Carbon dioxide sensing in the social context: leaf-cutting ants prefer elevated CO_2 levels to tend their brood

Daniela Römer, Martin Bollazzi, Flavio Roces

PII: S0022-1910(18)30066-0
DOI: https://doi.org/10.1016/j.jinsphys.2018.05.007
Reference: IP 3791

To appear in: *Journal of Insect Physiology*

Received Date: 28 February 2018
Revised Date: 15 May 2018
Accepted Date: 17 May 2018

Please cite this article as: Römer, D., Bollazzi, M., Roces, F., Carbon dioxide sensing in the social context: leaf-cutting ants prefer elevated CO_2 levels to tend their brood, *Journal of Insect Physiology* (2018), doi: https://doi.org/10.1016/j.jinsphys.2018.05.007

Title: Carbon dioxide sensing in the social context: leaf-cutting ants prefer elevated CO_2 levels to tend their brood

Authors: Daniela Römer[a,b]*, Martin Bollazzi[b] and Flavio Roces[a]

Affiliations:

[a] Department of Behavioral Physiology and Sociobiology, Biocenter, Am Hubland, University of Würzburg, 97074, Würzburg, Germany, email: roces@biozentrum.uni-wuerzburg.de

[b] Unidad de Entomología, Departamento de Protección Vegetal, Facultad de Agronomía, Avda. Eugenio Garzon 780, Universidad de la República, 12900 Montevideo, Uruguay, email: bollazzi@fagro.edu.uy

***Corresponding author:**

Daniela Römer
Email: Daniela.Roemer@uni-wuerzburg.de
Tel. +49 931 3180832
Address: Department of Behavioral Physiology and Sociobiology, Biocenter, Am Hubland, 97074 Würzburg, Germany

Abstract

Social insects show temperature and humidity preferences inside their nests to successfully rear brood. In underground nests, ants also encounter rising CO_2 concentrations with increasing depth. It is an open question whether they use CO_2 as a cue to decide where to place and tend the brood. Leaf-cutting ants do show CO_2 preferences for the culturing of their symbiotic fungus. We evaluated their CO_2 choices for brood placement in laboratory experiments. Workers of *Acromyrmex lundii* in the process of relocating brood were offered a binary choice consisting of two interconnected chambers with different CO_2 concentrations. Values ranged from