

Table S1. Telomere repeats in representative species.

Telomere repeat	Representative species	Reference
TSAR		
TTAGGG	<i>Ectocarpus siliculosus</i> (Stramenopiles)	[1] and references herein
TTTAGGG	<i>Phytophthora infestans</i> (Oomycetes)	[1] and references herein
TTTTGGGG	<i>Euplotes aediculatus</i> (Ciliata)	[1] and references herein
TTGGGG	<i>Tetrahymena</i> (Ciliata)	[1] and references herein
TTTGGG	<i>Chilodonella uncinata</i> (Ciliata)	[1] and references herein
TTTTAGGG	<i>Theileria annulata</i> (Apicomplexa)	[1] and references herein
TTTAGG	<i>Cryptosporidium parvum Iowa II</i> (Apicomplexa)	[1] and references herein
TTAGG	<i>Aurantiochytrium limacinum</i> (Stramenopiles)	[1] and references herein
Haptista		
TTAGGG	<i>Emiliana huxleyi</i> (Haptophyta)	[1] and references herein
Cryptista		
TTTAGGG	<i>Guillardia theta</i> (Cryptophyceae)	[1] and references herein
Archaeplastida		
TTTAGGG	<i>Arabidopsis thaliana</i> (Brassicaceae)	[2]
TTAGGG	<i>Asparagus officinalis</i> (Asparagales)	[3]
TTTTAGGG	<i>Chlamydomonas reinhardtii</i> (Chlorophyceae)	[4]
TTTTAGG	<i>Klebsormidium subtilissimum</i> (Charophyta)	[1]
TTCAGG/TTTCAGG	<i>Genlisea hispidula</i> (Lentibulariaceae)	[5]
CTCGGTTATGGG	<i>Allium cepa</i> (Amaryllidaceae)	[6]
AATGGGGGG	<i>Cyanidioschyzon merolae</i> (Rhodophyta)	[7,8]
TTTTTTAGGG	<i>Cestrum elegans</i> (Solanaceae)	[9]

Amorphea

TTAGGG	<i>Homo sapiens</i> (Animalia)	[10]
TTAGG	<i>Bombyx mori</i> (Insects)	[11]
TTAGGC	<i>Ascaris lumbricoides</i> (Nematodes)	[12]
TCAGG	<i>Tribolium castaneum</i> (Anthropoda)	[13]
TTGCA	<i>Parascaris univalens</i> (Nematoda)	[1] and references herein
TGTGGG	<i>Bdelloidea</i> (Rotifera)	[1] and references herein
TAAGGG	<i>Polysphodylium pallidum</i> (Amoebozoa)	[1] and references herein

Discoba

TTAGGG	<i>Andalucia godoyi</i> (Jakobida)	[1] and references herein
--------	------------------------------------	---------------------------

Metamonada

TAGGG	<i>Giardia lamblia</i> (Fornicata)	[1] and references herein
-------	------------------------------------	---------------------------

Malawimonadida

TTAGGG	<i>Malawimonas californiana</i> (Malawimonadida)	[1] and references herein
--------	--	---------------------------

1. Fulnečková, J.; Ševčíková, T.; Fajkus, J.; Lukešová, A.; Lukeš, M.; Vlček, Č.; Lang, B.F.; Kim, E.; Eliáš, M.; Sýkorová, E. A Broad Phylogenetic Survey Unveils the Diversity and Evolution of Telomeres in Eukaryotes. *Genome Biology and Evolution* **2013**, *5*, 468–483, doi:10.1093/gbe/evt019.
2. Richards, E.J.; Ausubel, F.M. Isolation of a higher eukaryotic telomere from *Arabidopsis thaliana*. *Cell* **1988**, *53*, 127–136, doi:10.1016/0092-8674(88)90494-1.
3. Sýkorová, E.; Lim, K.Y.; Kunická, Z.; Chase, M.W.; Bennett, M.D.; Fajkus, J.; Leitch, A.R. Telomere variability in the monocotyledonous plant order Asparagales. *Proc. R. Soc. Lond. B* **2003**, *270*, 1893–1904, doi:10.1098/rspb.2003.2446.
4. Petracek, M.E.; Lefebvre, P.A.; Silflow, C.D.; Berman, J. Chlamydomonas telomere sequences are A+T-rich but contain three consecutive G-C base pairs. *Proceedings of the National Academy of Sciences* **1990**, *87*, 8222–8226, doi:10.1073/pnas.87.21.8222.

5. Tran, T.D.; Cao, H.X.; Jovtchev, G.; Neumann, P.; Novák, P.; Fojtová, M.; Vu, G.T.H.; Macas, J.; Fajkus, J.; Schubert, I.; et al. Centromere and telomere sequence alterations reflect the rapid genome evolution within the carnivorous plant genus *Genlisea*. *Plant J* **2015**, *84*, 1087–1099, doi:10.1111/tpj.13058.
6. Fajkus, P.; Peška, V.; Sitová, Z.; Fulnečková, J.; Dvořáčková, M.; Gogela, R.; Sýkorová, E.; Hapala, J.; Fajkus, J. *Allium* telomeres unmasked: the unusual telomeric sequence (CTCGGTTATGGG)_n is synthesized by telomerase. *Plant J* **2016**, *85*, 337–347, doi:10.1111/tpj.13115.
7. Fulnečková, J.; Hasíková, T.; Fajkus, J.; Lukešová, A.; Eliáš, M.; Sýkorová, E. Dynamic Evolution of Telomeric Sequences in the Green Algal Order Chlamydomonadales. *Genome Biology and Evolution* **2012**, *4*, 248–264, doi:10.1093/gbe/evs007.
8. Matsuzaki, M.; Misumi, O.; Shin-i, T.; Maruyama, S.; Takahara, M.; Miyagishima, S.; Mori, T.; Nishida, K.; Yagisawa, F.; Nishida, K.; et al. Genome sequence of the ultrasmall unicellular red alga *Cyanidioschyzon merolae* 10D. *Nature* **2004**, *428*, 653–657, doi:10.1038/nature02398.
9. Peška, V.; Fajkus, P.; Fojtová, M.; Dvořáčková, M.; Hapala, J.; Dvořáček, V.; Polanská, P.; Leitch, A.R.; Sýkorová, E.; Fajkus, J. Characterisation of an unusual telomere motif (TTTTTTAGGG)_n in the plant *Cestrum elegans* (Solanaceae), a species with a large genome. *Plant J* **2015**, *82*, 644–654, doi:10.1111/tpj.12839.
10. Moyzis, Robert K The Human Telomere. **1991**, *265*, 48–57.
11. Sahara, K.; Marec, F.; Traut, W. TTAGG Telomeric Repeats in Chromosomes of Some Insects and Other Arthropods. *Chromosome Research* **1999**, *7*, 449–460, doi:10.1023/A:1009297729547.
12. Müller, F.; Wicky, C.; Spicher, A.; Tobler, H. New telomere formation after developmentally regulated chromosomal breakage during the process of chromatin diminution in *ascaris lumbricoides*. *Cell* **1991**, *67*, 815–822, doi:10.1016/0092-8674(91)90076-B.
13. Mravinac, B.; Meštrović, N.; Čavrak, V.V.; Plohl, M. TCAGG, an alternative telomeric sequence in insects. *Chromosoma* **2011**, *120*, 367–376, doi:10.1007/s00412-011-0317-x.