



Comammox *Nitrospira* act as key bacteria in weakly acidic soil via potential cobalamin sharing

Yuxiang Zhao¹, Jiajie Hu¹, Jiaqi Wang¹, Xiangwu Yao¹, Tong Zhang², Baolan Hu^{1*}

¹College of Environmental and Resource Sciences, Zhejiang University, Hangzhou 310058, China

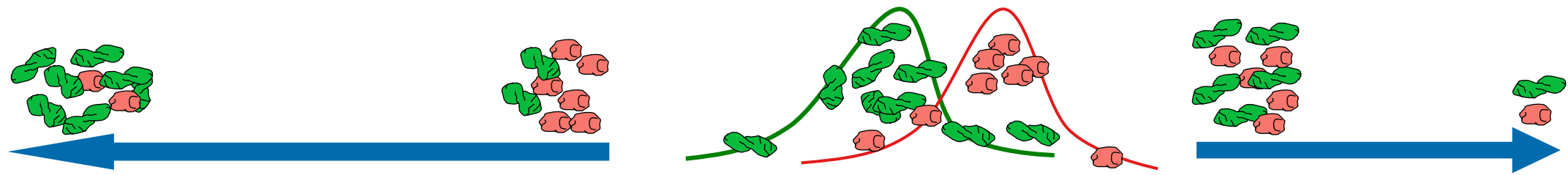
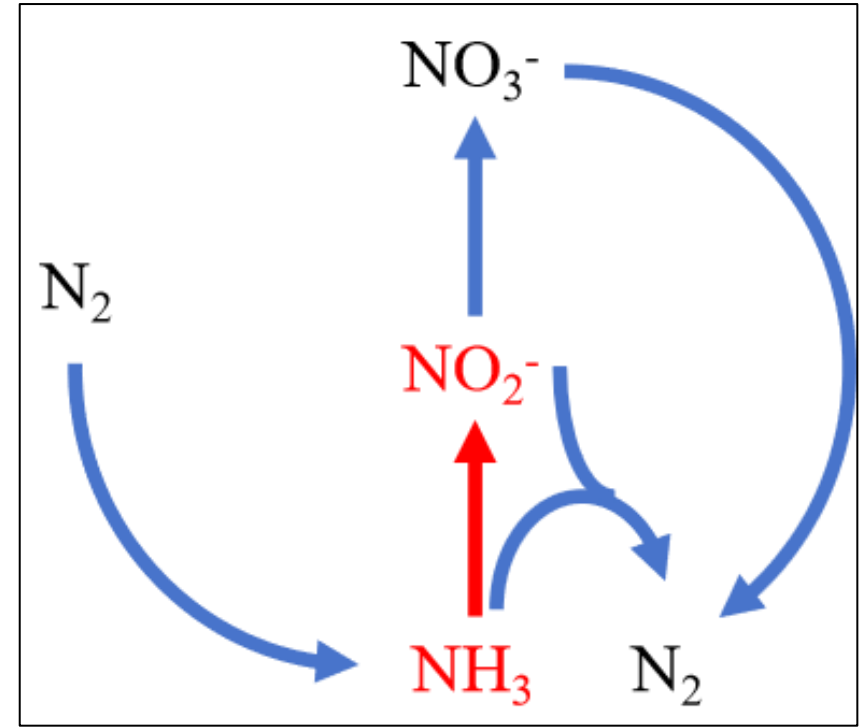
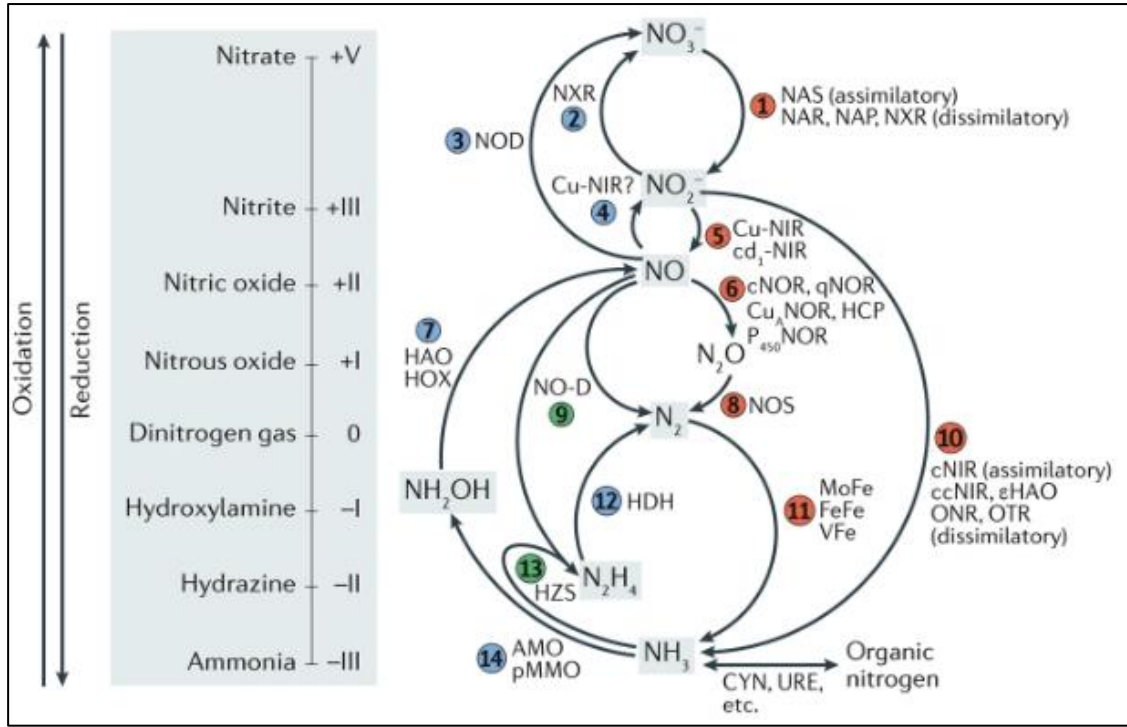
²Environmental Microbiome Engineering and Biotechnology Laboratory, Department of Civil Engineering,
The University of Hong Kong, Hong Kong SAR 999077, China



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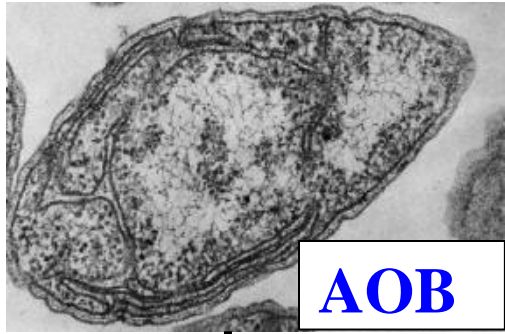
Background



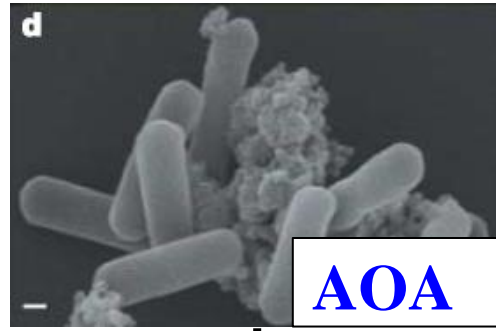
Ammonia oxidizing bacteria **AOB**

Ammonia oxidizing archaea **AOA**

Background



1890



2005

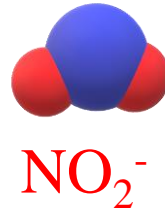


2015



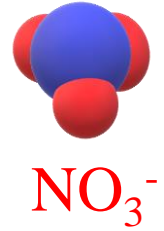
AOB
AOA

Ammonia oxidation



Nitrite oxidizing bacteria
NOB

Nitrite oxidation

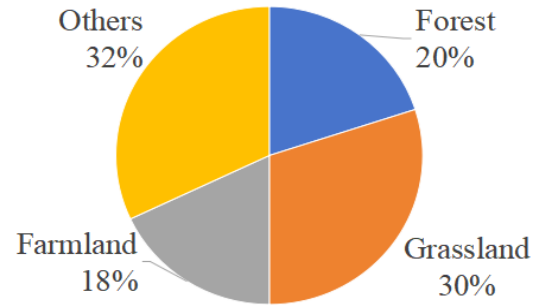
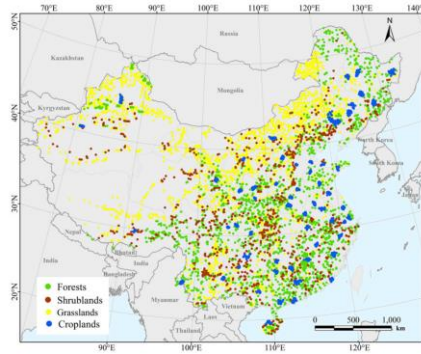


Comammox Nitrospira

Complete nitrification



Material and Methods



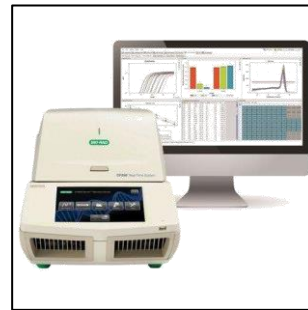
● Different land use types (3)

● Different climate types (4)

3 (Land use types) * 4 (Climate types) * 3 (Replicates) = **36** Samples



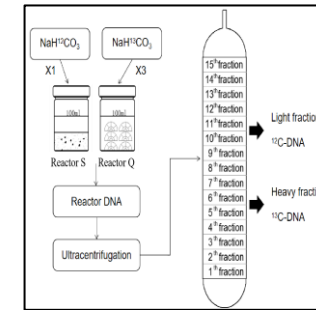
Nitrification rate



qPCR



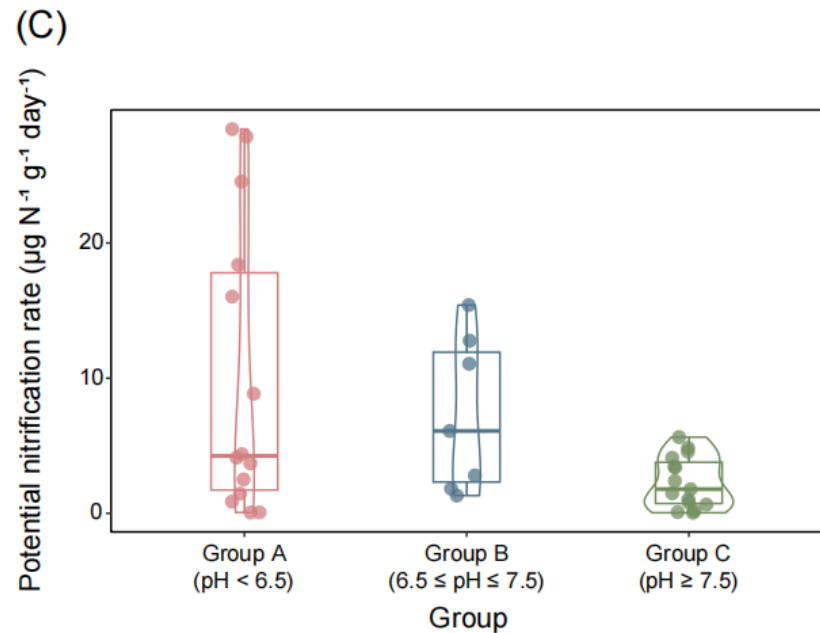
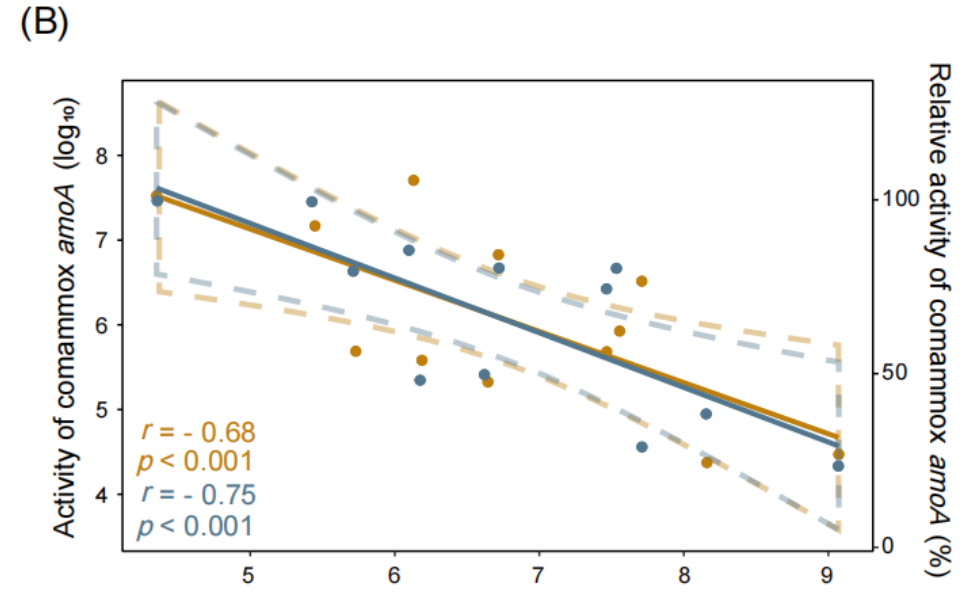
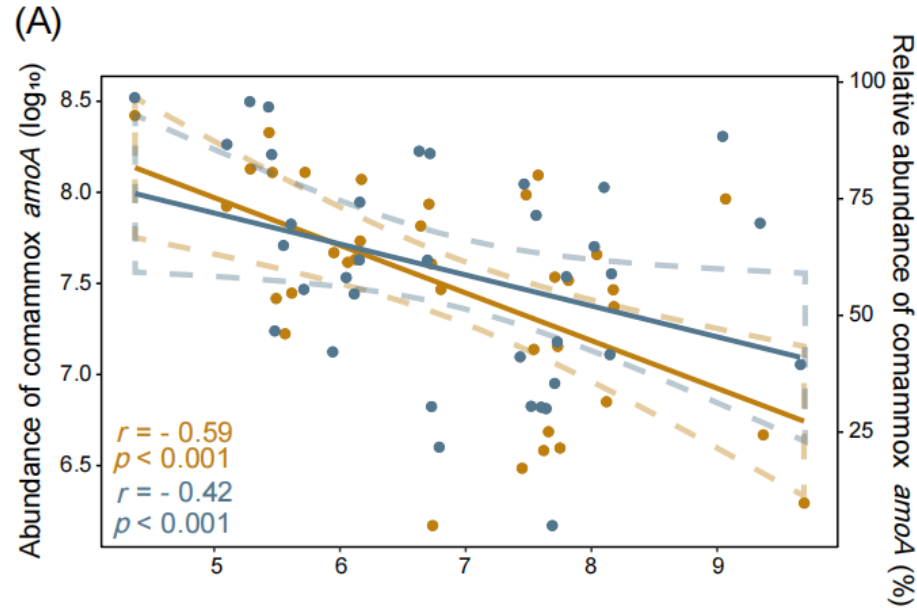
Sequencing technology



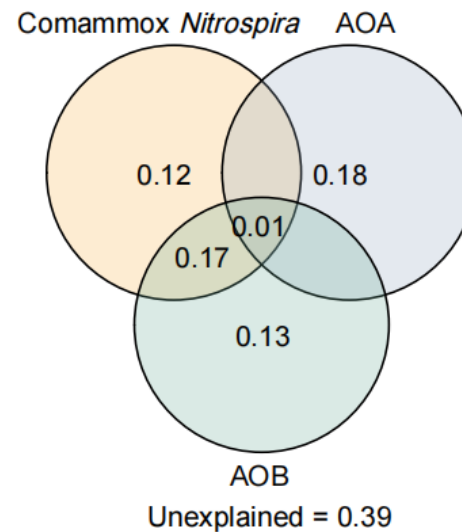
DNA-SIP



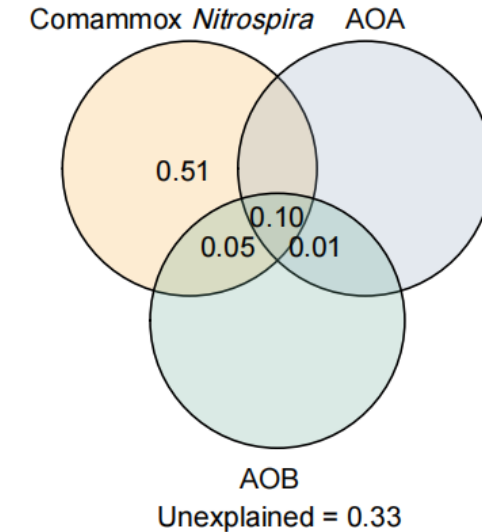
Comammox dominates ammonia oxidation in weakly acidic soils



(D) *amoA* gene abundance vs potential nitrification rate

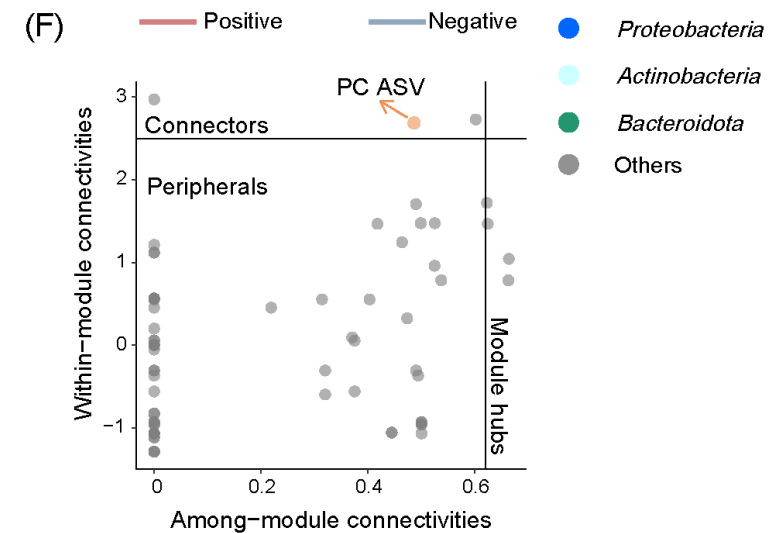
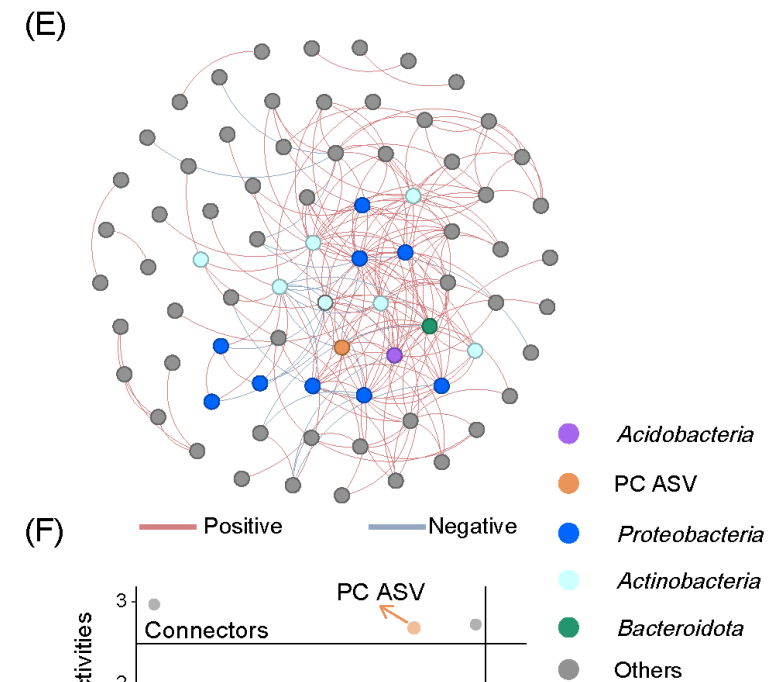
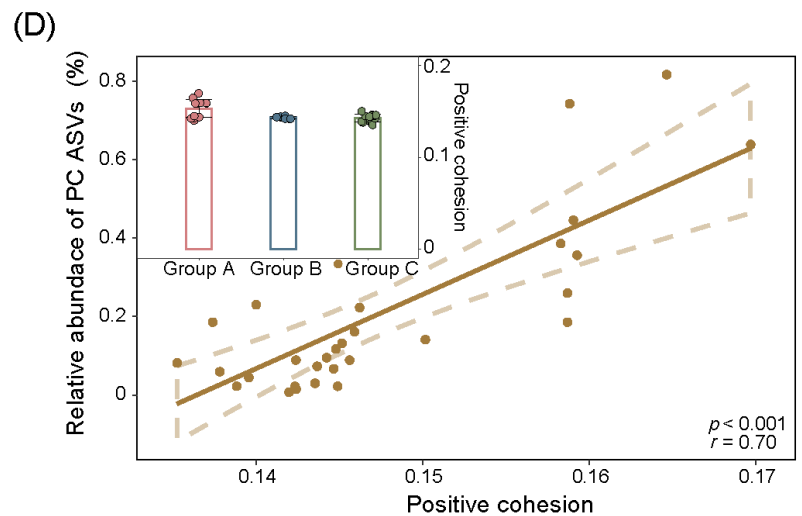
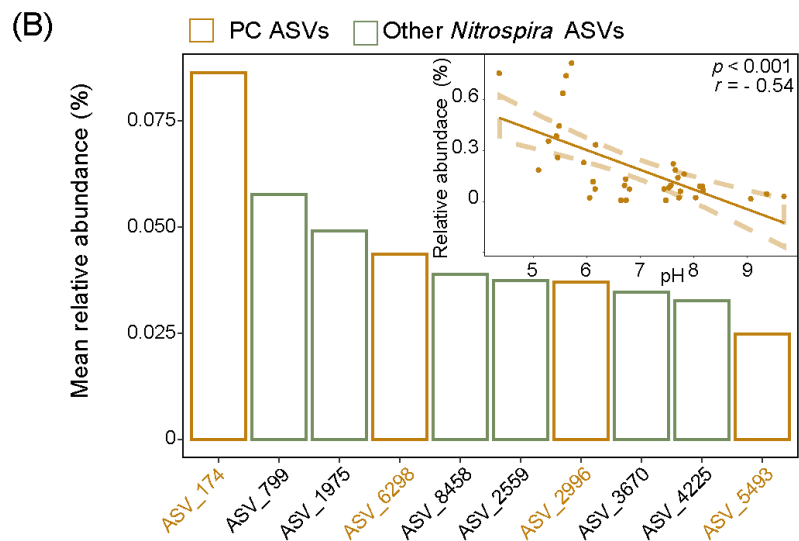
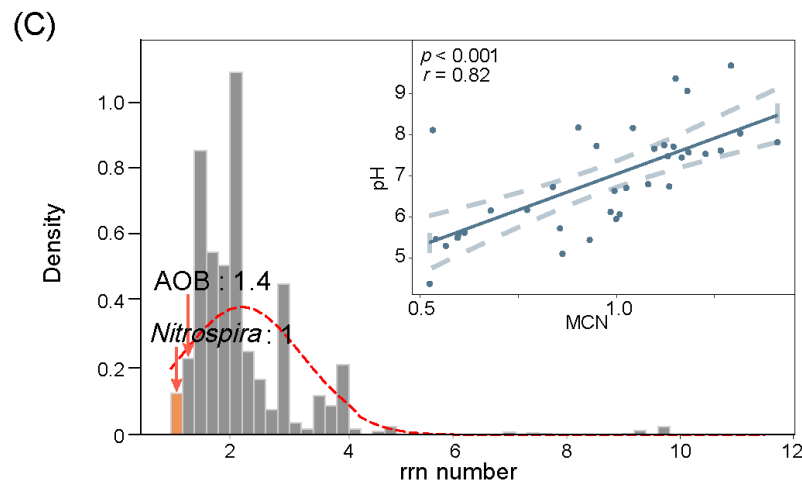
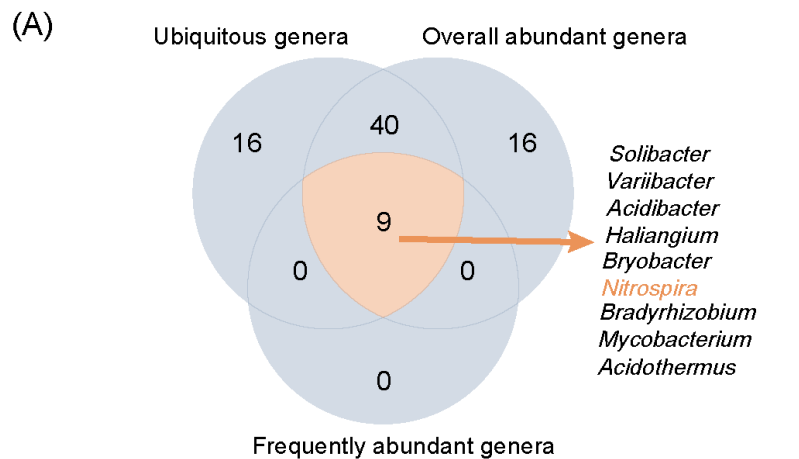


(E) *amoA* gene activity vs potential nitrification rate



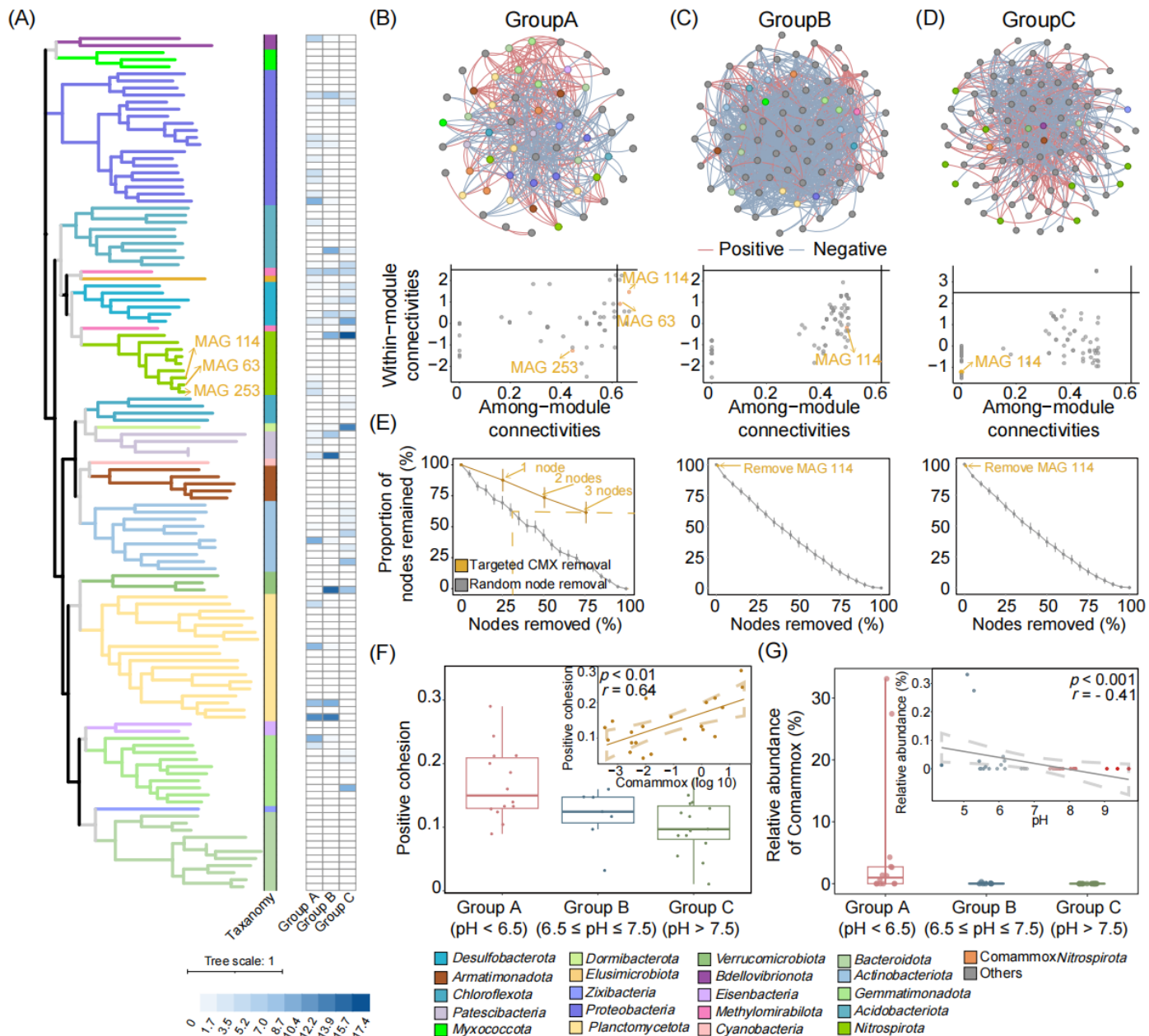


Comammox is the key and core species in weakly acidic soils



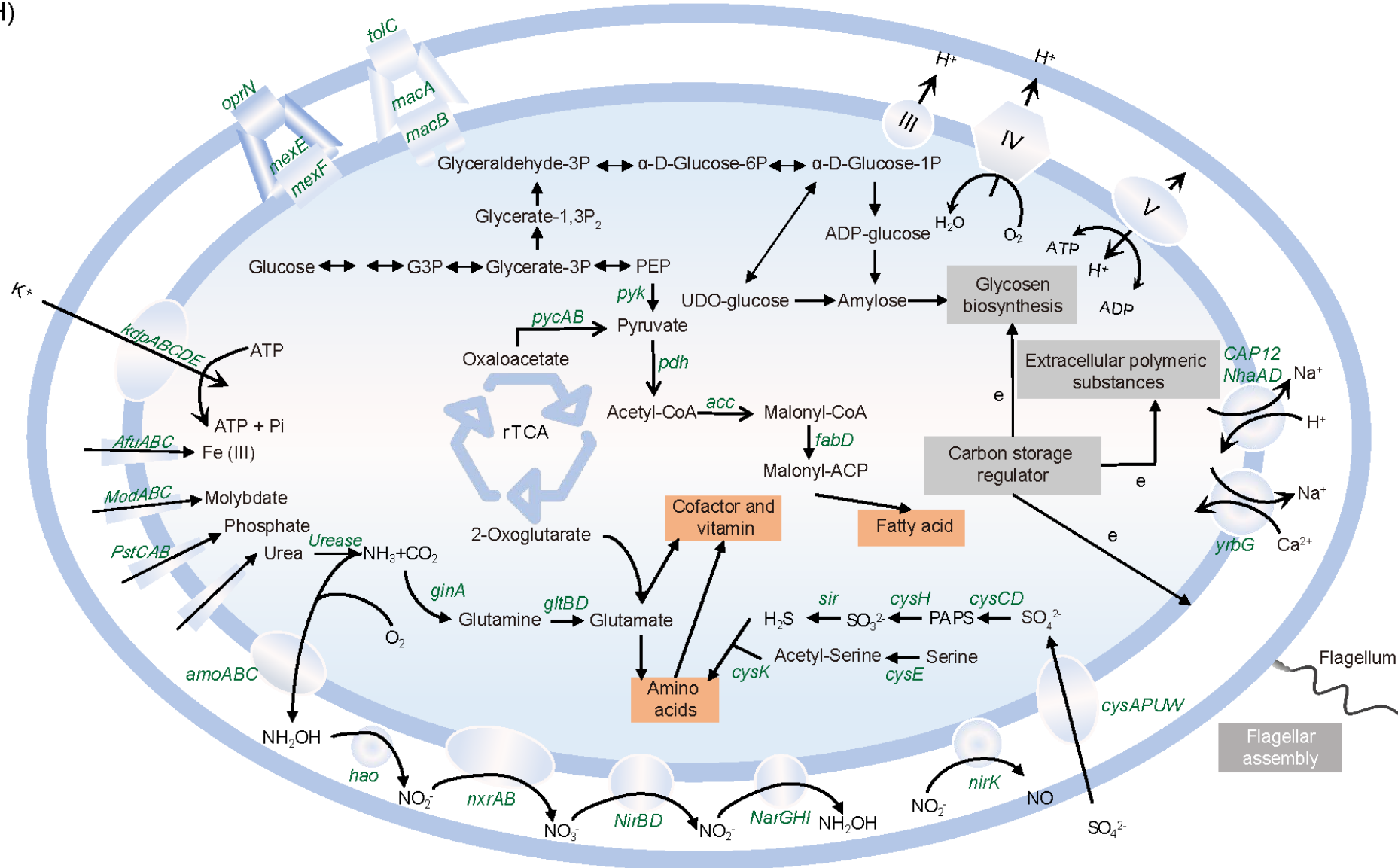


Comammox is the key and core species in weakly acidic soils



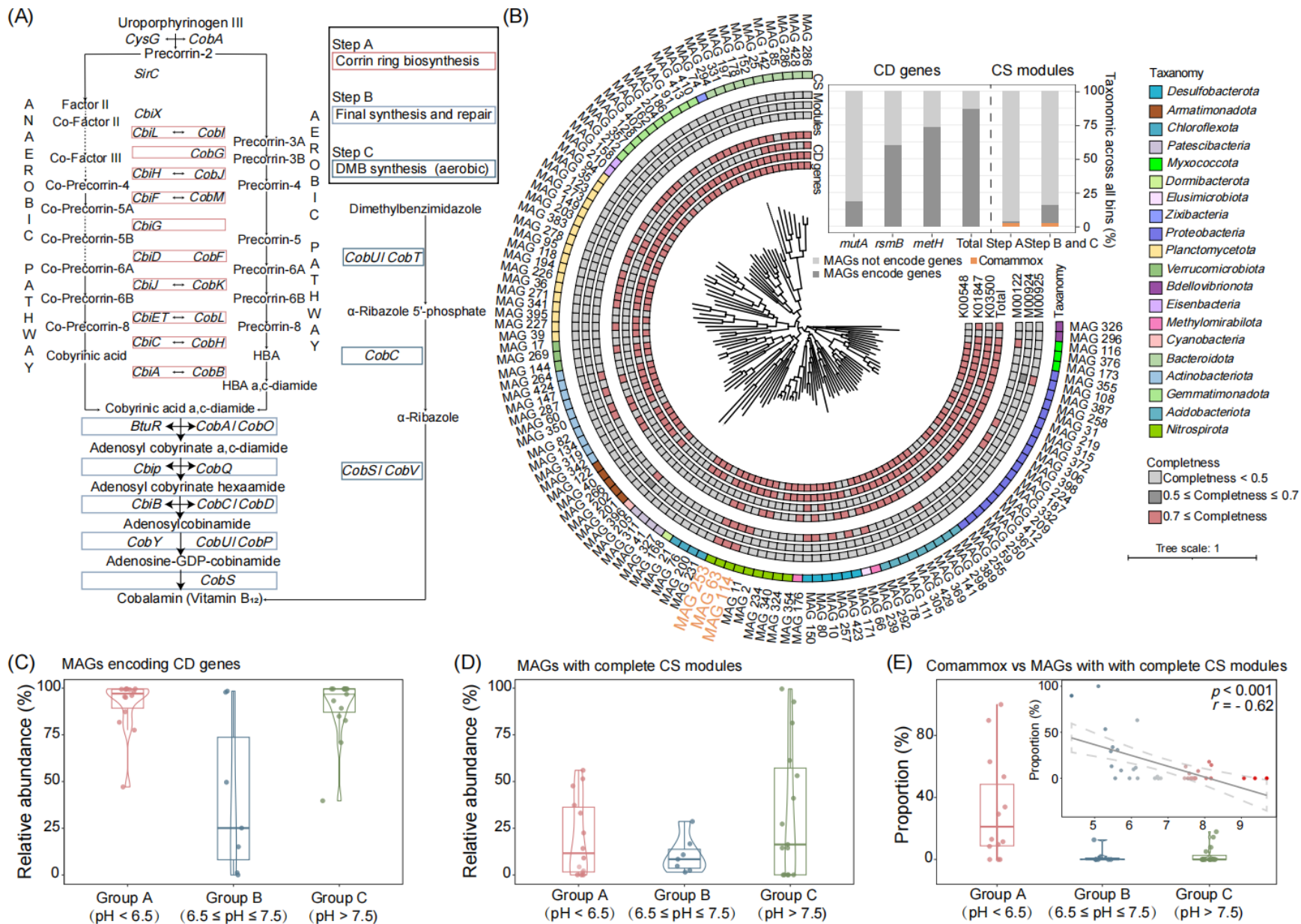
Cell metabolic diagram for soil comammox *Nitrospira*

(H)

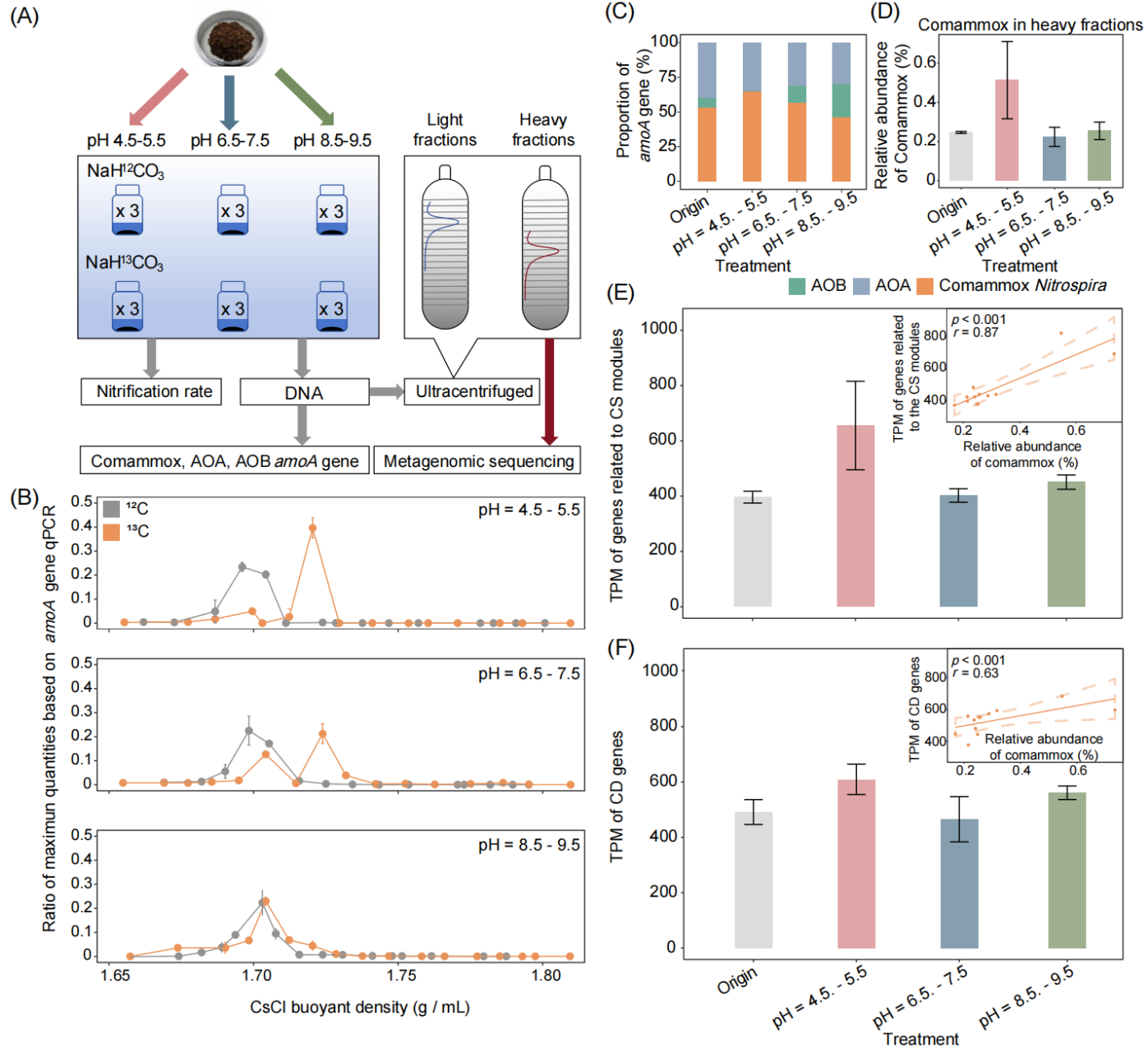




Comammox is a major cobalamin producer in weakly acidic soils



Results of DNA-SIP

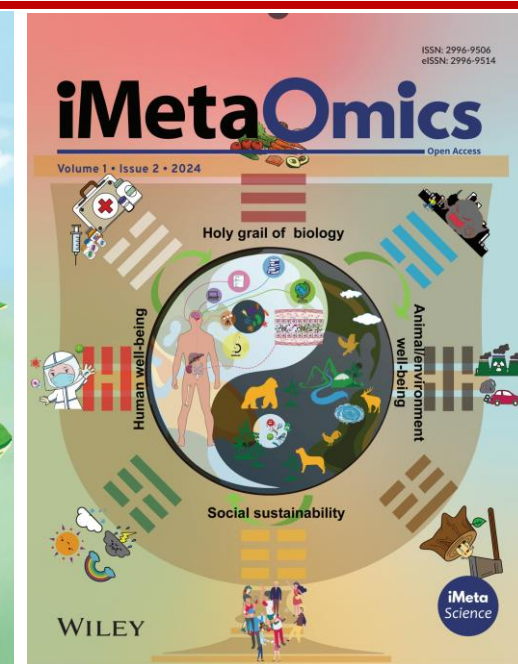
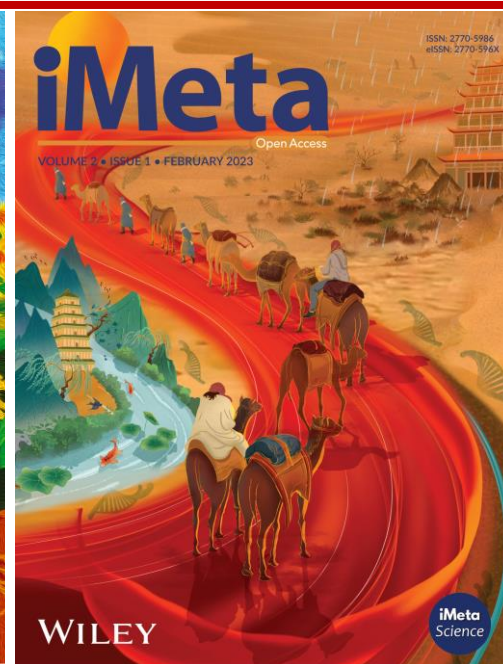




Take home message




- ❑ Comammox *Nitrospira* is the dominant ammonia oxidizers in weakly acidic soils.
- ❑ Comammox *Nitrospira* is the K-strategy species in weakly acidic soils.
- ❑ Comammox *Nitrospira* may promote bacterial cooperation under low pH conditions via cobalamin sharing.

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