



## Centromere diversity from a structural and functional perspective

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### Abstract/Resumo

The centromere is the chromosomal site responsible for correct chromosome segregation during mitosis and meiosis in eukaryotic organisms. Although the centromere is generally conserved among distant eukaryotic lineages, recent studies have revealed an unexpected diversity in certain organisms, both structurally and functionally. In kinetoplastids unconventional kinetochores are built using a distinct set of proteins. Holocentric insects and some arachnids lack the CENH3 (and also CENP-C in most cases), so far thought to be an essential protein for centromere identity. Moreover, in *Pisum* and *Lathyrus* species the so-called meta-polycentric chromosomes were found, which are characterized by harboring several centromere domains. In the species *Rhynchospora pubera* was found for the first time a DNA repeat associated with CENH3 in a holocentric organism. *Rhynchospora pubera* has also been characterized by showing a restructuring of its holocentromeres during meiosis in contrast to its close relative *Luzula elegans*. Thus, these recent studies have demonstrated that despite of the general “centromere rules”, some organisms may have alternative ways to build and behave its centromeres.



Keyword/Palavras-chave: Centromere diversity; Chromosome segregation; Repetitive DNA