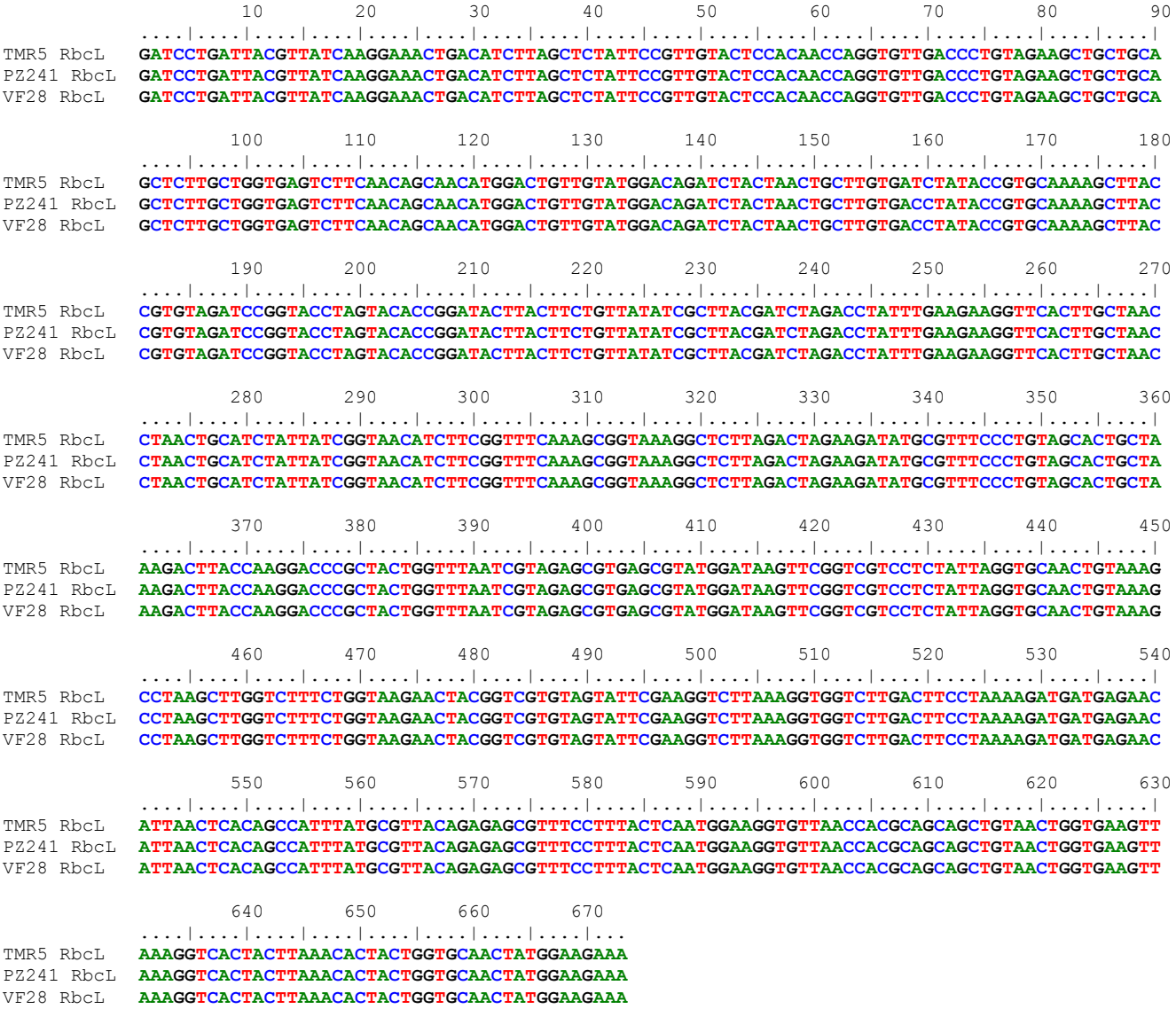
2014

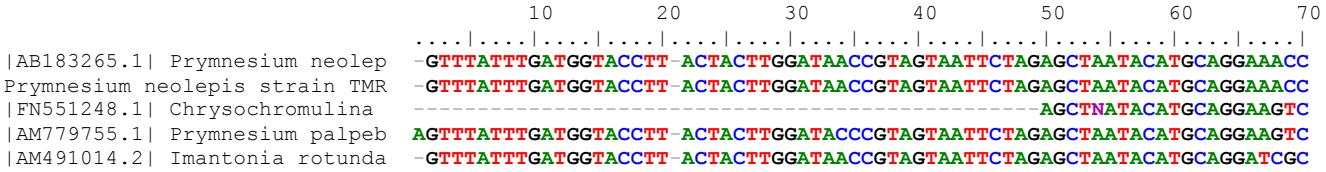
CELLULAR AND MOLECULAR MECHANISMS OF BIOMINERALISATION IN A SILICIFYING HAPTOPHYTE PRYMNESIUM NEOLEPIS

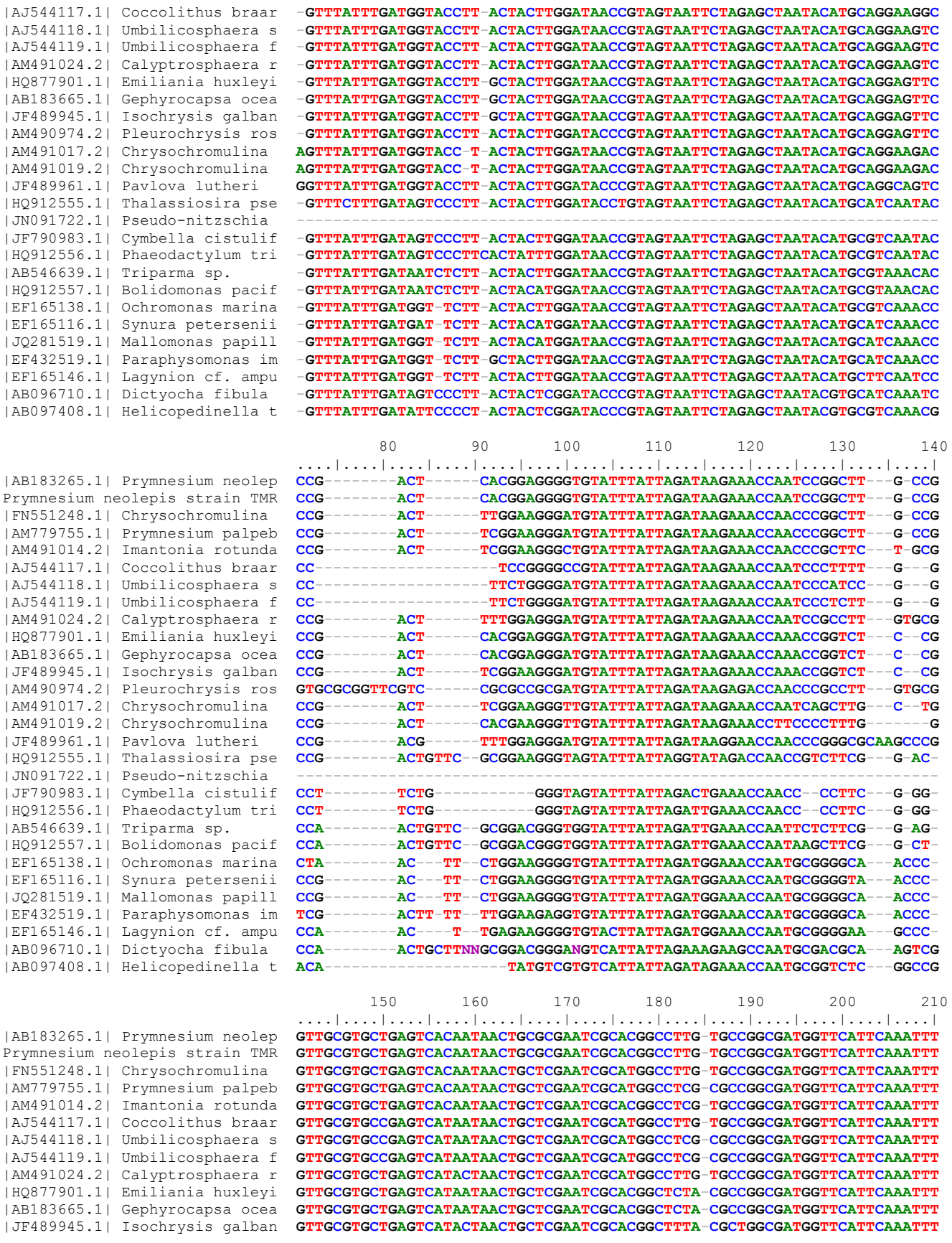
Durak, Grazyna

1. *rbc*L alignment of three strains of *P. neolepis*: TMR5, PZ241, VF28.



2. SSU alignment

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|AB546639.1| Triparma sp.
|HQ912557.1| Bolidomonas pacif
|EF165138.1| Ochromonas marina
|EF165116.1| Synura petersenii
|JQ281519.1| Mallomonas papill
|EF432519.1| Paraphysomonas im
|EF165146.1| Lagynion cf. ampu
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|AB097408.1| Helicopedinella t
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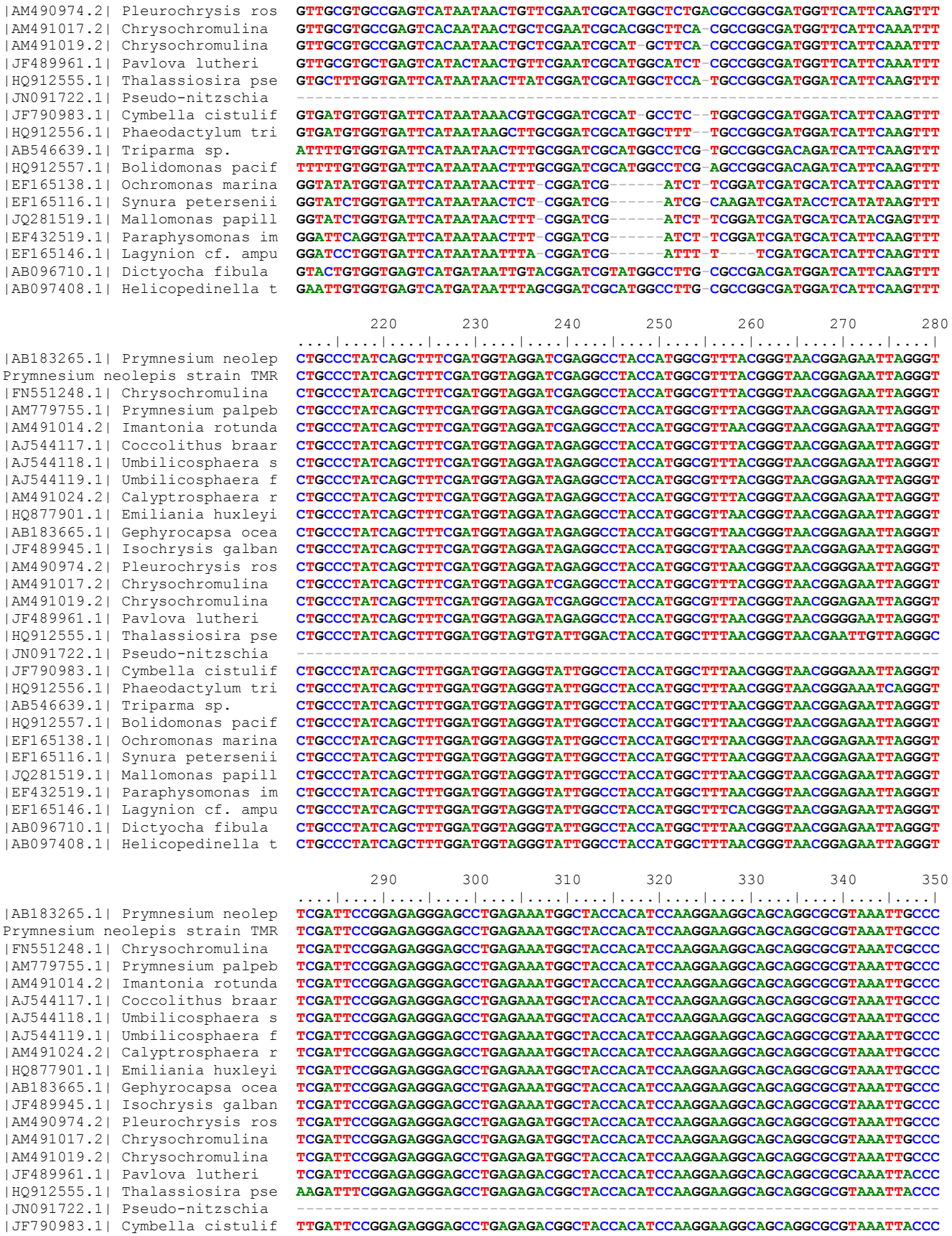
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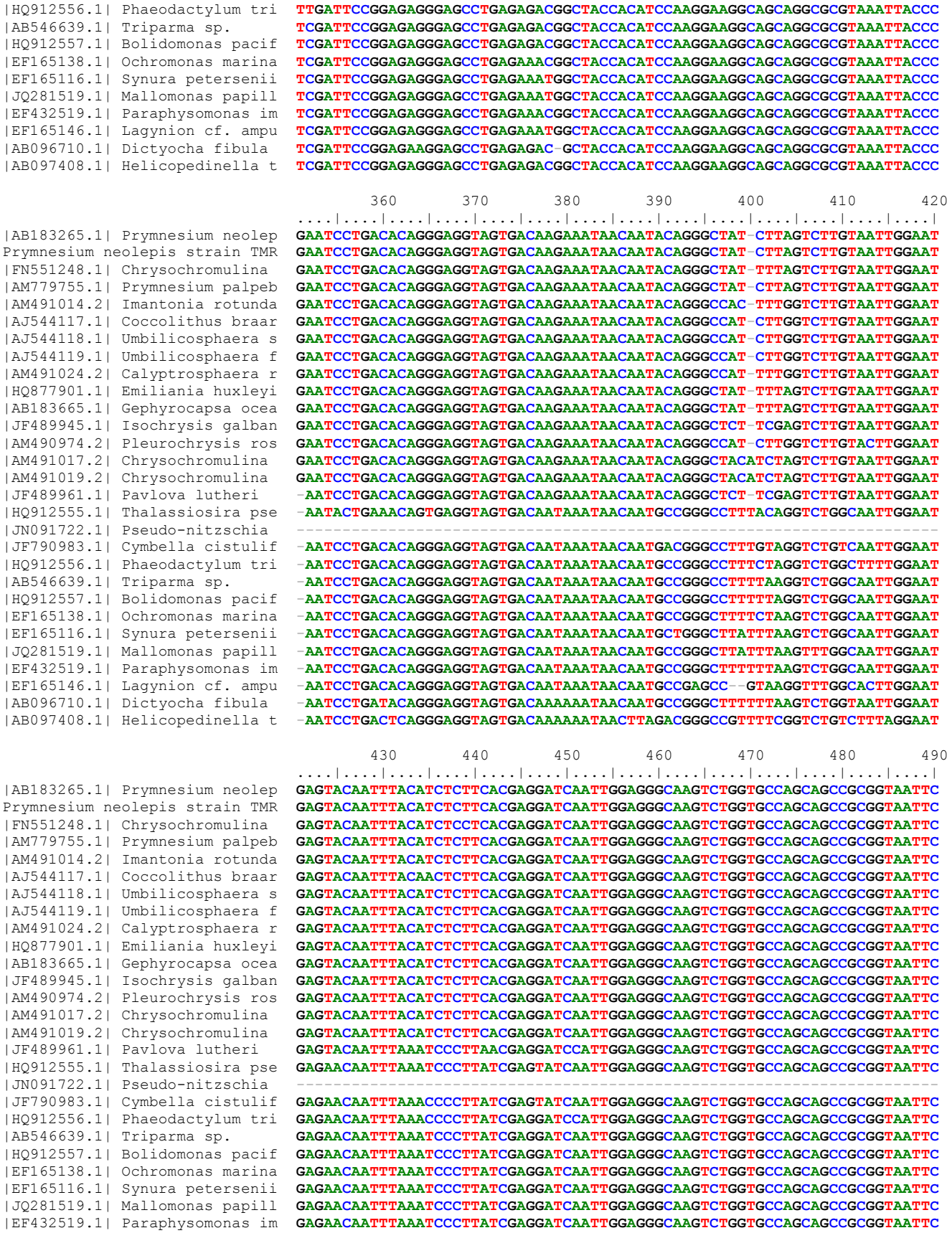
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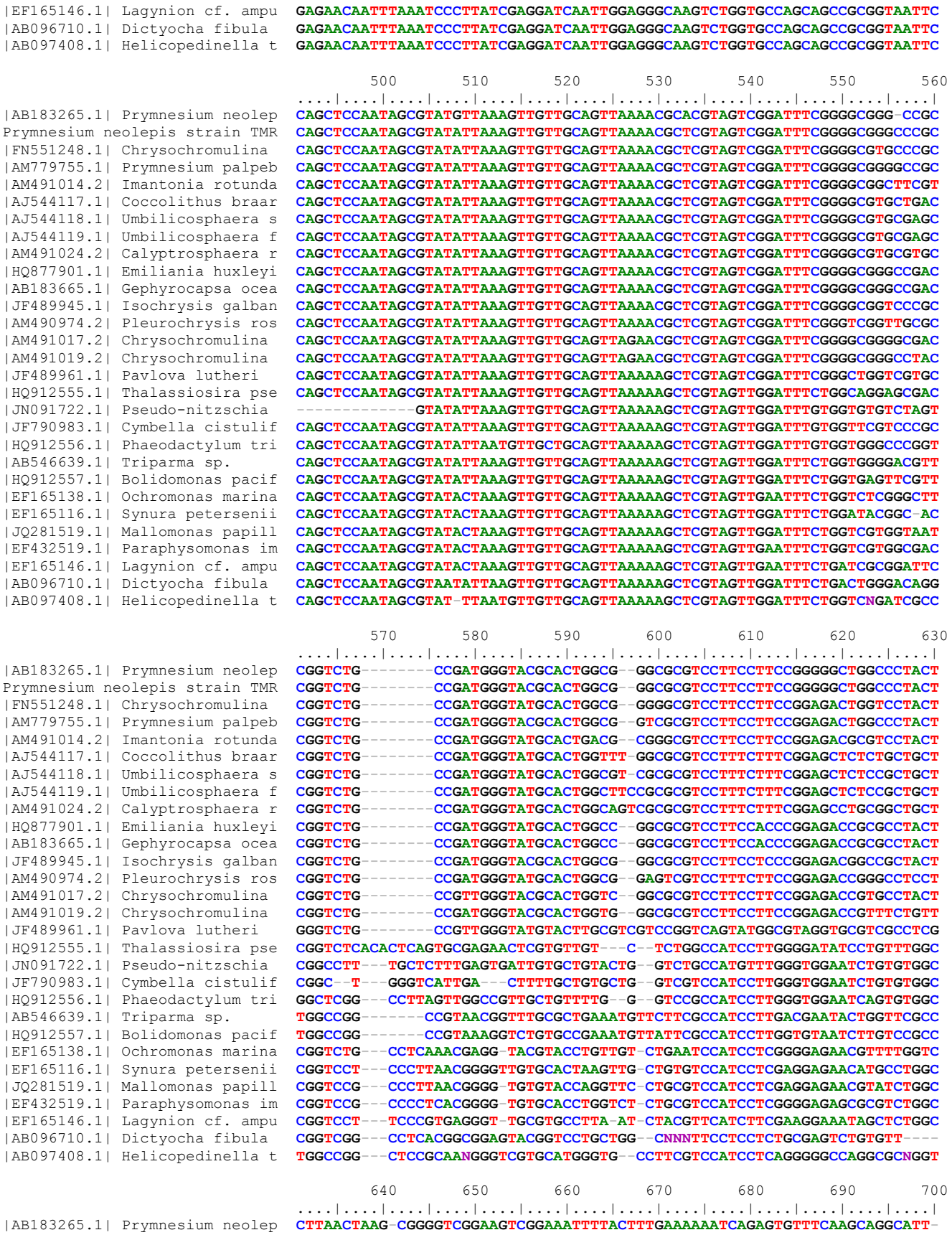
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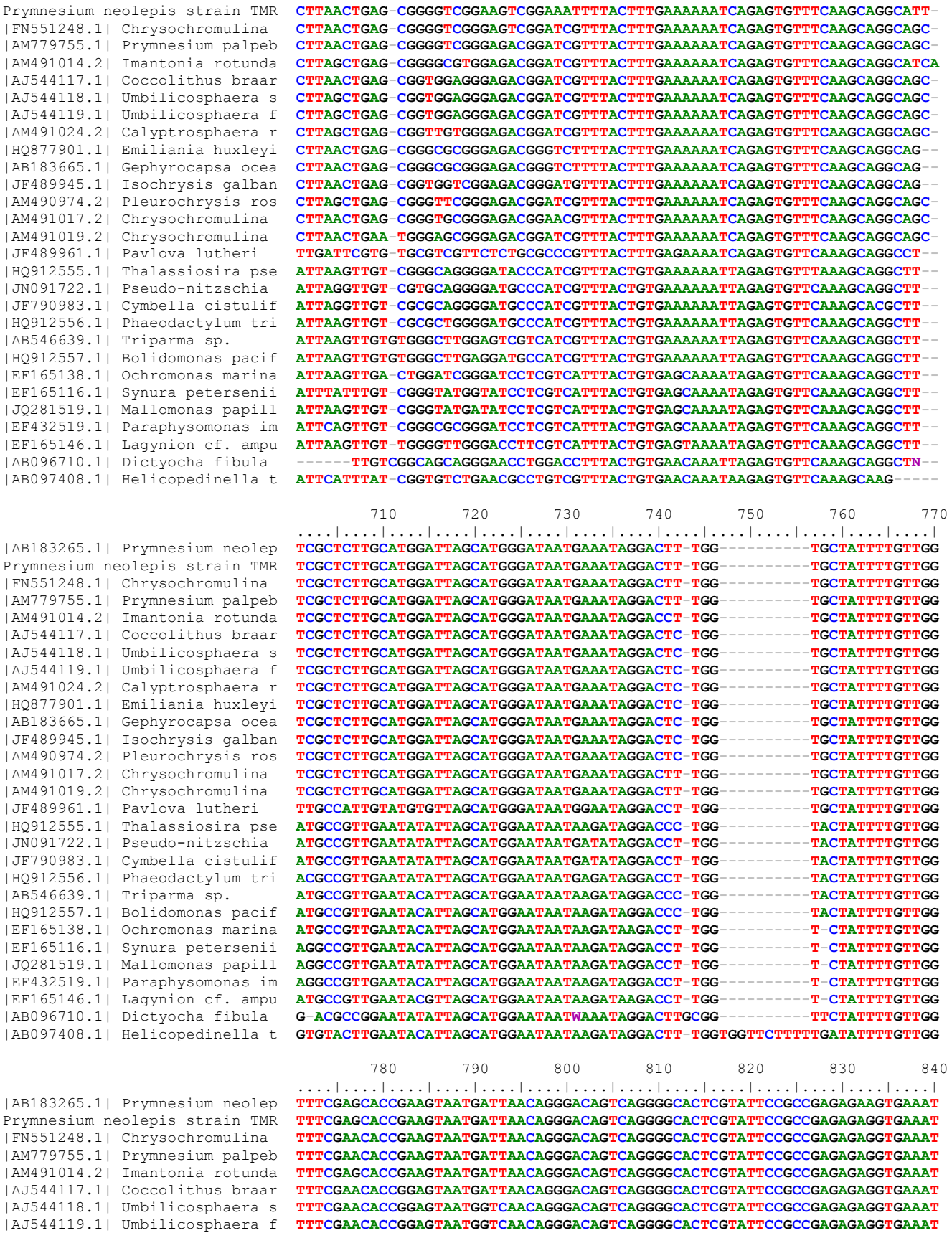
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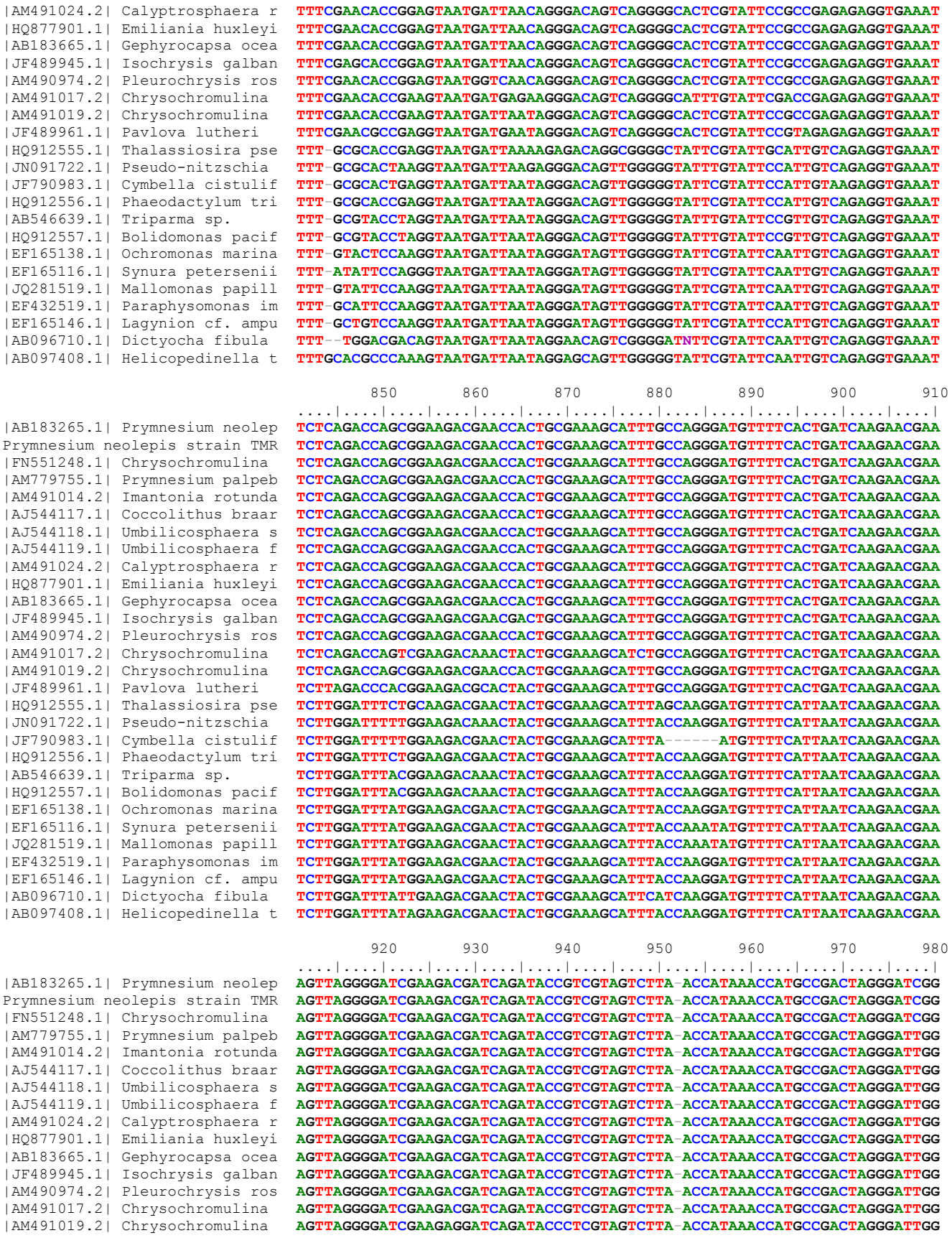
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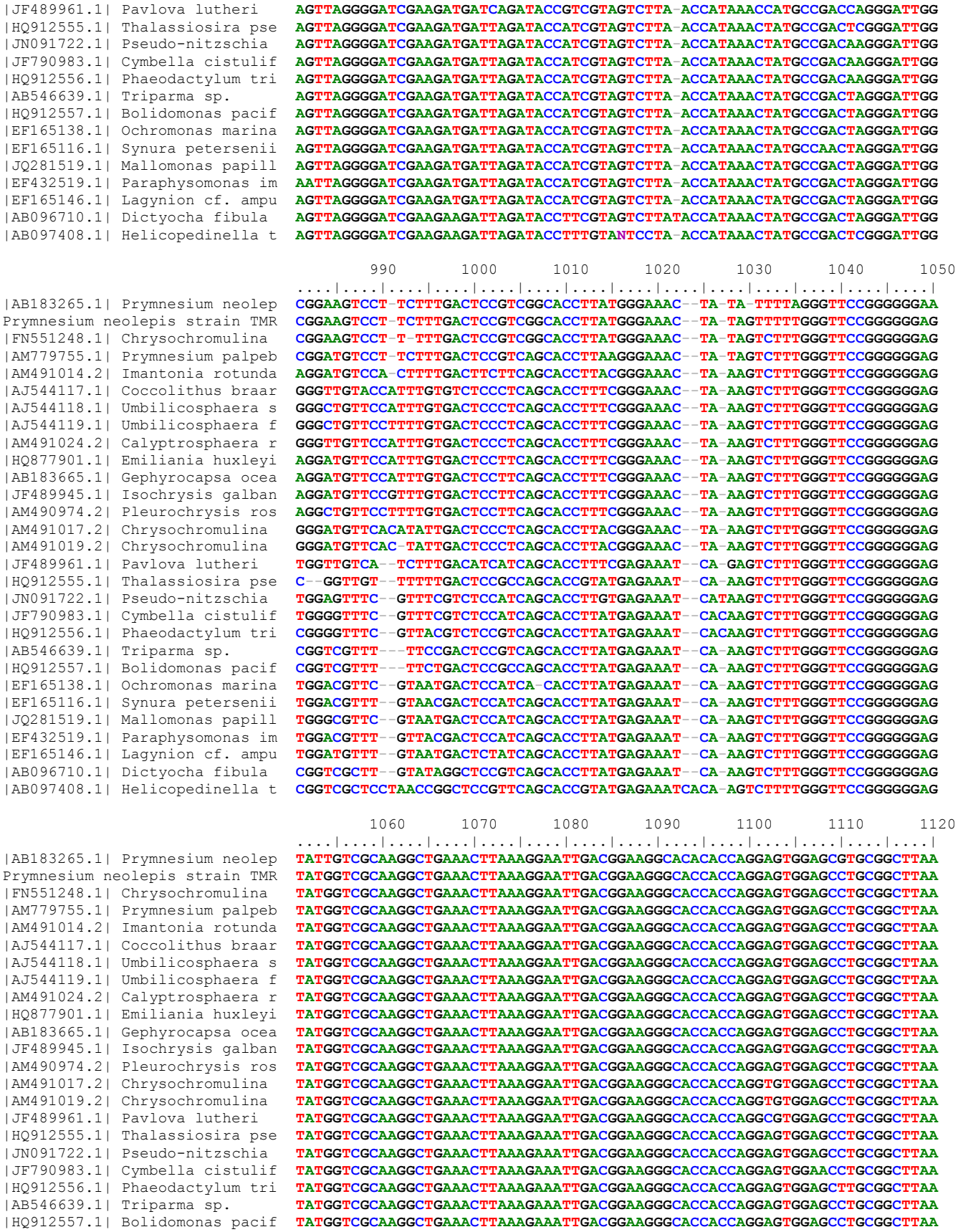
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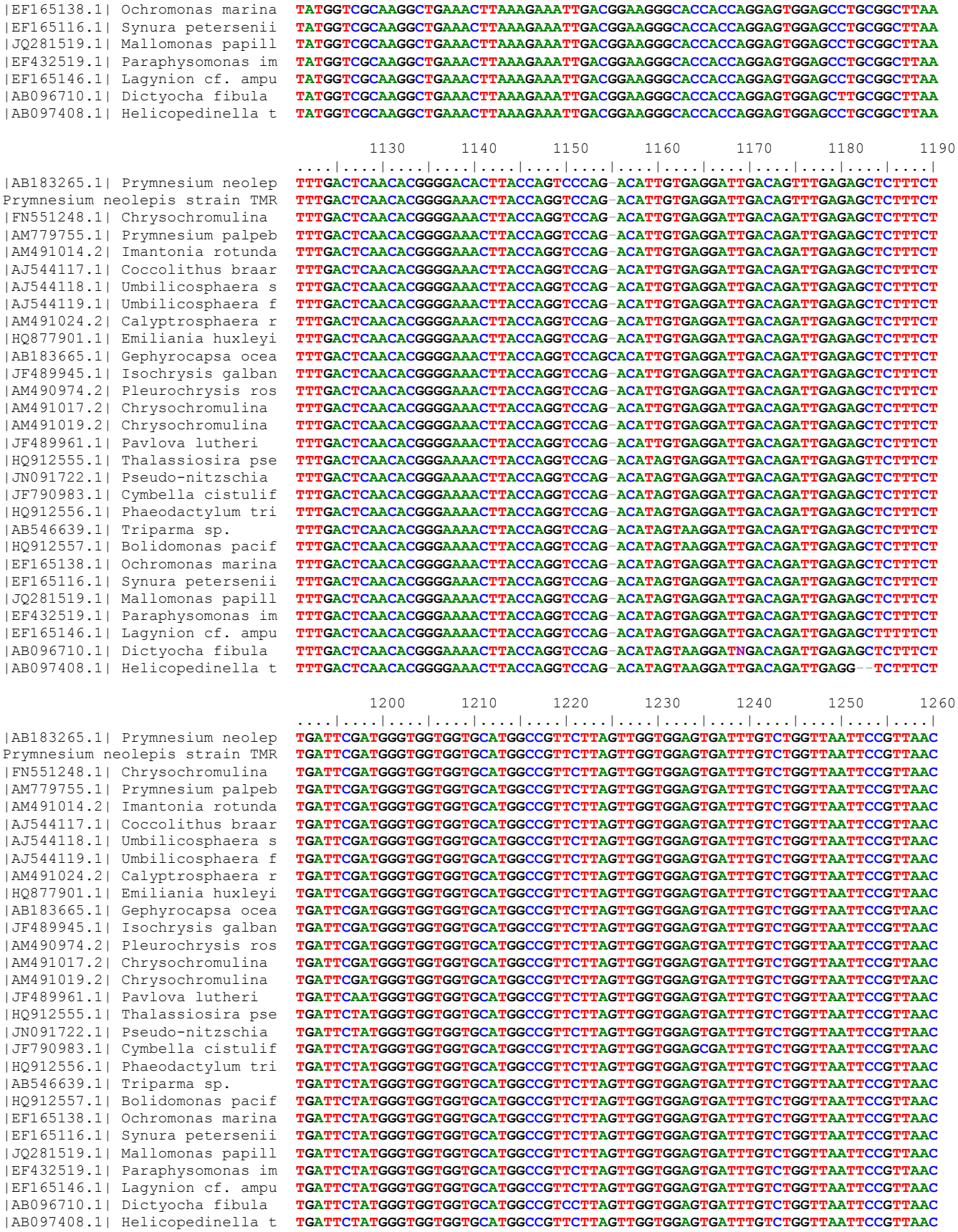
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Prymnesium neolepis strain TMR TTTGACTCAACACGGGGAAACTTACCAGGTCCAG-ACATTGTGAGGATTGACAGTTTGAGAGCTCTTTCT
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|AJ544119.1| Umbilicosphaera f TTTGACTCAACACGGGGAAACTTACCAGGTCCAG-ACATTGTGAGGATTGACAGATTGAGAGCTCTTTCT
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|JQ281519.1| Mallomonas papill TTTGACTCAACACGGGAAAACTTACCAGGTCCAG-ACATAGTGAGGATTGACAGATTGAGAGCTCTTTCT
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|AM779755.1| Prymnesium palpeb  GACAACTT-GTCTTCAACAAGTGGAAGTTTGAGGCAATAACAGGTCTGTGATGCCCTTAGATGTTCTGGG
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|AB096710.1| Dictyocha fibula   GACTTTCG-GCGACTAGCCGAAGGAAGTTGGGGGCAATAACAGGTCTGTGATGCCCTTAGATGTCCTGGG
|AB097408.1| Helicopedinella t  GACTGTGT-GAGACTATCACACGGAAGTTGGGGGCAATAACNGGTCTGTGATGCCCTTAGATGTCCTGGG

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|FN551248.1| Chrysochromulina   CCGCACGCGCGCTACACTGATGCACTCAACGAGTCTC------GCTCGACCGAGAGGTCCGGCAAACCTT
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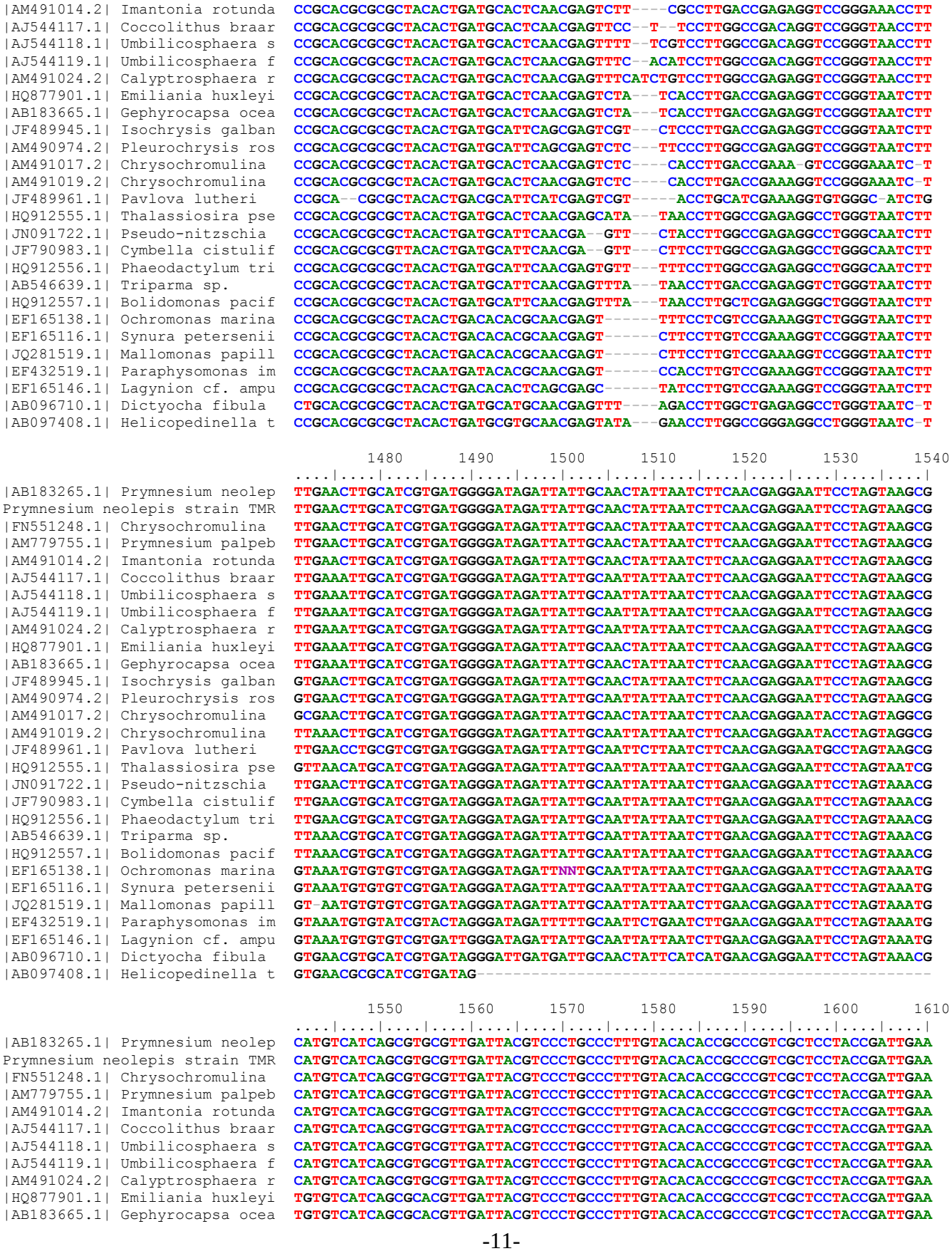
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|JF489945.1| Isochrysis galban
|AM490974.2| Pleurochrysis ros
|AM491017.2| Chrysochromulina
|AM491019.2| Chrysochromulina
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|JN091722.1| Pseudo-nitzschia
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|EF165138.1| Ochromonas marina
|EF165116.1| Synura petersenii
|JQ281519.1| Mallomonas papill
|EF432519.1| Paraphysomonas im
|EF165146.1| Lagynion cf. ampu
|AB096710.1| Dictyocha fibula
|AB097408.1| Helicopedinella t
1480
1490
1500
1510
1520
1530
1540
|AB183265.1| Prymnesium neolep
Prymnesium neolepis strain TMR
|FN551248.1| Chrysochromulina
|AM779755.1| Prymnesium palpeb
|AM491014.2| Imantonia rotunda
|AJ544117.1| Coccolithus braar
|AJ544118.1| Umbilicosphaera s
|AJ544119.1| Umbilicosphaera f
|AM491024.2| Calyptrosphaera r
|HQ877901.1| Emiliania huxleyi
|AB183665.1| Gephyrocapsa ocea
|JF489945.1| Isochrysis galban
|AM490974.2| Pleurochrysis ros
|AM491017.2| Chrysochromulina
|AM491019.2| Chrysochromulina
|JF489961.1| Pavlova lutheri
|HQ912555.1| Thalassiosira pse
|JN091722.1| Pseudo-nitzschia
|JF790983.1| Cymbella cistulif
|HQ912556.1| Phaeodactylum tri
|AB546639.1| Triparma sp.
|HQ912557.1| Bolidomonas pacif
|EF165138.1| Ochromonas marina
|EF165116.1| Synura petersenii
|JQ281519.1| Mallomonas papill
|EF432519.1| Paraphysomonas im
|EF165146.1| Lagynion cf. ampu
|AB096710.1| Dictyocha fibula
|AB097408.1| Helicopedinella t
1550
1560
1570
1580
1590
1600
1610
|AB183265.1| Prymnesium neolep
Prymnesium neolepis strain TMR
|FN551248.1| Chrysochromulina
|AM779755.1| Prymnesium palpeb
|AM491014.2| Imantonia rotunda
|AJ544117.1| Coccolithus braar
|AJ544118.1| Umbilicosphaera s
|AJ544119.1| Umbilicosphaera f
|AM491024.2| Calyptrosphaera r
|HQ877901.1| Emiliania huxleyi
|AB183665.1| Gephyrocapsa ocea

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|JF489945.1| Isochrysis galban  TGTGTCATCAGCGCACGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCTCCTACCGATTGAA
|AM490974.2| Pleurochrysis ros  CATGTCATCAGCGTGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCTCCTACCGATTGAA
|AM491017.2| Chrysochromulina   CATGTCATCAGCGTGCGTCGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCTCCTACCGATTGAA
|AM491019.2| Chrysochromulina   CATGTCATCAGCGTGCGTCGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCTCCTACCGATTGAA
|JF489961.1| Pavlova lutheri    TGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCTCCTACCGATTGGA
|HQ912555.1| Thalassiosira pse  CAGATCATCAATCTGCAATGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGGA
|JN091722.1| Pseudo-nitzschia   CAGATCATCAATCTGCATTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|JF790983.1| Cymbella cistulif  CAGTTCATCAAACTGCATTGGTTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|HQ912556.1| Phaeodactylum tri  CAGATCATCAATCTGCATTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGGA
|AB546639.1| Triparma sp.       CAGTTCATCAGACTGCATTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|HQ912557.1| Bolidomonas pacif  CAGTTCATCAGACTGCATTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|EF165138.1| Ochromonas marina  CGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|EF165116.1| Synura petersenii  CGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|JQ281519.1| Mallomonas papill  CGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|EF432519.1| Paraphysomonas im  CGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|EF165146.1| Lagynion cf. ampu  CGAGTCATCAGCTCGCGTTGATTACGTCCCTGCCCTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|AB096710.1| Dictyocha fibula   TGAGTCATCAGCTCACATTGATTACGTCCCTGCCTTTTGTACACACCGCCCGTCGCACCTACCGATTGAA
|AB097408.1| Helicopedinella t  ------------------------------------------------------------------------

                                        1620      1630      1640      1650      1660      1670      1680
                                        ....|....|....|....|....|....|....|....|....|....|....|....|....|
|AB183265.1| Prymnesium neolep  TGATCCGGTGAGGCCCCCGGACTGTGGCAATGCAGGTGGTTCGCCATCCGCGATGCCGCGGGAAGCTGTC
Prymnesium neolepis strain TMR  TGATCCGGTGAGGCCCCCGGACTGTGGCAATGCAGGTGGTTCGCCATCCGCGATGCCGCGGGAAGCTGTC
|FN551248.1| Chrysochromulina   TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCGCCAGCCGCGATGCCGCGGGAAGCTGTC
|AM779755.1| Prymnesium palpeb  TGATCCGGTGAGGCCCTTGGATTGTGGCAACGCAGCTGGTTCGCCAGCCGCGATGCCGCGAGAAGCTGTC
|AM491014.2| Imantonia rotunda  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCGCCAGCCGCGATGCCGCGGGAAGCTGTC
|AJ544117.1| Coccolithus braar  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCTCCAGCCGTGATGCCGCGGGAAGCTGTC
|AJ544118.1| Umbilicosphaera s  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCTCCAGCCGCGATGCCGCGGGAAGCTGTC
|AJ544119.1| Umbilicosphaera f  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCTCCAGCCGCGATGCCGCGGGAAGCTGTC
|AM491024.2| Calyptrosphaera r  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGCAGCTGGTTCTCCAGCCGTGATGCCGCGGGAAGCTGTC
|HQ877901.1| Emiliania huxleyi  TGATCCGGTGAGGCCCCCGGACTGCGGCGCCGCAGCTGGTTCTCCAGTCGCGACGCCGCGGGAAGCTGTC
|AB183665.1| Gephyrocapsa ocea  TGATCCGGTGAGGCCCCCGGACTGCGGCGCCGCAGCTGGTTCTCCAGCCGCGACGCCGCGGGAAGCTGTC
|JF489945.1| Isochrysis galban  TGATCCGGTGAGGCCCCCGGACTGCGGCGCCGCCGCTGGTTCTCCAGCGCTGGCGTCGCGGGAAGCTGTC
|AM490974.2| Pleurochrysis ros  TGATCCGGTGAGGCCCCCGGACTGTGGCAACGTGGCTGGTGTTCCAGCCGCGATGCCGCGGGAAGTTGTC
|AM491017.2| Chrysochromulina   TAATCCGGTGAGTTTTTTGGACCCTGGCAACGGCTTTGGTTCGCCAAAC-TGATGCTGGGGGAAGATACG
|AM491019.2| Chrysochromulina   TGATCCGGTGAGGCCCCCGGAATGGAGTCACTGC-GCGGTTTTCCGCAA-TGAGATTCTGTGAAGCTGTC
|JF489961.1| Pavlova lutheri    TGGTCCGGTGAGGTTTTCGGACTGGCGCAGTGCCGAGGTTCGCCTTG--GTGCTGCGCCGGGAAGTCACC
|HQ912555.1| Thalassiosira pse  TGGTCCGGTGAGGAGTCGAGATTGTGGCCTGGTTCC----TTTATTGGGATTTGGCTACGAGAACTTCTC
|JN091722.1| Pseudo-nitzschia   TGGTCCGGTGAAGCCTCGGGATTGTGATTAGTTTCC----TTTATTGGAAGGTAGTTATGAGAACCTGTC
|JF790983.1| Cymbella cistulif  TGGTCCGGTGAAGCCTCGGGATTGTGGCTGGTTTCC----TTTATTGGAGGTCGGTTGCGAGAACTTGTC
|HQ912556.1| Phaeodactylum tri  TGGTCCGGTGAAGCCTCGGGATTGTGACCAGTGCCT----TT--ATTGGTGTTGGTTGCGAGAACTTGTC
|AB546639.1| Triparma sp.       TGGTCCGGTGAAATTTCGGGACTGAGCGATTCTTGA----TTTATTTCGAGTTTTGCTTGGGAACTTACT
|HQ912557.1| Bolidomonas pacif  TGGTCCGGTGAAATTTCGGGACTGATCGTTTGGTGG----TTCATTCTGCCTTACGATCGGGAACTTACT
|EF165138.1| Ochromonas marina  TGATTCGGTGAAAATTTCGGACCGTGGCCAGGACGC----CATT-GGCGACCTAGCCGTGGGAAGTTATT
|EF165116.1| Synura petersenii  TGATTCGGTGAAAATTCTGGACTGTGGCTCGGACGC----CTTCGGGCGACCTTGCTGTGGGAAGTTATT
|JQ281519.1| Mallomonas papill  TGATTCGGTGAAAATTCCGGACTGTGGCTCGGACGC----CTTCGGGCGACCTTGCTGTAGGAAGTTA-T
|EF432519.1| Paraphysomonas im  TGGTTCGGTGAAAATCTCGGACTGCGGCTTGGATGC----CTTCGGGCAACCAGGCTGTGGAAAGTTGTT
|EF165146.1| Lagynion cf. ampu  TGATTCGGTGAAACTCTCGGACTGACATGGAGACAC----CCTCGGGCGACTCTGTATTGGGAAGTTATT
|AB096710.1| Dictyocha fibula   TGGCTCGGTGAGGCCTCAGGATTTTGGTCTAACACC----TTAACCGGAGTTTGATTAGAAGAATCTGTC
|AB097408.1| Helicopedinella t  ------------------------------------------------------------------------

                                        ....
|AB183265.1| Prymnesium neolep  CAAA
Prymnesium neolepis strain TMR  CAAA
|FN551248.1| Chrysochromulina   CAAA
|AM779755.1| Prymnesium palpeb  CAAA
|AM491014.2| Imantonia rotunda  CAAA
|AJ544117.1| Coccolithus braar  CAAA
|AJ544118.1| Umbilicosphaera s  CAAA
|AJ544119.1| Umbilicosphaera f  CAAA
|AM491024.2| Calyptrosphaera r  CAAA
|HQ877901.1| Emiliania huxleyi  CGAA
|AB183665.1| Gephyrocapsa ocea  CGAA
|JF489945.1| Isochrysis galban  CGAA
|AM490974.2| Pleurochrysis ros  CAAA
|AM491017.2| Chrysochromulina   CAAA
|AM491019.2| Chrysochromulina   CAAA
|JF489961.1| Pavlova lutheri    CAAA
|HQ912555.1| Thalassiosira pse  CAAA
|JN091722.1| Pseudo-nitzschia   TAAA
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|JF790983.1| Cymbella cistulif  TAAA
|HQ912556.1| Phaeodactylum tri  TAAA
|AB546639.1| Triparma sp.       TAAA
|HQ912557.1| Bolidomonas pacif  TAAA
|EF165138.1| Ochromonas marina  TAAA
|EF165116.1| Synura petersenii  TAAA
|JQ281519.1| Mallomonas papill  TAAA
|EF432519.1| Paraphysomonas im  TAAA
|EF165146.1| Lagynion cf. ampu  TAAA
|AB096710.1| Dictyocha fibula   CAAA
|AB097408.1| Helicopedinella t  ----
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3. *rbc*L alignment.

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                                        10        20        30        40        50        60        70
                                ....|....|....|....|....|....|....|....|....|....|....|....|....|....|
Prymnesium neolepis TMR5 RbcL   GATCCTGATTACGTTATCAAGGAAACTGACATCTTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTTG
Prymnesium neolepis PZ241 RbcL  GATCCTGATTACGTTATCAAGGAAACTGACATCTTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTTG
Prymnesium neolepis VF28 RbcL   GATCCTGATTACGTTATCAAGGAAACTGACATCTTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|76880158|dbj|AB183266.1| Hy  GATCCTGATTACGTTATCAAGGAAACTGACATCTTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|12082155|dbj|AB043697.1| Ch  GATCCTGATTACGTTATTAAAGAAACTGACGTTTTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|8099172|dbj|AB043632.1| Chr  GATCCTGATTACGCAATCAAAGAAACTGATATCTTAGCATTATTCCGTTGTACTCCTCAACCAGGTGTTG
gi|12082157|dbj|AB043698.1| Pr  GATCCTGATTACGTTATTAAAGACACTGATATTCTAGCTCTATTCCGTTGTACGCCACAACCAGGTGTTG
gi|12082151|dbj|AB043695.1| Ch  GATCCTGATTACGTAATCAAGGAAACAGATCTTCTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTAG
gi|12082153|dbj|AB043696.1| Im  GATCCTGATTATGCAATCAAGGAAACTGATCTTCTAGCACTATTCCGTTGTACTCCACAACCTGGAGTTG
gi|12082149|dbj|AB043694.1| Ch  GATCCAGATTACGTAATCAAGGAAACAGATATTCTAGCTCTATTCCGTTGTACTCCACAACCAGGTGTAG
gi|12082159|dbj|AB043699.1| Pl  GATCCTGATTATGTTATTAAAGATACTGACATTTTAGCTCTATTCCGTTGTACACCACAACCAGGAGTTG
gi|8099166|dbj|AB043629.1| Umb  GATCCAGAGTACTCGATCAAAGAAACTGATCTTCTAGCATTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|456605|dbj|D11140.1|PEHRBCL  GATCCAGAATATTCAATTAAGGAAACTGATATTTTAGCGCTTTTCCGTTGTACACCTCAACCAGGTGTTG
gi|436905916|gb|JX292160.1| Em  GCTGTTGAATCACGTACTCGTATTAAGAGTGAACGTTATGAATCTGGTGTAATCCCTTACGCTAAAATGG
gi|685217|dbj|D45844.1|GEOCPRB  GATCCAGAATATGTAATCAAGGATACTGATATCCTAGCACTATTCCGTTGTACACCTCAACCAGGTGTAG
gi|356472750|gb|HQ656833.1| Co  GATCCAGAATATGCAATTAAAGAAACTGATATTCTAGCACTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|12082137|dbj|AB043688.1| Pl  GATCCAGAATATTCAATTAAGGAAACTGATATTCTAGCACTTTTCCGTTGTACACCTCAACCAGGTGTTG
gi|356472744|gb|HQ656830.1| Pa  GATCCTGACTACGCAATCAAGGAAACTGATGTTCTAGCAATGTTTCGTCTGACTCCTCAGCCGGGTGTTG
gi|12082141|dbj|AB043690.1| Ca  GATCCAGAGTACTCGATCAAAGAAACTGATCTTCTAGCATTATTCCGTTGTACTCCACAACCAGGTGTTG
gi|12082147|dbj|AB043693.1| Is  GATCCAGAATACGCAATTAAGGATACTGATCTACTAGCACTGTTCCGTTGTACACCACAACCAGGTGTAG
gi|12082145|dbj|AB043692.1| He  GATCCAGAGTACACTATTAAAGAAACAGATCTACTAGCACTATTCCGTTGTACTCCACAACCAGGAGTTG
gi|12082163|dbj|AB043701.1| Ex  GATCCTGACTACGCAATTAAAGAAACTGATGTTCTAGCAATGTTCCGTCTAACACCTCAACCAGGTGTAG
gi|8099174|dbj|AB043633.1| Pav  GATCCTGACTACGCTATTAAAGAGACTGATGTTCTAGCAATGTTCCGTCTTACACCTCAACCAGGTGTAG

                                        80        90       100       110       120       130       140
                                ....|....|....|....|....|....|....|....|....|....|....|....|....|....|
Prymnesium neolepis TMR5 RbcL   ACCCTGTAGAAGCTGCTGCAGCTCTTGCTGGTGAGTCTTCAACAGCAACATGGACTGTTGTATGGACAGA
Prymnesium neolepis PZ241 RbcL  ACCCTGTAGAAGCTGCTGCAGCTCTTGCTGGTGAGTCTTCAACAGCAACATGGACTGTTGTATGGACAGA
Prymnesium neolepis VF28 RbcL   ACCCTGTAGAAGCTGCTGCAGCTCTTGCTGGTGAGTCTTCAACAGCAACATGGACTGTTGTATGGACAGA
gi|76880158|dbj|AB183266.1| Hy  ACCCTGTAGAAGCTGCTGCAGCTCTTGCTGGTGAGTCTTCAACAGCAACATGGACTGTTGTATGGACAGA
gi|12082155|dbj|AB043697.1| Ch  ACCCTGTAGAAGCTGCAGCAGCTCTTGCTGGTGAGTCTTCAACTGCAACATGGACTGTTGTATGGACGGA
gi|8099172|dbj|AB043632.1| Chr  ACCCTGTAGAAGCTGCTGCAGCTCTTGCTGGTGAGTCTTCAACTGCAACATGGACTGTTGTATGGACGGA
gi|12082157|dbj|AB043698.1| Pr  ATCCTGTAGAAGCTGCAGCAGCTCTTGCTGGTGAATCTTCAACAGCAACATGGACTGTTGTATGGACGGA
gi|12082151|dbj|AB043695.1| Ch  ACCCAGTAGAGGCTGCAGCAGCACTAGCTGGTGAGTCTTCAACTGCAACATGGACTGTTGTATGGACAGA
gi|12082153|dbj|AB043696.1| Im  ACCCAGTTGAAGCTGCTGCTGCTCTTGCAGGTGAATCTTCAACAGCAACGTGGACTGTTGTATGGACAGA
gi|12082149|dbj|AB043694.1| Ch  ACCCTGTAGAAGCAGCAGCAGCCCTTGCTGGTGAGTCTTCAACTGCAACATGGACTGTTGTATGGACAGA
gi|12082159|dbj|AB043699.1| Pl  ACCCTGTAGAAGCTGCAGCAGCGCTTGCTGGTGAATCGTCTACAGCAACATGGACTGTTGTATGGACAGA
gi|8099166|dbj|AB043629.1| Umb  ACCCTGTAGAAGCTGCAGCTGCACTAGCTGGTGAATCTTCAACAGCAACATGGACTGTTGTATGGACTGA
gi|456605|dbj|D11140.1|PEHRBCL  ACCCTGTAGAAGCTGCTGCCGCGCTAGCTGGTGAGTCGTCGACAGCAACATGGACAGTTGTATGGACGGA
gi|436905916|gb|JX292160.1| Em  GTTACTGGGATCCAGAATATGTAATCAAGGATACTGATATCCTAGCACTATTCCGTTGTACACCTCAACC
gi|685217|dbj|D45844.1|GEOCPRB  ATCCAGTTGAAGCGGCTGCTGCACTAGCAGGTGAGTCTTCTACTGCTACATGGACTGTAGTATGGACGGA
gi|356472750|gb|HQ656833.1| Co  ACCCTGTTGAAGCTGCAGCTGCATTAGCTGGTGAGTCTTCAACAGCAACATGGACTGTAGTATGGACTGA
gi|12082137|dbj|AB043688.1| Pl  ACCCTGTAGAAGCTGCTGCTGCACTAGCTGGTGAGTCATCAACAGCAACATGGACAGTTGTATGGACGGA
gi|356472744|gb|HQ656830.1| Pa  ACCCTGTTGAGTGTGCTGCAGCTGTTGCAGGTGAGTCATCTACAGCTACTTGGACTGTTGTATGGACTGA
gi|12082141|dbj|AB043690.1| Ca  ACCCTGTAGAAGCTGCAGCTGCTTTAGCTGGTGAGTCTTCGACAGCAACATGGACTGTTGTATGGACTGA
gi|12082147|dbj|AB043693.1| Is  ACCCAGTAGAAGCTGCAGCTGCACTTGCAGGTGAATCTTCAACTGCTACATGGACTGTTGTATGGACAGA
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gi|12082145|dbj|AB043692.1| He  ACCCGGTTGAAGCTGCAGCAGCACTTGCAGGTGAATCTTCAACTGCTACATGGACTGTTGTATGGACTGA
gi|12082163|dbj|AB043701.1| Ex  ACCCTGTAGAGTGTGCTGCAGCAGTTGCTGGTGAGTCTTCAACAGCTACATGGACAGTTGTATGGACTGA
gi|8099174|dbj|AB043633.1| Pav  ACCCTGTAGAGTGTGCTGCAGCGGTTGCTGGTGAGTCTTCTACTGCTACTTGGACTGTAGTATGGACTGA

                                        150       160       170       180       190       200       210
                                ....|....|....|....|....|....|....|....|....|....|....|....|....|....|
Prymnesium neolepis TMR5 RbcL   TCTACTAACTGCTTGTGATCTATACCGTGCAAAAGCTTACCGTGTAGATCCGGTACCTAGTACACCGGAT
Prymnesium neolepis PZ241 RbcL  TCTACTAACTGCTTGTGACCTATACCGTGCAAAAGCTTACCGTGTAGATCCGGTACCTAGTACACCGGAT
Prymnesium neolepis VF28 RbcL   TCTACTAACTGCTTGTGACCTATACCGTGCAAAAGCTTACCGTGTAGATCCGGTACCTAGTACACCGGAT
gi|76880158|dbj|AB183266.1| Hy  TCTACTAACTGCTTGTGATCTATACCGTGCAAAAGCTTACCGTGTAGATCCGGTACCTAGTACACCGGAT
gi|12082155|dbj|AB043697.1| Ch  TCTTTTAACTGCTTGTGATCTATACCGTGCGAAAGCTTACCGTGTAGATCCAGTACCAGGTACACCTGAT
gi|8099172|dbj|AB043632.1| Chr  TCTTCTAACTGCTTGTGATCTATACCGTGCGAAAGCATACCGTGTAGACCCAGTACCTAGCACACCAGAT
gi|12082157|dbj|AB043698.1| Pr  TCTTTTAACAGCTTGTGATCTATACCGTGCAAAAGCTTACCGTGTAGATCCTGTACCTAGTACACCTGAT
gi|12082151|dbj|AB043695.1| Ch  TCTACTAACTGCATGTGATCTATACCGTGCGAAAGCATACCGTGTAGACCCTGTACCAAACGCATCAGAT
gi|12082153|dbj|AB043696.1| Im  TCTACTAACTGCATGTGATCTATACCGTGCGAAAGCATACCGTGTAGACCCAGTACCAAGTACTCCTGAT
gi|12082149|dbj|AB043694.1| Ch  TCTACTTACTGCTTGTGACCTTTACCGTGCAAAAGCATACCGTGTAGATCCTGTACCTGGTGCAGCTGAT
gi|12082159|dbj|AB043699.1| Pl  TCTTTTAACTGCTTGTGATTTATATCGTGCTAAAGCTTACCGTGTAGATCCTGTACCAAGTGCAGCTGAT
gi|8099166|dbj|AB043629.1| Umb  CCTACTAACTGCATGTGATCTATACCGTGCGAAAGCTTACCGTGTTGACCCTGTACCAAGTGCATCTGAT
gi|456605|dbj|D11140.1|PEHRBCL  TCTTCTAACTGCATGTGATCTTTACCGTGCGAAAGCATACCGTGTAGATCCAGTGCCAAGTGCAGCAGAT
gi|436905916|gb|JX292160.1| Em  AGGTGTAGATCCAGTTGAAGCGGCTGCTGCACTAGCAGGTGAGTCTTCTACTGCTACATGGACTGTAGTA
gi|685217|dbj|D45844.1|GEOCPRB  TCTTTTAACTGCATGTGATCTTTACCGTGCTAAAGCTTTCCGTGTTGATCCAGTTCCAAGTGCTGCTGAT
gi|356472750|gb|HQ656833.1| Co  TCTACTAACTGCATGTGATTTATACCGTGCTAAAGCTTACCGTGTTGACCCTGTACCAAGTGCAGCGGAT
gi|12082137|dbj|AB043688.1| Pl  TCTTCTAACTGCATGTGATCTTTACCGTGCGAAAGCATACCGTGTAGATCCAGTACCAAGCGCAGCAGAT
gi|356472744|gb|HQ656830.1| Pa  CCTTTTAACAGCTTGTGACCTATATCGTGCTAAAGCATTCCGTGTAGATCCAGTACCAAATTCTTCTGAT
gi|12082141|dbj|AB043690.1| Ca  TCTATTAACTGCATGTGATCTATACCGTGCTAAGGCTTACCGTGTAGACCCTGTACCAAGTGCTGCTGAT
gi|12082147|dbj|AB043693.1| Is  CCTTTTAACTGCTTGTGATCTTTACCGTGCGAAAGCATACCGTGTTGATCCAGTTCCAGGCGCATCTGAT
gi|12082145|dbj|AB043692.1| He  TCTTCTAACTGCGTGTGATCTATACCGTGCAAAAGCTTATCGTGTTGACCCTGTACCTAGTGCAGCTGAC
gi|12082163|dbj|AB043701.1| Ex  CCTACTTACTGCTTGTGATCTATACCGTGCGAAAGCATTCCGTGTAGACCCAGTACCTAACTCTTCTGAT
gi|8099174|dbj|AB043633.1| Pav  CCTACTTACTGCTTGTGACCTATACCGTGCAAAAGCATTCCGTGTAGATCCAGTACCTAACTCTTCTGAT

                                        220       230       240       250       260       270       280
                                ....|....|....|....|....|....|....|....|....|....|....|....|....|....|
Prymnesium neolepis TMR5 RbcL   ACTTACTTCTGTTATATCGCTTACGATCTAGACCTATTTGAAGAAGGTTCACTTGCTAACCTAACTGCAT
Prymnesium neolepis PZ241 RbcL  ACTTACTTCTGTTATATCGCTTACGATCTAGACCTATTTGAAGAAGGTTCACTTGCTAACCTAACTGCAT
Prymnesium neolepis VF28 RbcL   ACTTACTTCTGTTATATCGCTTACGATCTAGACCTATTTGAAGAAGGTTCACTTGCTAACCTAACTGCAT
gi|76880158|dbj|AB183266.1| Hy  ACTTACTTCTGTTATATCGCTTACGATCTAGACCTATTTGAAGAAGGTTCACTTGCTAACCTAACTGCAT
gi|12082155|dbj|AB043697.1| Ch  ACTTACTTCTGCTACATCGCTTACGATTTAGATCTATTTGAAGAAGGTTCACTTGCTAACCTAACTGCAT
gi|8099172|dbj|AB043632.1| Chr  ACTTACTTCTGTTACGTTGCATACGATATCGATCTATTTGAAGAAGGTTCTTTAGCTAACCTAACTGCAT
gi|12082157|dbj|AB043698.1| Pr  ACTTATTTCTGTTACGTTGCTTACGATTTAGATCTATTTGAAGAAGGTTCACTTGCGAACTTAACTGCAT
gi|12082151|dbj|AB043695.1| Ch  ACATACTTCTGTTACATTGCATACGATATTGATCTATTTGAGGAAGGTTCTCTGGCTAACCTAACTGCAT
gi|12082153|dbj|AB043696.1| Im  ACTTACTTCTGTTACATCGCTTACGATATTGATCTATTTGAAGAAGGTTCACTAGCAAACTTAACTGCGT
gi|12082149|dbj|AB043694.1| Ch  ACTTACTTCTGTTACGTAGCATACGATATCGATCTATTTGAGGAGGGTTCTCTAGCTAACCTAACTGCTT
gi|12082159|dbj|AB043699.1| Pl  ACTTATTTCTGTTATATTGCTTATGACTTAGACCTTTTCGAAGAAGGTTCACTTGCTAACTTAACAGCAT
gi|8099166|dbj|AB043629.1| Umb  ACTTACTTCTGTTATATCGCTTATGATATCGATCTATTTGAAGAAGGTTCACTTGCTAACTTAACAGCGT
gi|456605|dbj|D11140.1|PEHRBCL  ACTTACTTCTGTTACATCGCTTACGATATTGATCTATTTGAGGAAGGCTCACTAGCTAACCTAACTGCGT
gi|436905916|gb|JX292160.1| Em  TGGACGGATCTTTTAACTGCATGTGATCTTTACCGTGCTAAAGCTTTCCGTGTTGATCCAGTTCCAAGTG
gi|685217|dbj|D45844.1|GEOCPRB  ACTTACTTCTGTTACATCGCATATGATATCGACCTATTTGAGGAAGGATCACTTGCTAACTTAACAGCAT
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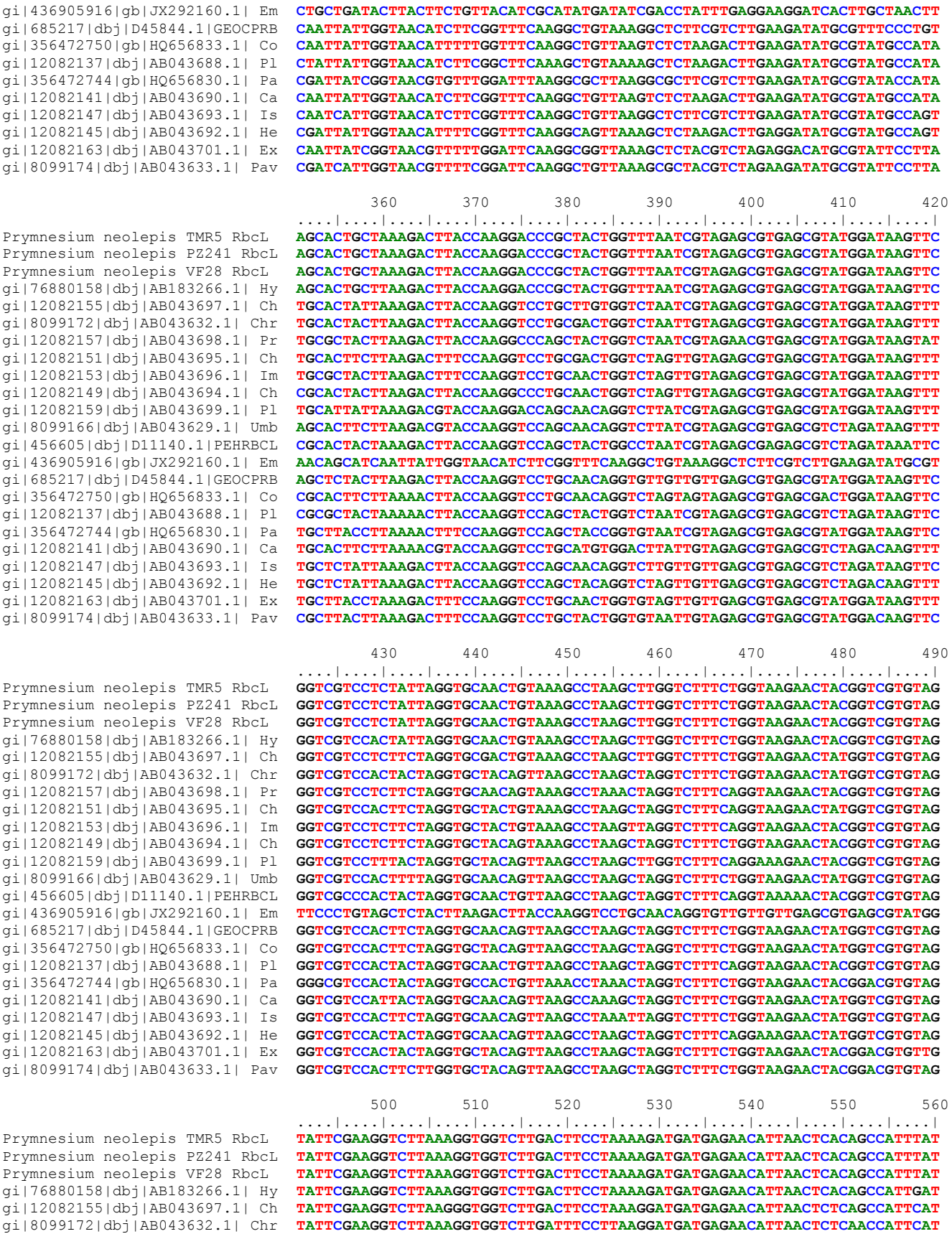
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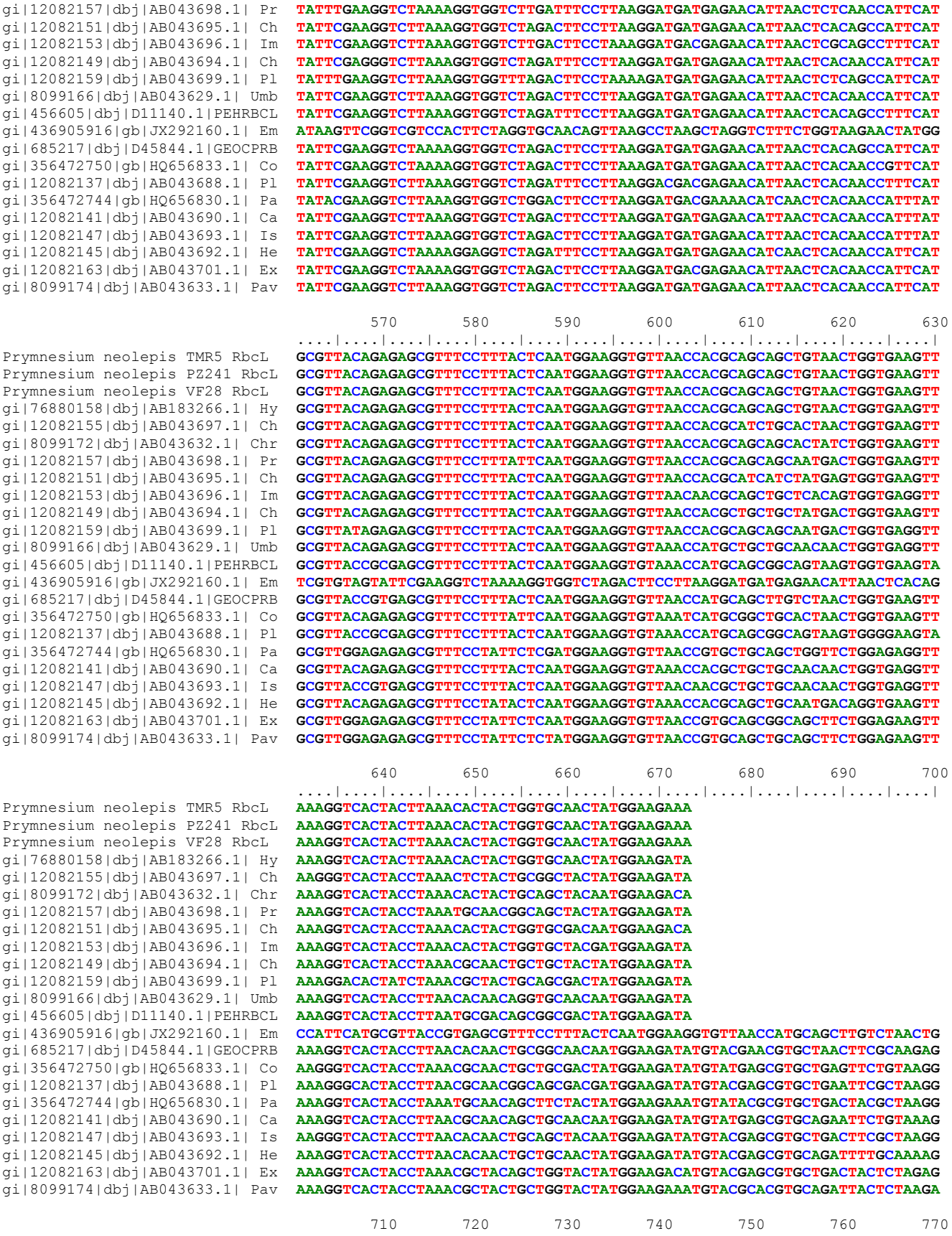
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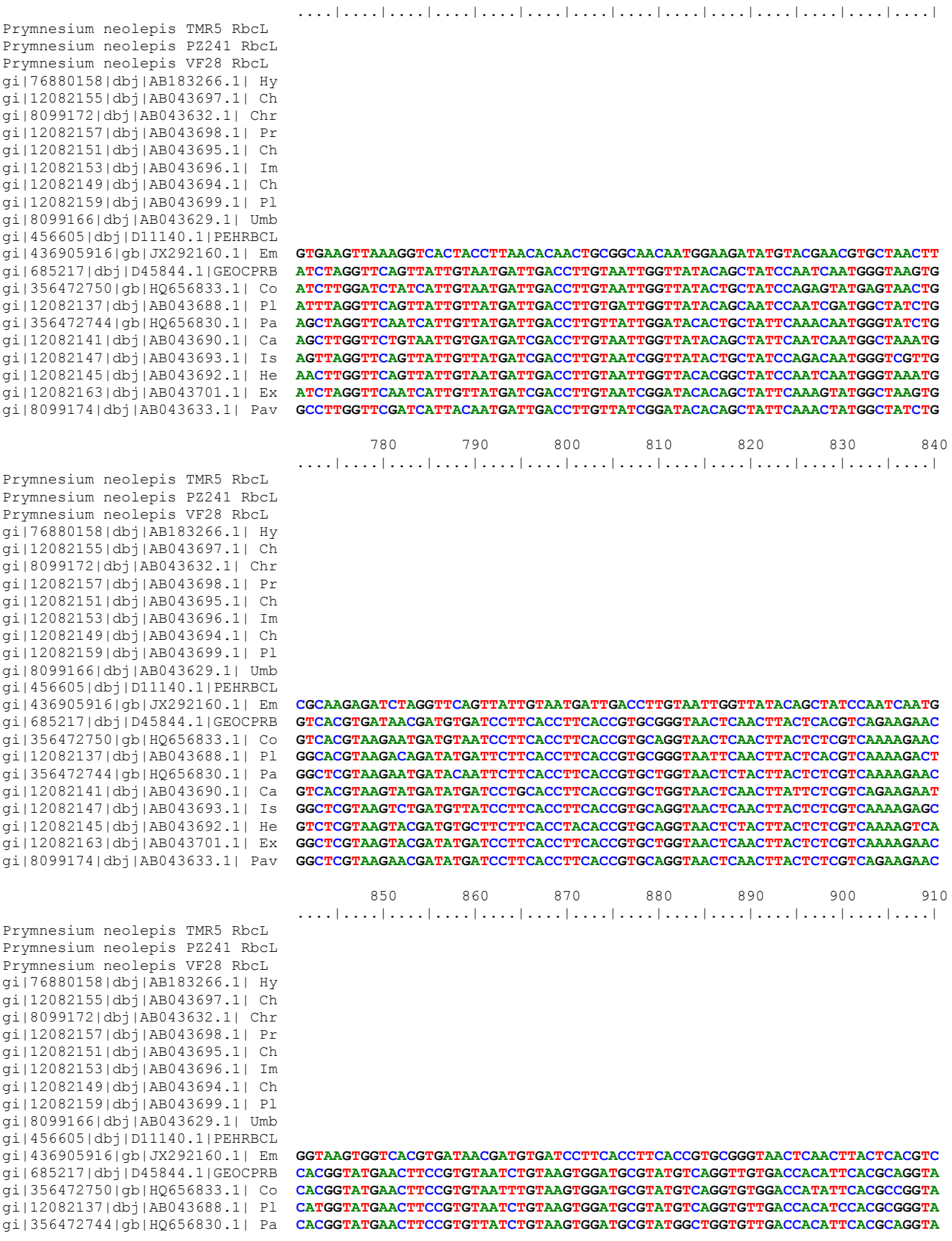
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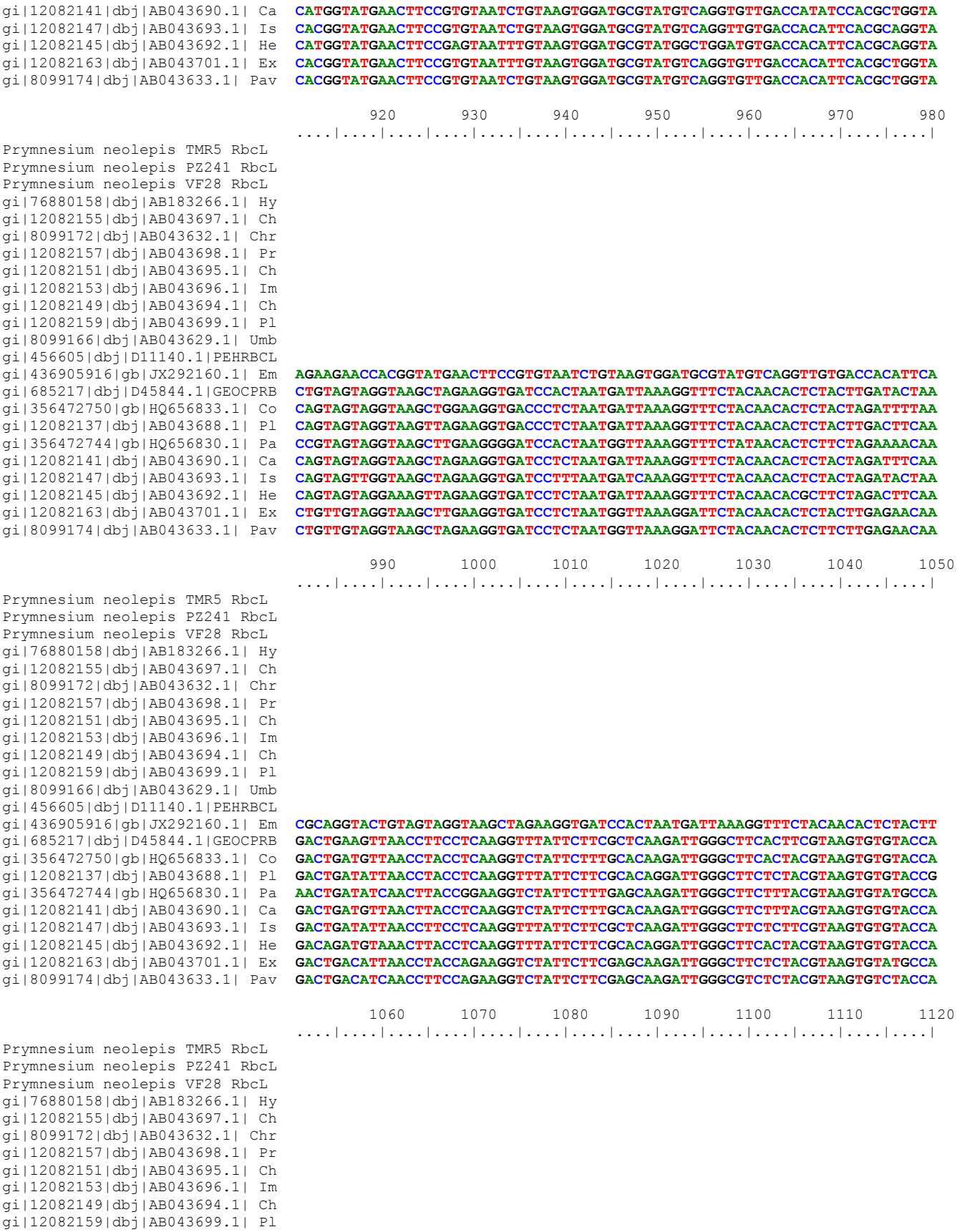
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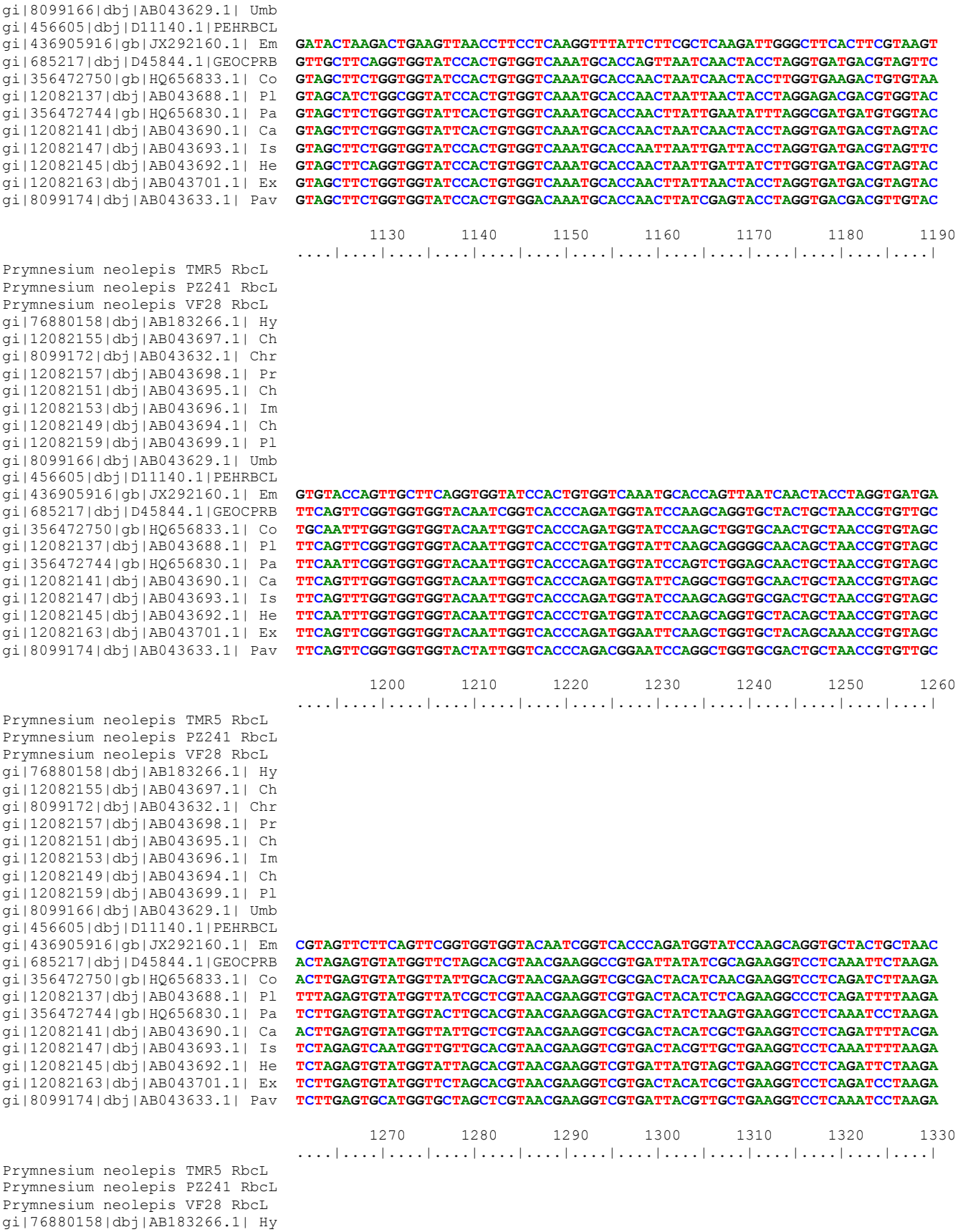
1060 1070 1080 1090 1100 1110 1120
Prymnesium neolepis TMR5 RbcL
Prymnesium neolepis PZ241 RbcL
Prymnesium neolepis VF28 RbcL
gi|76880158|dbj|AB183266.1| Hy
gi|12082155|dbj|AB043697.1| Ch
gi|8099172|dbj|AB043632.1| Chr
gi|12082157|dbj|AB043698.1| Pr
gi|12082151|dbj|AB043695.1| Ch
gi|12082153|dbj|AB043696.1| Im
gi|12082149|dbj|AB043694.1| Ch
gi|12082159|dbj|AB043699.1| Pl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gi|685217|dbj|D45844.1|GEOCPRB GTTGCTTCAGGTGGTATCCACTGTGGTCAAATGCACCAGTTAATCAACTACCTAGGTGATGACGTAGTTC
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gi|12082141|dbj|AB043690.1| Ca GTAGCTTCTGGTGGTATTCACTGTGGTCAAATGCACCAACTAATCAACTACCTAGGTGATGACGTAGTAC
gi|12082147|dbj|AB043693.1| Is GTAGCTTCTGGTGGTATCCACTGTGGTCAAATGCACCAATTAATTGATTACCTAGGTGATGACGTAGTTC
gi|12082145|dbj|AB043692.1| He GTAGCTTCAGGTGGTATCCACTGTGGTCAAATGCACCAACTAATTGATTATCTTGGTGATGACGTAGTAC
gi|12082163|dbj|AB043701.1| Ex GTAGCTTCTGGTGGTATCCACTGTGGTCAAATGCACCAACTTATTAACTACCTAGGTGATGACGTAGTAC
gi|8099174|dbj|AB043633.1| Pav GTAGCTTCTGGTGGTATCCACTGTGGACAAATGCACCAACTTATCGAGTACCTAGGTGACGACGTTGTAC
1130 1140 1150 1160 1170 1180 1190
Prymnesium neolepis TMR5 RbcL
Prymnesium neolepis PZ241 RbcL
Prymnesium neolepis VF28 RbcL
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gi|12082155|dbj|AB043697.1| Ch
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gi|12082159|dbj|AB043699.1| Pl
gi|8099166|dbj|AB043629.1| Umb
gi|456605|dbj|D11140.1|PEHRBCL
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gi|12082141|dbj|AB043690.1| Ca TTCAGTTTGGTGGTGGTACAATTGGTCACCCAGATGGTATTCAGGCTGGTGCAACTGCTAACCGTGTAGC
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1200 1210 1220 1230 1240 1250 1260
Prymnesium neolepis TMR5 RbcL
Prymnesium neolepis PZ241 RbcL
Prymnesium neolepis VF28 RbcL
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gi|12082153|dbj|AB043696.1| Im
gi|12082149|dbj|AB043694.1| Ch
gi|12082159|dbj|AB043699.1| Pl
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1270 1280 1290 1300 1310 1320 1330
Prymnesium neolepis TMR5 RbcL
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Prymnesium neolepis VF28 RbcL
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                                        1340      1350      1360      1370      1380      1390      1400
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Prymnesium neolepis TMR5 RbcL
Prymnesium neolepis PZ241 RbcL
Prymnesium neolepis VF28 RbcL
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gi|12082163|dbj|AB043701.1| Ex  CTTCAACTGATACTGCTGACTTCGTTGAAACAGCAACAGCTAACGTT
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Prymnesium neolepis TMR5 RbcL
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