

Investigators Annual Report for Study ORPI-00146

EAGER-NEON: 20 Year Dynamics of North American Ant Communities: Evaluating the Role of Climate and Biogeochemistry on Ecological Change.

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Abstract

This is a report of the ant sampling work done in Organ Pipe National Monument in August of 2017. We found 5 nests and 14 ant species in the 30m² we sampled. We include the list of ants we have identified and compare our findings to collections made in 1996 using the same methods at the same site.

Dates and Locations

On August 26-27, 2017, we (MDW & KAR) collected ant workers from a transect that had been originally sampled in 1996 (by MK) under permit number ORPI-2017-SCI-0012. The transect ran north-south parallel to and ~20m east of the power-line access road that runs parallel to AZ Hwy 85 (32.182N, 112.773W). We sampled ants from 30 1m² plots separated by 10m, thus the entire transect was 300m long and sampled 30m².

Findings

We found 14 ant species from 11 genera (Table One) and four ant subfamilies. The most common species was *Solenopsis xyloni*, a native fire ant. The second most common was *Novomessor cockerelli*: a large, conspicuous species that builds irregular gravel mounds. Two genera found in 1996 (*Monomorium* *Myrmecocystus*) were not found in 2017.

Our resampling found approximately the same nest density as the 1996 sampling (2017=5 nests, 1996=6 nests). Species richness was lower in 2017 (14 species) than in 1996 (19 species) perhaps due to the notable failure to find any of the 4 species of honey-pot ants (*Myrmecocystus* spp.) found in 1996. Of the 23 species found in both sampling efforts, less than half (11/23=48%) were sampled in both years.

Overall activity was lower, with 46% fewer species-by-plot occurrences. Species found in 1996 but not in 2017 accounted for 31% of the occurrences in 1996. Species found in 2017 but not in the original sampling accounted for <10% of

the 2017 occurrences. Thus the species that were not re-sampled were relatively abundant in 1996. The species added in 2017 are relatively rare and may have been present in the habitat in 1996, but with densities so low they were not sampled

Given our methods, we cannot yet determine if the decline in activity and specie richness is due to local extirpation of species populations or pseudo-extirpation due to other factors (e.g., weather conditions). We plan to request additional funds that would, with the NPS permission, monitor this transect to determine if the “missing” species have been extirpated from the area, reduced in density or simply estivating on the days we sampled.

Table One: A comparison of the collections made in 2017 to the original collections made in 1996. Each sampling event sampled 30m². “Nests” refers to the number of nests of each species found, “Occ.” (i.e., occurrences) refers to the number of plots in which that species was collected (i.e., stray foragers).

Species	1996		2017	
	Nests	Occ.	Nests	Occ.
<i>Camponotus festinatus</i>	0	1	0	2
<i>Camponotus "ghost"</i>	0	0	0	2
<i>Crematogaster depilis</i>	1	3	0	5
<i>Dorymyrmex insanus</i>	1	23	0	4
<i>Forelius mccooki</i>	0	5	0	6
<i>Forelius pruinosus</i>	0	4	0	0
<i>Monomorium cyaneum</i>	0	3	0	0
<i>Myrmecocystus depilis</i>	0	16	0	0
<i>Myrmecocystus mexicanus</i>	0	3	0	0
<i>Myrmecocystus placodops</i>	0	3	0	0
<i>Myrmecocystus romaine</i>	0	3	0	0
<i>Novomessor cockerelli</i>	0	8	0	10
<i>Odontomachus desertorum</i>	0	0	0	1
<i>Pheidole gilvescens</i>	0	0	1	4
<i>Pheidole rugulosa</i>	0	5	0	0
<i>Pheidole sp.</i>	0	0	0	3
<i>Pheidole xerophila</i>	1	15	2	4
<i>Pogonomyrmex californicus</i>	0	2	0	0
<i>Pogonomyrmex pima</i>	0	4	0	3
<i>Solenopsis amblychila</i>	1	2	0	0
<i>Solenopsis xyloni</i>	2	23	2	13
<i>Tetramorium hispidum</i>	0	4	0	5
<i>Veromessor pergandei</i>	0	4	0	8
Totals	6	131	5	70
Species Richness	19		14	

Status of research

We have nearly completed identifying the species from Organ Pipe National Monument. This work is part of a larger project re-sampling our 1990's transects across North America. We have collected 34 transects in 2016 and 2017 and are working to identify all of the collections. All vouchers will be deposited in the Sam Noble Oklahoma Museum of Natural History at the University of Oklahoma.

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