

# Call for data for the Scientific Opinion on the evaluation of the safety in use of plant preparations containing berberine

NIF Unit



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# CALL FOR DATA FOR THE SCIENTIFIC OPINION ON THE EVALUATION OF THE SAFETY IN USE OF PLANT PREPARATIONS CONTAINING BERBERINE

EFSA-Q-number: EFSA-Q-2022-00803

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Deadline for registering interest: 07/08/2023

Deadline for submission of data: 12/01/2024

## CALL

### BACKGROUND

In the context of Article 8(2) of Regulation (EC) 1925/2006 on the addition of vitamins and minerals and of other substances to foods, the European Commission requested EFSA to assess the available information on the safety of berberine in plant preparations used in food supplements.

In order to ensure a comprehensive assessment, EFSA launches a public call for all potentially relevant available data (published, unpublished or newly generated data) from interested parties. EFSA will then consider the relevance of the information provided for the risk assessment of berberine. The submission of the requested information is without prejudice to the final opinion of the NDA Panel.

### OVERALL OBJECTIVE

The purpose of this call for data is to offer interested parties (e.g. governments, food business operators, national food authorities, research institutions, academia) and/or other stakeholders the opportunity to submit documented information (published and/or unpublished) relevant to the safety evaluation of berberine in plant preparations used in food supplements.

In case a causal relationship will be identified between the dietary exposure to berberine and an adverse effect, EFSA will investigate whether protoberberine alkaloids which share the same molecular structure as berberine exert a similar effect through a similar mode of action. In such case, the combined exposure from berberine and the implicated protoberberine alkaloids will be assessed. Thus, EFSA is looking for data also on protoberberine alkaloids other than berberine, as listed in [Table 1](#).

**Table 1** List of protoberberine alkaloids

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Alborine

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Anisocycline  
Berberastine  
Berberrubine  
Columbamine  
Coptisine  
Corysamine  
Dehydrocaavidine  
Dehydrocheilanthifoline  
Dehydrocorytenchine  
Dehydrodiscretamine  
Dehydroscoulerine  
Demethyleneberberine  
epiberberine  
Fississaine  
Groenlandicine  
Jatrorrhizine  
Palmatine  
Pseudocolumbamine  
Stephabine  
Stepharanine  
Thalidastine  
Thalifendine  
Thalifendine chloride  
13-methylcolumbamine

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## SPECIFIC OBJECTIVES

- **Specific Objective 1: occurrence data**

EFSA is looking for analytical data on the content of berberine and other protoberberine alkaloids listed in [Table 1](#) in preparations of plants used in food supplements. The list of plants included in this assessment can be found in [Appendix A](#).

- **Specific Objective 2: use levels for supplements**

EFSA is looking for use levels recommended by manufacturers for food supplements containing berberine and other protoberberine alkaloids listed in [Table 1](#).

- **Specific Objective 3: biological and toxicological data**

EFSA is looking for biological and toxicological data to support the assessment of a causal relationship between dietary exposure to berberine as single substance and/or in plant preparations and the identified potential adverse effects, including data on absorption, digestion, absorption and metabolism (ADME) for berberine and within the food matrix.

EFSA is interested in collecting data also on protoberberine alkaloids other than berberine, as listed in [Table 1](#).



## DATA SOUGHT AND DATA SUBMISSION FORMAT

EFSA kindly invites interested parties to submit information as outlined below for each specific objective.

### Specific objectives 1 and 2 (occurrence data and use levels for supplements)

To submit data in the context of specific Objectives 1 and 2, please fill in the Excel file downloadable on the EFSA webpage of this call. This Excel file contains a selection of different data fields to collect information considered as essential to assess the reliability of the data before being used for the exposure assessment. Dedicated data fields are also included for food supplements (dose forms, weight of the dose form, etc.) and tea/herbal infusions (e.g. preparation) to allow precise and accurate estimations of the dietary exposure.

Data providers are encouraged to provide the information on the use levels in the appropriate data field described in the above-mentioned Excel file. Should you require assistance when filling in the Excel file for analytical data/use levels or have specific questions on how to send the data, please contact [nda\\_callfordata@efsa.europa.eu](mailto:nda_callfordata@efsa.europa.eu).

#### OTHER OPTION TO SUBMIT OCCURRENCE DATA

Please be informed that together with sending analytical data/use levels in the context of this call for data, it is also possible to submit analytical data as part of the 'EFSA Call for continuous collection of chemical contaminants occurrence data in food and feed'. These data must be submitted in electronic format (XML) to the EFSA Data Collection Framework (DCF) in SSD2 (Standard Sample Description version 2) format. You find all the details about this call [here](#) (deadline 31 August 2023).

### Specific objective 3 (biological and toxicological data)

EFSA is seeking data to answer the assessment sub-questions in Table 2.

**Table 2:** Assessment sub-questions and identified potential adverse effects

Number	Sub-question	Identified potential adverse effects
1	What is the absorption, distribution, metabolism and excretion (ADME) of berberine?	<ul style="list-style-type: none"> <li>• Body weight loss resulting from a toxic mode of action of berberine</li> </ul>
2	<p>a. Is there a causal relationship between dietary exposure to berberine as single substance and the identified potential adverse effect(s)?</p> <p>b. Is there a causal relationship between the dietary exposure to plant preparations containing berberine listed in <a href="#">Appendix A</a> and the a priori identified potential adverse effect(s)?</p>	<ul style="list-style-type: none"> <li>• Glucose homeostasis (e.g. hypoglycaemia)</li> <li>• Cardiovascular system (e.g. hypotension)</li> <li>• Reproductive system (e.g. reproductive impairment, developmental impairment, malformations, embryonic and foetal death)</li> </ul>



3	What are the potential mode(s) of action for the relationships found between berberine as a single substance and adverse health effects?	<ul style="list-style-type: none"><li>• Liver (e.g. liver fibrosis/cirrhosis/necrosis/hepatitis)</li><li>• Pancreas (e.g. pancreatitis)</li></ul>
4	What is the dose-response relationship between dietary exposure to berberine as single substance and risk of identified potential adverse effects in humans or animals?	<ul style="list-style-type: none"><li>• Gastrointestinal (e.g. gastrointestinal disorders)</li><li>• Nervous system (e.g. serotonin syndrome, spontaneous clonus, inducible clonus and diaphoresis, tremor and hyperreflexia)</li><li>• Hypoglycaemia</li><li>• Other (e.g. organ weights)</li></ul>

EFSA is interested in collecting data also on protoberberine alkaloids other than berberine, as listed in [Table 1](#).

Examples of correct data formats:

- full study reports
- articles or reports under preparation (newly generated data)

Examples of incorrect data formats:

- abstracts
- posters

## DEADLINES FOR SUBMISSION OF DATA AND DISCLOSURE OF CONTACT DETAILS

Interested parties and stakeholders should provide by **12/01/2024** the information described below.

Within 4 weeks from the publication of this call, please communicate in writing by e-mail to: [nda\\_callfordata@efsa.europa.eu](mailto:nda_callfordata@efsa.europa.eu), your availability to submit the requested information by the timeline specified above or any proposal for a new deadline providing justified reasons. Depending on the replies received the final deadline will be communicated to you through e-mail and by updating the current call.

To facilitate the collaboration of all interested parties to provide the data needed, we are seeking your consent to disclose the name and address of your organisation/business to the other parties that has expressed an interest to provide the requested information. If you do not wish to make these contact details available, clearly indicate it in your first communication.

## CONFIDENTIALITY

According to Article 39 of Regulation (EC) No 178/2002, EFSA shall not divulge to third parties confidential information received for which confidential treatment has been requested and justified, except for information which must be made public if circumstances so require, in order to protect public health. It follows that confidential treatment may be given by EFSA to information the disclosure of which might significantly harm the competitive position of business operators or other interested parties.



## SUBMISSION OF INFORMATION/DATA

Interested business operators and/or parties should submit the information/data in electronic format **exclusively via the tool Submission Builder "Portalino"** (available [here](#)).

Submission of data in any other form (email, third party e-submission platforms, etc) will not be accepted.

Information on how to use Portalino and submit confidentiality requests are available online [here](#). This user guide provides information about the submission of food-chain dossiers and datasets via Portalino. As such it should be read together with the [User Guide on Confidentiality](#) and with any [administrative and scientific documents](#) relevant for the submission, if applicable

Interested business operators and/or interested parties should submit the following information to EFSA **via Portalino**, clearly stating:

- in **the Subject of the submission: Call for data berberine-EFSA-Q-2022-00803 (the question number is indicated in the call for data on EFSA's website)**
- in **the Subject of the submission**: reference to the specific substance or process concerned within the call, when applicable.
- The contact details (name of contact person, name of company/organisation, e-mail address and telephone number) of the person responsible for the data submission and, if applicable, the list of interested business operators and/or interested parties represented and their contact details;
- Two separate versions (confidential and non-confidential) of the submitted information/data, as indicated [here](#). Each section claimed confidential must be accompanied by a confidentiality request in Portalino. You are also required to box or earmark each information/passages claimed confidential in the confidential version of the information you share with EFSA.

**Please note that confidentiality requests must be submitted if information should be kept confidential since EFSA is required to proactively publish all information, documents and data it receives without delay, pursuant to Article 38(1)(c) / 38(1)(d) of the GFL and Article 6(1) of EFSA's Practical Arrangements of transparency and confidentiality.** In case EFSA receives a new mandate for which data collected via this call will be used as a basis for EFSA's outputs, EFSA will also apply these rules of transparency: data providers will be notified about the requirement to submit their confidentiality requests via the Portalino at least 3 months before the planned publication date of the output.

POSSIBILITY FOR EFSA TO USE THE DATA FOR THE SAFETY ASSESSMENT OF THE SAME OR OTHER SUBSTANCE UNDER THE SAME OR OTHER LEGAL OR REGULATORY FRAMEWORKS.

Please note that EFSA may, where legally possible, use or re-use relevant information or data (i.e. technical, toxicological data) for the evaluation of the same or another substance under the same or a different legal or regulatory framework from the one mentioned above.



## CORRESPONDENCE

Please address any **technical enquiries** to [RAL@efsa.europa.eu](mailto:RAL@efsa.europa.eu).

Should you require **assistance when filling in the Excel file for analytical data/use levels** or have specific questions on how to send the data, please contact [nda\\_callfordata@efsa.europa.eu](mailto:nda_callfordata@efsa.europa.eu).





1 **Appendix A. List of plants included in the scientific assessment**

2 Table A1. Plants included in the current assessment





Latin name	Synonym <sup>a</sup>	Plant part
<i>Berberis aquifolium</i> Pursh	<ul style="list-style-type: none"><li>- <i>Mahonia aquifolium</i></li><li>- <i>Berberis aquifolium</i> var. <i>Aquifolium</i></li><li>- <i>Berberis aquifolium</i> var. <i>Juglandifolia</i> Rehder</li><li>- <i>Berberis aquifolium</i> var. <i>Lyallii</i> (Ahrendt) Marroq. &amp; Laferr.</li><li>- <i>Berberis brevipes</i> Greene</li><li>- <i>Berberis fasciculata</i> Schult.f.</li><li>- <i>Berberis pinnata</i> Banks ex DC.</li><li>- <i>Berberis pinnata</i> var. <i>Hortensis</i> (Fedde) Marroq. &amp; Laferr.</li><li>- <i>Berberis pinnata</i> var. <i>Wagneri</i> Rehder</li><li>- <i>Mahonia aquifolium</i> (Pursh) Nutt.</li><li>- <i>Mahonia aquifolium</i> var. <i>Juglandifolia</i> Jouin</li><li>- <i>Mahonia aquifolium</i> var. <i>Nutkana</i> DC.</li><li>- <i>Mahonia brevipes</i> Rehder</li><li>- <i>Mahonia diversifolia</i> Sweet</li><li>- <i>Mahonia latifolia</i> hort. Ex Dippel</li><li>- <i>Mahonia moseriana</i> Moser ex H.Martinet</li><li>- <i>Mahonia murrayana</i> hort. Ex Dippel</li><li>- <i>Mahonia pinnata</i> var. <i>Hortensis</i> Fedde</li><li>- <i>Mahonia pinnata</i> var. <i>Wagneri</i> Jouin</li><li>- <i>Mahonia</i> ×<i>moseri</i> Ahrendt</li><li>- <i>Mahonia</i> ×<i>undulata</i> Ahrendt</li><li>- <i>Mahonia</i> ×<i>wagneri</i> (Jouin) Rehder</li><li>- <i>Odostemon aquifolium</i> (Pursh) Rydb.</li><li>- <i>Odostemon brevipes</i> A.Heller</li><li>- <i>Odostemon nutkanus</i> Rydb.</li></ul>	Root
<i>Berberis aristata</i> DC	<ul style="list-style-type: none"><li>- <i>Berberis bodinieri</i> (Gagnep.) Laferr.</li><li>- <i>Berberis bussmul</i> K.Koch ex Miq.</li><li>- <i>Berberis ceratophylla</i> G.Don</li></ul>	Root, bark



*Berberis vulgaris* L.

- *Berberis chitria* D.Don
- *Berberis chitria* var. *sikkimensis* C.K.Schneid.
- *Berberis coccinea* hort. Ex K.Koch
- *Berberis coerulescens* hort.
- *Berberis elegans* hort. Ex K.Koch
- *Berberis gracilis* hort. Ex Lindl.
- *Berberis gracillima* K.Koch
- *Berberis macrophylla* hort. Ex K.Koch
- *Berberis microphylla* hort. Ex K.Koch
- *Berberis serratifolia* hort. Ex K.Koch
- *Berberis sikkimensis* (C.K.Schneid.) Ahrendt
- *Berberis sikkimensis* var. *baileyi* Ahrendt
- *Berberis sikkimensis* var. *glabramea* Ahrendt
- *Berberis trifurca* Lindl. & Paxton
- *Berberis undulata* hort. Ex K.Koch
- *Mahonia japonica* var. *Trifurca* (Lindl. & J.Paxton) Ahrendt
- *Berberis abortiva* P.Renault *Berberis acida* Gilib.
- *Berberis aethnensis* Bourg. Ex Willk. & Lange
- *Berberis alba* Poit. & Turpin
- *Berberis angulizans* hort.
- *Berberis apyrena* hort. Ex K.Koch
- *Berberis arborescens* hort. Ex K.Koch
- *Berberis articulata* Loisel.
- *Berberis asperma* Poit & Turpin
- *Berberis aurea* Tausch
- *Berberis bigelovii* Schrad.
- *Berberis corallina* hort.
- *Berberis dentata* Tausch
- *Berberis dentata* var. *capitata* Tausch
- *Berberis dulcis* hort. Ex K.Koch
- *Berberis dumetorum* Gouan

Root, bark



- *Berberis edulis hort. Ex K.Koch*
- *Berberis elongata hort.*
- *Berberis globularis hort. Ex Lavallée*
- *Berberis hakodate hort. Ex Dippel*
- *Berberis heterophylla hort. Ex K.Koch*
- *Berberis innominata Kielm.*
- *Berberis irritabilis Salisb.*
- *Berberis jacquinii hort. Ex K.Koch*
- *Berberis latifolia Poit. & Turpin*
- *Berberis marginata hort. Ex K.Koch*
- *Berberis maxima hort.*
- *Berberis maximowiczii Regel*
- *Berberis microphylla F.Dietr.*
- *Berberis mitis Schrad.*
- *Berberis nepalensis hort. Ex K.Koch*
- *Berberis nitens Schrad.*
- *Berberis obovata Schrad.*
- *Berberis orientalis Schneider*
- *Berberis pangharengensis hort.*
- *Berberis pauciflora Salisb.*
- *Berberis racemosa Stokes*
- *Berberis rubra Poit. & Turpin*
- *Berberis sanguinea hort. Ex K.Koch*
- *Berberis sanguinolenta hort. Ex K.Koch*
- *Berberis sibirica hort. Ex Schult.f.*
- *Berberis sieboldii hort. Ex Dippel*
- *Berberis sulcata K.Koch & C.D.Bouché*
- *Berberis sylvestris Poit. & Turpin*
- *Berberis violacea Poit. & Turpin*
- *Berberis vulgaris f. vulgaris*





- *Berberis vulgaris* subsp. *Cantabrica* Rivas Mart., T.E.Díaz, Fern.Prieto, Loidi & Penas
- *Berberis vulgaris* subsp. *Orientalis* (Schneid.) Takht.
- *Berberis vulgaris* var. *Acutifolia* (Prantl) C.K.Schneid.
- *Berberis vulgaris* var. *Alba* DC.
- *Berberis vulgaris* var. *alpestris* Rikli
- *Berberis vulgaris* var. *Apyrena* Schrad.
- *Berberis vulgaris* var. *asperma* Willd.
- *Berberis vulgaris* var. *flava* Schrad.
- *Berberis vulgaris* var. *Ilicifolia* Schult.f.
- *Berberis vulgaris* var. *Innominata* Schult.f.
- *Berberis vulgaris* var. *lutea* DC.
- *Berberis vulgaris* var. *nigra* DC.
- *Berberis vulgaris* var. *orientalis* (C.K.Schneid.) Grossh.
- *Berberis vulgaris* var. *orientalis* Papava
- *Berberis vulgaris* var. *purpurea* DC.
- *Berberis vulgaris* var. *purpurifolia* Ahrendt
- *Berberis vulgaris* var. *Rubra* Willd.
- *Berberis vulgaris* var. *Sanguinea* Schrad.
- *Berberis vulgaris* var. *Serotina* Schrad.
- *Berberis vulgaris* var. *sulcata* Ahrendt
- *Berberis vulgaris* var. *violacea* Willd.
- *Chelidonium haematodes* Moench
- *Chelidonium laciniatum* Mill.
- *Chelidonium laciniatum* var. *Fumariifolium* DC.
- *Chelidonium luteum* Gilib.
- *Chelidonium majus* f. *laciniatum* Schube
- *Chelidonium majus* f. *majus*
- *Chelidonium majus* f. *Quercifolium* (Willemet) Fast
- *Chelidonium majus* subsp. *Laciniatum* (Mill.) Domin
- *Chelidonium majus* var. *Fumariifolium* (DC.) K.Koch

*Chelidonium majus* L.

Herb



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	<ul style="list-style-type: none"><li>- <i>Chelidonium majus</i> var. <i>Grandiflorum</i> DC.</li><li>- <i>Chelidonium majus</i> var. <i>Laciniatum</i> (Mill.) Lam. &amp; DC.</li><li>- <i>Chelidonium majus</i> var. <i>laciniatum</i> Roth</li><li>- <i>Chelidonium majus</i> var. <i>pleniflorum</i> Lawalrée</li><li>- <i>Chelidonium majus</i> var. <i>Plenum</i> Latourr.</li><li>- <i>Chelidonium majus</i> var. <i>Tenuifolium</i> Lilj.</li><li>- <i>Chelidonium murale</i> P.Renault</li><li>- <i>Chelidonium olidum</i> Tarscher. Ex Ott</li><li>- <i>Chelidonium quercifolium</i> Willemet</li><li>- <i>Chelidonium ruderale</i> Salisb.</li><li>- <i>Chelidonium umbelliferum</i> Stokes</li></ul>	
<i>Coptis japonica</i> (Thunb.) Makino	<ul style="list-style-type: none"><li>- <i>Coptis anemonifolia</i> Siebold &amp; Zucc.</li><li>- <i>Coptis anemonifolia</i> var. <i>dissecta</i> Yatabe</li><li>- <i>Coptis brachypetala</i> Siebold &amp; Zucc.</li><li>- <i>Coptis brachypetala</i> var. <i>Major</i> Miq.</li><li>- <i>Coptis japonica</i> f. <i>Viridiflora</i> Honda ex Kadota</li><li>- <i>Coptis japonica</i> var. <i>Anemonifolia</i> (Siebold &amp; Zucc.) H.Ohba</li><li>- <i>Coptis japonica</i> var. <i>Dissecta</i> (Yatabe) Nakai ex Satake</li><li>- <i>Coptis japonica</i> var. <i>Major</i> (Miq.) Satake</li><li>- <i>Coptis occidentalis</i> var. <i>japonica</i> Huth</li><li>- <i>Coptis orientalis</i> Maxim.</li></ul>	Rhizome
<i>Coptis teeta</i> Wall.	<p><i>Thalictrum japonicum</i> Thunb.</p> <ul style="list-style-type: none"><li>- <i>Coptis teetoides</i> C.Y.Cheng</li><li>- <i>Helleborus teeta</i> Baill.</li></ul>	Rhizome
<i>Coptis trifolia</i> (L.) Salisb.	<ul style="list-style-type: none"><li>- <i>Anemone groenlandica</i> O.F.Müll.</li><li>- <i>Anemone groenlandica</i> Oeder</li><li>- <i>Chryza borealis</i> Raf.</li><li>- <i>Coptis daisetsuensis</i> Tatew. Ex Miyabe &amp; Tatew.</li><li>- <i>Coptis groenlandica</i> Fernald</li><li>- <i>Coptis trifolia</i> subsp. <i>Groenlandica</i> (Oeder) Hultén</li><li>- <i>Coptis trifolia</i> subsp. <i>Trifolia</i></li></ul>	Rhizome

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	<ul style="list-style-type: none"><li>- <i>Coptis trifolia</i> var. <i>groenlandica</i> Fassett</li><li>- <i>Coptis trifolia</i> var. <i>Semiplena</i> Miyabe &amp; Tatew.</li><li>- <i>Helleborus pumilus</i> Salisb.</li><li>- <i>Helleborus trifolius</i> Houtt.</li><li>- <i>Helleborus trifolius</i> L.</li><li>- <i>Helleborus trilobus</i> Lam.</li><li>- <i>Isopyrum trifolium</i> Britton</li></ul>	
<i>Cosciniium fenestratum</i> (Goetgh.) Colebr.	<ul style="list-style-type: none"><li>- <i>Cosciniium maingayi</i> Pierre</li><li>- <i>Cosciniium miosepalum</i> Diels</li><li>- <i>Cosciniium peltatum</i> Merr.</li><li>- <i>Cosciniium usitatum</i> Pierre</li><li>- <i>Cosciniium wallichianum</i> Miers</li><li>- <i>Cosciniium wightianum</i> Miers &amp; Diels</li><li>- <i>Menispermum fenestratum</i> Gaertn.</li><li>- <i>Pereiria medica</i> Lindl.</li></ul>	Root, stem
<i>Hydrastis canadensis</i> L.	<ul style="list-style-type: none"><li>- <i>Hydrastis trifolia</i> Raf.</li><li>- <i>Warneria canadensis</i> Mill.</li></ul>	Rhizome
<i>Jateorhiza palmata</i> (Lam.) Miers	<ul style="list-style-type: none"><li>- <i>Chasmanthera columba</i> Baill.</li><li>- <i>Chasmanthera palmata</i> Baill.</li><li>- <i>Cocculus palmatus</i> DC.</li><li>- <i>Cocculus palmatus</i> Hook.</li><li>- <i>Jateorhiza columba</i> Miers</li><li>- <i>Menispermum calumba</i> Stokes</li><li>- <i>Menispermum columba</i> Roxb.</li><li>- <i>Menispermum palmatum</i> Lam.</li></ul>	Root
<i>Phellodendron amurense</i> Rupr.	<ul style="list-style-type: none"><li>- <i>Phellodendron amurense</i> var. <i>Molle</i> (Nakai) S.H.Li &amp; S.Z.Liou</li><li>- <i>Phellodendron amurense</i> var. <i>Sachalinense</i> F.Schmidt</li><li>- <i>Phellodendron insulare</i> Nakai</li><li>- <i>Phellodendron japonicum</i> Maxim.</li><li>- <i>Phellodendron kodamanum</i> Makino</li></ul>	Bark

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<i>Thalictrum flavum</i> L.	<ul style="list-style-type: none"><li>- <i>Phellodendron lavalleyi</i> Dode</li><li>- <i>Phellodendron molle</i> Nakai</li><li>- <i>Phellodendron nikkomontanum</i> Makino</li><li>- <i>Phellodendron piriforme</i> E.L. Wolf</li><li>- <i>Phellodendron sachalinense</i> Sarg.</li><li>- <i>Thalictrum angustatum</i> Weinm. Ex Lecoy.</li><li>- <i>Thalictrum anonymum</i> Wallr. Ex Lecoy.</li><li>- <i>Thalictrum belgicum</i> Jord.</li><li>- <i>Thalictrum capitatum</i> Jord.</li><li>- <i>Thalictrum commutatum</i> C.A.Mey. ex Ledeb.</li><li>- <i>Thalictrum controversum</i> K.F.Schimp. &amp; Spenn.</li><li>- <i>Thalictrum exaltatum</i> Gaudin</li><li>- <i>Thalictrum flaccidum</i> Schleich.</li><li>- <i>Thalictrum flavum</i> var. <i>Euskarum</i> Elías &amp; Pau ex P.Monts.</li><li>- <i>Thalictrum friesii</i> Rupr.</li><li>- <i>Thalictrum glomerulosum</i> Fr.</li><li>- <i>Thalictrum heterophyllum</i> Lej.</li><li>- <i>Thalictrum pauperculatum</i> Herm. Ex DC.</li><li>- <i>Thalictrum princeps</i> Dumort.</li><li>- <i>Thalictrum prorepens</i> Jord.</li><li>- <i>Thalictrum purpurascens</i> var. <i>Rugosum</i> (Aiton) Farw.</li><li>- <i>Thalictrum riparium</i> Jord. Ex Boreau</li><li>- <i>Thalictrum rufinerve</i> Lej. &amp; Courtois</li><li>- <i>Thalictrum rugosum</i> Aiton</li><li>- <i>Thalictrum sphaerocarpum</i> Lej. &amp; Courtois</li><li>- <i>Thalictrum udum</i> Jord.</li><li>- <i>Thalictrum wallrothianum</i> Dettd. Ex Lecoy.</li></ul>	Root
<i>Tinospora sinensis</i> (Lour.) Merr.	<ul style="list-style-type: none"><li>- <i>Cocculus chondodendrum</i> DC.</li><li>- <i>Cocculus malabaricus</i> DC.</li><li>- <i>Cocculus tomentosus</i> Colebr.</li></ul>	Root, stem, leaf

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- *Epibaterium tomentosum* Pers.
- *Menispermum chondrodendron* Spreng.
- *Menispermum malabaricum* Lam.
- *Menispermum tomentosum* Roxb.
- *Tinospora malabarica* (Lam.) Hook.f. & Thomson
- *Tinospora tomentosa* (Colebr.) Hook.f. & Thomson

(a) Plants of the World Online (<https://powo.science.kew.org/>) was used to identify synonyms of the scientific

**Table A2. Other berberine containing plants in the EFSA Compendium**

<b>Plant species</b>	<b>Synonyms<sup>1</sup></b>
<i>Berberis sibirica</i> Pall.	<i>Berberis altaica</i> Pall.
<i>Boswellia sacra</i> Flueck. // <i>Boswellia carteri</i> Birdw.	<i>Boswellia sacra</i> Flueck. // <i>Boswellia carteri</i> Birdw.
<i>Dichroa febrifuga</i> Lour.	<i>Hydrangea febrifuga</i> (Lour.) Y.De Smet & C.Granados and <a href="#">synonyms</a>
<i>Lilium lancifolium</i> Thunb.	<a href="#">Synonyms list</a>
<i>Phellodendron chinense</i> C.K.Schneid.	<i>Phellodendron fargesii</i> Dode <i>Phellodendron sinii</i> Wu <i>Phellodendron macrophyllum</i> Dode <i>Phellodendron chinense</i> var. <i>chinense</i>
<i>Aquilegia vulgaris</i> L.	<a href="#">Synonyms list</a>
<i>Argemone mexicana</i> L.	Replaced synonym of: <i>Argemone intermedia</i> Sweet ex Prain, J. Bot. 33: 363 (1895), nom. Illeg.
<i>Borago officinalis</i> L.	No synonyms
<i>Coptis chinensis</i> Franch.	No synonyms
<i>Coptis deltoidea</i> C.Y.Cheng & P.K.Hsiao	No synonyms
<i>Xanthorhiza simplicissima</i> Marshall	<i>Xanthorhiza apiifolia</i> L'Her. <i>Xanthorhiza tinctoria</i> Woodh.
<i>Papaver puniceum</i> (Maxim.) Christenh. & Byng // <i>Meconopsis punicea</i> Maxim	<i>Meconopsis punicea</i> Maxim

<sup>1</sup> <https://powo.science.kew.org/>; <https://wfoplantlist.org/plant-list>



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*Papaver cambricum* L. // *Meconopsis*  
*cambrica* (L.) Vig.

**Basionym of**

[\*Parameconopsis cambrica\* \(L.\) Grey-Wilson, Gen. Meconopsis 367 \(2014\).](#)

**Basionym of**

[\*Argemone cambrica\* \(L.\) Desf., Dict. Sci. Nat. \[F. Cuvier\] 2: 481 \(1804\).](#)

**Basionym of**

[\*Meconopsis cambrica\* \(L.\) Vig., Hist. Nat. Pavots 48, f. 3 \(1814\).](#)

**Type of**

[\*Parameconopsis\* Grey-Wilson, Gen. Meconopsis 367 \(2014\).](#)

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