

# Convergent Bursts of Amylase Copy Number

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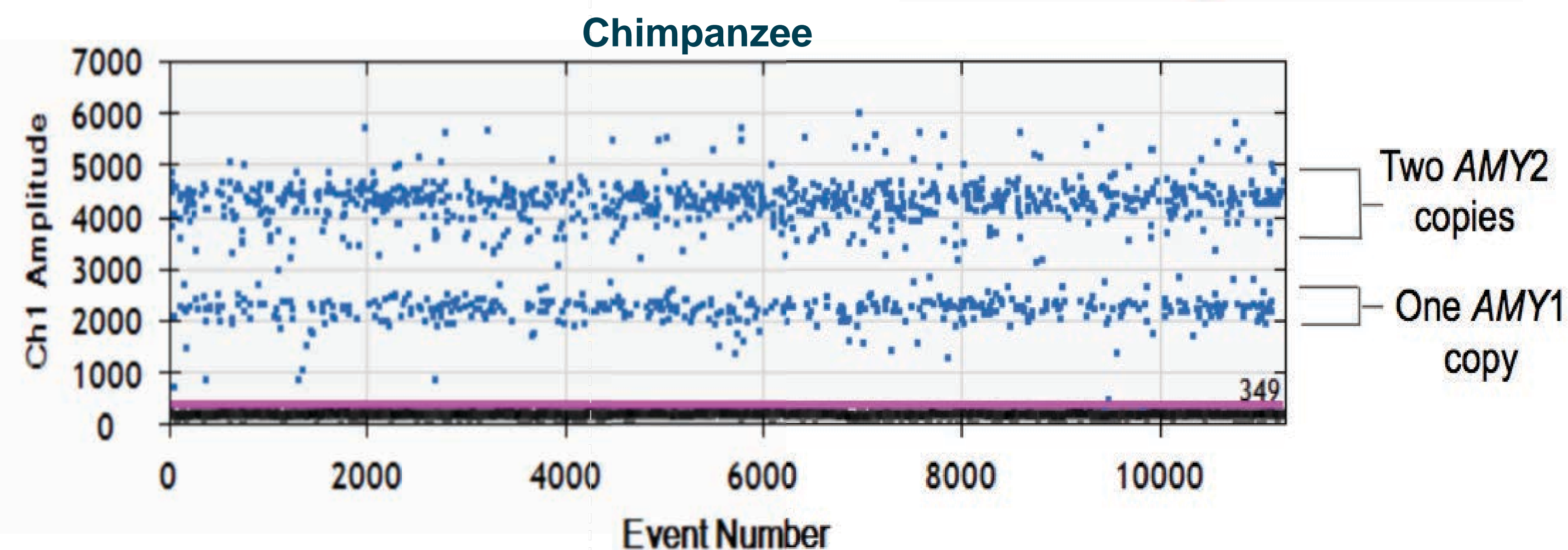


## BACKGROUND

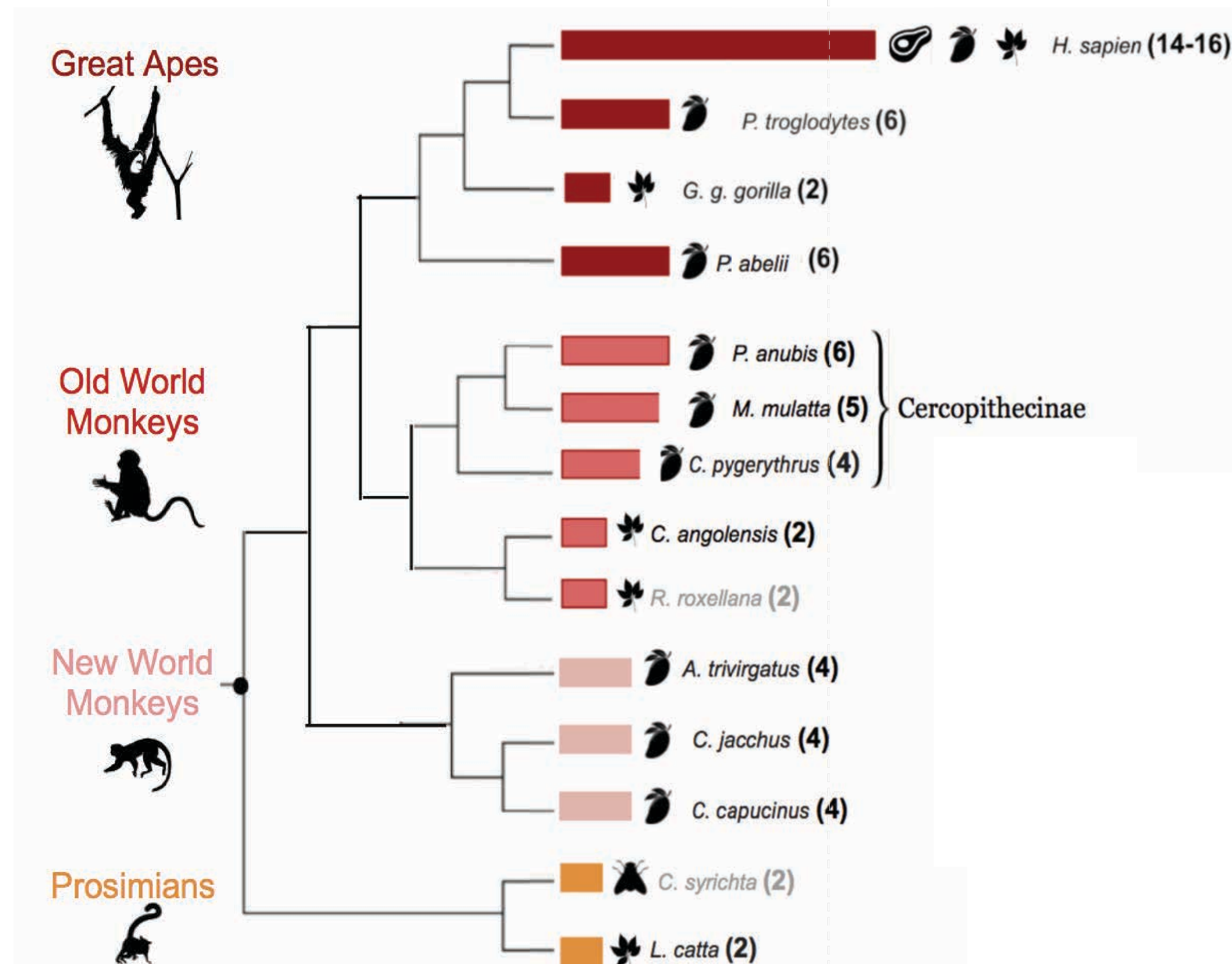
Amylase gene (*AMY*), which encodes the starch-digesting enzyme amylase in the pancreas and in saliva, has been extensively studied within the context of recent adaptive human evolution. Specifically, the copy number of this gene has been shown to adaptively increase in relation to starch consumption in the human lineage. We have expanded this notion and conducted a comprehensive digital PCR-based study of copy number variation of amylase in dozens of mammals.

## METHODS

### Digital Droplet PCR

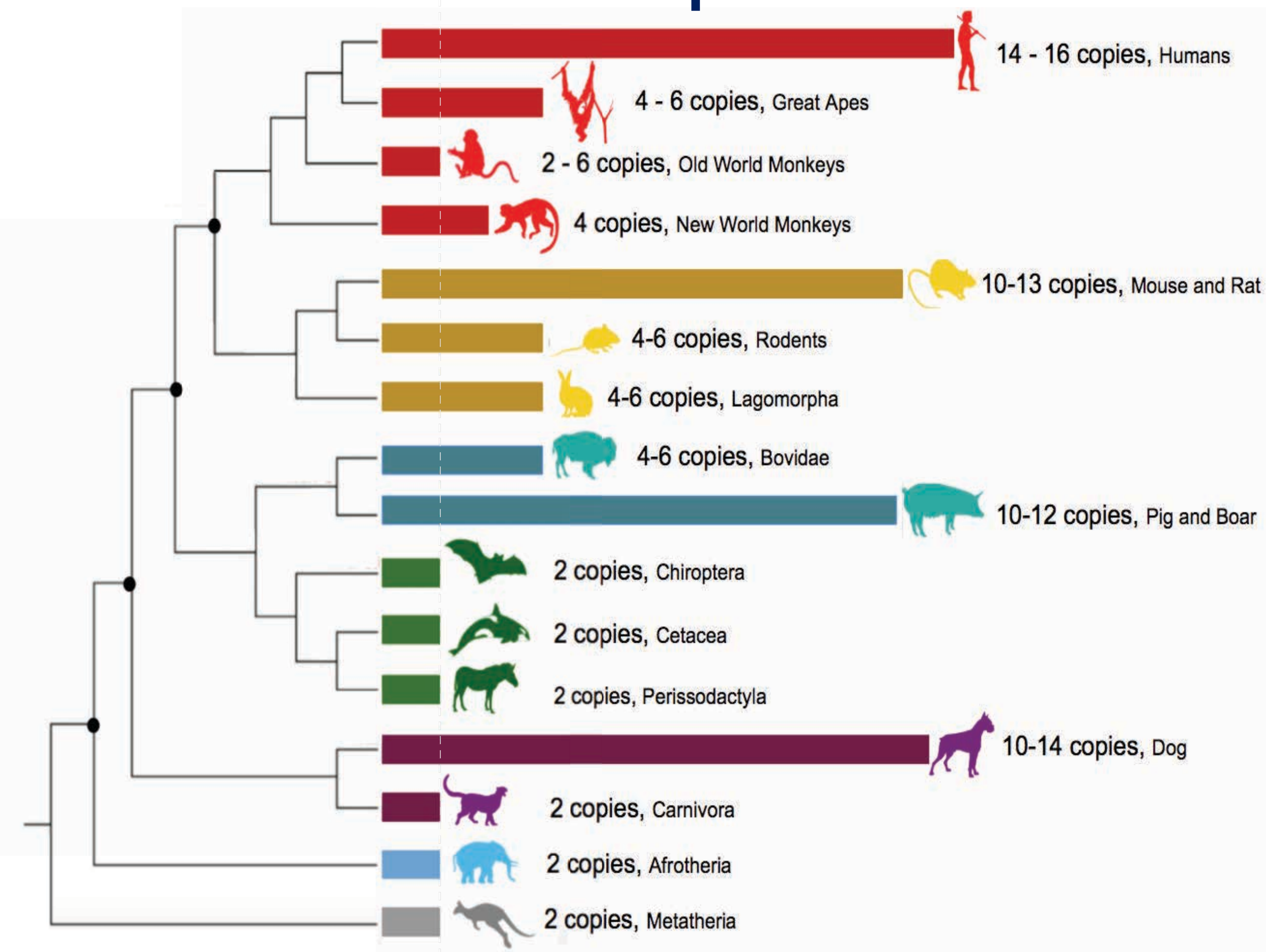


## Primates



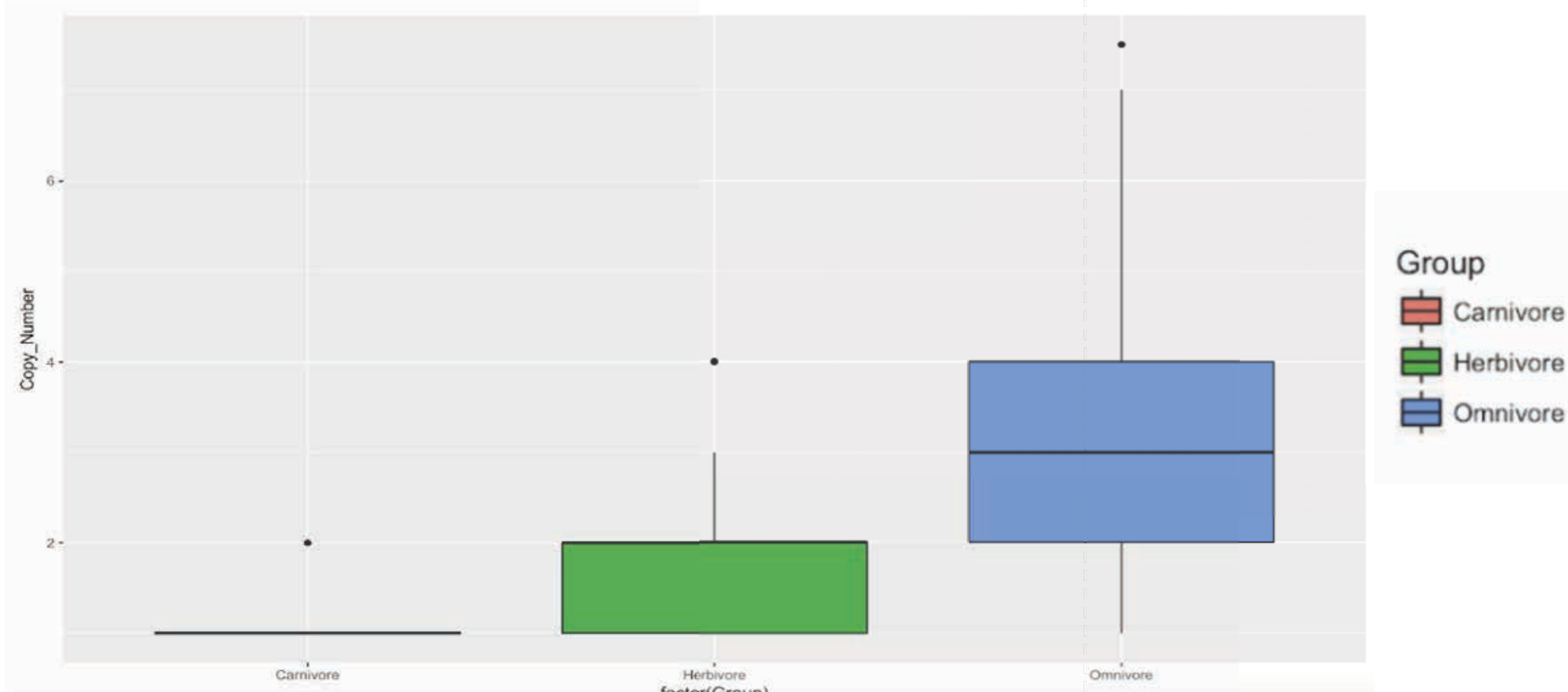
In primates, we find multiple independent and recurrent duplications of amylase.

## Primate and Non-primate Mammals



There are convergent bursts of *AMY* copy number in four different mammalian lineages.

## Starch Levels in Diet



*AMY* copy number is associated with starch levels in mammalian diets.

## CONCLUSION

- Gene duplications have independently happened in at least 4 different lineages.
- This is suggestive of extremely high mutation rates and adaptive retention of *AMY* copy number in mammals.
- The results have implications to understand the evolution of functional sequences in primates.
- The general dietary trends shaped by humans may have impacted the adaptive landscape on human commensal species.