

How will the decomposition in coastal heathlands be affected by nitrogen addition?

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Keypoints:

1. There is no significant effect of increased nitrogen input on the decomposition capacity in coastal heathlands.
2. There are indications that the response to nitrogen input varies depending on litter quality, with rooibos showing a slight negative trend in decomposition capacity.

1 Introduction and background

We have investigated if human induced nitrogen deposition affects decomposition in coastal heathlands. Increased nitrogen deposition has been found to increase productivity and decomposition rates. Consequently, **our hypothesis is that with increasing levels of nitrogen addition, there will be an increase in the decomposition rates.**

2 Material and methods

Fieldwork was conducted at **Lygra**, located north of Bergen. Following the TeaBagIndex protocol, **two** types of litter—**green tea** and **rooibos tea** bags—were placed near **four focal plant species**: *Calluna vulgaris*, *Vaccinium vitis-idaea*, *Vaccinium myrtillus*, and *Empetrum nigrum* and buried 83 days during peak growth season. In the laboratory, the tea bags were first cleaned and then dried in an oven at 65 degrees Celsius for 48 hours. After drying, the tea bags were cut open, and the **organic material** was weighed.

3 Results and discussion

A slight difference is observed in the decomposition rates of green and rooibos tea, with **rooibos showing a modest negative trend in decomposition as nitrogen levels increase.** The absence of significant results may be attributed to elevated nitrogen deposition from nearby industries, which may have led the system to already adapt to these levels.

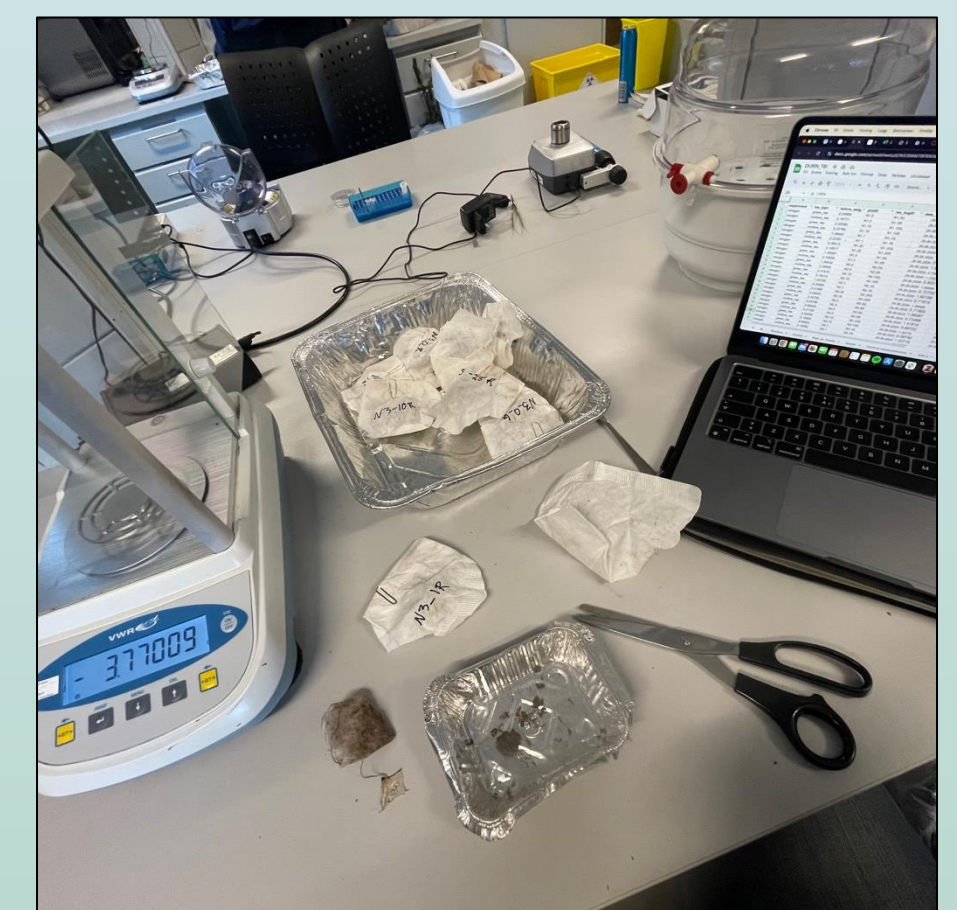


Illustration 1: (left) and illustration: 2 (right). From field (left) and lab (right) work.

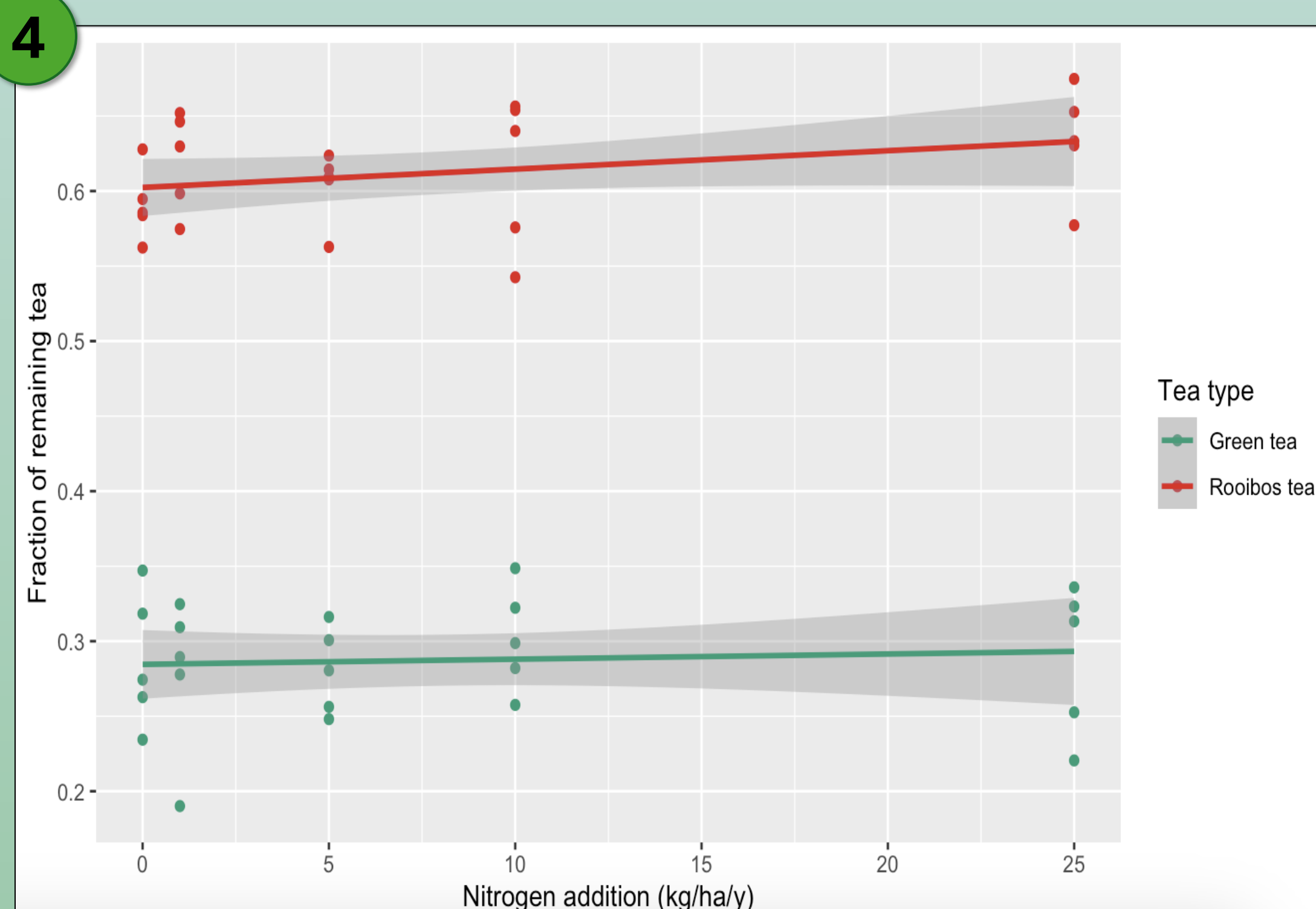


Fig. 1: Illustrating fraction of remaining organic material (g) in respect to nitrogen addition (kg/ha/y).

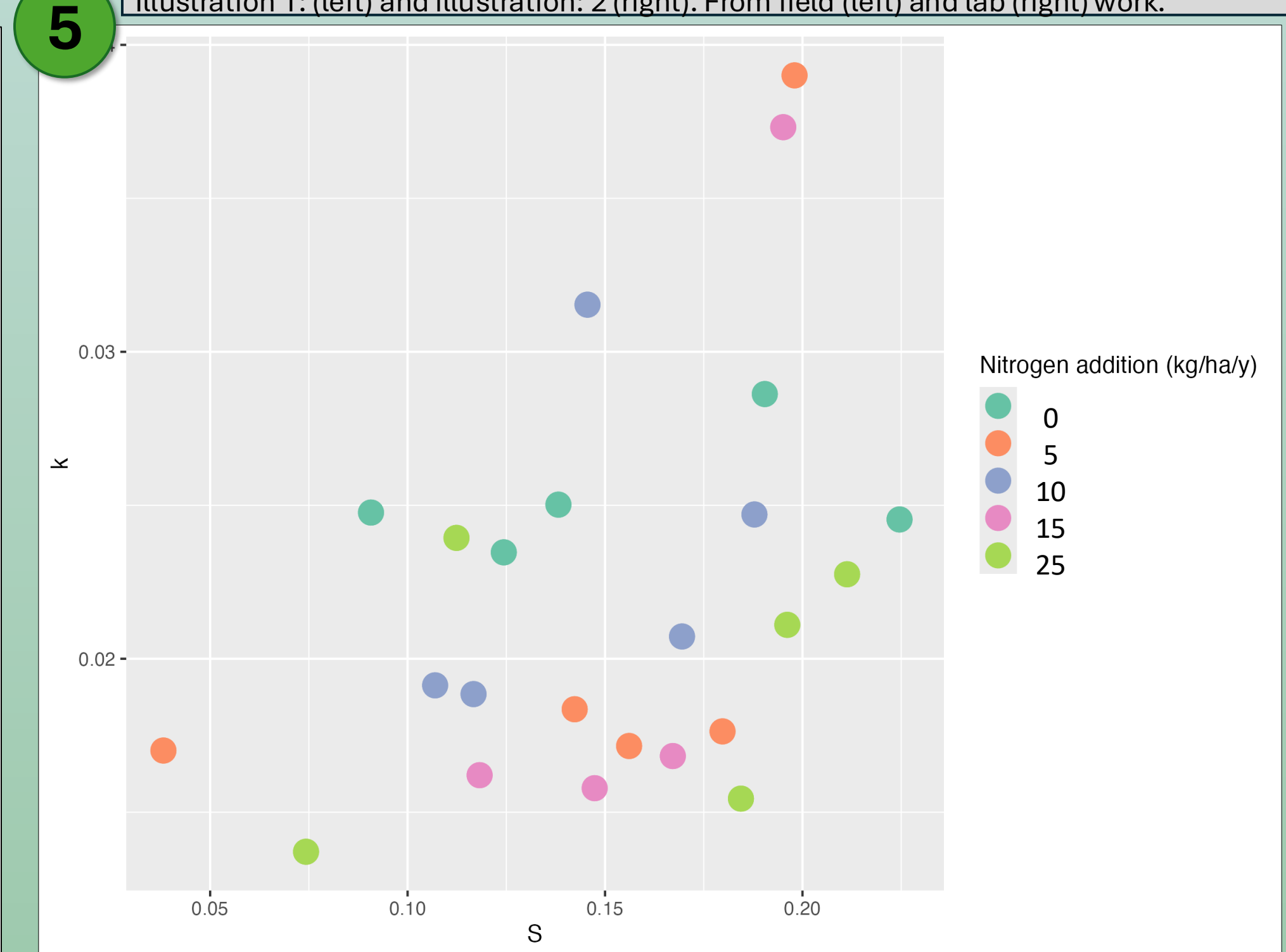


Fig. 2: Showing stabilization factor S (x-axis) and decomposition constant k (y-axis).



References:
1) Bähring, A. et al. (2017) 'Ecosystem functions as indicators for heathland responses to nitrogen fertilisation', *Ecological Indicators*, 72, pp. 185–193.
2) Keuskamp, J. A., Dingemans, B. J., Lehtinen, T., Sarneel, J. M., & Hefting, M. M. (2013). Tea Bag Index: a novel approach to collect uniform decomposition data across ecosystems. *Methods in Ecology and Evolution*, 4(11), 1070–1075.
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