



## **Plasticity in the construction of nest turrets in the leaf-cutting ant *Acromyrmex fracticornis***

Author(s): Daniela Römer, Daniela Römer , Marcela Cosarinsky , Flavio Roces

Institution(s): Department of Behavioural Physiology and Sociobiology (Zoology II), University of Würzburg, Würzburg, Germany ; Departamento de Ciencias Geológicas, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Argentina ; Department of Behavioural Physiology and Sociobiology (Zoology II), University of Würzburg, Würzburg, Germany ; Department of Behavioural Physiology and Sociobiology (Zoology II), University of Würzburg, Würzburg, Germany

Besides the excavation of huge underground nests with impressive architecture, leaf-cutting ants also erect conspicuous turrets above the nest openings. Both the construction and function of these structures remain almost unexplored. We investigated the building behaviors underlying the construction of nest turrets in *Acromyrmex fracticornis*, which builds small turrets made mostly out of grass blades and soil particles. Choice of building materials for construction was investigated in the field in northern Argentina, by first removing the original turret of a nest, and by offering building materials with different structural features for reconstruction. The choice of materials, thin or thick sticks, was recorded at two different phases in the rebuilding process. The reconstructed turrets were similar in shape and size to the original turrets (in average 2.84 cm high), with a single opening. Building activity was highest at the beginning of the construction process, and decreased thereafter. Ants chose building materials depending on the construction phase, selecting a mixture of thick and thin sticks at the beginning, and almost exclusively thin sticks 12 hours after the onset of building. Micromorphological analyses using thin sections indicated that ants first deposited more stable sticks like beams, and reinforced the subsequent basket-like structure with soil. In addition, we explored the cause for the construction of turrets with multiple openings. The experimental partitioning of the nest entrance with a beam-divider at the beginning of the rebuilding process led to the construction of turrets with several openings, as compared to control turrets. It is argued that both the selection of structurally more stable materials at the beginning, and the construction of turrets with several openings, create a long-lasting turret that could aid flood prevention, nest ventilation, or intruder defense, aspects that remain to be investigated.