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Trends in Parasitology | Parasite of the Month

Angomonas deanei

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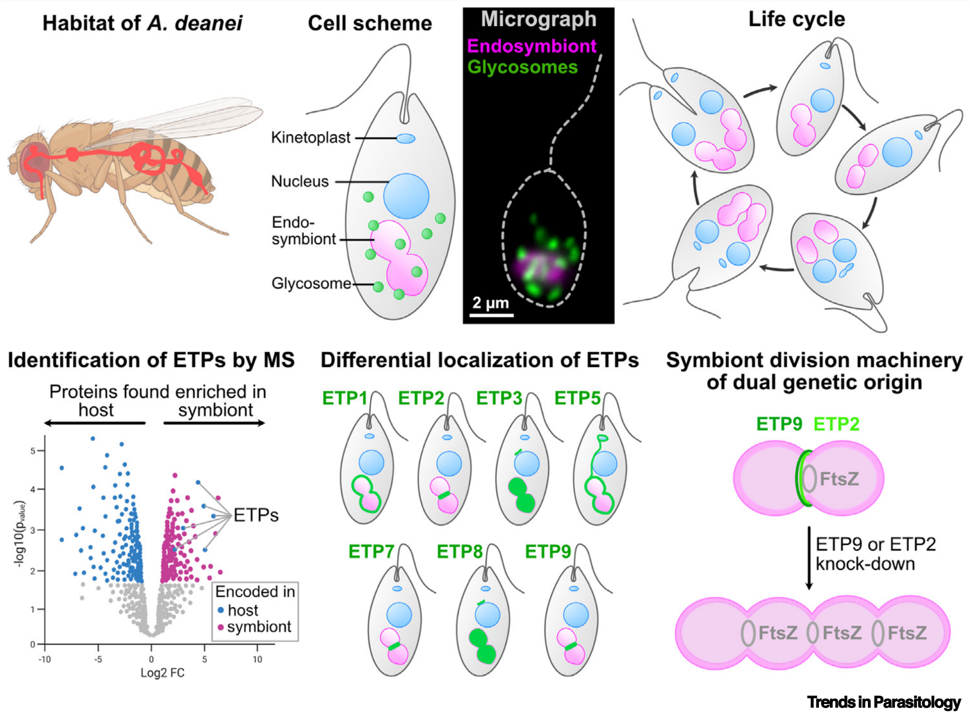
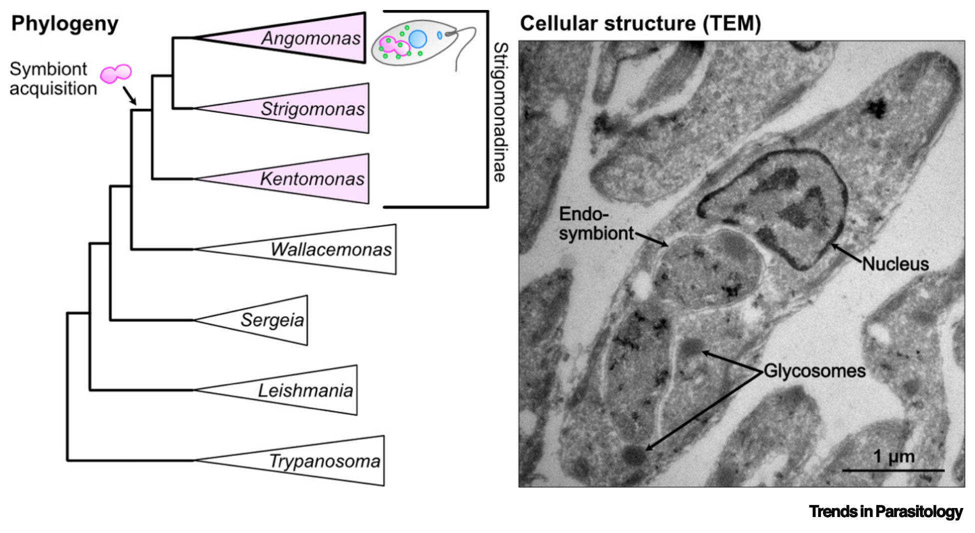


Angomonas deanei is a cosmopolitan species of monoxenous trypanosomatids parasitizing the gut of numerous insects. It harbors a tightly integrated bacterial endosymbiont that complements the metabolism of its osmotrophic host, supplying heme, several amino acids, nucleotides, and vitamins. The endosymbiont is closely associated with host glycosomes that adapted in protein composition, likely to provide the endosymbiont with metabolic intermediates. Remarkably, the single endosymbiont grows and divides in synchrony with its host. This synchronization of cell cycles appears to be enabled by the loss of most of the bacterial division machinery and evolution of a set of endosymbiont-targeted host proteins (ETPs). A dynamin-based machinery composed of ETPs became essential for endosymbiont division and may reflect an early stage of a trajectory converting a bacterium into an organelle. Efficient genetic manipulation makes *A. deanei* a versatile model for studying host/symbiont interaction.



KEY FACTS:

A. deanei harbors a vertically transmitted cytoplasmic β-proteobacterial endosymbiont, *Ca.* Kinetoplastibacterium crithidii (Alcaligenaceae), which is found exclusively in the trypanosomatid subfamily Strigomonadinae and is most closely related to the genus *Taylorella* containing pathogens of horses and donkeys.

The 0.8 Mbp genome of *Ca.* K. crithidii is streamlined to support host metabolism. The endosymbiont associates with host glycosomes – metabolically specialized peroxisomes.

The endosymbiont's division machinery has been largely replaced by a host-derived dynamin-based division system.

The high-quality genome assembly of *A. deanei* contains 10 365 protein-coding genes.

A. deanei became a versatile, genetically tractable model system for studying the molecular mechanisms underpinning host/endosymbiont interaction.

The species has been originally described as *Crithidia deanei* Carvalho, 1973. Another formally described species, *Herpetomonas roitmani* Fiorini, 1989, is indistinguishable from *A. deanei* by molecular analyses.

DISEASE FACTS:

A. deanei is a parasite or commensal of numerous true bug and fly species.

Its life cycle does not include host switching.

TAXONOMY AND CLASSIFICATION:
PHYLUM: Euglenozoa
CLASS: Kinetoplastea
ORDER: Trypanosomatida
FAMILY: Trypanosomatidae
SUBFAMILY: Strigomonadinae
GENUS: *Angomonas*
SPECIES: *A. deanei* Carvalho, 1973 emend. Teixeira et Camargo, 2011

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Declaration of interests

The authors declare no competing interests.

Resources

www.ncbi.nlm.nih.gov/datasets/genome/GCA_903995115.1/
www.ncbi.nlm.nih.gov/datasets/genome/GCF_000340825.1/
https://tritrypdb.org/

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