

CORRECTION

[View Article Online](#)
[View Journal](#) | [View Issue](#)


Cite this: *Green Chem.*, 2019, **21**, 6027

Correction: Sustainable bioproduction of the blue pigment indigoidine: Expanding the range of heterologous products in *R. toruloides* to include non-ribosomal peptides

Maren Wehrs,^{a,b,c} John M. Gladden,^{id} c,d Yuzhong Liu,^{a,c} Lukas Platz,^{a,c} Jan-Philip Prah,^{a,e} Jadie Moon,^{a,c} Gabriella Papa,^{a,e} Eric Sundstrom,^{a,e} Gina M. Geiselman,^{a,d} Deepti Tanjore,^{a,e} Jay D. Keasling,^{a,c,f,g,h,i,j} Todd R. Pray,^{a,e} Blake A. Simmons^{id} a,c and Aindrita Mukhopadhyay^{id} *a,c,k

DOI: 10.1039/c9gc90091h
rsc.li/greenchem

Correction for 'Sustainable bioproduction of the blue pigment indigoidine: Expanding the range of heterologous products in *R. toruloides* to include non-ribosomal peptides' by Maren Wehrs et al., *Green Chem.*, 2019, **21**, 3394–3406.

The authors regret that the standard curve used to assess titers (as g L⁻¹) of the final product indigoidine was incorrect. The authors would like to note that the findings and raw measurements for the indigoidine compound remain unchanged.

Using a corrected standard curve, titer values in Fig. 2e, 3, 4, 5b, 6 and 8 should be as shown below. Fig. S7 in the ESI has also been corrected.

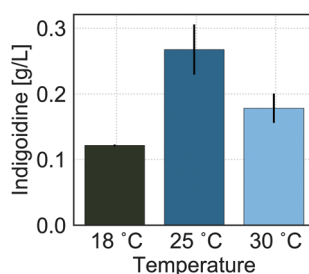


Fig. 2 (e) Cultivations in liquid culture were performed in synthetic defined media with a starting concentration of 100 g L⁻¹ glucose and 5 g L⁻¹ of ammonium sulfate.

^aBiological Systems and Engineering Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA. E-mail: amukhopadhyay@lbl.gov

^bInstitut für Genetik, Technische Universität Braunschweig, Braunschweig, Germany

^cJoint BioEnergy Institute, Lawrence Berkeley National Laboratory, Emeryville, CA 94608, USA

^dBiological and Engineering Sciences Center, Sandia National Laboratories, 7011 East Avenue, Livermore, California 94551, USA

^eAdvanced Biofuels and Bioproducts Process Development Unit, Lawrence Berkeley National Laboratory, Emeryville, CA 94608, USA

^fDepartment of Plant and Microbial Biology, University of California, Berkeley, CA 94720, USA

^gDepartment of Bioengineering, University of California, Berkeley, CA 94720, USA

^hDepartment of Chemical and Biomolecular Engineering, University of California, Berkeley, CA 94720, USA

ⁱThe Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark, Denmark

^jSynthetic Biochemistry Center, Institute for Synthetic Biology, Shenzhen Institutes for Advanced Technologies, Shenzhen, China

^kEnvironmental Genomics and Systems Biology Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA



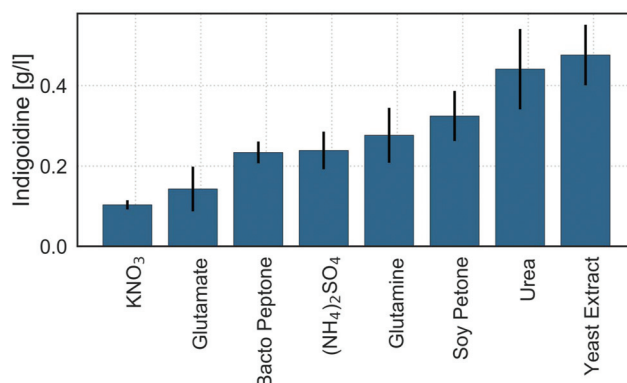


Fig. 3 Impact of nitrogen source on the indigoidine production after 3 days of cultivation using 100 g L⁻¹ glucose. Nitrogen content was normalized to elemental nitrogen at a C/N ratio of 4. Error bars represent SD of 4 replicates.

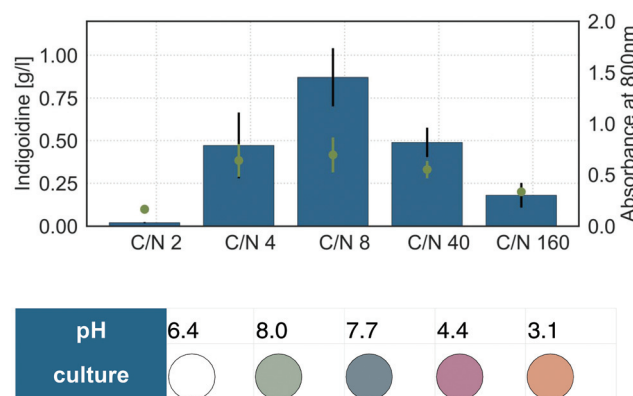


Fig. 4 Impact of C/N ratio on the indigoidine production, microbial growth and culture pH after 3 days of cultivation using 100 g L⁻¹ glucose and varying amounts of urea as carbon and nitrogen source respectively. Differently colored circles in the table represent depictions of the culture hue. Images of the culture broth can be found in Fig. S7. Error bars represent SD of 3 replicates.

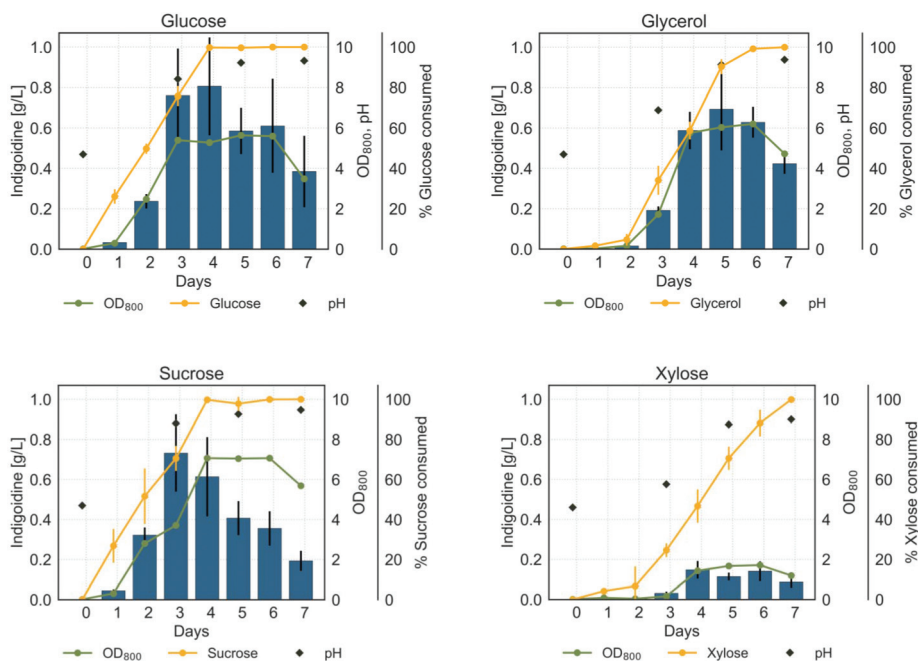


Fig. 5 (b) Concentrations of indigoidine (blue bars), consumed sugar (yellow line), OD800 (green line) and the culture pH (black rhombus) are plotted against time for cells grown in different carbon sources with an initial C/N ratio of 8 (starting sugar concentration was 100 g L⁻¹ = 10 g total in 100 mL), using urea as nitrogen source. Error bars represent SD of 3 replicates.



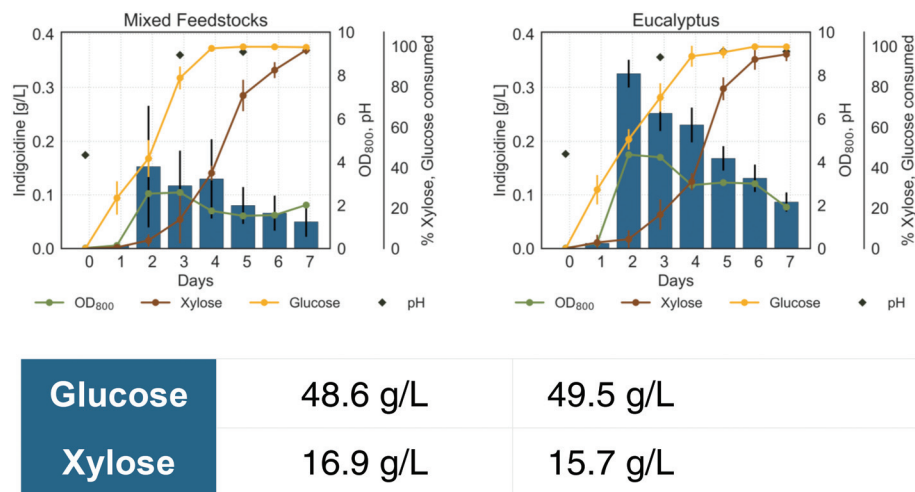


Fig. 6 Indigoidine production profile of BlueBelle using hydrolysate as carbon source. Concentrations of indigoidine (blue bars), consumed glucose (yellow line) and xylose (brown line), OD800 (green line) and the culture pH (black rhombus) are plotted against time for cells grown in hydrolysate obtained from different feedstocks (mixed feedstocks from eucalyptus and switchgrass as well as solely from eucalyptus) with an initial C/N ratio of 8, using urea as nitrogen source. The table shows glucose and xylose concentrations in media prepared with hydrolysates. Error bars represent SD of 3 replicates.

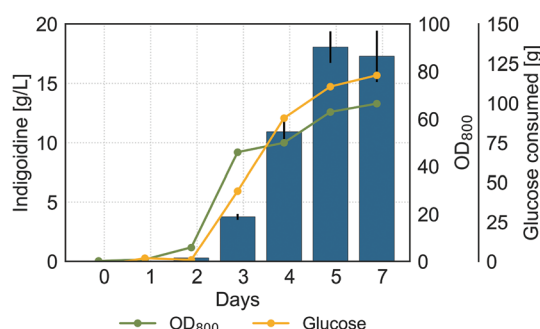


Fig. 8 Indigoidine production profile of BlueBelle in a high-carbon fedbatch production process. Concentrations of indigoidine (blue bars), glucose consumed (yellow line) and OD800 (green line) are plotted against time. The arrow indicates the start of the adjusted feeding at increased rate on day 4. Error bars for indigoidine extraction represent SD from 3 technical replicates.

Several statements in the study that refer to the numerical titer values should have read as follows:

In line 10 of the abstract on page one of the manuscript, ' $86.3 \pm 7.4 \text{ g L}^{-1}$ ' should say ' $18.04 \pm 1.50 \text{ g L}^{-1}$ '.

In line 12 in the 'indigoidine extraction' paragraph in the Experimental section on page three, 'we have developed previously.²⁹' should read 'prepared as described using indigoidine purified from BlueBelle cultures as described in Yu *et al.*⁹'.

In line 17 in the 'indigoidine purification and chemical analysis' in the Experimental section on page four, ' 2 g L^{-1} ' should read ' 1 g L^{-1} '.

In line 12 in paragraph four in the 'Utilization of various carbon sources for indigoidine production' section in the Results and discussion on page nine, ' 3.2 g L^{-1} in glycerol compared to 3.8 g L^{-1} ' should read ' 0.7 g L^{-1} in glycerol compared to 0.8 g L^{-1} '.

In line eight in paragraph two in the 'Production of the NRP indigoidine from lignocellulosic biomass' section in the Results and discussion on page nine, ' 1.51 g L^{-1} and 0.67 g L^{-1} ' should read ' 0.3 g L^{-1} and 0.15 g L^{-1} '.

In line 12 in paragraph two in the 'Fed-batch process with pH control results in increase of indigoidine titer' section in the Results and discussion on page 10, ' $86.3 \pm 7.4 \text{ g L}^{-1}$ was achieved after 5 days (116 h) of cultivation with an overall productivity and yield of $0.73 \text{ g L}^{-1} \text{ h}^{-1}$ and $0.91 \text{ g}_{\text{indigoidine}} \text{ g}_{\text{glucose}}^{-1}$ respectively (99.4 g indigoidine net production and 109.6 g glucose net consumed).' should read ' $18.04 \pm 1.5 \text{ g L}^{-1}$ was achieved after 5 days (116 h) of cultivation with an overall productivity and yield of $0.15 \text{ g L}^{-1} \text{ h}^{-1}$ and $0.19 \text{ g}_{\text{indigoidine}} \text{ g}_{\text{glucose}}^{-1}$ respectively (20.7 g indigoidine net production and 109.6 g glucose net consumed).'

In line five in paragraph two of the Conclusions on page 11, ' $86.3 \pm 7.4 \text{ g L}^{-1}$ and yield $0.91 \text{ g}_{\text{indigoidine}} \text{ g}_{\text{glucose}}^{-1}$ ' should read ' $18.04 \pm 1.50 \text{ g L}^{-1}$ and yield $0.19 \text{ g}_{\text{indigoidine}} \text{ g}_{\text{glucose}}^{-1}$ '.

In line three in paragraph five of the Conclusions on page 11, ' 100 g L^{-1} ' should say ' 20 g L^{-1} '.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

