



Metadata Standards

Fundamentals of Scientific Metadata: Why Context Matters

Schema or standard?



A well established metadata schema can become a standard.

The Dublin Core



Researchers, librarians and web technologists drafted the Dublin Core – a set of library-card-catalog-like metadata elements for the web – in 1995 at a meeting in Dublin, Ohio (USA). [1]

Creator
Contributor
Publisher
Title
Date
Language
Format
Subject
Description
Identifier
Relation
Source
Type
Coverage
Rights

[1] <https://www.dublincore.org/resources/metadata-basics/>

[2] <https://www.dublincore.org/specifications/dublin-core/dcmi-terms/#section-3>

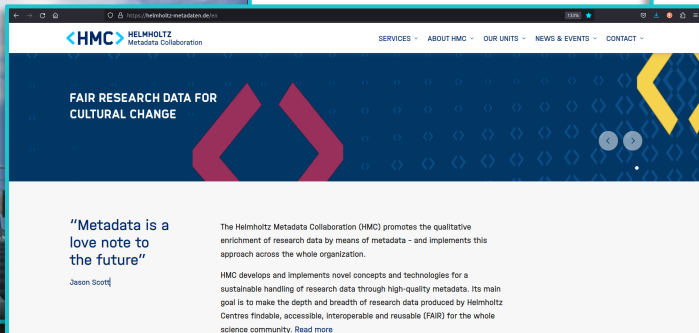
[3] <https://www.dublincore.org/about/>

[4] <https://www.iso.org/standard/71339.html>

Web resources



Colossus Front Row Seat on-ride HD POV Thorpe Park



Sulfate Metabolism in *C. Flaveria* Species Is Controlled by the Root and Connected to Serine Biosynthesis^{11OPEN}

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DOI: 10.1093/aob/abz001

Evolution of C_4 photosynthesis led to an increase in carbon assimilation rates and plant growth compared to C_3 photosynthetic plants. This enhanced plant growth, in turn, affects the requirement for soil-derived mineral nutrients. However, mineral nutrition has scarcely been considered in connection with C_4 photosynthesis. Sulfur is crucial for plant growth and development, and preliminary studies in the genus *Flaveria* suggested metabolic differences in sulfate assimilation along the C_3 to C_4 evolutionary trajectory. Here, we show that in controlled conditions, sulfur accumulation of the reduced sulfur compounds Cys and glutathione (GSH) increased with progressing establishment of the C_4 photosynthetic cycle in different *Flaveria* species. An increased demand for reduced sulfur in *C. Flaveria* species is reflected in high rates of $[^{35}S]$ sulfate incorporation into GSH upon sulfate deprivation and increased GSH turnover as a reaction to the inhibition of GSH synthesis. Expression analyses indicate that the γ -glutamyl cycle is crucial for the recycling of GSH in C_4 species. Sulfate reduction and GSH synthesis seems to be preferentially localized in the roots of C_4 species, which might be linked to the colocalization with the phosphorylated pathway of biosynthesis. Interspecific grafting experiments of *F. robusta* (C_3) and *F. hirsuta* (C_4) revealed that the root system primarily controls sulfate acquisition, GSH synthesis, and sulfate and metabolite allocation in C_3 and C_4 plants. This study thus shows that the evolution of C_4 photosynthesis resulted in a wide range of adaptations of sulfur metabolism and points out the need for broader studies on importance of mineral nutrition for C_4 plants.

Sulfur (S) possesses a wide variety of essential functions for cell structure and metabolism. Incorporated in the amino acids Cys and Met, S is an important component of proteins. Cys is further a constituent of the tripeptide glutathione (GSH), which maintains cellular redox balance and is involved in signaling and xenobiotic and heavy metal detoxification. Further, GSH is a component of prosthetic groups of various enzymes, including those involved in the biosynthesis of lignin, lipids, and other secondary metabolites.

Sulfate uptake and distribution within the organism is facilitated by sulfate transporters. For assimilation, the inert and stable sulfate is activated by ATP sulfurylase (ATPS) by transferring it onto an α -phosphate residue of ATP and yielding in adenosine-5-phosphosulfate (APS).

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0000-0003-3043-5657

Keywords
Plant Science, Research Data Management, Data Science, Molecular Biology, Metadata

Countries
Germany

to this you? Sign in to start

Name
Silke Christine Gerlich

Activities
Employment (3)

Forschungszentrum Jülich GmbH, Jülich, Nordrhein-Westfalen, DE

2021-06-01 to present | Post Doc (IAS-9 | Helmholtz Metadata Collaboration (HMC))

Employment
Source: Silke Christine Gerlich

StudienStiftung des deutschen Volkes eV, Bonn, Nordrhein-Westfalen, DE

2018-01-01 to 2020-09-30 | Coordinator

Employment
Source: Silke Christine Gerlich

Universität zu Köln, Köln, Nordrhein-Westfalen, DE

2015-01-01 to 2018-12-31 | PhD student (Botanical Institute)

Employment
Source: Silke Christine Gerlich



Source: detail

Source: detail



Dublin Core and its extensions are widely used and referenced today. The Dublin Core Metadata Initiative (DCMI) states to work openly, with a paid-membership model. [3] The 15 Dublin Core metadata elements have been formally standardized for cross-domain resource description as e. g. **ISO 15836-1:2017**. [4]

Creator
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









<https://www.science.org/>

  Inspector  Console  Debugger  Network   19   

Search HTML  

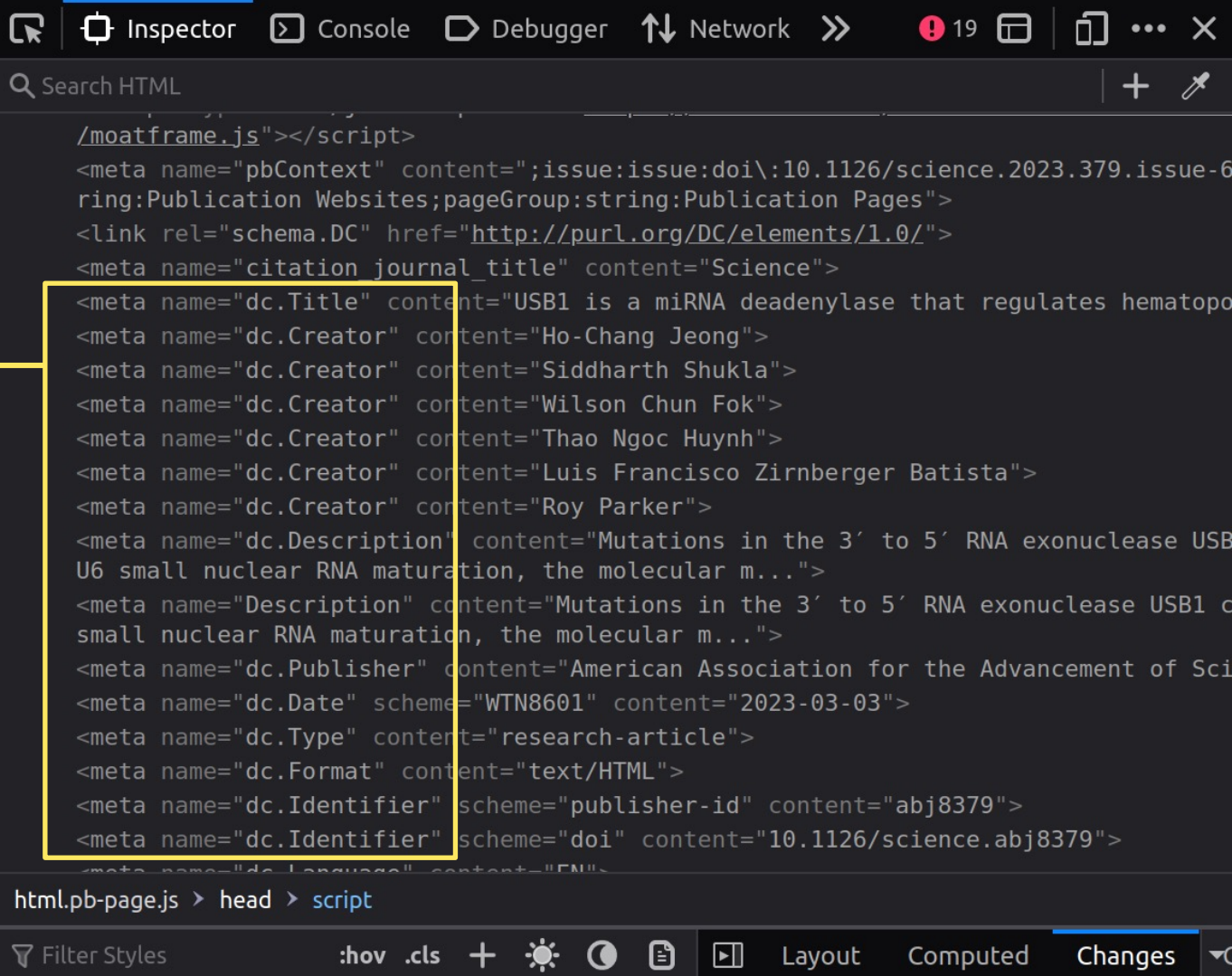
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<https://www.science.org/>

Dublin Core Elements



Inspector Console Debugger Network

Search HTML

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<https://www.theguardian.com>



Open Graph Protocol

schema.org

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This slide deck is part of the Lesson

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Why Context Matters

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The Carpentries Incubator.

You can find more information about this course on **Github**.



image:
https://c.pxhere.com/photos/35/f5/coffee_notebook_wooden_backgroud_orange_work_table_office-1222115.jpg