Heliyon 5 (2019) e02950

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Application and optimization of ultrasound-assisted deep eutectic solvent for the extraction of new skin-lightening cosmetic materials from *Ixora javanica* flower

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ARTICLE INFO

Keywords:
Natural product chemistry
Ixora javanica
Deep eutectic solvent
Flavonoid
Skin lightening
Response surface methodology

ABSTRACT

The high demand for cosmetics has had a great impact on the development of innovative products in the cosmetic industry. The availability of raw materials has become a common problem in the cosmetic industry. Materials from nature can act as alternative sources, such as *Ixora javanica*. Several studies have shown the potential of *I. javanica* as an antioxidant and skin lightening agent. The objectives of the present study were to develop and optimize a green ultrasound-assisted deep eutectic solvent extraction of *I. javanica*. Eleven deep eutectic solvents were evaluated based on extraction efficiency parameters; that is, flavonoid and anthocyanin yields; the antioxidant and tyrosinase inhibitory activities of the extracts. The combination of choline chloride and propylene glycol (1:1) was shown to be the optimal deep eutectic solvent for *I. javanica* extraction. The extraction parameters of temperature, extraction time, and solid-to-liquid ratio were also optimized using response surface methodology. The total flavonoid compound obtained was 33 mg quercetin equivalent/g dried sample under the optimum extraction condition (extraction time of 5 min, temperature of 57 °C, solid-to-liquid ratio of 0.02 g/mL). In sum, this work demonstrates the potential of natural deep eutectic solvent as an organic solvent replacement to obtain high quality *Ixora javanica* extract, which is a potential new source of skin-lightening cosmetic materials.

1. Introduction

Ixora javanica is a shrub or small tree plant belonging to the family Rubiaceae. Because of its attractive and distinctive color, it is commonly known as "common red *Ixora*," "jungle flame *Ixora*," or "Soka Jawa" in Indonesia. It is very well known by the community and has been widely studied for its compounds and biological activities (Kharat et al., 2013). Extract activities reported in previous studies included antioxidant, antitumor, anti-inflammatory, and hepatoprotective effects (Nair et al., 1991; Hemalatha et al., 2012; Dontha et al., 2016; Vishwanadham et al., 2016). Studies have shown that the flower provides the greatest activity compared to the other parts of the plant (Rohini et al., 2012; Dontha et al., 2015).

Various polyphenolics, such as flavonoids and anthocyanins, were found to be the primary extract compounds in the *I. javanica* flowers (Dontha et al., 2015). Several studies showed that polyphenolics, flavonoid, and anthocyanin compounds were responsible for most of the activity of *Ixora* flower extracts (Nair et al., 1991; Kharat et al., 2013; Dontha et al., 2015, 2016; Usha et al., 2016; Vishwanadham et al., 2016). Furthermore, polyphenolic, flavonoid, and anthocyanin compounds reportedly exhibit tyrosinase inhibitory activity (An et al., 2008; Chang, 2012; Liang et al., 2014). Methanolic extract from the *Ixora* flower has also shown activity as a tyrosinase inhibitor (Rohini et al., 2012). There are almost 500 species belonging in the genus *Ixora*. Compared to other species, *Ixora javanica* contain high level of ferulic acid and its derivatives (Nair et al., 1991; Kharat et al., 2013; Dontha et al., 2015; Usha et al., 2016). On the other hand, ferulic acid was known as tyrosinase inhibitor due to its structural similarity with tyrosine so that it can compete with tyrosine to occupy the active side of the tyrosinase (An et al., 2008; Liang et al., 2014).

Thus far, research on *Ixora* flowers was limited to compound extraction using organic solvents. However, several reports have shown the potential toxicity of organic solvents for both humans and the environment (De Carvalho and Da Fonseca, 2004; Levet et al., 2016; Lin et al.,

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https://doi.org/10.1016/j.heliyon.2019.e02950
Received 21 September 2019; Received in revised form 21 October 2019; Accepted 25 November 2019
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2018; Seo and Kim, 2018). Environmental awareness has encouraged efforts to find safer and environmentally friendly alternative solvents (green solvents), including in the extraction process (green extraction). Deep eutectic solvents (DESs), which comprise hydrogen bond acceptors (HBAs) and hydrogen bond donors (HBDs) in certain molar ratios, are among the most popular green solvents because of their advantages over other solvents that include less toxicity, easy obtainability, and high extraction efficiency. In addition, the HBA and HBD combination can be adapted according to the extraction requirements (Pena-Pereira and Tobiszewski, 2017). Choline chloride as the HBD has been widely used in previous studies because it is highly effective in plant metabolite extraction (Ruesgas-Ramon et al., 2017).

The utilization of green extraction must be supported by the use of environmentally friendly extraction methods and minimal energy use. Ultrasound-assisted extraction (UAE) is a nonconventional extraction method mediated by ultrasonic waves that is often used in green extraction. The cavitation phenomenon in UAE can increase extraction efficiency so that the extraction time, solvent use, and energy consumption can be reduced (Rutkowska et al., 2017).

To our best knowledge, the application of green extraction using DESs in the *I. javanica* extraction process has not been reported elsewhere. This study aimed to determine environmentally friendly solvent alternatives for extraction of *I. javanica* that can provide high levels of flavonoid and anthocyanin compounds with antioxidant and tyrosinase inhibitory activity. The optimum parameters for the flavonoid extraction were also investigated.

2. Materials and methods

2.1. Chemicals

The chemicals used in this study included pharmaceutical grade choline chloride (Xi'an Rongsheng Biotechnology Co, Ltd, China); propylene glycol, glycerol, ethylene glycol, polyethylene glycol, sorbitol, 1,3-propanediol, oxalic acid, lactic acid, glycolic acid, malic acid, and citric acid (Merck, Germany); 2,2-diphenyl-1-picrylhydrazyl (DPPH), quercetin, mushroom tyrosinase, and L-tyrosine (Sigma Aldrich, USA).

2.2. Plant materials

Fresh *Ixora javanica* flowers were collected from Dusun Ngampel, Kediri, East Java, Indonesia, and were authenticated by the Center for Traditional Medicine Information and Development, Faculty of Pharmacy, University of Surabaya. Red flower blooms were collected, washed, and dried under shade. After shade drying, the flowers were mechanically powdered and sieved using a size 30 mesh. The dry powder was stored in an airtight container until further processing.

2.3. Preparation of deep eutectic solvents

DESs were prepared using a heating method. Choline chloride and the HBD were weighed and used at various molar ratios. The compounds were combined and constantly stirred at 50 °C for 30 min until a homogeneous transparent liquid was generated. Table 1 lists the choline chloride and HBD molar ratios and the abbreviations of the DESs used in this study.

2.4. UAE procedure

The solid-to-liquid ratio of 0.05-g dried flower powder per milliliter of DES or conventional solvent (ethanol) was used during extraction with the UAE method. Extraction was carried out at room temperature for 25 min. The extracts were centrifuged at 1500 rpm for 15 min and the filtrates were collected. The filtrate was adjusted to a final volume of 10.0 mL. The component yield and activities of the filtrate were then determined. All extraction procedures were conducted in triplicate.

Table 1. List of DESs and their abbreviation used in this study.

Abbreviation	Combination of HBA and HBD	Molar ratio
ChPg	Choline chloride: propylene glycol	1:1
ChGl	Choline chloride: glycerol	1:2
ChEg	Choline chloride: ethylene glycol	1:2
ChPeg	Choline chloride: polyethylene glycol	1:2
ChSb	Choline chloride: sorbitol	1:1
ChPd	Choline chloride: 1,3-propanediol	1:3
ChOa	Choline chloride: oxalic acid	1:1
ChLa	Choline chloride: lactic acid	1:2
ChGa	Choline chloride: glycolic acid	1:1
ChMa	Choline chloride: malic acid	1:1
ChCa	Choline chloride: citric acid	1:1

2.5. Determination of total flavonoid content in DES extracts

The total flavonoid content was determined by spectrophotometry according to the method described by Mun'im et al. (2017) with minor modifications. In brief, 1.0 mL of extract filtrate, 1.5 mL of 0.32% $AlCl_3$, and 1.5 mL of 10% sodium acetate solutions were mixed in a volumetric flask. The mixture then had 96% ethanol added until a total solution volume of 10.0 mL was obtained. The mixture was homogenized and incubated for 30 min. The absorbance of each sample was analyzed using a UV-Vis spectrophotometer (UV-1900, Shimadzu Corp, Kyoto, Japan) at λ_{max} of 432.5 nm. The reference compound standard was quercetin. The total flavonoid content (TFC) was expressed in terms of milligram quercetin equivalent (QE) per gram of dried flower powder (mg/g). The procedures were conducted in triplicate.

2.6. Determination of total anthocyanin content in DES extracts

The total anthocyanin content of each DES extract was analyzed using the pH differential spectrophotometric method of Lee et al. (2005) with modification. Initially, two sample solutions were prepared. One solution was prepared by diluting 1.0-mL extract filtrate with potassium chloride buffer and adjusting to pH 1.0 until a volume of 5.0 mL was obtained. The other solution was diluted with sodium citrate buffer and adjusted to pH 4.5. Each solution was homogenized and incubated for 20 min at room temperature. The absorbance of the pH-adjusted sample solutions were measured at 510 nm (A_{510}) and 700 nm (A_{700}) using a 1-cm path length cuvette. The total anthocyanin content (TAC) was calculated as milligrams monomeric anthocyanin of cyanidin-3-glucoside equivalent (CgE) per gram dried flower powder (mg/g) according to Eq. (1):

$$TAC = \frac{A \times MM \times DF \times 1000}{\varepsilon \times l} \quad (1)$$

where A is $(A_{510}-A_{700})_{pH\ 1.0} - (A_{510}-A_{700})_{pH\ 4.5}$ sample absorbance; MM is the molecular mass of cyanidin-3-glucoside (449.2 g/mol); DF is the dilution factor; ε is the molar absorptivity of cyanidin-3-glucoside (26,900 L/cm·mol); 1 is the correction optic path factor (1 cm); and 1000 is the conversion of grams to milligrams.

All analyses were performed in triplicate.

2.7. In vitro antioxidant activity

The antioxidant activity of the extract was evaluated by its DPPH radical scavenging activity (Bakirtzi et al., 2016). Each diluted solution was mixed with 3.0 mL of 0.004% DPPH and incubated for 30 min. The absorbance of the extract mixture ($A_{extract}$) and the absorbance of 0.004% DPPH (A_{DPPH}) were determined at 517.0 nm. The DPPH scavenging

Table 2. Composition of solution in tyrosinase inhibitor assay.

Solution	Composition of solution (μl)			
	a	b	c	d
Phosphate buffer	120	160	80	120
Substrate (L-tyrosine)	40	40	40	40
Sample	-	-	40	40
Mushroom tyrosinase	40	-	40	-

Table 3. The coded, range, and real levels of each factor for the experimental design.

Factor	Unit	Code	Range and level (xi)		
			−1	0	1
Extraction time	min	x_1	5	10	20
Temperature	°C	x_2	30	40	57
Solid-to-liquid ratio	g/mL	x_3	1:20	1:30	1:50

activity was calculated as percentage inhibition using Eq. (2). Quercetin was used as a positive control. The experiments were performed in triplicate.

$$\%\ \text{inhibition of DPPH radical} = \frac{A_{DPPH} - A_{extracts}}{A_{DPPH}} \quad (2)$$

2.8. In vitro tyrosinase inhibitory activity

Assays were performed as previously described by Chiocchio et al. (2018) with slight modifications. Mushroom tyrosinase solution was freshly prepared from 1.73 mg of 500 U/mL mushroom tyrosinase diluted in 10.0 mL of 0.05 M phosphate buffer solution, pH 6.5. Substrate solution was also freshly prepared by diluting 1.81 mg of L-tyrosine in 10.0 mL of 0.05 M phosphate buffer solution. Each of the solutions and sample were mixed at certain volumes according to Table 2.

All of the mixtures were incubated at 25 °C for 30 min, and the reaction was monitored using a microplate reader at 475 nm. The percentage inhibition of tyrosinase activity was calculated using the following equation:

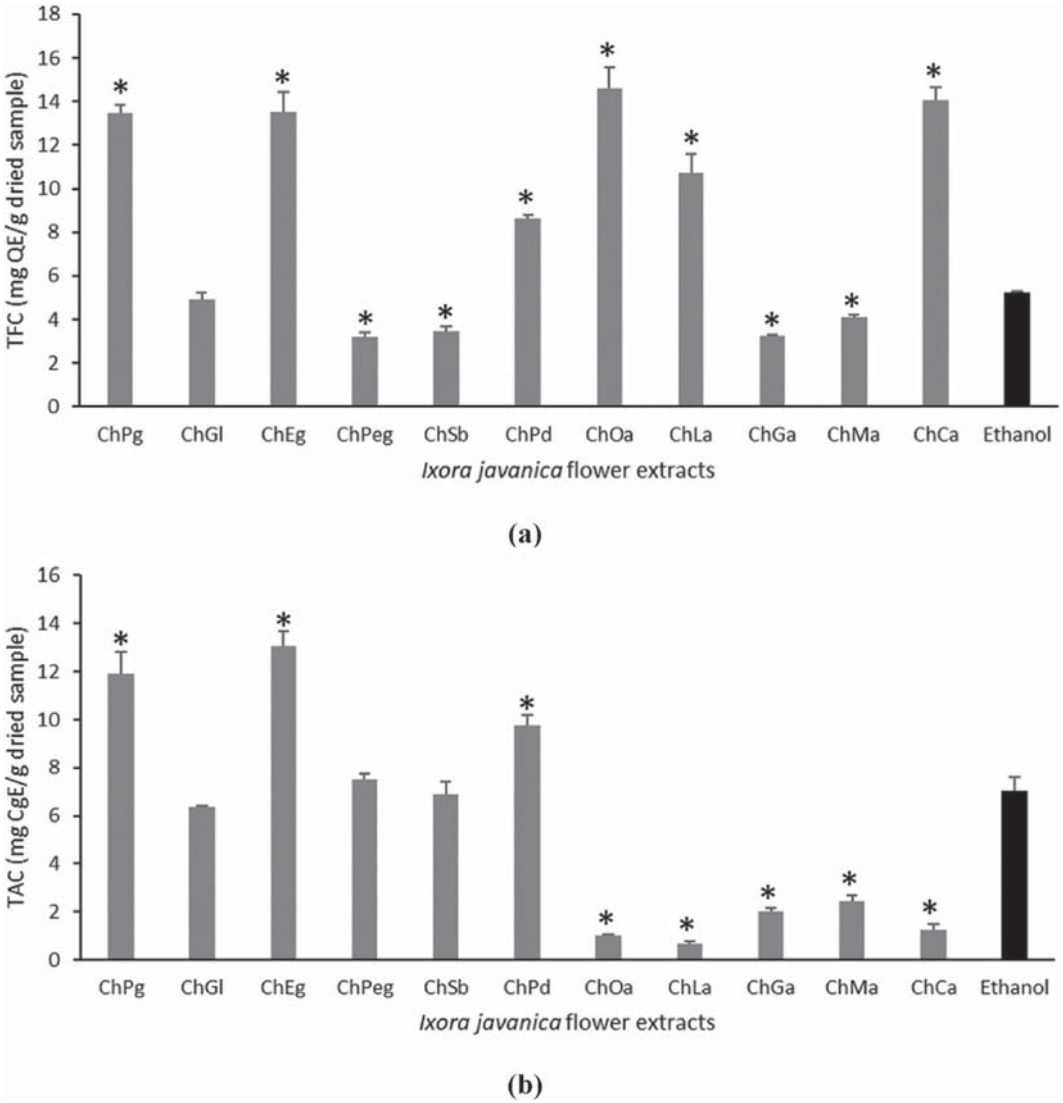


Figure 1. Total flavonoid (a) and anthocyanin (b) yields from *I. javanica* with different DES types. * means $p < 0.05$ compared with ethanol.

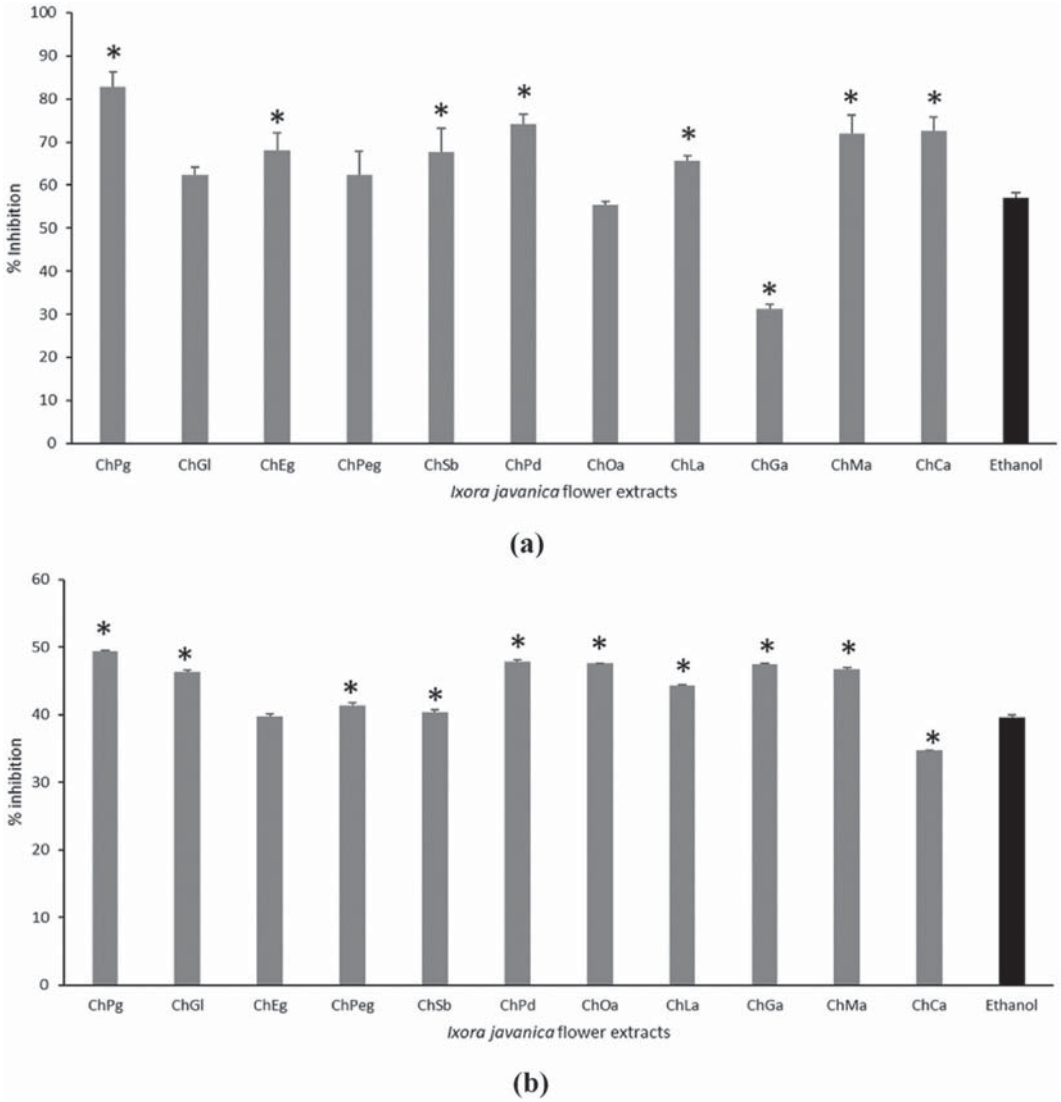


Figure 2. *In vitro* antioxidant activities (a) and tyrosinase inhibition activities (b) of *I. javanica* flower extracts obtained with various DESs. * means $p < 0.05$ compared with ethanol.

$$\%\ \text{inhibition of tyrosinase} = \frac{(A-B)-(C-D)}{(A-B)} \times 100\% \quad (3)$$

where A is solution a absorbance; B is solution b absorbance; C is solution c absorbance; and D is solution d absorbance. Analyses were performed in triplicate.

2.9. Optimization of the extraction of total flavonoid using response surface methodology

Optimization of the extraction condition was assisted using response surface methodology (RSM) with three factors, where each factor consisted of three levels. RSM was done by central composite design using Minitab® Software version 16 (Minitab Pty Ltd, Sydney, Australia). Three factors were optimized to obtain a high level of total flavonoid in the flower extract. The code of each independent variable is represented in Table 3. A 20-run experiment by RSM was performed for verification and the results were compared with the predicted values.

2.10. Statistical analysis

Total flavonoid and TAC data are presented as the mean ± standard deviation (SD). The results of the *in vitro* studies are expressed as the mean of %inhibition ±SD. All data obtained in this study were analyzed via one-way analysis of variance (ANOVA) test (significance level of $p < 0.05$) using SPSS software version 16 for Windows (IBM, New York, United States).

3. Results and discussion

3.1. Flavonoid and anthocyanin extraction using different DESs

In this study, 11 DESs with different compositions and characteristics were investigated for the extraction of *I. javanica* flowers. Each DES was tested for its extraction efficiency for bioactive compounds. The results showed that different types of DESs influenced the total flavonoid and total anthocyanin yields. According to previous studies, different HBA and HBD compositions can affect the physicochemical characteristic of DESs and also their extraction efficiency (Zainal-Abidin et al., 2017). DESs containing higher polarity HBD, such as polyalcohol and acid, may be used as alternatives for flavonoid and anthocyanin extraction (Bubalo et al., 2016; Radosevic et al., 2016; Bosiljkov et al., 2017). Our results demonstrated that most of the DESs used in this study yielded better flavonoid and anthocyanin extraction than that of ethanol. Among the DESs, ChOa, ChCa, ChEg, ChPg, ChLa, ChPd, showed higher capability in flavonoid extraction compared to ethanol ($p < 0.05$) (Figure 1a). While

Table 4. The experimental results of each variable combination.

RUN	Independent variable			Response
	X_1	X_2	X_3	Total flavonoid (mg QE/g dried sample)
1	−1	1	1	33.9
2	−1	0	0	19.7
3	0	0	0	7.3
4	−1	−1	−1	17.8
5	−1	1	−1	25.9
6	1	1	−1	15.7
7	0	1	0	16.2
8	0	0	0	8.3
9	0	−1	0	8.1
10	1	−1	1	15.1
11	0	0	0	8.2
12	0	0	1	16.9
13	0	0	0	8.7
14	1	1	1	24.5
15	1	0	0	5.1
16	0	0	−1	7.6
17	0	0	0	8.5
18	0	0	0	8.7
19	1	−1	−1	4.0
20	−1	−1	1	28.4

ChEg, ChPg, ChPd demonstrated the highest anthocyanin extraction ability compared to ethanol ($p < 0.05$) (Figure 1b).

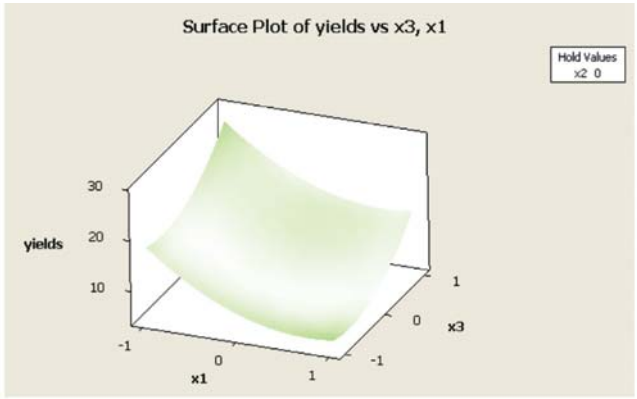
Acid-based DESs provided slightly higher total levels of flavonoid than DESs with polyalcohols. Generally, acid-based DESs are more polar than sugar and polyalcohol (Craveiro et al., 2016; Radosevic et al., 2016). Based on our findings, the polarity affected the ability of the DES to extract flavonoid compounds. A similar observation that acidic and more polar DESs showed higher yields of flavonoid was reported by Duan et al. (2016). In contrast with the flavonoid extraction, polyalcohol-based DESs showed greater efficiency than acids in anthocyanin extraction. Similar results where ChPg exhibited a greater anthocyanin extraction capability than those of acid-based-DESs have been reported in previous studies (Sang et al., 2018; Meng et al., 2018).

The DES's capability to extract bioactive compound is influenced by several parameters that include viscosity, polarity, solubility, and physicochemical interactions (Li et al., 2017). One possible mechanism of extraction of flavonoid compound is the formation of hydrogen bonds between the DES molecules and the flavonoid (Garcia et al., 2015; Cunha and Fernandes, 2018; Liu et al., 2018). DESs with high viscosity, that can inhibit the formation of hydrogen bonds between the HBA and the HBD, had lower extraction yields in previous studies (Dai et al., 2016; Bubalo et al., 2016; Bosiljkov et al., 2017). Our results show that viscous ChSb and ChGl DESs had lower efficiency in flavonoid extraction.

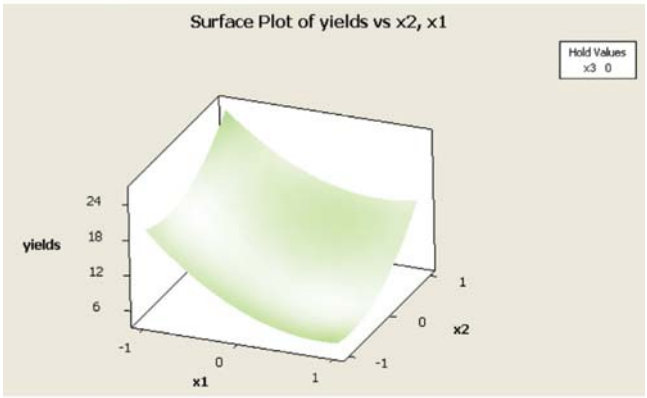
In addition, the complexity of the polyalcohol structure seems to affect the extraction efficiency of flavonoid compounds. We found that a simple structure DES component, such as ethylene glycol, resulted in greater flavonoid extraction efficiency. With more complex DES component structures, such as ChSb and ChPeg, the flavonoid yield decreased. Similar to viscosity, steric hindrance can inhibit the formation of chemical bonds, such as hydrogen, van der Waals, and hydrophobic

Table 5. Analysis of variance for total flavonoid yields.

Source	Degrees of freedom	Sum of squares	Mean square	F-value	*p*-value
Regression	9	1363.19	151.465	299.53	0.000
Linear	3	787.44	262.479	519.07	0.000
x_1	1	375.77	375.769	743.11	0.000
x_2	1	183.18	183.184	362.26	0.000
x_3	1	228.48	228.484	451.84	0.000
Square	3	565.50	188.502	372.78	0.000
x_1*x_1	1	50.20	50.205	99.28	0.000
x_2*x_2	1	44.50	44.501	88.00	0.000
x_3*x_3	1	46.74	46.741	92.43	0.000
Interaction	3	10.24	3.415	6.75	0.009
x1*x2	1	7.03	7.031	13.90	0.004
x1*x3	1	0.21	0.211	0.42	0.533
x2*x3	1	3.00	3.001	5.94	0.035
Lack-of-fit	5	3.69	0.738	2.70	0.150
Residual Error	10	5.06	0.506		
Pure Error	5	1.37	0.274		



(a)



(b)

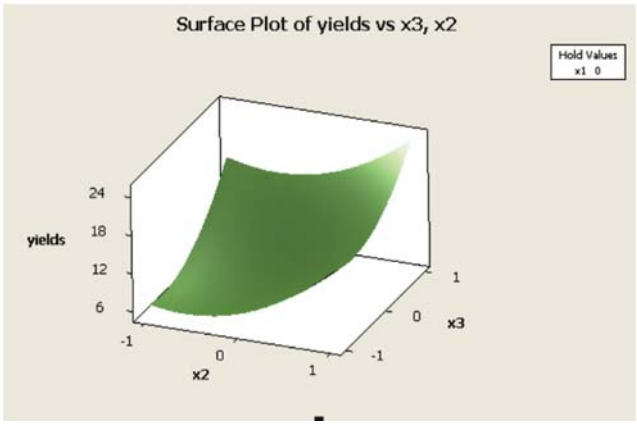


Figure 3. Interaction between extraction conditions and yield. 3D Surface graphs of (a) yield versus solid-to-liquid ratio (x3) and extraction time (x1); (b) yield versus temperature (x2) and extraction time (x1); (c) yield versus solid-to-liquid ratio (x3) and temperature (x2).

bonds, between the DES and the compound molecules (Ferrone et al., 2018). Surprisingly, this behavior did not occur with acidic DESs, possibly because the extraction mechanisms of acid-based and polyalcohol-based DESs were different.

3.2. Antioxidant and tyrosinase inhibition activities of the extracts

The result showed that ChPg, ChPd, ChCa, ChMa ChEg, ChSb, ChLa extracts have higher ($p < 0.05$) DPPH free radical inhibition compared to ethanolic extract (Figure 2a). Statistically, ChPg extract also showed the greatest ability to neutralize DPPH free radicals among all of the extracts ($p < 0.05$). Compounds with activity against free radicals and oxidative stress are a new strategy in combating aging and skin hyperpigmentation (Kanlayavattanakul et al., 2018).

Our findings show that ChPg extract was also effective as a tyrosinase inhibitor (Figure 2b). Based on statistical result, ChPg showed higher tyrosinase inhibition capability compared to all extracts ($p < 0.05$). Tyrosinase is an enzyme that plays an important role in melanin production or melanogenesis. In general, three main reactions occur during the formation of melanin. First, tyrosine hydroxylation into dihydroxyphenylalanine (DOPA); second, the oxidation of DOPA to dopaquinone; and third, the oxidation of 5,6-dihydroxyindole (DHI) to indolequinone. Inhibition of tyrosinase activity will decrease melanin synthesis (Chang, 2012). Certain phenolic compounds and anthocyanin isolated from plants reportedly have tyrosinase inhibitory activity (Jhan et al., 2016). Tyrosinase inhibitors have potential not only as skin-lightening agents but also in the treatment of cancer and neurodegenerative diseases. Our results highlighted the excellent ability of ChPg as an extraction medium to produce extracts with strong antiradical effects and tyrosinase inhibition activity.

3.3. The optimum DES-UAE condition

The selection of the optimum DES type is the crucial point in the extraction of bioactive compounds from plants. ChPg extract showed the highest capability as antioxidant and tyrosinase inhibitor. ChPg also significantly provided higher levels of flavonoid and anthocyanin compared to ethanol. Furthermore, ChPg was chosen as the optimum DES for *I. javanica* extraction. The extraction conditions optimized in this study included extraction time, temperature, and solid-to-liquid ratio toward total flavonoid yield as response. The responses observed in experimental results of each variable combination are presented in Table 4.

For showing the relationship between the variables and the response and also the predicted total flavonoid yields in *I. javanica* flower extract, all data was formulated in a mathematical equation model:

$$Y = 8.2209–6.1300\ x_1 + 4.2800\ x_2 + 4.7800\ x_3 + 4.2727\ x_1^2 + 4.0227\ x_2^2 + 4.1227\ x_3^2 + 0.9375\ x_1x_2 - 0.1625\ x_1x_3 - 0.6125\ x_2x_3$$

where x_1 represents the extraction time, x_2 represents the temperature, and x_3 represents the solid-to-liquid ratio.

ANOVA was performed for evaluating the model quality (Table 5). The great agreement between the experimental results and the predicted yield from the model was shown by $R^2 = 0.9779$. This means that this model can express >97.79% of variances. The lack-of-fit showed that failure of the model in representing the data was not significant with $p = 0.150$ (>0.05). The results showed that all of the variables had significant effect on the response ($p = 0.000$). Interaction was seen between each of the variables ($p < 0.05$) except between the extraction time and the solid-to-liquid ratio. The results are represented as contour surface and 3D surface graphs in Figure 3 and Figure 4.

The optimum point where the highest total flavonoid compound yield was obtained is shown in the dark green area in Figure 4. The extraction of the total flavonoid compound from *I. javanica* flower using ChPg reached its optimum point at an extraction time of 5 min, temperature of 57 °C and solid-to-liquid ratio of 1:50 g/mL and provided 33.9 mg QE/g dried sample. The total flavonoid yields from this study were close to the predicted value (34.1166 mg QE/g dried sample).

The extraction time is associated with the contact of the solvent with the plant material. Longer contact of the solvent with the plant material

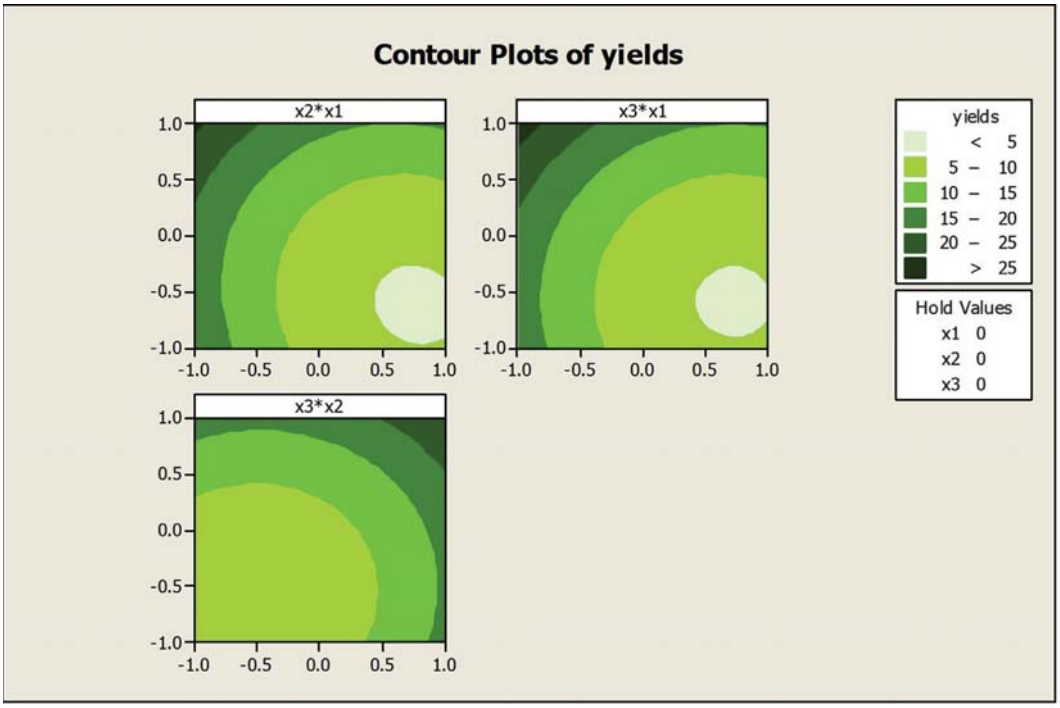


Figure 4. Contour surface graphs of yields for temperature and extraction time (x2*x1); solid-to-liquid ratio and extraction time (x3*x1); and solid-to-liquid ratio and temperature (x3*x2).

increased the diffusion process of the compound and thus increased the extraction efficiency. However, in UAE methods, increasing the extraction time can affect the stability of the compound. Numerous studies showed decreased extraction yields with increasing extraction time (Khezeli et al., 2016; Li et al., 2017; Syakfanaya et al., 2019).

A temperature increase in the extraction process can be an external force to increase mass transfer as well as increase solubility and diffusion and reduce viscosity. However, compound stability can be affected when high temperatures cause degradation of the compounds. Problems with high viscosity DESs in the extraction process can be solved by increasing the temperature, resulting in increased extraction efficiency (Bubalo et al., 2016; Ozturk et al., 2018; Yuniarti et al., 2019).

The solid-to-liquid ratio represents the ratio between the amount of plant material and the solvent volume in the extraction process. A lower value of the solid-to-liquid ratio means a higher volume of solvent has been added. Increasing the solvent volume can result in increasing extraction yields. However, this must be considered with the efficiency of solvents used (Ozturk et al., 2018).

4. Conclusion

DESs are promising alternative green solvents that can replace the use of organic solvent for bioactive compound extraction from plants. In consideration of antioxidant activity, tyrosinase inhibitory activity, total anthocyanin and total flavonoid yield, combination of choline chloride as the HBA and propylene glycol as the HBD (molar ratio 1:1) was chosen as the solvent for extraction of *I. javanica*. Furthermore, we succeeded in optimizing the extraction process to enhance flavonoid compound in extract. The optimum extraction conditions suggested from this study were extraction time of 5 min, temperature of 57 °C, and solid-to-liquid ratio of 1:50 g/mL.

Declarations

Author contribution statement

Nina Dewi Oktaviyanti: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Kartini: Conceived and designed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Abdul Munim: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This work was supported by the Directorate of Research and Community Engagement, Universitas Indonesia, Indonesia for Q1Q2 2019 scheme funding support. Nina Dewi Oktaviyanti was supported by the Universitas Surabaya, Indonesia PhD program scholarship.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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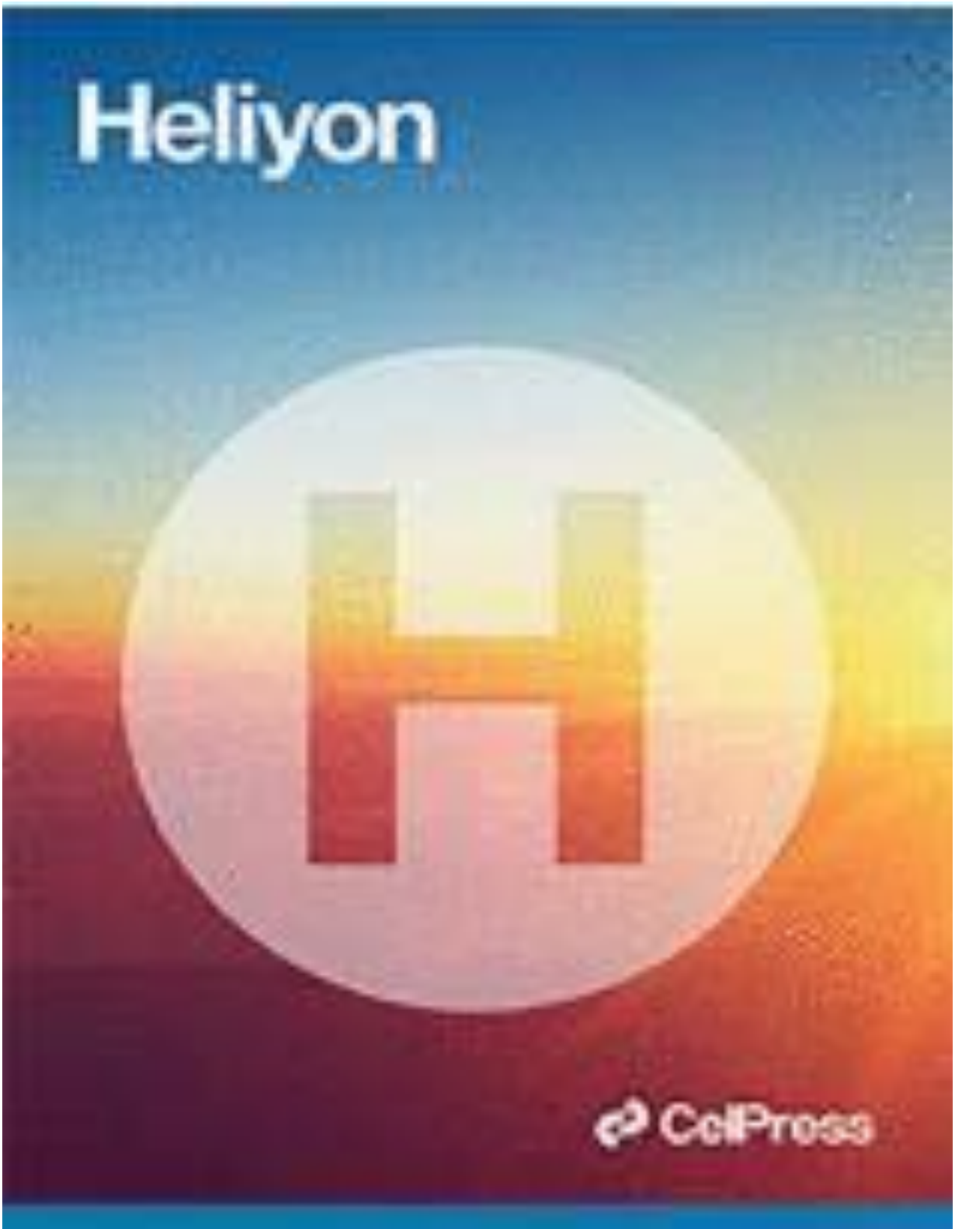
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Pia Willberg-Keyriläinen, Jarmo Ropponen

Article e02898

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Research article *Open access*

Antibacterial efficacy of green synthesized α-Fe_2O_3 nanoparticles using *Sida cordifolia* plant extract

Panduranga Naga Vijay Kumar Pallela, Shameem Ummey, Lakshmi Kalyani Ruddaraju, Satyananarayana Gadi, ... S.V.N. Pammi

Article e02765

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Stability of well-posed stochastic evolution equation

S.A. Bishop, S.A. Iyase, H.I. Okagbue

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FEEDBACK

3D digital analysis of magnetic force-driven orthodontic tooth movement

Yukinori Kuwajima, Yoshiki Ishida, Cliff Lee, Hisayo Mayama, ... Shigemi Ishikawa-Nagai

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Review article *Open access*

An overview of albumin and alpha-1-acid glycoprotein main characteristics: highlighting the roles of amino acids in binding kinetics and molecular interactions

Michel Bteich

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Explanations around physical abuse, neglect and preventive strategies among older Yoruba people (60+) in urban Ibadan Southwest Nigeria: A qualitative study

Ojo Melvin Agunbiade

Article e02888

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Research article *Open access*

Psychopathy and chronotype disposition: the mediating role of depression

Umair Akram, Jodie C. Stevenson, Maria Gardani, Asha Akram, Sarah Allen

Article e02894

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Research article *Open access*

Anti-obesity effects of dichloromethane leaf extract of *Gnidia glauca* in high fat diet-induced obese rats

Wycliffe Makori Arika, Cromwell Mwiti Kibiti, Joan Murugi Njagi, Mathew Piero Ngugi

Article e02800

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Research article *Open access*

A pilot study of *Livin* gene and *Yes-associated protein 1* expression in hepatocellular carcinoma patients

Eman AE. Badr, Ibrahim El Tantawy El Sayed, Mohamed FA. Assar, Sahar AM. Ali, Nehal S. Ibrahim

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Research article *Open access*

Isolation and identification of cholestane and dihydropyrene from *Calophyllum inophyllum*

David Febrilliant Susanto, Hakun Wirawasista Aparamarta, Arief Widjaja, Nurul Jadid, Setiyo Gunawan

Article e02893

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Research article *Open access*

A chronic high-fat diet causes sperm head alterations in C57BL/6J mice

Sirirat Nantavisai, Watchareewan Rodprasert, Koranis Pathanachai, Parattakorn Wikran, ... Chenphop Sawangmake
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Health risk assessment of Patulin intake through apples and apple-based foods sold in Qatar

Iman Saleh, Ipek Goktepe

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Review article *Open access*

Water demand modelling using evolutionary computation techniques: integrating water equity and justice for realization of the sustainable development goals

Oluwaseun Oyebode, Damilola E. Babatunde, Chukwuka G. Monyei, Olubayo M. Babatunde

Article e02796

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Humeral fracture treatment in pigeons by bone pins made from ovine and canine bones

Seifollah Dehghani Nazhvani, Fatemeh Etemadi, Mehrdad Mohammadi, Fatemeh Dehghani Nazhvani

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Research article *Open access*

Influence of *Lysinibacillus sphaericus* on compressive strength and water sorptivity in microbial cement mortar

Daniel Karanja Mutitu, Jackson Muthengia Wachira, Romano Mwirichia, Joseph Karanja Thiong'o, ... Genson Muriithi

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Research article *Open access*

Development of microporous activated Aloji clay for adsorption of lead (II) ions from aqueous solution

K.S. Obayomi, M. Auta

Article e02799

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Research article *Open access*

Modulatory effects of ghrelin on sperm quality alterations induced by a fructose-enriched diet

Nicolás David Ramírez, Eugenia Mercedes Luque, Xaviar Michael Jones, Pedro Javier Torres, ... Ana Carolina Martini

Article e02886

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Research article *Open access*

Floristic diversity of receiving environments polluted by effluent from agri-food industries

N.A. Noukeu, R.J. Priso, S.D. Dibong, D. Ndongo, ... D. Essono

Article e02747

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FEEDBACK

Structural activity analysis, spectroscopic investigation, biological and chemical properties interpretation on Beta Carboline using quantum computational methods

K. Hemachandran, P. Anbusrinivasan, S. Ramalingam, R. Aarthi, C.K. Nithya

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Quantum chemical and experimental evaluation of the inhibitory action of two imidazole derivatives on mild steel corrosion in sulphuric acid medium

M. Ouakki, M. Galai, M. Rbaa, A.S. Abousalem, ... M. Cherkaoui

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Research article *Open access*

Light transmission and internal scattering in pulsed laser-etched partially-transparent silicon wafers

Muhd Hatim Rohaizar, Suhaila Sepeai, Nurfarizza Surhada, N.A. Ludin, ... Saleem H. Zaidi

Article e02790

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Data driven methodology for model selection in flow pattern prediction

Juan Sebastian Hernandez, Carlos Valencia, Nicolas Ratkovich, Carlos F. Torres, Felipe Muñoz

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Molecular design of antioxidant lubricating oil additives via QSPR and analysis dynamic simulation method

Usman Abdulfatai, Adamu Uzairu, Sani Uba, Gideon Adamu Shallangwa

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Research article *Open access*

Common inflammatory markers after cardiac surgery in infants and their relation to blood stream sepsis

Shaad Abqari, Mahesh Kappanayil, Abish Sudhakar, Rakhi Balachandran, ... R. Krishna Kumar

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Research article *Open access*

U–Pb geochronology and Hf isotope data from the Late Cretaceous Mawat ophiolite, NE Iraq

Heider Al Humadi, Markku Väisänen, Sabah A. Ismail, Jaakko Kara, ... Marja Lehtonen

Article e02721

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Research article *Open access*

Systematic review of study designs and methods in health transition research for young people with intellectual disabilities

FEEDBACK

Mumtaz Hussain, Tahir Qadri, Zahid Hussain, Aamer Saeed, ... Arif Malik
Article e02812

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Research article *Open access*

Immobilized cells of a novel bacterium increased the degradation of *N*-methylated carbamates under low temperature conditions

Anum Fareed, Sania Riaz, Ismat Nawaz, Mazhar Iqbal, ... Tatheer Alam Naqvi
Article e02740

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Research article *Open access*

Performance evaluation of surfactant modified kaolin clay in As(III) and As(V) adsorption from groundwater: adsorption kinetics, isotherms and thermodynamics

Rabelani Mudzielwana, Mugera Wilson Gitari, Patrick Ndungu
Article e02756

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Research article *Open access*

Nutritional value, micronutrient and antioxidant capacity of some green leafy vegetables commonly used by southern coastal people of Bangladesh

S.M. Neamul Kabir Zihad, Yashu Gupt, Shaikh J. Uddin, Muhammad Torequl Islam, ... Satyajit D. Sarker
Article e02768

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Research article *Open access*

Soil flushing pilot test in a landfill polluted with liquid organic wastes from lindane production

Aurora Santos, Carmen M. Domínguez, David Lorenzo, Raul García-Cervilla, ... Joaquín Guadaño
Article e02875

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Research article *Open access*

Studies on nucleation and crystal growth kinetics of ferrous oxalate

Chuanbo Li, Yongzhi Ning, Taihong Yan, Weifang Zheng
Article e02758

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Research article *Open access*

Binder jet additive manufacturing method to fabricate near net shape crack-free highly dense Fe-6.5 wt.% Si soft magnets

Corson L. Cramer, Peeyush Nandwana, Jiaqiang Yan, Samuel F. Evans, ... M. Parans Paranthaman
Article e02804

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Research article *Open access*

Supersaturated proteins are enriched at synapses and underlie cell and tissue vulnerability in Alzheimer's disease

Rosie Freer, Pietro Sormanni, Prajwal Ciryam, Burkhard Rammner, ... Michele Vendruscolo
Article e02589

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Research article *Open access*

Theoretical QSAR modelling and molecular docking studies of some 4-hydroxyphenylpyruvate dioxygenase (HPPD) enzyme inhibitors potentially used as herbicides

Saidu Tukur, Gideon Adamu Shallangwa, Abdulkadir Ibrahim

Article e02859

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ISSN: 2405-8440

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FEEDBACK

Heliyon

COUNTRY

Netherlands

Universities and research institutions in Netherlands

Media Ranking in Netherlands

SUBJECT AREA AND CATEGORY

Multidisciplinary
Multidisciplinary

PUBLISHER

Elsevier B.V.

H-INDEX

88

PUBLICATION TYPE

Journals

ISSN

24058440

COVERAGE

2015-2023

INFORMATION

Homepage

How to publish in this journal

c.schulz@cell.com

SCOPE

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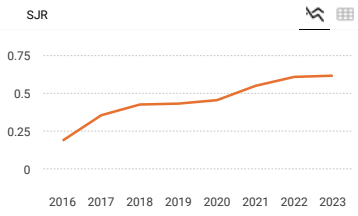

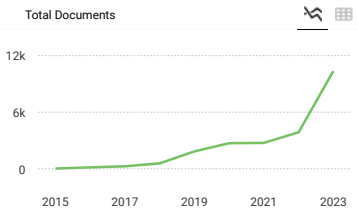

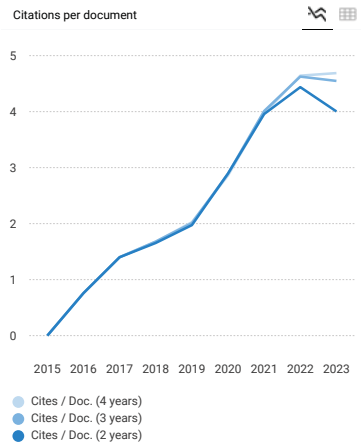

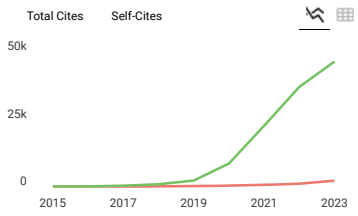

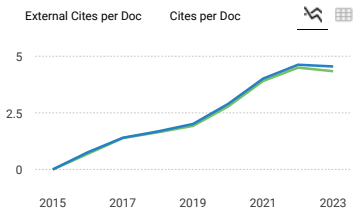

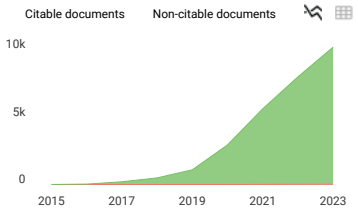

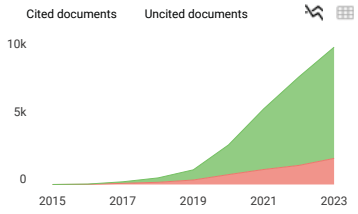

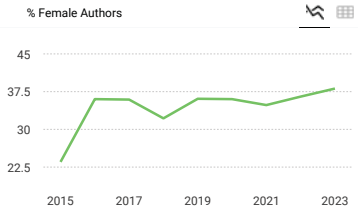

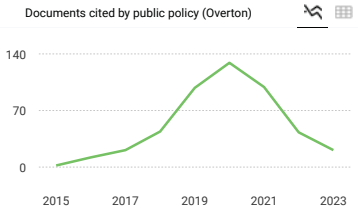

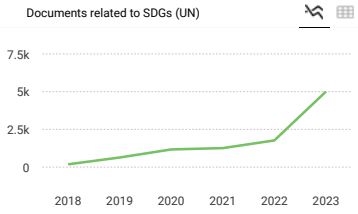

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R **R.SIVARANJANI** 3 months ago

Dear sir,

Im intreast to sumbit my paper, may i know about APC Charge? How many days to take accpetance and publication ?

reply

SCImago Team

Melanie Ortiz 3 months ago

Dear Sivaranjani,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

S **Scholarly Criticism** 7 months ago

This is the latest story we broke. We hope Scimago will approve this comment:

Elsevier Unethically Promotes its Journals via Scopus: The Case of Heliyon

https://scholarlycritic.com/elsevier-unethically-promotes-its-journals-via-scopus-case-of-heliyon.html

reply

M **MUDITHA** 8 months ago

what is the ranking of this journal article.(how many stars)
ISSN 24058440
PUBLISHER Elsevier Ltd
Title -A cross-cultural comparison of work engagement in the relationships between trust climate – Job performance and turnover intention: Focusing China and Pakistan
Authors Aini Aman, Muhammad Rafiq , Omkar Dastane

reply

SCImago Team

Melanie Ortiz 8 months ago

Dear Muditha,
Thank you for contacting us. Could you please expand a little bit on your request so we can assist you better?
Best Regards, SCImago Team

J **Jose** 9 months ago

How much does it cost to publish an article with you?

Thanks

reply

SCImago Team

Melanie Ortiz 9 months ago

Dear Jose,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

M **Muluneh Getaneh Tegegn** 10 months ago

Thank you, in advance.
On average, How long does Heliyon take to accept my manuscript?
Thanks

reply

SCImago Team

Melanie Ortiz 10 months ago

Dear Muluneh,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

J **Jacobus H. de Waard** 10 months ago

Does this journal publish methods papers?

Jacobus

reply

SCImago Team

Melanie Ortiz 10 months ago

Dear Jacobus,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.

Best Regards, SCImago Team

O **Oussama Khouili** 11 months ago

please is this journal Q1 or Q2 for 2024??

reply

J **Jose** 10 months ago

Hi Melanie,

I would like to know if Heliyon is a peer reviewed journal.
Thanks.
Regards,

jose

SCImago Team

Melanie Ortiz 10 months ago

Dear Jose,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

SCImago Team

Melanie Ortiz 11 months ago

Dear Oussama,
Thank you for contacting us. Our data come from Scopus, they annually send us an update of the data. This update is sent to us around April / May every year. The SJR for 2022 was released on 1st May 2023. Therefore, the indicators for 2023 will be available in May/June 2024.
Best Regards, SCImago Team

O **Olga** 1 year ago

Hi!

I submmited a paper in 16st may, recently (about 5 days) there was the notification that It has 2 reviews. I have sent email yo the editor asking about the decision and status of my paper, however nobody answer. What can I do? What should I do if I want to send It to another journal? In the plataform there isn't comments neither instructions.

reply

SCImago Team

Melanie Ortiz 1 year ago

Dear Olga, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

H **Hana** 1 year ago

Hello..
How long does the research take to be accepted for publication?
I want the research to be published before 8/30/2023. Is this possible?

reply

N **Natt Pimpa** 1 year ago

I have recently got my paper accepted there and it took 11 months (5 revisions). Good learning process.

W **WARMAN** 1 year ago

I have a paper I want to submit to Heliyon with the title Improving the Pedagogical Competence of Elementary School Teachers in West Kutai Indonesia through the Utilization of Academic Supervision.

Is there an opportunity to publish it ???

M **Mohamed** 1 year ago

Hi,
Unfortunately it takes very long, I have submitted my paper in March and still under review :(

SCImago Team

Melanie Ortiz 1 year ago

Dear Hana,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

H **Hendy satria** 2 years ago

Hello, Is the journal category still multidisciplinary? Or will there be changes in the near future?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Hendy,
Thank you for contacting us.
You can consult the journal's categories just above.
Best Regards, SCImago Team

R **rizal** 2 years ago

Hello
does the heliyon journal have scope in the field of language?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Rizal,
Thank you for contacting us.
We suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

A **Adan DORIA** 2 years ago

Buen día, por favor me podría indicar en que cuartil se encuentra esta revista? coordine con Scopus pero me indican que coordinen con ustedes Scimago. Gracias por la repuesta.

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Adan, thank you very much for your request. You can consult that information just above. Best Regards, SCImago Team

Mubbasher munir 2 years ago

Hi

What is the status of journal in 2022?

Is it recognized yet?

reply

SCImago Team

Melanie Ortiz 2 years ago

Dear Mubbasher,
Thank you very much for your comment.
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2021 was released on 11 May 2022. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.
The Scopus' update list can also be consulted here:
https://www.elsevier.com/solutions/scopus/how-scopus-works/content
Best Regards, SCImago Team

S **Safa** 3 years ago

Dear Sir,

Could you provide me if this journal is included in the Scopus and Clarivate lists?

Regards
Safa

reply

Z **zul** 2 years ago

Heliyon is still in scopus list as in nov 2022 (extlistNovember2022.xlsx)
https://www.scopus.com/sources.uri?zone=TopNavBar

SCImago Team

Melanie Ortiz 3 years ago

Dear Safa,
Thank you for contacting us.
SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request referring to the index status. We suggest you consult Scopus database (see the current status of the journal) or the mentioned database for further information.
Best Regards, SCImago Team

A **Anwar** 3 years ago

What is the difference between Heliyon Elsiever and Heliyon Cell press

reply

W **Wilson Rajagukguk** 2 years ago

Dear Melanie

I have a manuscritp underreview by Heliyon. There is rumor in Inoonesia that Heliyon is under review and in danger to be discotinued by Scopus. I am worry about the rumor.

Can you explain and give the assurance of status and continuation in Scopus?

Thank you so much

SCImago Team

Melanie Ortiz 2 years ago

Dear Wilson,
Thank you for your comment.
Our data source is Scopus, SCImago doesn't participate in the journal's selection. SCImago has no authority to include or exclude SJR journals. Please contact Scopus Support regarding this matter here:
https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/
Best Regards, SCImago Team

G **Gerald Cleaver** 3 years ago

I am the editor of Heliyon Physics. There is no difference. Cell Press is a division of Elsevier. The latter placed Heliyon under the auspices of Cell Press about two years ago.

SCImago Team

Melanie Ortiz 3 years ago

Dear Anwar,
Thank you for contacting us. We suggest you consult the link below:
https://en.wikipedia.org/wiki/Cell_Press
Best Regards, SCImago Team

S **siavash sharifi** 3 years ago

Dear Secretary
Please how much rate the Impact factor and Quarterly of Heliyon journal?

Wishing you good health
Dr Siavash sharifi

reply

SCImago Team

Melanie Ortiz 3 years ago

Dear Siavash, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

S **Sherif Mohamed shawky** 3 years ago

I would like to ask about the journal impact factor.
It is not mentioned in clarivate and SJR.
It is only showing the quartile.

Many Thanks
Sherif shawky

reply

SCImago Team

Melanie Ortiz 3 years ago

Dear Sherif, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

M **M.Shravanthi Bandari** 3 years ago

Hello,

Can I know if Heliyon is in UGC approved 2020-2021 journal's list and can I know it's IF.

reply

S **SANAA** 3 weeks ago

YES, ITS UGC

SCImago Team

Melanie Ortiz 3 years ago

Dear M.Shravanthi , thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source.
Best Regards, SCImago Team

A **Ajmal Hameed** 3 years ago

Dear

How can I submit my paper to this journal? pleas send me the procedure.

Thank you,
Ajmal

reply

SCImago Team

Melanie Ortiz 3 years ago

Dear Ajmal, thank you very much for your comment, we suggest you look for the author's instructions/submission guidelines in the journal's website. Best Regards, SCImago Team

A **Asmaa** 3 years ago

Is this journal free for Egypt?

reply

SCImago Team

Melanie Ortiz 3 years ago

Dear Asmaa,
Thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

D **Dr. Md. Ismail Hossain** 3 years ago

APC for this journal showing USD 1750. How can I ger wave for this APC? Please let me know asap.

reply

N **Nur Hasan Mahmud Shahen** 3 years ago

Dear,
What country do you belong? If its type C country then its autometicly reduceed.
or If you can write to the head of Elsevier publisher then they can minimize it.
Pleace go to the journal APC process for more details.
Thank you.

SCImago Team

Melanie Ortiz 3 years ago

Dear Dr. Md. Ismail, thank you very much for your comment. Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff so they could inform you more deeply. Best Regards, SCImago Team

Z **zainal hasan** 3 years ago

In the near future, I will submit it to this journal. best regards...aez hasan

reply

SCImago Team

Melanie Ortiz 3 years ago

Dear Zainal, thanks for your participation! Best Regards, SCImago Team

M **Mohamed E. Hasan** 4 years ago

what is the impact factor of this journal?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Mohamed, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

O **Omolara** 4 years ago

Please tell us the publication fee

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Omolara,
Thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

W **wasim bari** 4 years ago

In heliyon journal what is the time to decision after submit the paper correction according to reviewer question?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Wasim,

Thank you for contacting us. Please see comments below.

Best Regards, SCImago Team

C **Cristian Torres** 4 years ago

When will Heliyon have the impact factor calculated? Is there an estimated date?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Cristian, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

M **Mark** 4 years ago

It is an unreliable journal. A year after sending my manuscript, they told me that it was initially accepted, there were minor revisions, I made the respective corrections, six months passed and they did not give me a response. I sent my manuscript to another journal and in four months they accepted it without a publication charge and it is also Q1.

reply

T **Tayme** 1 year ago

can you please tell me the the name of the journal accepted your paper?
and how you are withdrawn the Research from the journal ?

W **Wilson Rajagukguk** 2 years ago

Hi Mark

I need your help. Can you tell me the second journal? thank you so much

A **Anna** 3 years ago

Hello Mark
Please help me to send my paper to second journal that you mentioned it .
It is emergency.
Thanks

A **Au Tang** 3 years ago

HI Mark. Thank you very much for your information. COuld you please tell me (My email: tangau.qth@gmail.com) the second journal you submitted and got acceptance in 4 months. I am appreciated it.

M **Magdy Fouad** 3 years ago

Dear Mark
Can you tell me the name of the journal that accept your paper in 4 months please?
I need rapid publication in Q1 journal for my upgrading.
Thanks

Mey 4 years ago

Hi, Mark! I wonder if you can share here the second journal where you submitted your manuscript. It's interesting that a Q1 journal responds and decides in 4 months.

D **Dyg** 4 years ago

Hi Mark...just curious which journal did you submit the second and got accepted...it is Q1 and no charge...that is good..

U **unkown** 4 years ago

I am having a similar probelm like marK. i Submitted my paper in july 2020. They gave me major revisions to do after 4 months.After i made the respective corrctions and resubmitted the revised one in december . After 2 months they told me decision is under process. After few days status changed to decision rescinded. Now the new status is showing as reviewer invited. I am wondering what will be the future of my paper with this journal.Any suggetsons will be highly aprecaited . Kindly suggest me how to expedite with this journal. Please.What shoud be the best way to do as of now

M **Mahmud** 4 years ago

You could just mail them. They response very frequently. Moreover, many of the journals take too much time in publishing papers. Sometimes, reviewers delay for personal reasons.

If you face similar problem, i recommend you to mail them.

SCImago Team

Melanie Ortiz 4 years ago

Dear Mark, thanks for your participation! Best Regards, SCImago Team

B **Biyanu Medenes Zerom** 4 years ago

what is the JIF (Journal Impact factor) of this journal

reply

E **Ebtesam** 4 years ago

Journal Impact factor of this journal is still not calculated, it is indexed in WOS, Emerging citation index source which means that the journal has been already already in WOS but didn't get IF yet. But it is growing journal. Its citation is increasing in good way.

SCImago Team

Melanie Ortiz 4 years ago

Dear Biyanu, thank you very much for your comment. SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it on our website). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

N **Nazmul** 4 years ago

Is Heliyon a good journal? How many issues does it publish in a year?

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Nazmul,

Thank you for contacting us. You can check the scientometric indicators for Heliyon just above. For further information about the publication frecuency, please consult its website.

Best Regards, SCImago Team

M **Mohamed** 4 years ago

Hello,
Does this journal is indexed as ISI journal

Thank you in advance

reply

E **Ebtesam** 4 years ago

Yes, it is indexed.

L **Lanfranco Corazzi** 4 years ago

Dear team,
when Heliyon will be mentioned by WOS (WEB OF SCIENCES) in the Journal Citations Reports?
Many thanks for your reply.
Lanfranco Corazzi

SCImago Team

Melanie Ortiz 4 years ago

Dear Lanfranco,

Thank you for contacting us . Unfortunately, we cannot help you with your request, we suggest you contact WoS Team.

Best Regards, SCImago Team

SCImago Team

Melanie Ortiz 4 years ago

Dear Mohamed,
Thank you for contacting us.
SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus. Unfortunately, we cannot help you with your request referring to the index status. We suggest you consult Scopus database (see the current status of the journal) or the mentioned database for further information. You can also check that information in the journal's website or contact directly with the editorial staff.
Best Regards, SCImago Team

A **aspirant eagle** 4 years ago

- what does the quartile mean? What is it's importance?
-And Why the journal quartile her is Q1 but in the scoups is Q2?

Thanks

reply

SCImago Team

Melanie Ortiz 4 years ago

Dear Sir/Madam,

Thank you for contacting us.

Our data come from Scopus, they annually send us an update of the data. This update is sent to us around April / May every year.
The calculation of the indicators is performed with the copy of the Scopus database provided to us annually. However, the methodology used by Scopus is different from the one's used by SCImago, even if, since the past year, the scientometrics indicators' calculation procedure changed in order to resemble SciVal.

In the case of SCImago, for every journal, the annual value of the SJR is integrated into the distribution of SJR values of all the thematic categories to which the journal belongs. There are more than 300 thematic categories; the position of each journal is different in any category and depends on the performance of the category, in general, and the journal, in particular .
The SJR indicator is a very sophisticated indicator that is much more complex to calculate and understand than the Impact Factor. Several variables must be taken into account to calculate the SJR. There are two important variables that we cannot leave out:

-The number of citations is one of those variables but not the only one because it is weighted by the citations received and where the journal is cited in. It is different if the citations come from highly-cited Journals or not. Imagine that these 5 quotes appear in the most cited Journals. That part of the calculation is no longer worth 5, it is worth much more. This variable is called "authority principle".

-The second variable is the thematic Category's distribution. If most of the journals categorized in X thematic category are cited by lowly-cited journals, the quartile of a journal cited in highly-cited journals will be better than the other ones.

Best Regards, SCImago Team

D **Daniel Bravo** 5 years ago

Dear Editors team,

I would like to know what is the frame-time to the first answers of revision (in weeks). All the very best.

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Daniel,
thank you for contacting us.
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

K **kahsu Atsbha** 5 years ago

What is the difference between Heliyon cell press and heliyon Elsevier? Are they the same or not?

reply

R **Rocktim R Das** 4 years ago

Thanks, Kahsu,

I too was thinking about this issue, In the online HTML I see the Elsevier logo and Cell press, but when downloading the pdf only the cell press logo is present. One possibility might be that the journal is published by Cell press but hosted by Elsevier in Science direct.com. Apart from that, I don't have much clue.

Sincerely
Rocktim

SCImago Team

Melanie Ortiz 5 years ago

Dear Kahsu,
Thank you for contacting us. Could you please expand a little bit your comment? Do these journals have different ISSN numbers? Best Regards, SCImago Team

H **Hesti Maheswari** 5 years ago

Is the Heliyon journal still indexed by Scopus in 2019?

reply

R **Rocktim R Das** 4 years ago

Yes.

A **Achmad Fanani** 4 years ago

Masih

SCImago Team

Melanie Ortiz 5 years ago

Dear Hesti, thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you to consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.
Best Regards, SCImago Team

F **Frank** 5 years ago

That is not the scope of the journal. Change it to the scope...
https://www.cell.com/heliyon/home

"Heliyon is an open access journal publishing scientifically accurate and valuable research across life, physical, social, and medical sciences."

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Frank,

thank you for contacting us. The Scope's information has been updated based on what appears in the journal's website (check here: https://www.cell.com/heliyon/aims-and-scope) Best Regards, SCImago Team

G **GsmA** 5 years ago

Thanks...

reply

G **GsmA** 5 years ago

Hi,

Just I want to ask about the fees to publish in the journal, can you help me?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Sir,
thank you for contacting us.
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
Best Regards, SCImago Team

A **Ali** 5 years ago

Dear All,

I hope anybody knows about the speed of response and decision it takes to let us know about it.

Best Regards,

reply

S **Sintayehu** 4 years ago

I published one paper on Heliyon Social Sciences and another one is just accepted for publication. They announce the first review result in 90 days. I found the review process a little bit slow but very thorough and helps a lot to improve the original work. Preliminary decision for publication will be communicated one month after the submission of the revised version of the work. Final decision of publication will be announces after two weeks. In total, it took six months to publish.

H **Hamzeh Ghahramani** 4 years ago

They gave me the first decision after 3 week with a meticulous review of my manuscript

SCImago Team

Melanie Ortiz 5 years ago

Dear Ali, thanks for your participation! Best Regards, SCImago Team

K **Khaled Karam** 5 years ago

Hi,

Is this journal published in print or online only?

Thanks for your consideration

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear user,
thank you for contacting us.
We suggest you to visit the journal's homepage.
You can see the updated journal's information just above .
Best Regards, SCImago Team

D **Dan** 5 years ago

This journal was started in 2015. It has achieved scopus Q1 rank becasue this is Elsevier's own journal. It is also indexed in ESCI. I can see that publishing giants have their own journals indexed with their own databases. Other journals would take years to get indexed in such databases. It all about money. Cheers!

reply

R **Rhys** 5 years ago

I believe this is a Cell Press Journal rather than Elsevier https://www.cell.com/heliyon/home

SCImago Team

Melanie Ortiz 5 years ago

Dear Dan, thanks for your participation! Best Regards, SCImago Team

M **Mahesh Kumar Tripathi** 5 years ago

Hello Elena,
Please tell me.....
Is Heliyon SCI journal?
When it will get impact factor?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear Mahesh, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our web to locate the journal. We suggest you to consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

H **Hossein Sabahi** 5 years ago

Dear Editor
how many is the charge for publication a article ?

Sincerely
Dr. H. Sabahi

reply

M **Messali** 5 years ago

1750 USD

SCImago Team

Melanie Ortiz 5 years ago

Dear Hossein,
thank you for contacting us.
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.
Unfortunately, we cannot help you with your request, we suggest you to visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.
You can see the updated journal's information just above .
Best Regards, SCImago Team

Z **Zemenu Bires** 5 years ago

in which index Heliyon is indexed? would you tell me please?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear user, we suggest you to consult that information in the journal's website. You can also consult the Scopus database directly. Best Regards, SCImago Team

Z **Zemenu Bires** 5 years ago

Would you mind telling me about Heliyon journal in which it is indexed; Scopus, SCI, ISI-index/ Scopus or any index?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear user, we suggest you to consult the journal's website or Scopus database directly. For other indicators like ISI or Impact Factor, we suggest you to consult the Journal Citation Report with a Web of Science data source. Best Regards, SCImago Team

S **Santosh** 5 years ago

Hi,
Can you please tell when Heliyon expected will get impact factor (will come under sci or esci)?

reply

SCImago Team

Melanie Ortiz 5 years ago

Dear user, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our web to locate the journal. We suggest you to consult the Journal

Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

D **Deni** 6 years ago

Dear Elena, How long has Heliyon released the article, I have submitted?

reply

SCImago Team

Elena Corera 6 years ago

Dear Deni,
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you look for author's instructions in the journal's website.
Best Regards,
SCImago Team

S **SIFI** 6 years ago

what are the favorite and targeted topics in this journal?

reply

A **Ali** 6 years ago

Hello,

I read in your website that this journal is not free of charge for publication. let me know that is it true?
thanks.

reply

SCImago Team

Elena Corera 6 years ago

Dear Ali,

Please, check comments below.

Best regards,
SCImago Team

H **Harjali** 6 years ago

Nice to meet you, could you give me detail information of Heliyon Journal? I have checked it at SJR that this journal has 7 H Index and Q1, It is right?. thank you very much.

Best regards

Harjali

reply

F **Foad buazar** 6 years ago

Hi
I wonder how a journal like Heliyon Rank Q1 but without impact factor?
I am really confused. Would you please clarify the vague feeling of authors concerning this notion?

Thank you

reply

SCImago Team

Elena Corera 6 years ago

Dear Foad,

you can check impact factor in SJR website.

Best regards,
SCImago Team

A **Achmad Herman** 6 years ago

Dear Colleagues
I am interested to submit a paper (or more) to your journal... I would like to ask about the average period from date of submission to date of publication (if the paper is accepted)... and also about the fees (if any). Thank you..

Achmad Herman

reply

SCImago Team

Elena Corera 6 years ago

Dear Achmad, we suggest you locate the author's instructions on the journal's website. Best Regards, SCImago Team

N **Nahed** 6 years ago

Hello,

Is it possible to know if this Journal is indexed in Thomson Reuters (M)?

Best

reply

SCImago Team

Elena Corera 6 years ago

Dear Insum, we suggest you contact the journal directly. Best Regards, SCImago Team

H **Hashim** 6 years ago

Dear Sir or Madham
Could you please give me the impact factor for this journal ?
best regards

reply

M **Maria Helena Andrade Santana** 6 years ago

Dear Sir or Madham
Could you please give me the impact factor for this journal ?
best regards

SCImago Team

Elena Corera 6 years ago

Dear Maria Helena, SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source. Best Regards, SCImago Team

SCImago Team

Elena Corera 6 years ago

Dear Hashim, the SJR data of the journal are on this page, see the evolution graphs of the indicators above. Best Regards, SCImago Team

M **Mikle** 6 years ago

Hello,
Does this journal has or will have an impact factor?
Thank you in advance

reply

SCImago Team

Elena Corera 6 years ago

Dear Mikle, SJR uses Scopus data, our impact indicator is the SJR. Check our page to locate the journal. We suggest you consult the Journal Citation Report for other indicators with a Web of Science data source. Best Regards, SCImago Team

J **Jad** 6 years ago

Hello,

The is possibility to send me a topic of your journal.

Best Regard
Jad Tahouri

reply

SCImago Team

Elena Corera 6 years ago

Dear Jad, we suggest you contact the journal directly. Best Regards, SCImago Team

Leave a comment

Name

Email
(will not be published)

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

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EST MODUS IN REBUS

Source details

Heliyon

Open Access

Years currently covered by Scopus: from 2015 to 2024

Publisher: Elsevier

E-ISSN: 2405-8440

Subject area: Multidisciplinary

Source type: Journal

View all documents > | Set document alert | Save to source list

CiteScore 2023
4.5

SJR 2023
0.617

SNIP 2023
1.257

CiteScore | CiteScore rank & trend | Scopus content coverage

CiteScore 2023

$$4.5 = \frac{88{,}206 \text{ Citations } 2020 - 2023}{19{,}663 \text{ Documents } 2020 - 2023}$$

Calculated on 05 May, 2024

CiteScoreTracker 2024

$$3.5 = \frac{116{,}423 \text{ Citations to date}}{33{,}317 \text{ Documents to date}}$$

Last updated on 05 November, 2024 • Updated monthly

CiteScore rank 2023

Category	Rank	Percentile
Multidisciplinary		
Multidisciplinary	#31/171	82nd

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