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BOOK of ABSTRACTS

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1183 - STABLE ISOTOPE RATIO ANALYSIS FOR AUTHENTICATION OF CHITOSAN

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Stable isotope ratio analysis for authentication of chitosan

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Introduction:
Chitosan is a linear polysaccharide with a number of possible uses (e.g. in medicine). Itis produced by deacetylation of chitin, which is the structural element of exoskeleton of crustaceans.Due to the presence ofallergens in seafood,its production from fungi has gained increasingattention. To identify its origin,residual glucans, viscosity and settled densityare used, but often not effective. This calls to the development of new methods, such as the stable isotope ratio analysis.

Methods:
Following the prescription of OIV International Œnological Codex [1],residual glucans, viscosity and settled densityweremeasuredto identify the crustaceous or fungi origin of 20 chitosan samples. Moreover, the stable isotope ratios (SIRs) of fourbioelements - hydrogen, carbon, nitrogen, oxygen - were analysedin the raw product using Isotope Ratio Mass Spectrometry.

Results:
The biosynthetic pathway of the chitosan's precursor chitin affects its isotopic composition. The samples identified by the OIV official methods as from crustaceans showed lower$\delta^{13}C$ (averagely -20.8‰) and higher$\delta^{15}N$values (-2‰). This fits with the marine origin of the font (the exoskeleton of crustaceans)characterized by low $\delta^{13}C$ value (around -20‰) and high positive $\delta^{15}N$ value (around +7‰)[2]. The low $\delta^{15}N$ values here found are probably duo to the addition to the yeast broth of nitrogen synthetic sources such as urea with low $\delta^{15}N$ values [3]. The samples identifiedof fungi origin based on the OIV prescriptions, are characterized by higher $\delta^{13}C$(-13.8‰) and lower $\delta^{15}N$ values (-4.1‰). The higher $\delta^{13}C$ values of these chitosan samples are explained on the basis of the fact that sugar cane juice and molasses with typical $\delta^{13}C$ around -11‰ [4] are used as economic substrates in fungi chitosan production [3] .D/H and $\delta^{18}O$ are lower in chitosan from fungi probably due to the lower value of the fermentation water.

Conclusions:
This work considers a robust and effective method,based on the determination of stable isotope ratios of bioelement, that can be used to identify the origin of chitosan.

Novel Aspect:
Stable isotope analysis could be a rapid method to identify the crustaceans or fungi origin of chitosan.

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