

Gregarines: parasites, commensals or even mutualists?

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The phylum Apicomplexa is known to contain only obligate parasites, which is probably true for many of the more than 6.000 known species. They infect invertebrates and vertebrates, but no other protists. In contrast, gregarine apicomplexans infect almost exclusively invertebrates. Especially the archigregarines, have been shown in recent phylogenetic studies to be the most ancestral and probably the paraphyletic stemgroup within the apicomplexans. Therefore, they represent an important transition step from closely related free-living photosynthetic (e.g. *Chromera*, *Vitrella*), or predatory (e.g. *Colpodella*) lineages to obligate, intracellular parasites (e.g. *Plasmodium*, *Toxoplasma*). Even though they are always referred to as parasites, it is currently disputed what lifestyle the gregarines actually have due to their unique position within the apicomplexans. Are they really parasites, or maybe rather commensals or even mutualists? We will present 'historic' evidence for the whole range of symbiotic relationships in gregarine apicomplexans. We will propose and discuss the next steps forward for a better understanding of their role in the evolution of parasitism within the apicomplexans.