN (mmol/L)	6.22±0.70	6.56±0.96	5.80±1.41	5.94±1.11
T-Che (mmol/L)	1.83±0.15	1.82±0.13	1.80±0.14	1.77±0.13
HDL (mmol/L)	0.56±0.15	0.64±0.15	0.62±0.14	0.62±0.15
TG (mmol/L)	0.94±0.12	0.91±0.08	0.91±0.07	0.94±0.13

a: $p<0.05$, as compared with the controls

Table 23. Effects of different seleniums compounds on clinical chemistry assays of female rats in the middle of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
ALT (U/L)	42.7±4.9	48.1±7.5	47.2±3.74	57.1±7.2[a]
AST (U/L)	141.1±9.3	145.3±6.1	143.7±10.4	147.0±7.1
TP (g/L)	75.4±2.6	70.0±4.59	75.6±2.9	70.3±5.2
ALB(g/L)	37.4±1.6	36.1±1.2[b]	37.0±1.3	35.7±1.5[b]
GLU(mmol/L)	6.15±0.68	5.90±0.57	5.91±0.77	6.29±0.65
BUN (mmol/L)	7.17±0.86	6.99±0.47	7.32±0.85	7.42±0.52
T-Che (mmol/L)	1.73±0.15	1.72±0.10	1.69±0.14	1.70±0.14
HDL (mmol/L)	0.65±0.15	0.67±0.17	0.68±0.14	0.58±0.17
TG (mmol/L)	0.96±0.07	0.93±0.09	0.96±0.14	0.95±0.12

a: $p<0.05$, as compared with the controls

b: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 24. Effects of different seleniums compounds on clinical chemistry assays of male rats at the end of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
ALT (U/L)	59.3±11.8	84.2±12.3[a]	77.7±17.8[a]	84.1±11.3[a]
AST (U/L)	160.9±25.7	174.2±24.4	174.1±23.2	177.1±22.6
TP (g/L)	78.7±3.32	75.4±2.3[b]	76.4±4.5	74.0±3.18[b]
ALB(g/L)	39.2±1.22	35.3±1.2[b]	37.4±2.04	35.1±1.15[b]
GLU(mmol/L)	6.19±0.46	5.80±0.48	6.49±0.42	6.17±1.54
BUN (mmol/L)	7.54±0.83	7.65±0.39	6.85±0.63	6.90±0.79
T-Che (mmol/L)	1.64±0.27	1.35±0.11[a]	1 .49±0.25[a]	1.41±0.14[a]
HDL (mmol/L)	0.39±0.06	0.43±0.13	0.41±0.07	0.40±0.06
TG (mmol/L)	1.86±0.61	1.32±0.26[a]	1.25±0.42[a]	0.98±0.30[a]

a: $p<0.05$, as compared with the controls
b: $p<0.05$, as compared with the controls and Xiwang capsule-treated group

Table 25. Effects of different seleniums compounds on clinical chemistry assays of female rats at the end of the study (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
ALT (U/L)	44.7±5.6	58.4±5.16[a]	51.7±9.2	62.4±8.3[a]
AST (U/L)	140.3±18.7	158.9±20.0	143.5±21.9	153.9±18.1
TP (g/L)	80.7±2.8	76.4±2.8[a]	74.4±5.5[a]	77.7±3.60[a]
ALB(g/L)	40.8±1.34	39.1±1.2[a]	39.4±1.7[a]	38.8±1.3[a]
GLU(mmol/L)	5.89±0.45	5.84±0.45	5.99±0.47	6.73±0.43[a]
BUN (mmol/L)	6.97±0.65	6.48±0.58	6.84±0.91	6.71±0.61
T-Che (mmol/	1.93±0.27	1.62±0.22[a]	1.58±0.36[a]	1.65±0.31[a]
HDL (mmol/L)	0.70±0.20	0.59±0.19	0.56±0.19	0.65±0.15
TG (mmol/L)	2.10±0.33	0.90±0.39[a]	0.9±0.35[a]	0.70±0.28[a]

a: $p<0.05$, as compared with the controls

Table 26. Effects of different seleniums compounds on organ and body weight ratio in male rats (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Final body weight (g)	399.9±34.3	334.6±44.8[a]	369.3±55.4	308.0±42.2[a]
Liver weight (g)	12.4±1.16	11.82±1.80	11.86±2.85	11.9±2.23
Relative liver weight (g/100g bw)	3.12±0.40	3.53±0.23[a]	3.18±0.46	3.60±0.31[a]
Kidney weight (g)	2.34±0.25	2.04±0.23[a]	2.21±0.23	2.00±0.17[a]
Relative kidney weight (g/100g bw)	0.58±0.06	0.61±0.04	0.60±0.05	0.61±0.05

a: $p<0.05$, as compared with the controls

Table 27. Effects of different seleniums compounds on organ and body weight ratio in female rats (mean±SD)

Parameters	Control	Selenoprotein	Xiwang capsule	Sodium selenite
Final body weight (g)	252.9±18.5	212.7±22.1[b]	221.7±24.7[b]	194.1±23.5[a]
Liver weight (g)	8.27±1.58	7.77±1.42	7.79±1.37	7.05±0.95
Relative liver weight (g/100g bw)	3.27±0.59	3.65±0.56	3.53±0.63	3.68±0.63
Kidney weight (g)	1.74±0.17	1.57±0.17[b]	1.57±0.14[b]	1.41±0.15[a]
Relative kidney weight (g/100g bw)	0.69±0.05	0.74±0.07	0.71±0.07	0.73±0.08

a: $p<0.05$, as compared with the other groups
b: $p<0.05$, as compared with the controls