

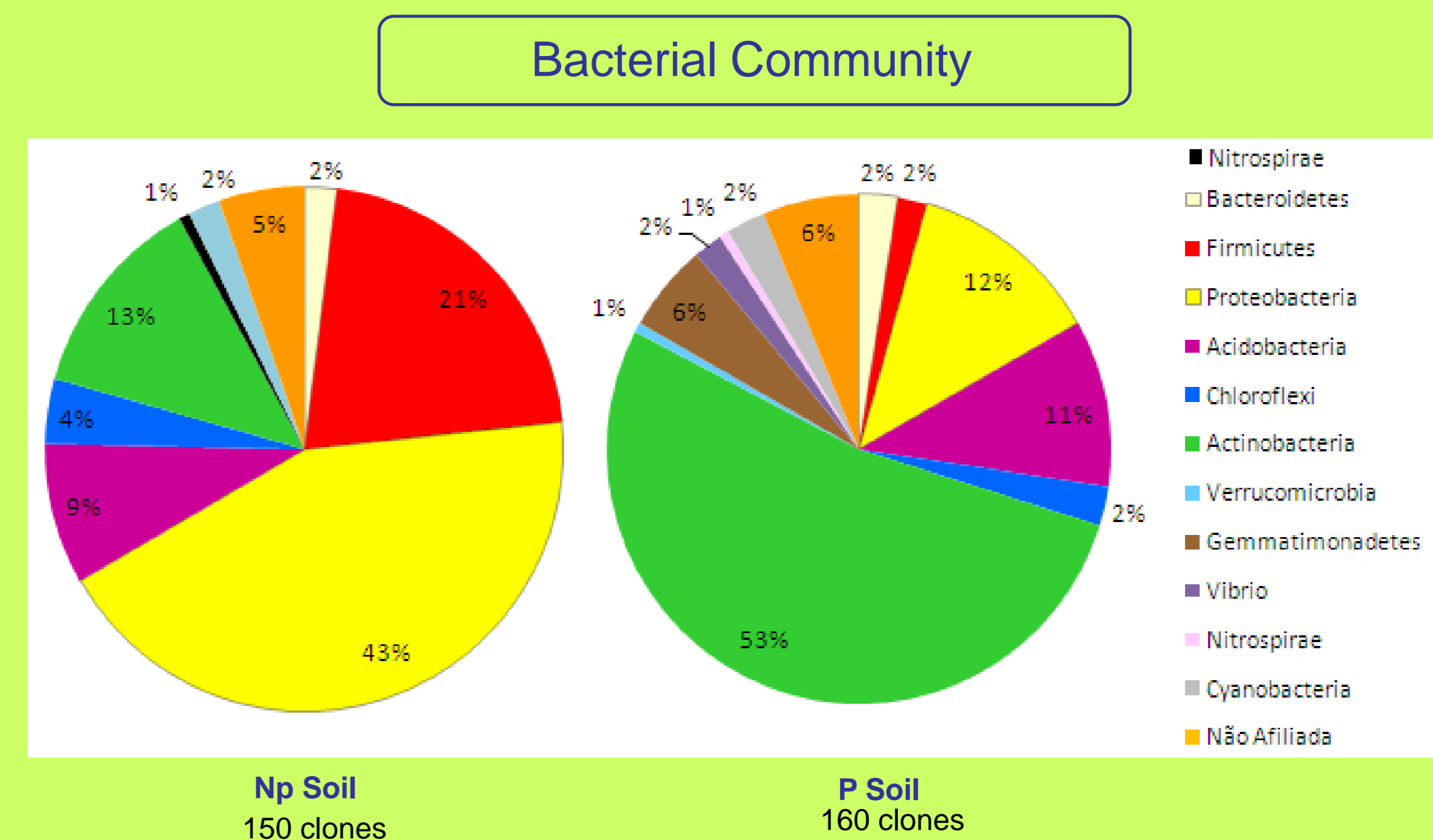
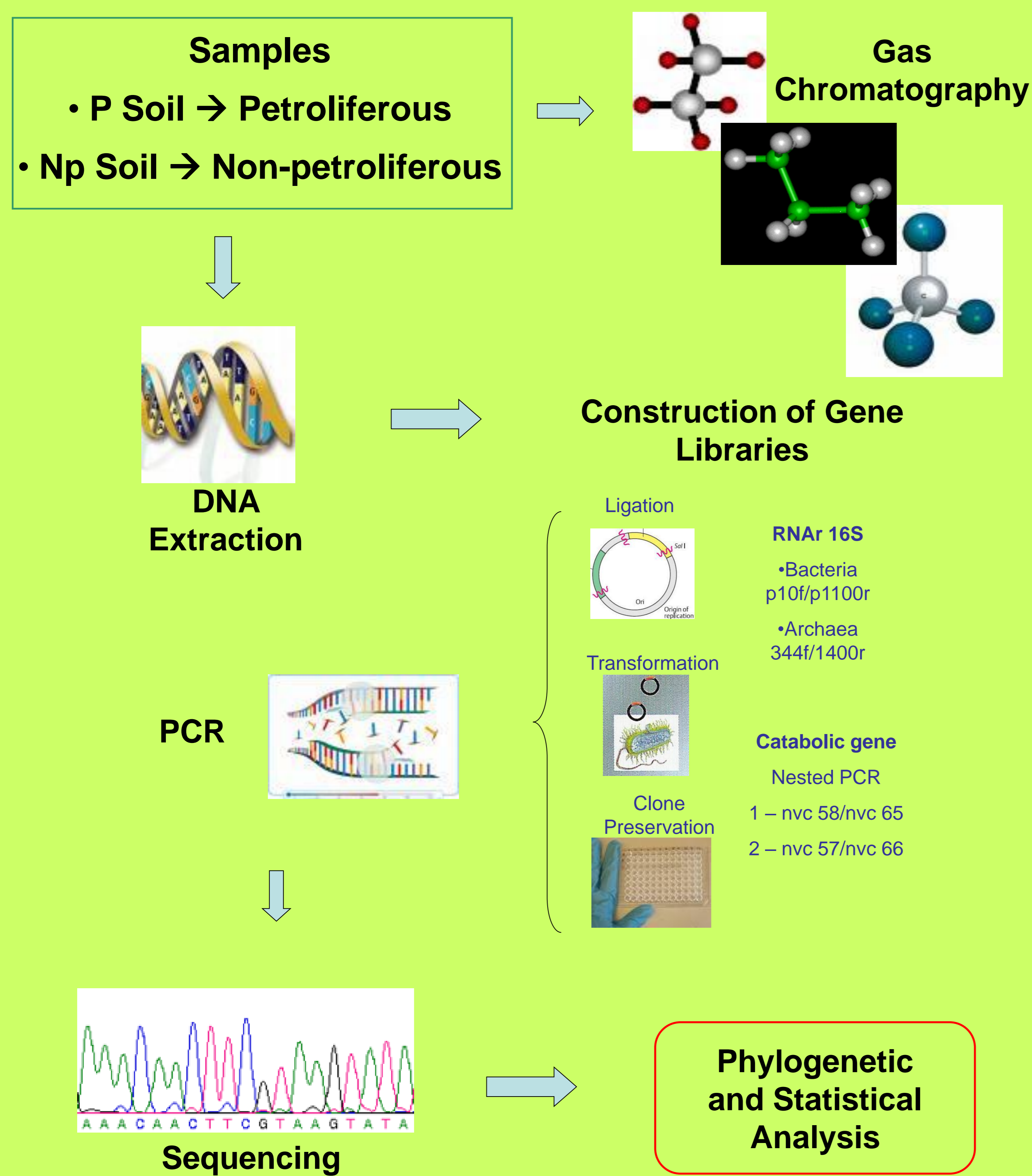
# MOLECULAR CHARACTERIZATION OF MICROBIAL COMMUNITIES INVOLVED IN SHORT-CHAIN ALKANE METABOLISM IN SOIL SAMPLES

Paula Brandão Miqueletto<sup>1</sup>, Justo Camejo Ferreira<sup>2</sup>, Eugenio Vaz dos Santos Neto<sup>2</sup> & Valéria Maia de Oliveira<sup>1</sup>  
<sup>1</sup>Microbial Resources Division, Research Center for Chemistry, Biology and Agriculture (CPQBA), UNICAMP, CP 6171, Campinas, SP, CEP:13081-970, Brazil; <sup>2</sup>PETROBRAS P & D Cidade Universitária, Q-7, CEP:21949-900, Rio de Janeiro, RJ, Brazil.  
 E-mail: [pamique@gmail.com](mailto:pamique@gmail.com)

## INTRODUCTION

The contents of gaseous hydrocarbons in sub-surface soil and sediment occur in highly variable amounts and the origin and occurrence of such compounds on Earth surface are not entirely understood. The upper formations of oil reservoirs may produce gas leaking which is supposed to be indirectly detectable through soil bacterial populations capable of consuming it. The goal of the present work was to characterize microbial communities in two soil samples received from Petrobras, focusing on populations specialized in short-chain alkane metabolism which can represent a biotechnological tool for petroleum prospection.

## MATERIAL AND METHODS



**Statistical Analysis - Dotur**

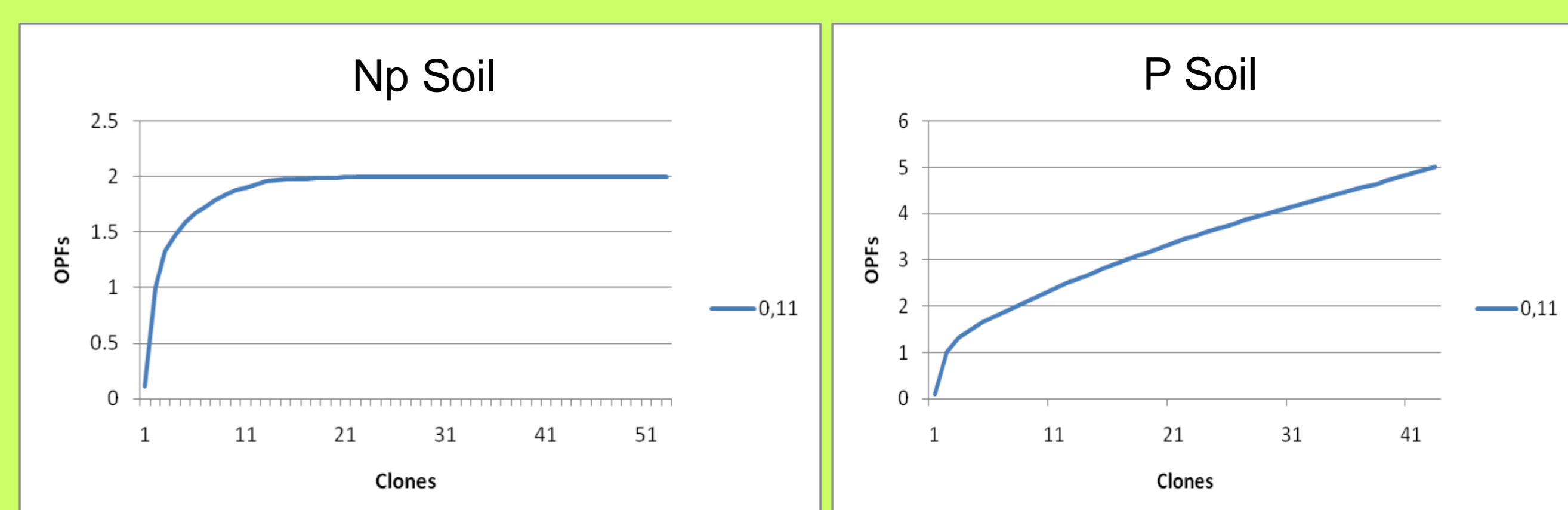
Sample	ACE	Chao	Shannon
Np Soil	760.063	465.5	4.43455
P Soil	391.464	331.867	4.49058

### Archaea

Sample	ACE	Chao	Shannon
Np Soil	30.9741	26	2.2046
P Soil	18.356	17	2.05307

The analysis of the catabolic genes revealed the occurrence of two Operational Protein Families (OPF) in Np soil and five in P soil. Clones related to the Ethene monooxygenase group (EtnC) were detected only in the latter, which also presented higher values of OPF's richness and diversity. Hydrocarbon measures performed by gas chromatography showed higher levels of methane and lower levels of ethane and propane in the P soil sample.

### Rarefaction Curves



Results obtained demonstrated that clone libraries of functional genes offer a more appropriate technique to evaluate microbial populations related to light gas metabolism. The majority of catabolic genes obtained from the libraries correspond to potentially new genes not related to those found in known bacterial species.

## RESULTS

Short-chain Hydrocarbon Contents (Petrobras Research Center)

	Np Soil	P Soil
Methane	140.36	1152.14
Ethane	5.36	1.16
Propane	3.43	0.39

### Phylogenetic Analysis

#### Archaeal Community

