

**MUSHROOM POISONING:**

***CORTINARIUS SPECIOSISSIMUS*  
NEPHROTOXICITY**

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- II. Holmdahl J, Ahlmén J, Bergek S, Lundberg S and Persson S-Å (1987). **Isolation and nephrotoxic studies of orellanine from the mushroom *Cortinarius speciosissimus*.** *Toxicon* **25 (2):**195-199.
- III. Holmdahl J and Blohmé I (1995). **Renal transplantation after *Cortinarius speciosissimus* poisoning.** *Nephrol Dial Transplant* **10:**1920-1922.
- IV. Holmdahl J. **The *Cortinarius* NephroToxicity (CNT) index: a method for the evaluation of treatment and outcome in *Cortinarius* mushroom poisoning.** Manuscript.
- V. Holmdahl J. ***Cortinarius* mushroom nephrotoxicity in Sweden 1979-1999: treatment, short and long-term outcome.** Manuscript.
- VI. Holmdahl J and Bohlin A (2001). ***Cortinarius speciosissimus* intoxications in Sweden 1979-1999: epidemiological aspects.** *Windahlia*, journal of mycology. In press.

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# MUSHROOM POISONING: *CORTINARIUS SPECIOSISSIMUS* NEPHROTOXICITY

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## Abstract

*Cortinarius* mushroom nephrotoxicity causes acute and/or end-stage renal failure. Although on average only 1-2 cases yearly require qualified medical treatment for *Cortinarius* intoxication in Sweden, the poor long-term outcome after the acute renal failure in 30-50% of the patients makes this mushroom poisoning one of the most feared.

The overall purpose of the study was to investigate *Cortinarius* intoxications in mice and man with the aim of preventing and/or treating acute renal failure and/or end-stage renal disease.

To achieve this, the LD<sub>50</sub> in mice of freeze-dried *Cortinarius speciosissimus* and *Cortinarius orellanus* was determined and shown to be 2.0 g/kg and 3.2 g/kg respectively.

A nephrotoxic substance in *Cortinarius speciosissimus* was isolated and the 3,3',4,4'-tetrahydroxy-2,2'-bipyridine-N,N'-dioxide structure was confirmed by the mass spectrum and the NMR spectra.

The LD<sub>50</sub> in mice of the nephrotoxic molecule isolated from *Cortinarius speciosissimus* was calculated to be approximately 20 mg/kg.

The short and long-term results in five patients transplanted after *Cortinarius speciosissimus* intoxication showed that renal transplantation 6-36 months after the intoxication does not carry any additional short or long-term risks in comparison with other renal transplant patients.

The *Cortinarius* NephroToxicity (CNT) prognostic index was constructed to evaluate the treatment and outcome in *Cortinarius* poisoning and made it possible to classify the patients in three risk-groups: CNT index < 1.1, = 1.1 – 2.1 or > 2.1, indicating a good, an intermediate or a poor prognosis. The CNT index was based on the serum creatinine value (μmol/l) before treatment (y) and the number of days after the mushroom meal (x) according to the formula: CNT index = (y+316) / (x x 10<sup>2</sup>).

The short and long-term results in 30 patients treated for *Cortinarius* intoxications in Sweden between 1979 and 1999 showed that treatment with haemoperfusion and/or haemodialysis 3-8 days after the ingestion of mushrooms does not influence the clinical course of *Cortinarius* intoxications. The geographical distribution of 31 cases of *Cortinarius speciosissimus* intoxication in Sweden between 1979 and 1999 did not exclude the possibility of a causal connection related to the acidification. The chronological distribution of the 31 cases indicates that the incidence is not increasing. The reason is suggested to be that mushroom-pickers nowadays are more aware of the existence of the dangerous fungus.

**Keywords:** *Cortinarius speciosissimus*, acute renal failure, nephrotoxicity, end-stage renal failure, renal transplantation, mushroom intoxication, orellanine, haemodialysis, haemoperfusion, prognostic index.

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