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The Effect of *Hypericum perforatum* Extract on Several Physical Indices for Growth of Rats

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The great leader Comrade Kim Il Sung said:

"We should collect different kinds of medicinal herbs abundant in our country, create many herb garden, and build up production bases of Koryo medicines, so as to produce plenty of them as needed to protect and promote the people's health."

Hypericum perforatum, a perennial herb with unique pharmacological substances, is being widely used for prevention and treatment of various diseases in many countries. In recent years, the result of the intensive studies on *Hypericum perforatum* mechanism of this herb's pharmacological effects is worked out and the scope of its usage is extending. However, there has never been any report on its effect on the growth of animals, especially on the growth indices including the weight of pituitary gland and the content of growth hormone (GH) of white rats [1, 2].

Therefore, we worked to clarify the effect of *Hypericum perforatum* extract on several physiological indices for growth of rats.

1. Materials and Methods

Hypericum perforatum extract used for the experiment is from the the whole herb which had been harvested in early July (blooming period) and dry-grinded.

40 rats with the average weight of about 75g were divided into a control group and 3 test groups and were experimented for 30 consecutive days.

Rats in test groups were fed feed with *Hypericum perforatum* extract added in doses of 100, 200, 300mg/kg respectively for 1kg of body weight, while the control group were fed feed with nothing added. The same conditions were provided for both control and test groups including their feeding quantity.

On the last day of the test, we decided on the optimal dose by measuring the change in body weight. We also dissected rats in control group and in test groups in which the optimal dose was applied in order to measure the weight of pituitary gland and the concentration of GH. GH was isolated by polyacrylamide gel–electrophoresis, and its concentration was measured by spectrometric assay. GH secretion was evaluated by measuring the thickness of cartilage of the neck bones, their length and weight and weights of several organs.

2. Result and Consideration

2.1. The effect of *Hypericum perforatum* extract on the weight of pituitary gland and the content of GH

Table 1. The effect of *Hypericum perforatum* extract on the weight of pituitary gland and content of GH

Group	Number of rats	Pituitary gland		GH			
		Weight /mg	Ratio /%	Total amount in pituitary gland / μg	Ratio /%	GH /($\mu g \cdot mg^{-1}$)	Ratio /%
Control	10	3.4±0.3	100.0	31.3±0.7	100.0	9.2±0.2	100.0
Test	10	4.5* ±0.4	132.3	43.1* ±0.4	137.7	9.6±0.1	104.3

* $p<0.05$

As table 1 shows, the weight of pituitary gland and GH content in rats treated with 200mg/kg of *Hypericum perforatum* extract increased to 132, 137.7% compared with nontreated rats. This shows that *Hypericum perforatum* extract increased weight of pituitary gland and GH content in rats.

2.2. The effect of *Hypericum perforatum* extract on the growth of tibiotarsus

We removed the neck bones of the rats in both control and test groups to for their length and weight and measured the thickness of their cartilage by micrometer (Table 2).

Table 2. The effect of *Hypericum perforatum* extract on the growth of tibiotarsus

Group	Cartilage		Tibiotarsus			
	Thickness/μm	Ratio/%	Length/mm	Ratio/%	Weight/g	Ratio/%
Control	113±6	100	30.5±0.6	100.0	2.1±0.2	100.0
Test	125* ±3	110.6	32.8* ±0.5	107.5	2.6* ±0.1	123.8

* $p<0.05$

Length, weight and cartilage thickness of tibiotarsus in test group increased significantly compared to those of control group. It indicates that the acceleration of GH secretion resulted in the stimulation of the growth of tibiotarsus.

The expeirment results above prove that *Hypericum perforatum* extract not only accelerates GH synthesis but also strenthens its secretion in the pituitary gland of rats.

2.3. The effect of *Hypericum perforatum* extract on weights of several organs

Table 3. The effect of *Hypericum perforatum* extract on weights of several organs of rat

Group	heart/g	liver/g	kidney/g	spleen/g
Control	0.30±0.02	3.1±0.1	0.24±0.02	0.31±0.2
Test	0.37* ±0.01	4.4* ±0.3	0.32* ±0.03	0.47* ±0.6
ratio/%	123.3	141.9	133.3	151.6

* $p<0.05$

As table 3 shows, treatment with *Hypericum perforatum* extract significantly increased the weights of heart, liver, kidney and spleen.

2.4. The effect of *Hypericum perforatum* extract on body weight of rat

Table 4. The effect of *Hypericum perforatum* extract on weights of

Group	Body weight		Increased/g	Ratio /%
	Beginning/g	End/g		
Control	75.4±0.7	105.8±1.3	30.4	100.0
Test 1	75.3±0.4	109.2*±0.9	33.9	111.5
Test 2	75.3±0.2	111.5*±1.2	36.2	119.1
Test 3	75.5±0.3	111.3*±1.5	35.8	117.6

n=10; * $p < 0.05$

Table 4 shows that the body weight of rats in test groups increased significantly and Test 2 group, in particular, in a dose of 200mg/kg witnessed the most increase (36.2g).

It indicates that *Hypericum perforatum* extract increased body weight of rat and the optimal dose is 200mg/kg.

There are some reports that hypericum and hyperforin, the main pharmacological ingredients of *Hypericum perforatum*, regulate the activities of monoaminergic neurons in hypothalamus [1, 2].

From this, it can be considered that *Hypericum perforatum* extract enhances synthesis and secretion of GH in the anterior lobe of pituitary through monoaminergic neurons in hypothalamus, so that it can accelerate the growth of animals.

Conclusion

Hypericum perforatum extract increases the weight of pituitary gland and stimulates synthesis and secretion of GH of rats.

Hypericum perforatum extract increases the weights of body and organs of rats.

References

[1] M. Franklin et al.; Biol. Psychiatry, 46, 581, 1999.

[2] C. Schüler et al.; Neuropsychobiology, 49, 58, 2004.