A Manuscript Microscope 'Sentence Audit' of:

Smartphone-assisted real-time estimation of chlorophyll and carotenoid contents in spinach following the inversion of red and green color features

What is the Manuscript Microscope Sentence Audit?

The Manuscript Microscope Sentence Audit is a research paper introspection system that parses the text of your manuscript into minimal sentence components for faster, more accurate, enhanced proofreading.

Why use a Sentence Audit to proofread your manuscript?

- Accelerated Proofreading: Examine long technical texts in a fraction of the usual time.
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Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.06.434237v1

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Audit Date: 29/03/21 **Audit Identifier:** TCDGWSDVGITB016 **Code Version:** 3.6

Features of the Sentence Audit:

The Sentence Audit combines two complementary proofreading approaches:

1. Each sentence of your text is parsed and displayed in isolation for focused inspection.
2. Each individual sentence is further parsed into Minimal Sentence Components for a deeper review of the clarity, composition and consistency of the language you used.

The Minimal Sentence Components shown are the smallest coherent elements of each sentence of your text as derived from it's conjunctions, prepositions and selected punctuation symbols (i.e. commas, semicolons, round and square brackets).

The combined approaches ensure easier, faster, more effective proofreading.

Comments and Caveats:

• The sentence parsing is achieved using a prototype natural language processing pipeline written in Python and may include occasional errors in sentence segmentation.

• Depending on the source of the input text, the Sentence Audit may contain occasional html artefacts that are parsed as sentences (E.g. "Download figure. Open in new tab").

• Always consult the original research paper as the true reference source for the text.

Contact Information:

To get a Manuscript Microscope Sentence Audit of any other research paper, simply forward any copy of the text to John.James@OxfordResearchServices.com.

All queries, feedback or suggestions are also very welcome.

Research Paper Sections:

The sections of the research paper input text parsed in this audit.

Section No.	Headings	Sentences
Section: 1	Abstract	17
Section: 2	1. Introduction	10
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title **Smartphone-assisted real-time estimation of chlorophyll and carotenoid contents in spinach following the inversion of red and green color features**

S1 [001] Abstract

S1 [002] Purpose Chlorophyll (Chl) content is a reliable indicator of leaf nitrogen content and plant health status.

Purpose Chlorophyll ...
... (Chl) ...
... content is a reliable indicator ...
... of leaf nitrogen content ...
... and plant health status.

S1 [003] Currently available methods for image-based Chl estimation require complex mathematical derivations and high-throughput imaging set-up along with multiplex image-preprocessing steps.

Currently available methods ...
... for image-based Chl estimation require complex mathematical derivations ...
... and high-throughput imaging set-up ...
... along with multiplex image-preprocessing steps.

S1 [004] Further, the influence of carotenoid (CAR) content has been largely ignored in the process.

Further, ...
... the influence ...
... of carotenoid ...
... (CAR) ...
... content has been largely ignored ...
... in the process.

S1 [005] The present study describes a smartphone-based leaf image analysis method for real-time estimation of Chl content and Chl/CAR ratio.

The present study describes a smartphone-based leaf image analysis method ...
... for real-time estimation ...
... of Chl content ...
... and Chl/CAR ratio.

S1 [006] Methods

Methods

S1 [007] Color features were obtained from RGB (red, green, blue) images of spinach leaves using a smartphone, and inverse R and G values were calculated.

Color features were obtained ...

... from RGB ...
... (red, ...
... green, ...
... blue) ...
... images ...
... of spinach leaves ...
... using a smartphone, ...
... and inverse R ...
... and G values were calculated.

S1 [008] Correlation analysis of color indices and photosynthetic pigment (PP) contents was performed, followed by principal component analysis (PCA).

Correlation analysis ...
... of color indices ...
... and photosynthetic pigment ...
... (PP) ...
... contents was performed, ...
... followed by principal component analysis ...
... (PCA).

S1 [009] Linear mathematical modeling was performed for describing regression equations for predicting PP contents.

Linear mathematical modeling was performed ...
... for describing regression equations ...
... for predicting PP contents.

S1 [010] Results

Results

S1 [011] 1/R and 1/G showed strong positive linear correlation (0.93 < r2 < 0.96) with Chl and CAR contents, respectively.

1/R ...
... and 1/G showed strong positive linear correlation ...
... (0.93 < r2 < 0.96) ...
... with Chl ...
... and CAR contents, ...
... respectively.

S1 [012] Furthermore, 1/R+1/G and [1/R]/[1/G] presented strong positive linear correlation with Chl + CAR (r2 = 0.95) and Chl/CAR (r2 = 0.88), respectively.

Furthermore, ...
... 1/R+1/G ...
... and ...
... [1/R]/[1/G] ...
... presented strong positive linear correlation ...
... with Chl + CAR ...
... (r2 = 0.95) ...
... and Chl/CAR ...
... (r2 = 0.88), ...

... respectively.

S1 [013] PCA confirmed the association of color indices with the respective PP features, which were subsequently estimated using the correlation models.

PCA confirmed the association ...
... of color indices ...
... with the respective PP features, ...
... which were subsequently estimated ...
... using the correlation models.

S1 [014] A smartphone-based companion application was developed using the linear models for non-invasive, real-time estimation of Chl content and Chl/CAR ratio.

A smartphone-based companion application was developed ...
... using the linear models ...
... for non-invasive, ...
... real-time estimation ...
... of Chl content ...
... and Chl/CAR ratio.

S1 [015] Conclusion

Conclusion

S1 [016] The ratios 1/R and 1/G indicate the contents of Chl and CAR via linear models.

The ratios 1/R ...
... and 1/G indicate the contents ...
... of Chl ...
... and CAR ...
... via linear models.

S1 [017] The smartphone application developed using the linear models enables real-time estimation of Chl content and Chl/CAR ratio without complicated image preprocessing steps or mathematical derivations.

The smartphone application developed ...
... using the linear models enables real-time estimation ...
... of Chl content ...
... and Chl/CAR ratio ...
... without complicated image preprocessing steps ...
... or mathematical derivations.

S2 [018] ## 1. Introduction

S2 [019] Chlorophyll (Chl) content is considered a reliable indicator of plant health status due to its central role in photosynthesis, as well as its close association with leaf nitrogen content (Kawashima and Nakatani 1998; Carter and Knapp 2001; Rorie et al. 2011 ; Wang et al. 2019).

Chlorophyll ...
... (Chl) ...
... content is considered a reliable indicator ...
... of plant health status ...
... due to its central role ...
... in photosynthesis, ...
... as well ...
... as its close association ...
... with leaf nitrogen content ...
... (Kawashima ...
... and Nakatani 1998; ...
... Carter ...
... and Knapp 2001; ...
... Rorie et al. 2011 ; ...
... Wang et al. 2019).

S2 [020] Although the use of Chl meters has been adopted for rapid non-destructive assessment of Chl content, the high cost of such devices has limited their usage significantly.

Although the use ...
... of Chl meters has been adopted ...
... for rapid non-destructive assessment ...
... of Chl content, ...
... the high cost ...
... of such devices has limited their usage significantly.

S2 [021] Since Chls are directly associated with leaf coloration, analysis of leaf digital color features is becoming a popular cost-effective tool for non-destructive, real-time assessment of Chl content (Kawashima and Nakatani 1998; Pagola et al. 2009; Rorie et al. 2011; Agarwal and Dutta Gupta 2018).

Since Chls are directly associated ...
... with leaf coloration, ...
... analysis ...
... of leaf digital color features is becoming a popular cost-effective tool ...
... for non-destructive, ...
... real-time assessment ...
... of Chl content ...
... (Kawashima ...
... and Nakatani 1998; ...
... Pagola et al. 2009; ...
... Rorie et al. 2011; ...
... Agarwal ...
... and Dutta Gupta 2018).

S2 [022] A variety of color indices derived from leaf digital images have been examined with the aim of finding the most suitable indicators of Chl content.

A variety ...

End of Sample Audit

This is a truncated Manuscript Microscope Sample Audit.

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John.James@OxfordResearchServices.com
