Food authenticity is a one of the major challenge of market. Authentic food commodities have to have defined origin, quality and often they must originate from specific sources. Moreover, many of them must be produced only in certain countries or even in specific region of country. On the contrary, there are significant effort of low-cost producers or sellers to reduce production costs, in other words, to use cheaper, frequently less-valuable materials, while they are offered to the consumers as „full-valuable“ under the same name or brand. A fight against such illicit practices requires powerful analytical approaches, methods and instrumentation. In the last decade, it has been shown that comprehensive techniques (GC×GC and LC×LC) in connection with identification method (TOF-MS) are especially suited for the separation and identification of analytes in complex samples. This work was aimed on utilisation of comprehensive gas chromatography in connection with time of flight mass spectrometry for searching of suitable authentication markers either for determination of botanical origin of honey or for determination of used processing technology in production of juniper flavoured spirits. Obtained two dimensional chromatograms were evaluated by statistical methods used calculation of Fisher ratios followed by Cluster analysis and Principal component analysis to find differences in VOC composition that enabled us to differentiate those spirits based on the geographical origin or producer and honey based on their botanical origin. **Acknowledgements:** This work was supported by VEGA grant no. 1/0972/12.