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**Detoxification of *Ginkgo biloba* seeds by home cooking and industrial processes:  
quantification of 4'-O-methylpyridoxine by HPLC-FLD**

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**ABSTRACT**

In recent years, the market of botanicals has grown exponentially arising concerns about the quality, efficacy and safety aspects of the ingredients used. To face the problem of risk and benefit assessment of plant food supplements, the European project plantLIBRA was funded by EU in the seventh framework program. In this context, a prospective study was performed to assess new cases of adverse effects caused by botanicals used as ingredients in supplements or consumed as food. Among them, a case of *Ginkgo biloba* seed poisoning was included. A 23-month-old Asian child (resident in Switzerland) developed convulsions followed by vomiting and drowsiness after ingestion of an unknown amount of microwave-baked *G. biloba* seeds. Poisoning by ginkgo seeds is due to the presence of the neurotoxin 4'-O-methylpyridoxine (MPN), called ginkgotoxin. It is chemically related to vitamin B6 and can interfere with its physiological functions; the decreased level of vitamin B6 interferes with the formation of the inhibitor mediator gamma-aminobutyric acid (GABA), where the vitamin operates as a cofactor. GABA decrease is associated with the neurological symptoms observed in ginkgo seed poisoning.

The diffusion of oriental cuisine is increasing worldwide, and, in parallel, the risk deriving from food containing *G. biloba* seeds is becoming gradually relevant. In fact, recipes and products are readily available on the Internet marketplace; moreover, in some websites, homemade procedures for the collection, preparation and cooking of seeds harvested from the plant are also indicated.

Therefore, the aims of this study were the development of an analytical method for the determination and quantification of MPN in *G. biloba* seeds and the evaluation of the effect of different technological processes (home cooking or industrial treatment) on MPN concentration.

To achieve this purpose, untreated and microwave-baked ginkgo seeds from Japan were analyzed by a reverse phase high performance liquid chromatography coupled with a fluorimeter (RP-HPLC/FLD). Commercial packaged seeds were from China but sold in the Italian market.

Our results showed that only the industrial treatment reduces significantly the level-of MPN, so that their consume can be considered safe. Further thermic treatments will be applied to *G. biloba* seeds, in order to evaluate if other domestic preparations are suitable in reducing significantly the ginkgotoxin content and to guarantee a safe consumption of ginkgo seeds.