Reproductive status and not parental reproductive strategy differentiate phenotypic and reproductive castes in a termite

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INTRODUCTION

In the termite *Cavitermes tuberosus*, reproductive females develop from two alternative pathways:

Larvae → Nymphs → Alates → Primary queens

Larvae → Female aspirants → Neotenics → Secondary queens

These developmental pathways are related to sexual and asexual (parthenogenetic) reproduction in queens; most female aspirants are from parthenogenetic origin.

We aimed to:

1- characterize termite social structure and female reproductive maturation.

2- investigate whether and how sexual and parthenogenic reproduction affected female expression profile.

METHODS

We assembled the transcriptome of *C. tuberosus* and qualitatively compared the transcriptomic profiles and co-expression clusters of multiple phenotypic and reproductive castes (soldiers, workers, females and males alates, sexual and asexual female aspirants, neotenic queens and primary queens).

Queen maturation is marked by gene expression **downregulation** and **specialization** in **reproductive** genes.

C. tuberosus primary queen (center), king (above queen) and workers (soil-filled guts) © Robert Hanus

C. tuberosus primary king and its harem of secondary queens (neotenics) ©Robert Hanus

Gene expression profile of same caste individuals from **asexual** and **sexual** origins **varies**, but **female reproductive status** global **expression** pattern **is conserved**.

RESULTS