OP-232 [Beekeeping Technology and Quality]
Adulterated honey: fake or real news?

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Honey (Apis mellifera) adulteration is a worldwide problem because of its economic, commercial and sanitary implications. The main world beekeeping organization, APIMONDIA, considers that the detection of adulteration in honey is still an unresolved problem. This highlights the importance of the development of analytical techniques that allow the unequivocal detection of adulterants in honey, especially those emerging adulterants whose use has recently emerged. The aim of this work was to develop a rapid, easy to perform, low-cost analytical method for the qualitative and quantitative determination of different syrups and mixtures of them by using the Fourier transform infrared spectroscopy (FTIR) technique with the attenuated total reflectance (ATR) module, without complex mathematical procedures or sophisticated sample preparation. In this study, 426 adulterated samples of 92 pure samples of multifloral bee honey from Spain were analyzed. The method, strictly based on the determination of absorbance directly at the appropriate wavelength, allows the unequivocal detection of syrup or its mixture in adulterated honey containing 3% (m/m) or more of these adulterants. The use of the model for quantification shows high accuracy and precision, in terms of relative error (0.32%, m/m) and coefficient of variation (1.4%).

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APIMONDIA
SCANDINAVIA
SWEDEN | DENMARK | NORWAY
23-27 SEPTEMBER
2025

ADULTERATED HONEY: FAKE OR REAL NEWS?
How reality is twisted and why we need to do something about it

JO Cáceres, J. Cárdenas-Escudero, J.L. Urraca Ruiz. D. Galan Madruga

“The future is not written”

there is no destiny except the one we make for ourselves

John Connor: Terminator

Whom do consumers really trust?

4 %

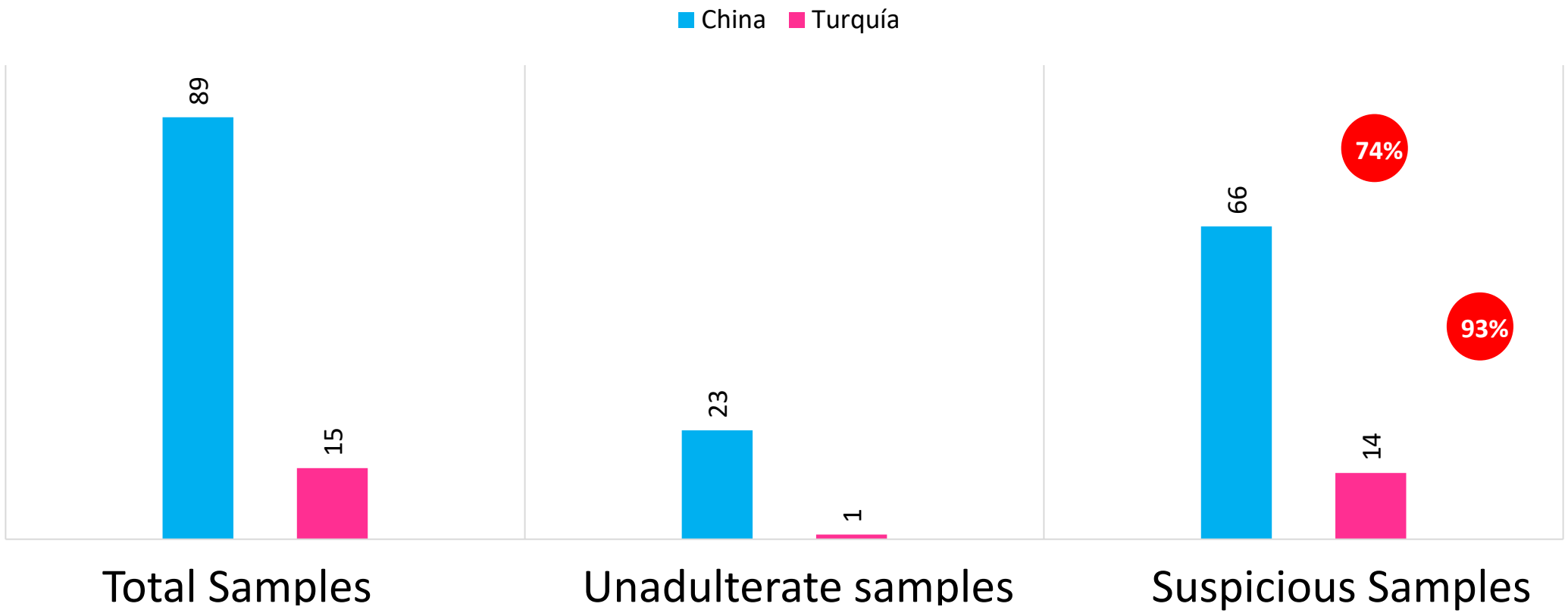
2016

2023

European Commission

JRC TECHNICAL REPORT

Coordinated action by the European Union with the Joint Research Centre identified certain fraudulent practices in the honey sector, as represented in the figures:



Fuente: Ždiniaková, T. et al. “EU Coordinated action to deter certain fraudulent practices in the honey sector”, EUR 31461 EN, Publications Office of the European Union, Luxembourg, 2023, JRC130227.

New Lobby :

Activity aimed at influencing decision-making in the public or private sphere in favor of specific interests.

how do you do this? → Saying that the OLAF Report is a fake news

Adulterating honey is not cost-effective:
Nothing could be further from the truth.
All that they needed was to act fraudulently

But this is not enough.
They must also be said that adulteration is not cost-effective.

Alimentos y bebidas > Ingredientes alimenticios > Aditivos alimentarios

Jarabe de arroz de alta fructosa de calidad alimentaria Food grade high fructose rice syrup

No hay opiniones · HALAL certificado

Foodchem International Corporation · Verified Proveedor multiespecialidad · 19 yrs · CN

Personalizable

1000 - 4999 kilogramos	5000 - 9999 kilogramos
0,8238 €	0,6694 €

>= 10000 kilogramos

0,5149 €

Precio de muestra: 85,81 € Pedir muestra

Variaciones Editar selecciones

Peso neto(1)

280KG

Envío

La tarifa de envío y la fecha de entrega se pueden negociar. Habla con el proveedor para más detalles.

Enviar consulta Chatear

Protecciones para este producto

Artificial Honey Syrup

Artificial miel

el jarabe de miel está hecho de jarabe de miel natural pura y arroz. su sabor, olor y nutrición son muy similar a la miel pura.

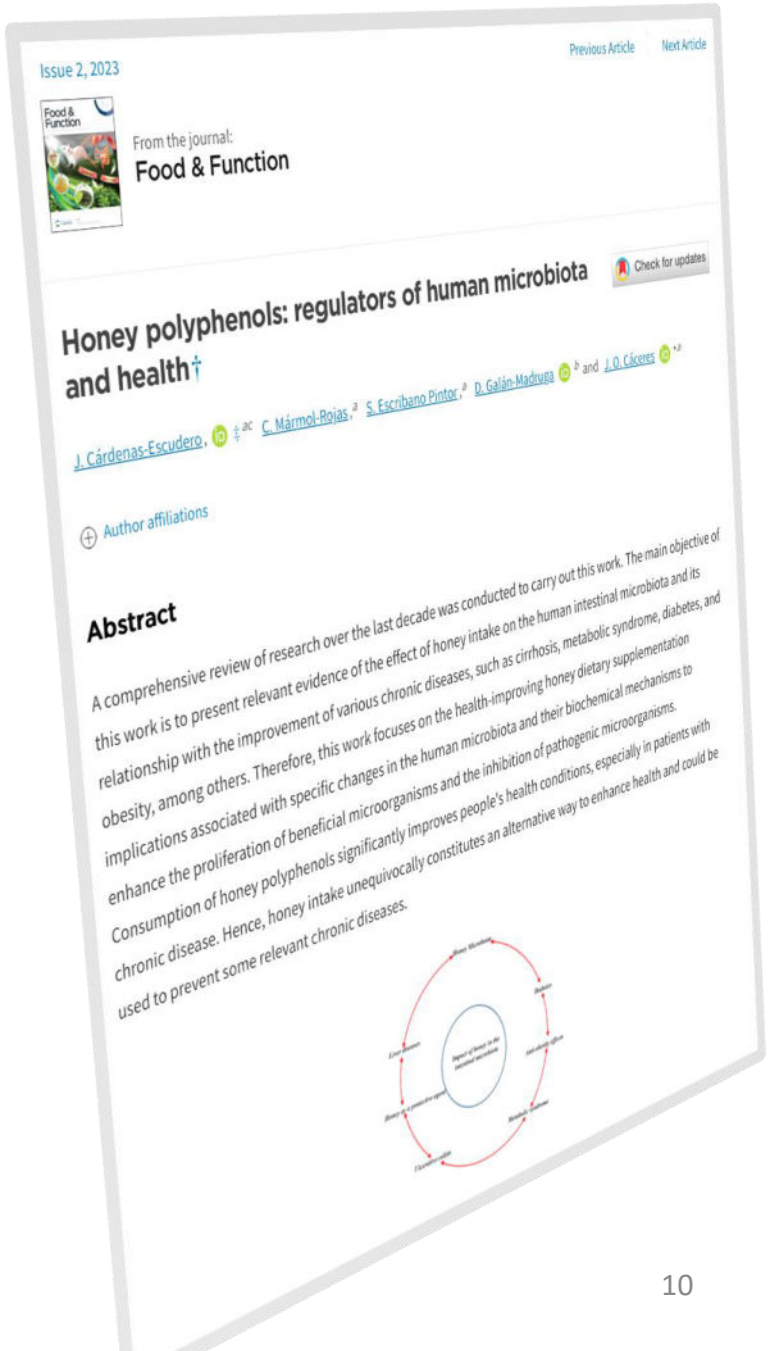
Detalles rápidos

Tipo de product...	Miel	Lugar del origen:	Anhui, China (Mainland)	Marca:	DELI
Número de Mo...	DL-miel	Color:	amarillento a Ámbar	Empaquetado:	Bulto
Certificación:	GMP, HACCP, ISO, Certificación...	Grado:	Premium	Periodo de Vali...	24 meses
Brix (%):	80%	Peso (kilogram...	290 kg	Aditivos:	NINGUNO
Max. Humedad...	18.5%	Actividad de la ...	8.3%	HMF:	20
Azúcar reducto...	65%	nombre del pro...	jarabe de miel miel artificial	forma:	líquido
antibióticos:	Estándar de LA UE	Tipo de proces...	crudo, puro, esterilizado	capacidad:	50 MT/DÍA
Fuente de néct...	Polyflora, multiflower	muestra:	envío	OEM:	sí
Tipo De paquete:	cubo, Mason Jar, botella de PE...	otros miel:	miel de Acacia, linden miel, viol...		

The most important fake news, for me, is that it does not affect health.

matory cell infiltration.[96] It was also observed that group 3 (positive control) had a more evident improvement than group 2 (alcohol consumers), and group 7 (fructose syrup) had more severe liver damage than group 2, which is important evidence for the adverse effects of high fructose syrup consumption and its use as a honey adulterant.[96]

Cárdenas-Escudero, J., et al., *Honey polyphenols: regulators of human microbiota and health.* Food & Function, 2023. **14**(2): p. 602-620.



Expert Group “Honey Platform”

Representatives of member states (Ministries)	Expert stakeholders in the honey supply chain	Civil society experts	Scientific experts

The group is composed of 90 members

Expert Group “Honey Platform”

Objectives

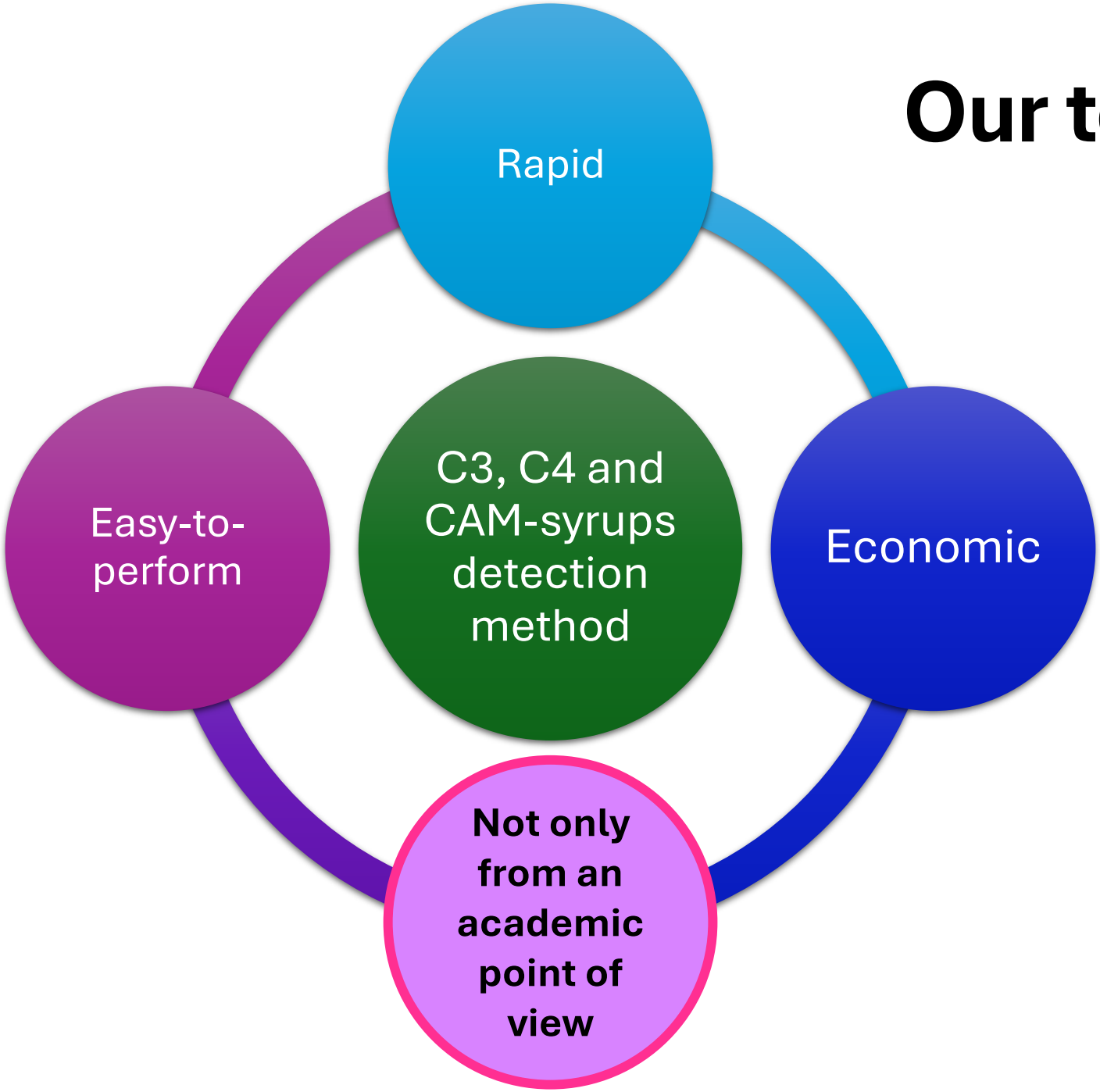
1. Improve **checks on the authenticity of honey**, in particular methods for detecting adulteration in honey, with a view to possible harmonization.

2. Make recommendations for a Union **traceability system** to trace honey back to the harvester or importer.

3. Make recommendations on the possible need to update the **compositional criteria and other quality parameters** laid down in this Directive.

4. Make recommendations with a view to the establishment of a Union **reference laboratory** dedicated exclusively to honey authentication.

Our team Objective



When we compare the infrared spectra of honey and rice syrup, curious **differences are observed**.

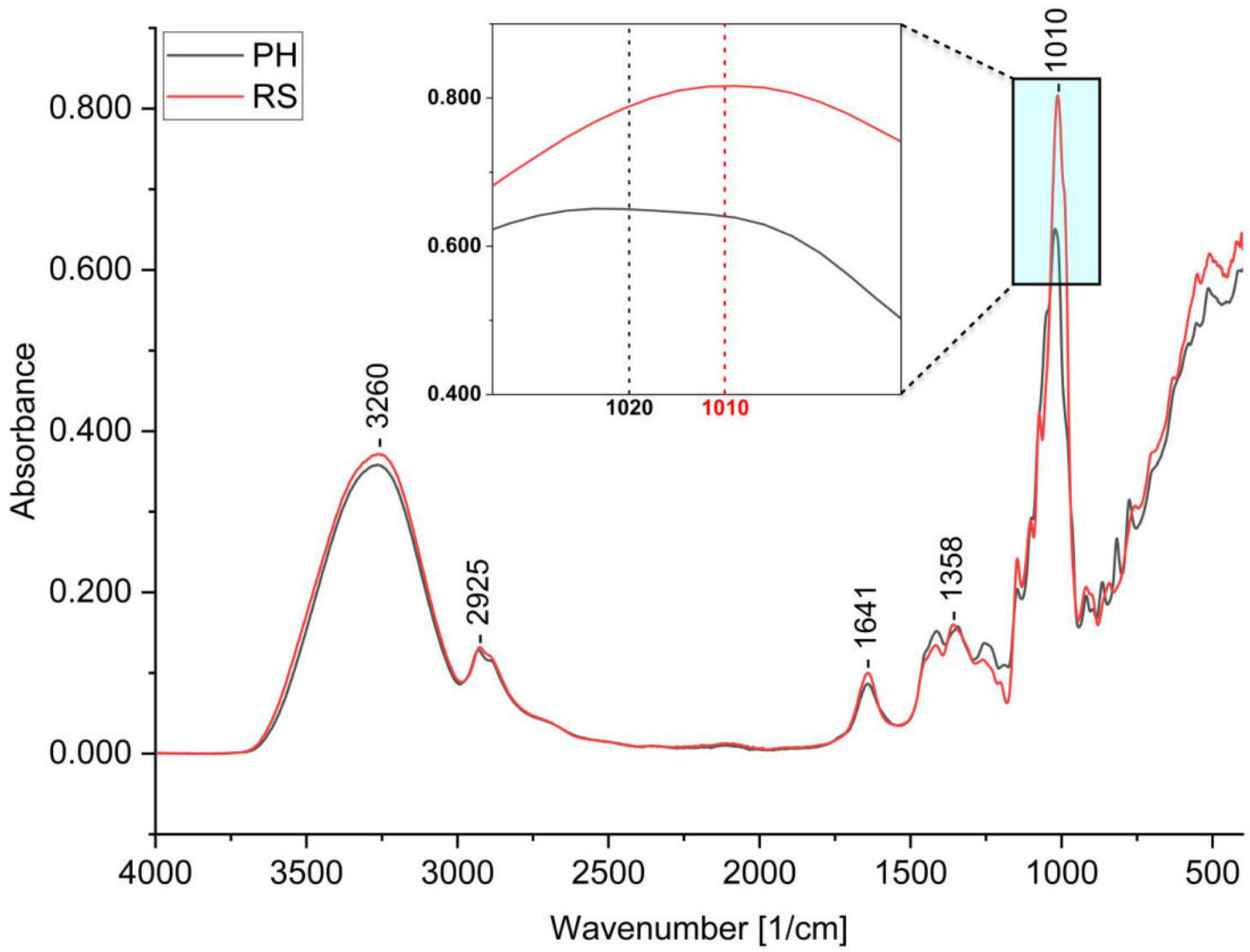


Figure 2. Average (n = 92) FTIR-ATR spectra of pure honey (PH) and commercial rice syrup (RS) between 4000 and 400 cm^{-1}. The zoomed area shows more clearly the 10 cm^{-1} difference observed between the two interest maxima of pure honey (1020 cm^{-1}) and rice syrup (1010 cm^{-1}).

Honey absorbance characteristically increases at 1013 cm^{-1} as the degree of rice syrup adulteration of the honey is intentionally increased

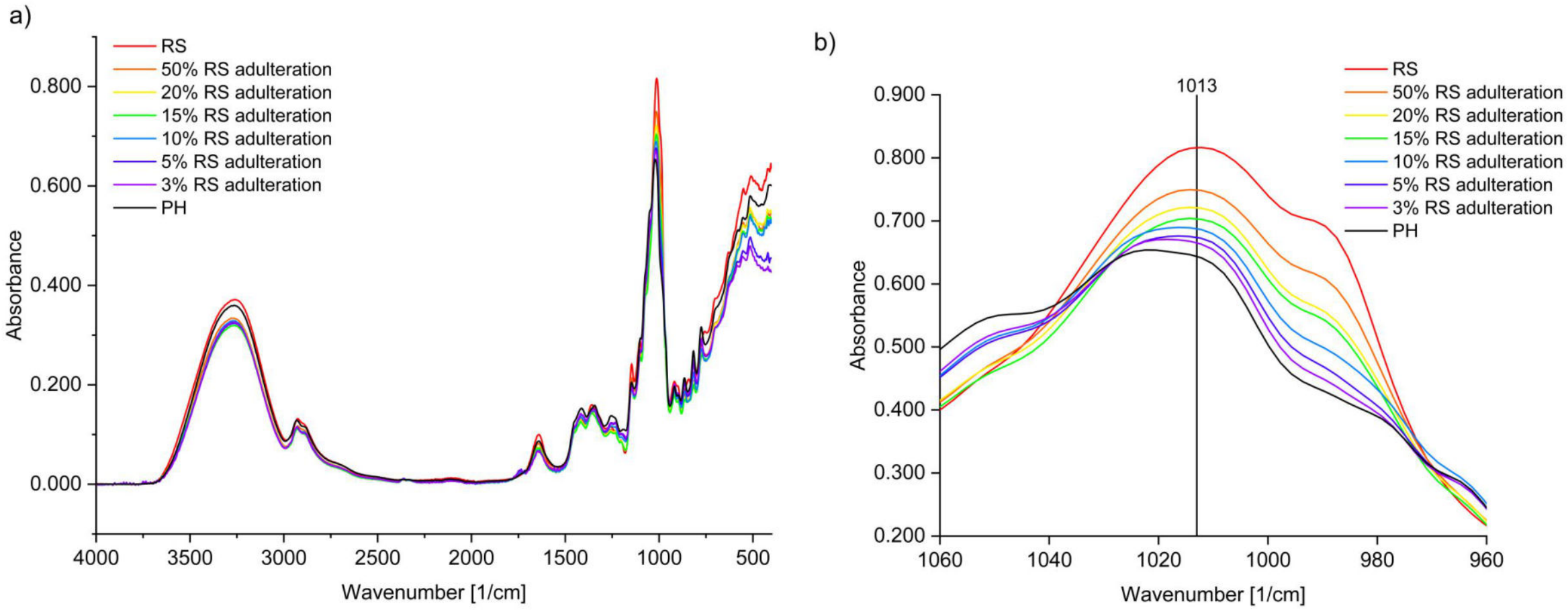


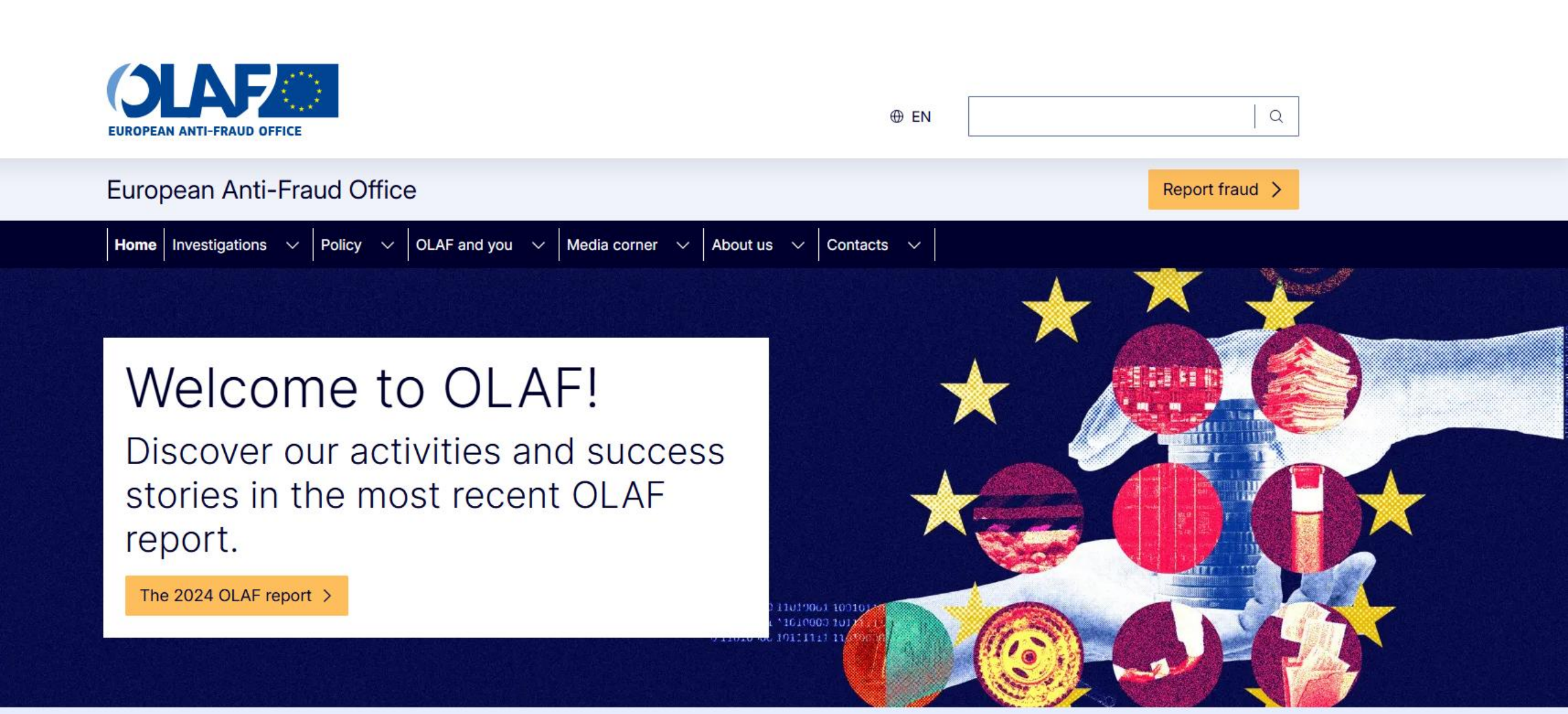
Figure 3. FTIR-ATR average spectra (n = 32) by adulteration grade of selected honey samples. a) Whole spectra 4000–400 cm^{-1}). b) Zoomed zone between 1060 and 960 cm^{-1} shows the increase in the absorbance in the working solutions in order by adulteration grade.

Cárdenas-Escudero, J., D. Galán-Madruga, and J.O. Cáceres, *Rapid, reliable and easy-to-perform chemometric-less method for rice syrup adulterated honey detection using FTIR-ATR.* Talanta, 2023. **253**: p. 123961.

Cárdenas-Escudero, J., D. Galán-Madruga, and J.O. Cáceres, *FTIR-ATR detection method for emerging C3-plants-derivated adulterants in honey: Beet, dates, and carob syrups.* Talanta, 2023. **265**: p. 124768.

SILENCE

¡Denounce!



https://anti-fraud.ec.europa.eu/index_en

Conclusion: The future depends on us

Honey adulteration is not a marginal phenomenon. It is a global problem with deep roots in the dynamics of international trade, lack of effective control, and institutional permissiveness.

But, as that *Terminator* poster said, destiny is not written. We have an opportunity—and a responsibility—to change the rules of the game.

Science is on our side. All that is needed is for society, institutions, and citizens to commit to defending truth, health, and justice.

Acknowledgements

LASER CHEMISTRY RESEARCH GROUP
Complutense University of Madrid

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European Commission

FACULTAD DE CIENCIAS QUÍMICAS
UNIVERSIDAD COMPLUTENSE MADRID

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

Research Projects PID2021-125723NB-I00 (Spanish Ministry of Economy and Competitiveness), PR27/21-015 (Complutense University and Madrid Government), and CPP2022-009754 (Spanish Ministry of Science and Innovation).

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YOU
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ARIGATO
SHUKURIA
DANKSCHEEN
JUSPAXAR
GOZAIMASHITA
EFCHARISTO
KOMAPSUMNIDA
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GRAZIE
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Twisting reality

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