

Notes from Underground

Observations from the Field

A Survey of Leafcutter Ants from the Southern Tip of the Nicoya Peninsula in Costa Rica

Durante los meses de Noviembre y Diciembre del 2002, los autores realizaron una nueva encuesta de las hormigas arrieras a lo largo de la punta sureña de la península de Nicoya en Costa Rica.

Solamente una especie de hormiga arrieras, *Ac. octospinosus*, se encontro en el terreno analizado. Las muestras de estas especies de hormigas se tomaron en diferentes colonias y alrededor de los pueblos de Montezuma, Cobano, Tambor, y Paquera (oeste y este). Tambien los habitantes de Cabuya nos informaron sobre la presencia de las hormigas arrieras (cerca de la Reserva de Cabo Blanco), y en Curu.

Las especies *A. cephalotes* y *A. colombica*, no se encontraron durante la encuesta. El analisis de tierra en la punta sureña de la península de Nicoya reveló ciertas características, tal como las tierras vertisols de pellic y cambisols de eutric.

Es por la alta presencia de tipos vertisol sobre esta área que especulamos algo muy interesante, si la ausencia de esta importante especie de hormigas arrieras es debido a razones ya avanzadas por Wetterer et al (1997). ¿Puede ser explicado aducadamente que la exclusión de spp *Atta* en la parte sureña de la península de Nicoya, sea debido a la incapacidad de estas hormigas en construir sus profundos nidos en vertisols?



Acromyrmex octospinosus from Cobano

There are several leafcutting species that occur naturally in Costa Rica, including *Atta cephalotes* and *Atta colombica*, which are the dominant herbivore pest species in this area. However, in a survey of leafcutter species in Palo Verde National Park, it was found that the only leafcutter present was *Acromyrmex octospinosus*. This was attributed to the vertisol type of soil in the area, which has poor drainage when wet and can contain large cracks when dry. Both *A. cephalotes* and *A. colombica* have very deep underground nests, and it was surmised that such structures could not be maintained in these soil conditions (Wetterer, Gruner and Lopez, 1997).

This present study extends the survey to include the southern areas of the Nicoya peninsula in Costa Rica.

This new survey was undertaken by the authors on November-December 2002 along the entire length of the southernmost tip of the peninsula. This area contains scattered tropical deciduous forest, and has an annual precipitation of 1763 mm. Because the area receives more rain than the northern parts of the peninsula, it is considered a transitional zone between a dry forest climate and tropical rainforest. Temperature in the area averages 33 C during the day and the climate is punctuated by a long dry season from December to April. The new survey coincided with the beginning of the dry season.

Only one leafcutter ant species, *Ac. octospinosus*, was found in the surveyed locations. Samples of this species were taken from different colonies in and around the towns of (from West to East) Montezuma, Cobano, Tambor, and Paquera. The presence of leafcutters was also reported by local people in Cabuya (near the Cabo Blanco Reserve), and in Curu (see accompanying map).



Sampled Towns. Nicoya Peninsula, Costa Rica

The species exhibited extreme variability in foraging behavior. Most of the colonies had workers which foraged for fallen petals, brown leaves, and other such fallen organic material. On the other hand, the foraging workers in the Cobano colony were actively cutting leaves from a nearby stand of trees. Similarly, locals reported that the workers of the Paquera colony, whose nest mounds hugged the inside wall of a long ditch, were very active in climbing and foraging on the mango trees of an extensive fruit orchard.

The colonies also demonstrated differences in the time of foraging. Workers from colonies found in Cobano, Tambor and Montezuma foraged during the daytime, but workers in the majority of colonies did not leave the nest before dusk. In all cases, no workers were found that foraged openly under the relatively hot sun. This confirms other studies that show that there is seasonal variation in the foraging patterns of *Ac. octospinosus*, with foraging occurring during the day during the wet season, but foragers coming out mainly at night during the dry season (Wetterer 1991).

A. cephalotes and *A. colombica* were not encountered during the survey, although *A. cephalotes* was present in great numbers across the Gulf of Nicoya in Puntarenas and the surrounding areas. An examination of the soil characteristics of the southern tip of the Nicoya peninsula revealed that it is characterized by soils such as pellic vertisols and eutric cambisols. It may also include chromic vertisols and eutric fluvisols (FAO, 1970). Vertisols are clayey soils which crack widely when dry and swell when wet. Fluvisols develop on river deposits and show

alluvial stratification. They occur along major river valleys and deltas and their high fertility means they are one of the most important soils groups used for growth of food crops. Cambisols have a texture of sandy loam or finer, and have color or structure changes from the parent material which permit the identification of a cambic B horizon.

Because of the heavy presence of vertisol types of soil in this area, it is interesting to speculate whether the absence of these major leafcutter species may be due to reasons similar to that advanced by Wetterer et al (1997). Can the exclusion of *Atta* spp from the southernmost tip of the Nicoya peninsula be adequately explained by the inability of these ants to construct their deep nests in vertisols?

Before making any premature conclusions, it would be prudent and highly instructive to conduct future surveys of the central regions of the Nicoya peninsula, which do not have a predominance of vertisols as part of their soil characteristics. If the hypothesis above holds true, then *Atta* leafcutters would be counted in any major survey of the area.

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FAO 1970. Soil map of the world. Carte mondiale des sols. Mapa mundial de suelos.

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