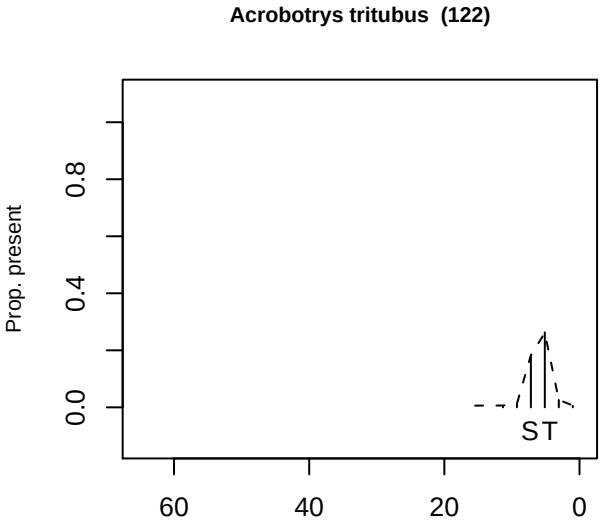
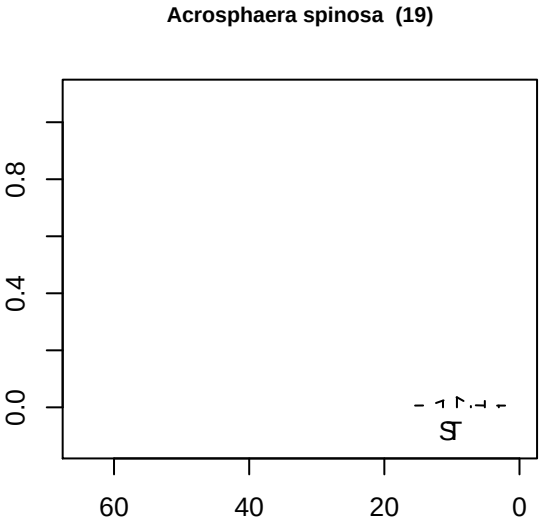
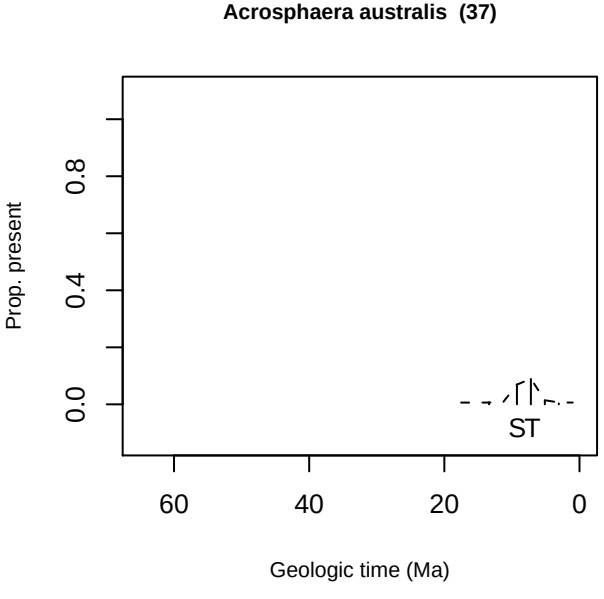
Supplementary Material: Radiolarians

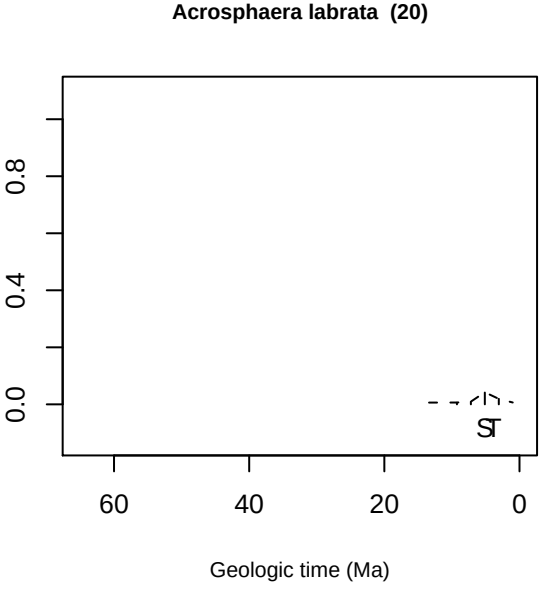
We first present plots of each of our model ("hat") fits to each radiolarian species. Vertical bars show the observed proportion of sites occupied by the species in 2 Myr bins. Dotted curves are the fitted curves. The labels "S" and "T" on each plot show the inflection points for the rise and fall of species (see model under methods), respectively. Following the species "hat", we show plots of the time period over which samples are available for each species and the temporal distribution of preservation status (preservation codes G for "good," M for "moderate" and P for "poor" and gray closed circles for samples with no preservation state coded). The first set of plots does not overlap completely with the second set because we have no preservation information for a few species.

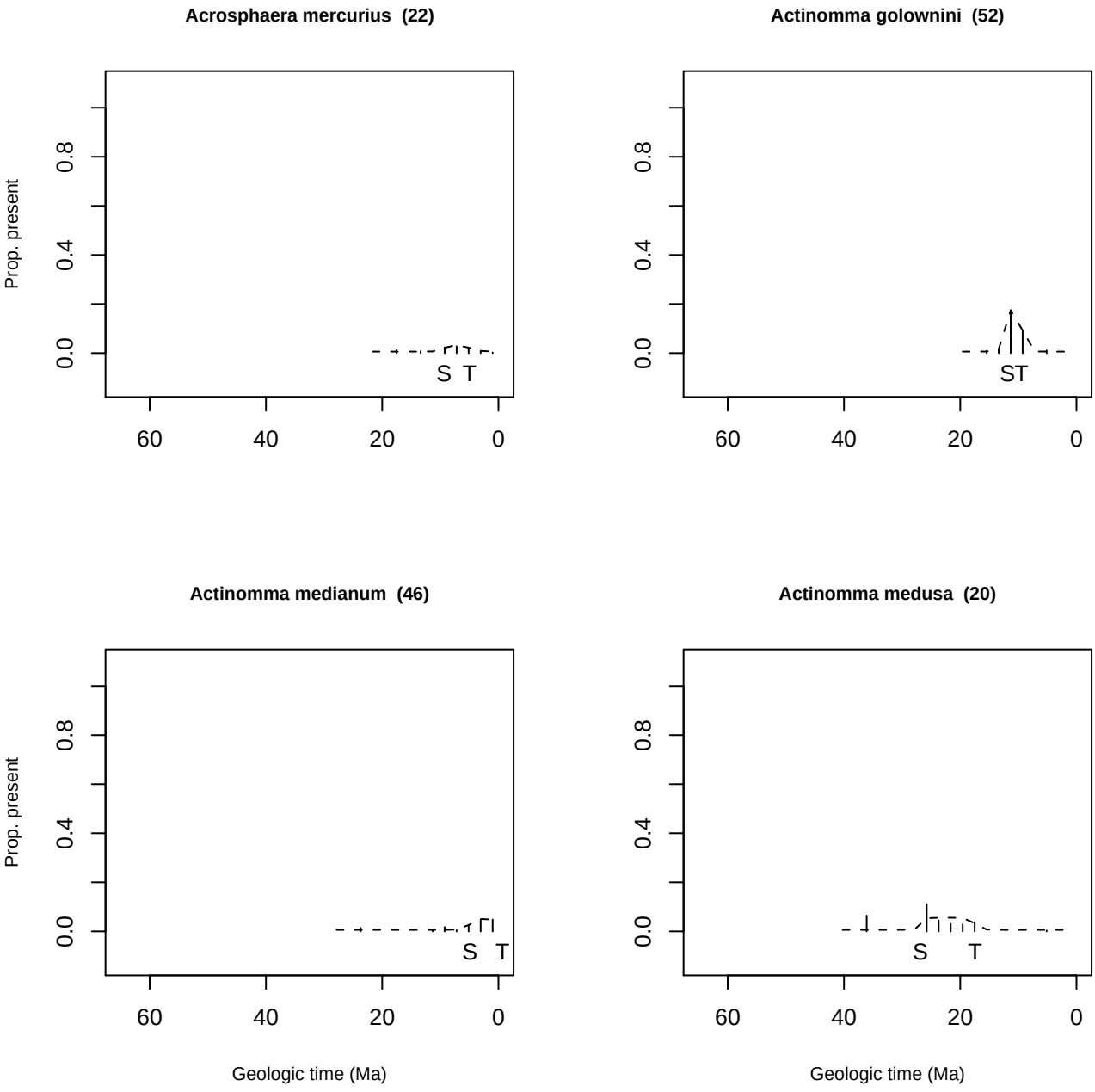
Note that our model does not fit all species perfectly and that the parameter p_0 deals with cases such as *Calocycletta virginis* which has occurrence around 58 Ma, even though the bulk of its occurrences are in the Neogene with no intervening time periods where it occurs. For *Amphymenium splendiarmatum* we could have fit the single "hat" over the earlier occurrences, hence the plotted solution only happens to be what is optimal based on the group effects.

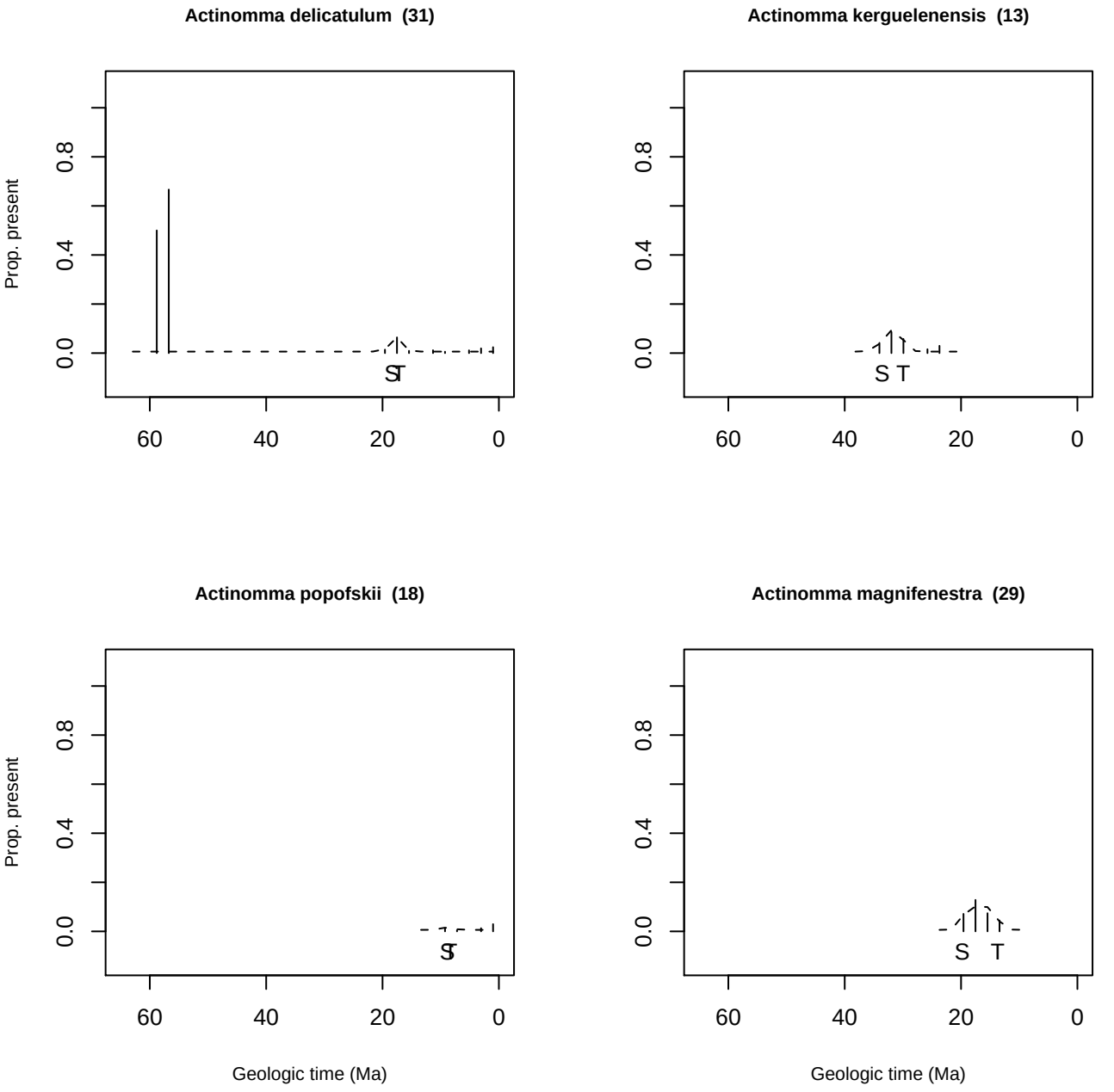

Acrobotrys tritubus (122)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T

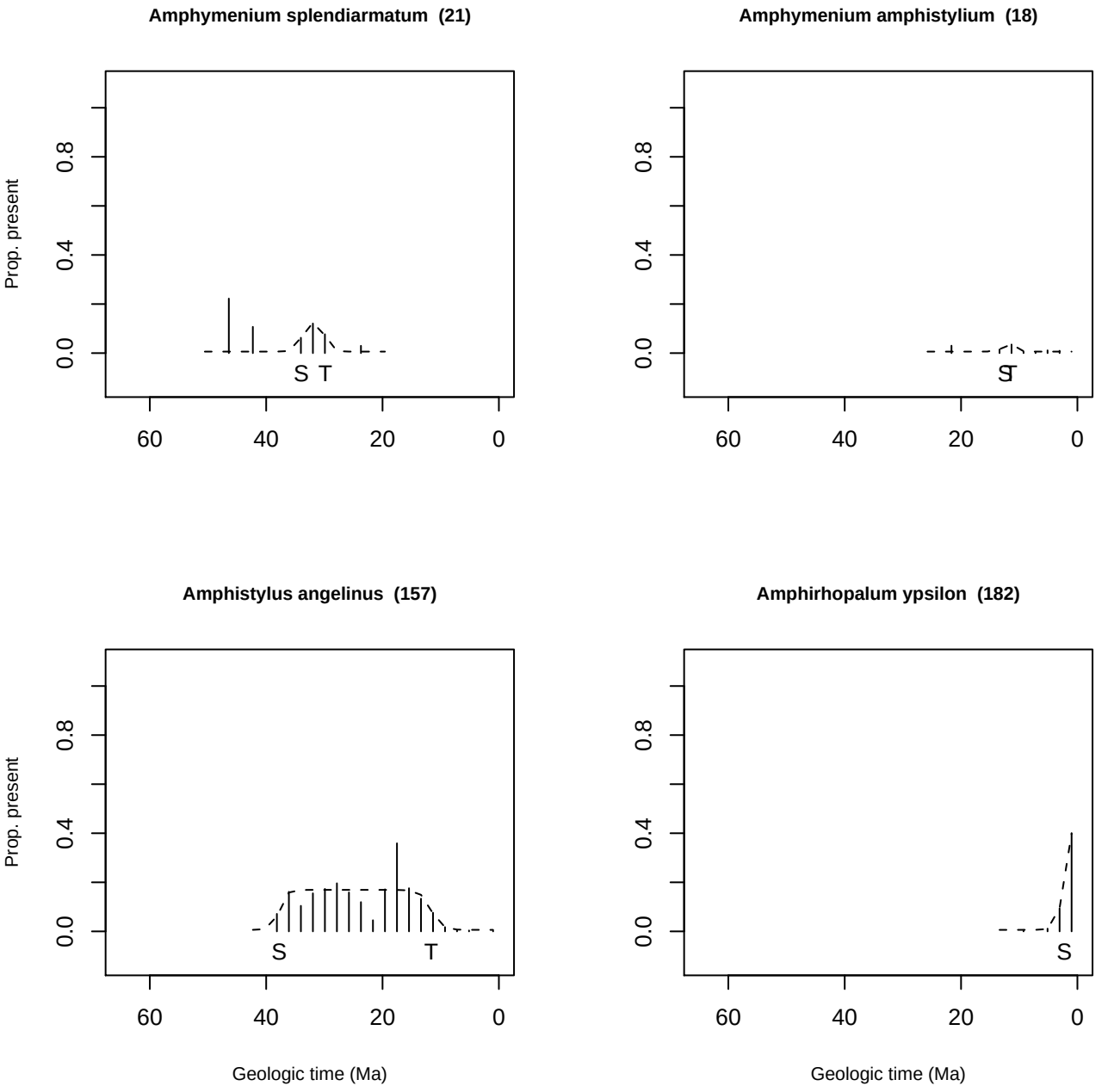

Acrosphaera spinosa (19)
0.0
0.4
0.8
60
40
20
0
S T

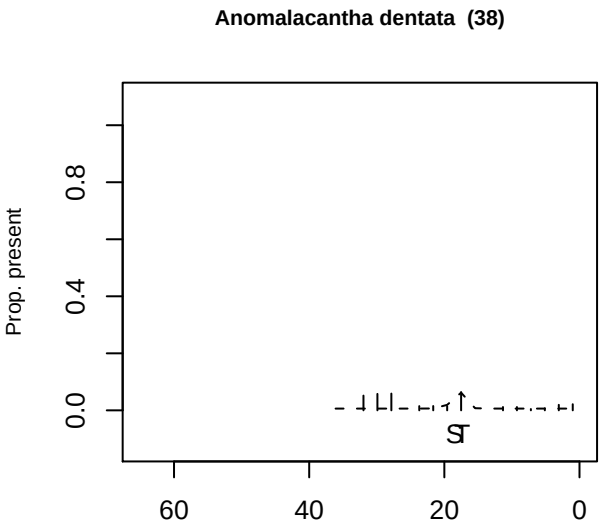

Acrosphaera australis (37)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

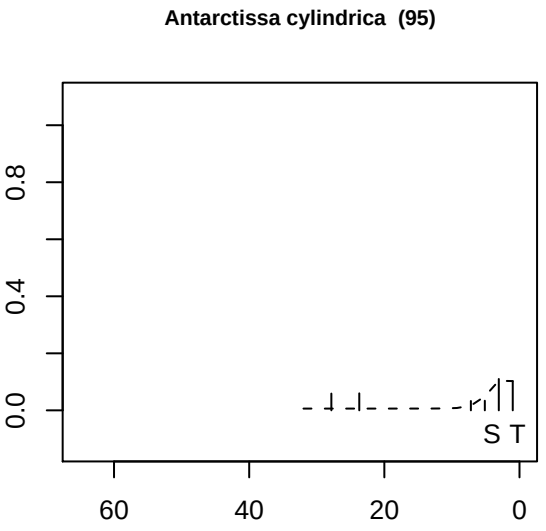

Acrosphaera labrata (20)
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

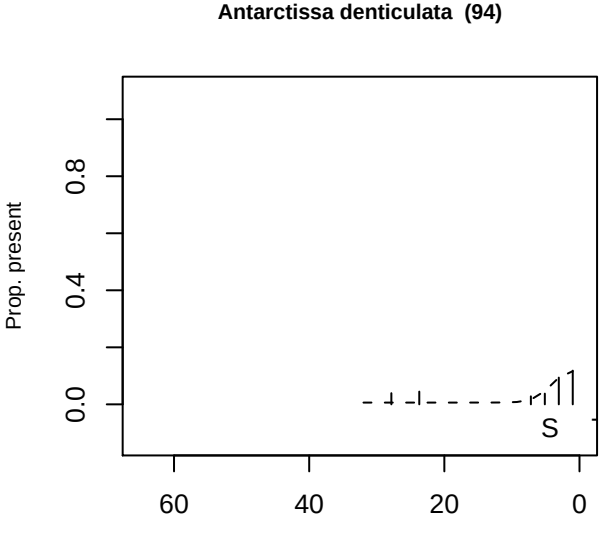

Acrosphaera mercurius (22)
Actinomma golownini (52)
Actinomma medianum (46)
Actinomma medusa (20)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
ST
Geologic time (Ma)

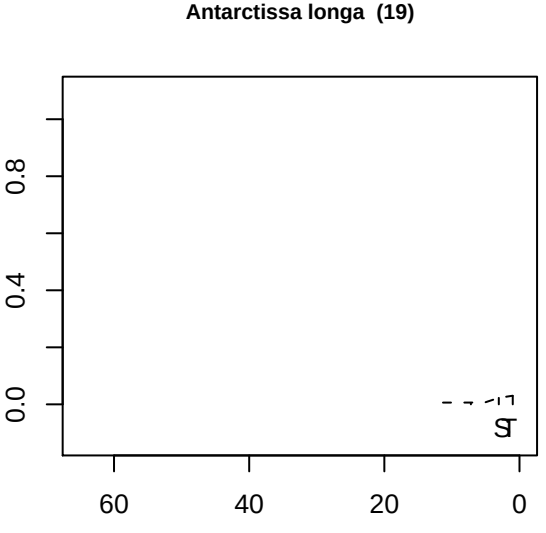

Actinomma delicatulum (31)
Actinomma kerguelenensis (13)
Actinomma popofskii (18)
Actinomma magnifenestra (29)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

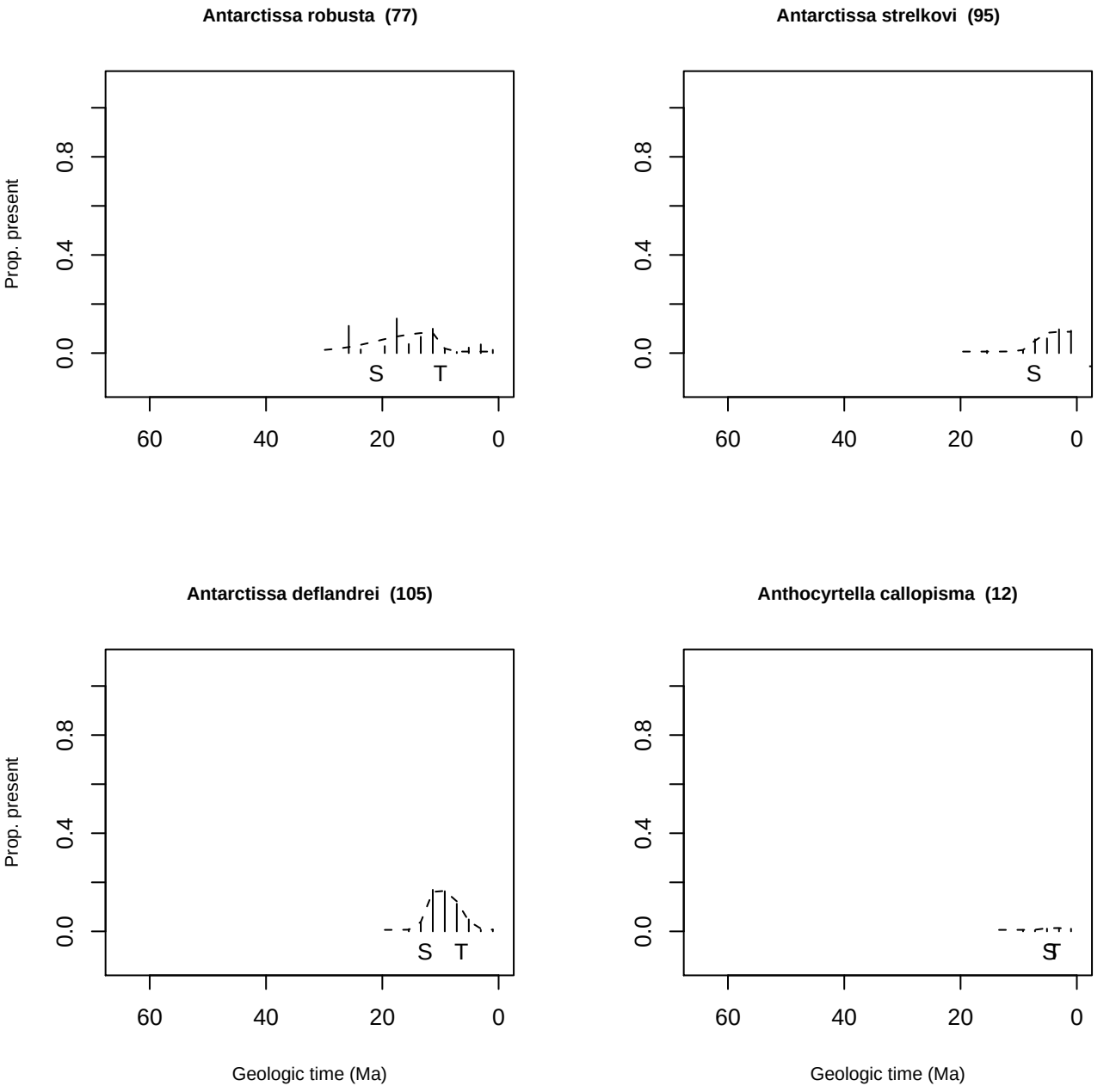

Amphymenium splendiarmatum (21)
Amphymenium amphistylium (18)
Amphistylus angelinus (157)
Amphirhopalum ypsilon (182)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

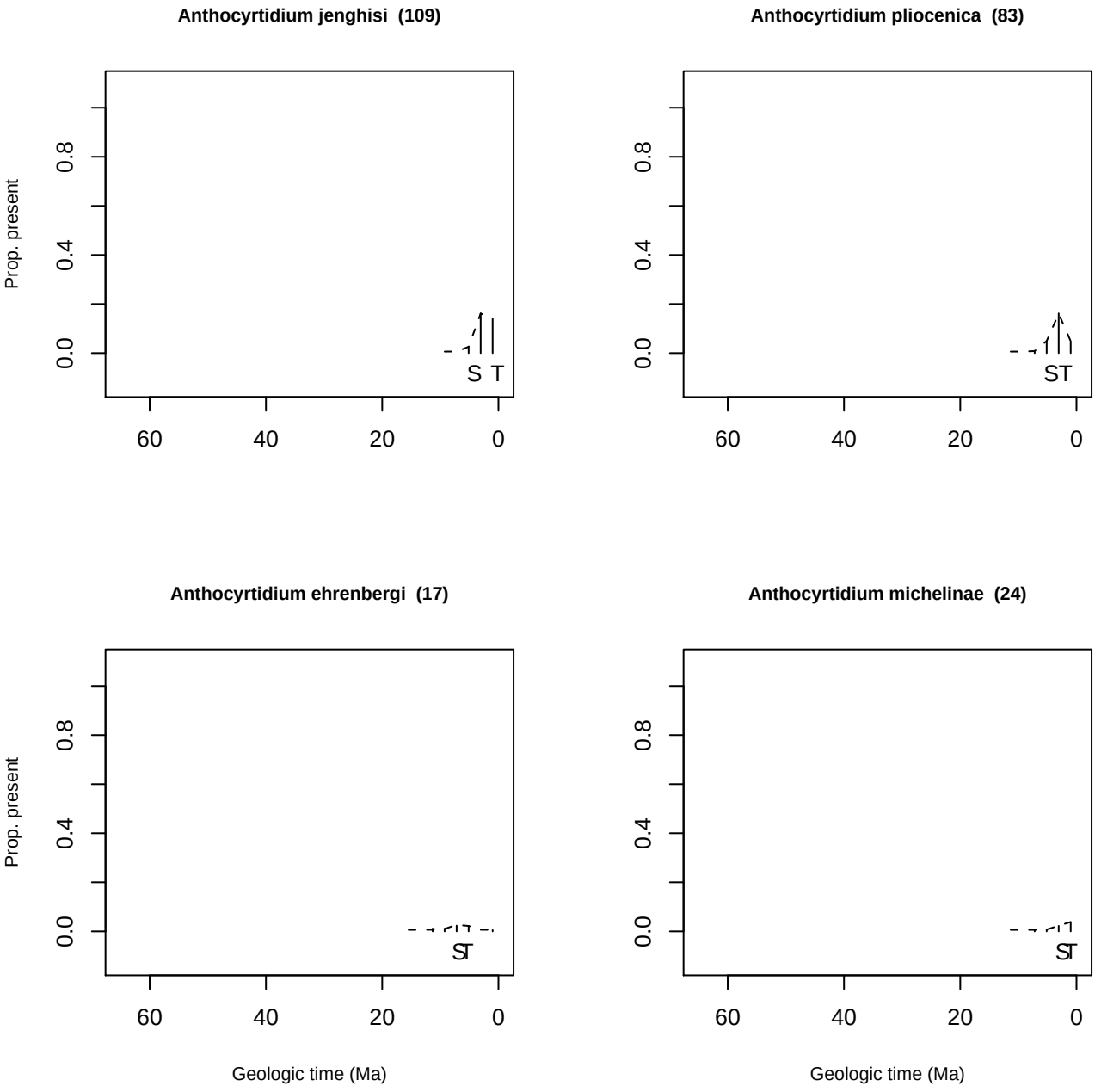

Anomalacantha dentata (38)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T

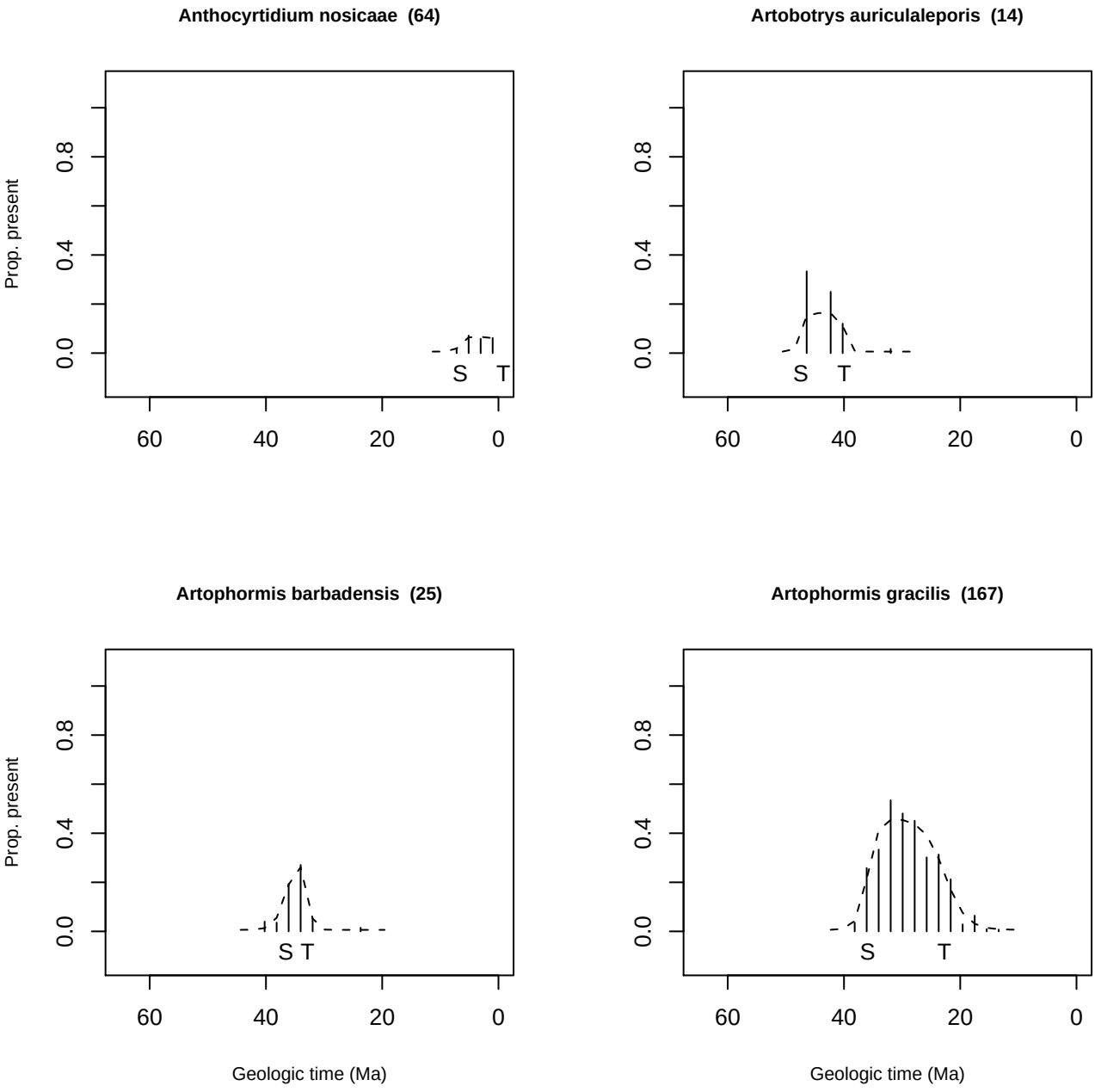

Antarctissa cylindrica (95)
0.0
0.4
0.8
60
40
20
0
S T

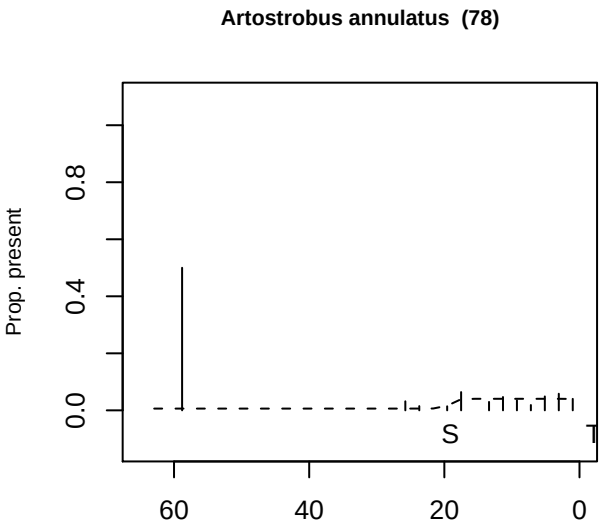

Antarctissa denticulata (94)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)

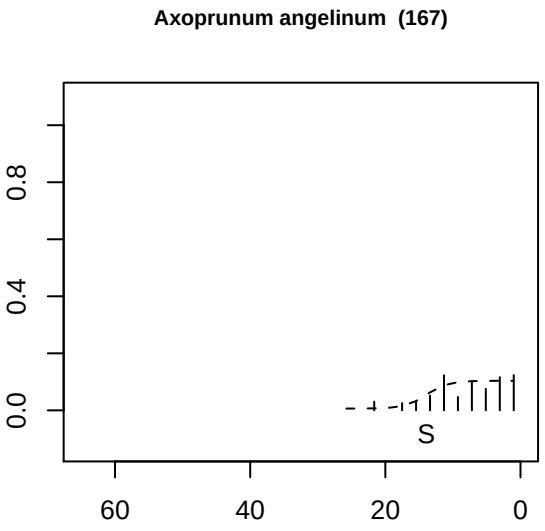

Antarctissa longa (19)
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

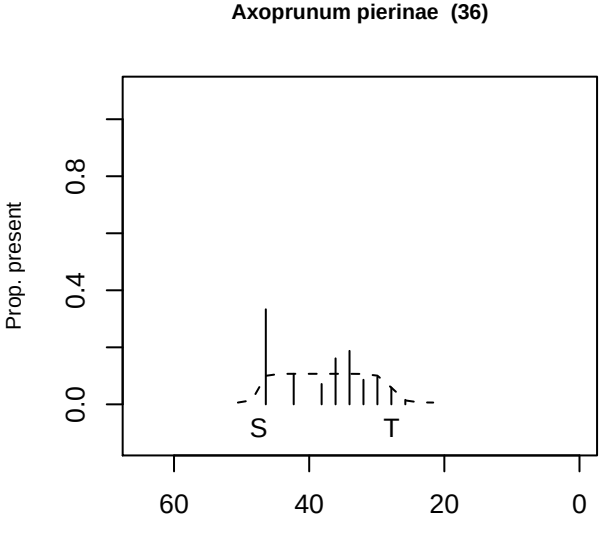

Antarctissa robusta (77)
Antarctissa strelkovi (95)
Antarctissa deflandrei (105)
Anthocyrtella callopisma (12)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

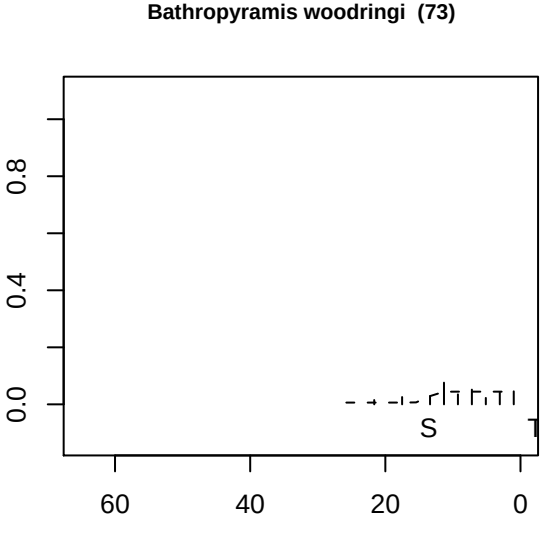

Anthocyrtidium jenghisi (109)
Anthocyrtidium pliocenica (83)
Anthocyrtidium ehrenbergi (17)
Anthocyrtidium michelinae (24)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
ST
Geologic time (Ma)

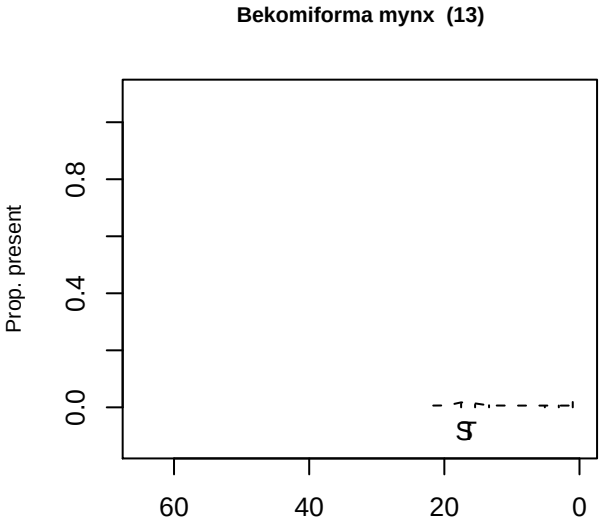

Anthocyrtidium nosicaae (64)
Artobotrys auriculaleporis (14)
Artophormis barbadensis (25)
Artophormis gracilis (167)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

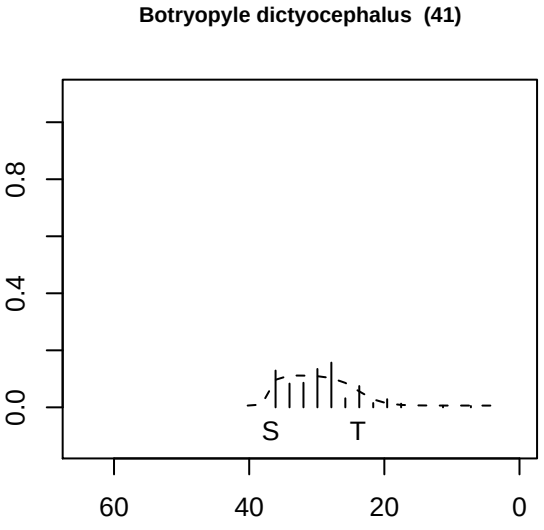

Artostrobus annulatus (78)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0


Axoprunum angelinum (167)
0.0
0.4
0.8
S
60
40
20
0

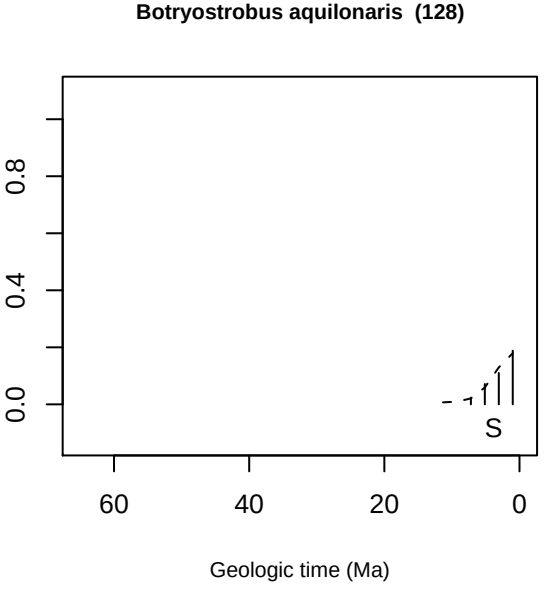

Axoprunum pierinae (36)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

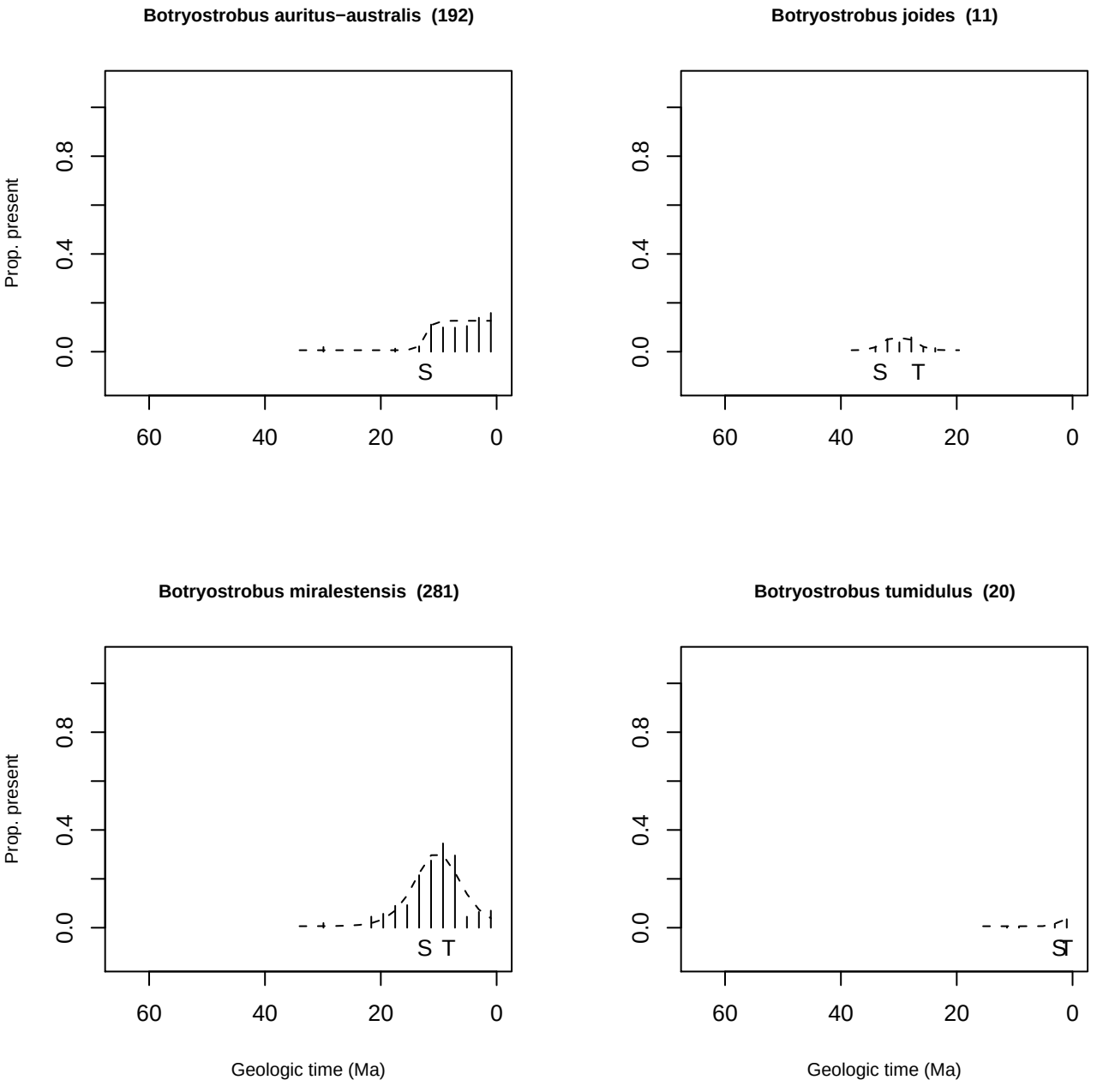

Bathropyramis woodringi (73)
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

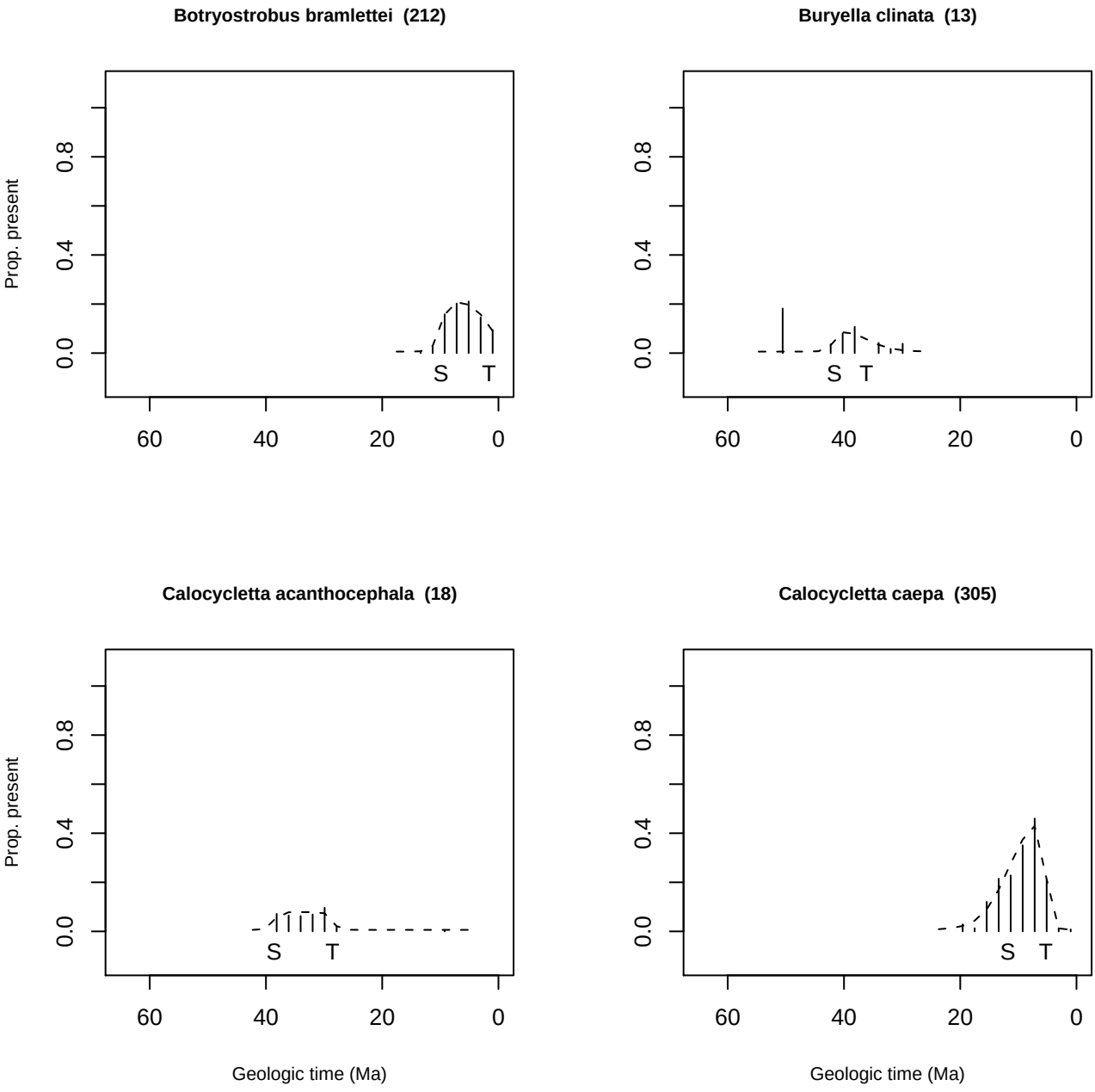

Bekomiforma mynx (13)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T

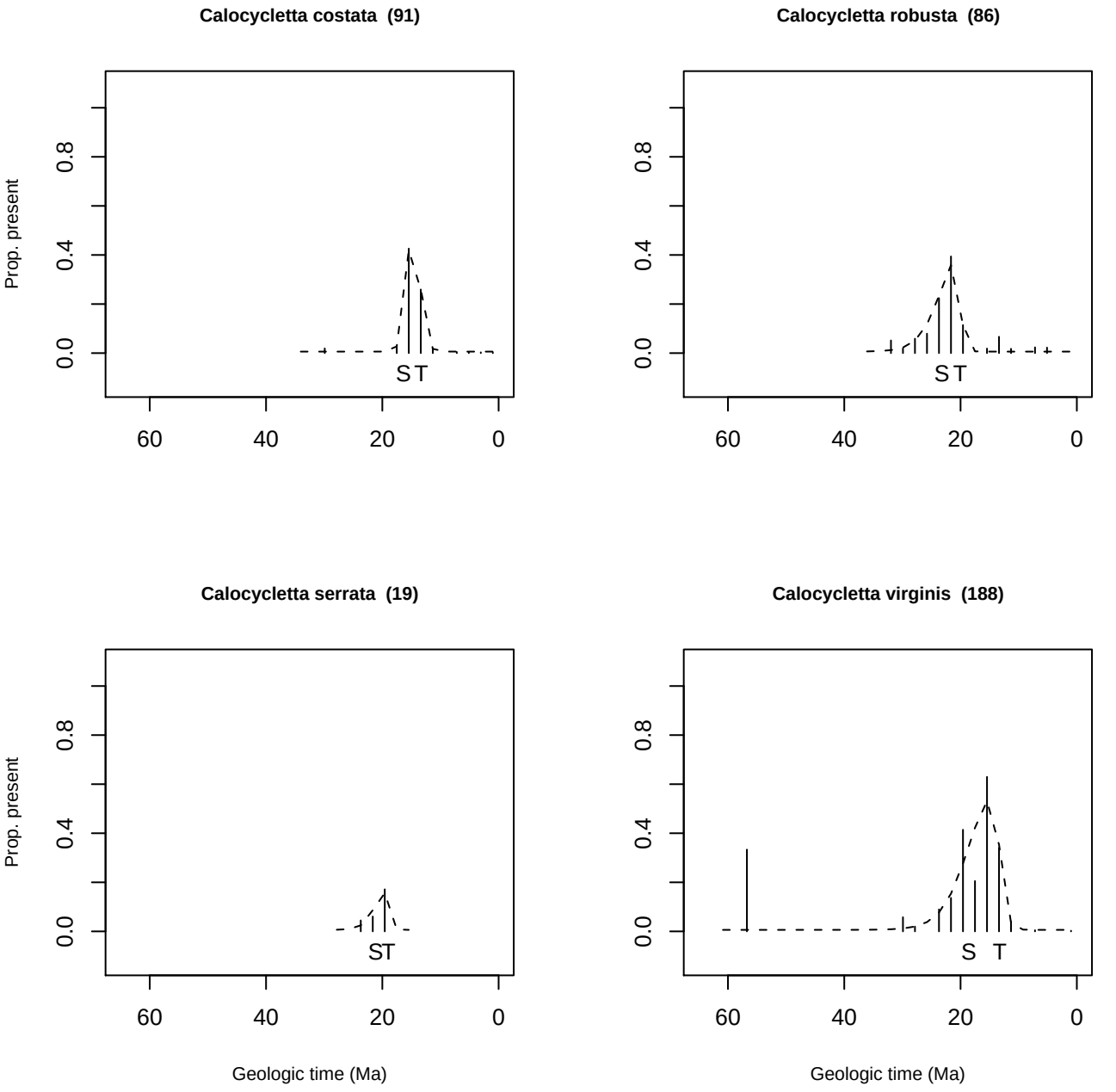

Botryopyle dictyocephalus (41)
0.0
0.4
0.8
60
40
20
0
S
T

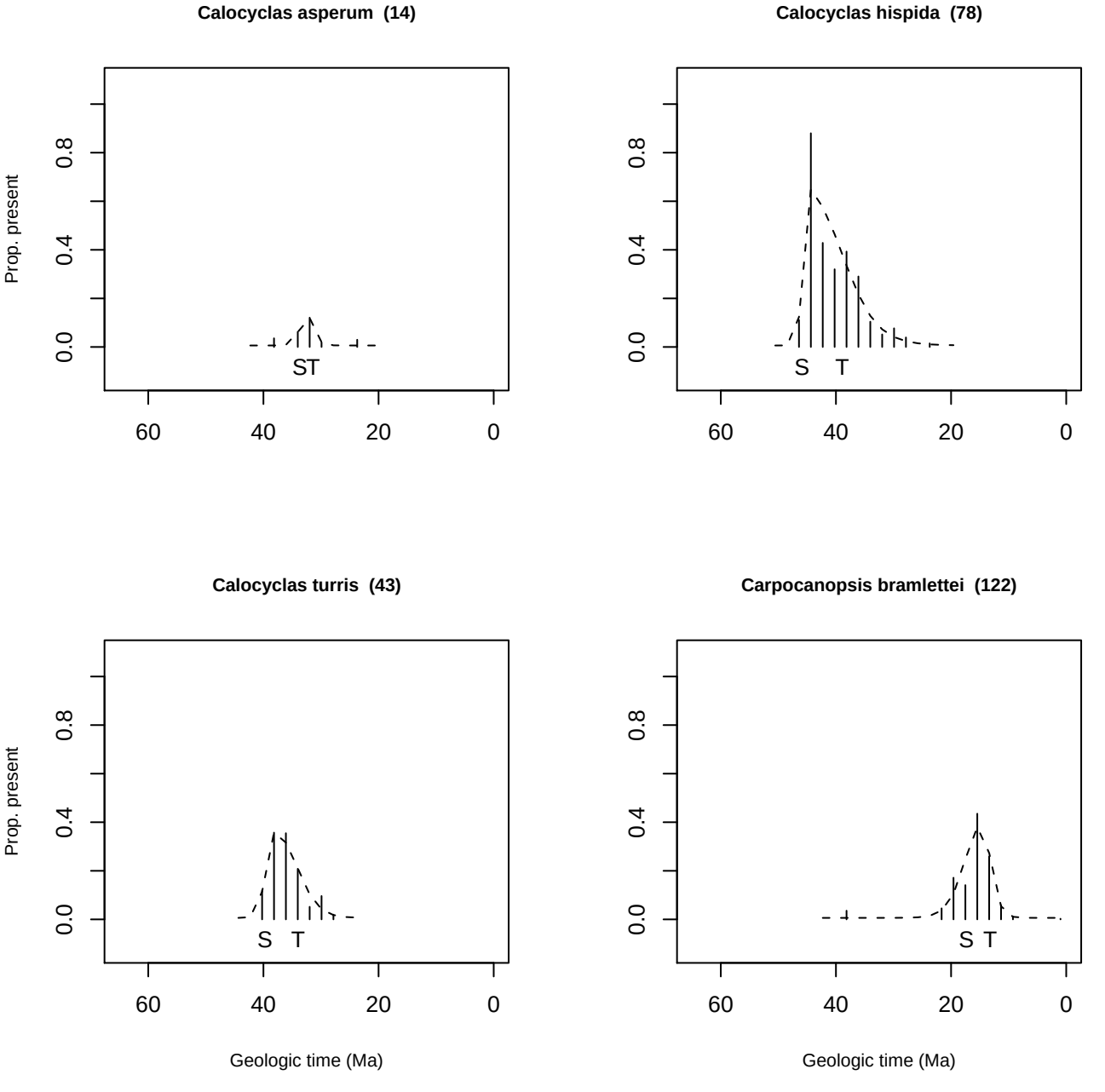
Botryopera triloba (18)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

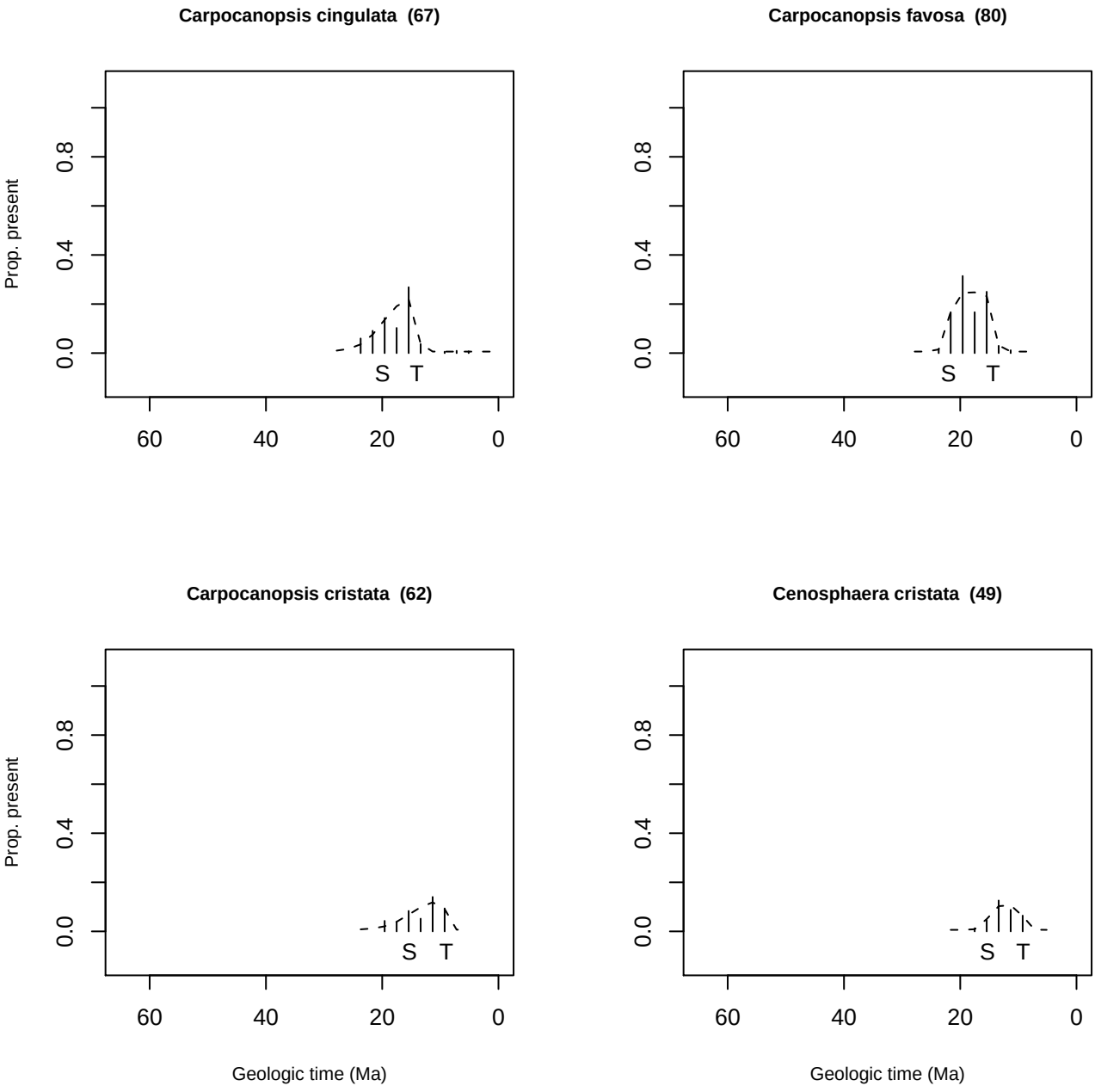

Botryostrobus aquilonaris (128)
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)

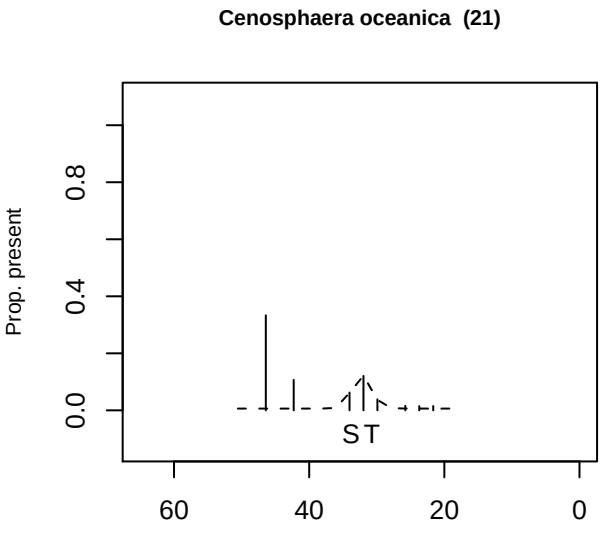

Botryostrobus auritus−australis (192)
Botryostrobus joides (11)
Botryostrobus miralestensis (281)
Botryostrobus tumidulus (20)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

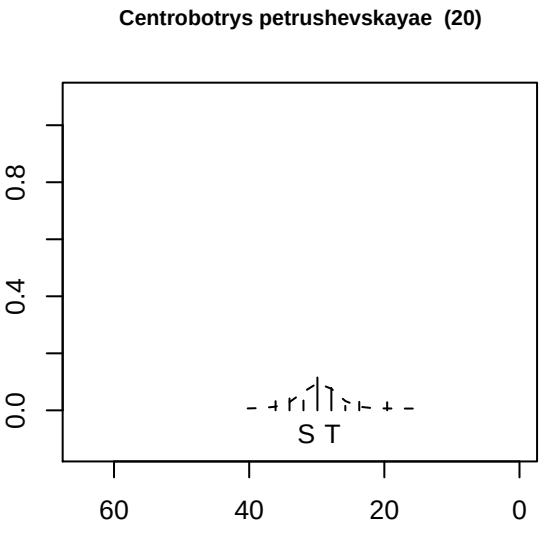

Botryostrobus bramlettei (212)
Buryella clinata (13)
Calocycletta acanthocephala (18)
Calocycletta caepa (305)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

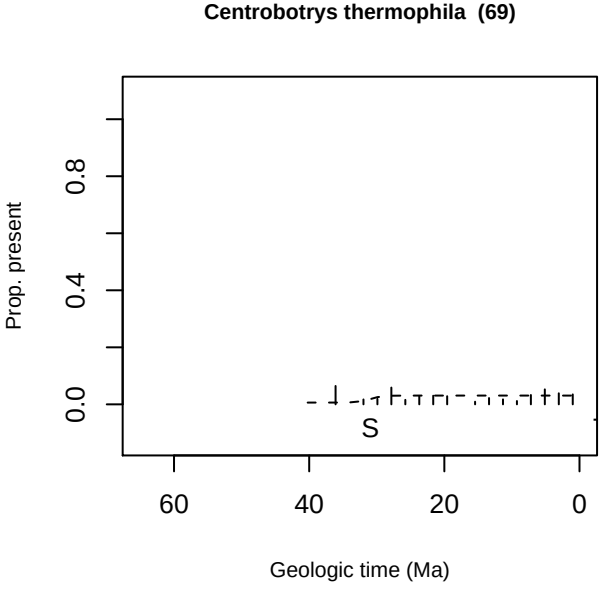

Calocycletta costata (91)
Calocycletta robusta (86)
Calocycletta serrata (19)
Calocycletta virginis (188)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
ST
Geologic time (Ma)

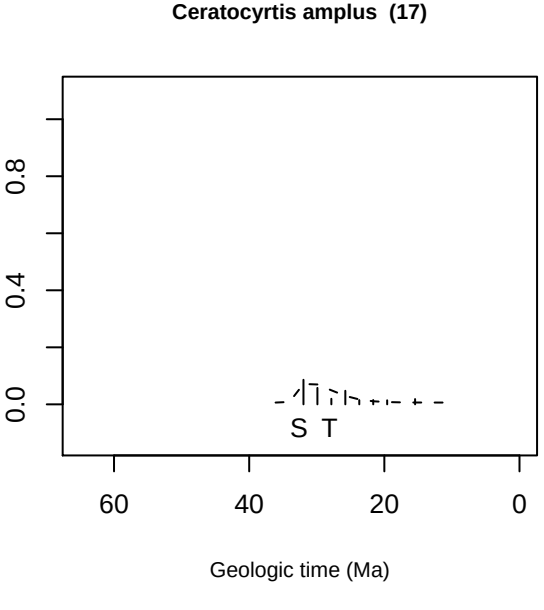

Calocyclas asperum (14)
Calocyclas hispida (78)
Calocyclas turris (43)
Carpocanopsis bramlettei (122)
Prop. present
0.0
0.4
0.8
ST
S
T
60
40
20
0
Geologic time (Ma)

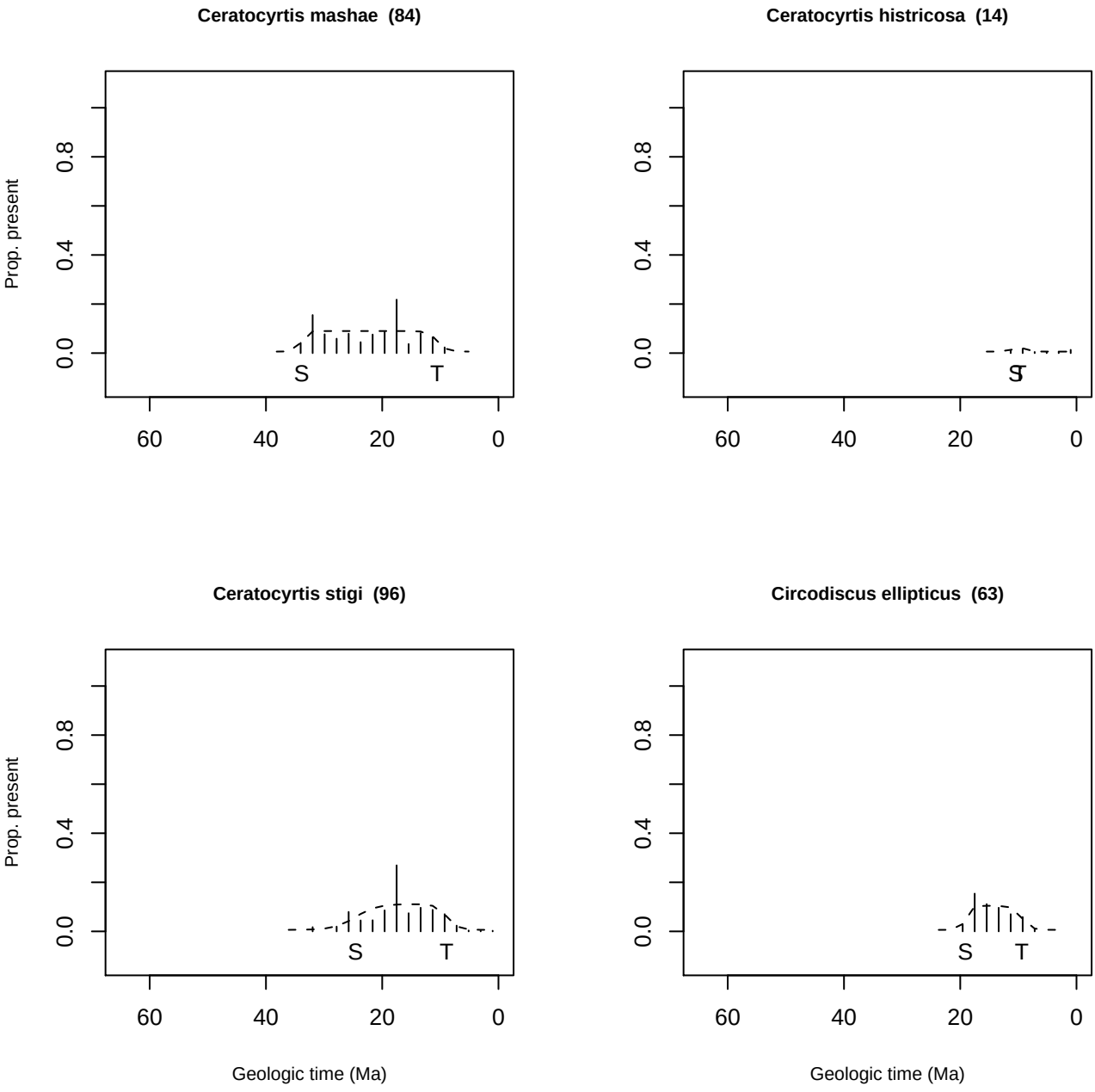

Carpocanopsis cingulata (67)
Carpocanopsis favosa (80)
Carpocanopsis cristata (62)
Cenosphaera cristata (49)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

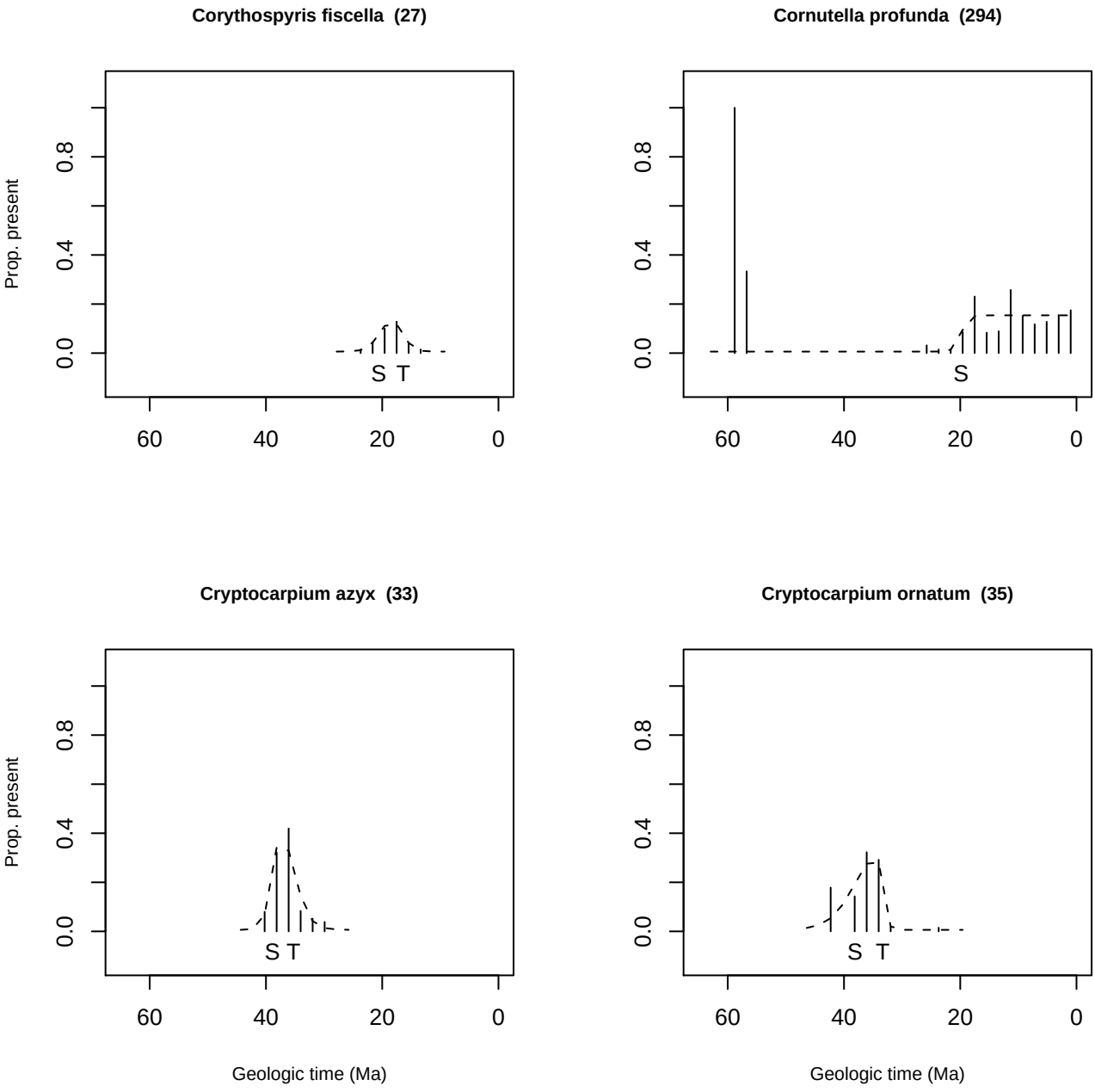

Cenosphaera oceanica (21)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0

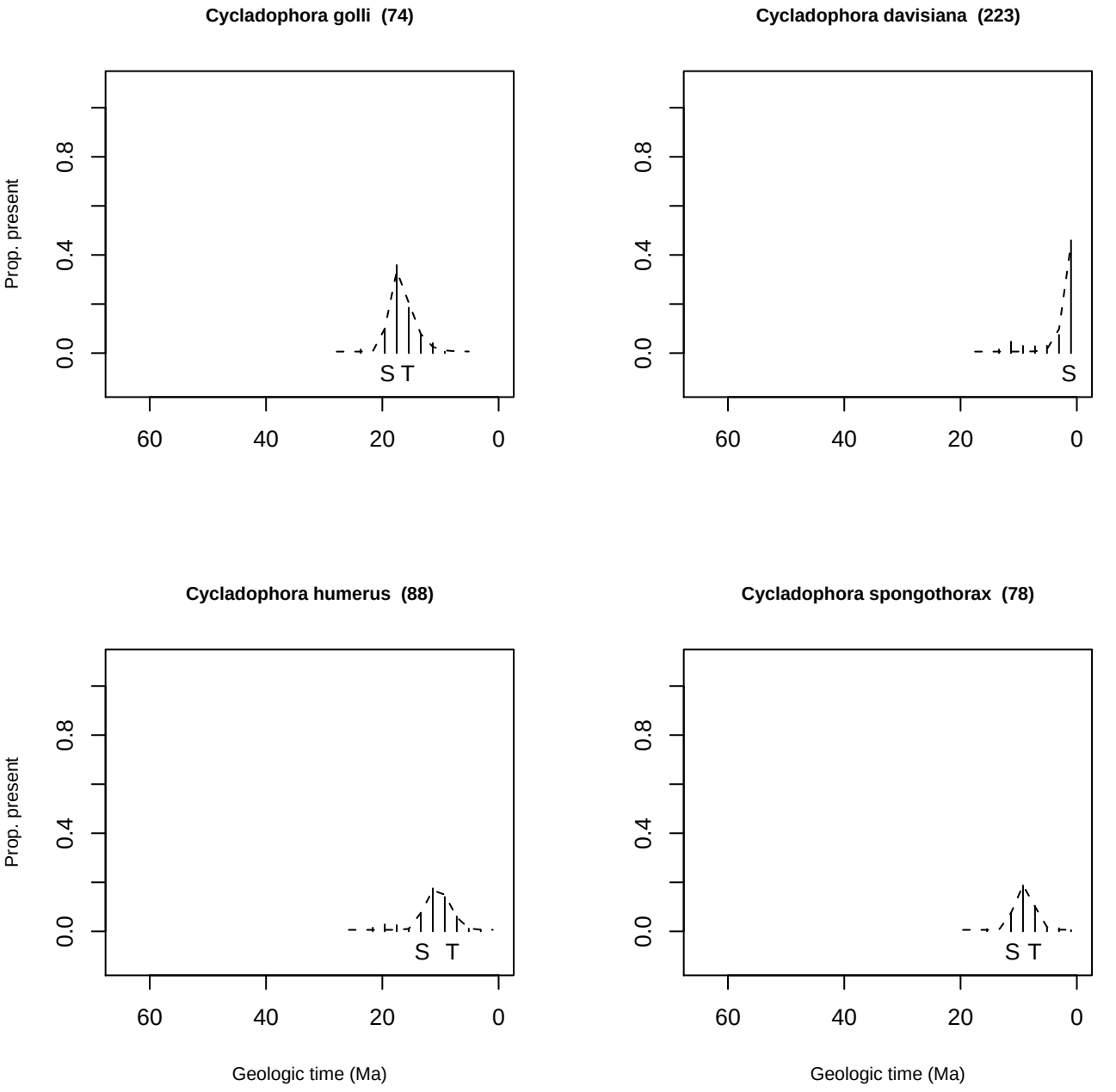

Centrobotrys petrushevskayae (20)
0.0
0.4
0.8
S T
60
40
20
0

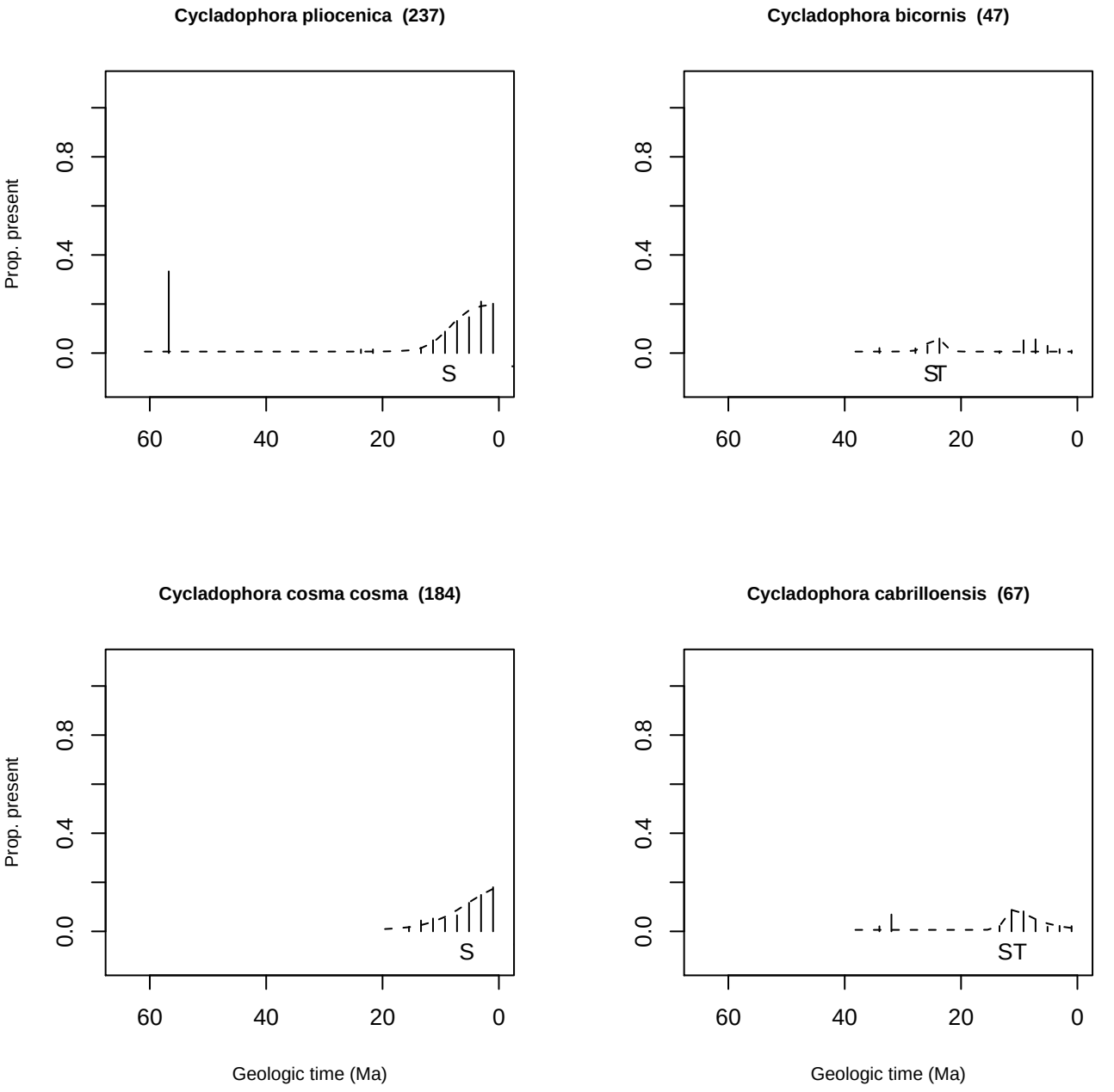

Centrobotrys thermophila (69)
Prop. present
0.0
0.4
0.8
S
60
40
20
0
Geologic time (Ma)

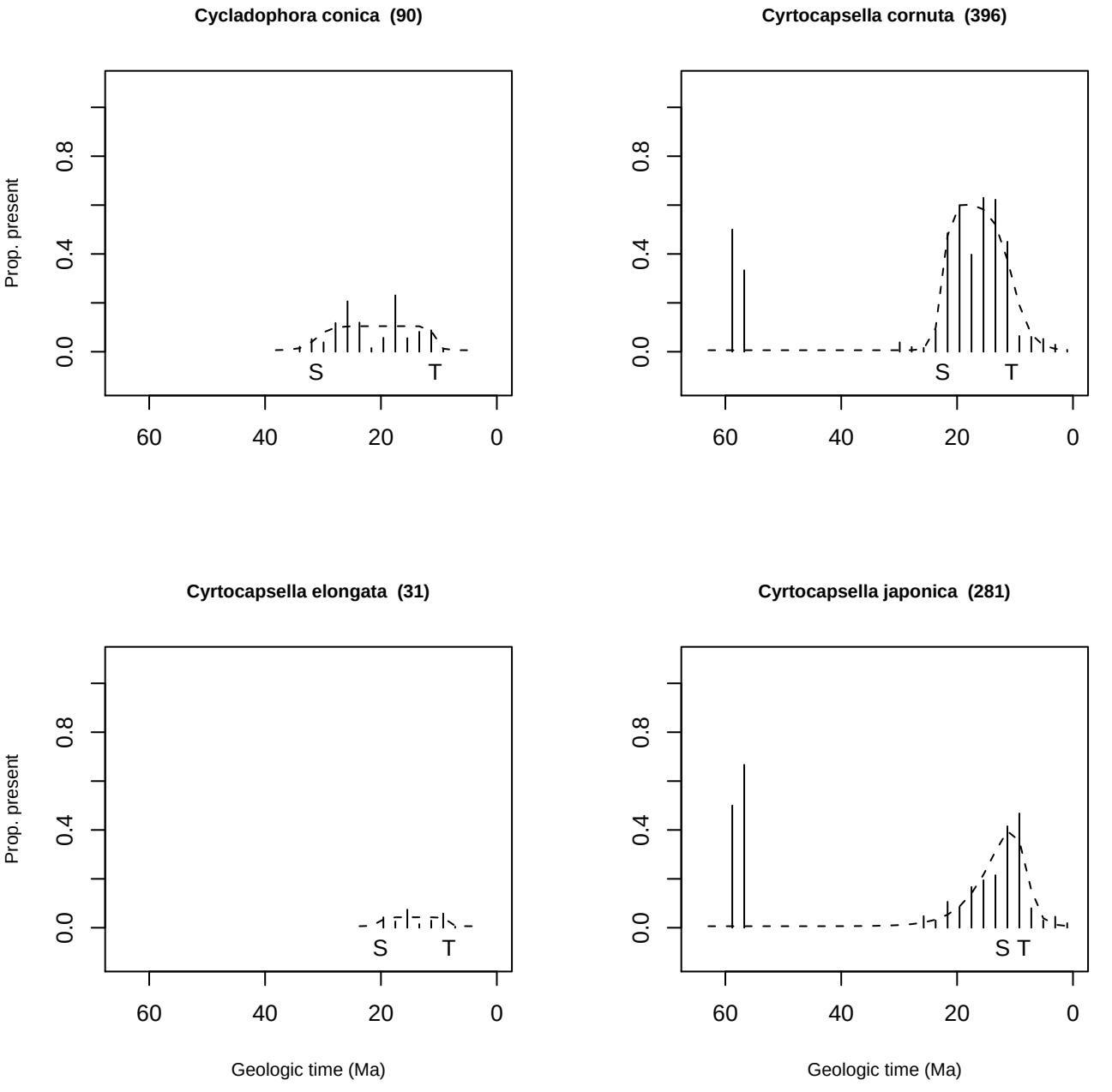

Ceratocyrtis amplus (17)
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

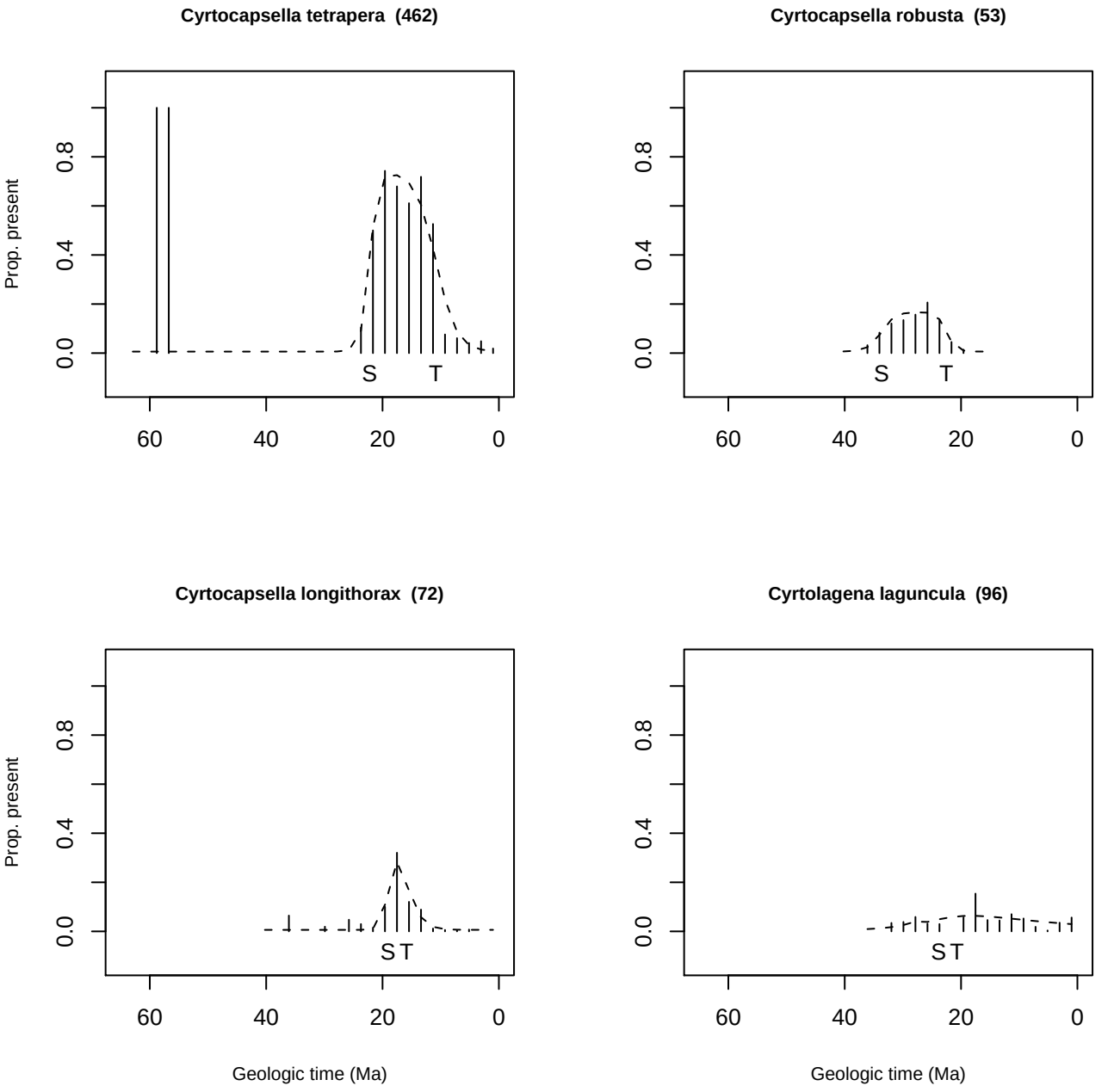

Ceratocyrtis mashae (84)
Ceratocyrtis histricosa (14)
Ceratocyrtis stigi (96)
Circodiscus ellipticus (63)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

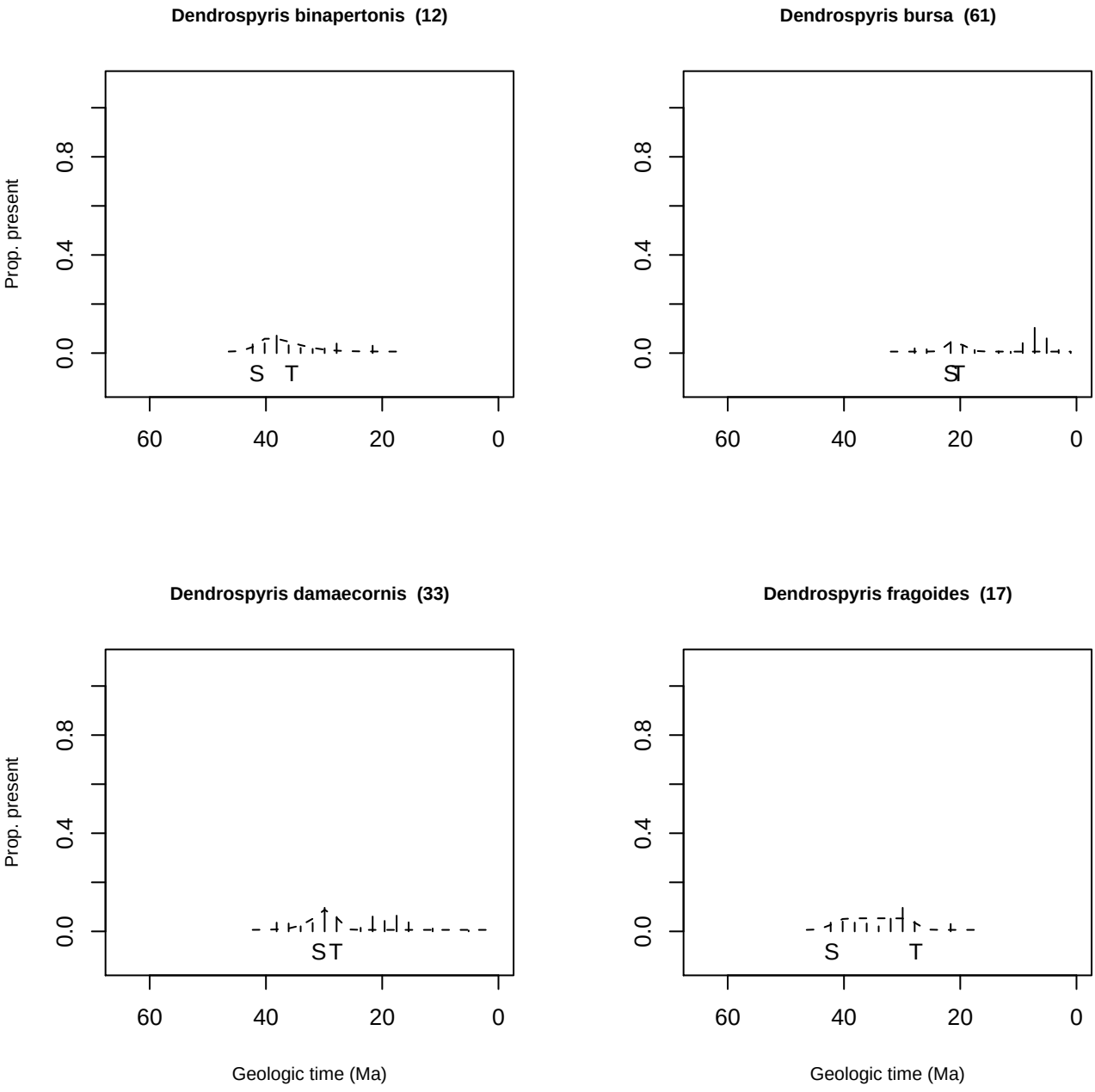

Corythospyris fiscella (27)
Cornutella profunda (294)
Cryptocarpium azyx (33)
Cryptocarpium ornatum (35)
Prop. present
0.0
0.4
0.8
S T
S
60
40
20
0
Geologic time (Ma)

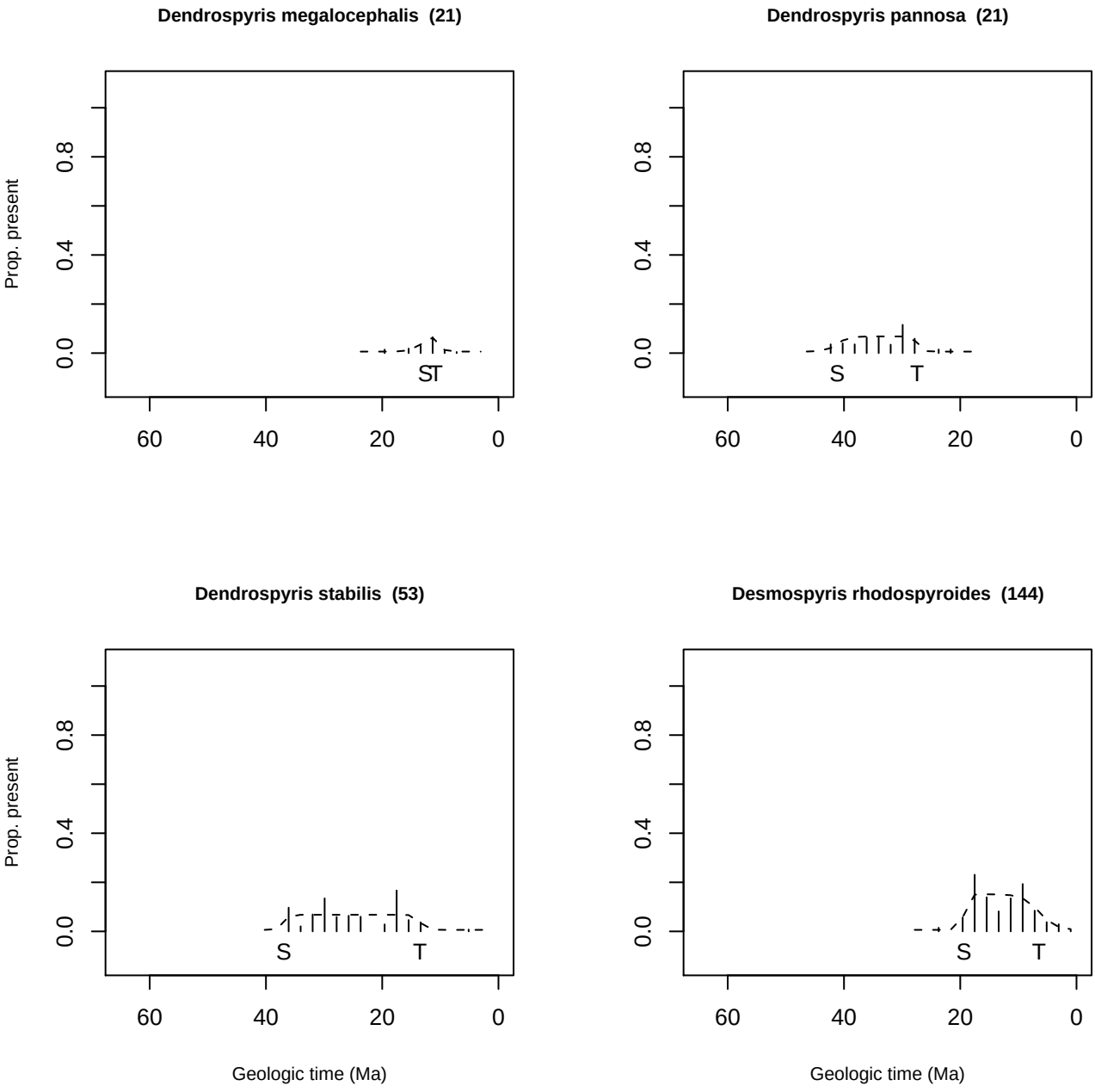

Cycladophora golli (74)
Cycladophora davisiana (223)
Cycladophora humerus (88)
Cycladophora spongothorax (78)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
S
S T
S T
Geologic time (Ma)
Geologic time (Ma)

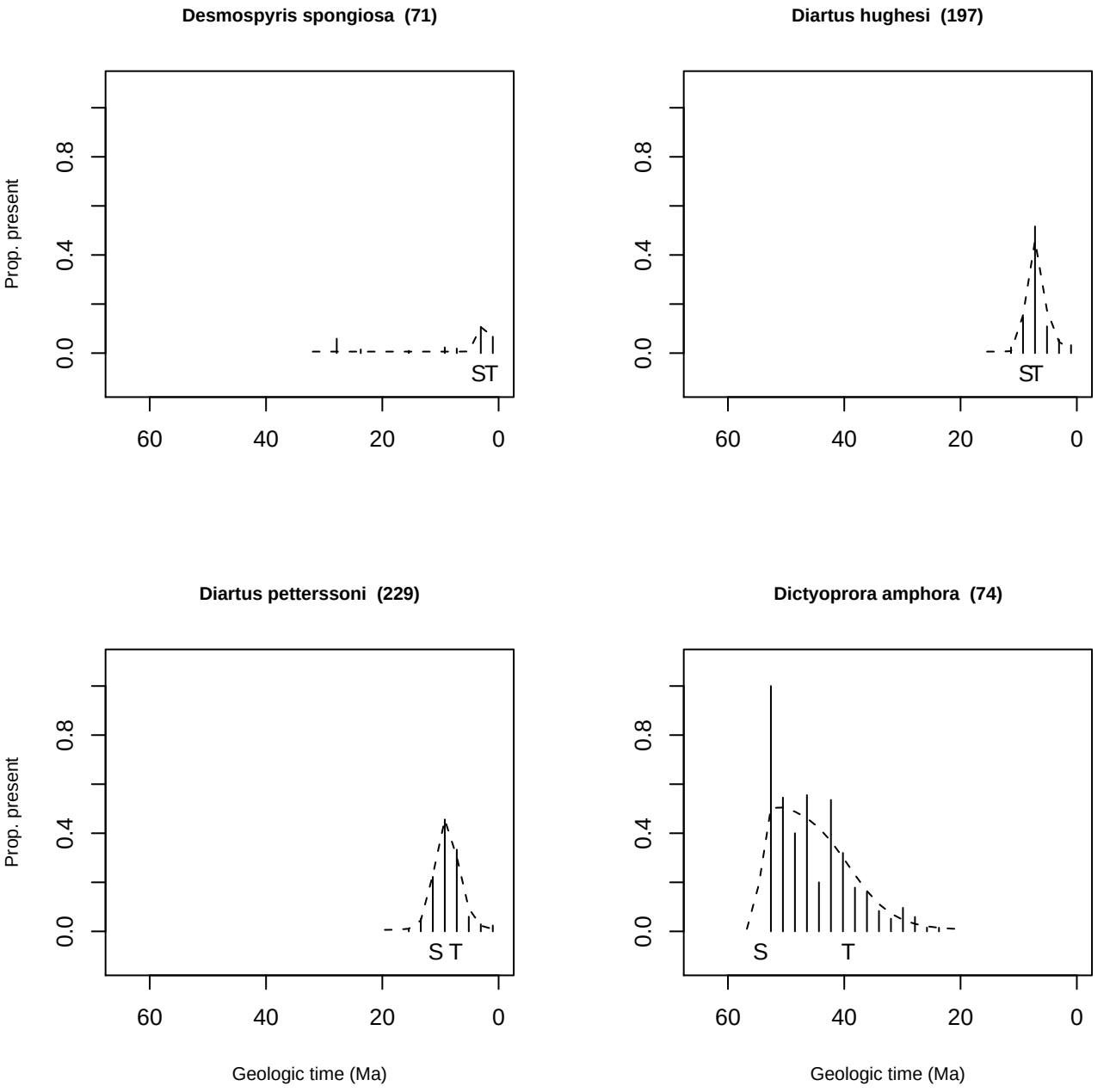

Cycladophora pliocenica (237)
Cycladophora bicornis (47)
Cycladophora cosma cosma (184)
Cycladophora cabrilloensis (67)
Prop. present
0.0
0.4
0.8
S
ST
60
40
20
0
Geologic time (Ma)

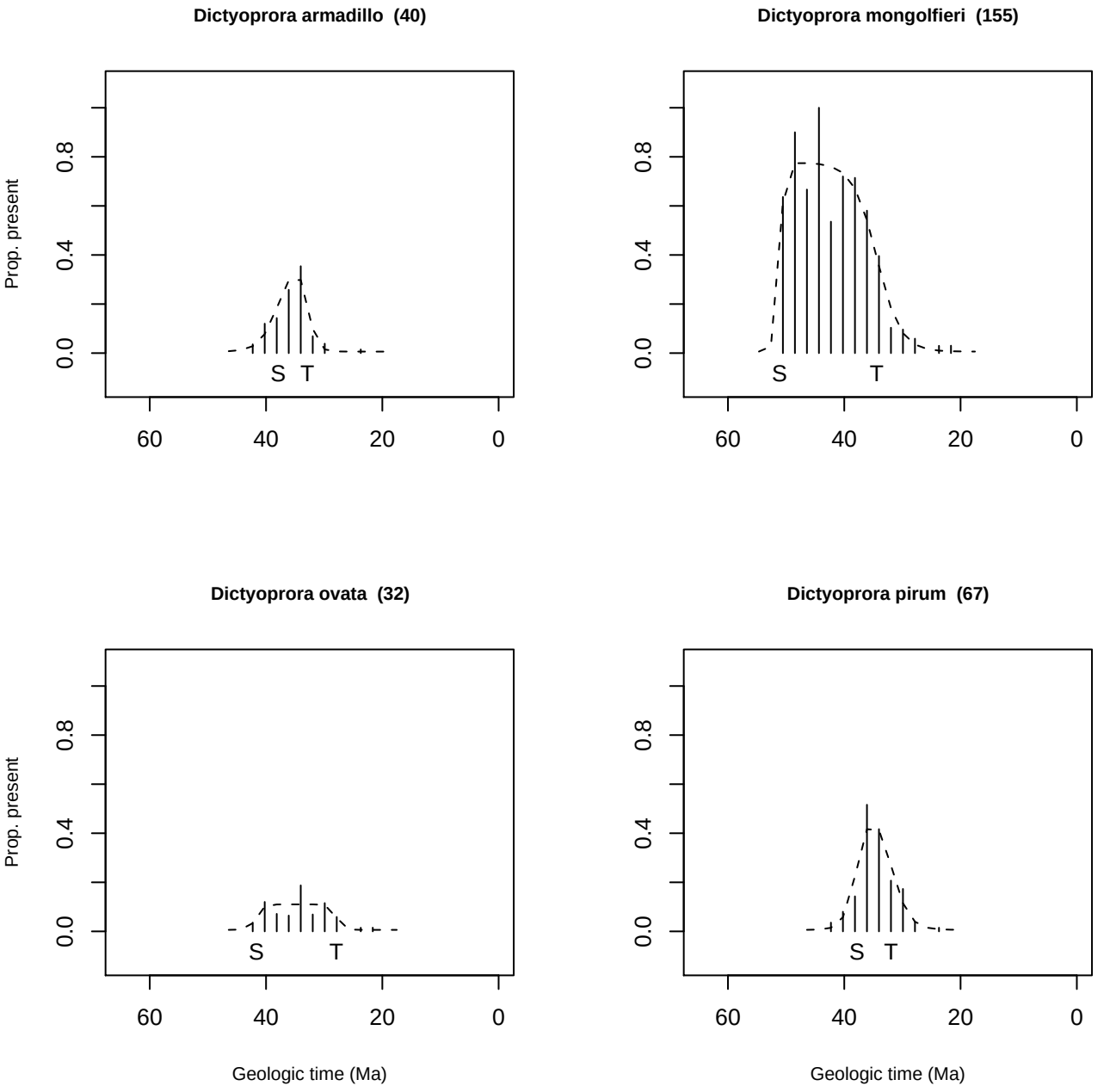

Cycladophora conica (90)
Cyrtocapsella cornuta (396)
Cyrtocapsella elongata (31)
Cyrtocapsella japonica (281)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

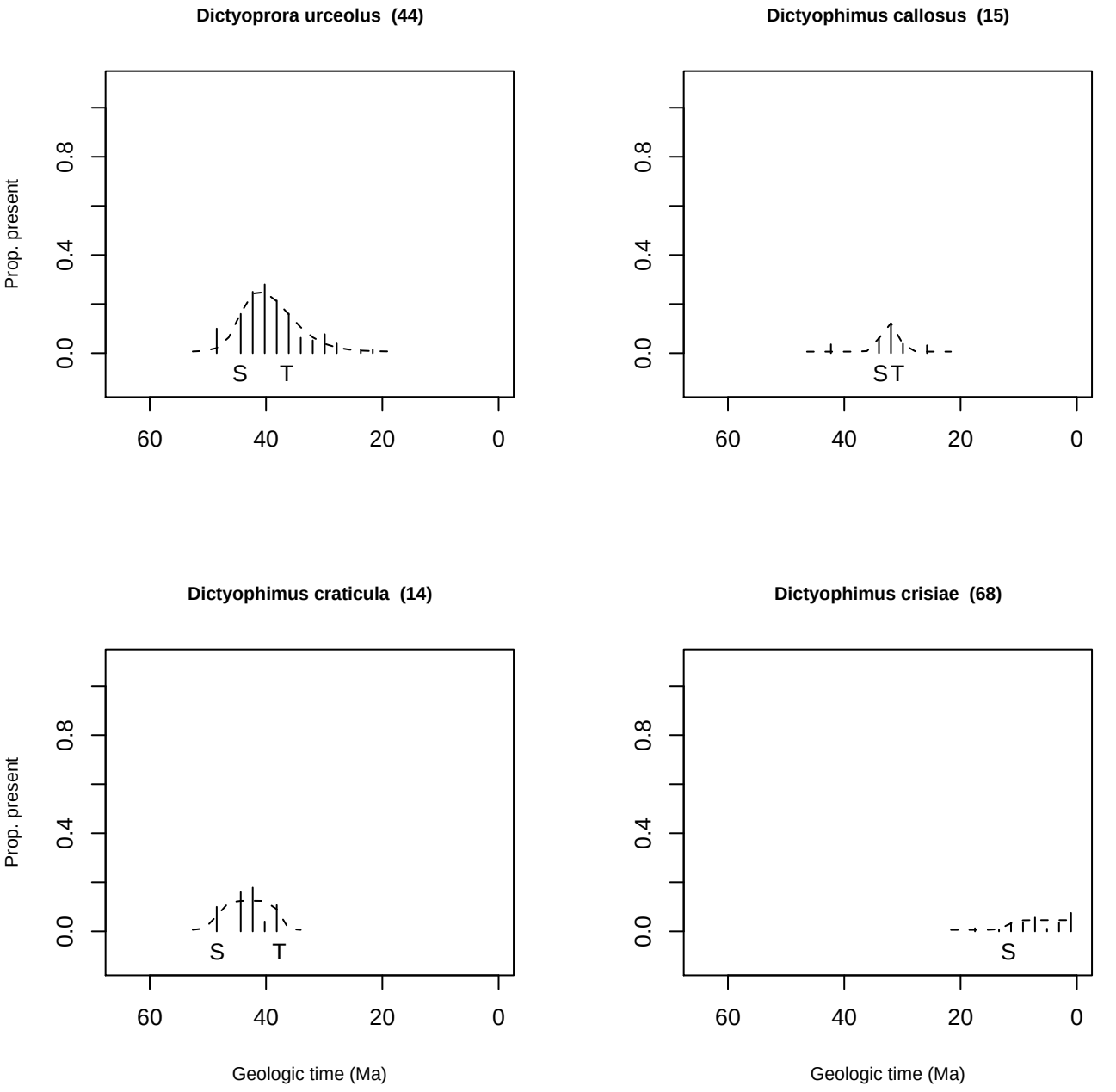

Cyrtocapsella tetrapera (462)
Cyrtocapsella robusta (53)
Cyrtocapsella longithorax (72)
Cyrtolagena laguncula (96)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

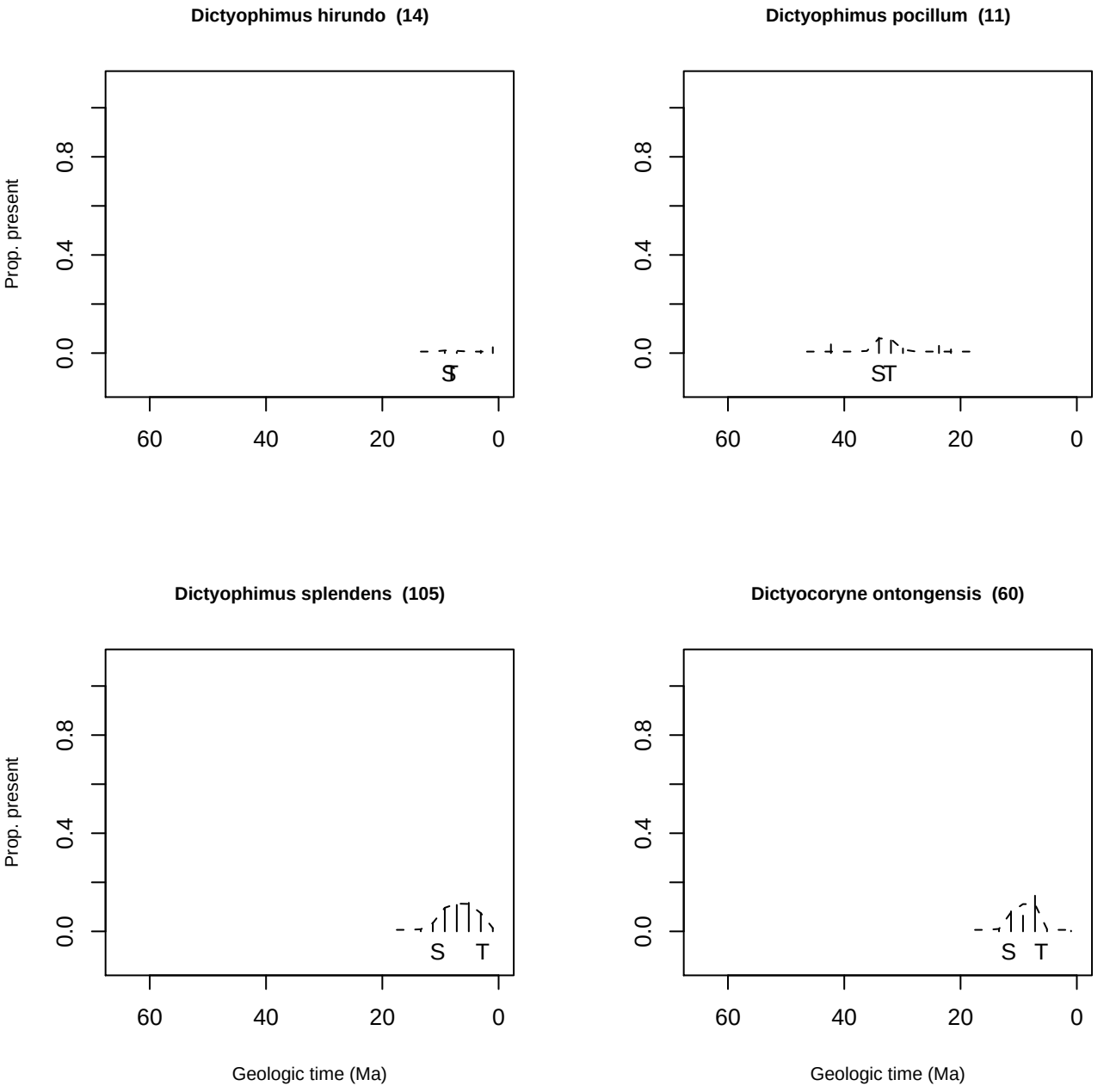

Dendrospyris binapertonis (12)
Dendrospyris bursa (61)
Dendrospyris damaecornis (33)
Dendrospyris fragoides (17)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Dendrospyris megalocephalis (21)
Dendrospyris pannosa (21)
Dendrospyris stabilis (53)
Desmospyris rhodospyroides (144)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)


Desmospyris spongiosa (71)
Diartus hughesi (197)
Diartus petterssoni (229)
Dictyoprora amphora (74)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S T
S
T
Geologic time (Ma)


Dictyoprora armadillo (40)
Dictyoprora mongolfieri (155)
Dictyoprora ovata (32)
Dictyoprora pirum (67)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Dictyoprora urceolus (44)
Dictyophimus callosus (15)
Dictyophimus craticula (14)
Dictyophimus crisiae (68)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)


Dictyophimus hirundo (14)
Dictyophimus pocillum (11)
Dictyophimus splendens (105)
Dictyocoryne ontongensis (60)
Prop. present
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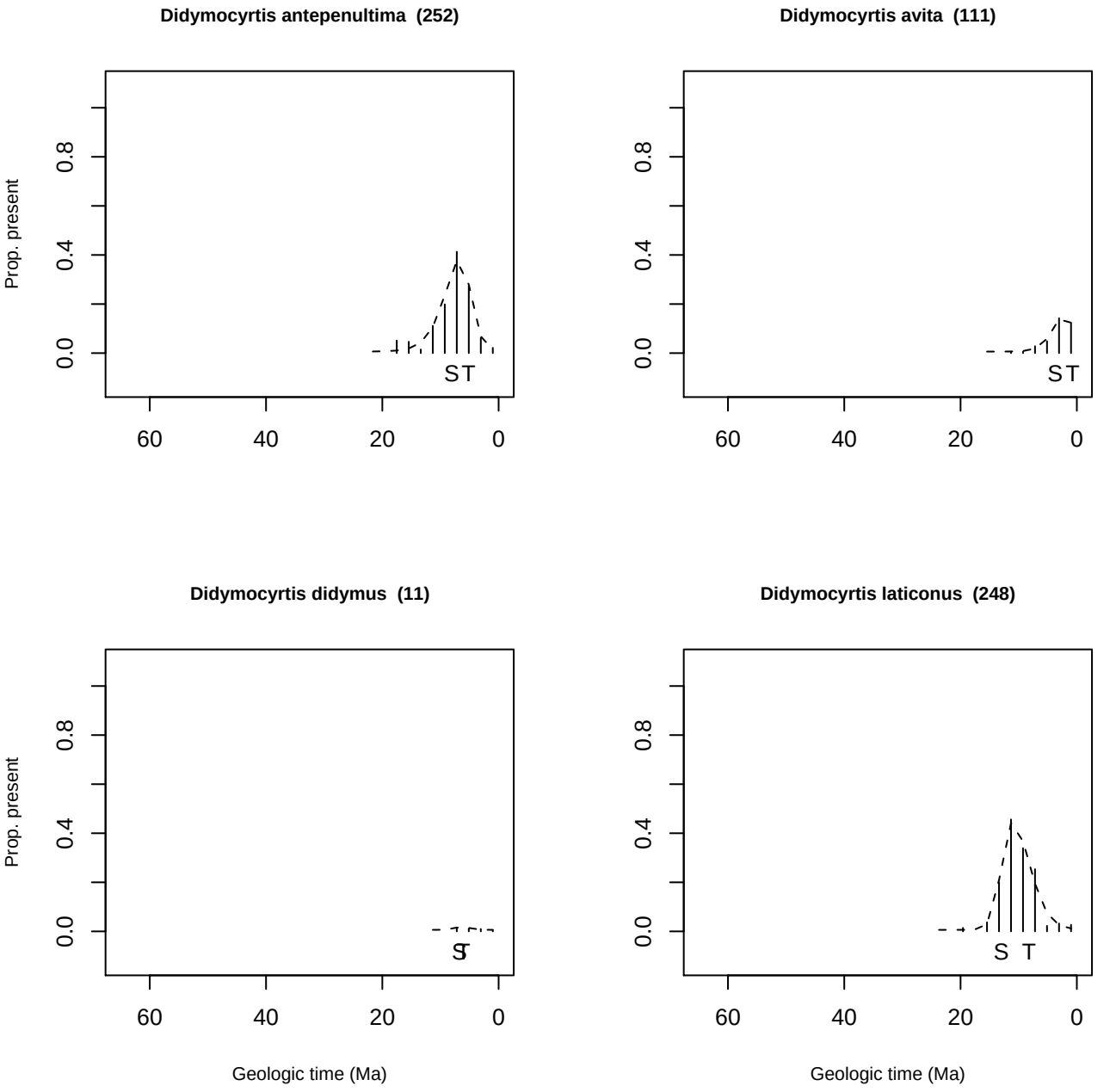
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Didymocyrtis antepenultima (252)
Didymocyrtis avita (111)
Didymocyrtis didymus (11)
Didymocyrtis laticonus (248)
Prop. present
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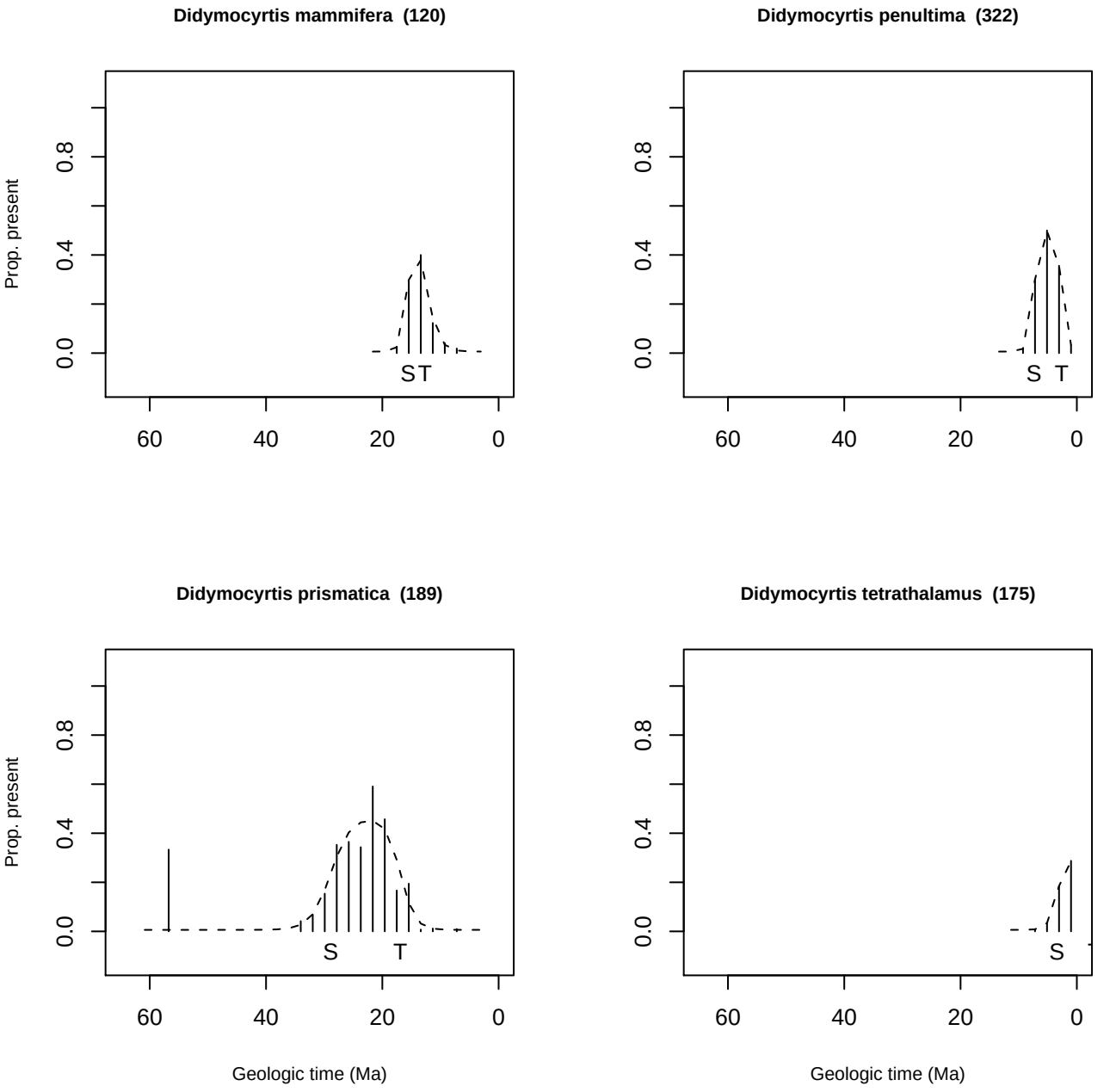
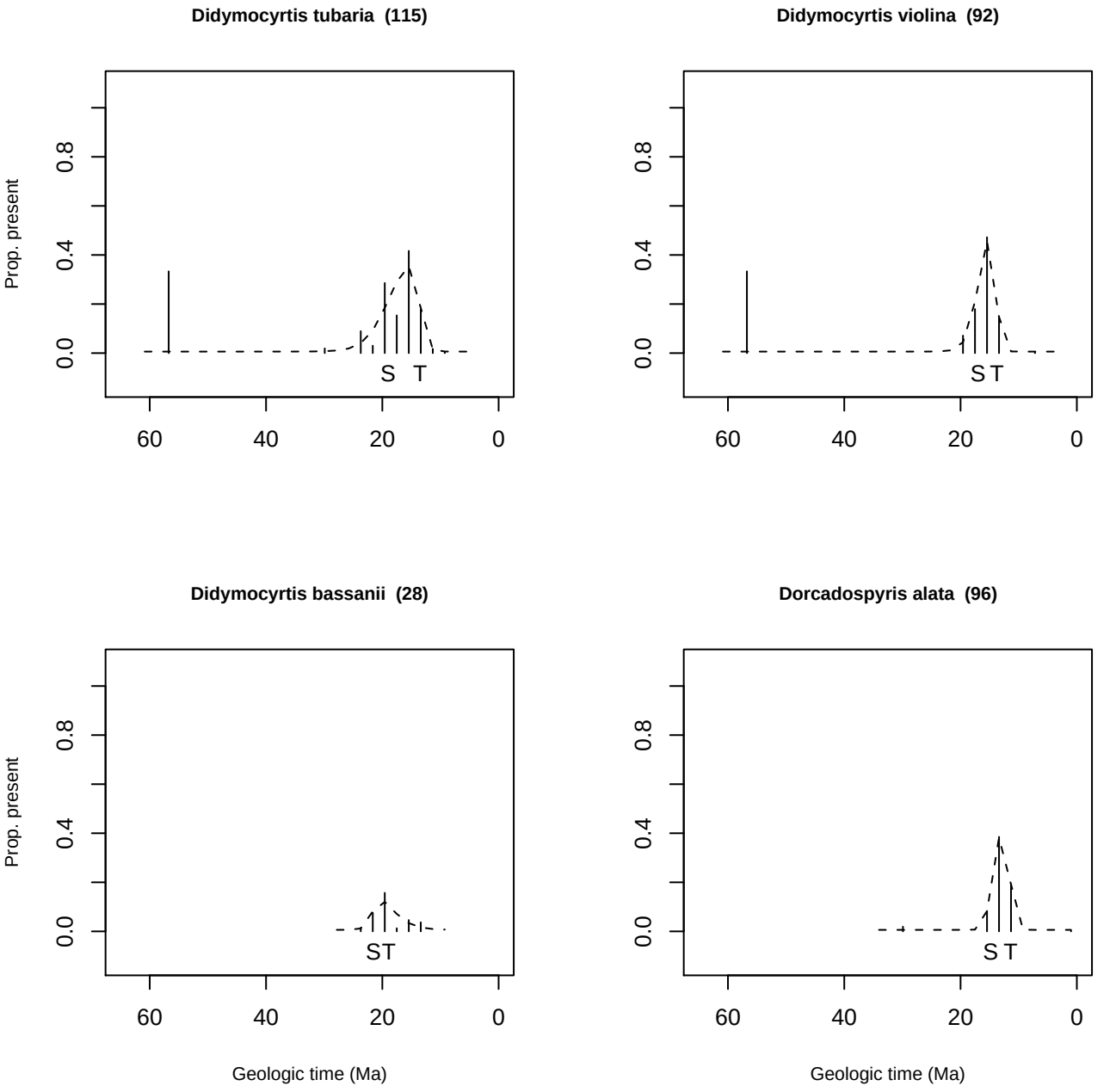
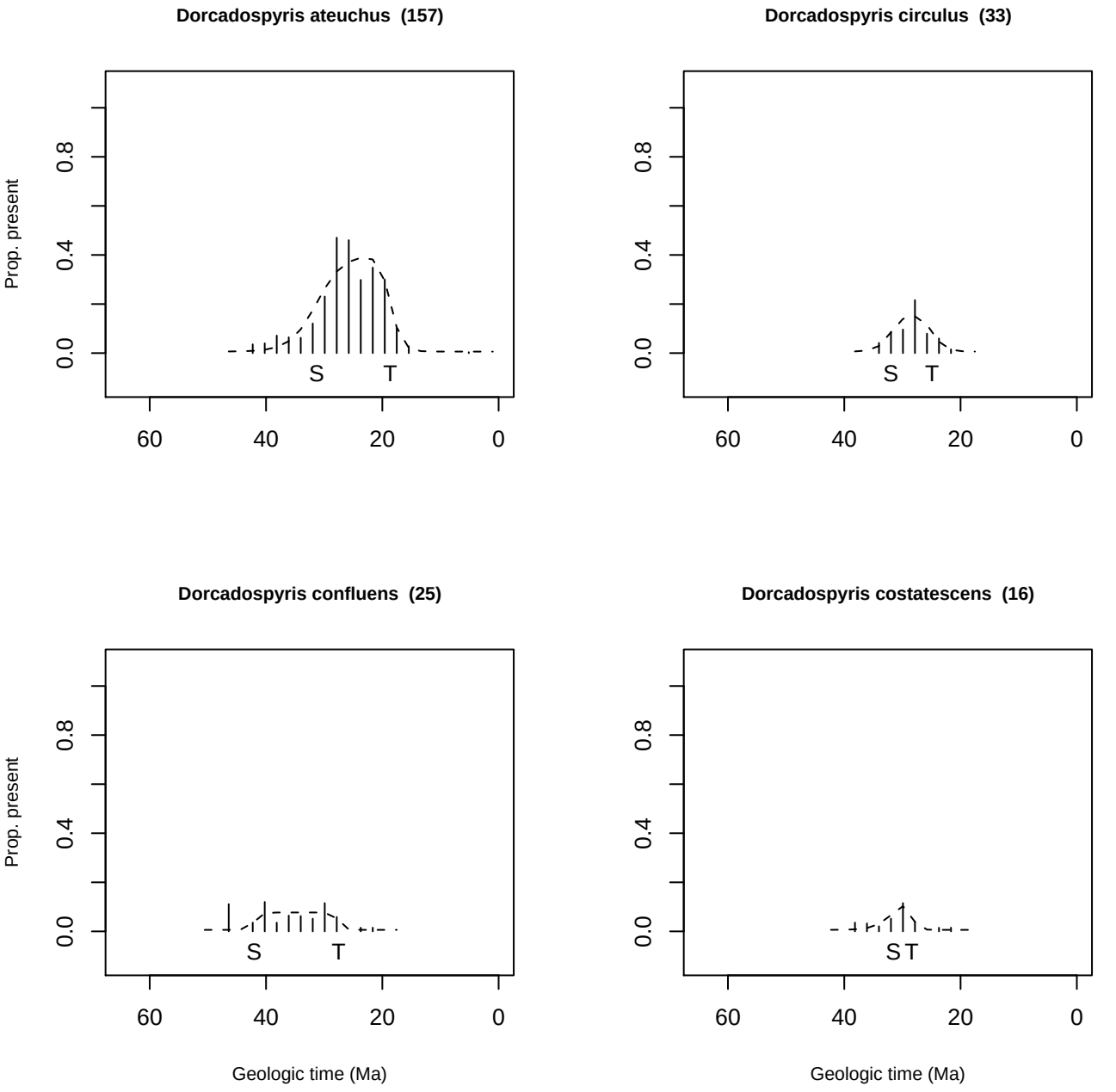
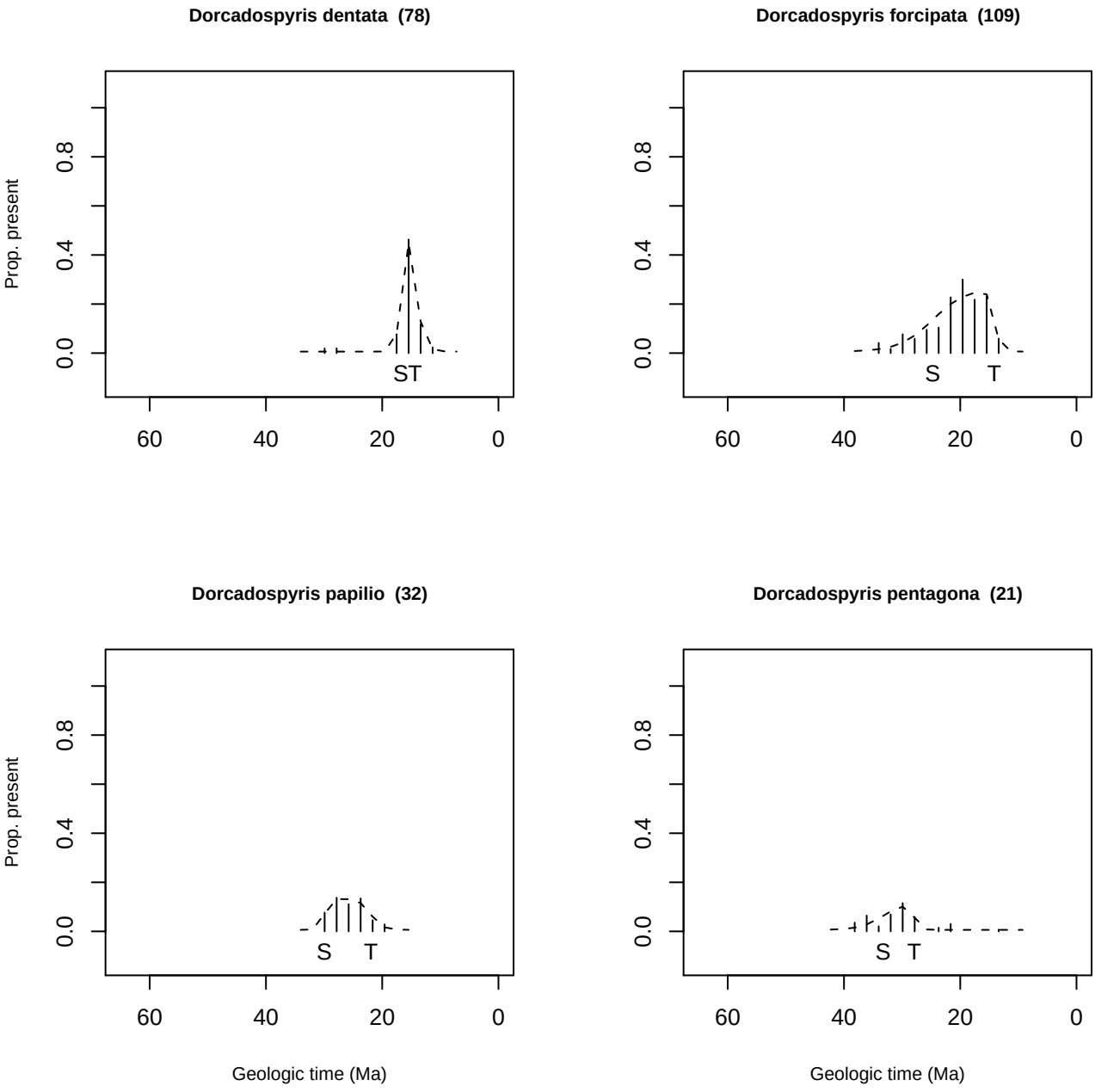
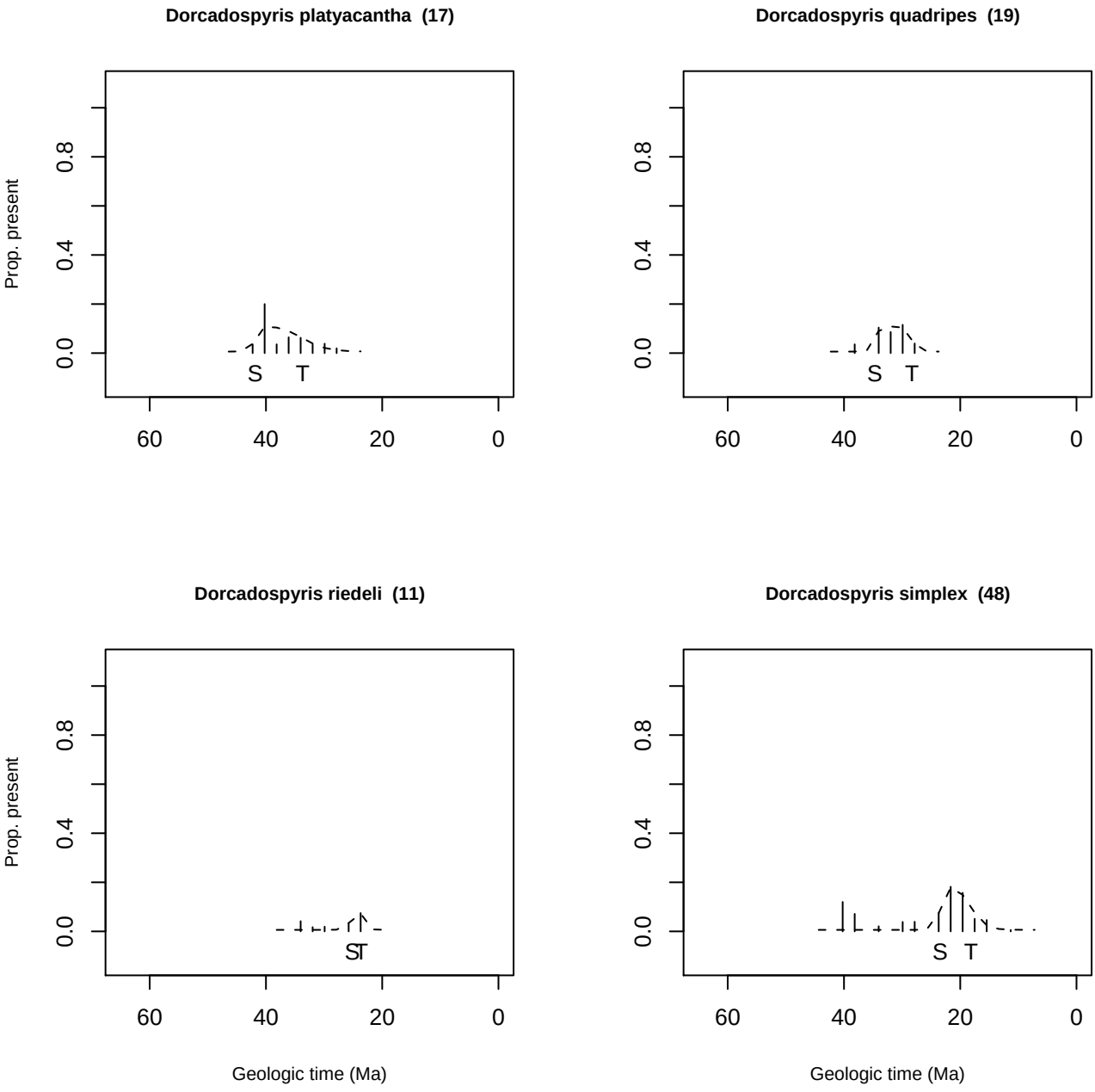
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

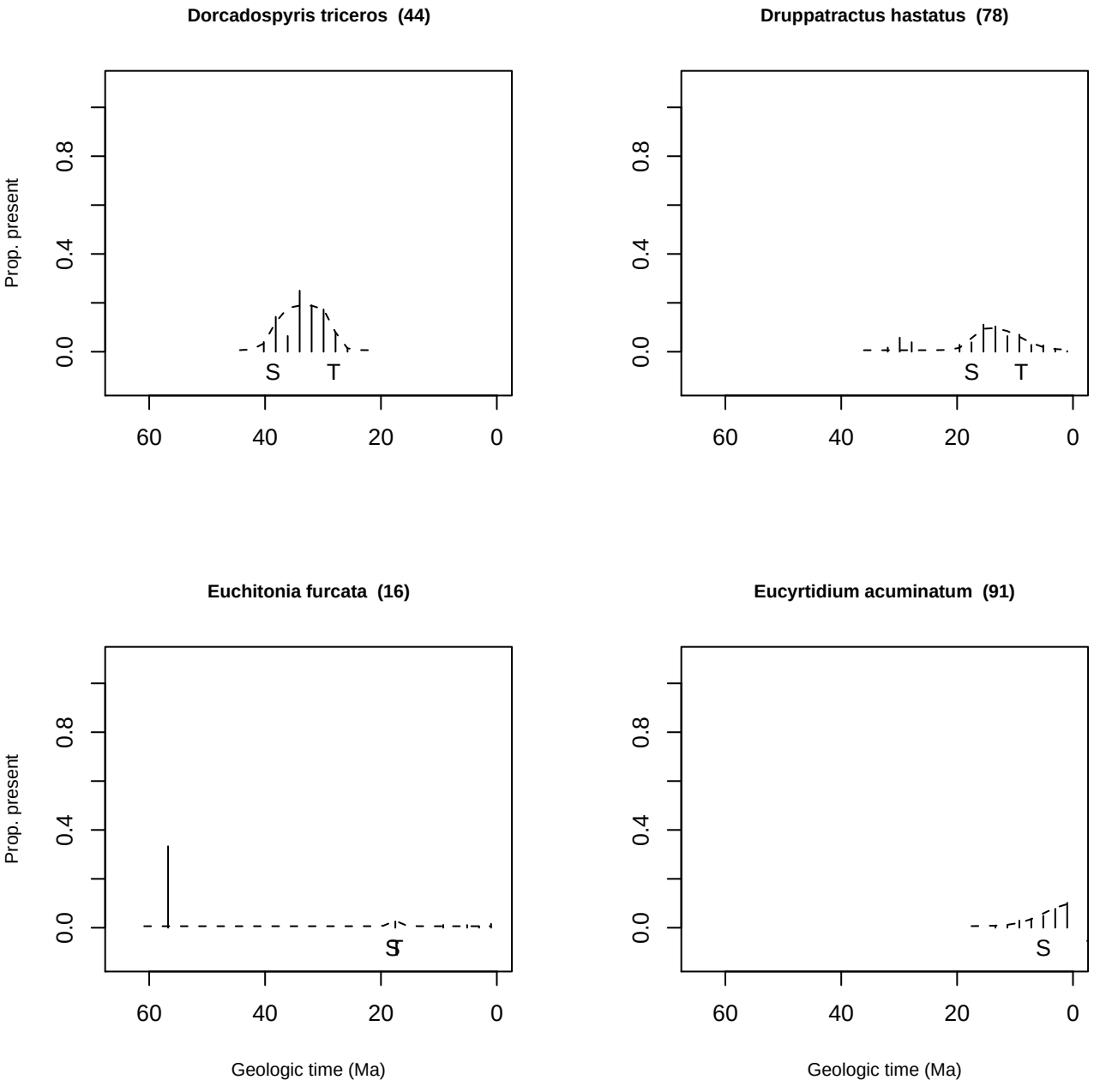

Didymocyrtis mammifera (120)
Didymocyrtis penultima (322)
Didymocyrtis prismatica (189)
Didymocyrtis tetrathalamus (175)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
S T
S T
S
Geologic time (Ma)
Geologic time (Ma)

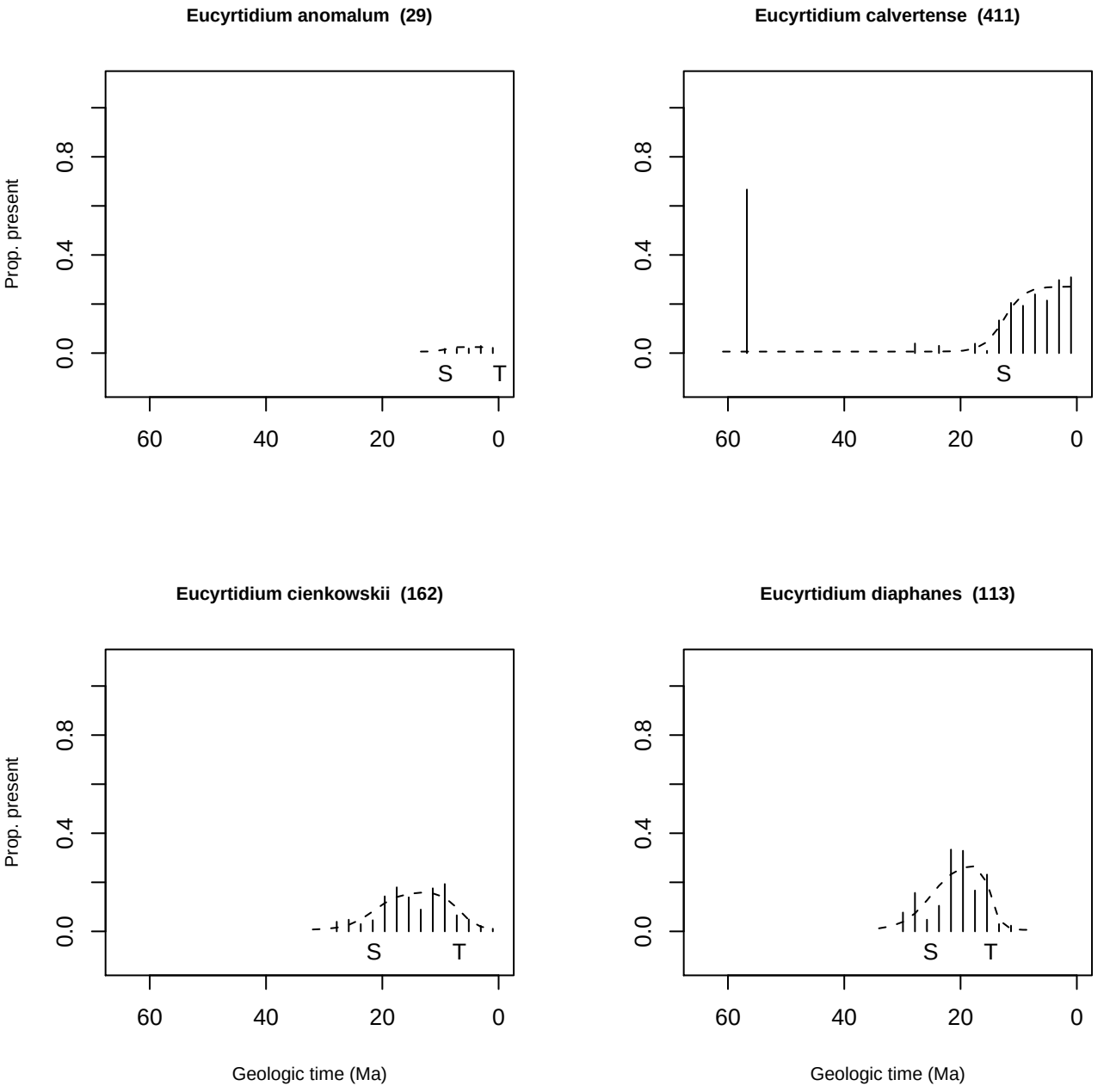

Didymocyrtis tubaria (115)
Didymocyrtis violina (92)
Didymocyrtis bassanii (28)
Dorcadospyris alata (96)
Prop. present
0.0
0.4
0.8
S T
ST
60
40
20
0
Geologic time (Ma)

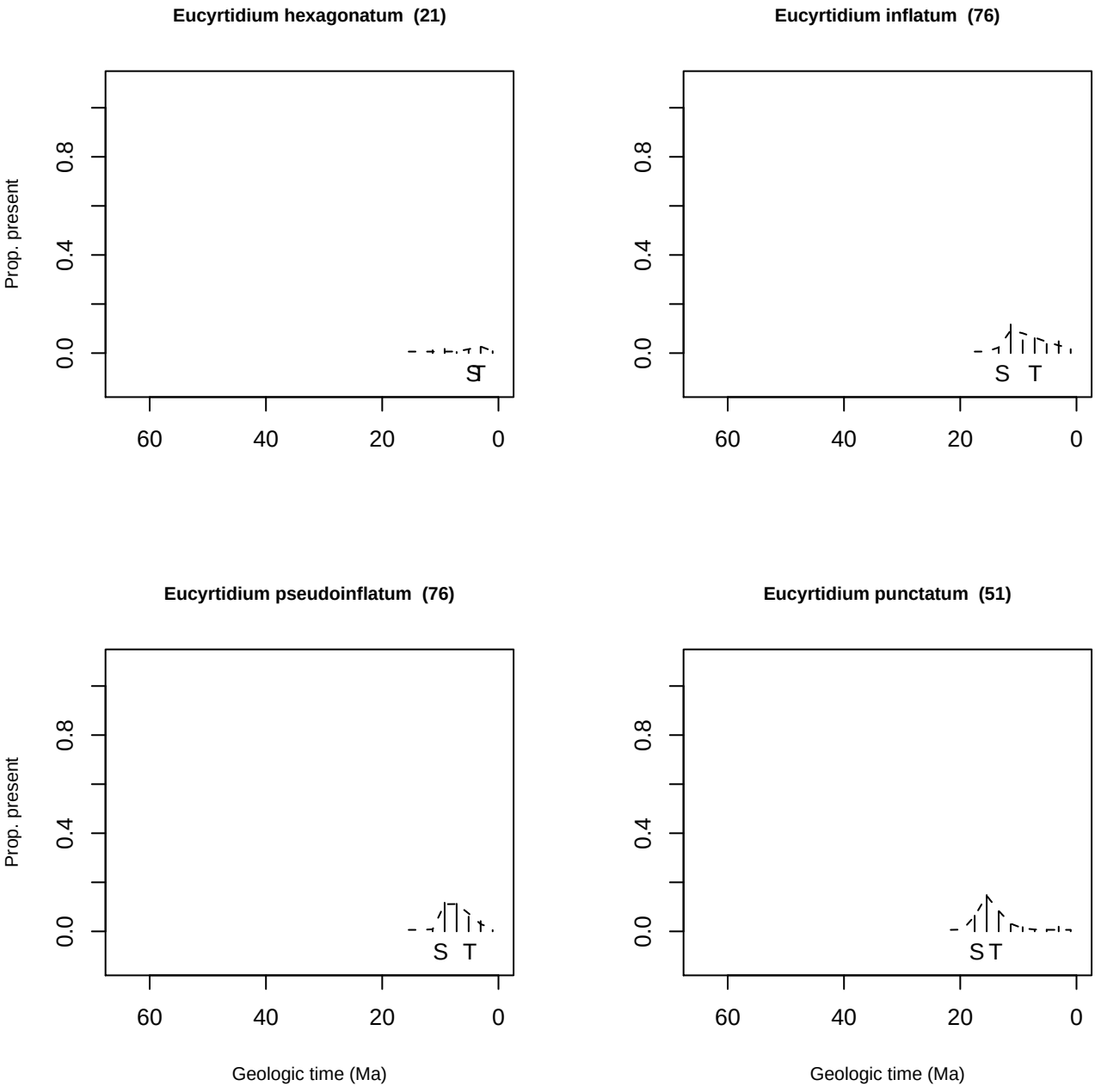

Dorcadospyris ateuchus (157)
Dorcadospyris circulus (33)
Dorcadospyris confluens (25)
Dorcadospyris costatescens (16)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

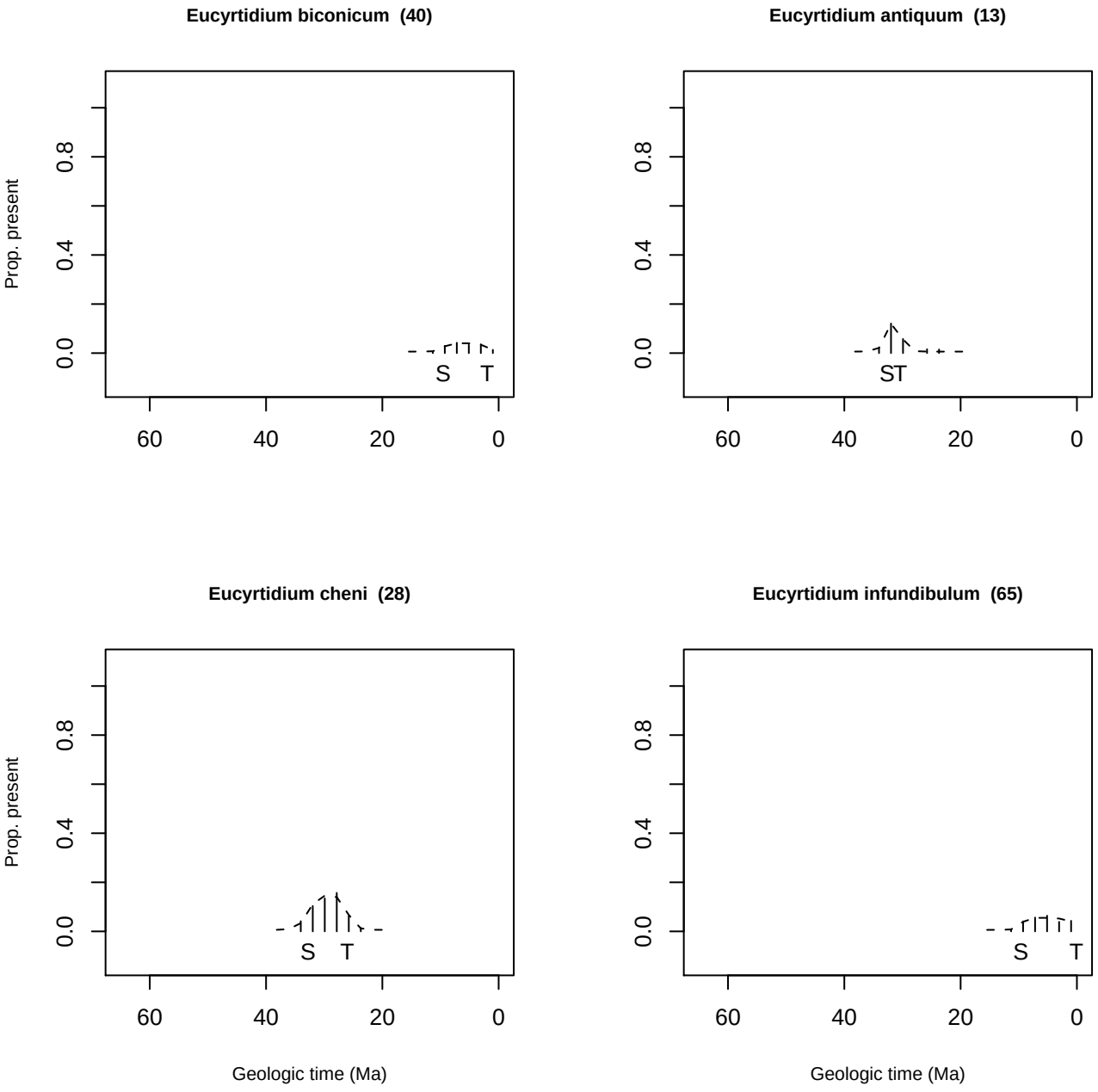

Dorcadospyris dentata (78)
Dorcadospyris forcipata (109)
Dorcadospyris papilio (32)
Dorcadospyris pentagona (21)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
T
Geologic time (Ma)

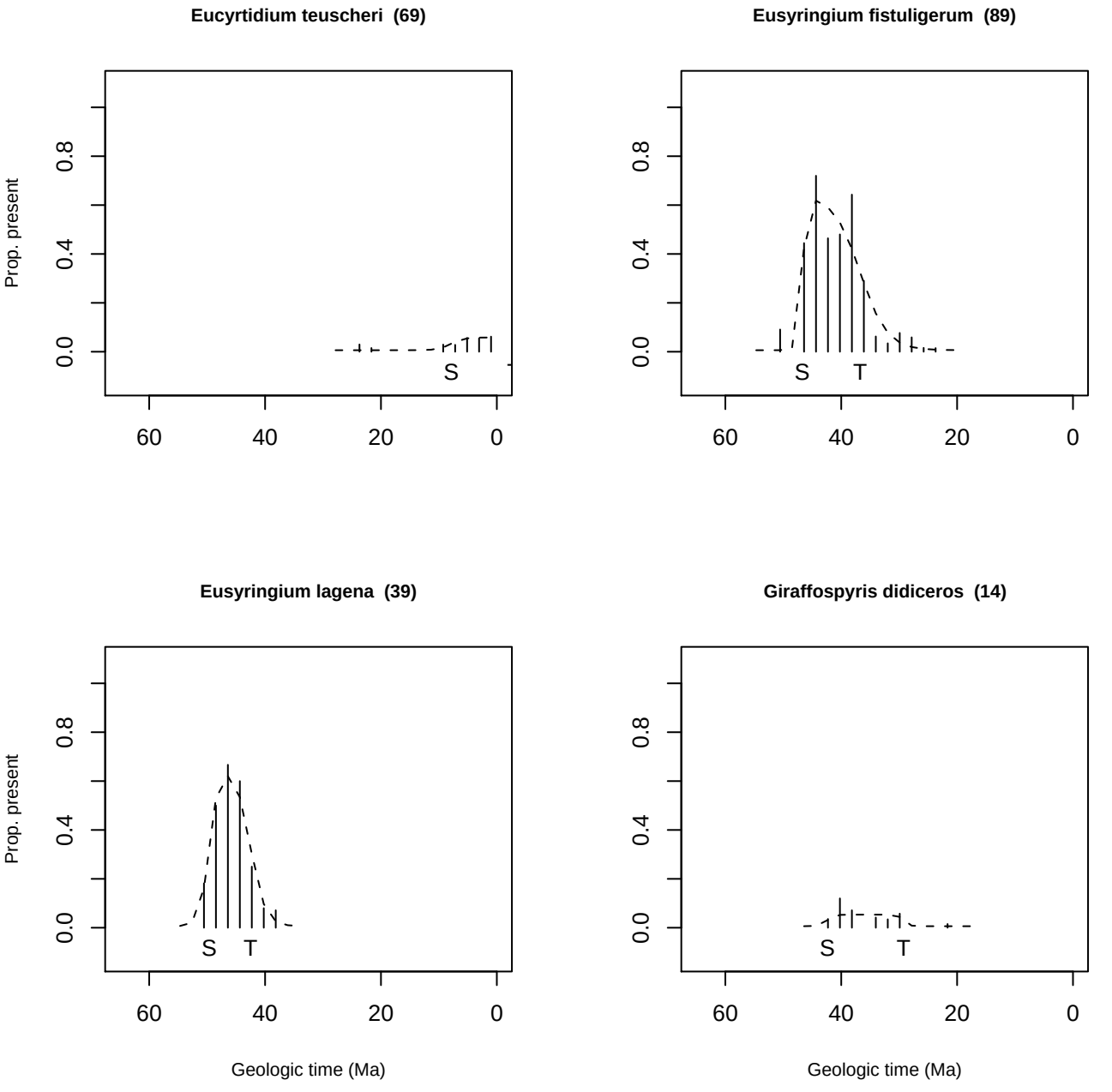

Dorcadospyris platyacantha (17)
Dorcadospyris quadripes (19)
Dorcadospyris riedeli (11)
Dorcadospyris simplex (48)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

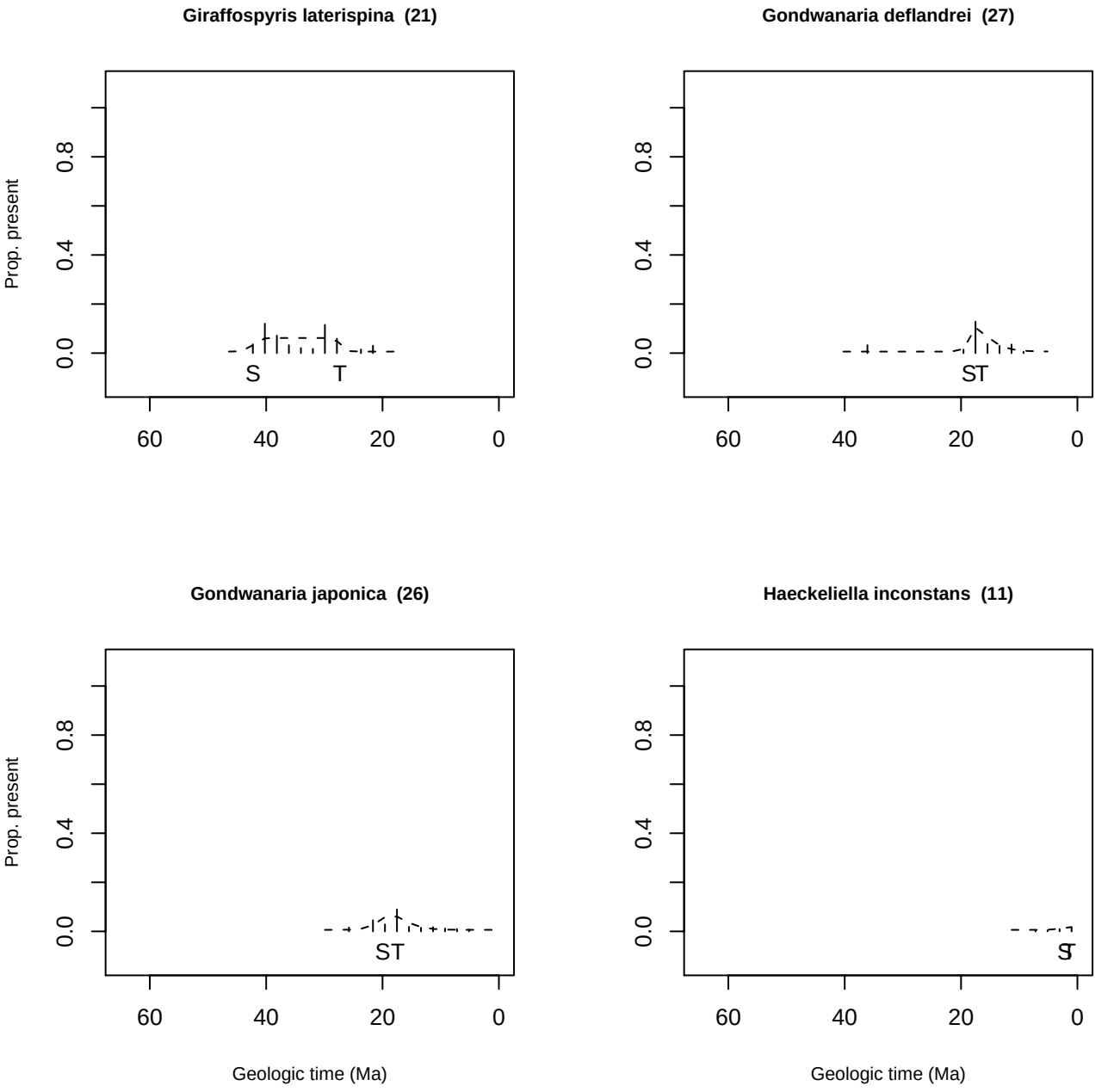

Dorcadospyris triceros (44)
Druppatractus hastatus (78)
Euchitonia furcata (16)
Eucyrtidium acuminatum (91)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

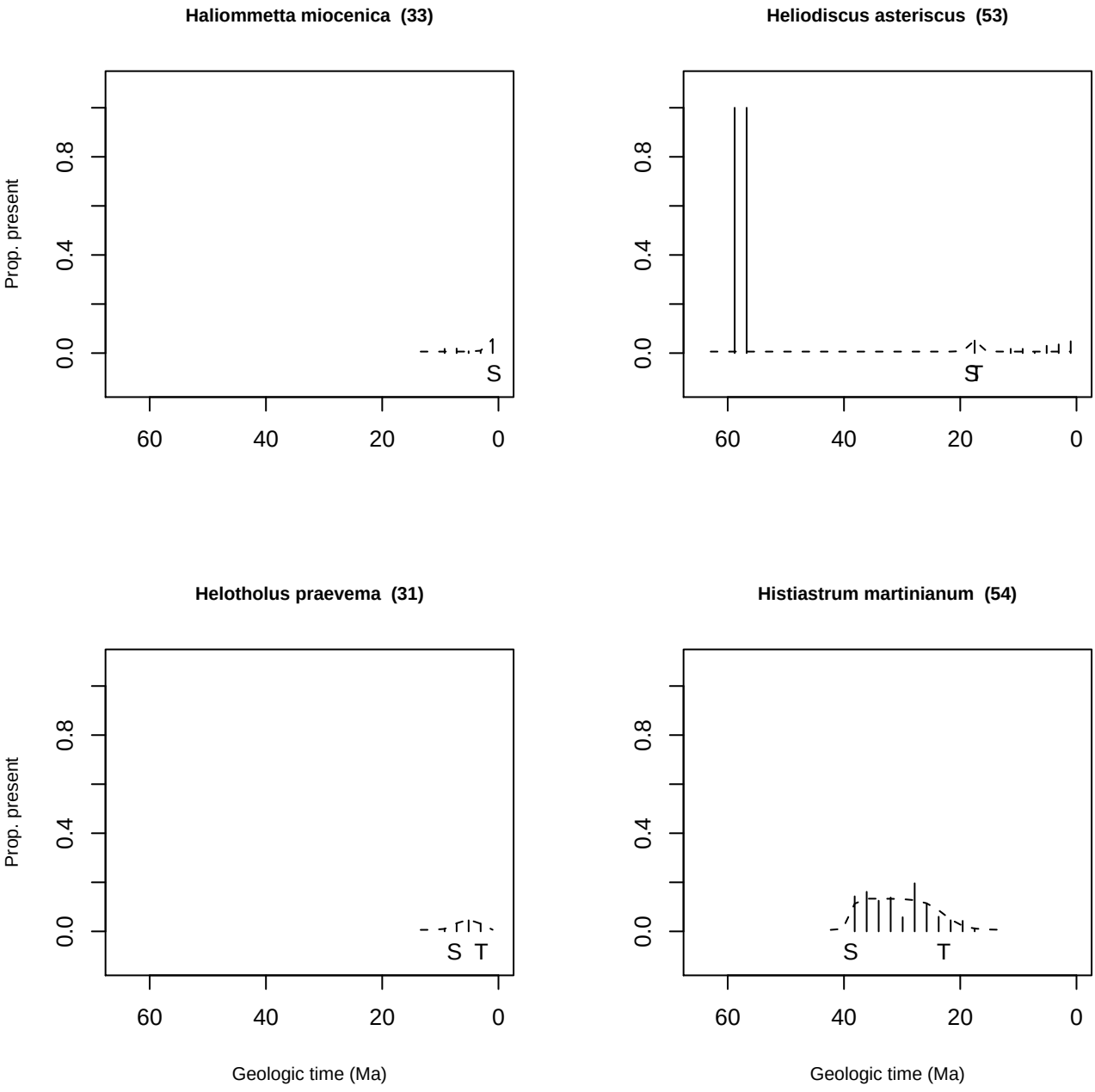

Eucyrtidium anomalum (29)
Eucyrtidium calvertense (411)
Eucyrtidium cienkowskii (162)
Eucyrtidium diaphanes (113)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

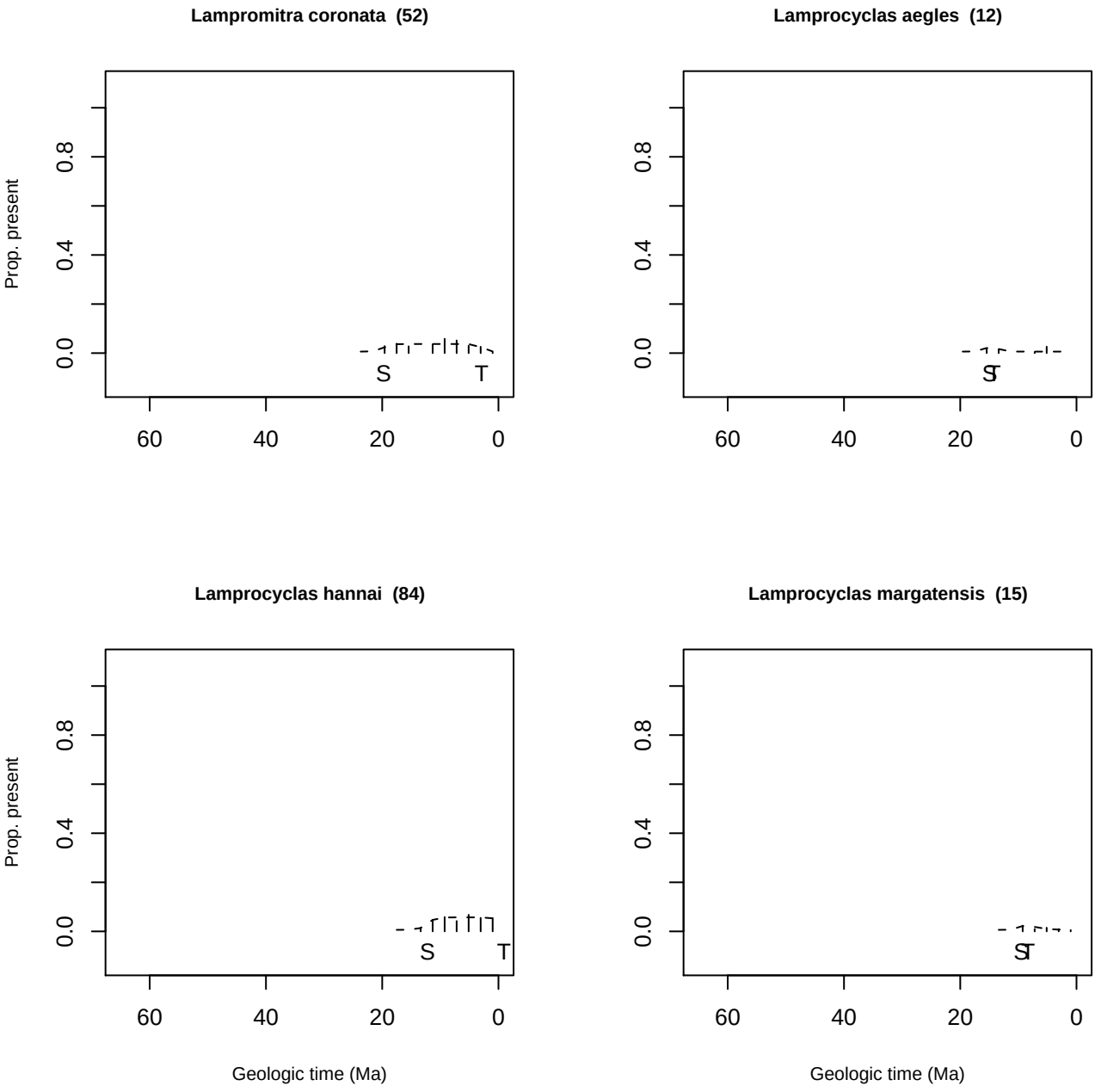

Eucyrtidium hexagonatum (21)
Eucyrtidium inflatum (76)
Eucyrtidium pseudoinflatum (76)
Eucyrtidium punctatum (51)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

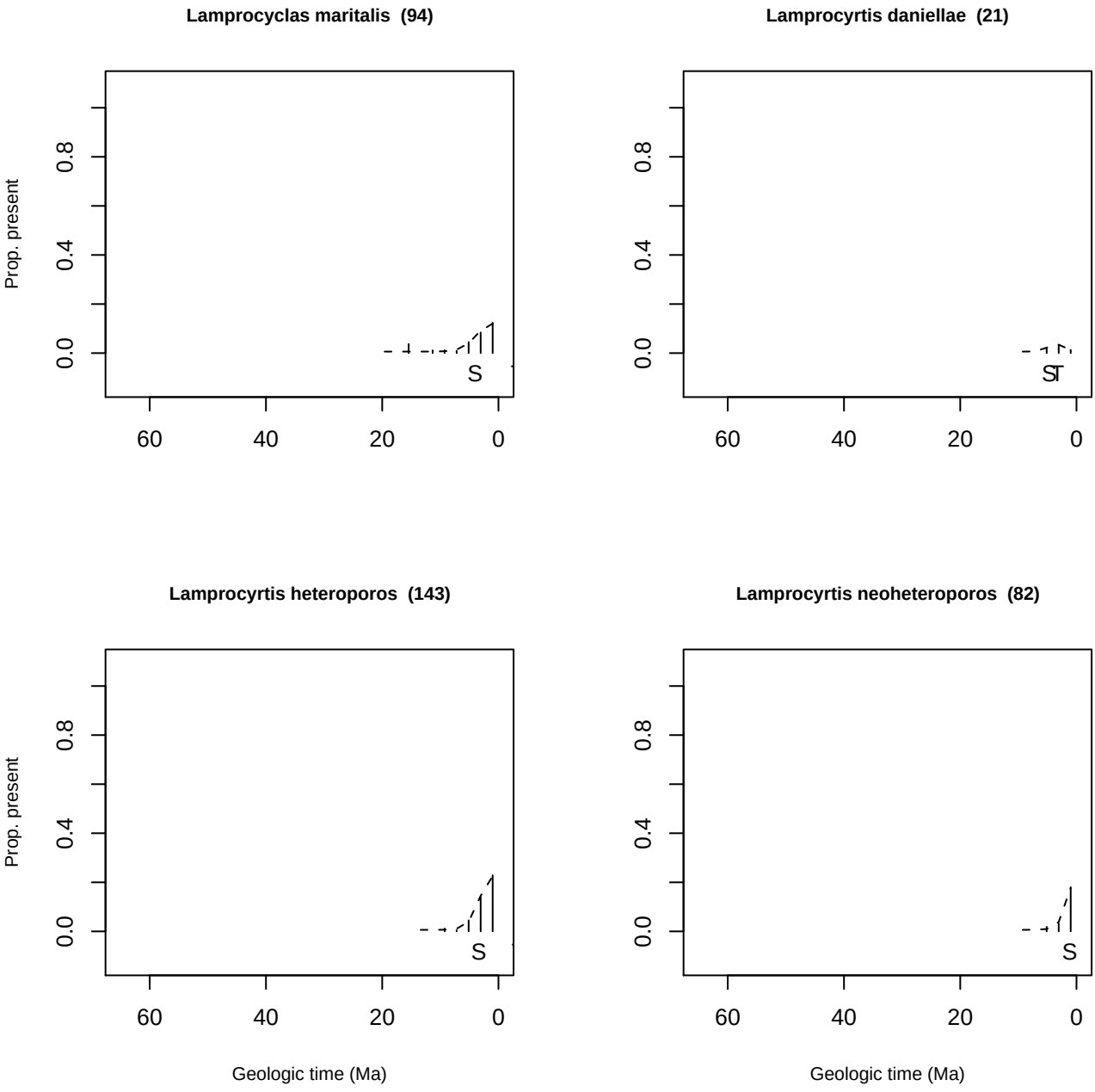

Eucyrtidium biconicum (40)
Eucyrtidium antiquum (13)
Eucyrtidium cheni (28)
Eucyrtidium infundibulum (65)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

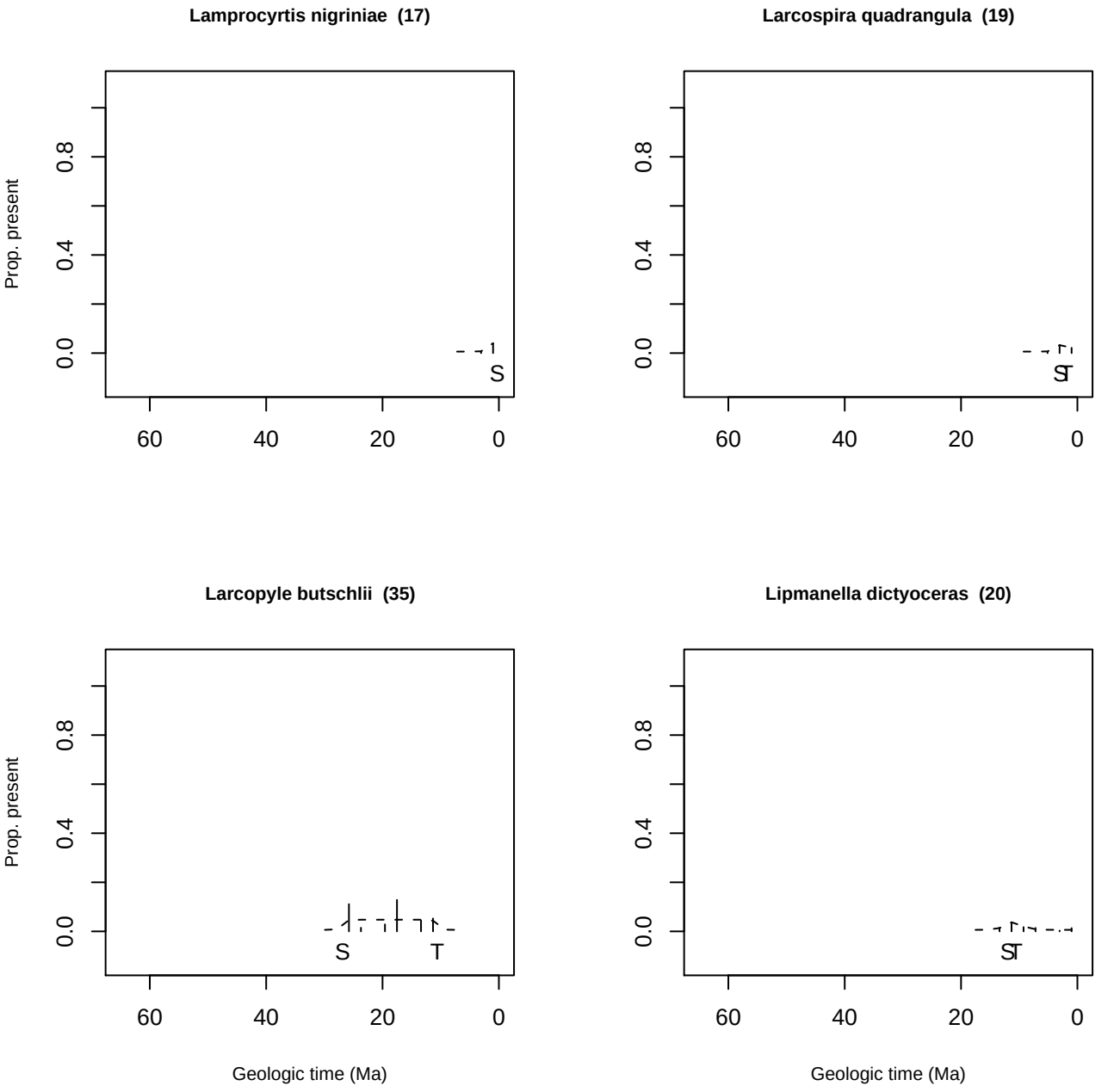

Eucyrtidium teuscheri (69)
Eusyringium fistuligerum (89)
Eusyringium lagena (39)
Giraffospyris didiceros (14)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

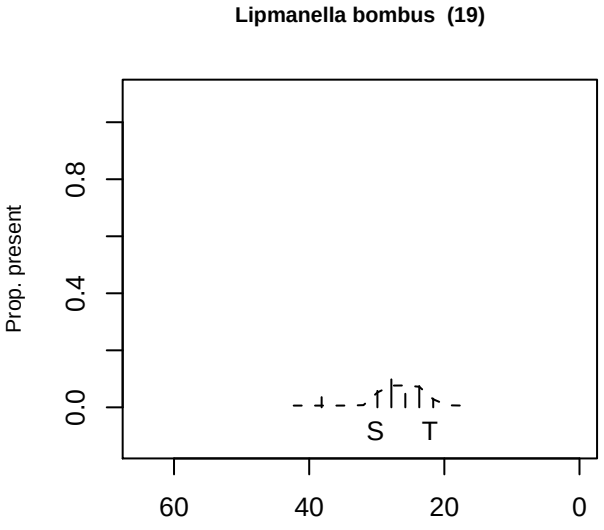

Giraffospyris laterispina (21)
Gondwanaria deflandrei (27)
Gondwanaria japonica (26)
Haeckeliella inconstans (11)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

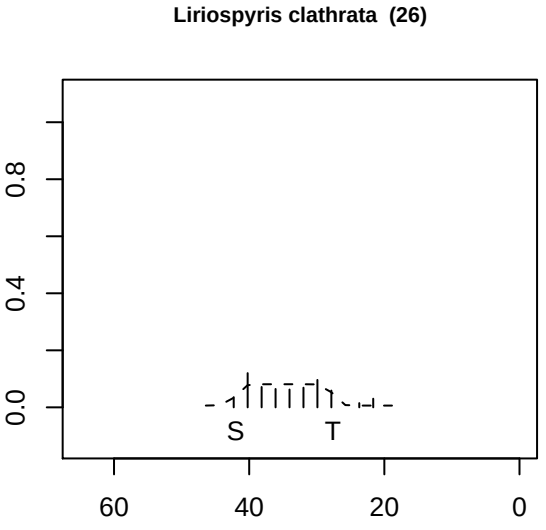

Haliommetta miocenica (33)
Heliodiscus asteriscus (53)
Helotholus praevema (31)
Histiastrum martinianum (54)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

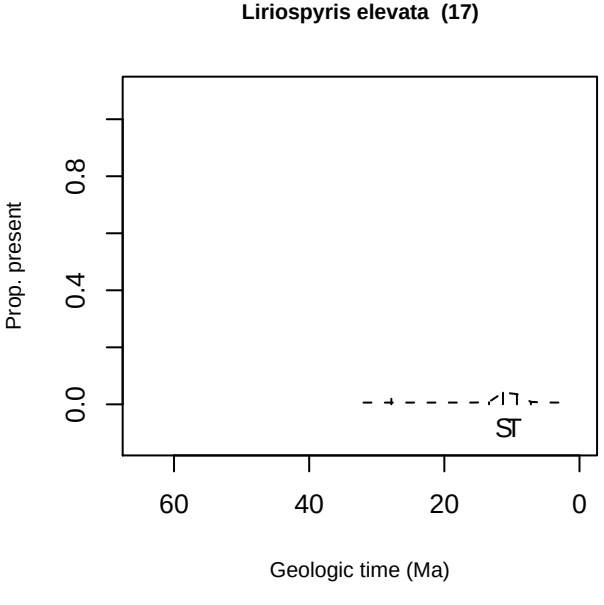

Lampromitra coronata (52)
Lamprocyclas aegles (12)
Lamprocyclas hannai (84)
Lamprocyclas margatensis (15)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

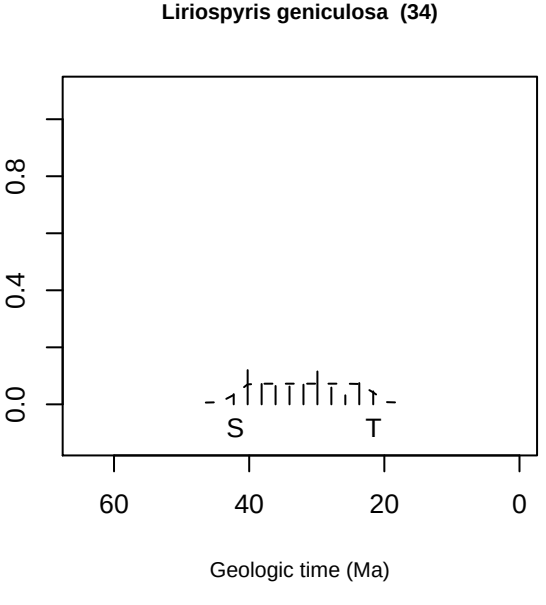

Lamprocyclas maritalis (94)
Lamprocyrtis daniellae (21)
Lamprocyrtis heteroporos (143)
Lamprocyrtis neoheteroporos (82)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)

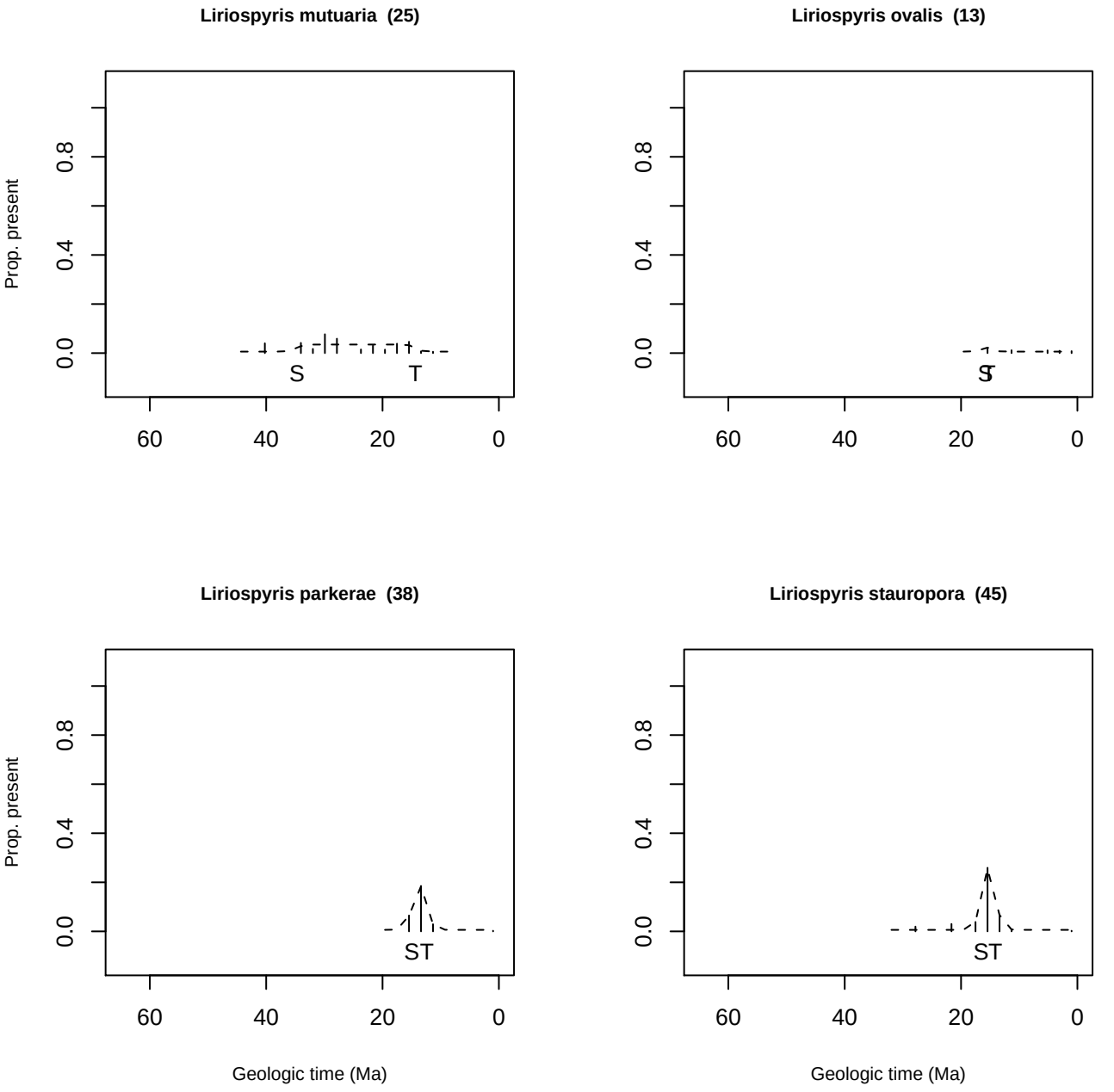

Lamprocyrtis nigriniae (17)
Larcospira quadrangula (19)
Larcopyle butschlii (35)
Lipmanella dictyoceras (20)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

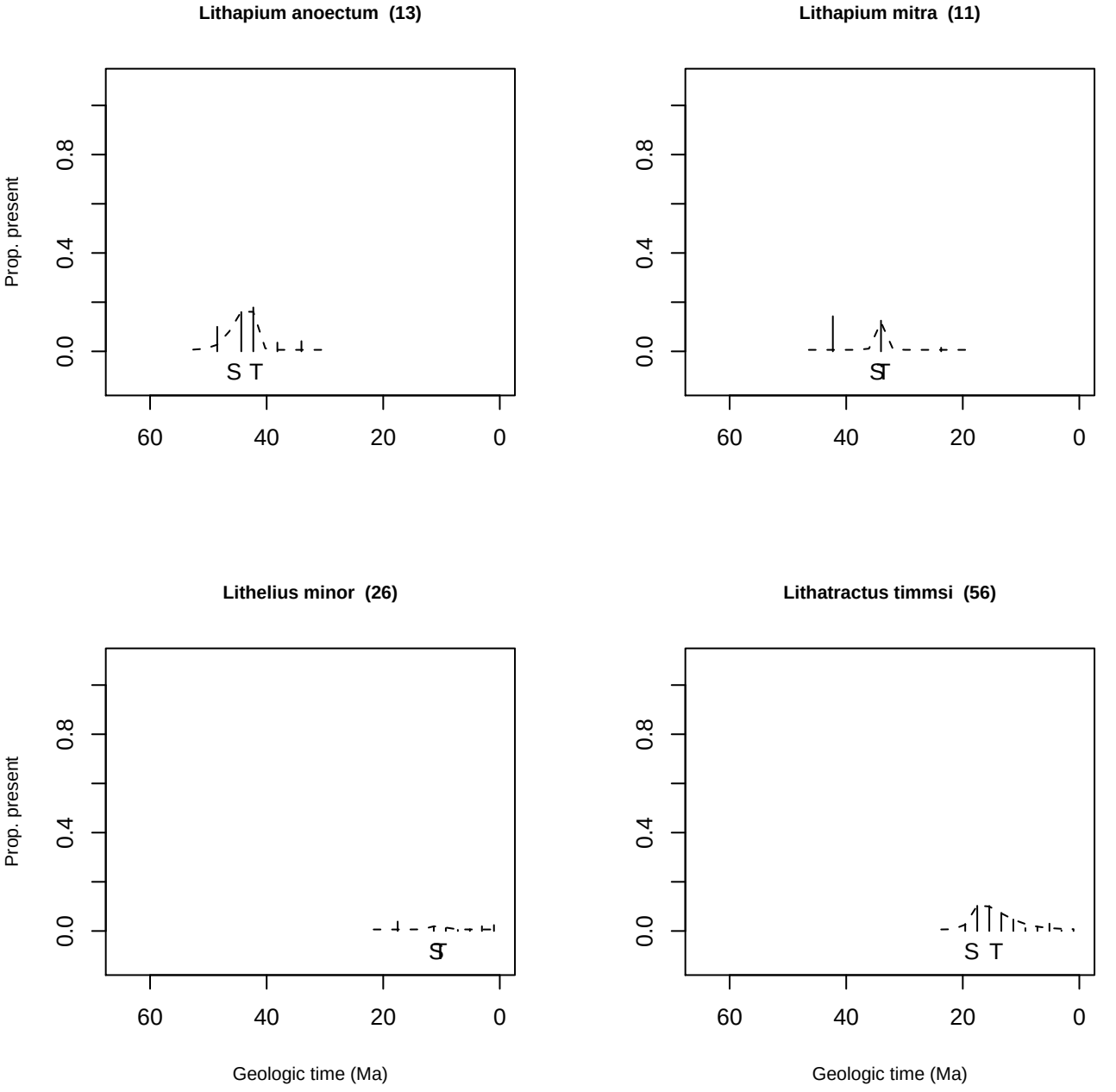

Lipmanella bombus (19)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0

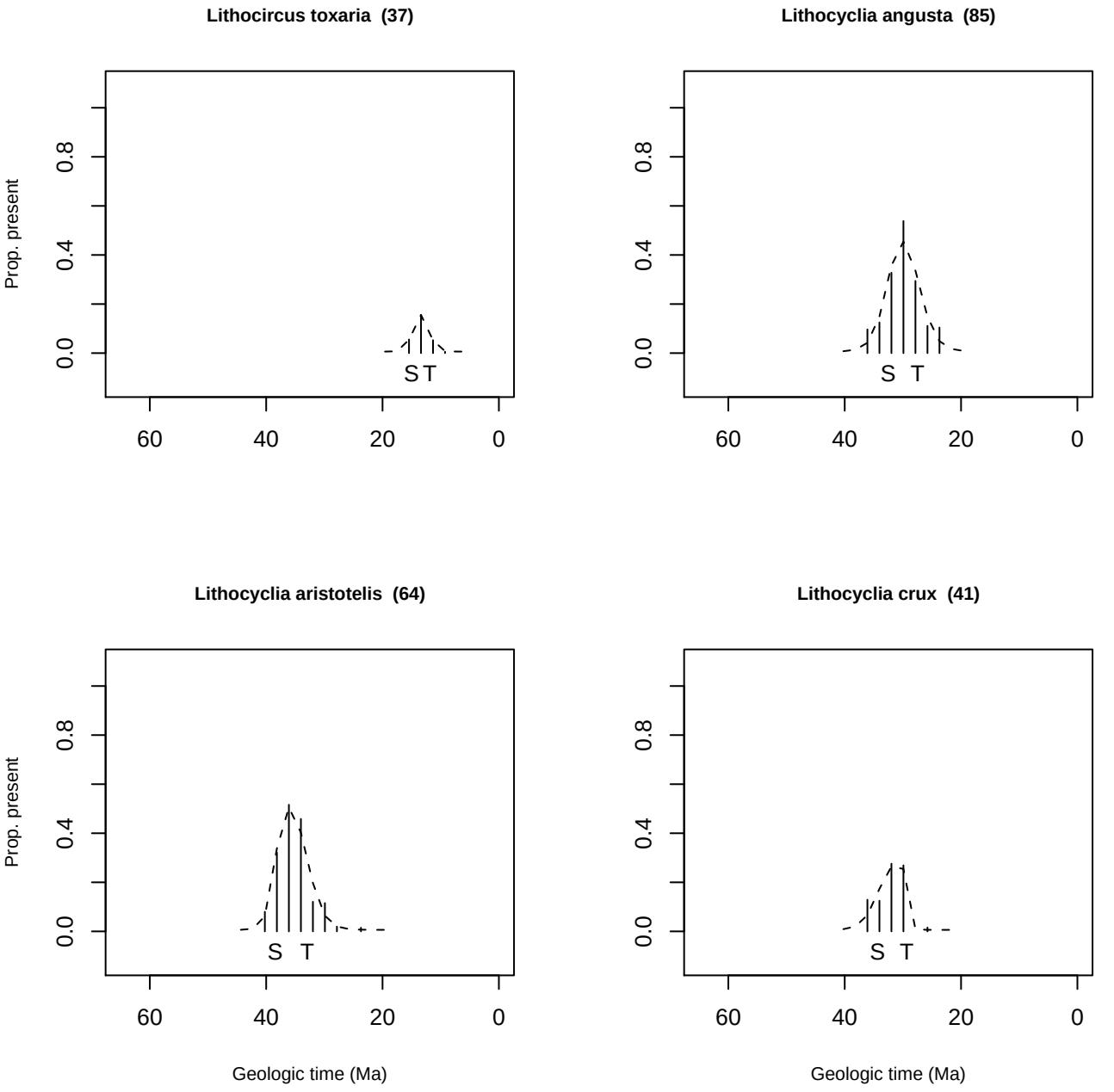

Liriospyris clathrata (26)
0.0
0.4
0.8
S
T
60
40
20
0

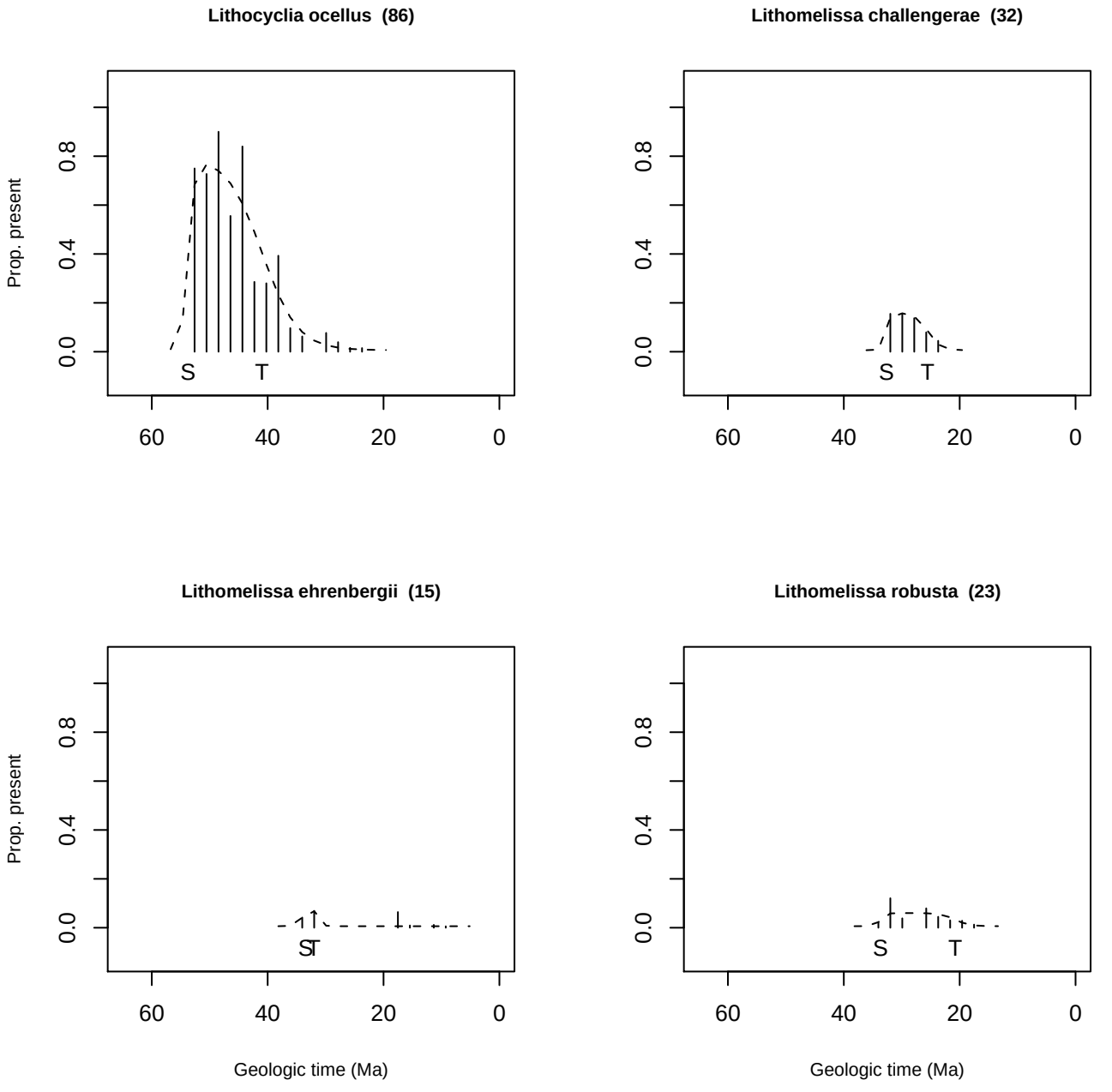

Liriospyris elevata (17)
Prop. present
0.0
0.4
0.8
ST
60
40
20
0
Geologic time (Ma)

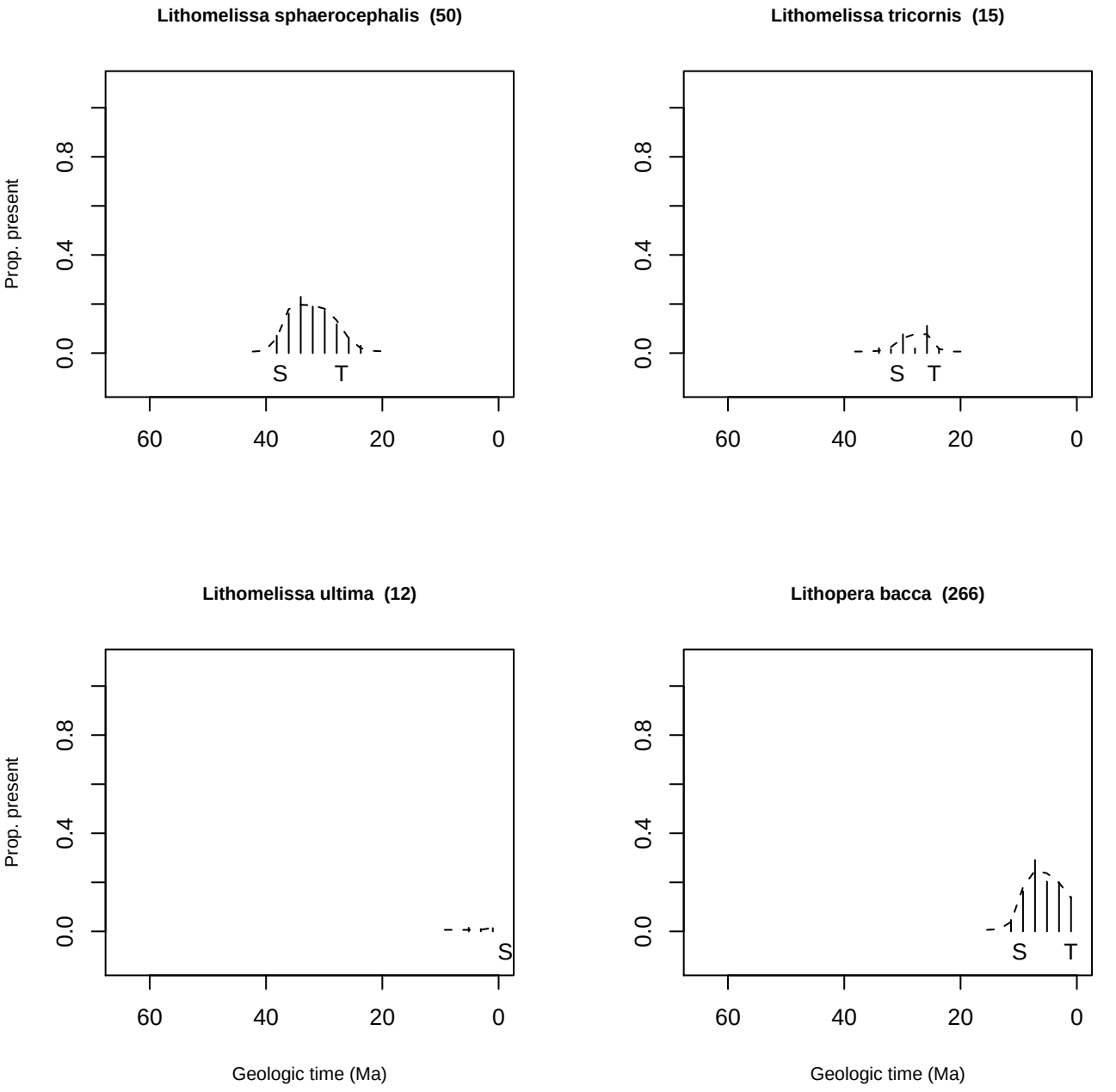

Liriospyris geniculosa (34)
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

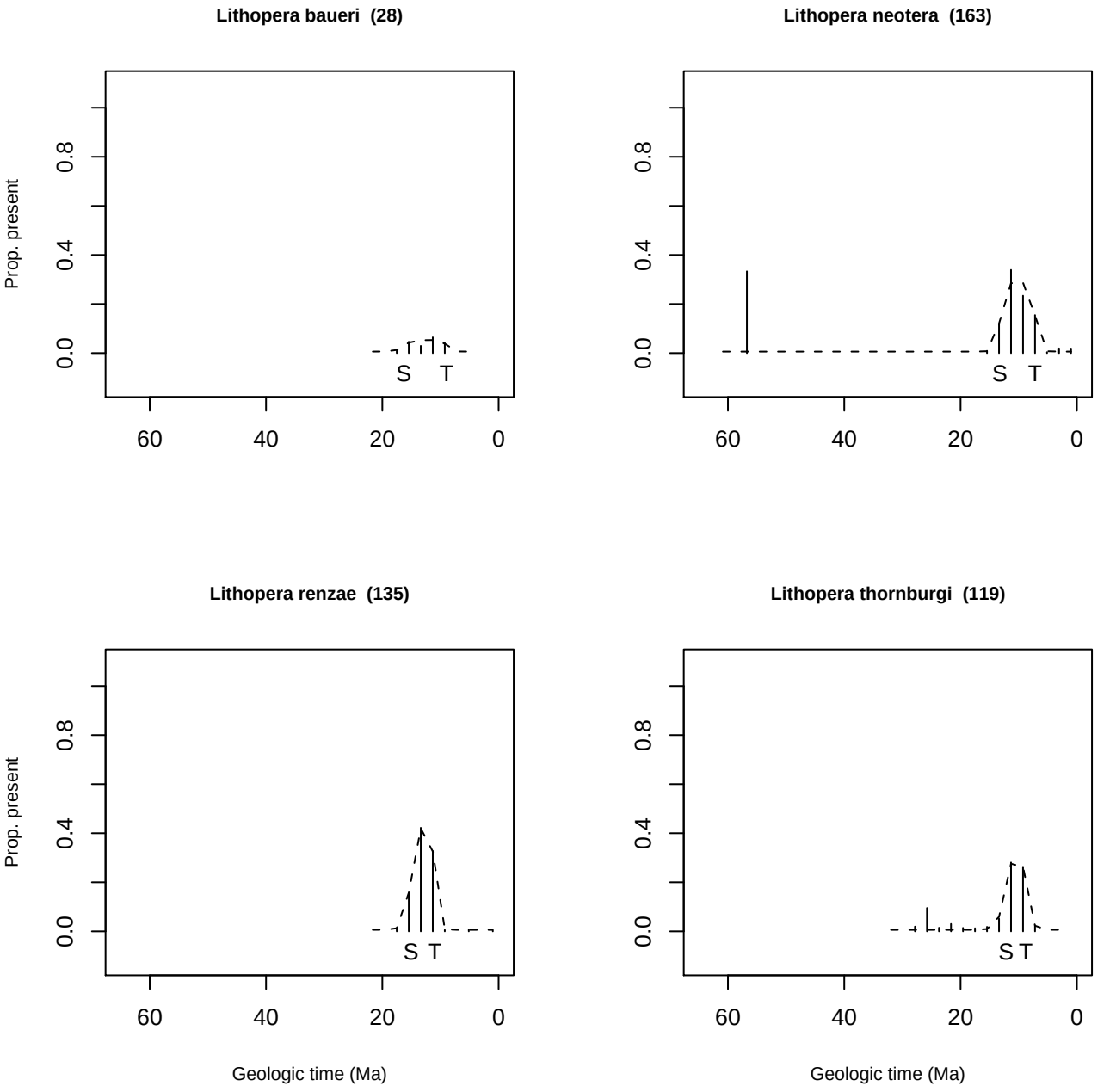

Liriospyris mutuaria (25)
Liriospyris ovalis (13)
Liriospyris parkerae (38)
Liriospyris stauropora (45)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

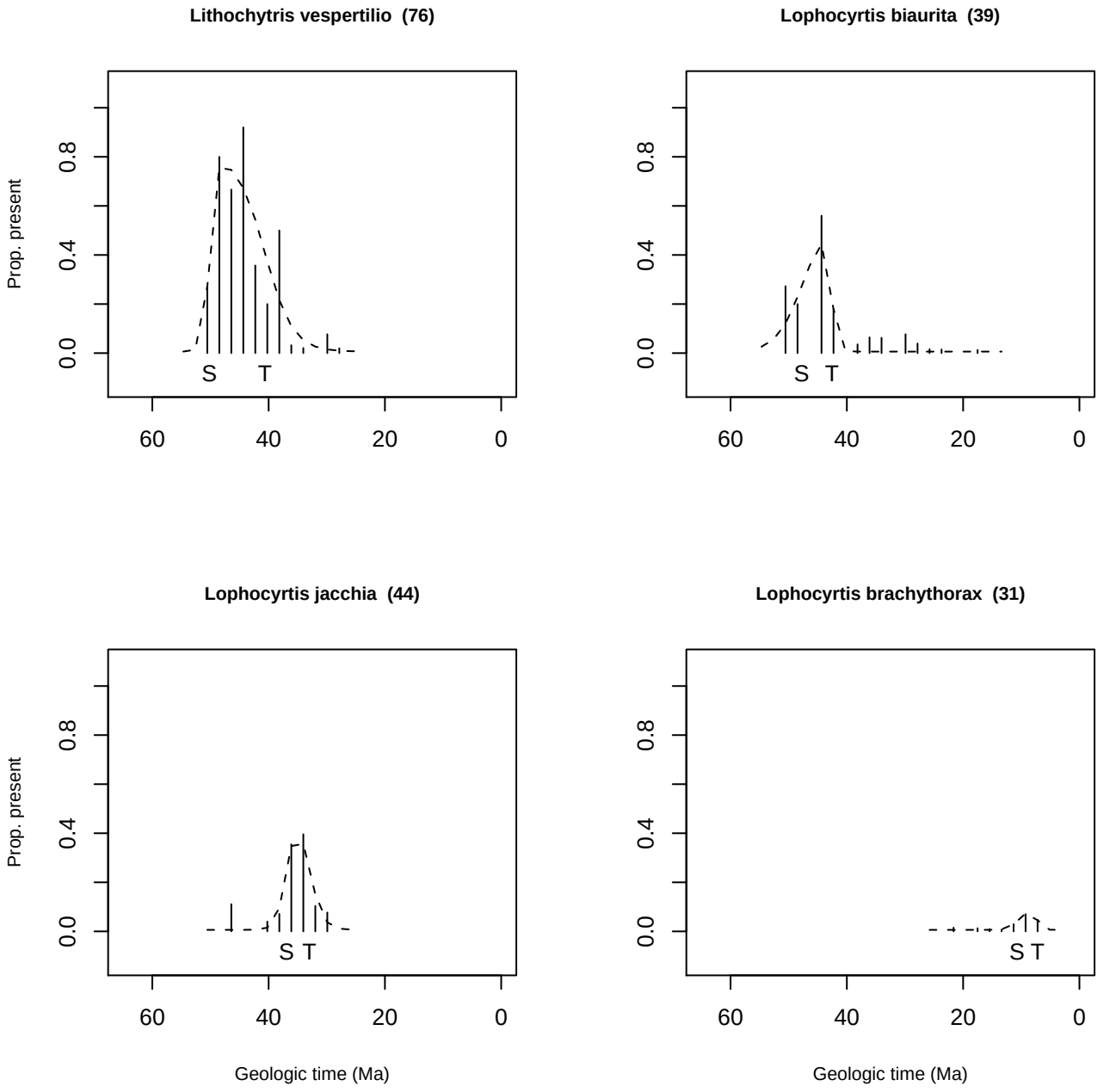

Lithapium anoectum (13)
Lithapium mitra (11)
Lithelius minor (26)
Lithatractus timmsi (56)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

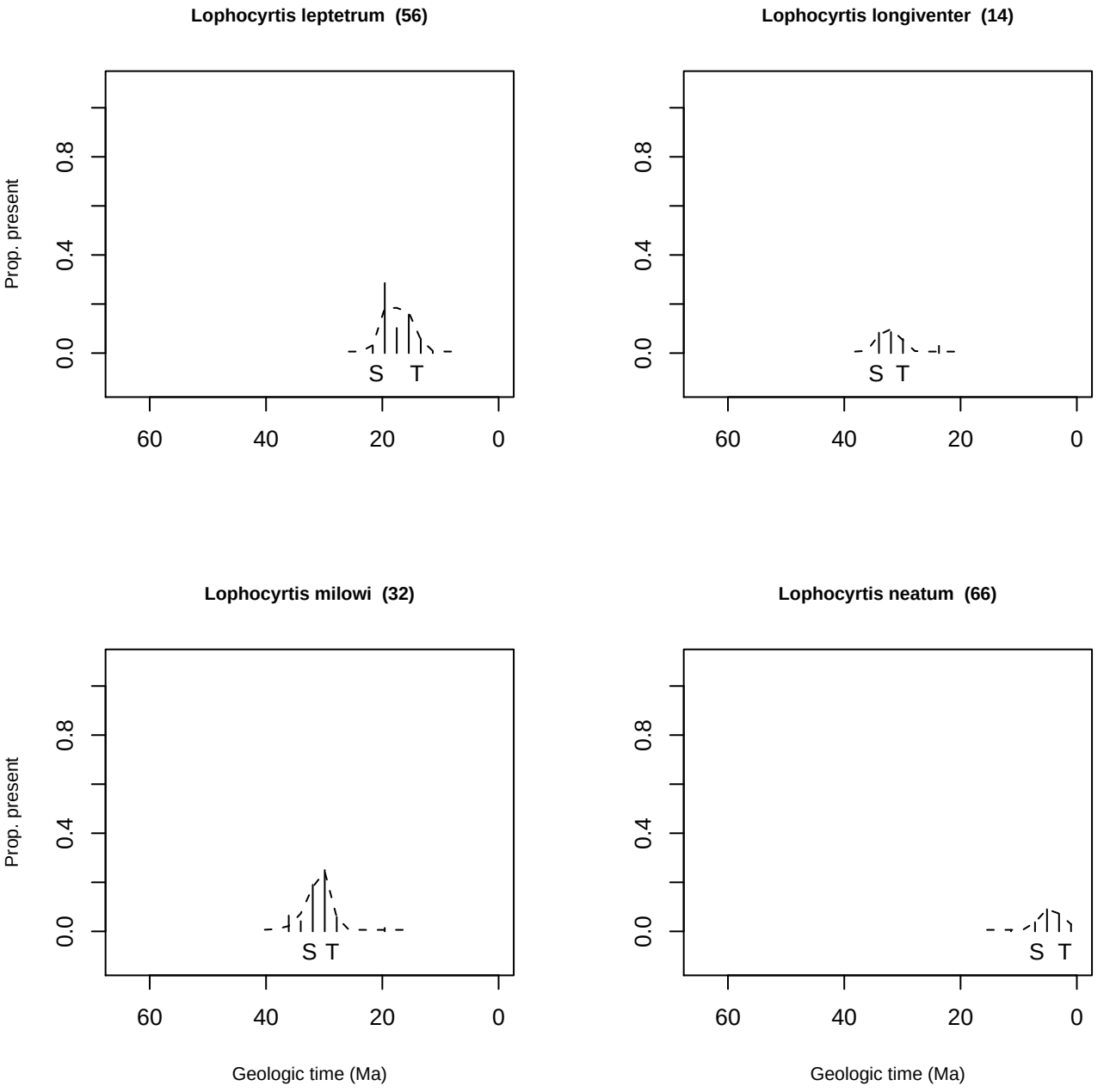

Lithocircus toxaria (37)
Lithocyclia angusta (85)
Lithocyclia aristotelis (64)
Lithocyclia crux (41)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

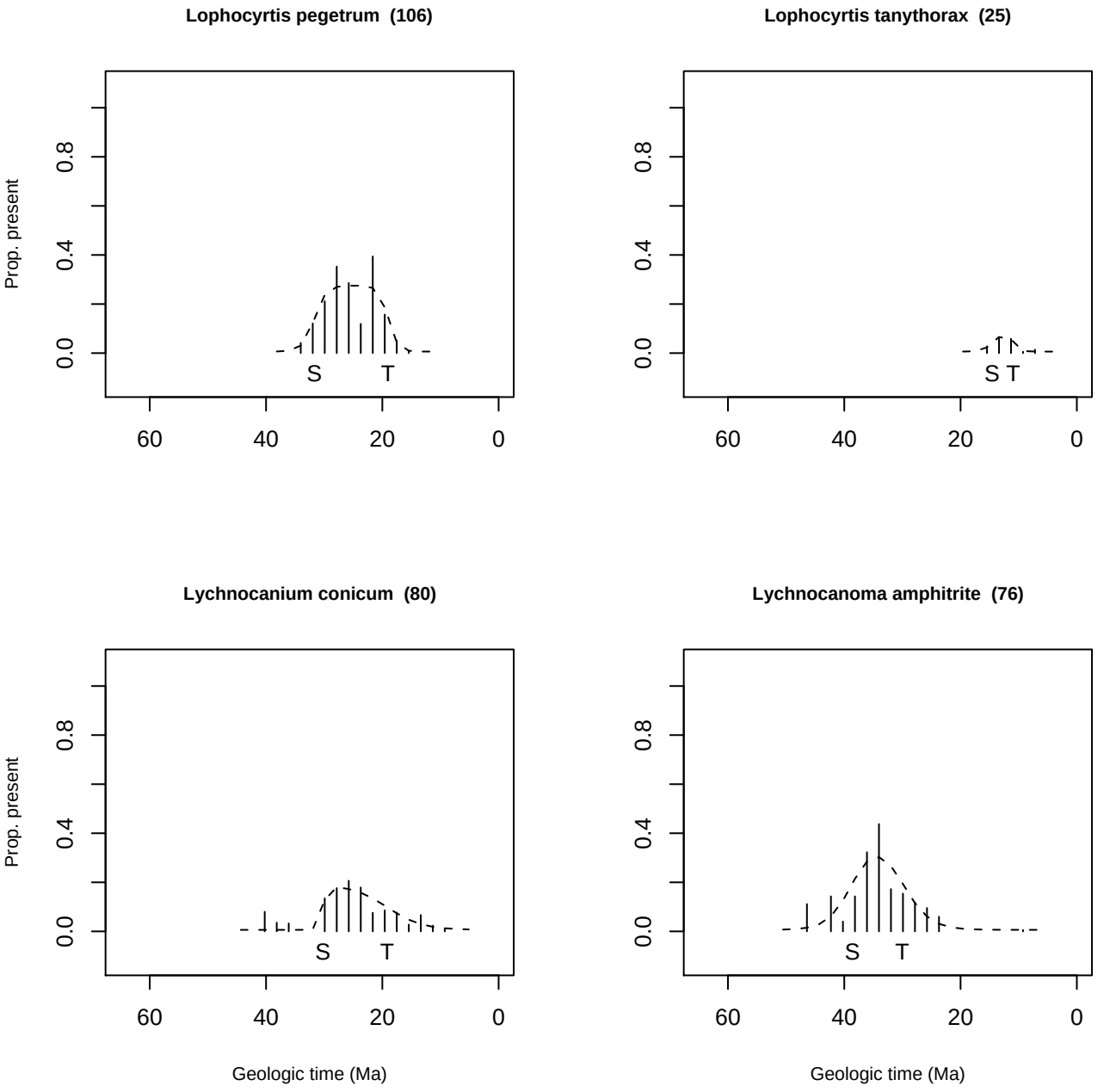

Lithocyclia ocellus (86)
Lithomelissa challengerae (32)
Lithomelissa ehrenbergii (15)
Lithomelissa robusta (23)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

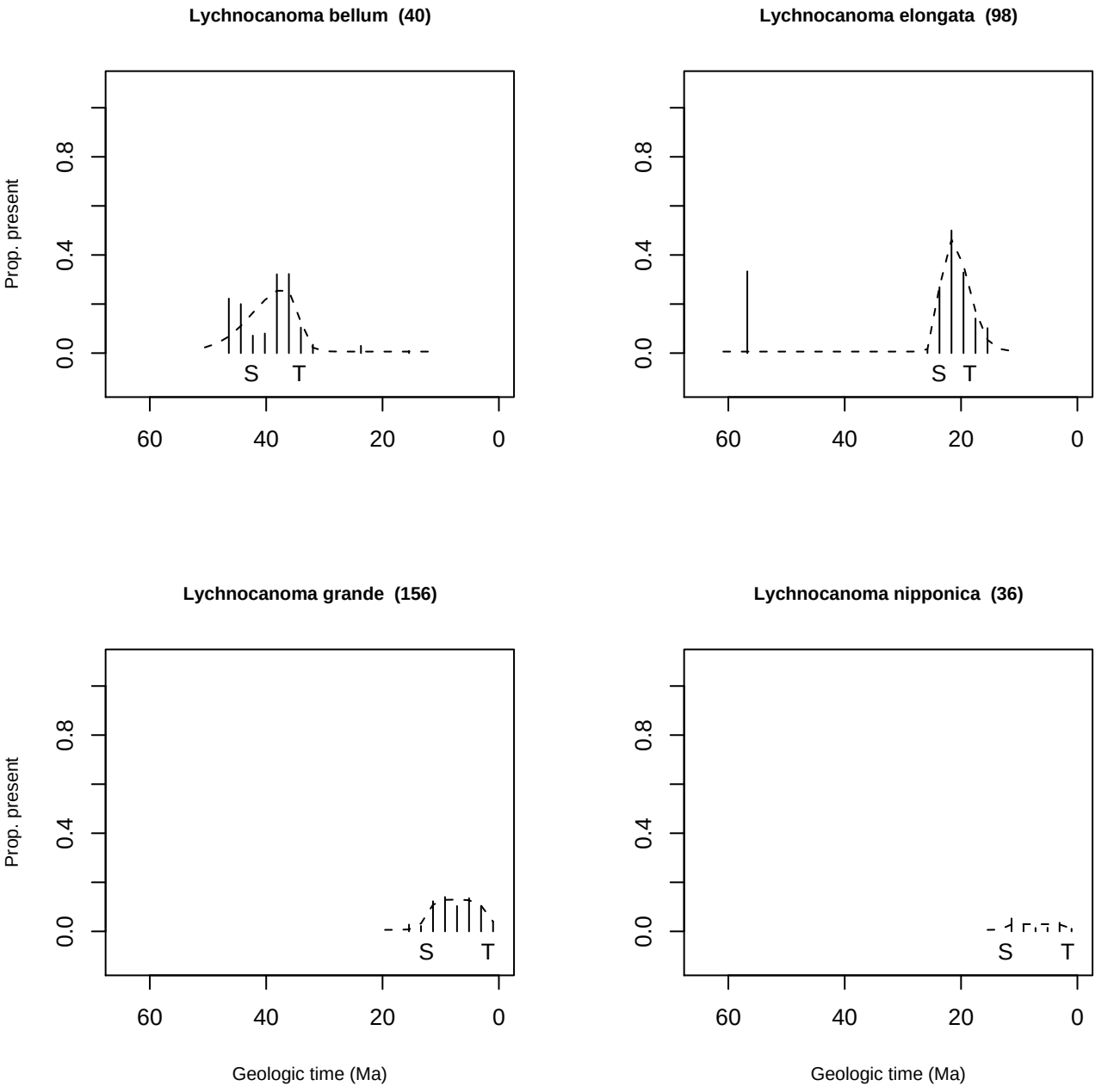

Lithomelissa sphaerocephalis (50)
Lithomelissa tricornis (15)
Lithomelissa ultima (12)
Lithopera bacca (266)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

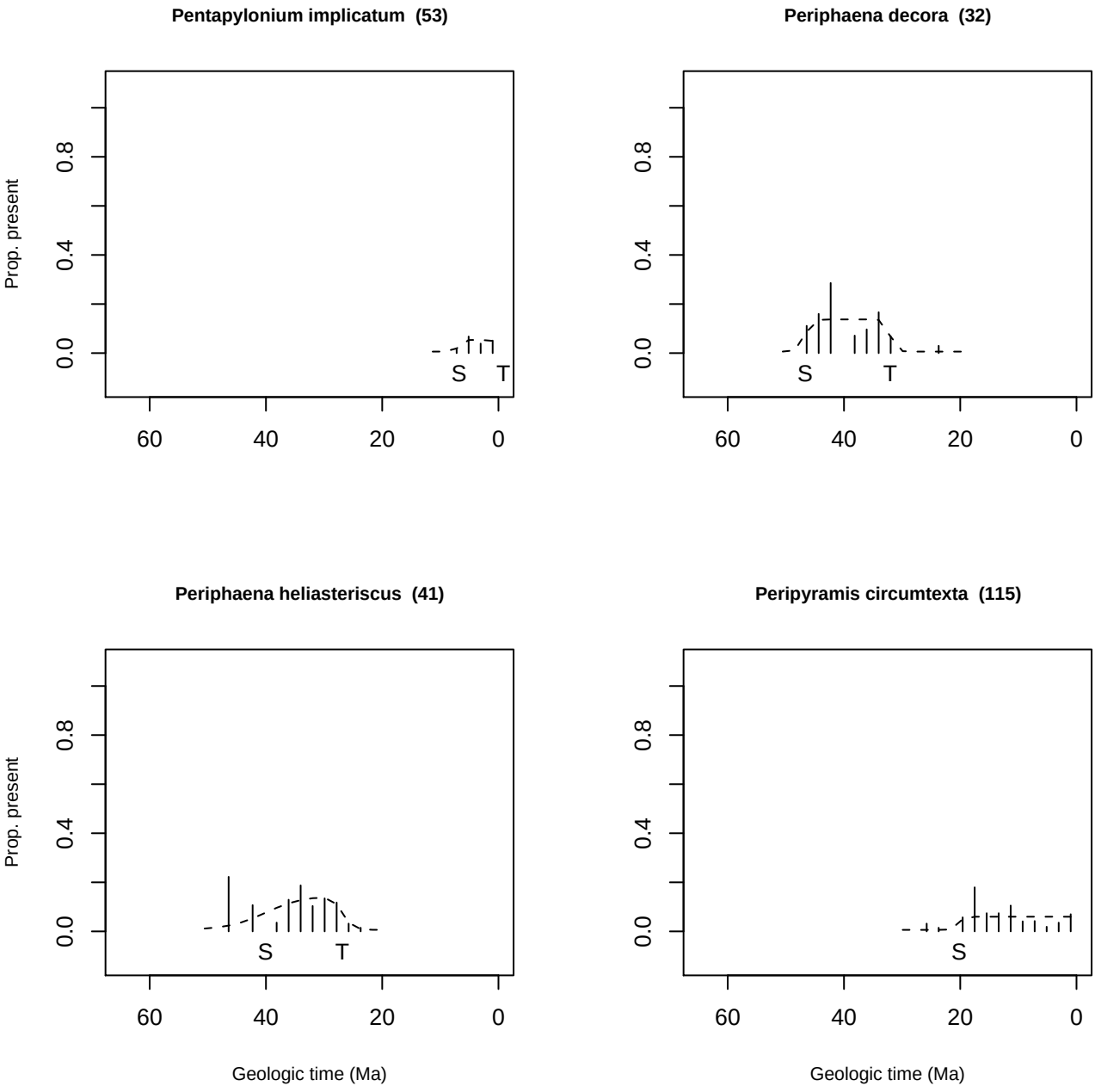

Lithopera baueri (28)
Lithopera neotera (163)
Lithopera renzae (135)
Lithopera thornburgi (119)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Lithochytris vespertilio (76)
Lophocyrtis biaurita (39)
Lophocyrtis jacchia (44)
Lophocyrtis brachythorax (31)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Lophocyrtis leptetrum (56)
Lophocyrtis longiventer (14)
Lophocyrtis milowi (32)
Lophocyrtis neatum (66)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Lophocyrtis pegetrum (106)
Lophocyrtis tanythorax (25)
Lychnocanium conicum (80)
Lychnocanoma amphitrite (76)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Lychnocanoma bellum (40)
Lychnocanoma elongata (98)
Lychnocanoma grande (156)
Lychnocanoma nipponica (36)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Pentapylonium implicatum (53)
Periphaena decora (32)
Periphaena heliasteriscus (41)
Peripyramis circumtexta (115)
Prop. present
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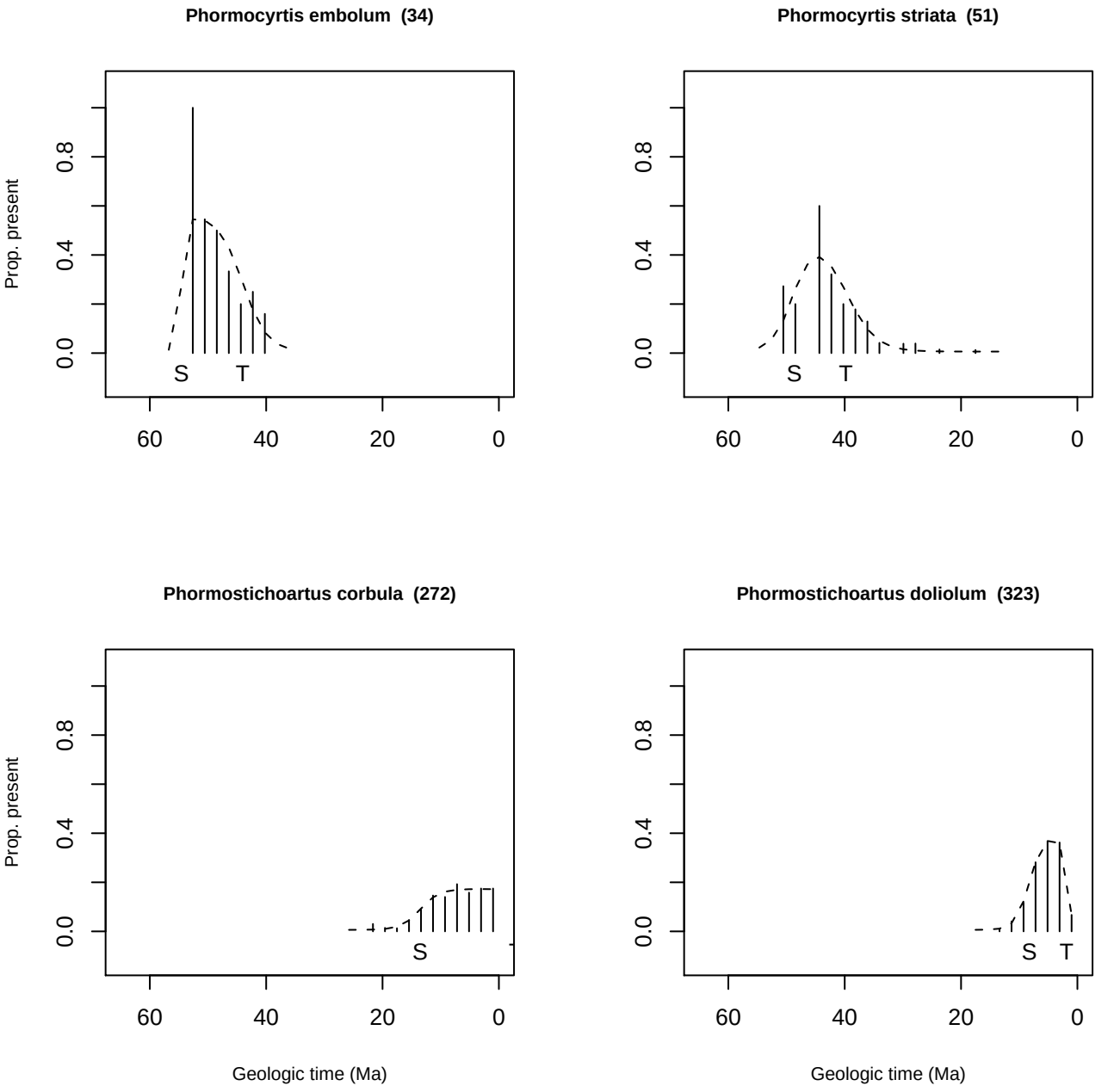
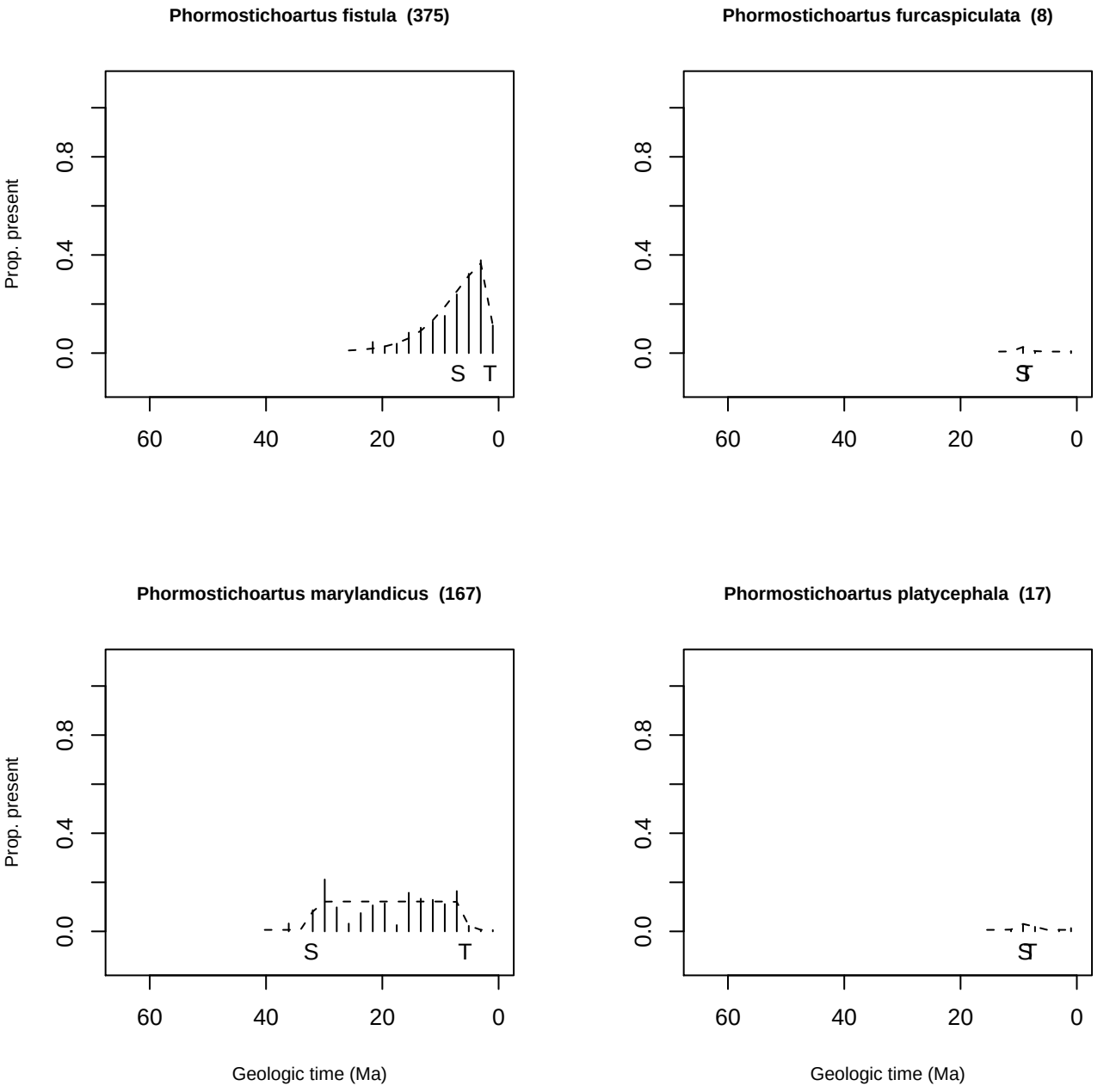
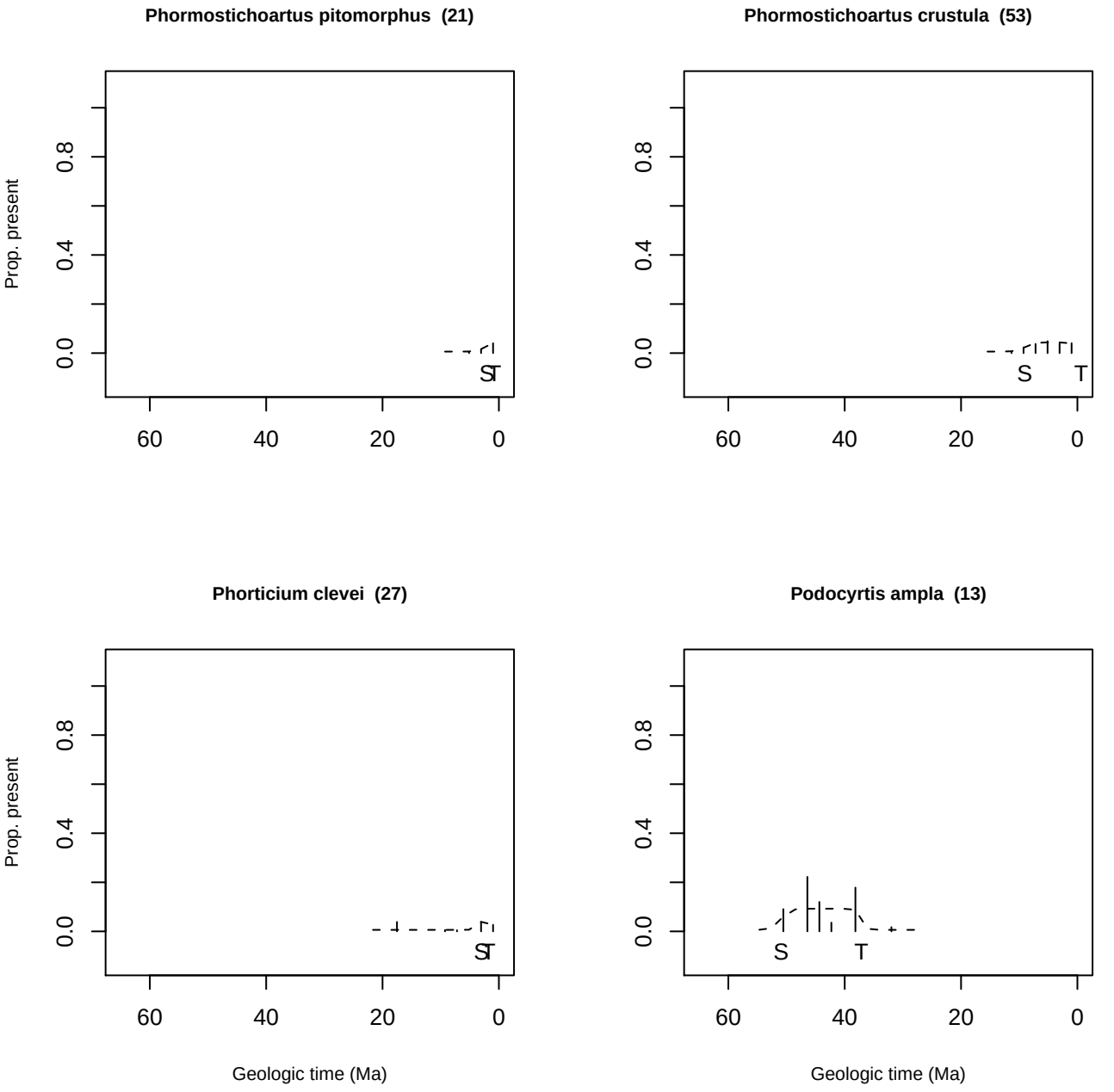
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Phormocyrtis embolum (34)
Phormocyrtis striata (51)
Phormostichoartus corbula (272)
Phormostichoartus doliolum (323)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Phormostichoartus fistula (375)
Phormostichoartus furcaspiculata (8)
Phormostichoartus marylandicus (167)
Phormostichoartus platycephala (17)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Phormostichoartus pitomorphus (21)
Phormostichoartus crustula (53)
Phorticium clevei (27)
Podocyrtis ampla (13)
Prop. present
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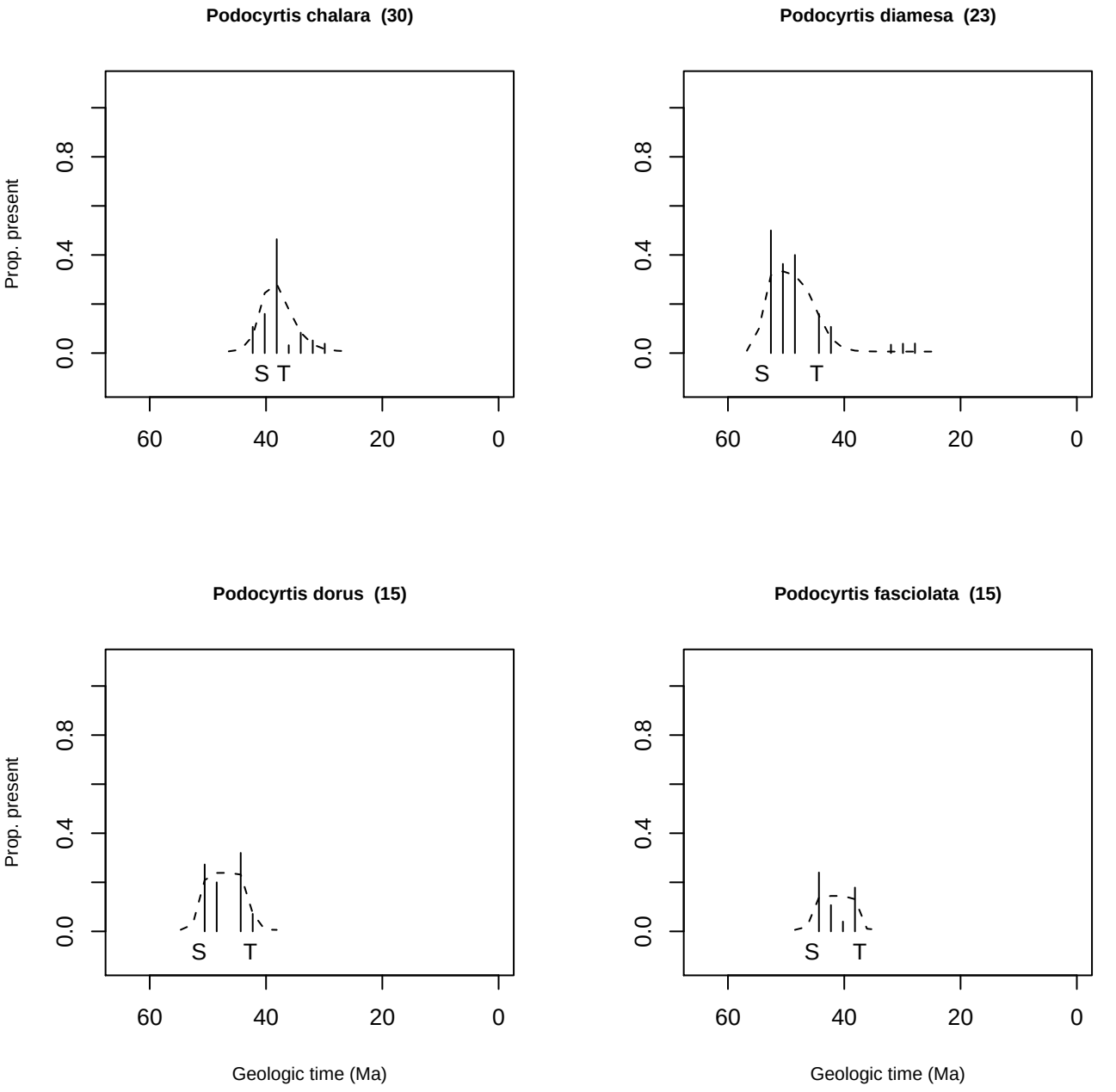
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Podocyrtis chalara (30)
Podocyrtis diamesa (23)
Podocyrtis dorus (15)
Podocyrtis fasciolata (15)
Prop. present
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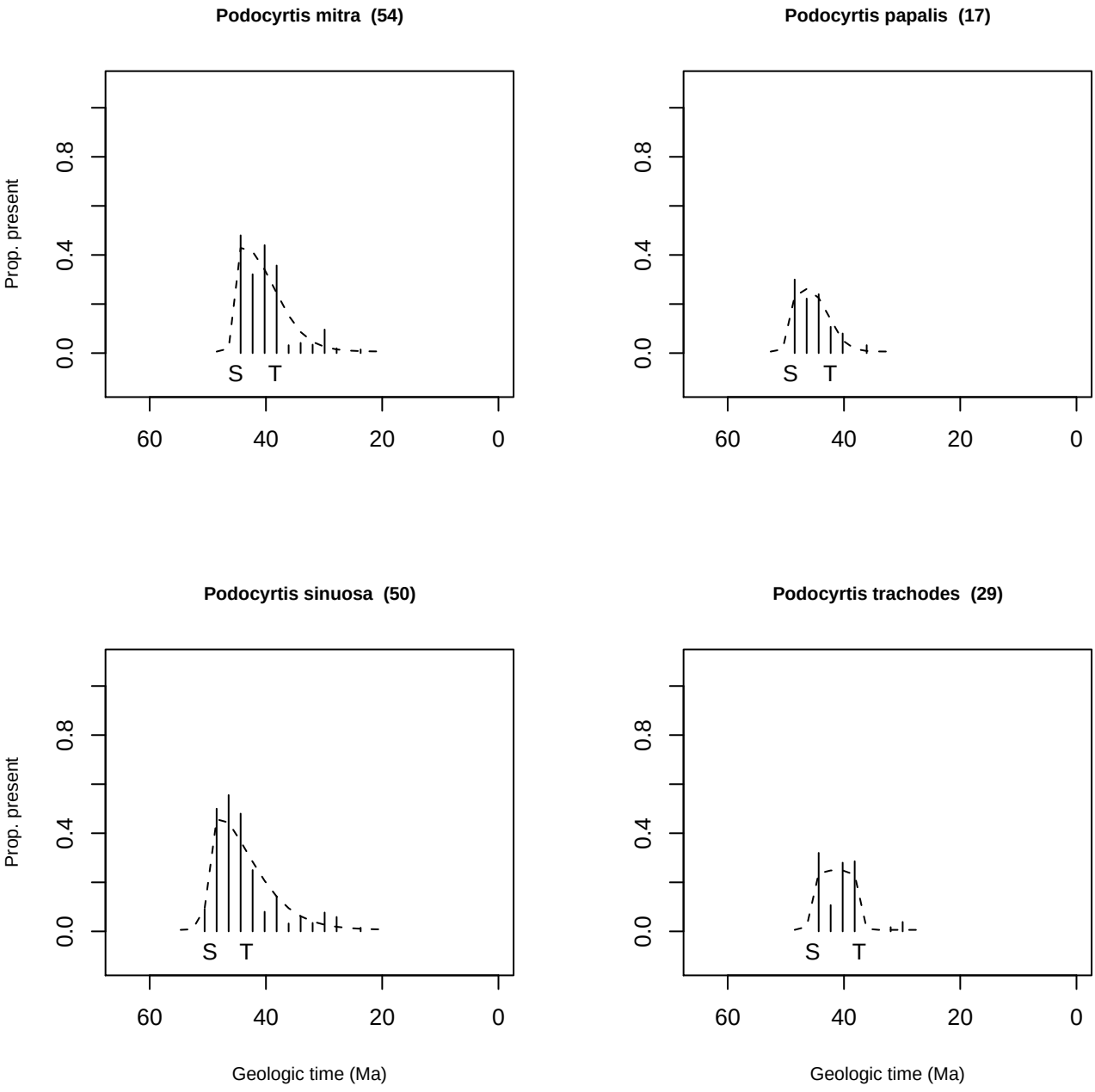
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Podocyrtis mitra (54)
Podocyrtis papalis (17)
Podocyrtis sinuosa (50)
Podocyrtis trachodes (29)
Prop. present
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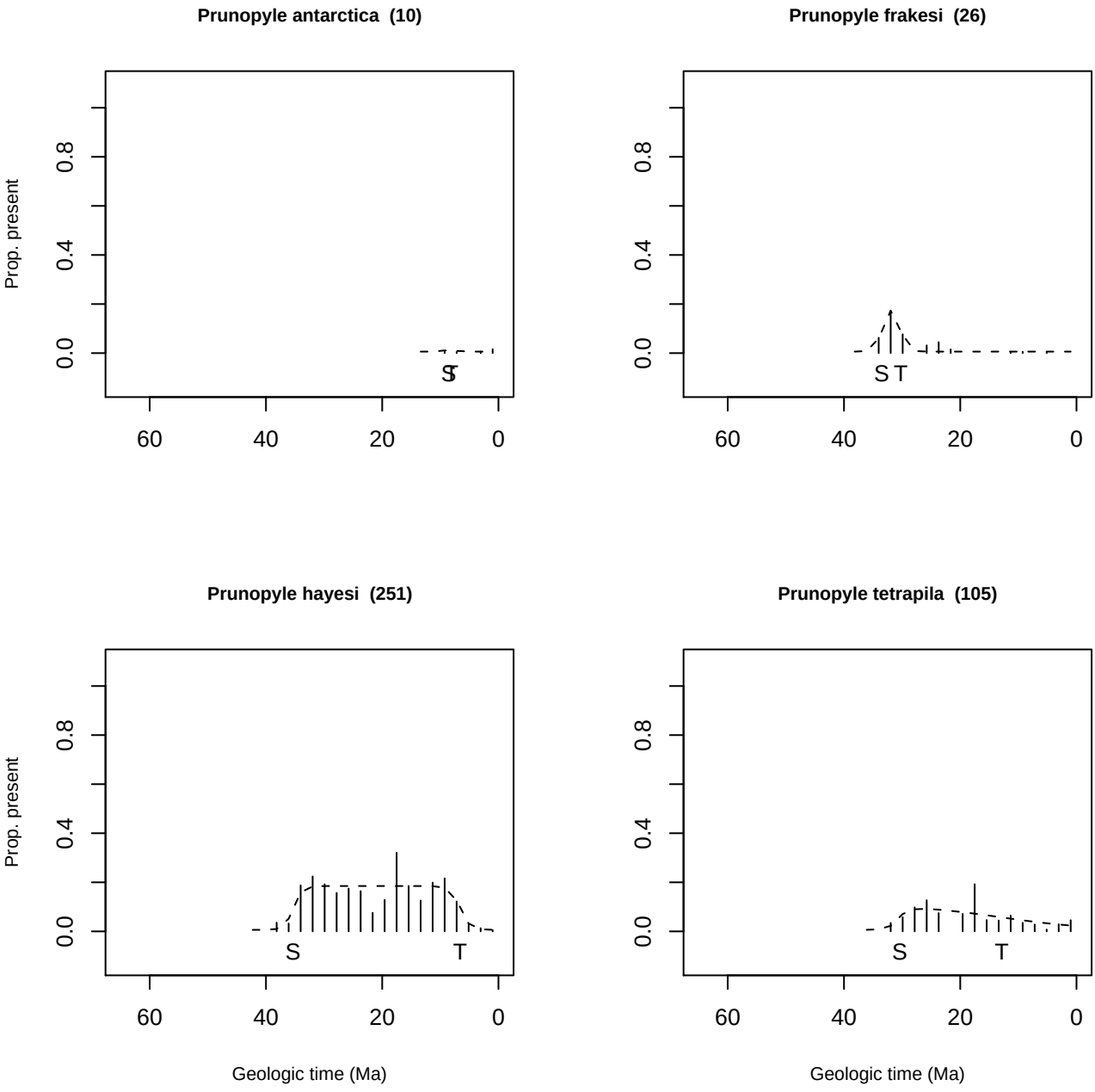
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Prunopyle antarctica (10)
Prunopyle frakesi (26)
Prunopyle hayesi (251)
Prunopyle tetrapila (105)
Prop. present
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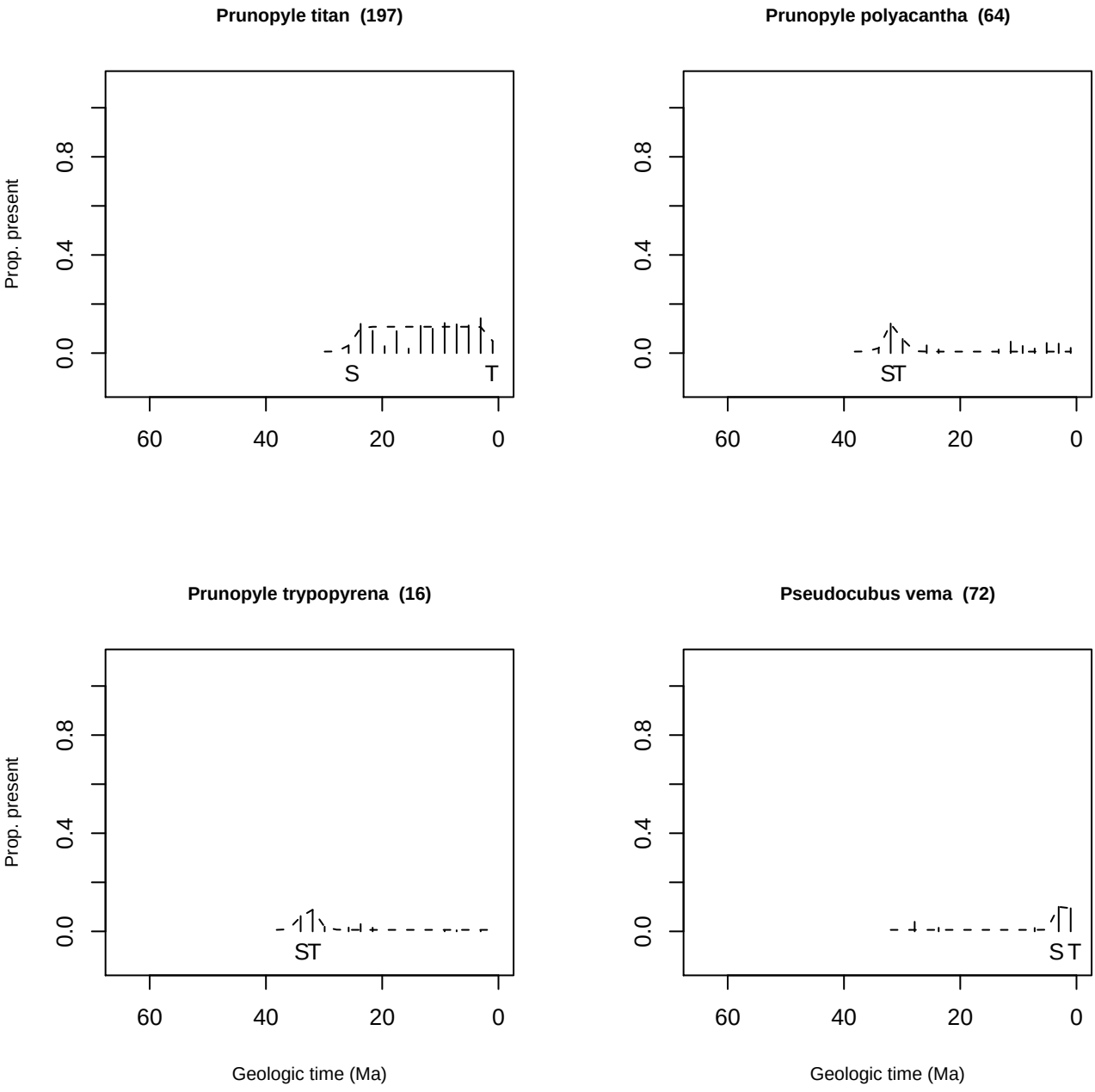
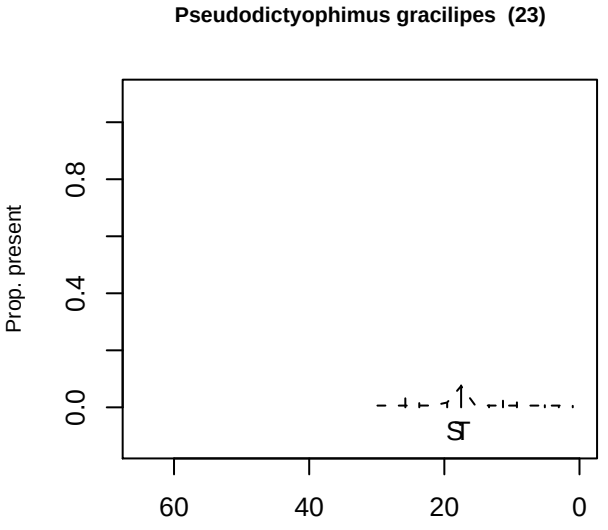
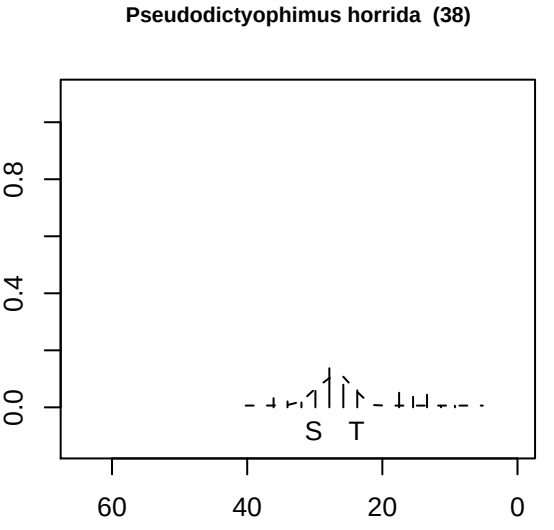
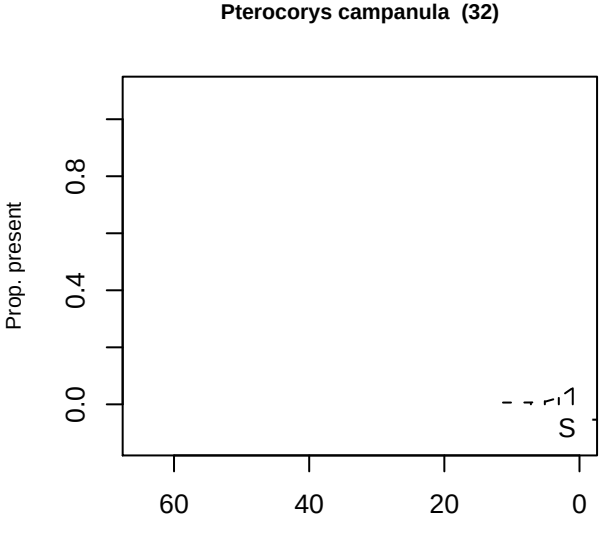
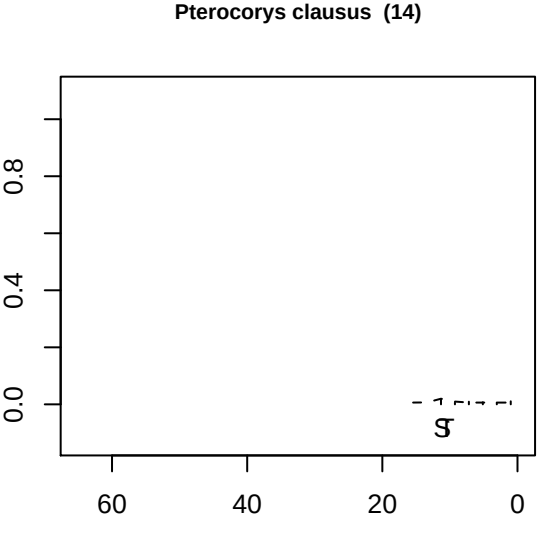
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

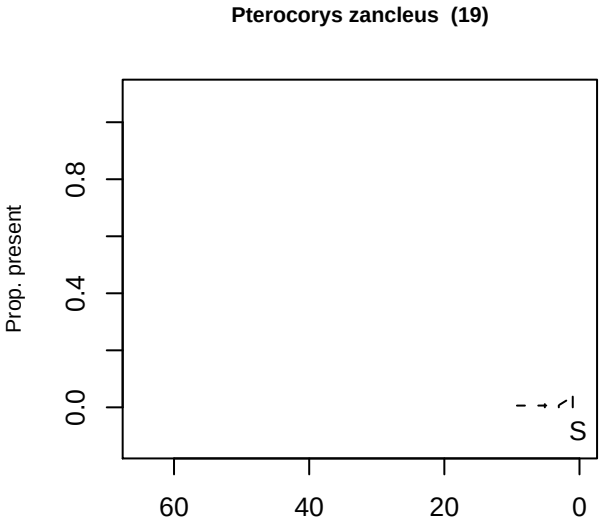

Prunopyle titan (197)
Prunopyle polyacantha (64)
Prunopyle trypopyrena (16)
Pseudocubus vema (72)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)


Pseudodictyophimus gracilipes (23)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T


Pseudodictyophimus horrida (38)
0.0
0.4
0.8
60
40
20
0
S
T


Pterocorys campanula (32)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)


Pterocorys clausus (14)
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)


Pterocorys zancleus (19)
Prop. present
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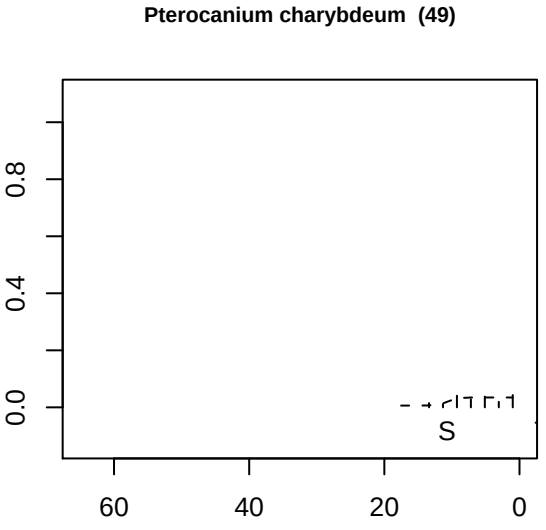
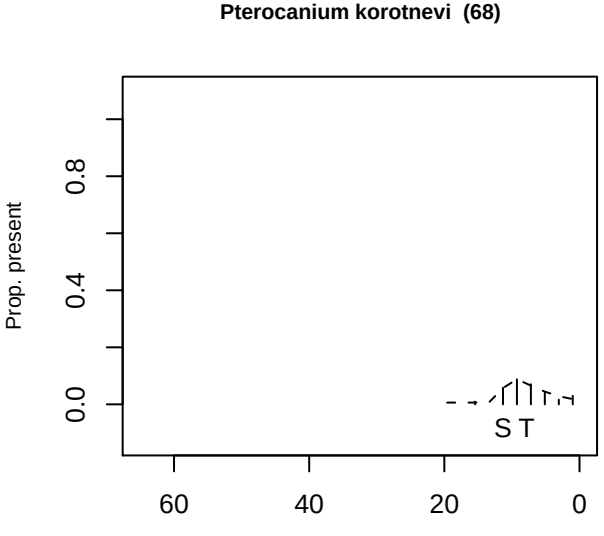
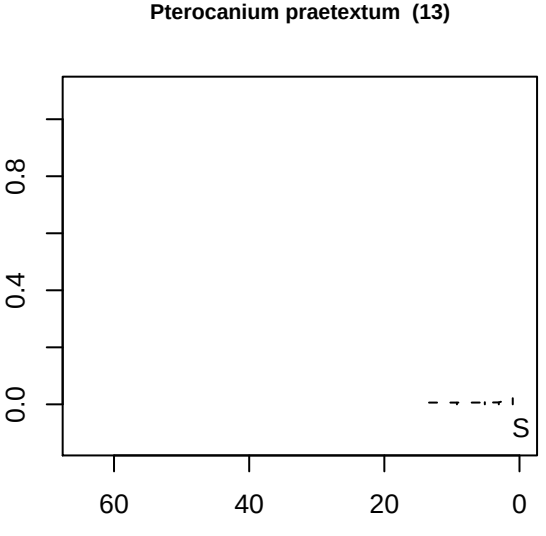
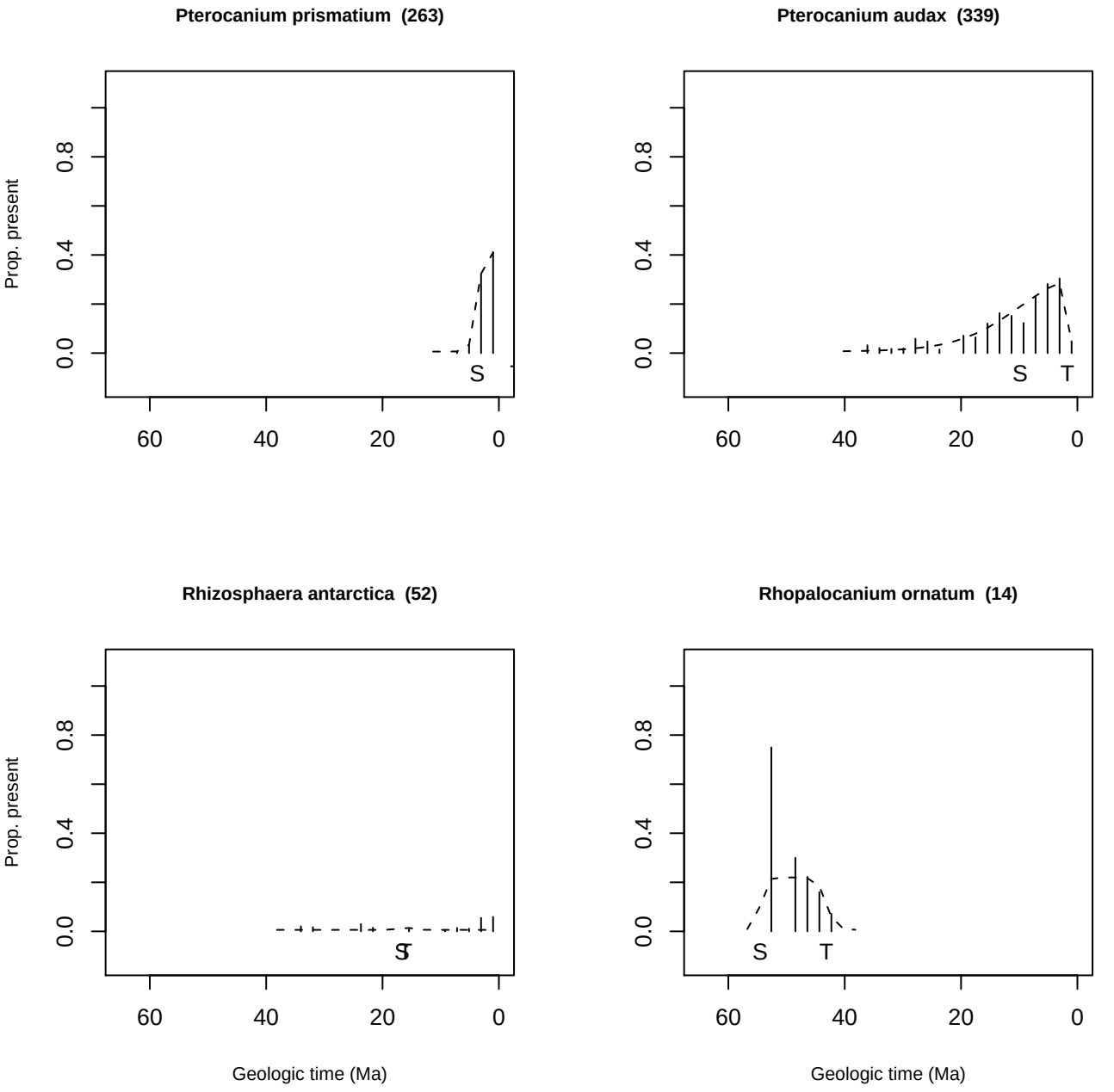
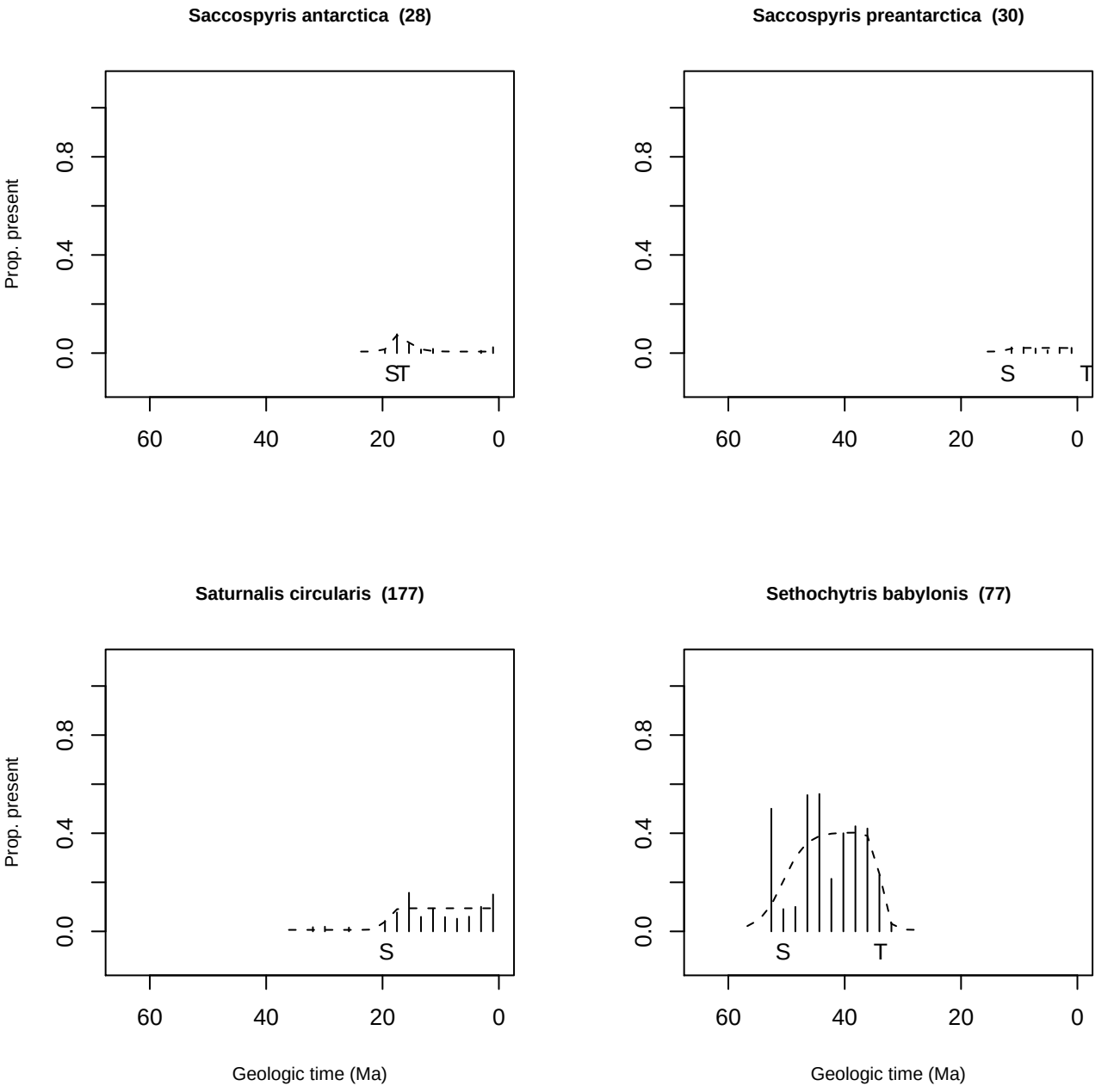
0.4
0.8
S
60
40
20
0

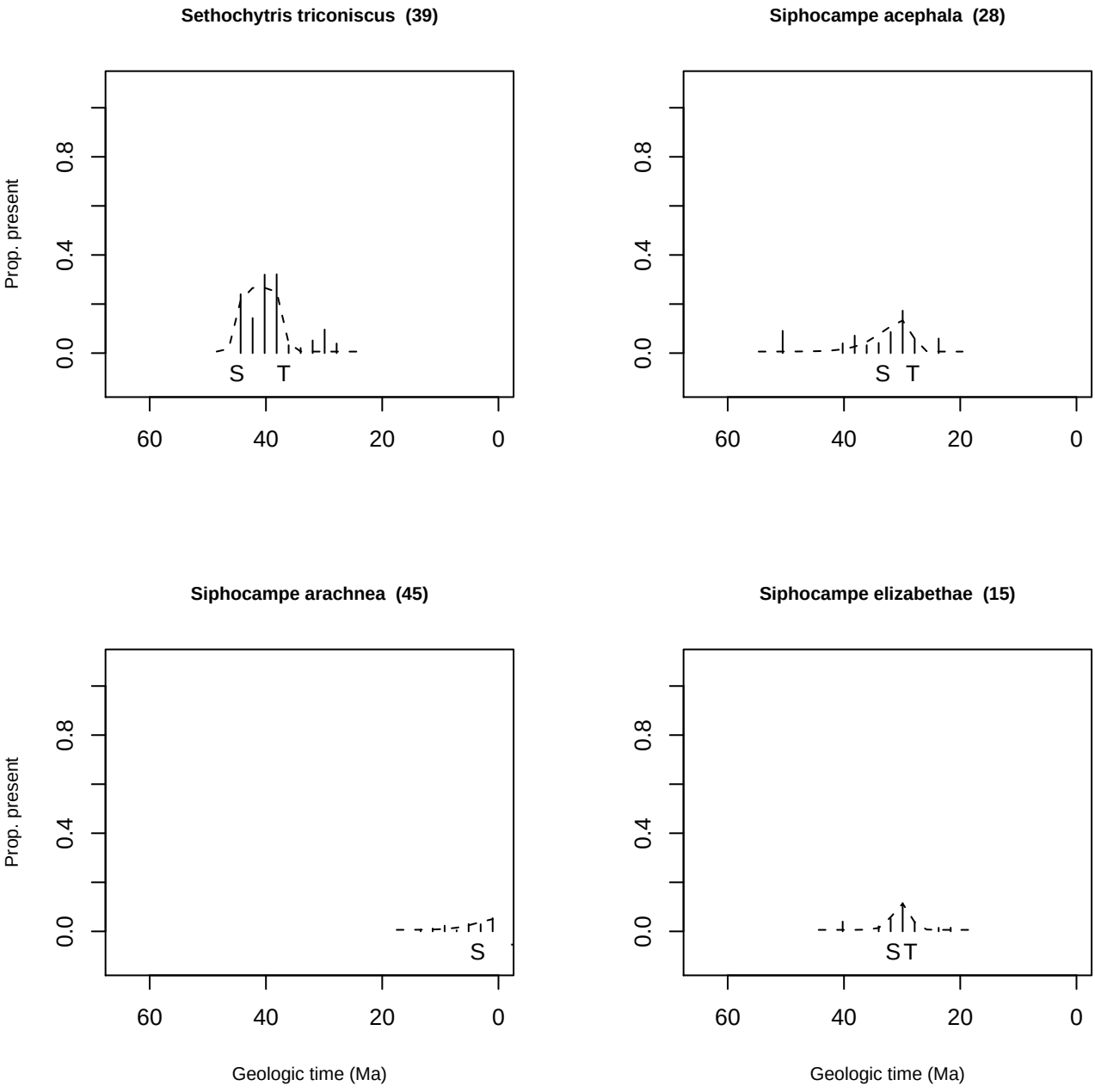

Pterocanium charybdeum (49)
0.0
0.4
0.8
S
60
40
20
0

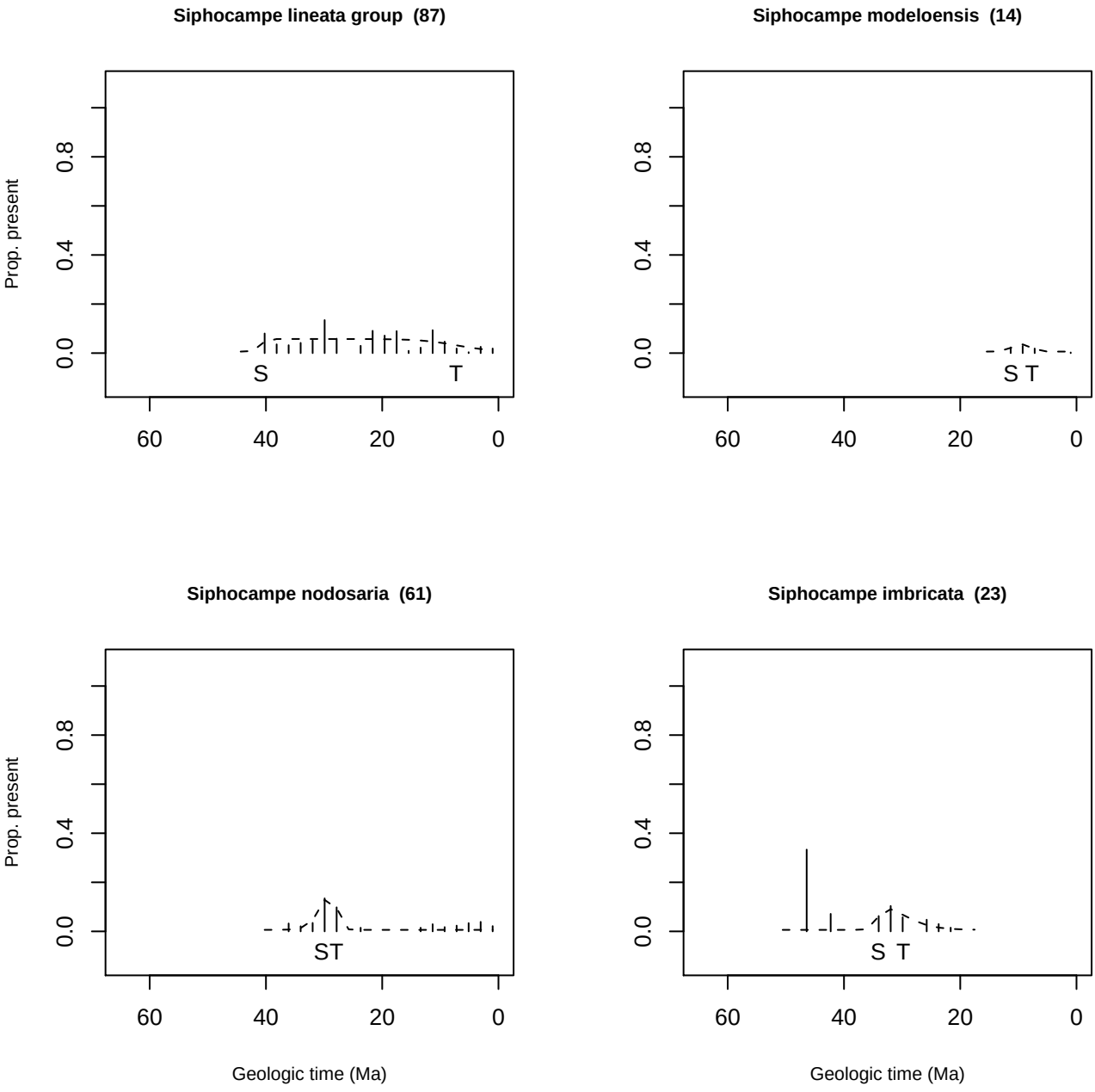

Pterocanium korotnevi (68)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

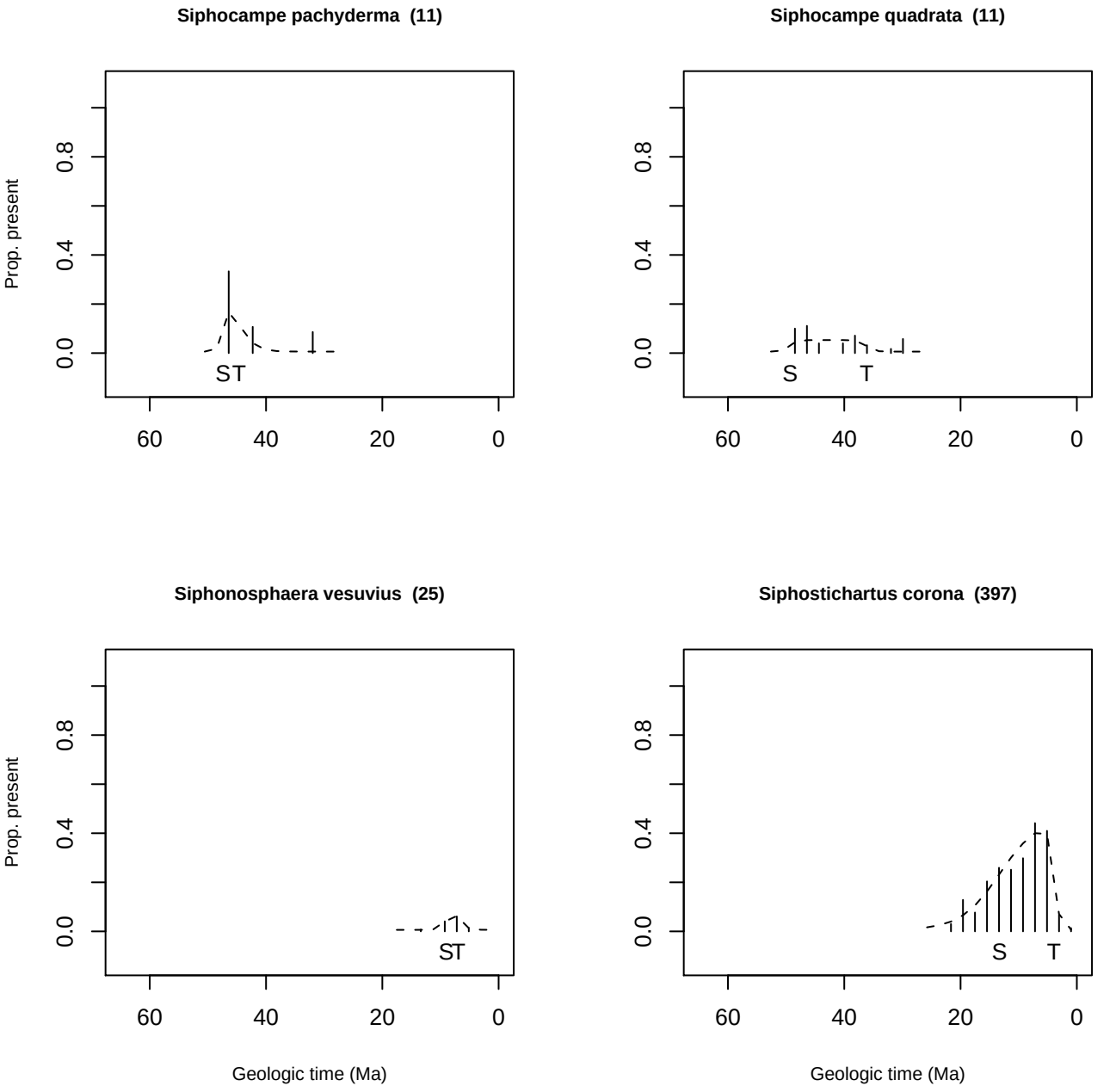

Pterocanium praetextum (13)
0.0
0.4
0.8
S
60
40
20
0
Geologic time (Ma)

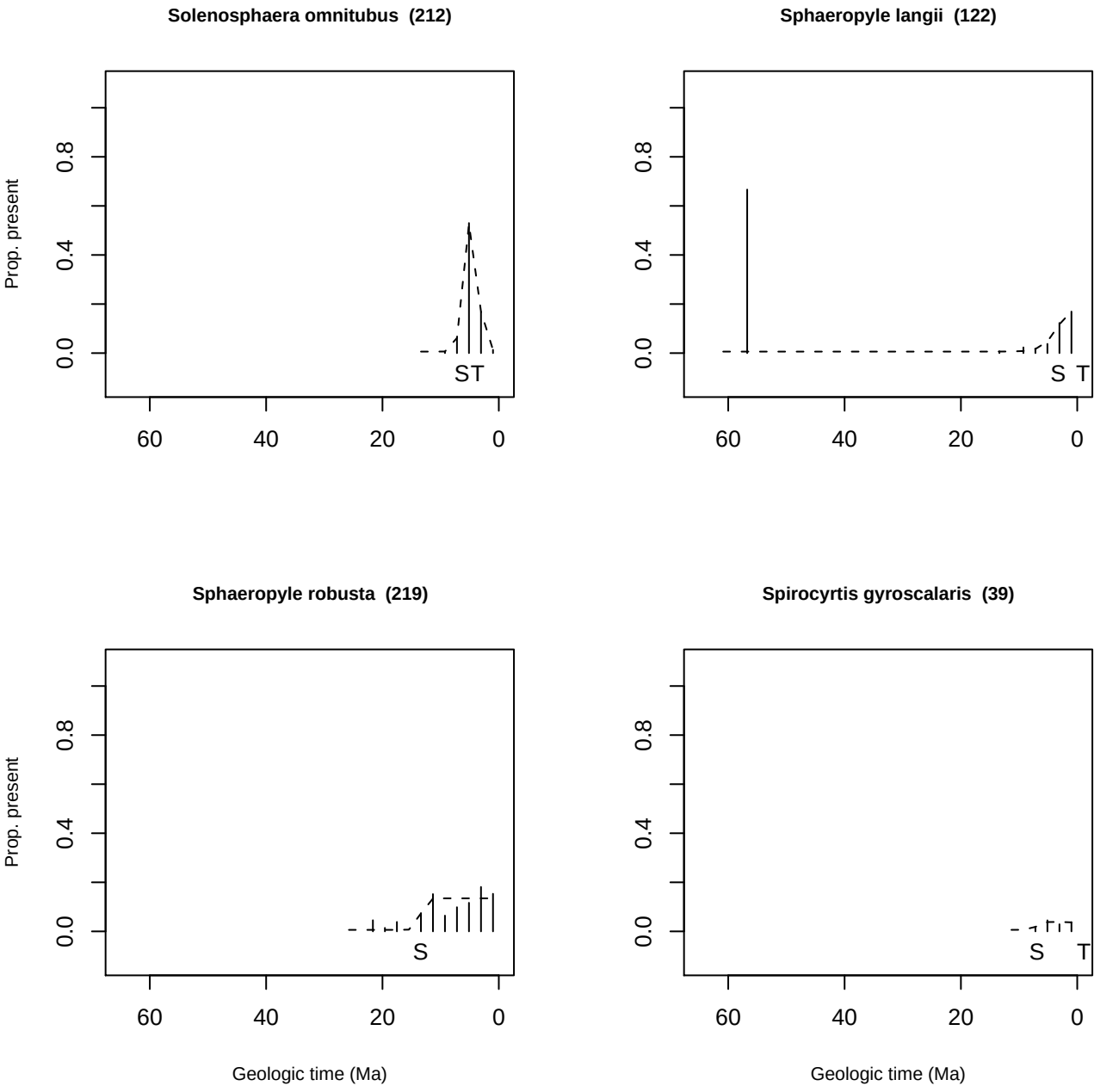

Pterocanium prismatium (263)
Pterocanium audax (339)
Rhizosphaera antarctica (52)
Rhopalocanium ornatum (14)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Saccospyris antarctica (28)
Saccospyris preantarctica (30)
Saturnalis circularis (177)
Sethochytris babylonis (77)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
T
Geologic time (Ma)


Sethochytris triconiscus (39)
Siphocampe acephala (28)
Siphocampe arachnea (45)
Siphocampe elizabethae (15)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Siphocampe lineata group (87)
Siphocampe modeloensis (14)
Siphocampe nodosaria (61)
Siphocampe imbricata (23)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)


Siphocampe pachyderma (11)
Siphocampe quadrata (11)
Siphonosphaera vesuvius (25)
Siphostichartus corona (397)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
T
Geologic time (Ma)


Solenosphaera omnitubus (212)
Sphaeropyle langii (122)
Sphaeropyle robusta (219)
Spirocyrtis gyroscalaris (39)
Prop. present
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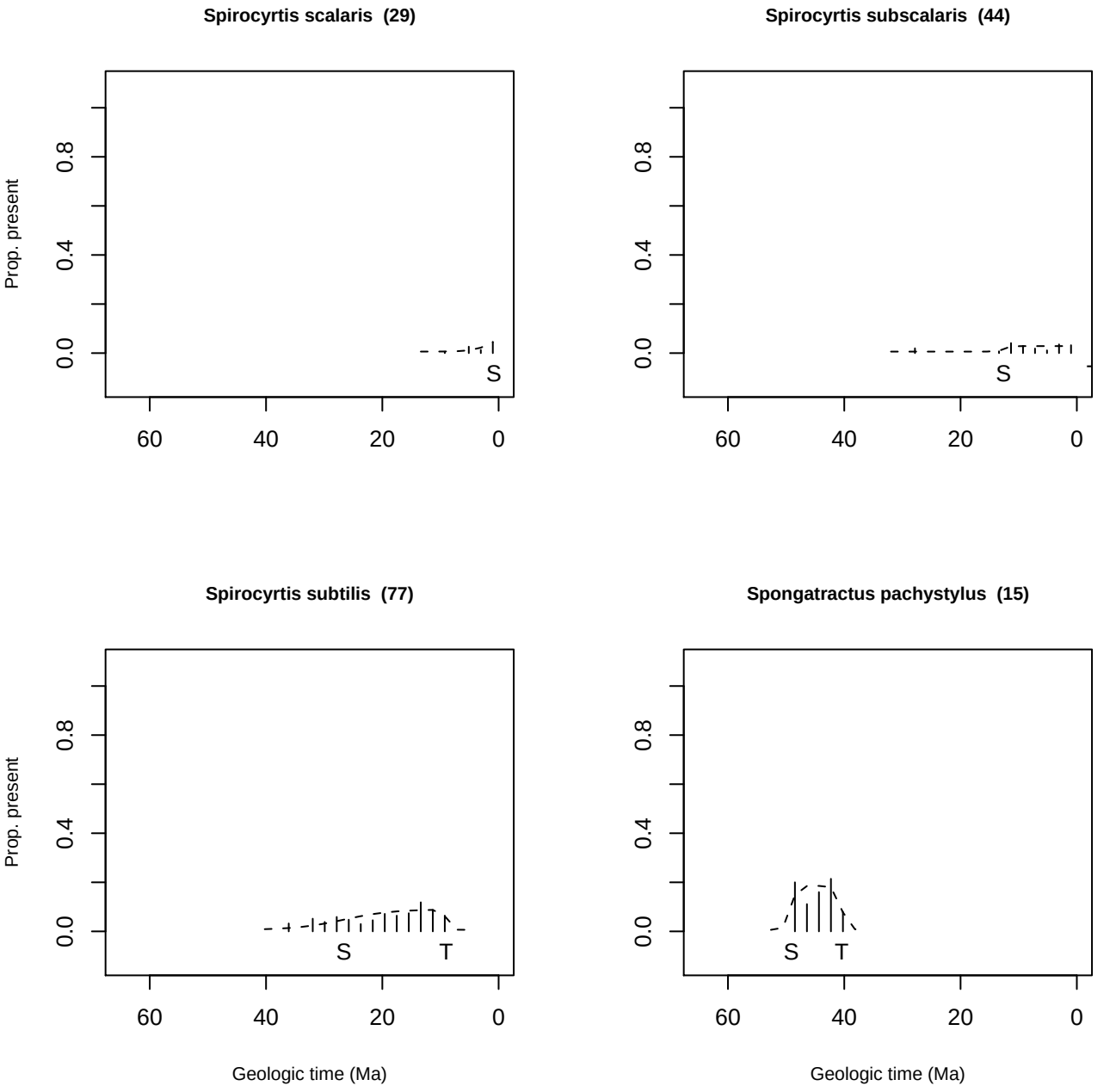
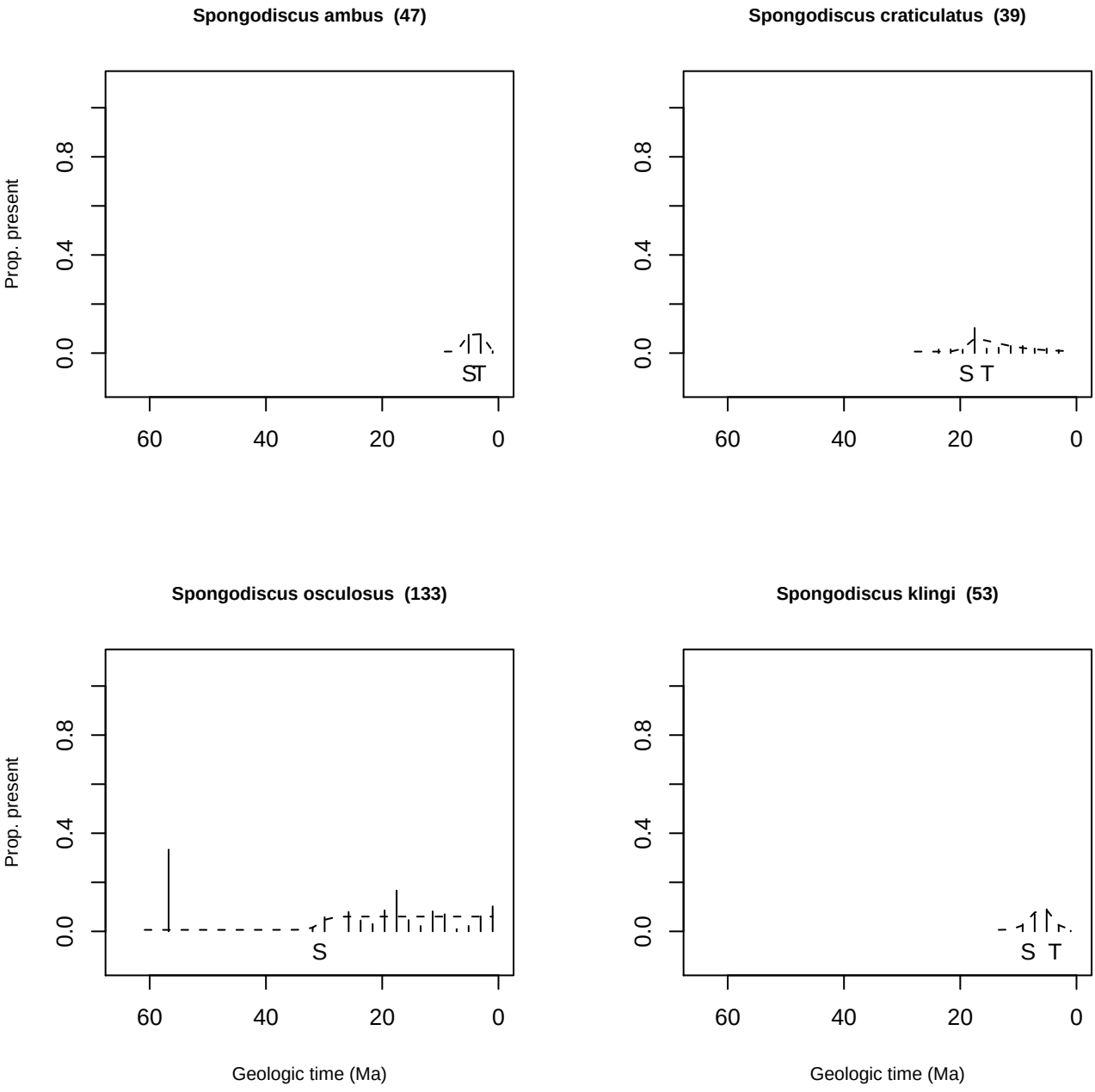
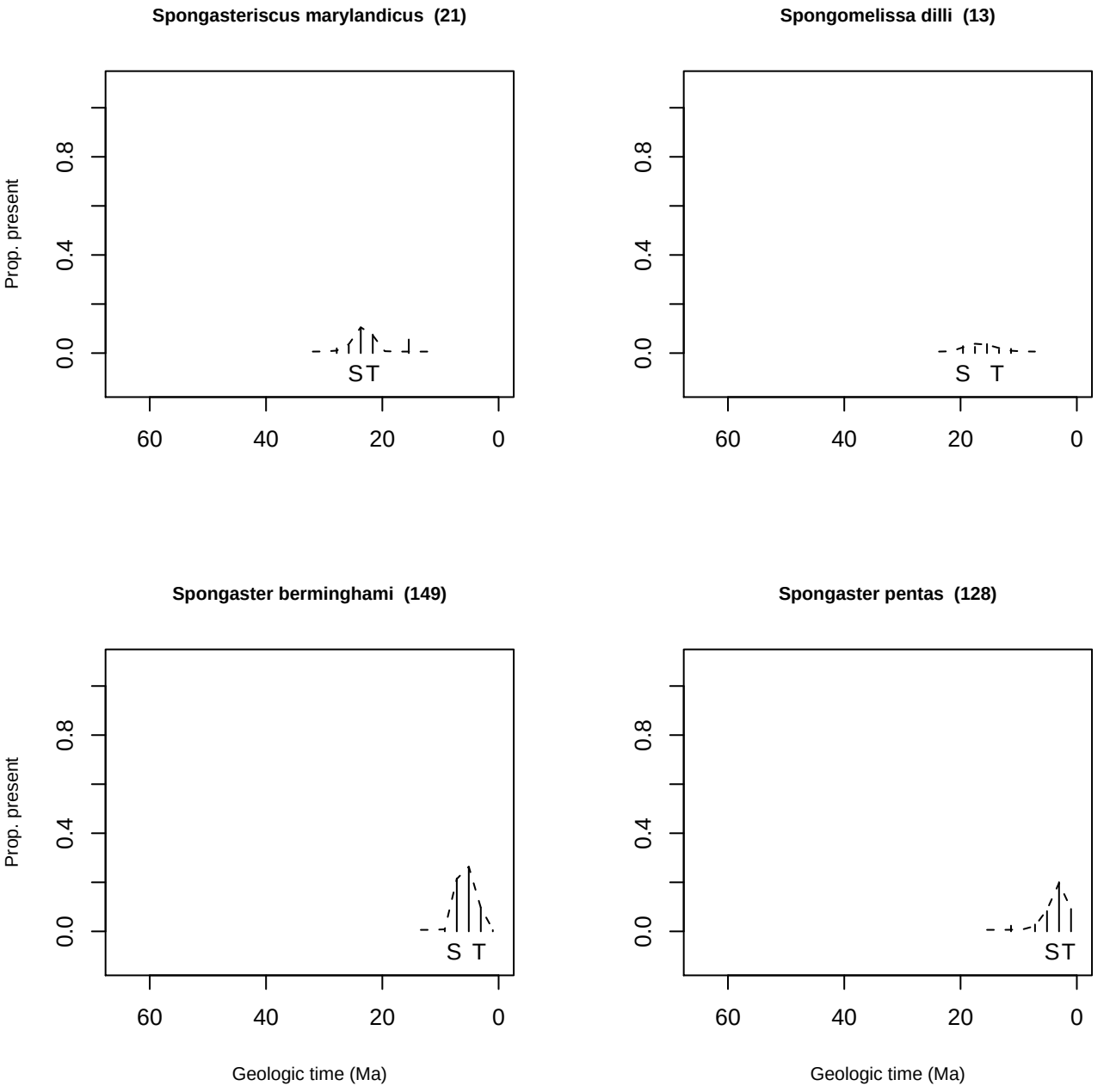
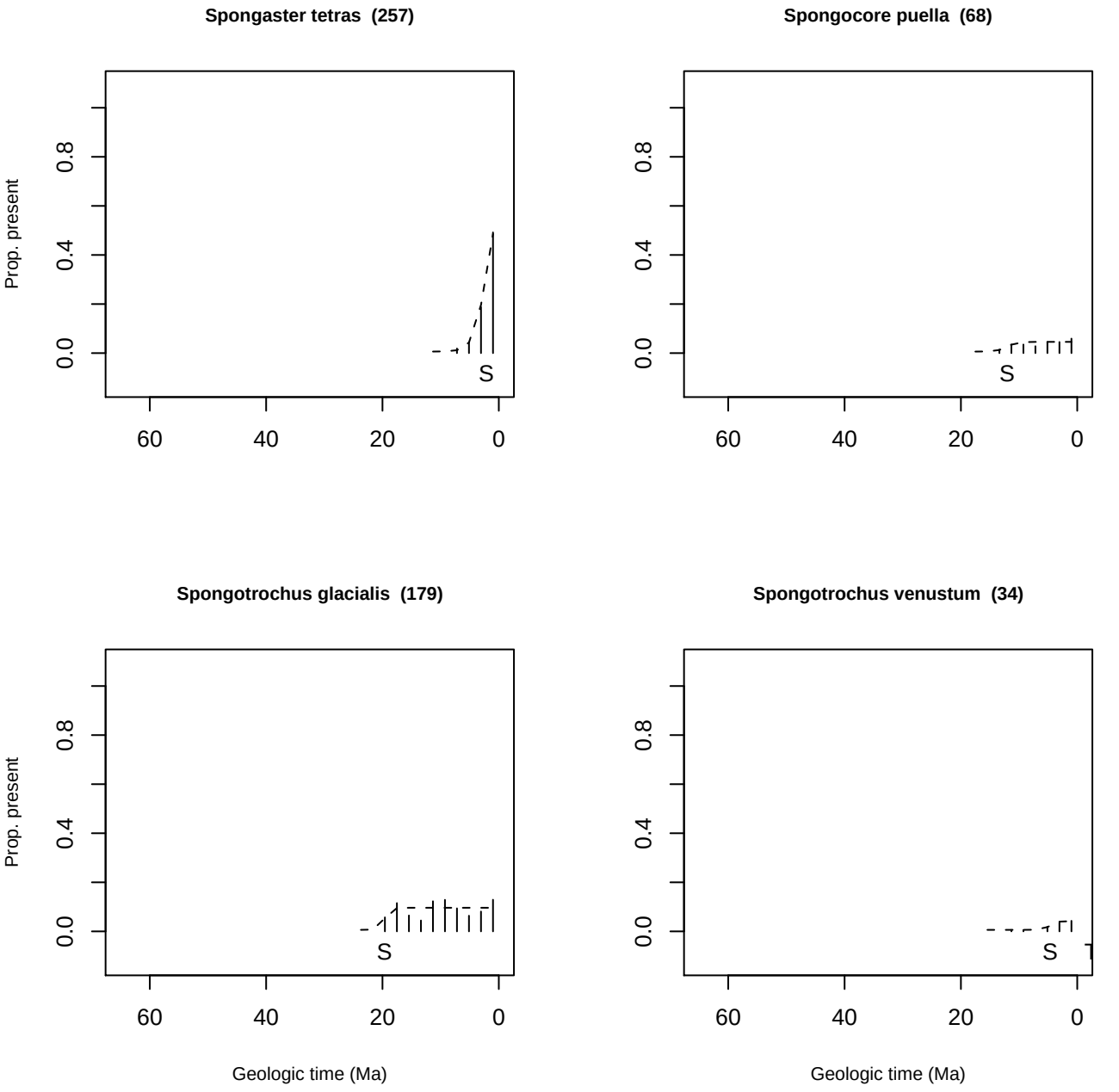
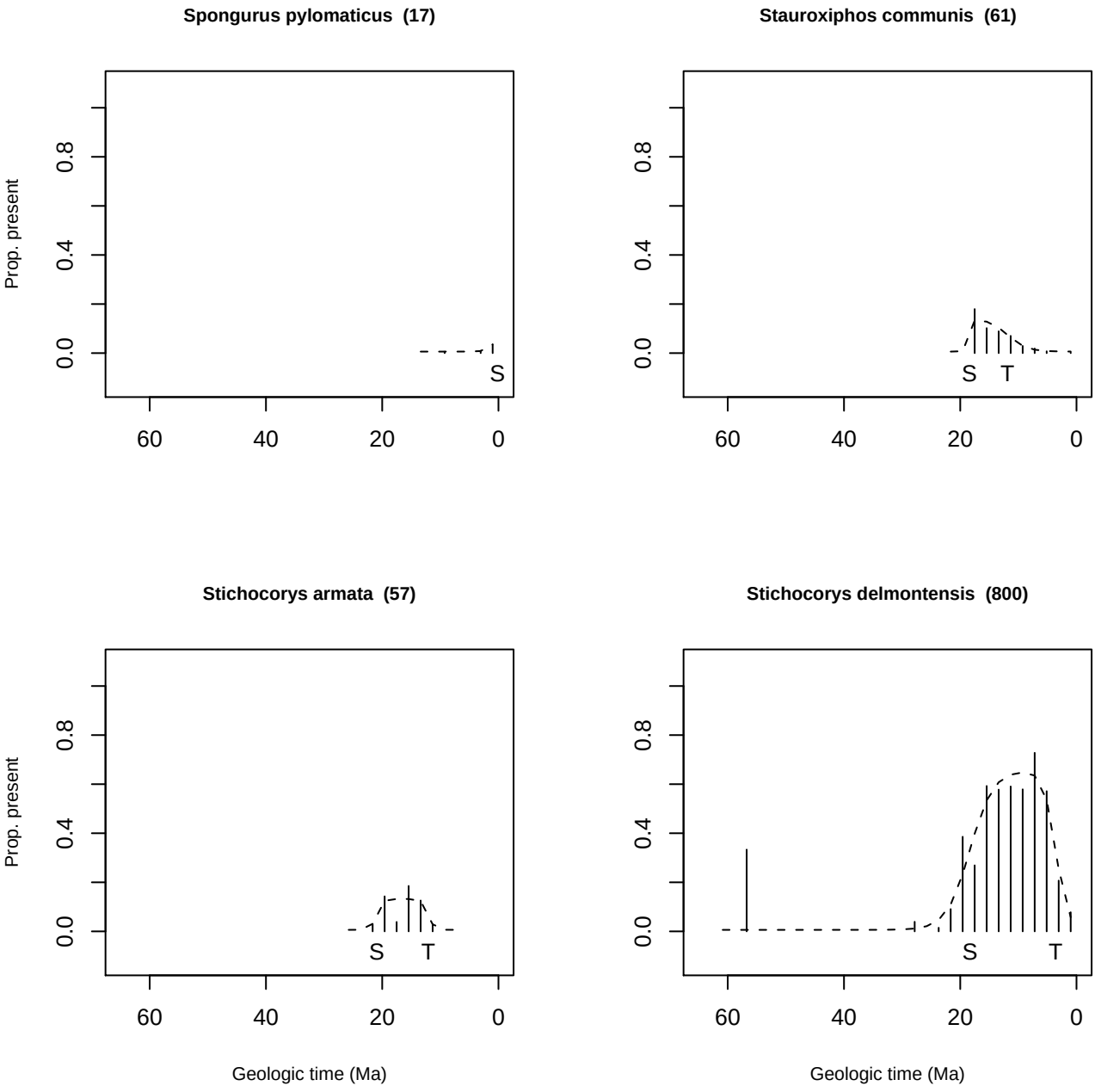
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

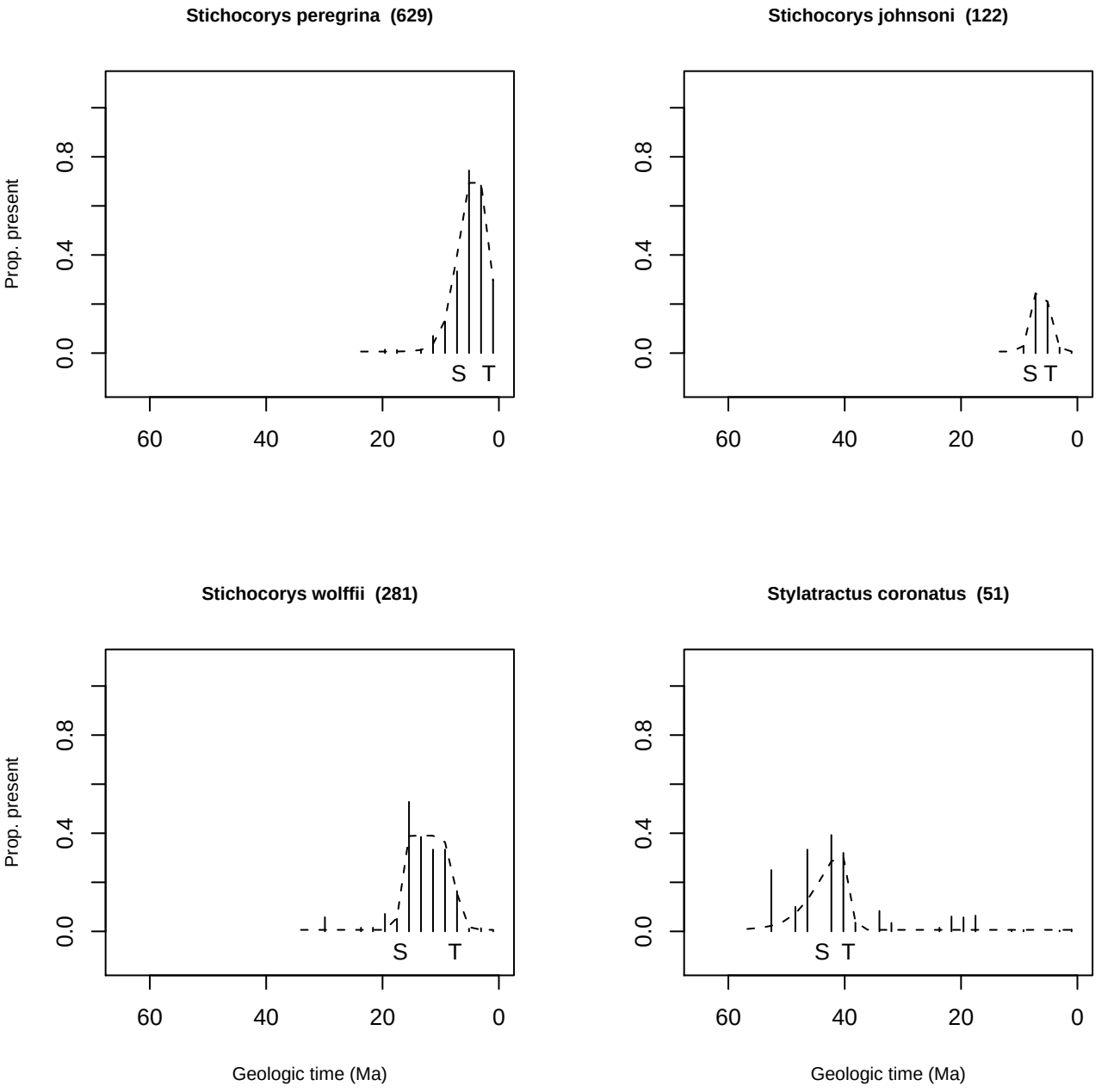

Spirocyrtis scalaris (29)
Spirocyrtis subscalaris (44)
Spirocyrtis subtilis (77)
Spongatractus pachystylus (15)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

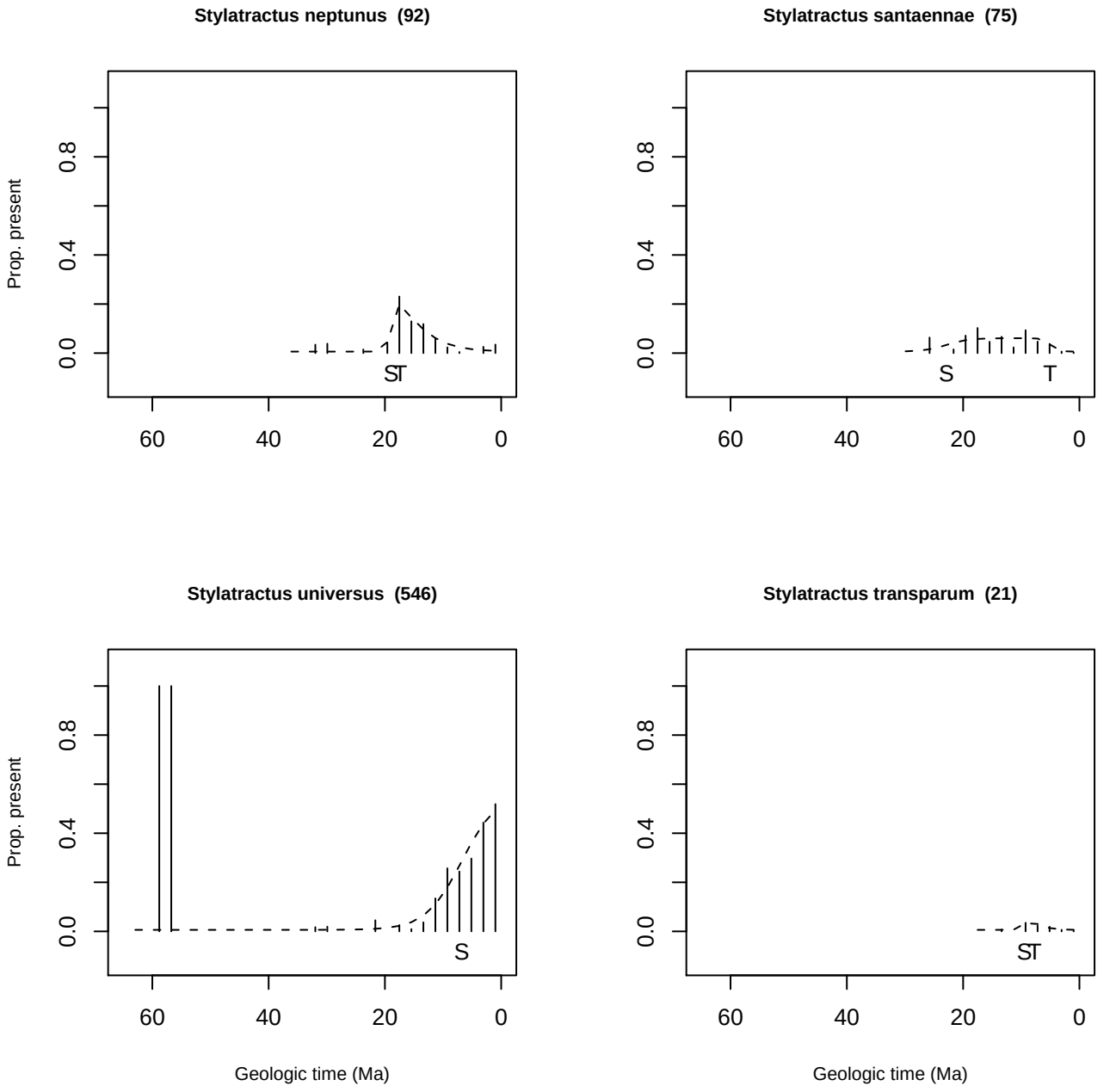

Spongodiscus ambus (47)
Spongodiscus craticulatus (39)
Spongodiscus osculosus (133)
Spongodiscus klingi (53)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

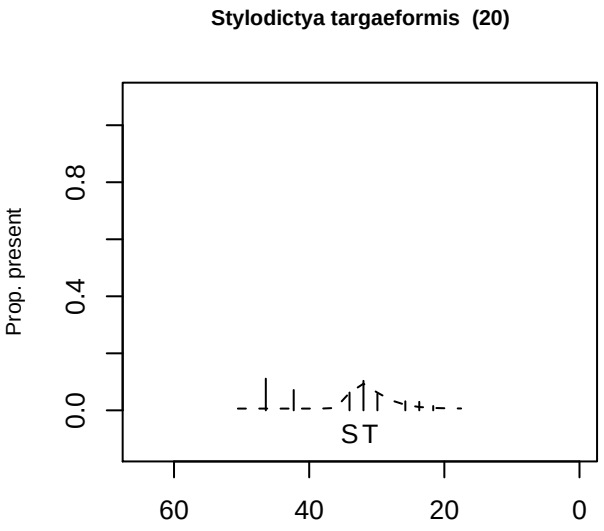

Spongasteriscus marylandicus (21)
Spongomelissa dilli (13)
Spongaster berminghami (149)
Spongaster pentas (128)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

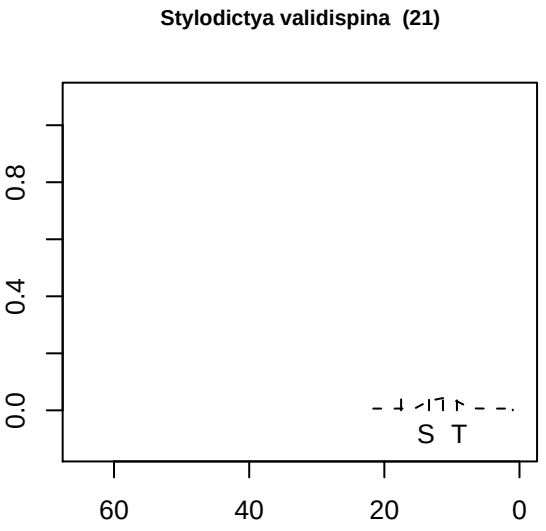

Spongaster tetras (257)
Spongocore puella (68)
Spongotrochus glacialis (179)
Spongotrochus venustum (34)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
Geologic time (Ma)

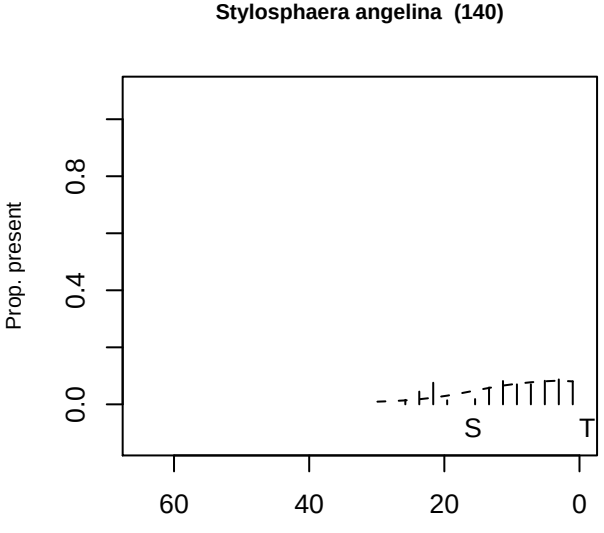

Spongurus pylomaticus (17)
Stauroxiphos communis (61)
Stichocorys armata (57)
Stichocorys delmontensis (800)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

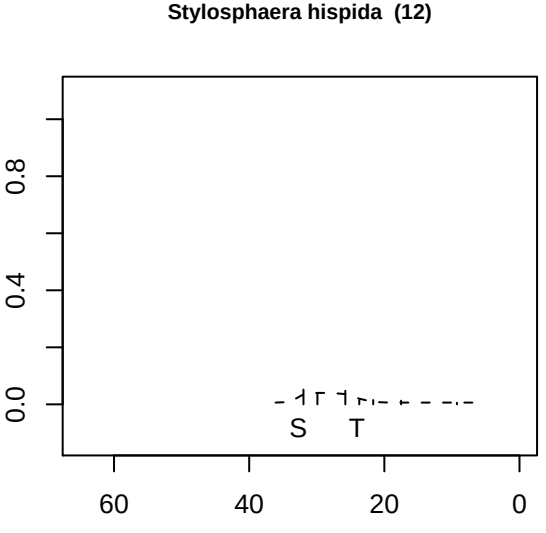

Stichocorys peregrina (629)
Stichocorys johnsoni (122)
Stichocorys wolffii (281)
Stylatractus coronatus (51)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

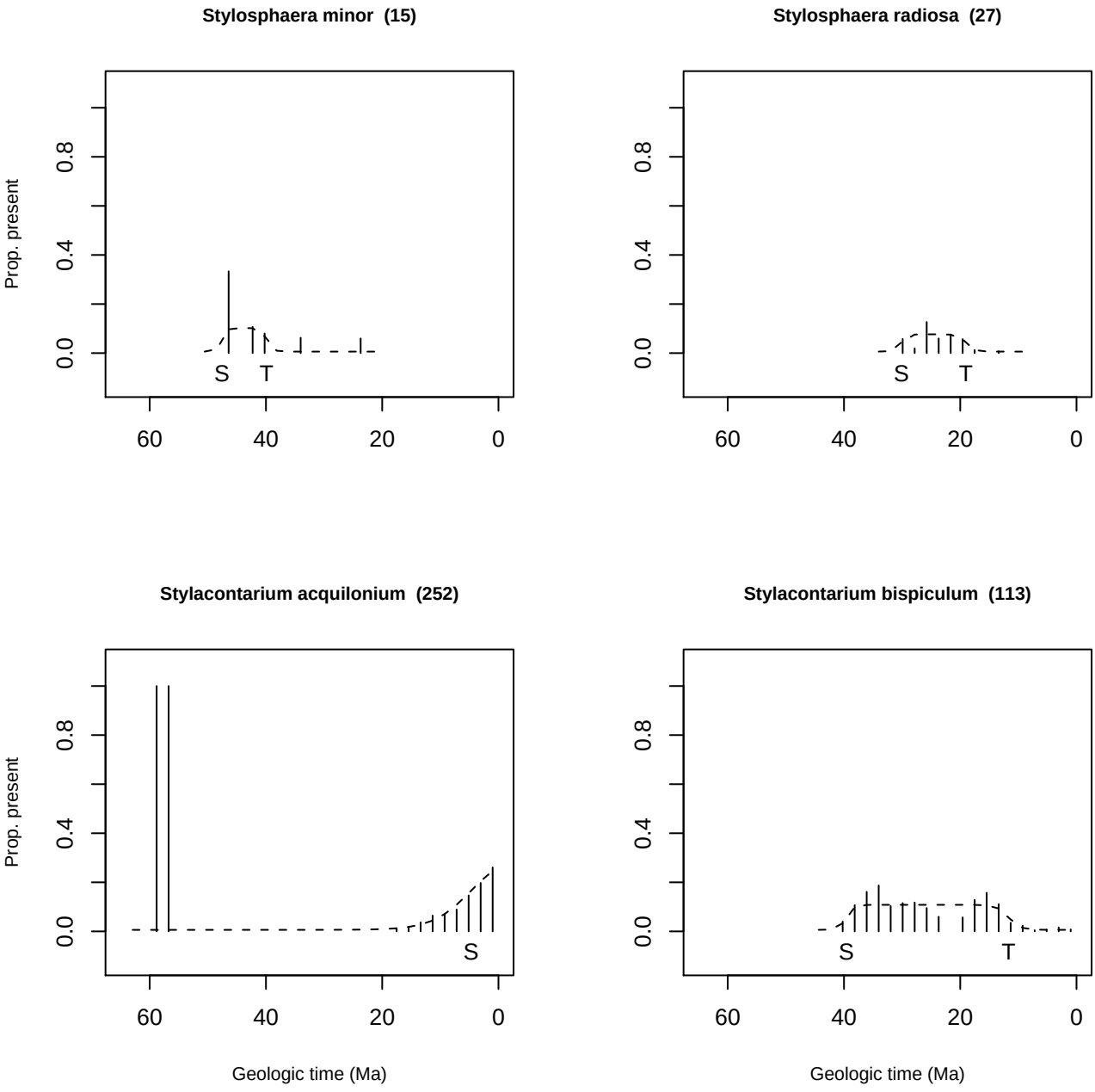

Stylatractus neptunus (92)
Stylatractus santaennae (75)
Stylatractus universus (546)
Stylatractus transparum (21)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
T
S
ST
Geologic time (Ma)
Geologic time (Ma)

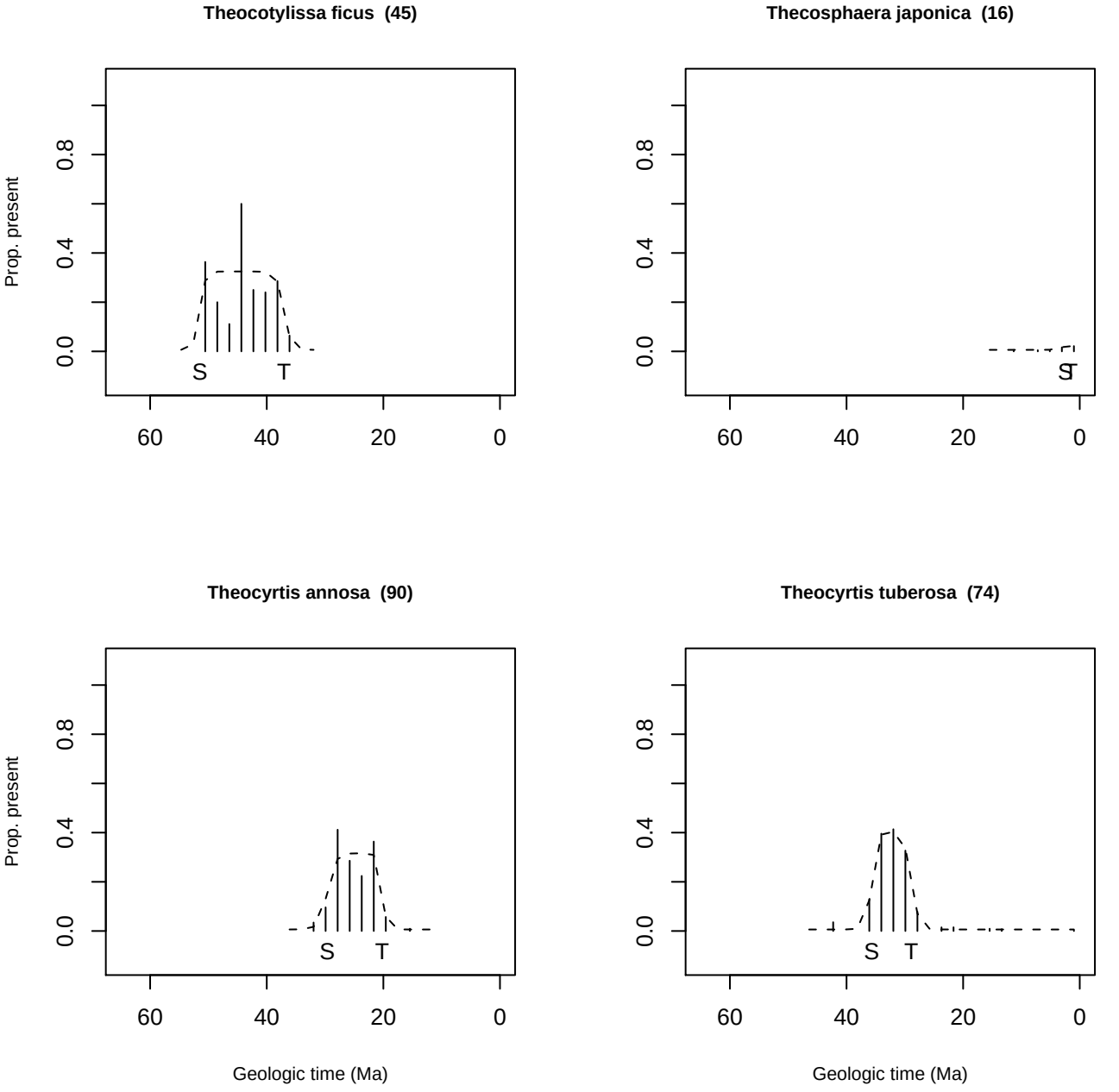

Stylodictya targaeformis (20)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0

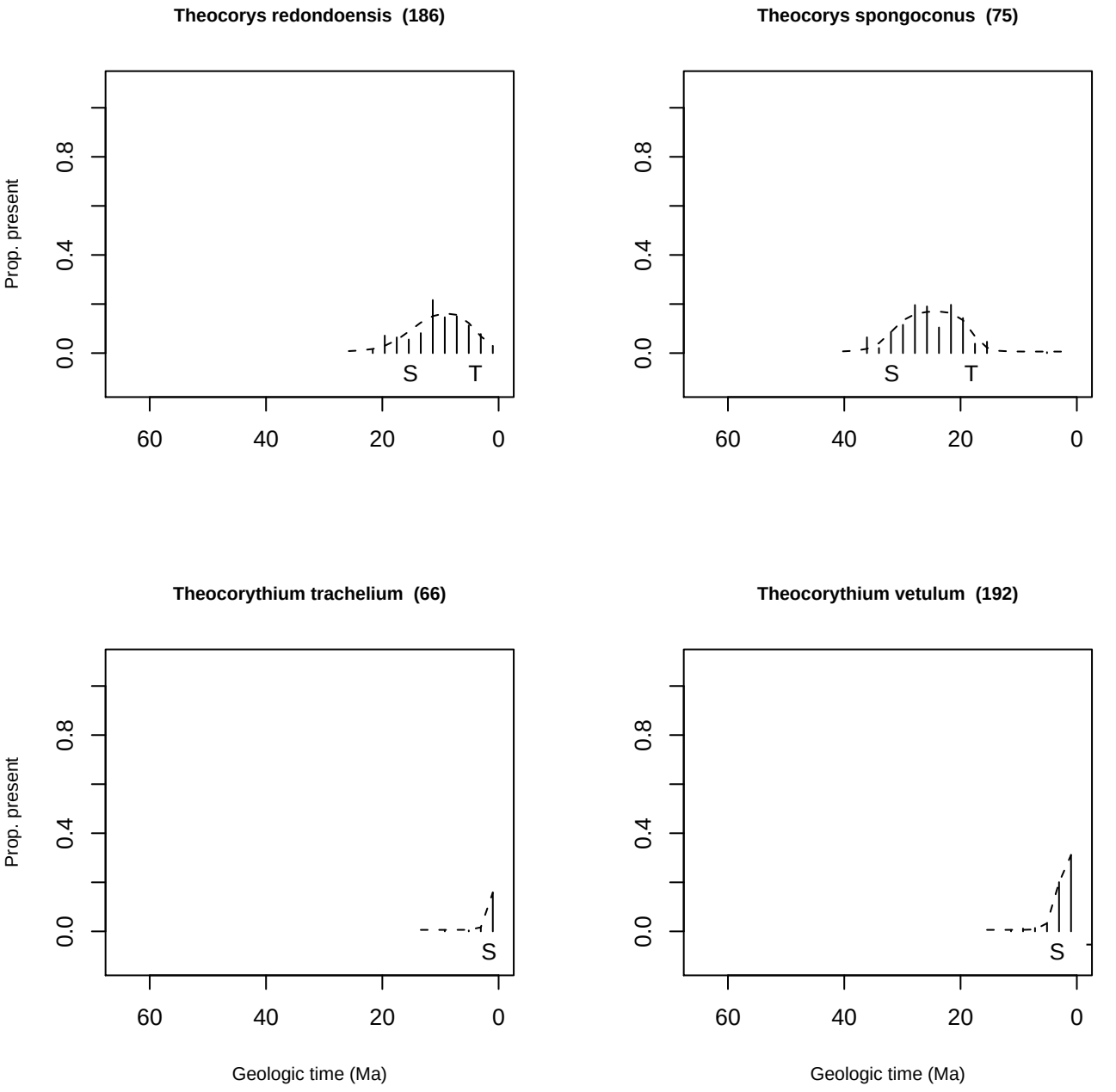

Stylodictya validispina (21)
0.0
0.4
0.8
S T
60
40
20
0

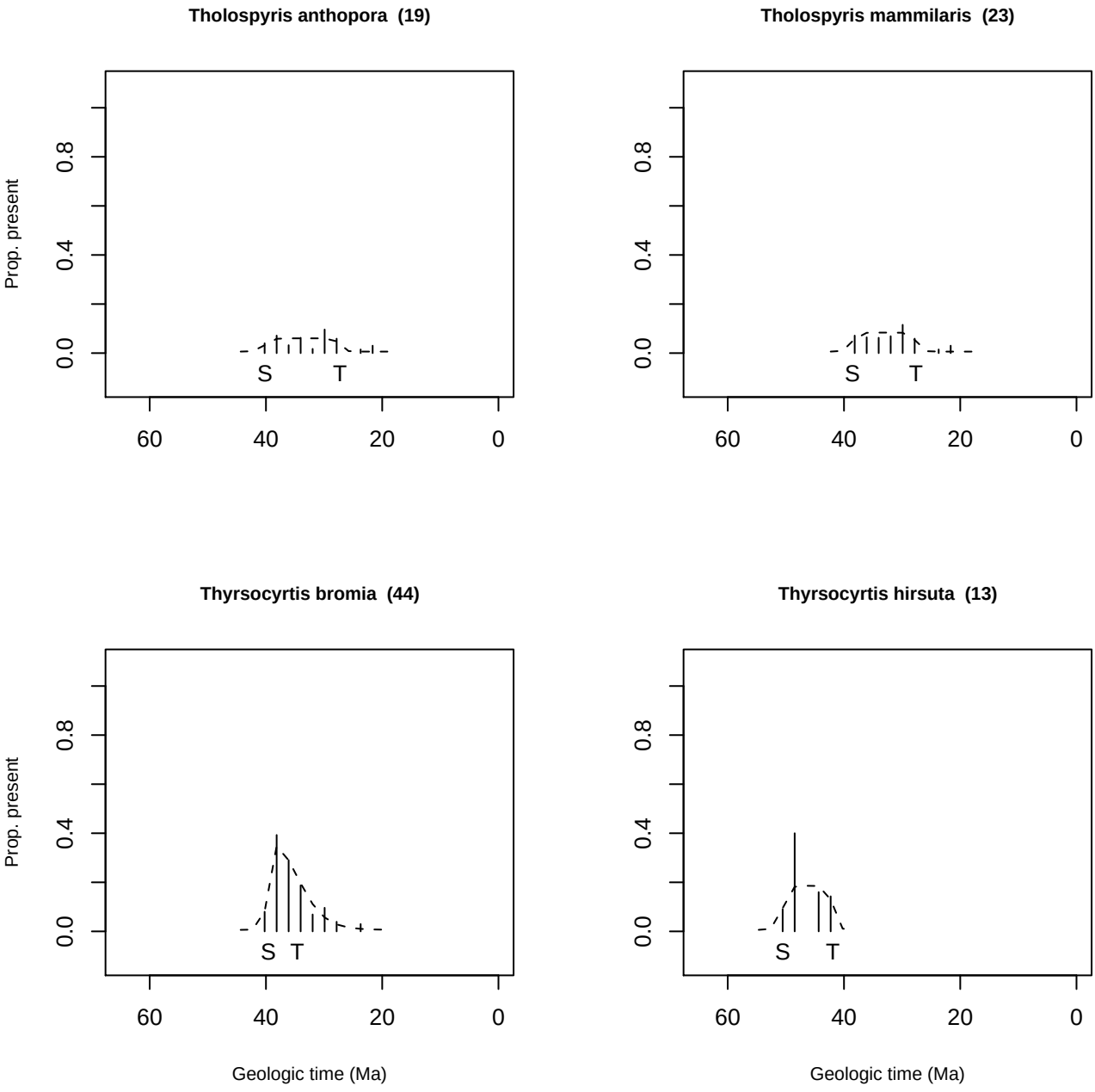

Stylosphaera angelina (140)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

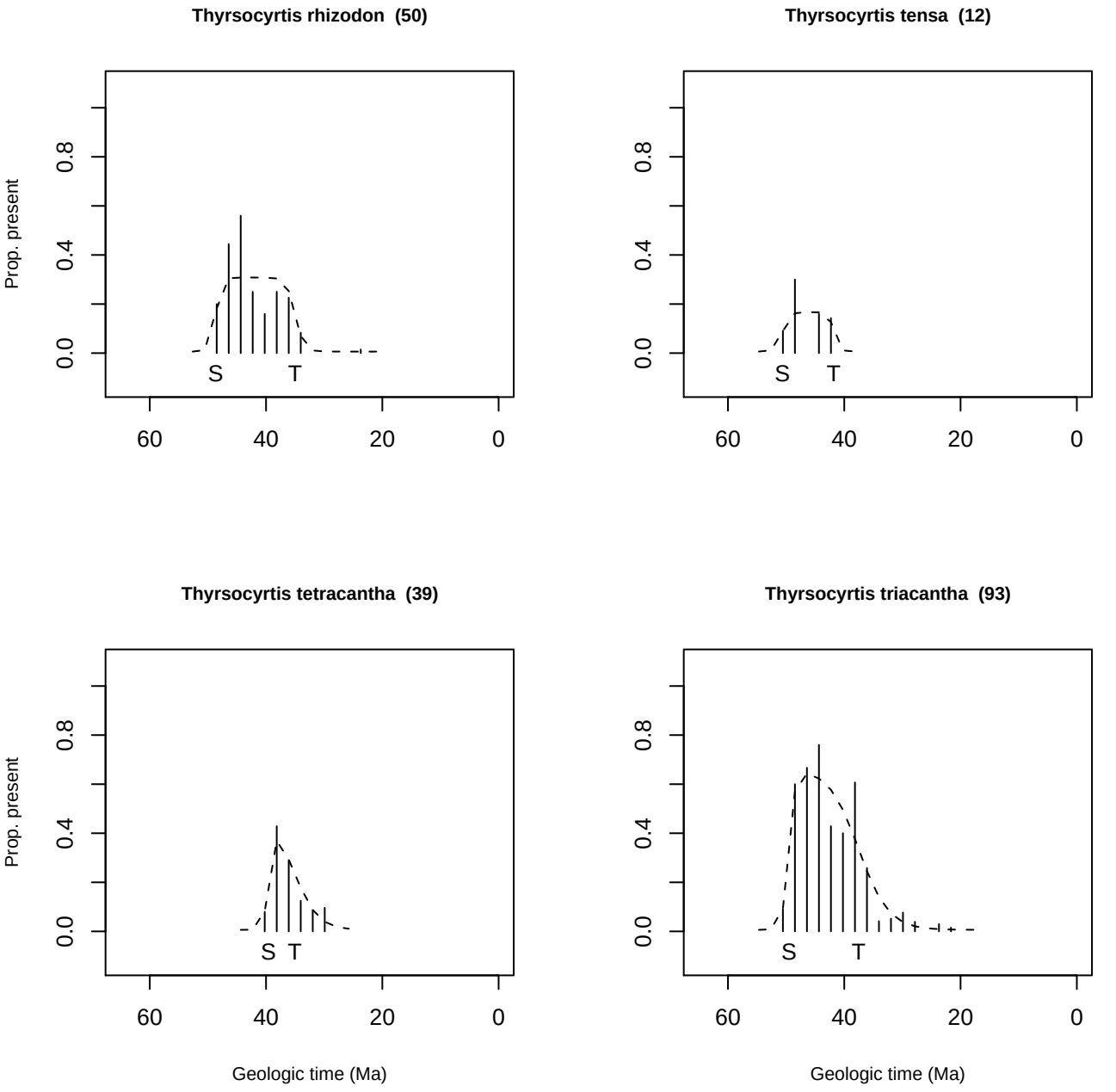

Stylosphaera hispida (12)
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

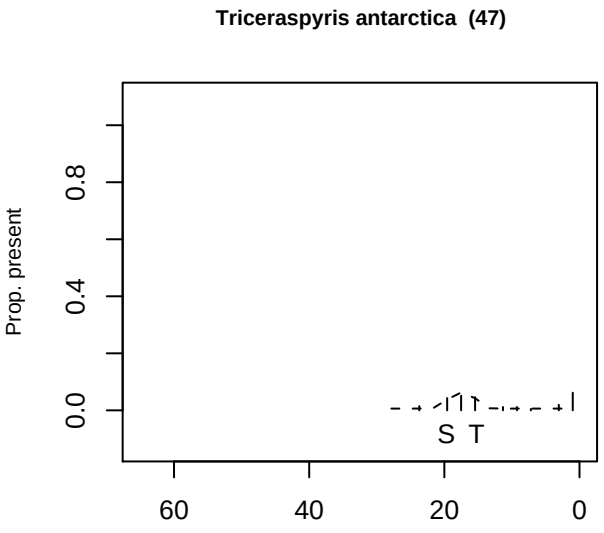

Stylosphaera minor (15)
Stylosphaera radiosa (27)
Stylacontarium acquilonium (252)
Stylacontarium bispiculum (113)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

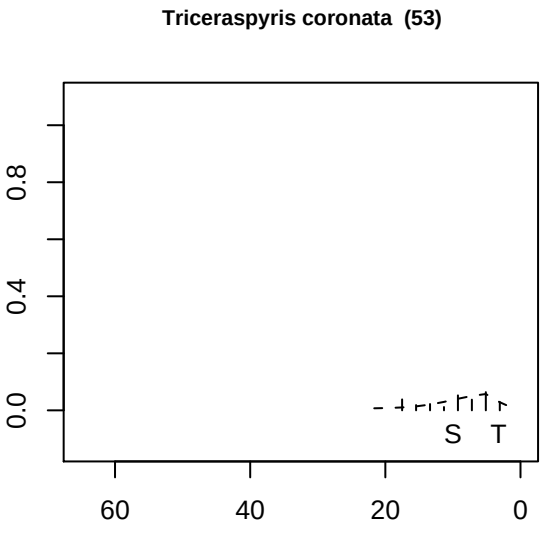

Theocotylissa ficus (45)
Thecosphaera japonica (16)
Theocyrtis annosa (90)
Theocyrtis tuberosa (74)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

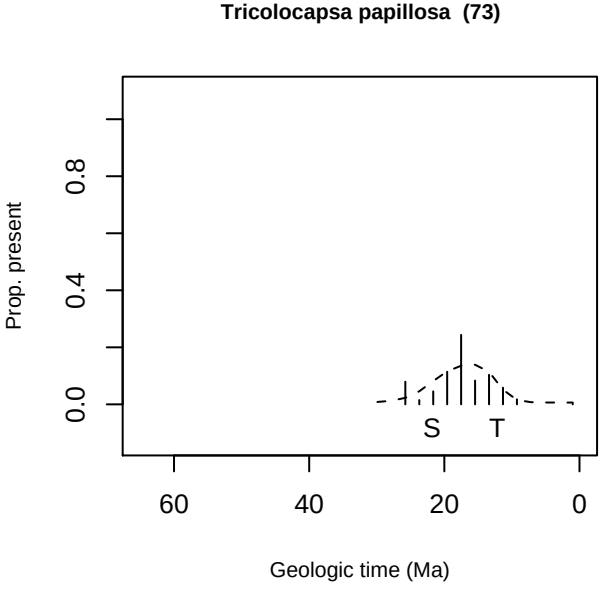

Theocorys redondoensis (186)
Theocorys spongoconus (75)
Theocorythium trachelium (66)
Theocorythium vetulum (192)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

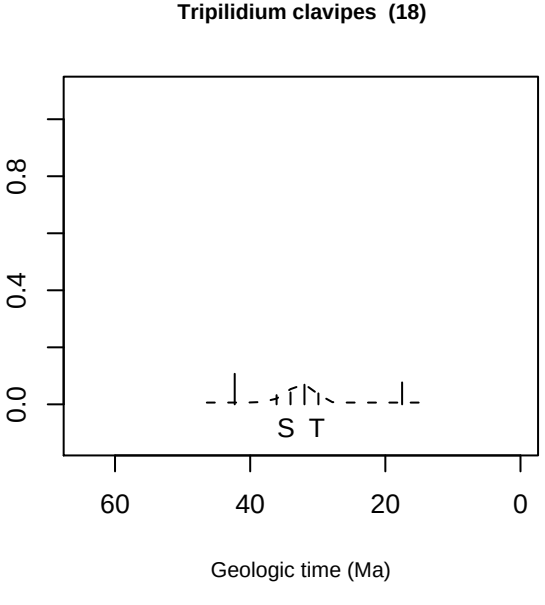

Tholospyris anthopora (19)
Tholospyris mammilaris (23)
Thyrsocyrtis bromia (44)
Thyrsocyrtis hirsuta (13)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

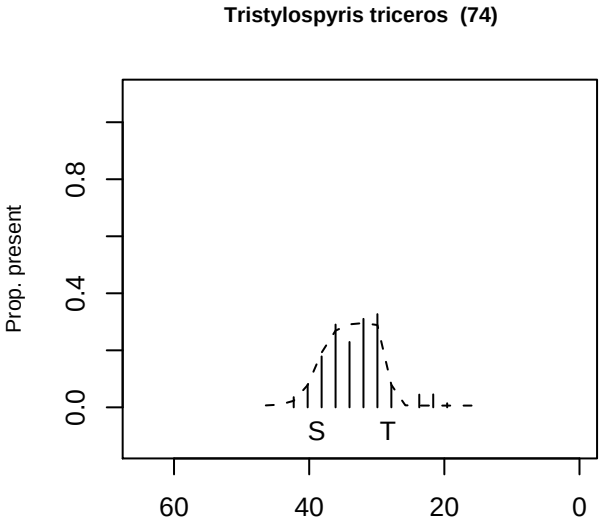

Thyrsocyrtis rhizodon (50)
Thyrsocyrtis tensa (12)
Thyrsocyrtis tetracantha (39)
Thyrsocyrtis triacantha (93)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

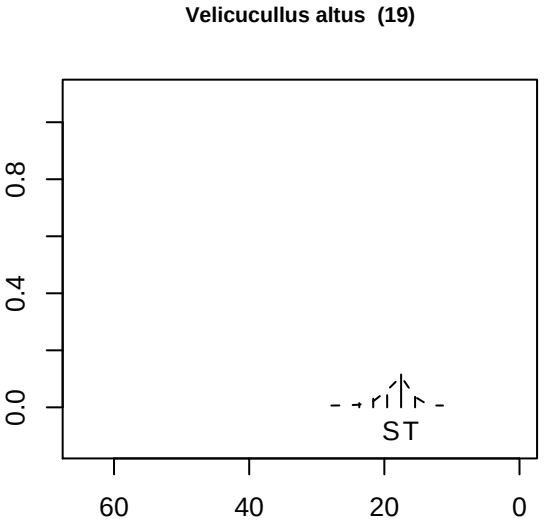

Triceraspyris antarctica (47)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0

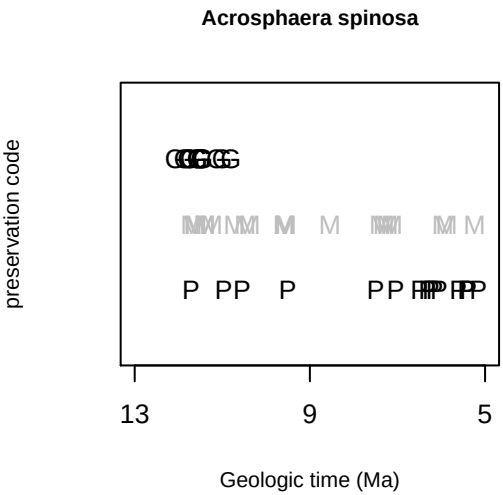

Triceraspyris coronata (53)
0.0
0.4
0.8
S T
60
40
20
0

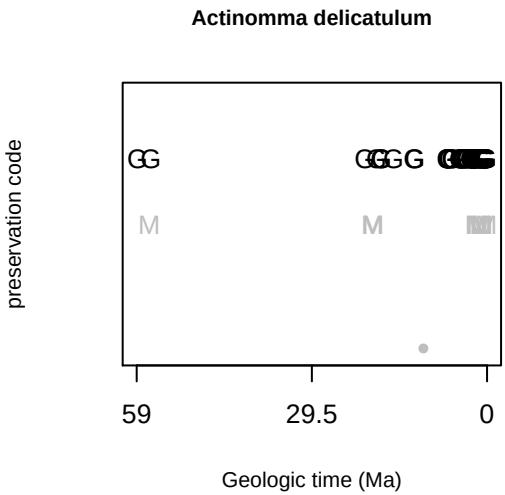

Tricolocapsa papillosa (73)
Prop. present
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

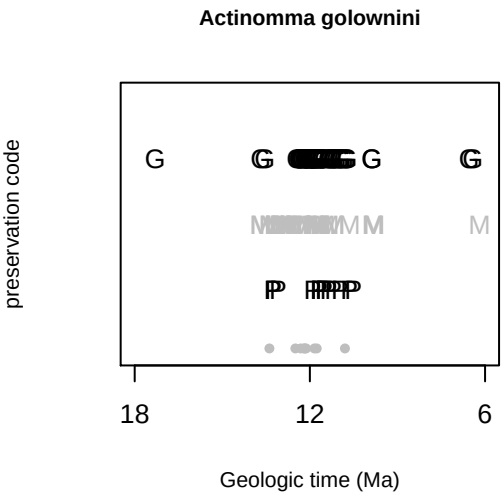

Tripilidium clavipes (18)
0.0
0.4
0.8
S T
60
40
20
0
Geologic time (Ma)

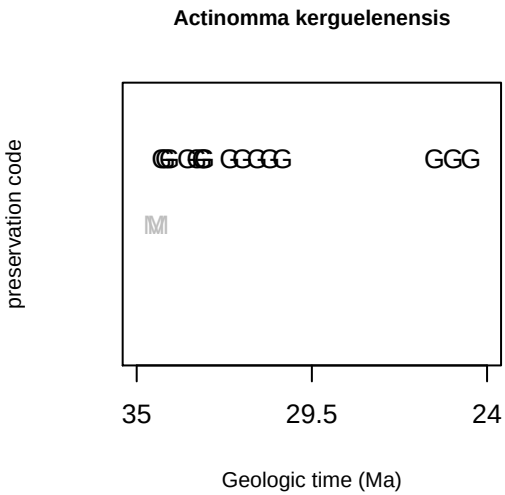

Tristylospyris triceros (74)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0

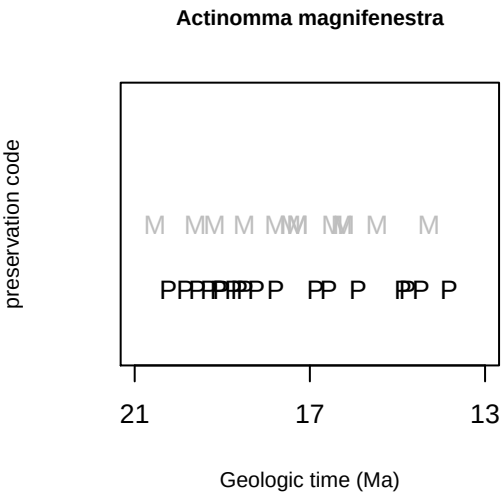

Velicucullus altus (19)
0.0
0.4
0.8
ST
60
40
20
0

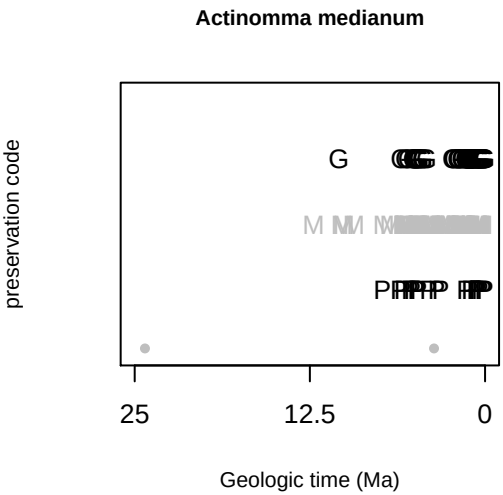

Acrosphaera spinosa
preservation code
13
9
5
Geologic time (Ma)

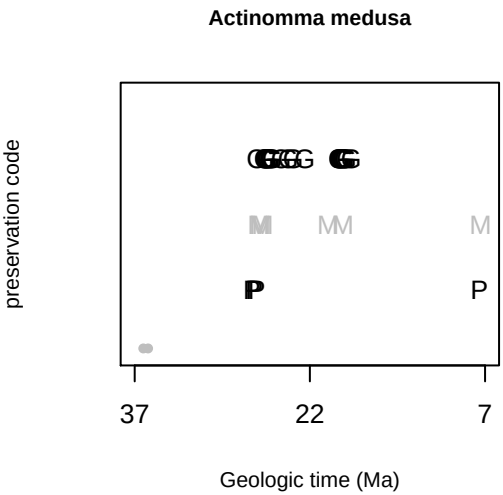

Actinomma delicatulum
preservation code
59
29.5
0
Geologic time (Ma)

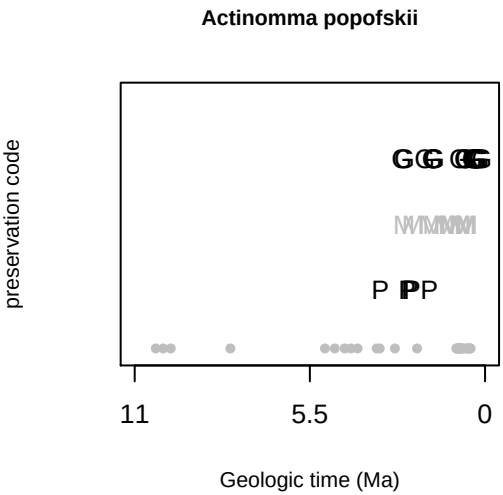

Actinomma golownini
preservation code
18
12
6
Geologic time (Ma)

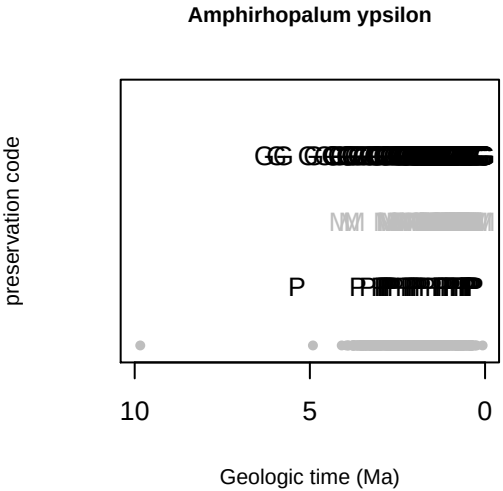

Actinomma kerguelenensis
preservation code
35
29.5
24
Geologic time (Ma)

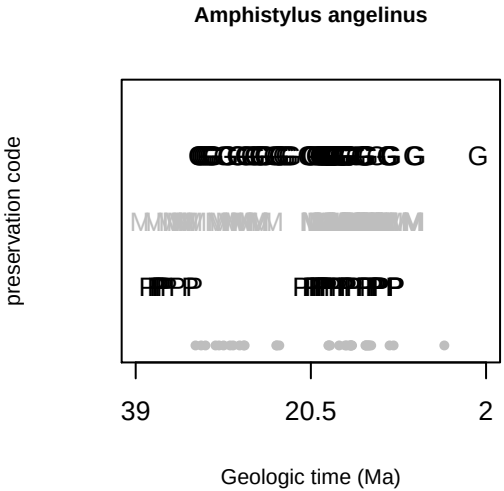

Actinomma magnifenestra
preservation code
21
17
13
Geologic time (Ma)

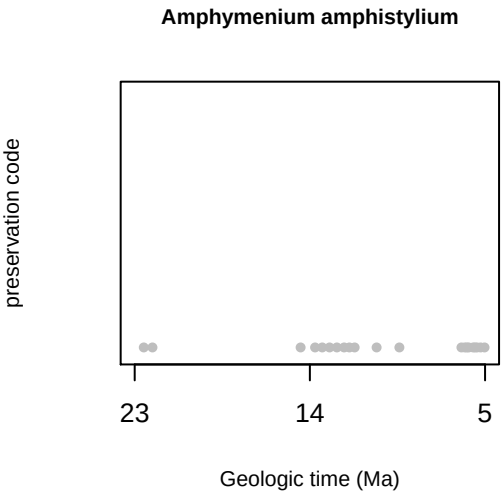

Actinomma medianum
preservation code
25
12.5
0
Geologic time (Ma)

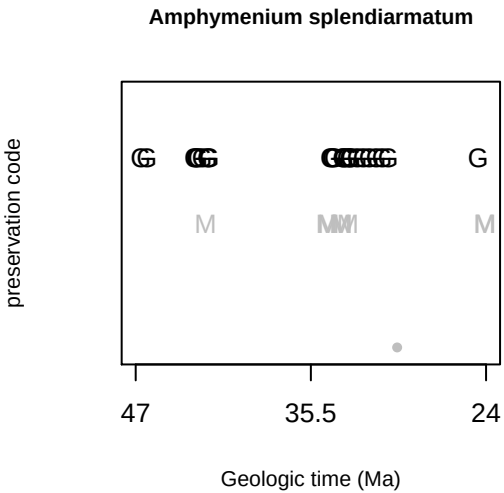

Actinomma medusa
preservation code
37
22
7
Geologic time (Ma)

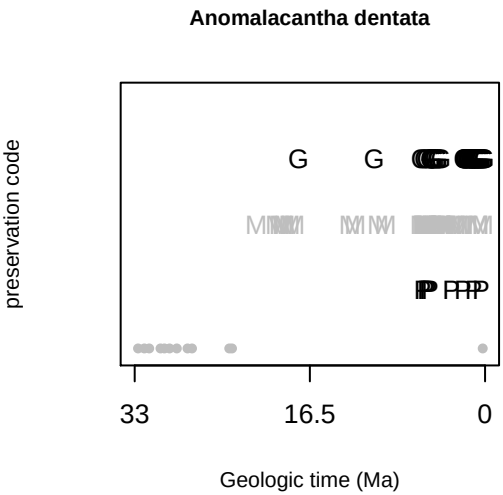

Actinomma popofskii
preservation code
11
5.5
0
Geologic time (Ma)

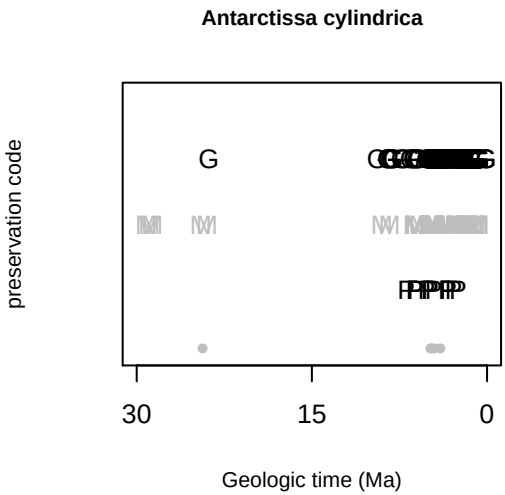

Amphirhopalum ypsilon
preservation code
P
10
5
0
Geologic time (Ma)

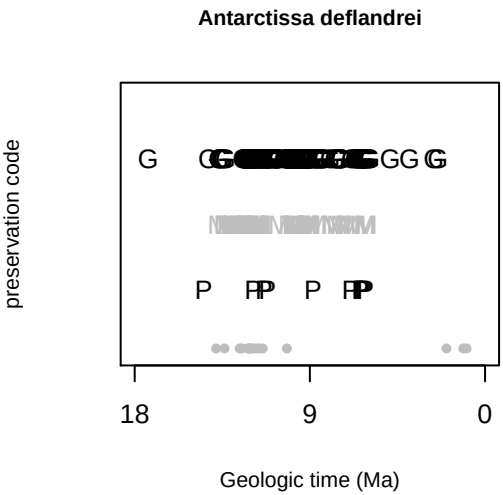

Amphistylus angelinus
preservation code
G
39
20.5
2
Geologic time (Ma)

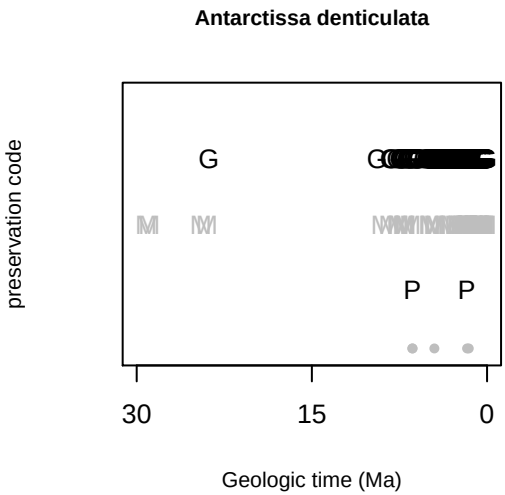

Amphymenium amphistylium
preservation code
23
14
5
Geologic time (Ma)

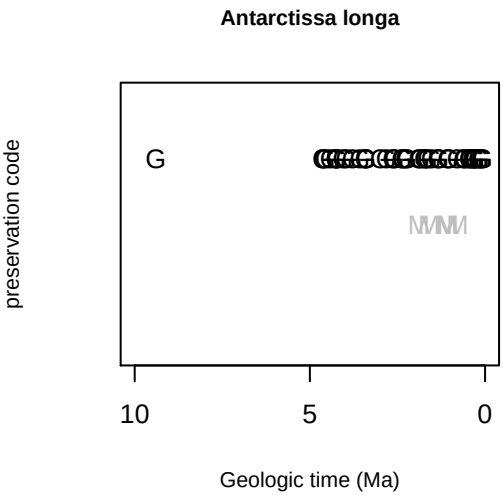

Amphymenium splendiarmatum
preservation code
G
M
47
35.5
24
Geologic time (Ma)

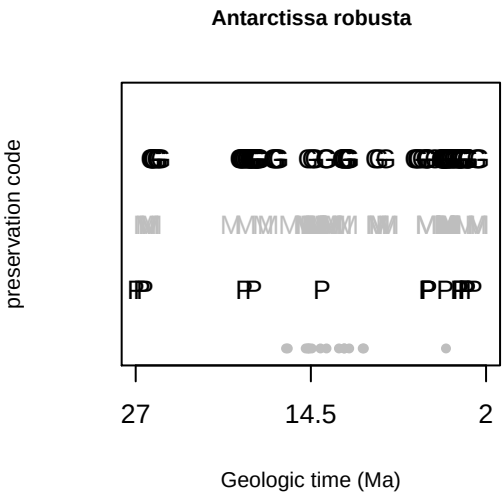

Anomalacantha dentata
preservation code
G
G
33
16.5
0
Geologic time (Ma)

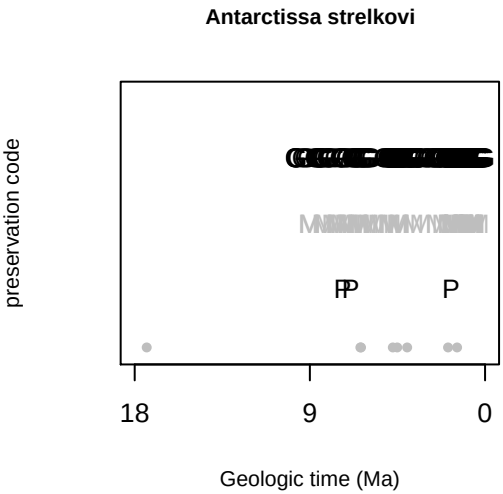

Antarctissa cylindrica
preservation code
G
30
15
0
Geologic time (Ma)

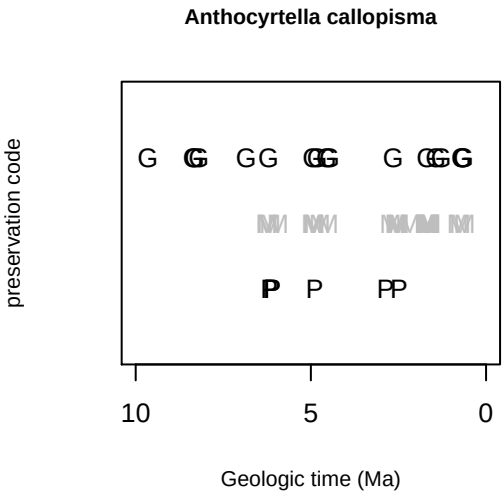

Antarctissa deflandrei
preservation code
G
GG G
P
P
P
18
9
0
Geologic time (Ma)

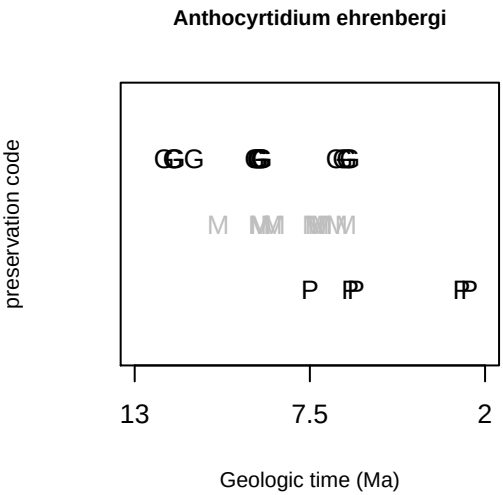

Antarctissa denticulata
preservation code
G
P
P
30
15
0
Geologic time (Ma)

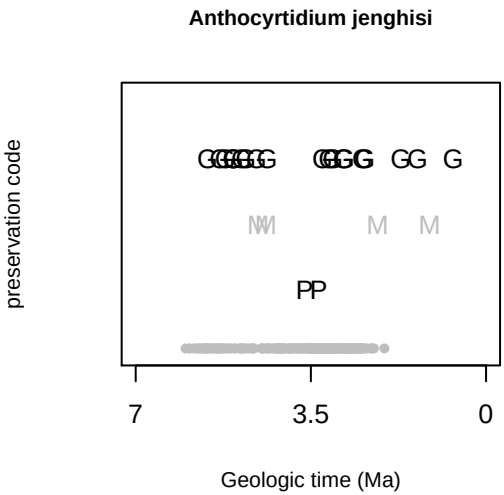

Antarctissa longa
preservation code
G
10
5
0
Geologic time (Ma)

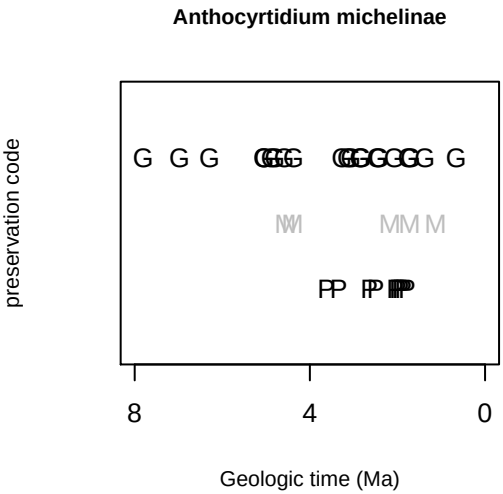

Antarctissa robusta
preservation code
G
P
27
14.5
2
Geologic time (Ma)

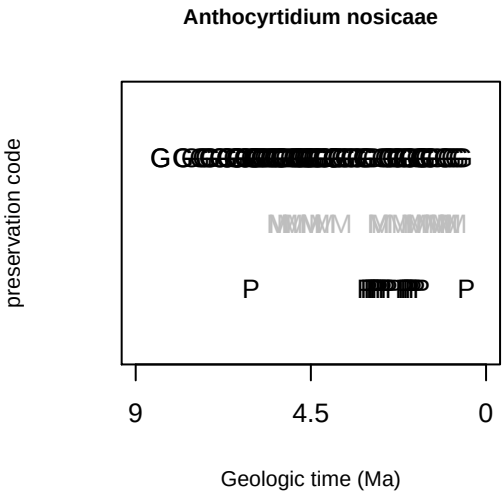

Antarctissa strelkovi
preservation code
P
18
9
0
Geologic time (Ma)

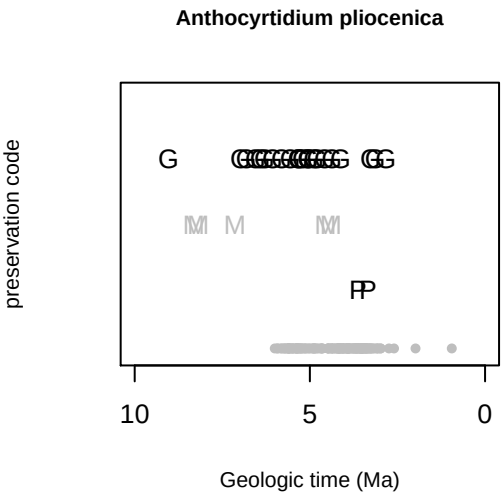

Anthocyrtella callopisma
preservation code
G
P
10
5
0
Geologic time (Ma)

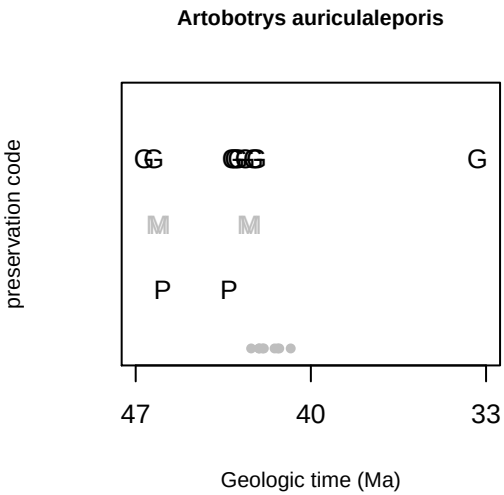

Anthocyrtidium ehrenbergi
preservation code
13
7.5
2
Geologic time (Ma)

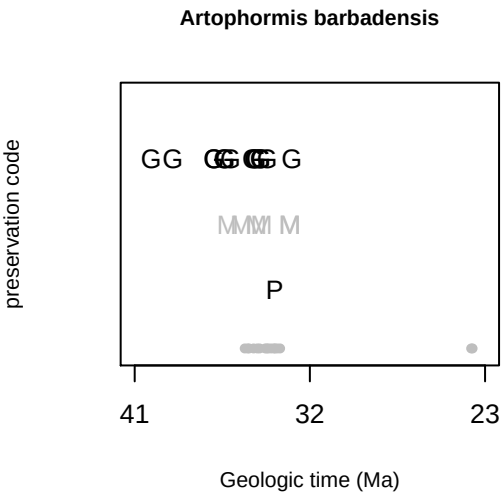

Anthocyrtidium jenghisi
preservation code
7
3.5
0
Geologic time (Ma)

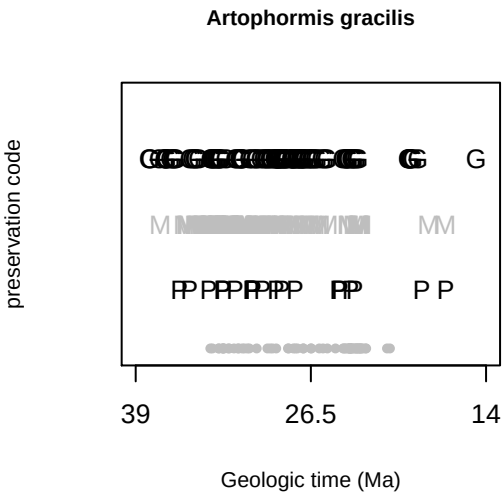

Anthocyrtidium michelinae
preservation code
8
4
0
Geologic time (Ma)

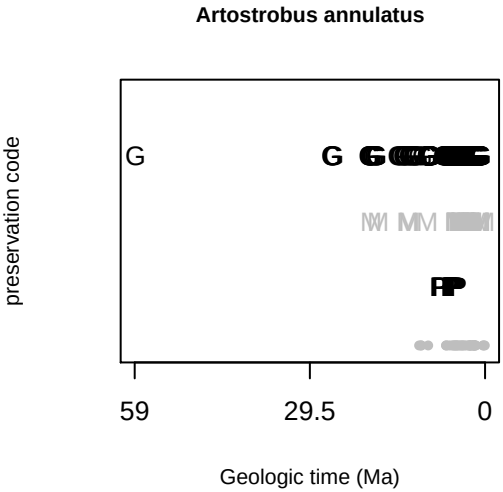

Anthocyrtidium nosicaae
preservation code
9
4.5
0
Geologic time (Ma)

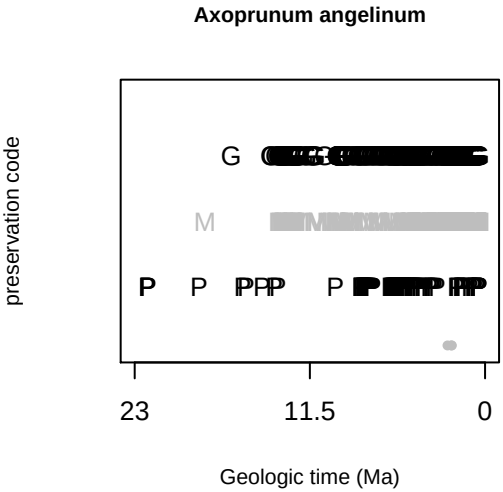

Anthocyrtidium pliocenica
preservation code
Geologic time (Ma)
10
5
0

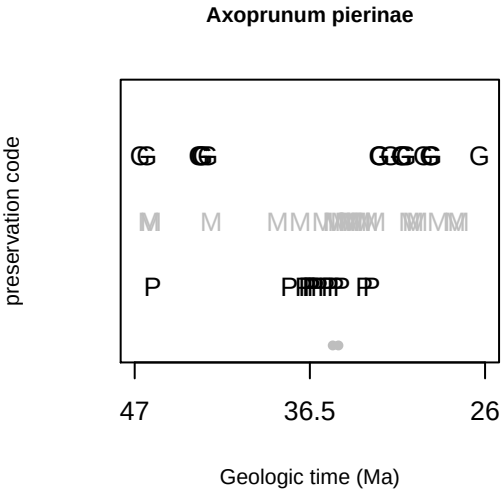

Artobotrys auriculaleporis
preservation code
Geologic time (Ma)
47
40
33

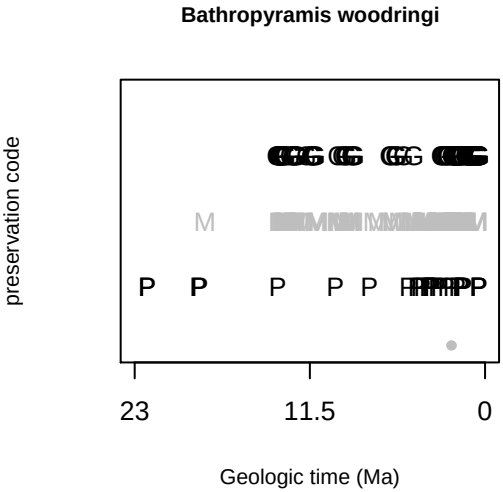

Artophormis barbadensis
preservation code
Geologic time (Ma)
41
32
23

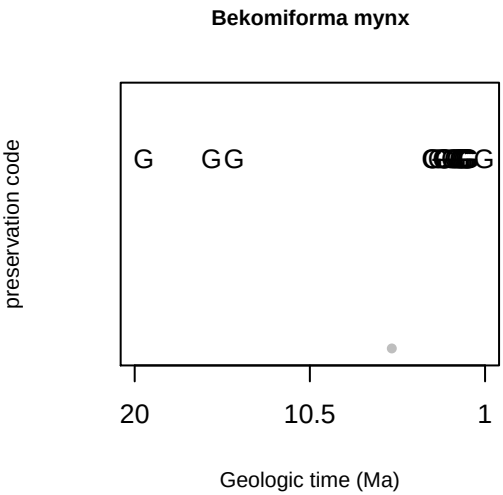

Artophormis gracilis
preservation code
Geologic time (Ma)
39
26.5
14

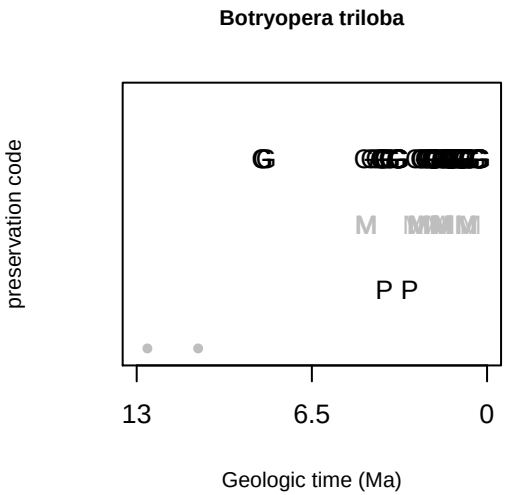

Artostrobus annulatus
preservation code
G
M
P
59
29.5
0
Geologic time (Ma)

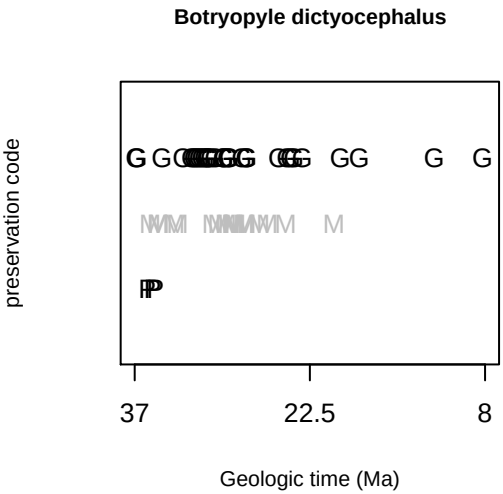

Axoprunum angelinum
preservation code
G
M
P
23
11.5
0
Geologic time (Ma)

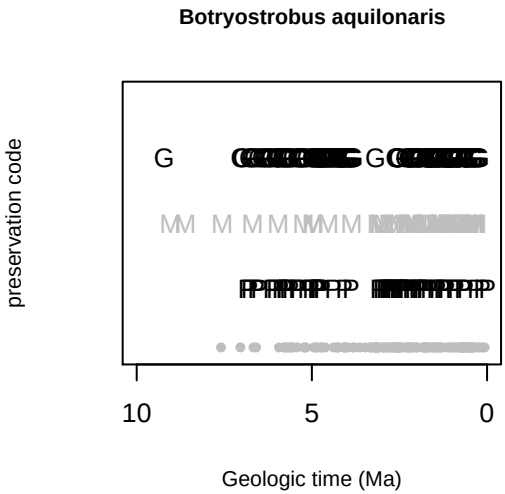

Axoprunum pierinae
preservation code
G
M
P
47
36.5
26
Geologic time (Ma)

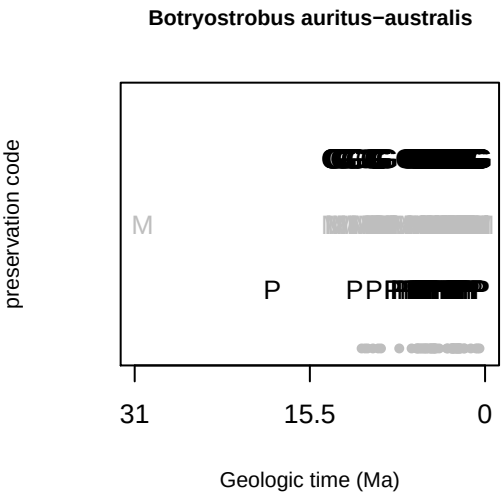

Bathropyramis woodringi
preservation code
M
P
23
11.5
0
Geologic time (Ma)

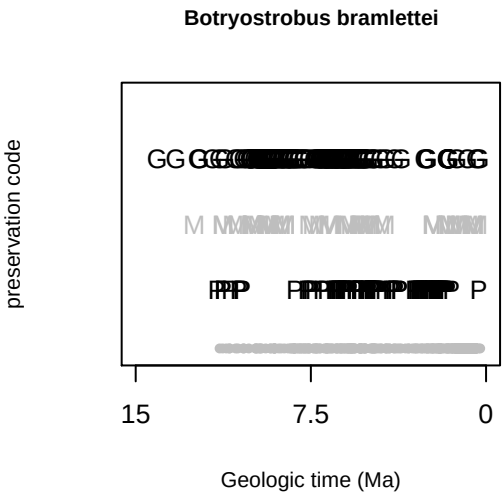

Bekomiforma mynx
preservation code
G
G G
G
20
10.5
1
Geologic time (Ma)

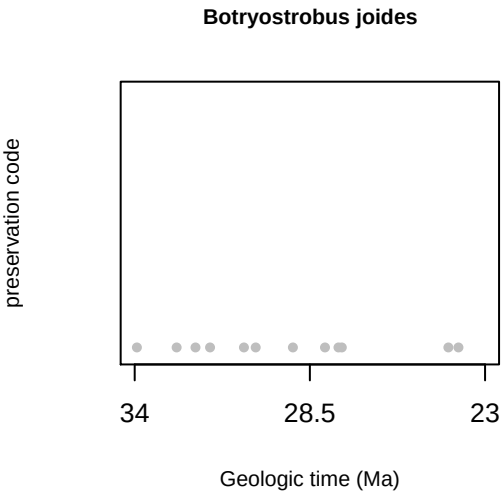

Botryopera triloba
preservation code
G
M
P P
13
6.5
0
Geologic time (Ma)

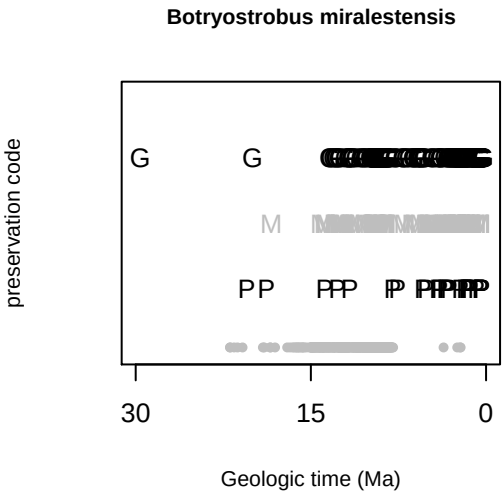

Botryopyle dictyocephalus
preservation code
G G G G G
M
P
37
22.5
8
Geologic time (Ma)

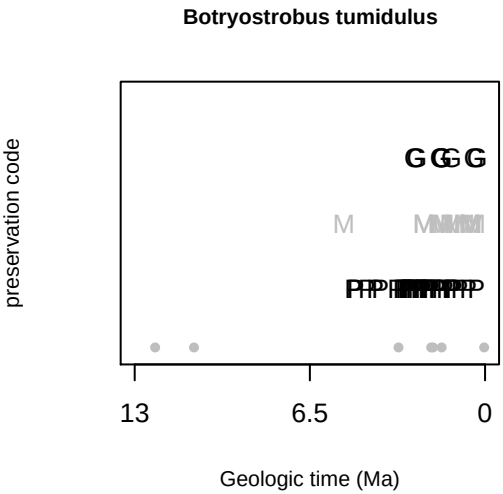

Botryostrobus aquilonaris
preservation code
G
M M M M M
10
5
0
Geologic time (Ma)

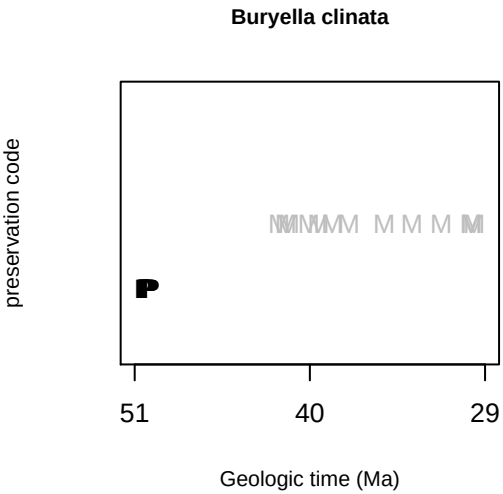

Botryostrobus auritus−australis
preservation code
M
P
31
15.5
0
Geologic time (Ma)

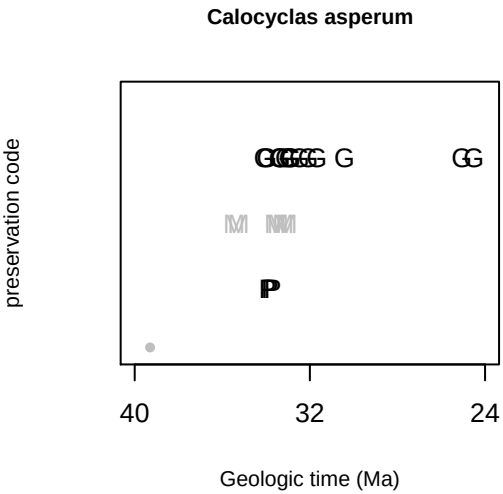

Botryostrobus bramlettei
preservation code
GG
M
P
15
7.5
0
Geologic time (Ma)

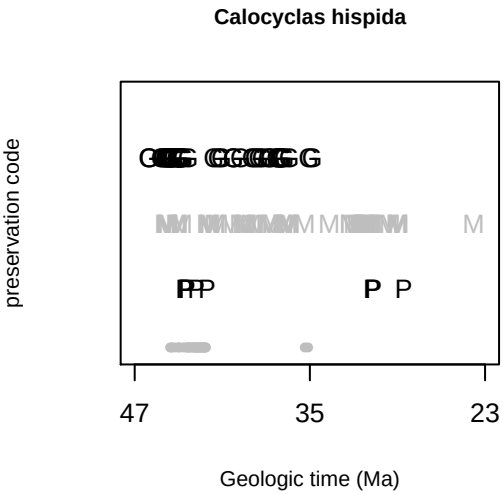

Botryostrobus joides
preservation code
34
28.5
23
Geologic time (Ma)

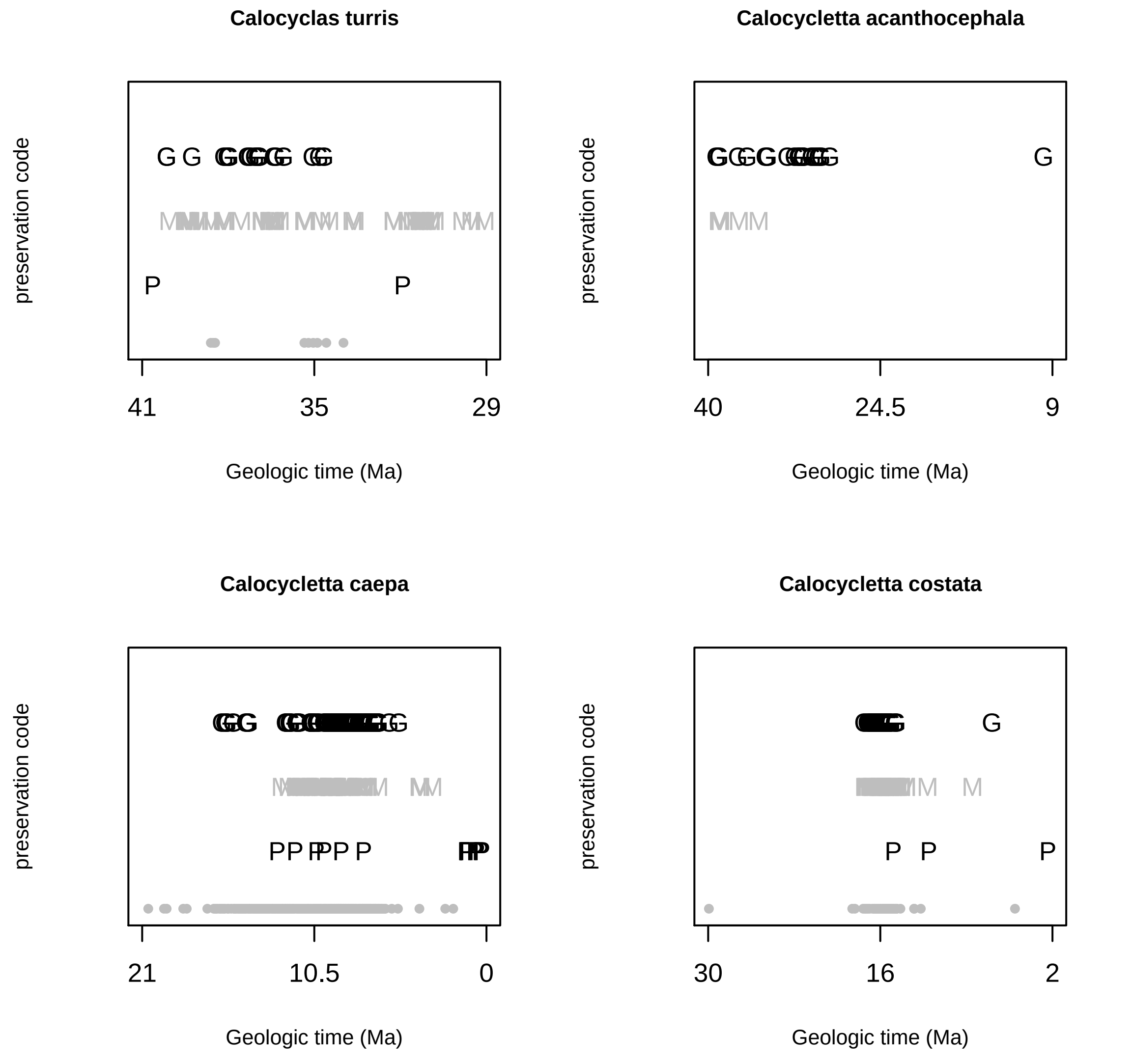

Botryostrobus miralestensis
preservation code
G
G
M
PP
30
15
0
Geologic time (Ma)

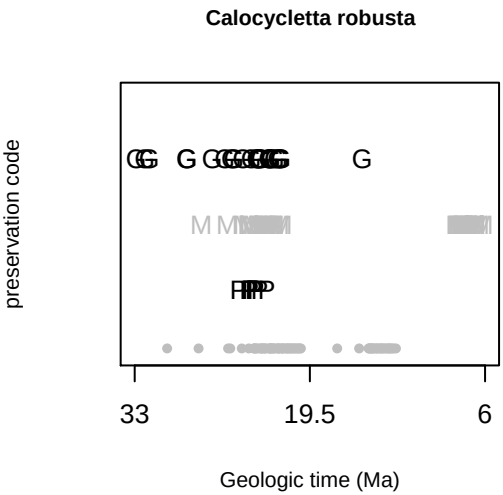

Botryostrobus tumidulus
preservation code
13
6.5
0
Geologic time (Ma)

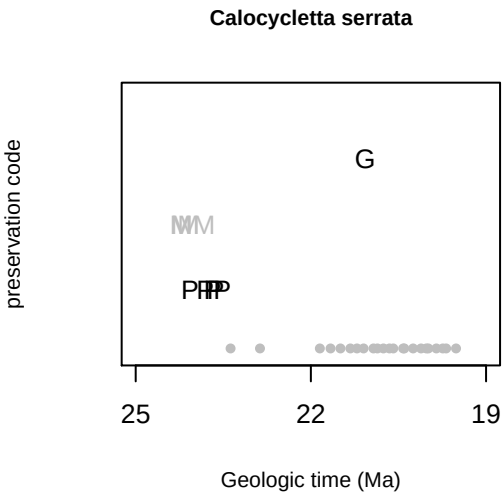

Buryella clinata
preservation code
51
40
29
Geologic time (Ma)

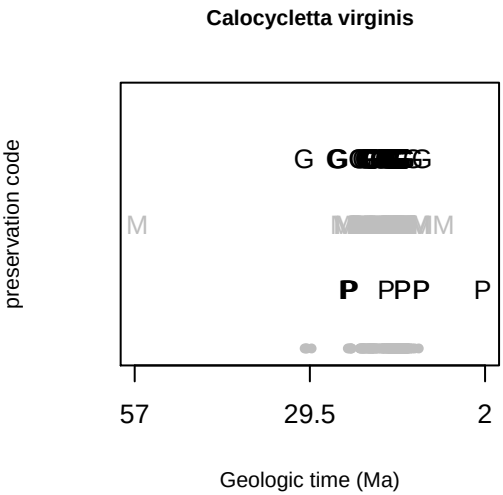

Calocyclas asperum
preservation code
40
32
24
Geologic time (Ma)

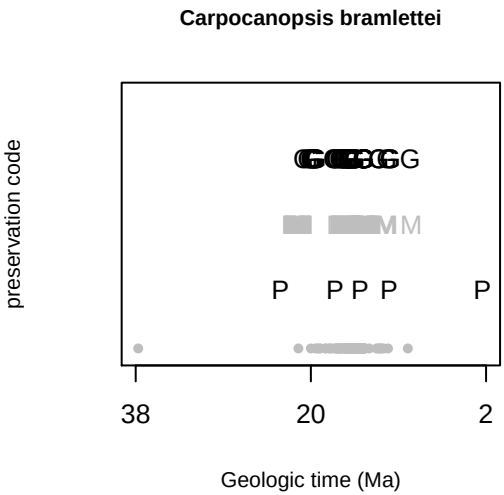

Calocyclas hispida
preservation code
47
35
23
Geologic time (Ma)

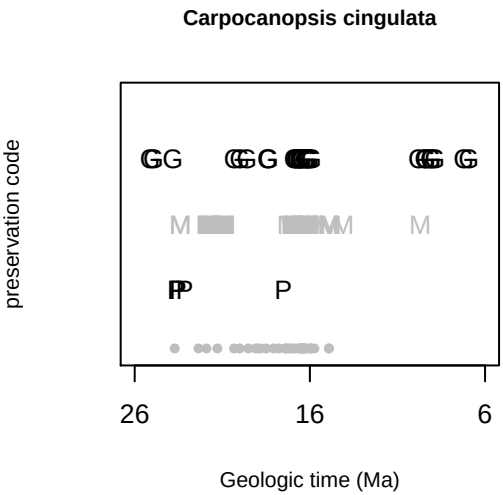

Calocyclas turris
preservation code
41
35
29
Geologic time (Ma)
Calocycletta acanthocephala
preservation code
40
24.5
9
Geologic time (Ma)
Calocycletta caepa
preservation code
21
10.5
0
Geologic time (Ma)
Calocycletta costata
preservation code
30
16
2
Geologic time (Ma)

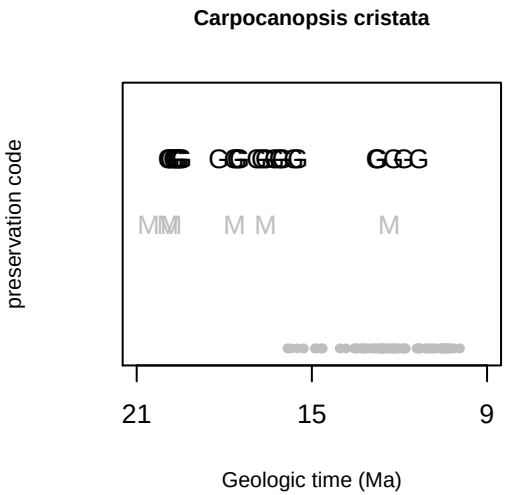

Calocycletta robusta
preservation code
33
19.5
6
Geologic time (Ma)

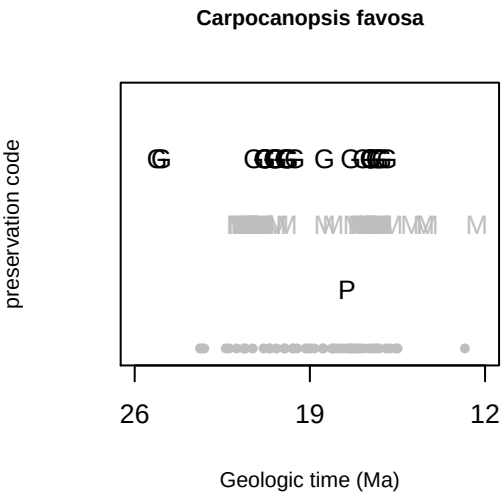

Calocycletta serrata
preservation code
25
22
19
Geologic time (Ma)

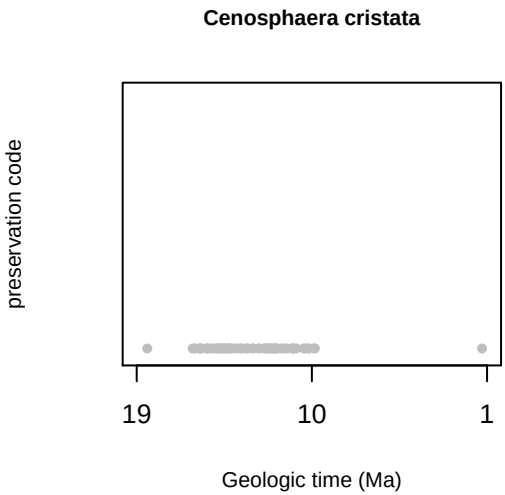

Calocycletta virginis
preservation code
57
29.5
2
Geologic time (Ma)

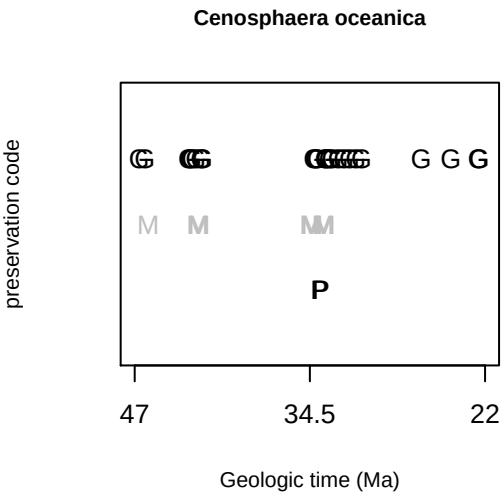

Carpocanopsis bramlettei
preservation code
38
20
2
Geologic time (Ma)

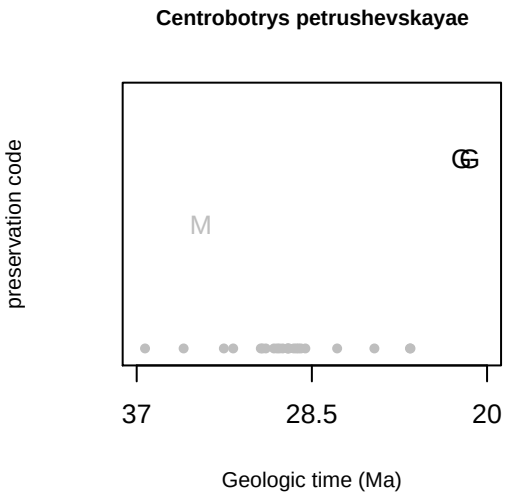

Carpocanopsis cingulata
preservation code
G
M
P
26
16
6
Geologic time (Ma)

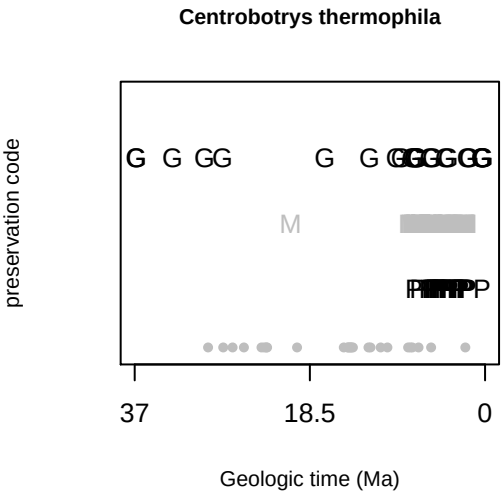

Carpocanopsis cristata
preservation code
G
M
21
15
9
Geologic time (Ma)

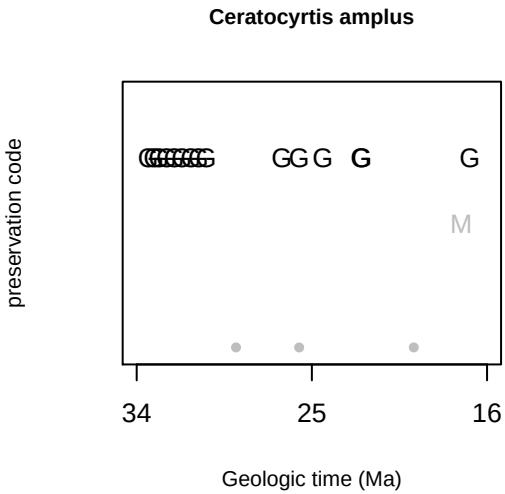

Carpocanopsis favosa
preservation code
G
M
P
26
19
12
Geologic time (Ma)

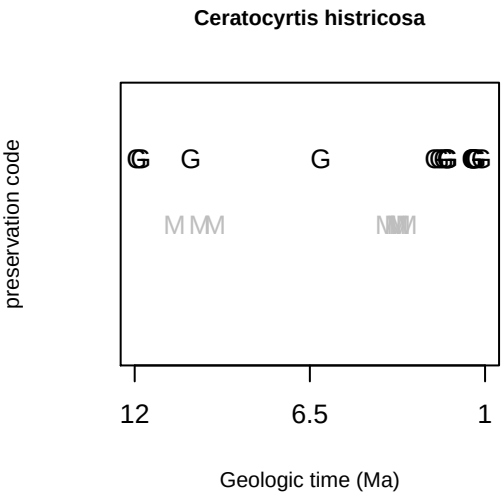

Cenosphaera cristata
preservation code
19
10
1
Geologic time (Ma)

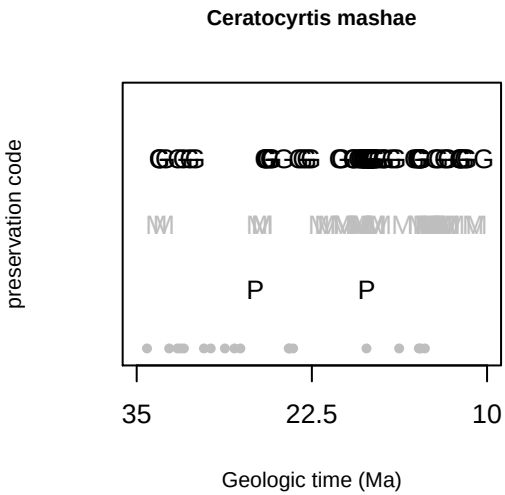

Cenosphaera oceanica
preservation code
G G G
M M M
P
47
34.5
22
Geologic time (Ma)

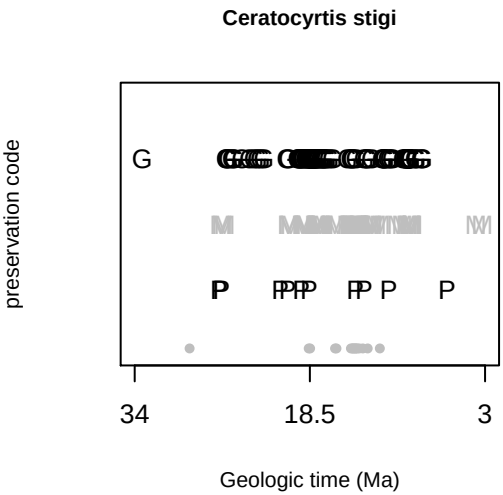

Centrobotrys petrushevskayae
preservation code
G
M
37
28.5
20
Geologic time (Ma)

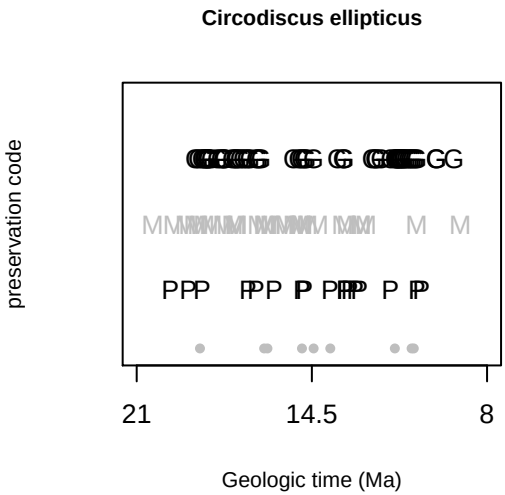

Centrobotrys thermophila
preservation code
G G GG G G
M
P
37
18.5
0
Geologic time (Ma)

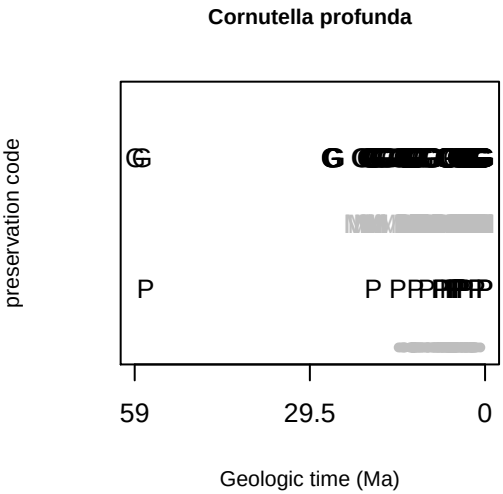

Ceratocyrtis amplus
preservation code
GG G G G
M
34
25
16
Geologic time (Ma)

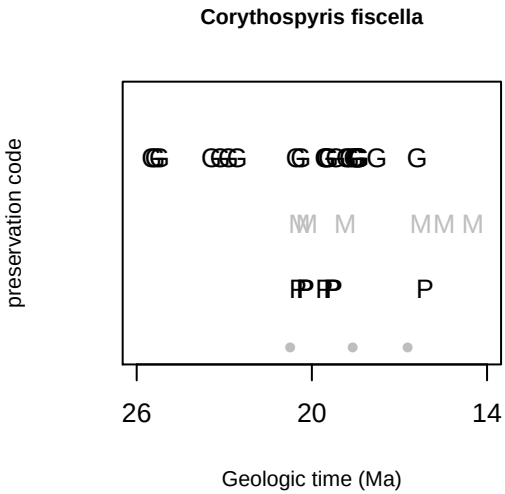

Ceratocyrtis histricosa
preservation code
12
6.5
1
Geologic time (Ma)

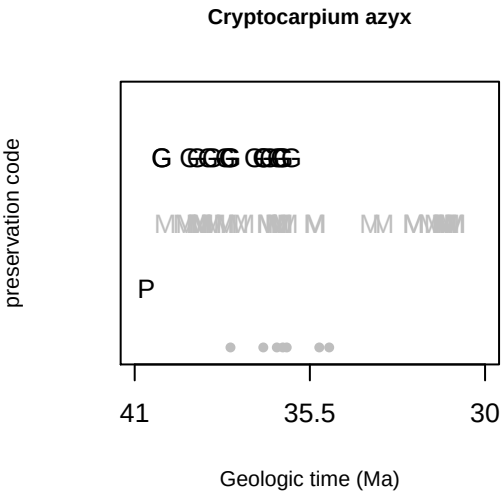

Ceratocyrtis mashae
preservation code
35
22.5
10
Geologic time (Ma)

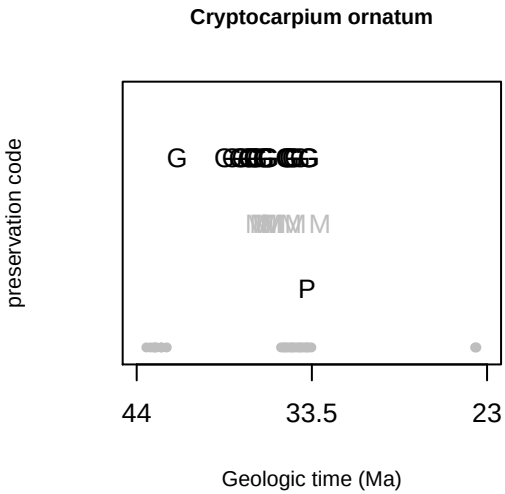

Ceratocyrtis stigi
preservation code
34
18.5
3
Geologic time (Ma)

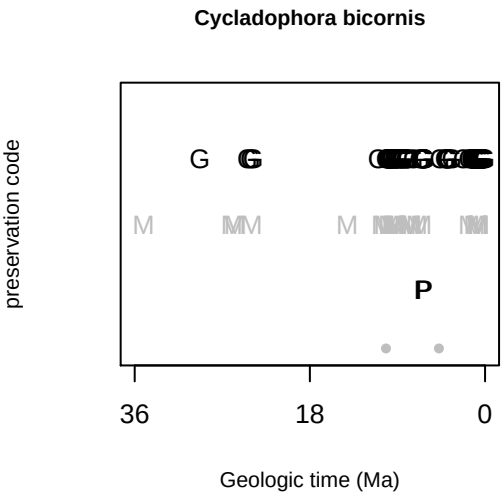

Circodiscus ellipticus
preservation code
21
14.5
8
Geologic time (Ma)

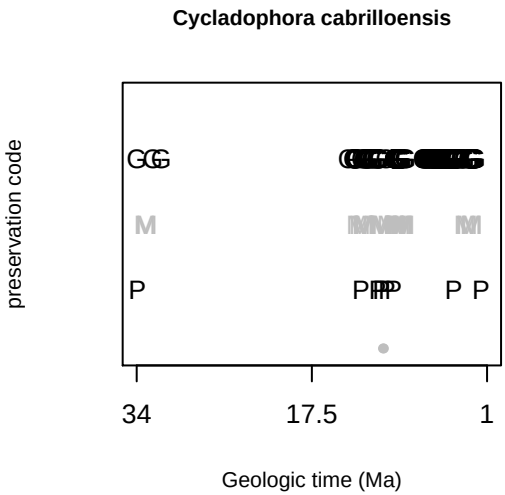

Cornutella profunda
preservation code
G
P
59
29.5
0
Geologic time (Ma)

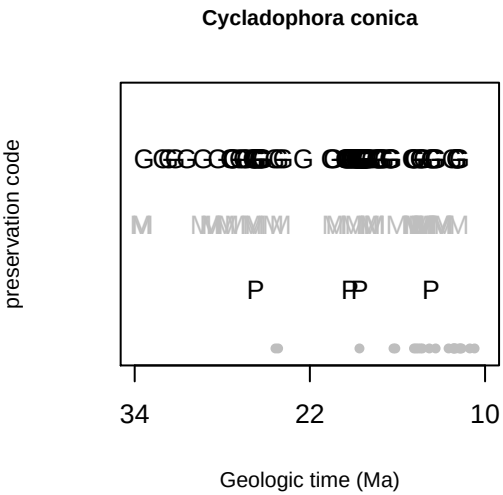

Corythospyris fiscella
preservation code
G
M
P
26
20
14
Geologic time (Ma)

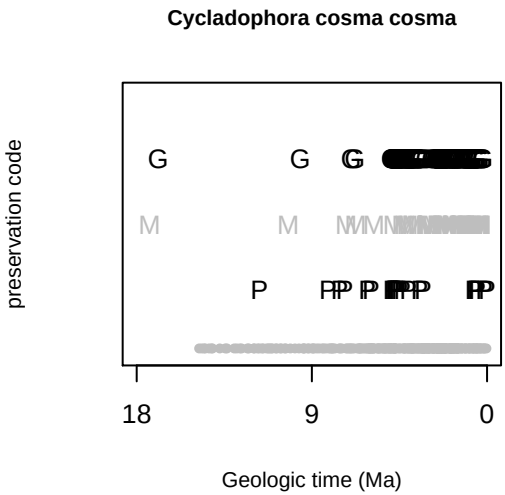

Cryptocarpium azyx
preservation code
G
M
P
41
35.5
30
Geologic time (Ma)

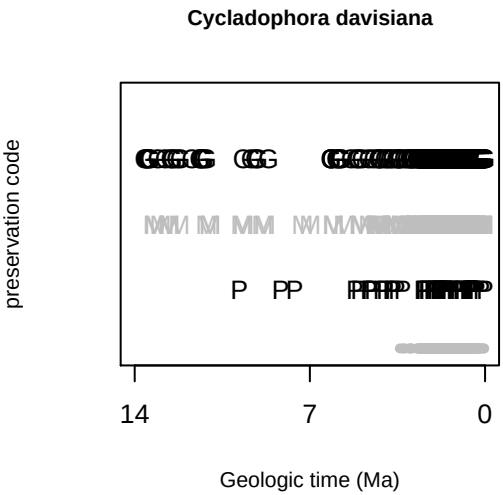

Cryptocarpium ornatum
preservation code
G
M
P
44
33.5
23
Geologic time (Ma)

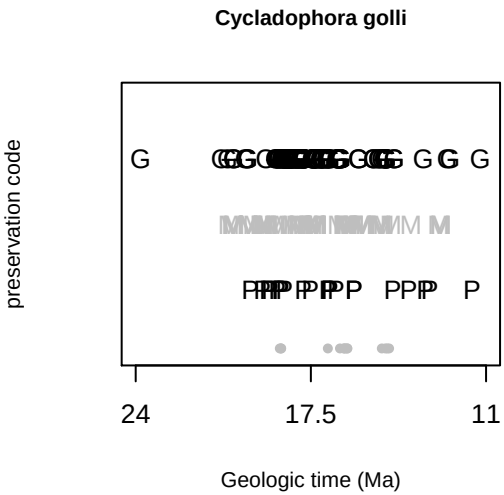

Cycladophora bicornis
preservation code
G
M
P
36
18
0
Geologic time (Ma)

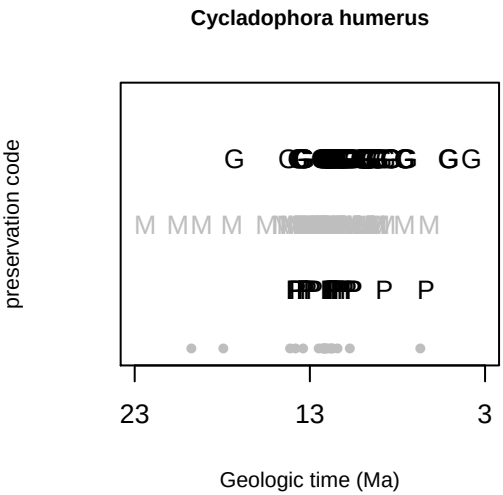

Cycladophora cabrilloensis
preservation code
G
M
P
34
17.5
1
Geologic time (Ma)

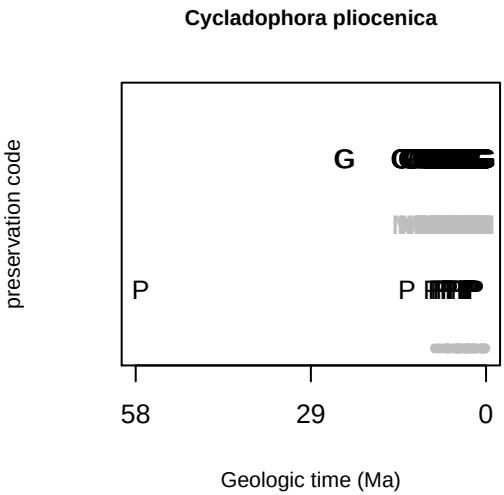

Cycladophora conica
preservation code
G
M
P
34
22
10
Geologic time (Ma)

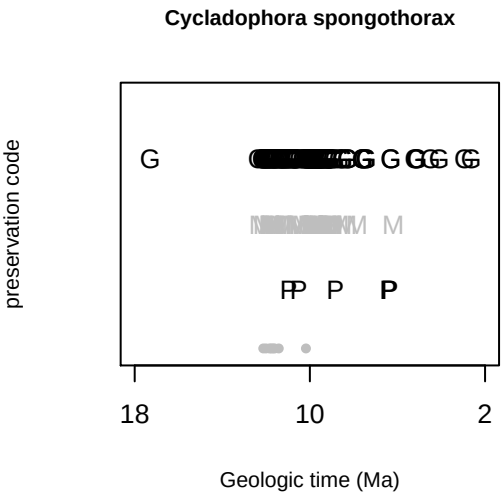

Cycladophora cosma cosma
preservation code
G
M
P
18
9
0
Geologic time (Ma)

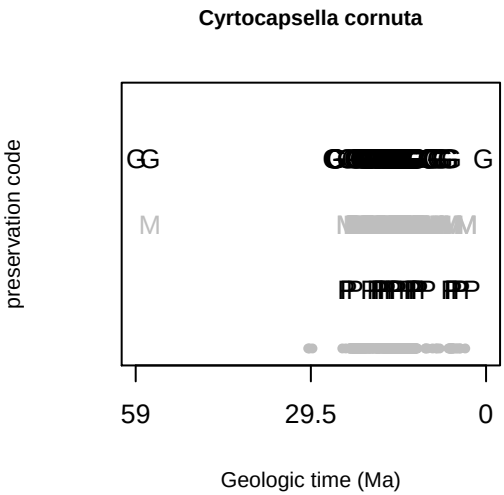

Cycladophora davisiana
preservation code
14
7
0
Geologic time (Ma)

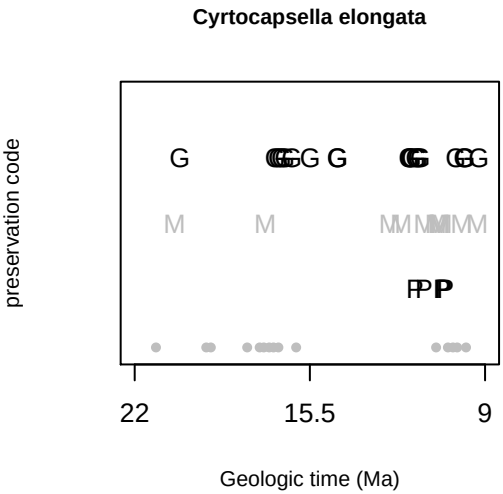

Cycladophora golli
preservation code
24
17.5
11
Geologic time (Ma)

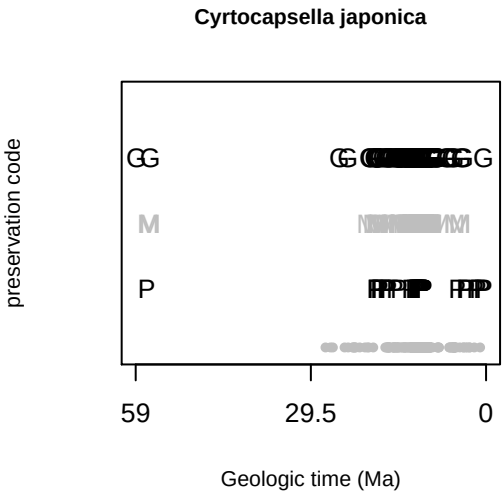

Cycladophora humerus
preservation code
23
13
3
Geologic time (Ma)

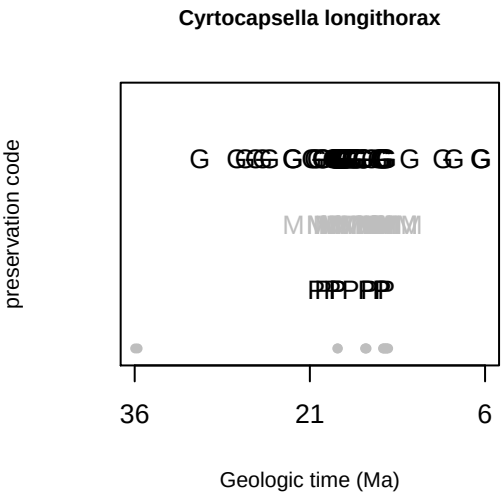

Cycladophora pliocenica
preservation code
58
29
0
Geologic time (Ma)

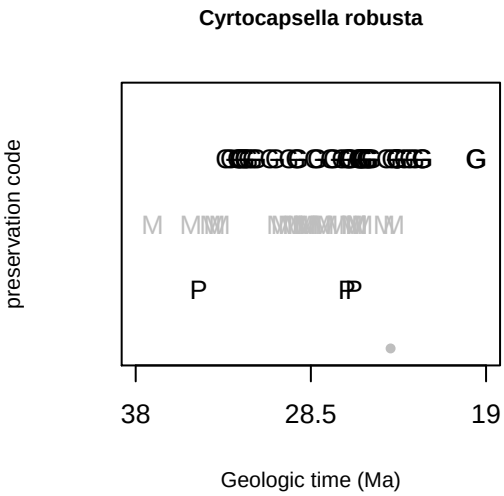

Cycladophora spongothorax
preservation code
G
M
P
18
10
2
Geologic time (Ma)

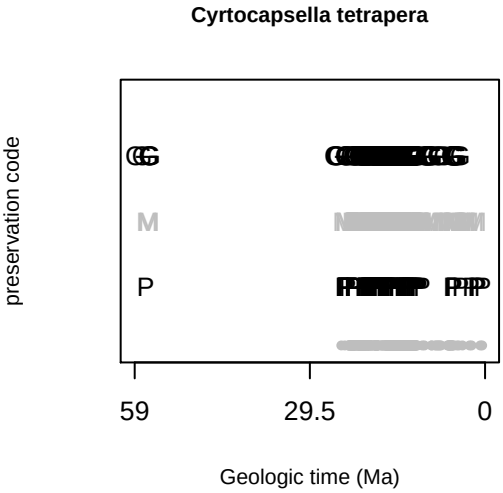

Cyrtocapsella cornuta
preservation code
G
M
P
59
29.5
0
Geologic time (Ma)

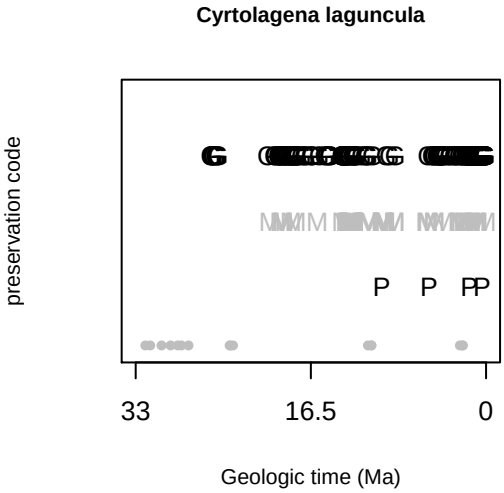

Cyrtocapsella elongata
preservation code
G
M
P
22
15.5
9
Geologic time (Ma)

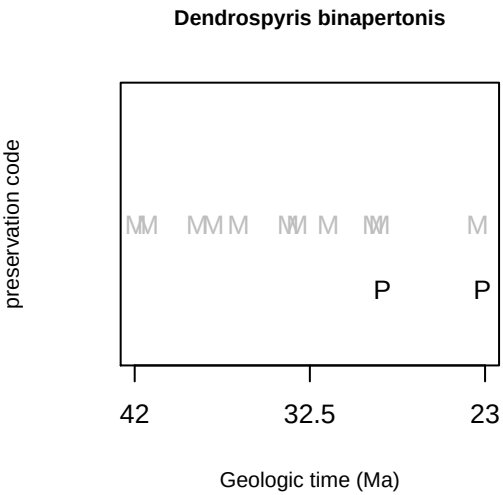

Cyrtocapsella japonica
preservation code
G
M
P
59
29.5
0
Geologic time (Ma)

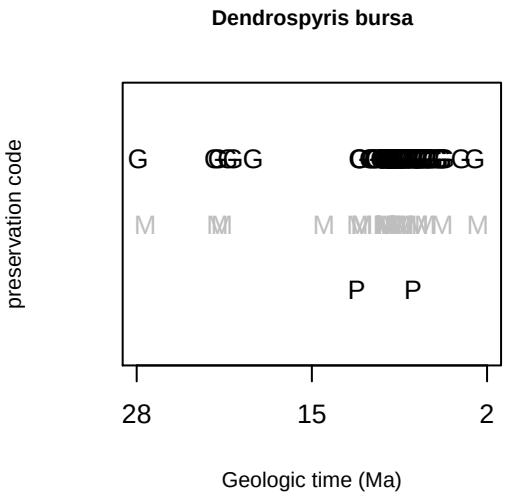

Cyrtocapsella longithorax
preservation code
G
M
P
36
21
6
Geologic time (Ma)

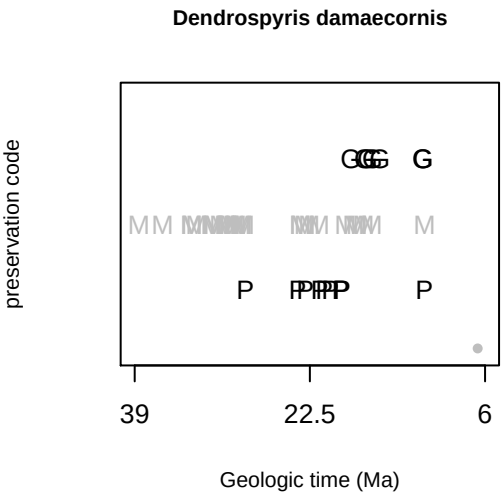

Cyrtocapsella robusta
preservation code
G
M
P
38
28.5
19
Geologic time (Ma)

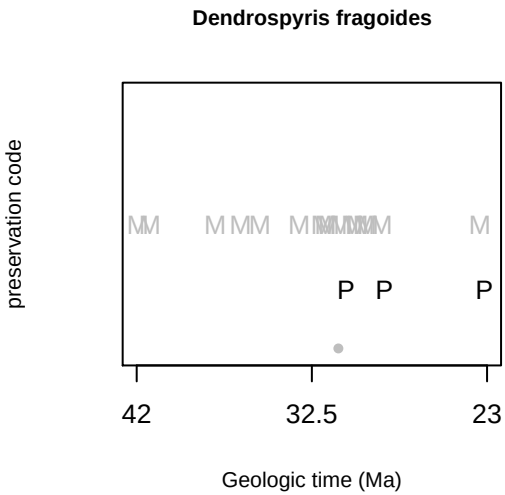

Cyrtocapsella tetrapera
preservation code
G
M
P
59
29.5
0
Geologic time (Ma)

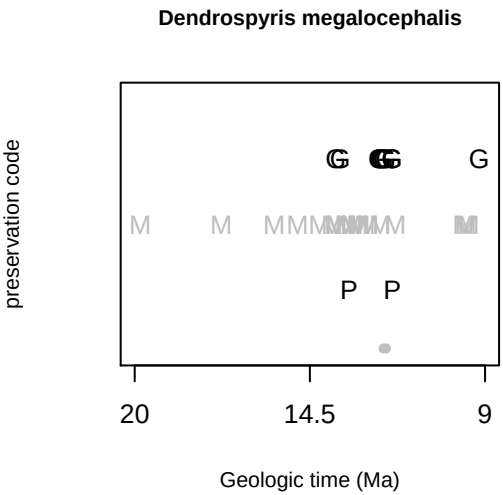

Cyrtolagena laguncula
preservation code
G
M
P
33
16.5
0
Geologic time (Ma)

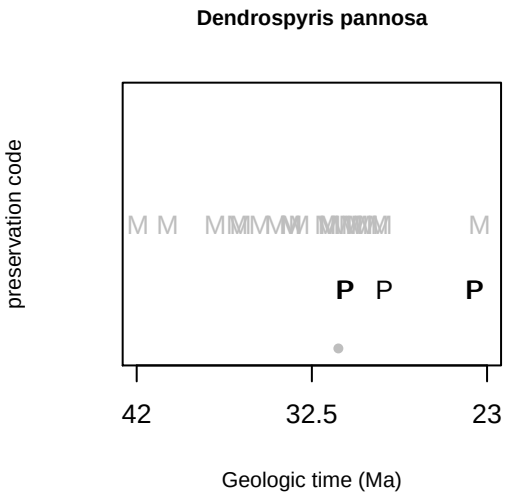

Dendrospyris binapertonis
preservation code
M
P
42
32.5
23
Geologic time (Ma)

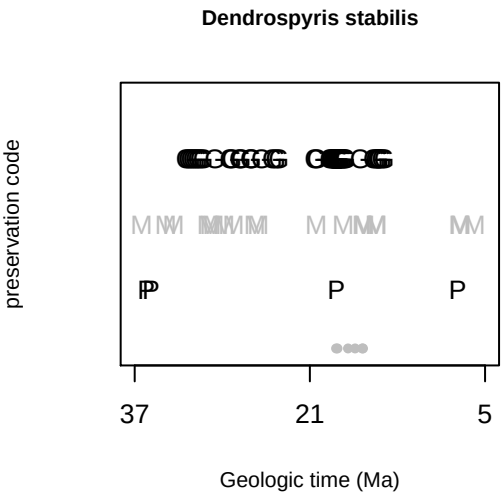

Dendrospyris bursa
preservation code
G
M
P
28
15
2
Geologic time (Ma)

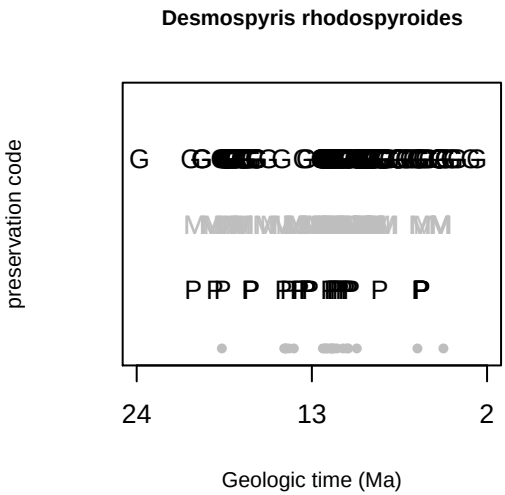

Dendrospyris damaecornis
preservation code
G
M
P
39
22.5
6
Geologic time (Ma)

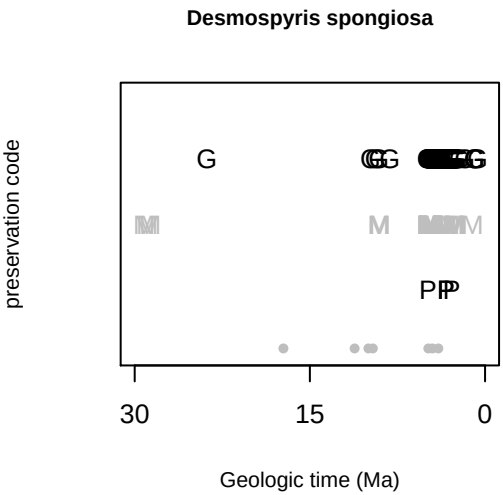

Dendrospyris fragoides
preservation code
M
P
42
32.5
23
Geologic time (Ma)

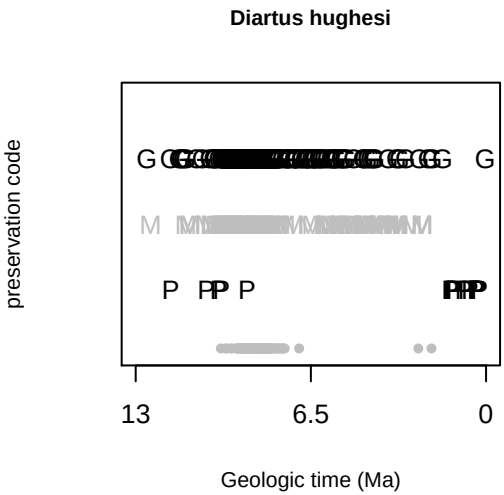

Dendrospyris megalocephalis
preservation code
20
14.5
9
Geologic time (Ma)


Dendrospyris pannosa
preservation code
42
32.5
23
Geologic time (Ma)

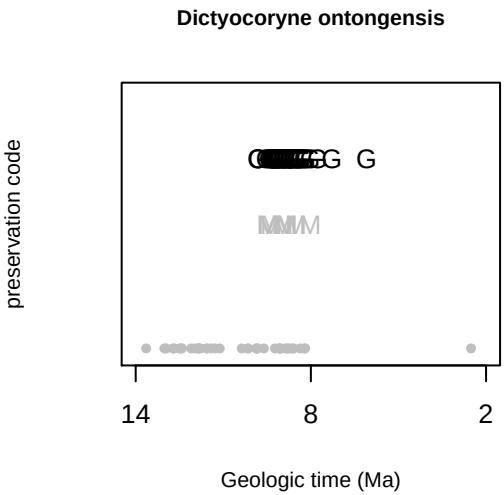

Dendrospyris stabilis
preservation code
37
21
5
Geologic time (Ma)

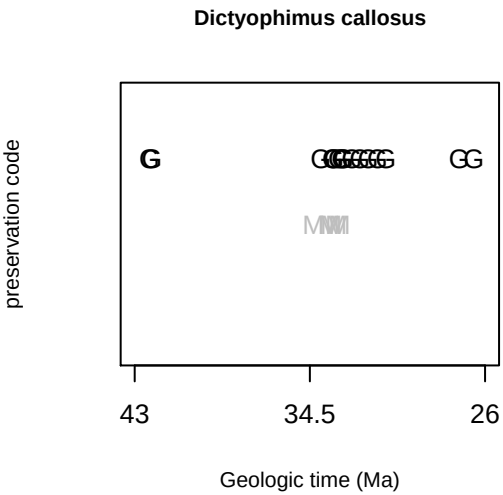

Desmospyris rhodospyroides
preservation code
24
13
2
Geologic time (Ma)

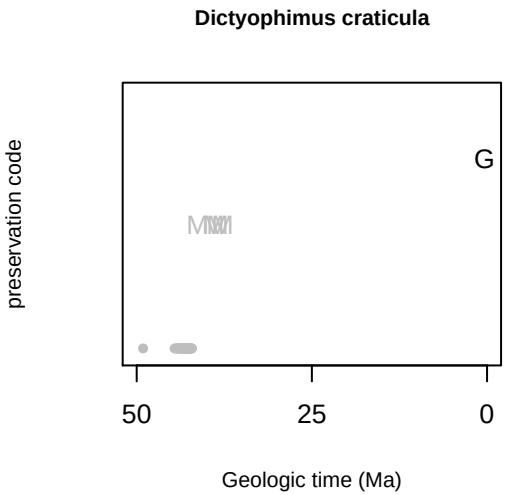

Desmospyris spongiosa
preservation code
30
15
0
Geologic time (Ma)

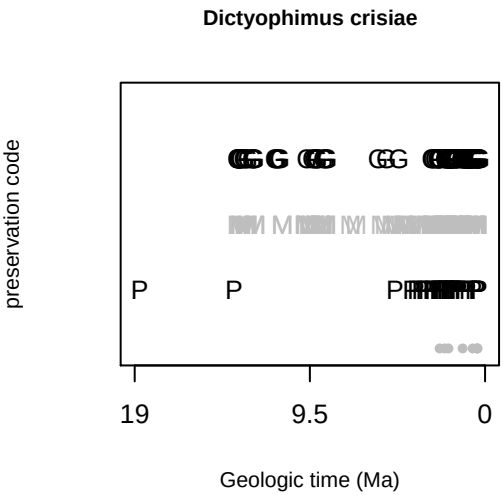

Diartus hughesi
preservation code
13
6.5
0
Geologic time (Ma)

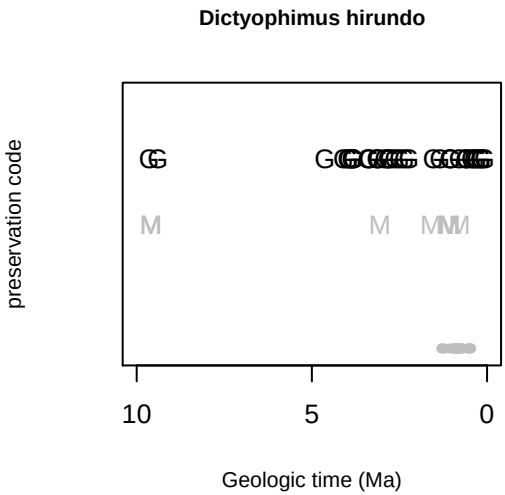
Diartus petterssoni
preservation code
17
9
1
Geologic time (Ma)

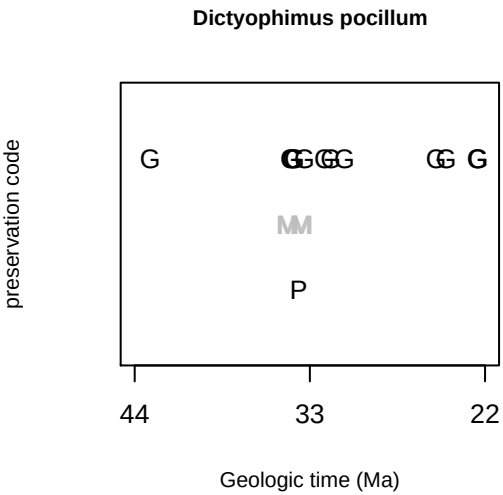

Dictyocoryne ontongensis
preservation code
14
8
2
Geologic time (Ma)

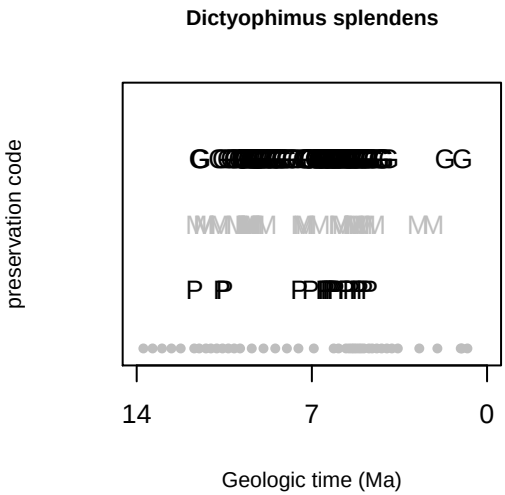

Dictyophimus callosus
preservation code
43
34.5
26
Geologic time (Ma)

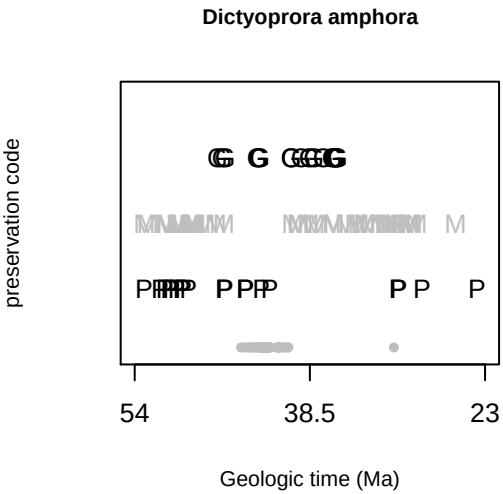

Dictyophimus craticula
preservation code
50
25
0
Geologic time (Ma)

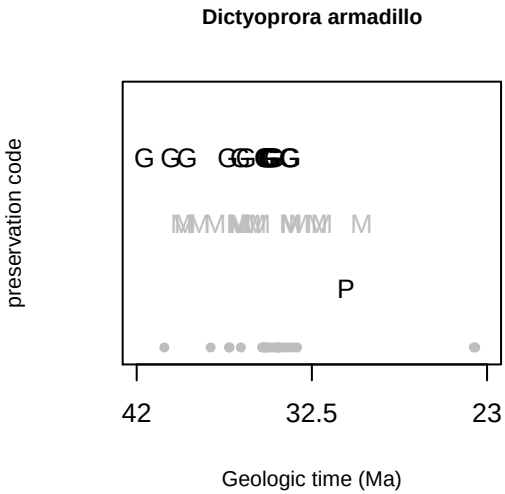

Dictyophimus crisiae
preservation code
19
9.5
0
Geologic time (Ma)

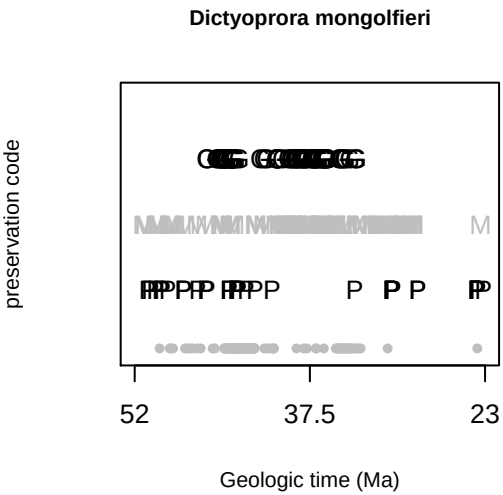

Dictyophimus hirundo
preservation code
10
5
0
Geologic time (Ma)

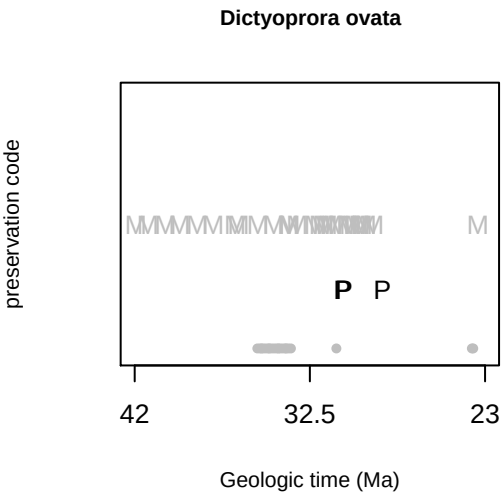

Dictyophimus pocillum
preservation code
44
33
22
Geologic time (Ma)

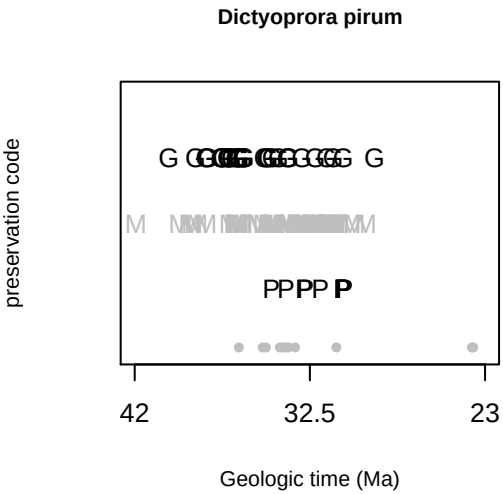

Dictyophimus splendens
preservation code
14
7
0
Geologic time (Ma)

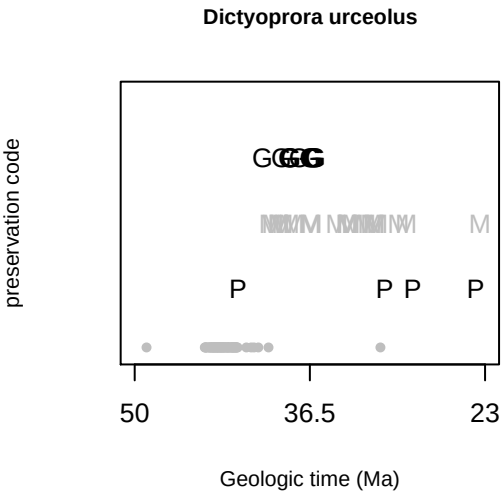

Dictyoprora amphora
preservation code
54
38.5
23
Geologic time (Ma)

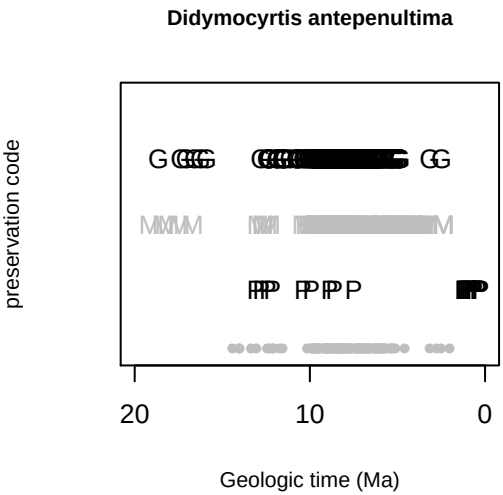

Dictyoprora armadillo
preservation code
42
32.5
23
Geologic time (Ma)

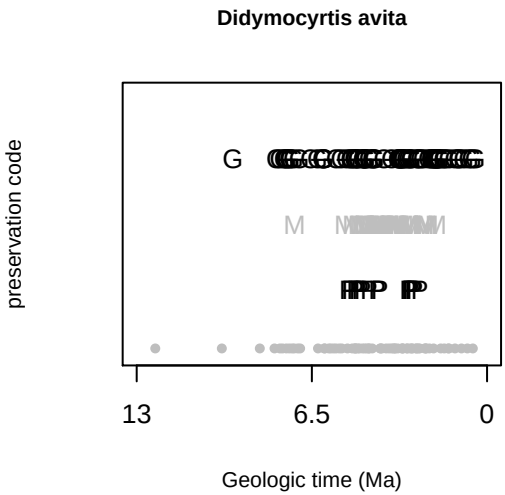

Dictyoprora mongolfieri
preservation code
52
37.5
23
Geologic time (Ma)

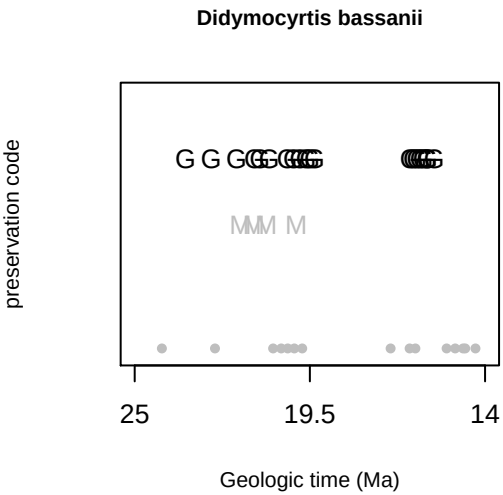

Dictyoprora ovata
preservation code
42
32.5
23
Geologic time (Ma)

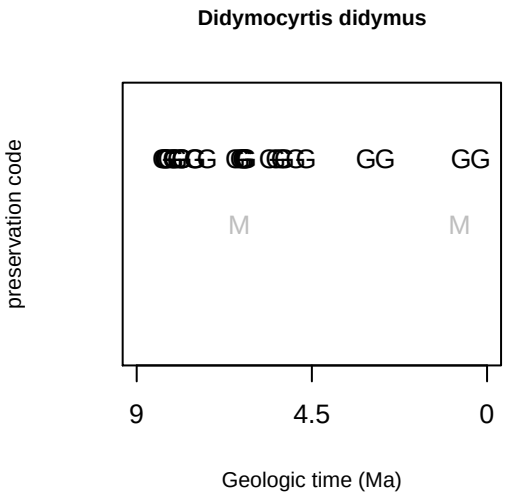

Dictyoprora pirum
preservation code
42
32.5
23
Geologic time (Ma)

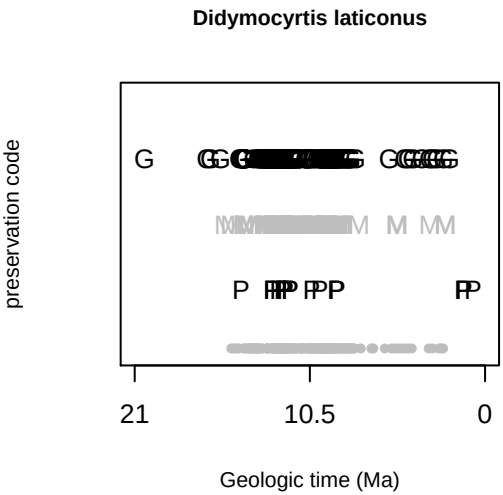

Dictyoprora urceolus
preservation code
50
36.5
23
Geologic time (Ma)

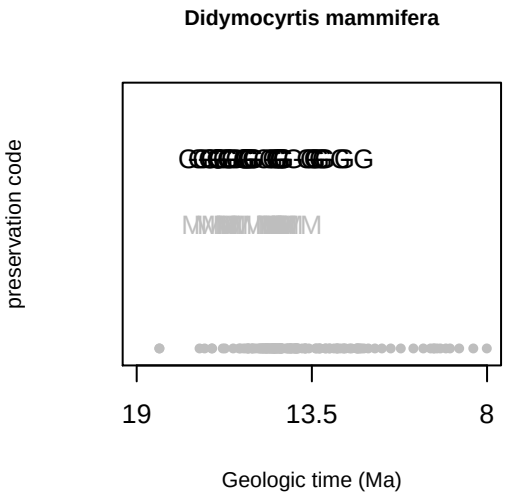

Didymocyrtis antepenultima
preservation code
20
10
0
Geologic time (Ma)

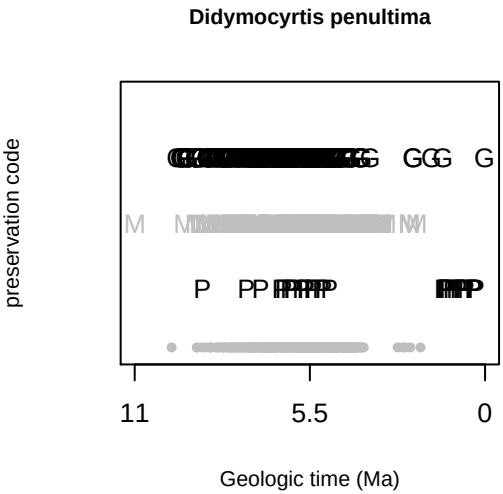

Didymocyrtis avita
preservation code
13
6.5
0
Geologic time (Ma)

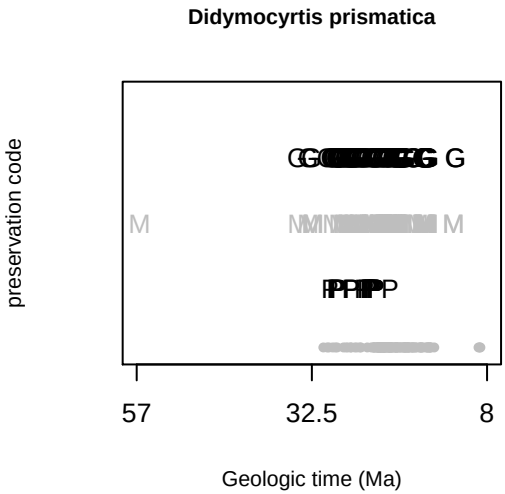

Didymocyrtis bassanii
preservation code
25
19.5
14
Geologic time (Ma)

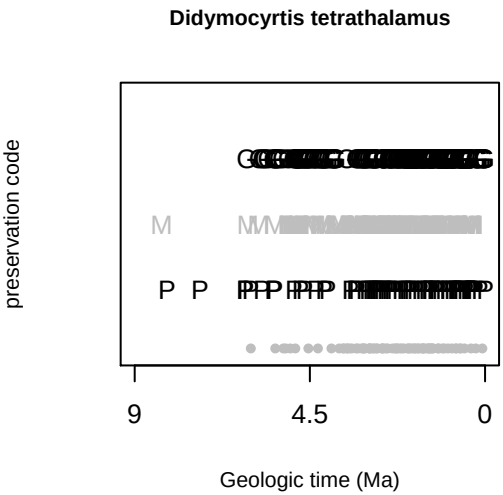

Didymocyrtis didymus
preservation code
9
4.5
0
Geologic time (Ma)

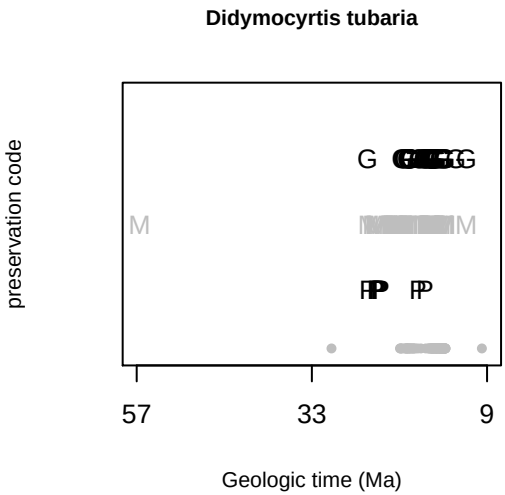

Didymocyrtis laticonus
preservation code
21
10.5
0
Geologic time (Ma)

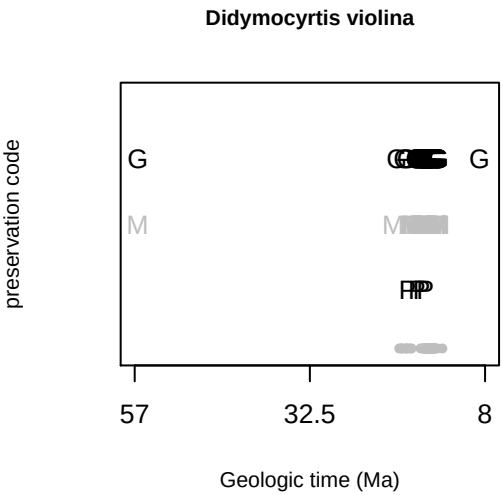

Didymocyrtis mammifera
preservation code
19
13.5
8
Geologic time (Ma)

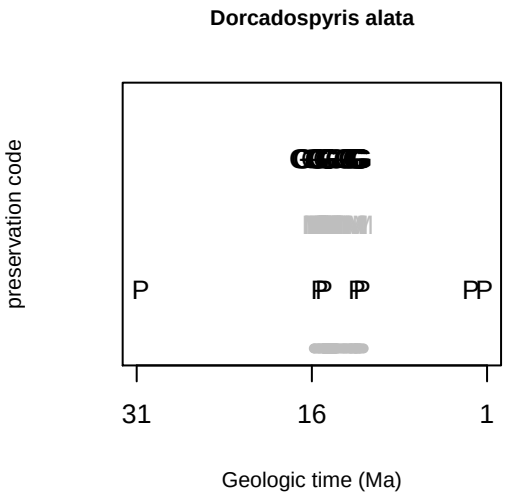

Didymocyrtis penultima
preservation code
11
5.5
0
Geologic time (Ma)

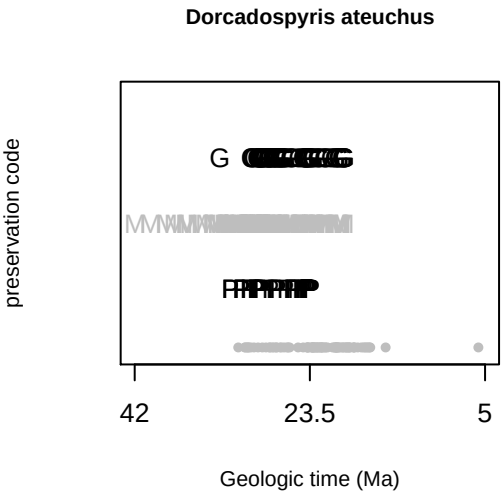

Didymocyrtis prismatica
preservation code
57
32.5
8
Geologic time (Ma)

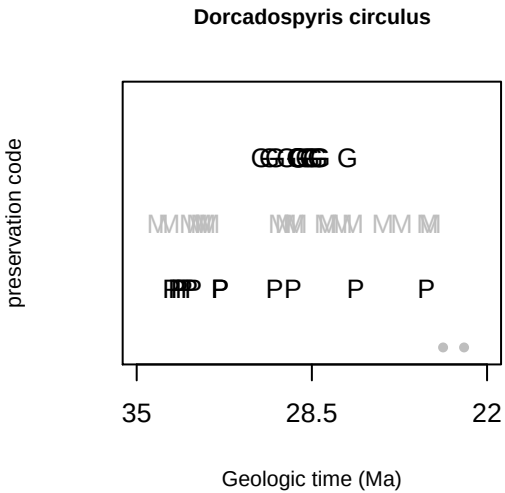

Didymocyrtis tetrathalamus
preservation code
G
M
P
9
4.5
0
Geologic time (Ma)

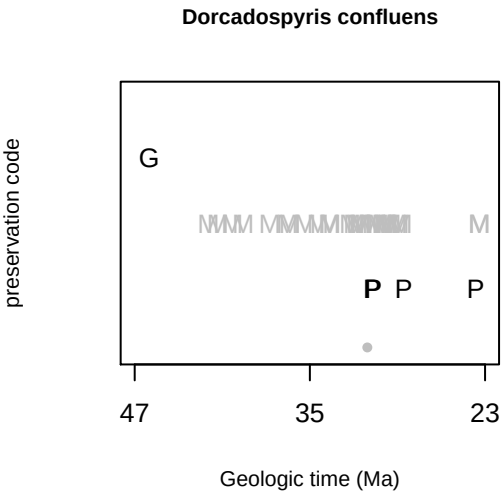

Didymocyrtis tubaria
preservation code
G
M
57
33
9
Geologic time (Ma)

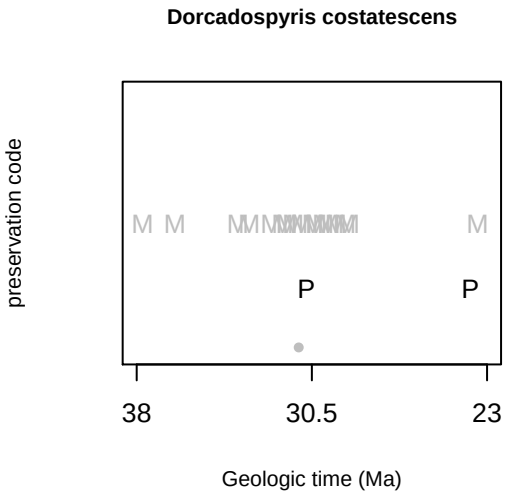

Didymocyrtis violina
preservation code
G
M
57
32.5
8
Geologic time (Ma)

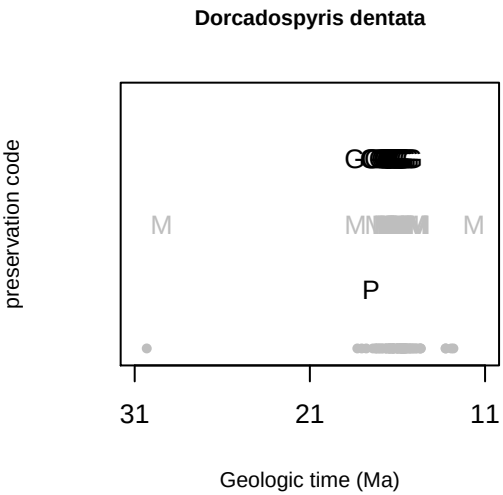

Dorcadospyris alata
preservation code
P
31
16
1
Geologic time (Ma)

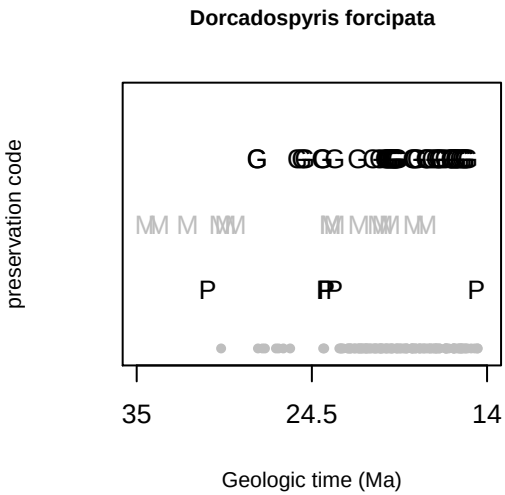

Dorcadospyris ateuchus
preservation code
G
M
P
42
23.5
5
Geologic time (Ma)

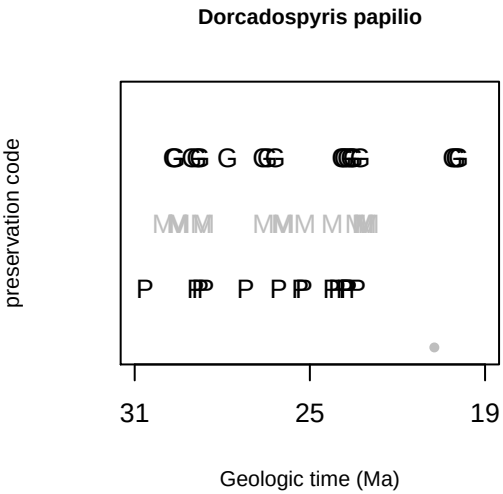

Dorcadospyris circulus
preservation code
G
M
P
PP
P
P
35
28.5
22
Geologic time (Ma)

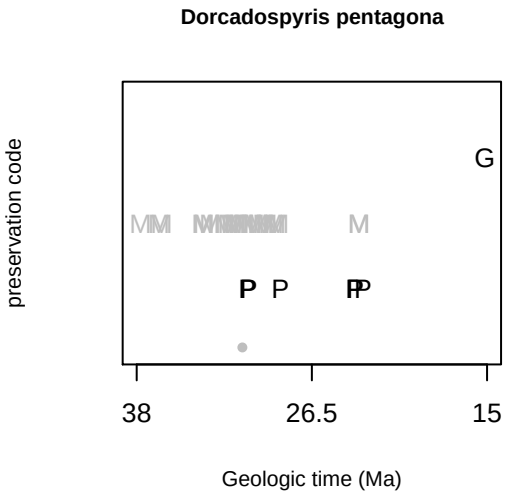

Dorcadospyris confluens
preservation code
G
M
P
P
P
47
35
23
Geologic time (Ma)

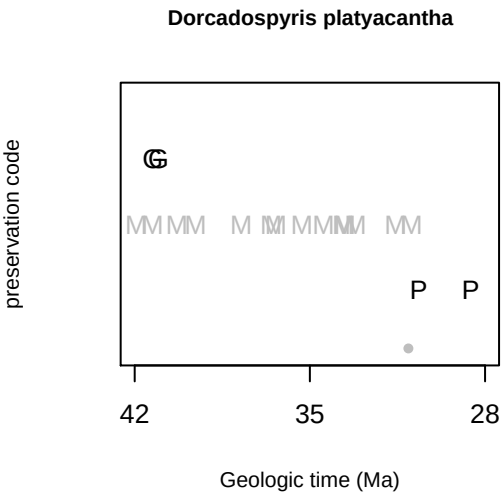

Dorcadospyris costatescens
preservation code
M
M
M
P
P
38
30.5
23
Geologic time (Ma)

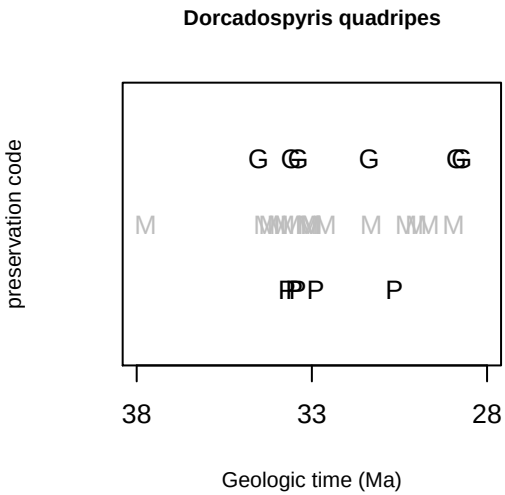

Dorcadospyris dentata
preservation code
31
21
11
Geologic time (Ma)

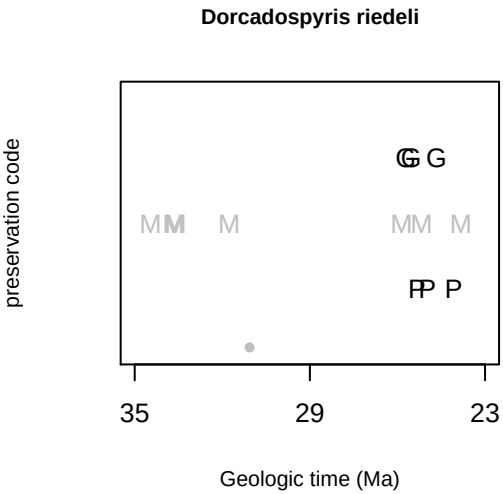

Dorcadospyris forcipata
preservation code
35
24.5
14
Geologic time (Ma)

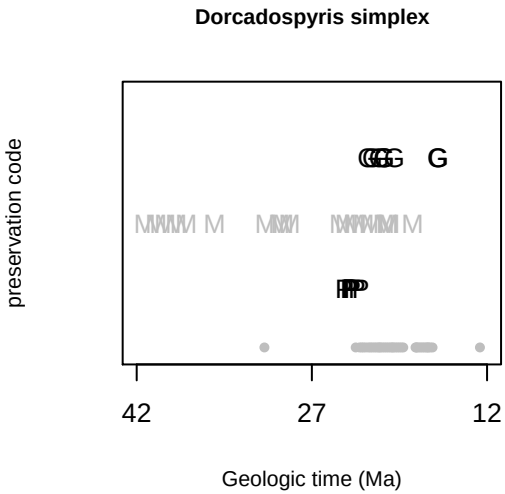

Dorcadospyris papilio
preservation code
31
25
19
Geologic time (Ma)

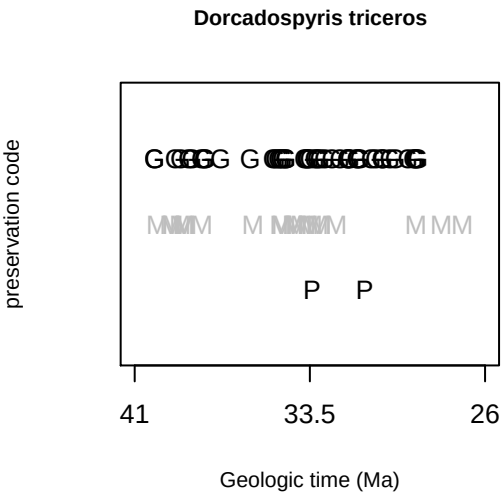

Dorcadospyris pentagona
preservation code
38
26.5
15
Geologic time (Ma)

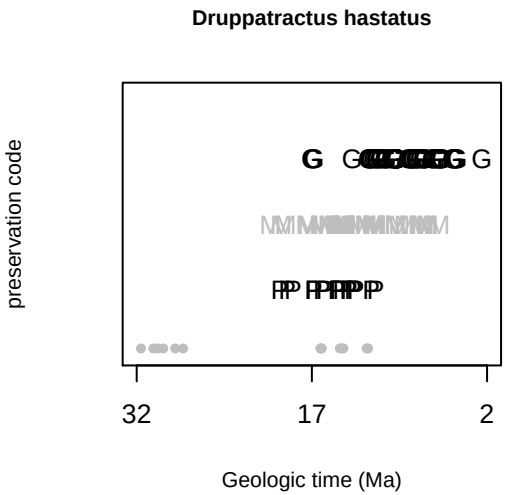

Dorcadospyris platyacantha
preservation code
Geologic time (Ma)
42
35
28

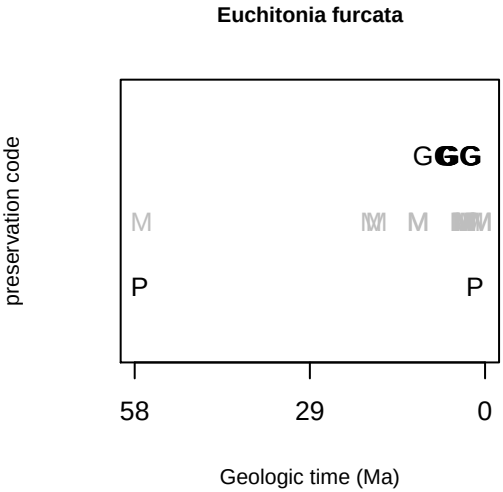

Dorcadospyris quadripes
preservation code
Geologic time (Ma)
38
33
28

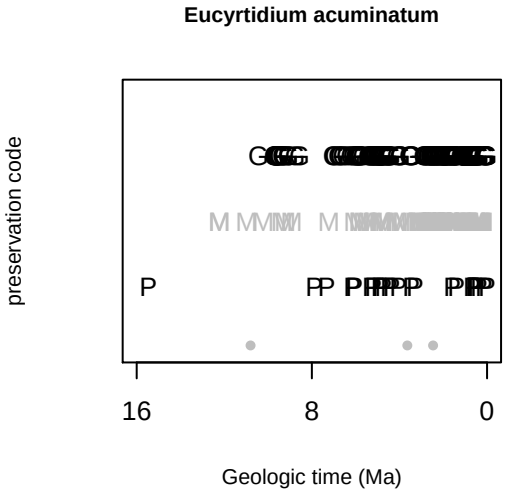

Dorcadospyris riedeli
preservation code
Geologic time (Ma)
35
29
23

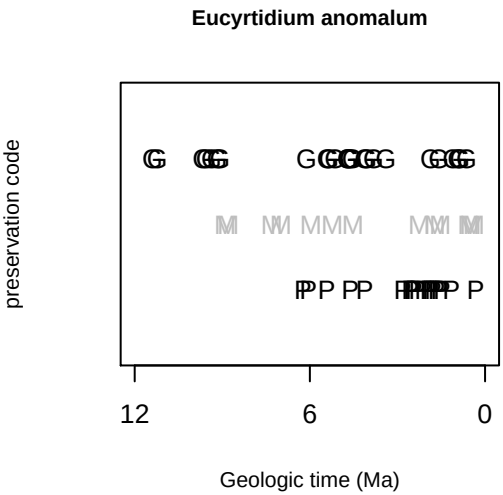

Dorcadospyris simplex
preservation code
Geologic time (Ma)
42
27
12

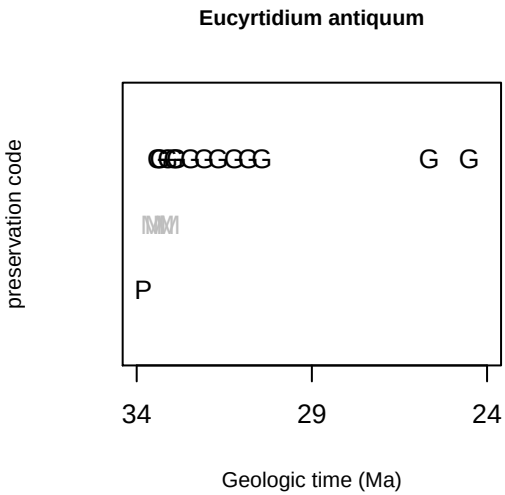

Dorcadospyris triceros
preservation code
41
33.5
26
Geologic time (Ma)

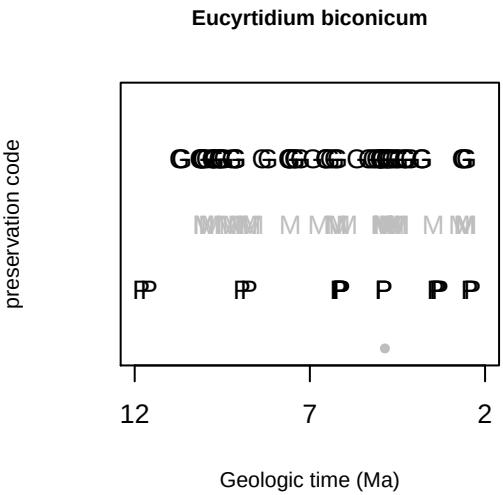

Druppatractus hastatus
preservation code
32
17
2
Geologic time (Ma)

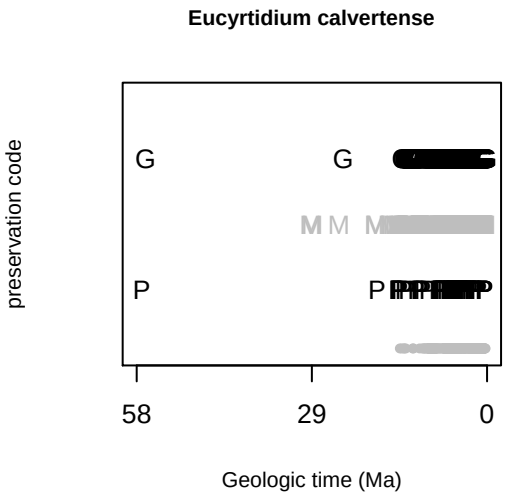

Euchitonia furcata
preservation code
58
29
0
Geologic time (Ma)

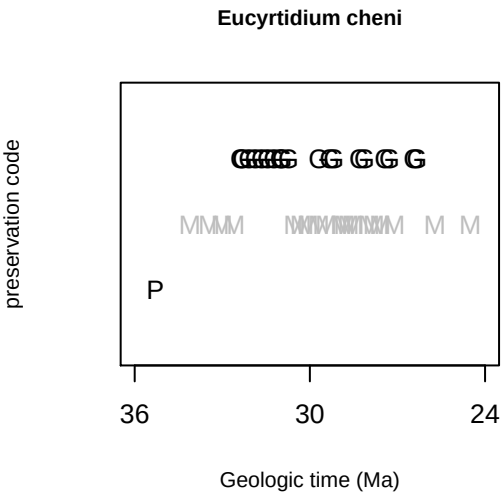

Eucyrtidium acuminatum
preservation code
16
8
0
Geologic time (Ma)

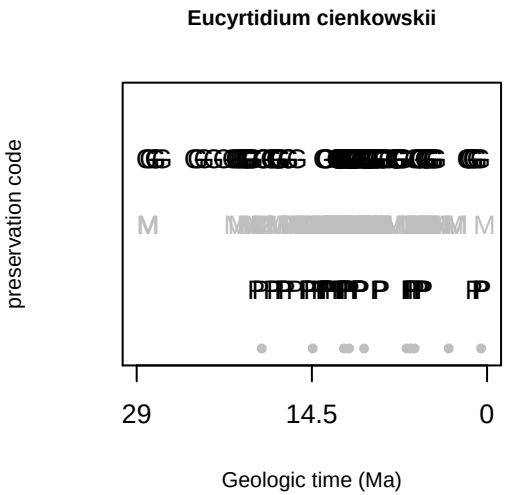

Eucyrtidium anomalum
preservation code
G
M
P
12
6
0
Geologic time (Ma)

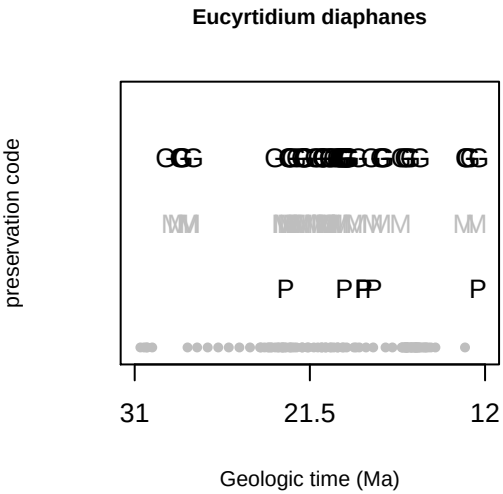

Eucyrtidium antiquum
preservation code
G
M
P
34
29
24
Geologic time (Ma)

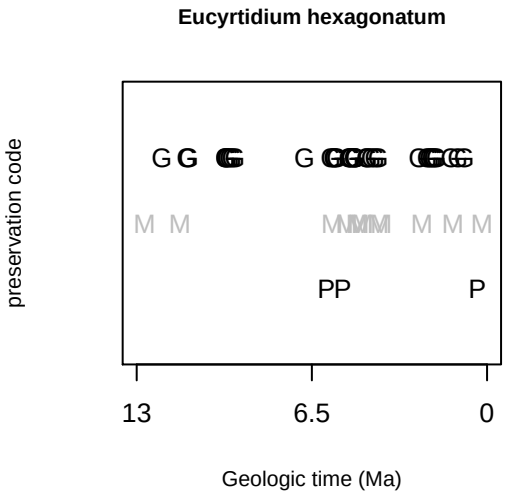

Eucyrtidium biconicum
preservation code
G
M
P
12
7
2
Geologic time (Ma)

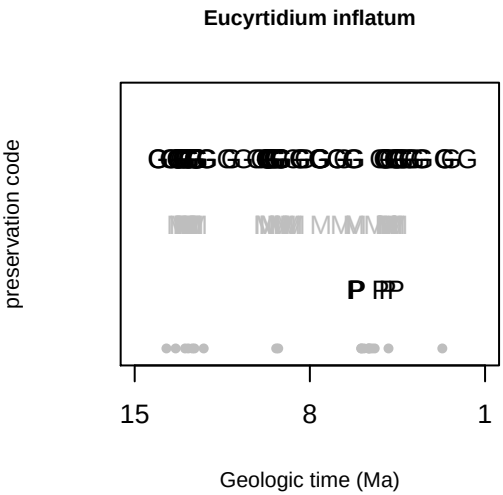

Eucyrtidium calvertense
preservation code
G
M
P
58
29
0
Geologic time (Ma)

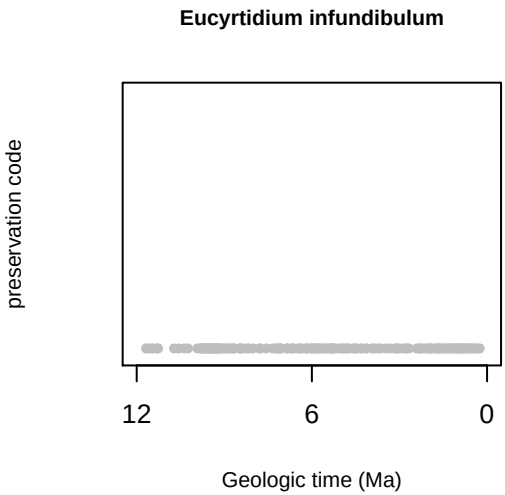

Eucyrtidium cheni
preservation code
36
30
24
Geologic time (Ma)

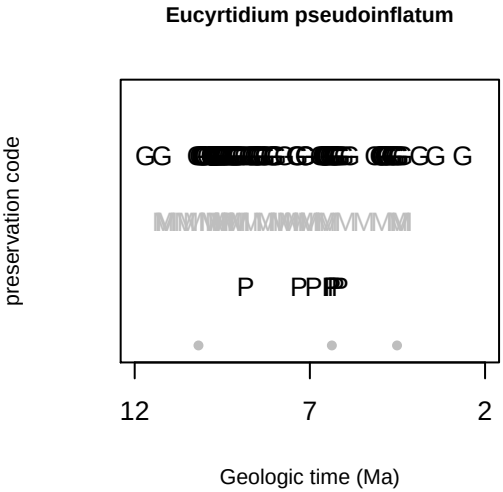

Eucyrtidium cienkowskii
preservation code
29
14.5
0
Geologic time (Ma)

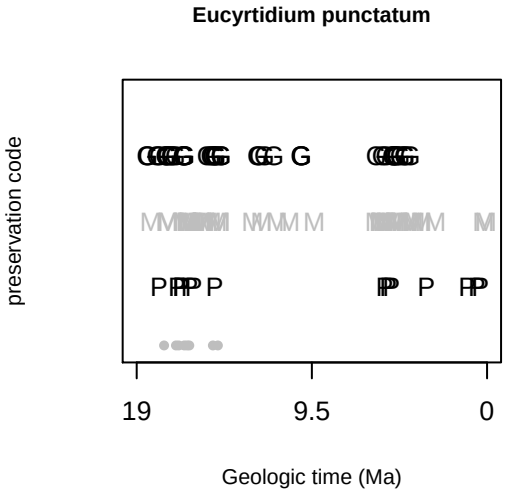

Eucyrtidium diaphanes
preservation code
31
21.5
12
Geologic time (Ma)

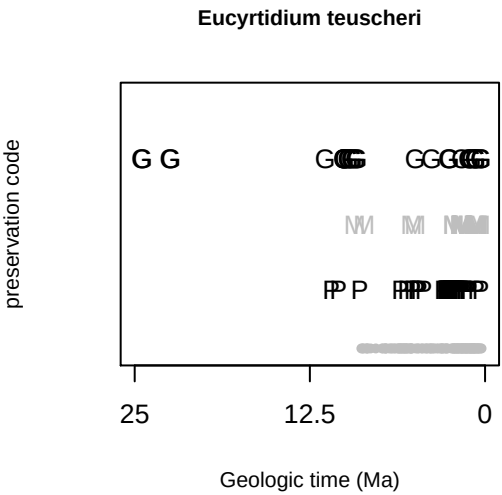

Eucyrtidium hexagonatum
preservation code
13
6.5
0
Geologic time (Ma)

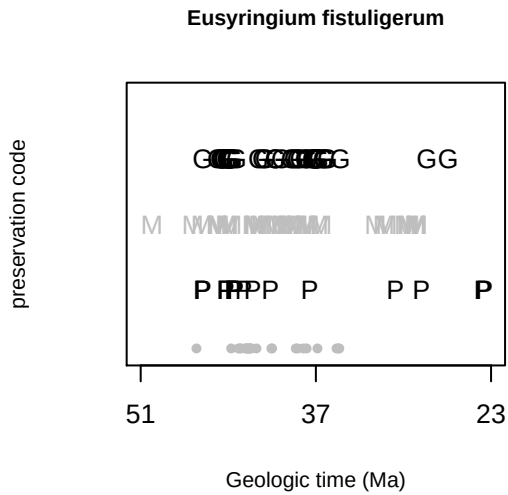

Eucyrtidium inflatum
preservation code
15
8
1
Geologic time (Ma)

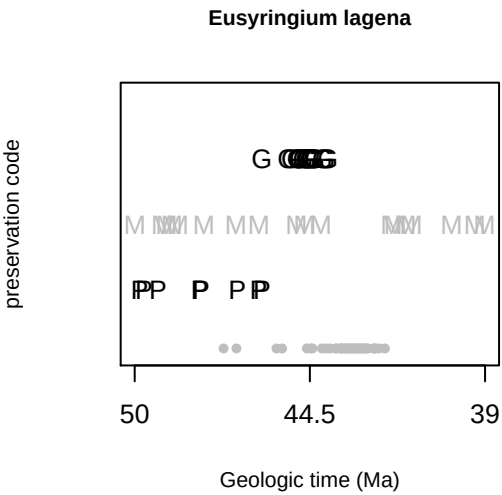

Eucyrtidium infundibulum
preservation code
12
6
0
Geologic time (Ma)

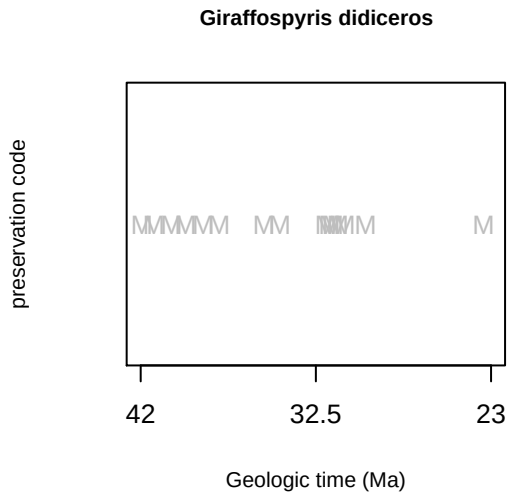

Eucyrtidium pseudoinflatum
preservation code
12
7
2
Geologic time (Ma)

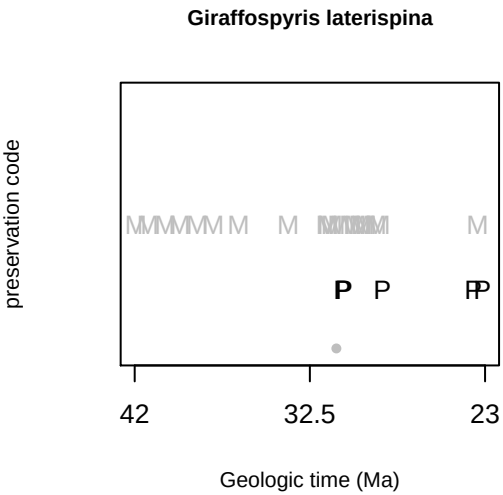

Eucyrtidium punctatum
preservation code
19
9.5
0
Geologic time (Ma)

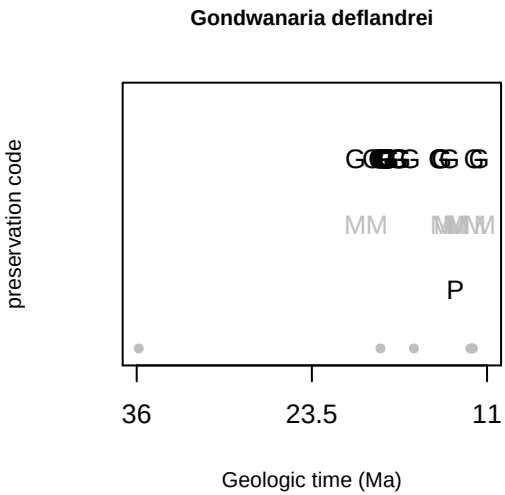

Eucyrtidium teuscheri
preservation code
25
12.5
0
Geologic time (Ma)

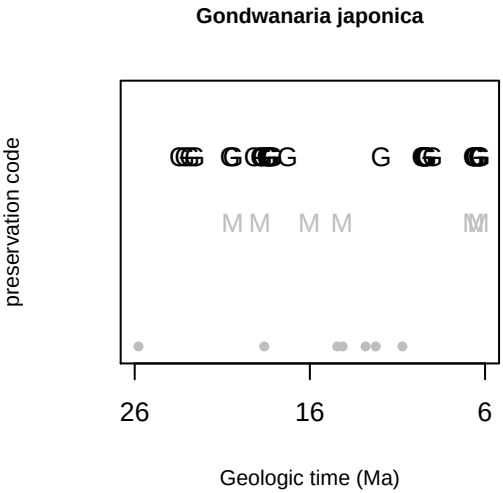

Eusyringium fistuligerum
preservation code
51
37
23
Geologic time (Ma)

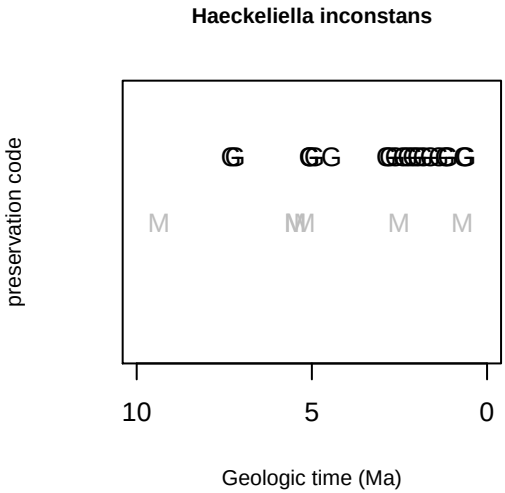

Eusyringium lagena
preservation code
50
44.5
39
Geologic time (Ma)

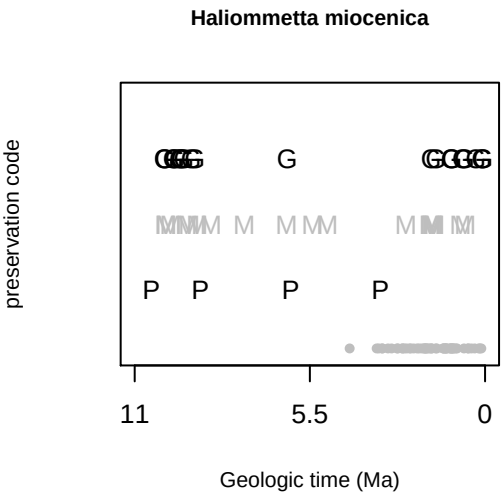

Giraffospyris didiceros
preservation code
42
32.5
23
Geologic time (Ma)

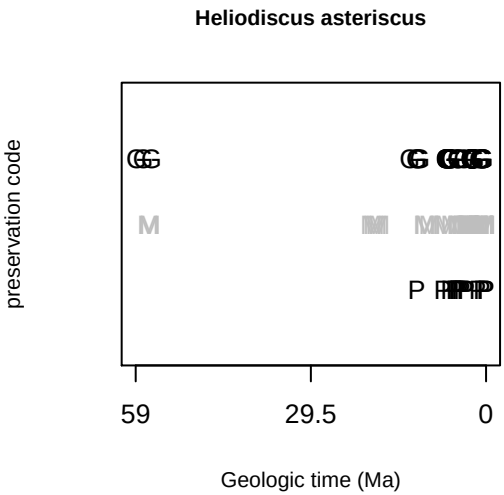

Giraffospyris laterispina
preservation code
42
32.5
23
Geologic time (Ma)

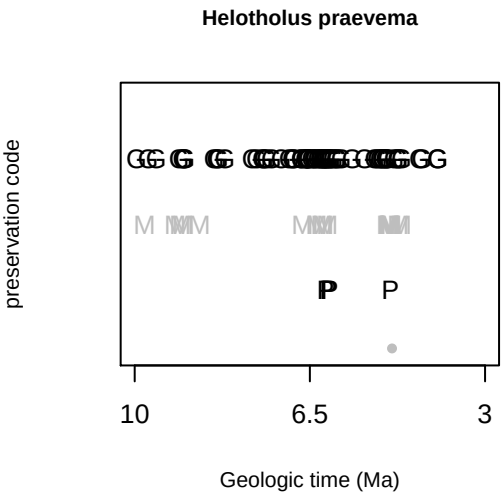

Gondwanaria deflandrei
preservation code
36
23.5
11
Geologic time (Ma)

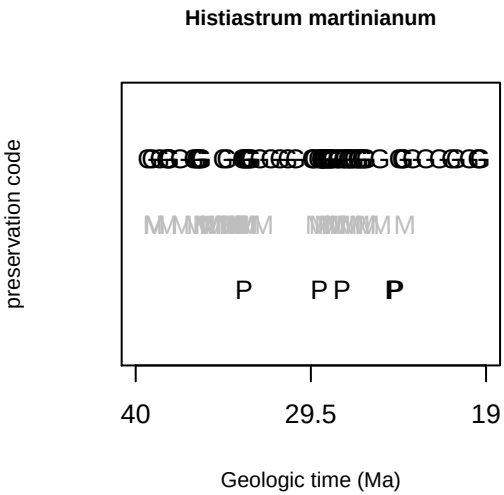

Gondwanaria japonica
preservation code
26
16
6
Geologic time (Ma)

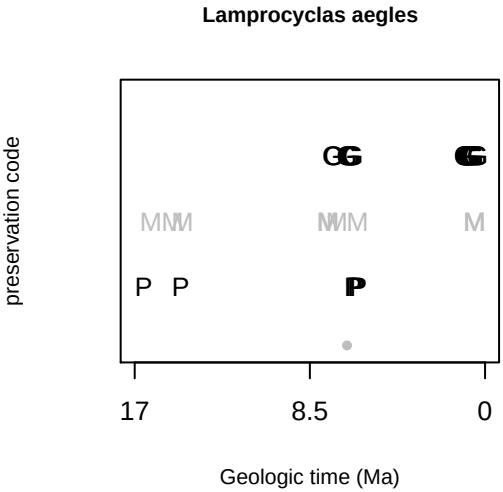

Haeckeliella inconstans
preservation code
10
5
0
Geologic time (Ma)

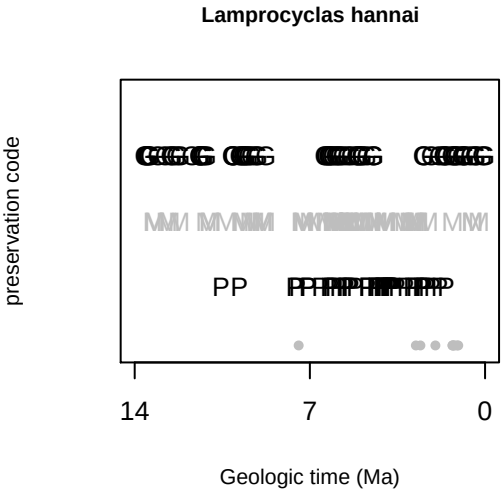

Haliommetta miocenica
preservation code
11
5.5
0
Geologic time (Ma)

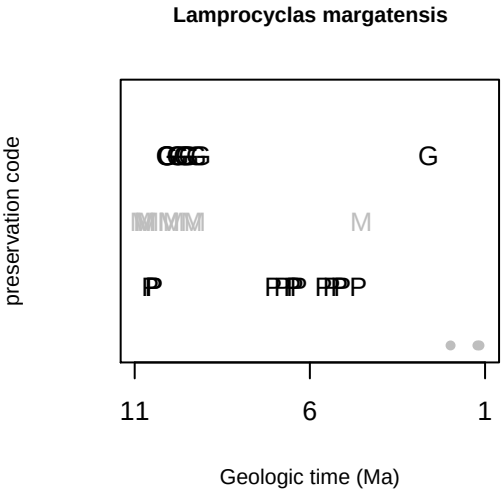

Heliodiscus asteriscus
preservation code
59
29.5
0
Geologic time (Ma)

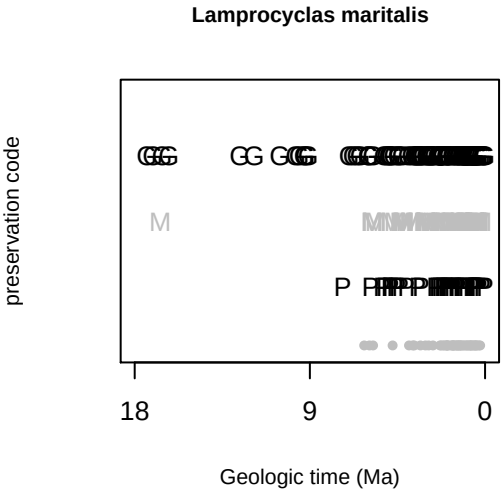

Helotholus praevema
preservation code
10
6.5
3
Geologic time (Ma)

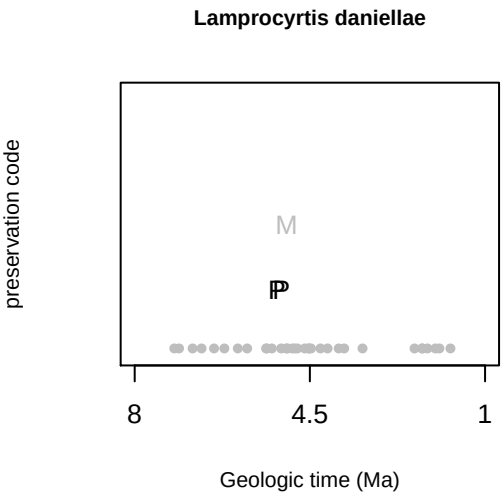

Histiastrum martinianum
preservation code
40
29.5
19
Geologic time (Ma)

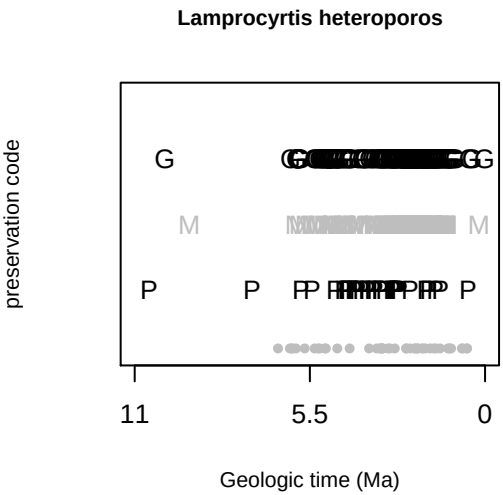

Lamprocyclas aegles
preservation code
17
8.5
0
Geologic time (Ma)

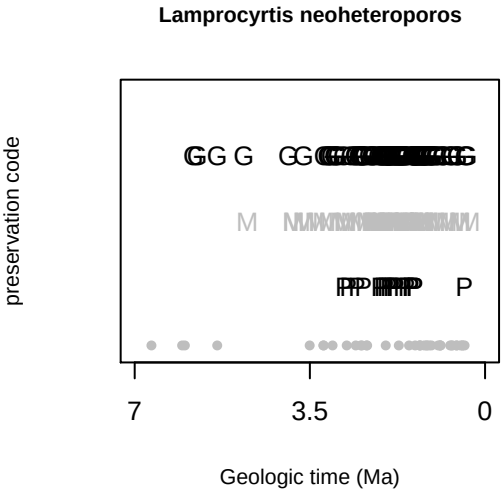

Lamprocyclas hannai
preservation code
14
7
0
Geologic time (Ma)

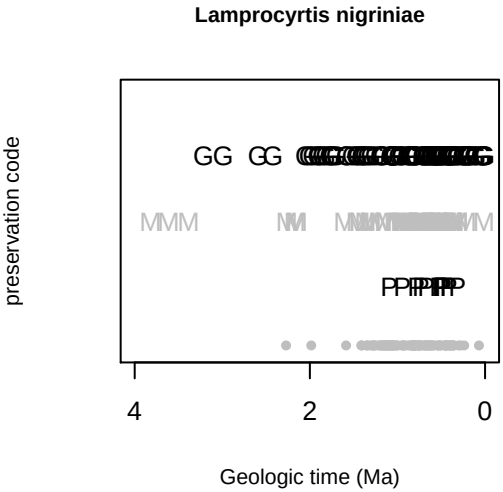

Lamprocyclas margatensis
preservation code
11
6
1
Geologic time (Ma)

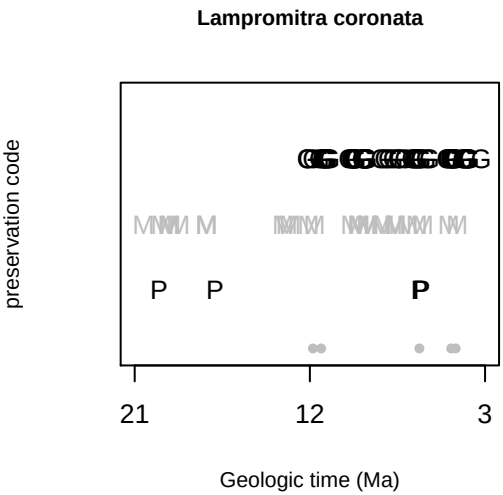

Lamprocyclas maritalis
preservation code
18
9
0
Geologic time (Ma)

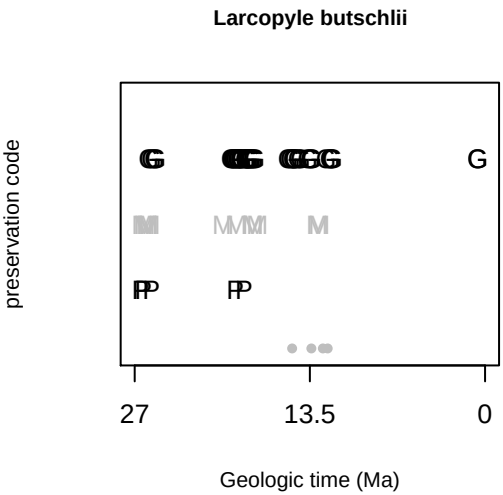

Lamprocyrtis daniellae
preservation code
M
P
8
4.5
1
Geologic time (Ma)

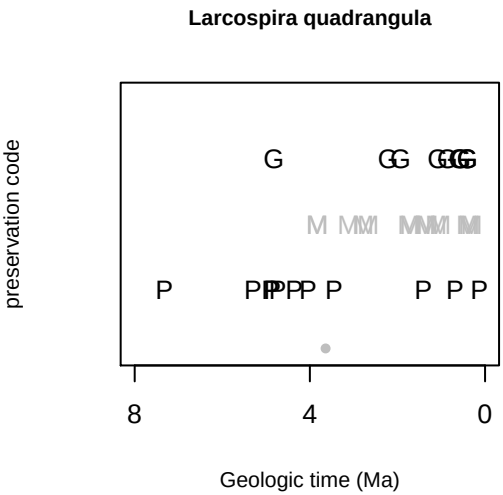

Lamprocyrtis heteroporos
preservation code
G
M
P
11
5.5
0
Geologic time (Ma)

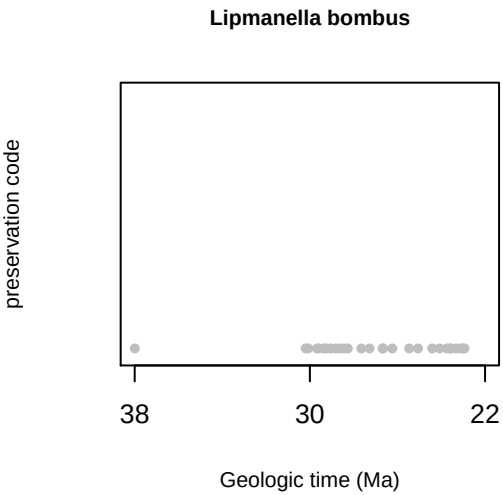

Lamprocyrtis neoheteroporos
preservation code
G
M
P
7
3.5
0
Geologic time (Ma)

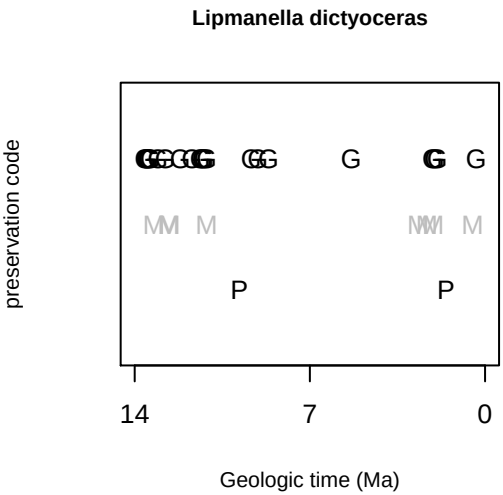

Lamprocyrtis nigriniae
preservation code
G
M
P
4
2
0
Geologic time (Ma)

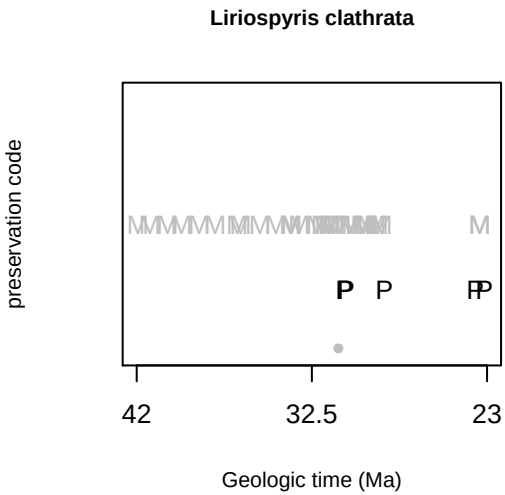

Lampromitra coronata
preservation code
21
12
3
Geologic time (Ma)

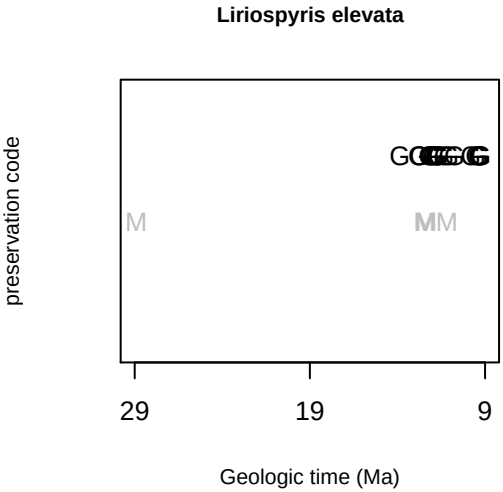

Larcopyle butschlii
preservation code
27
13.5
0
Geologic time (Ma)

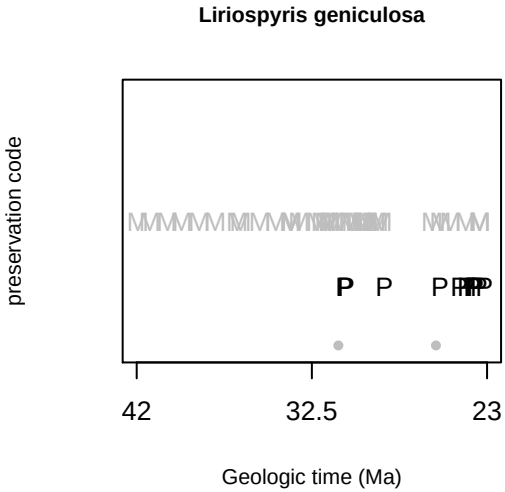

Larcospira quadrangula
preservation code
8
4
0
Geologic time (Ma)

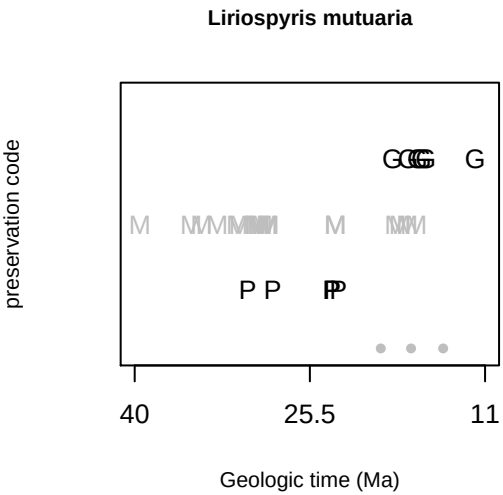

Lipmanella bombus
preservation code
38
30
22
Geologic time (Ma)

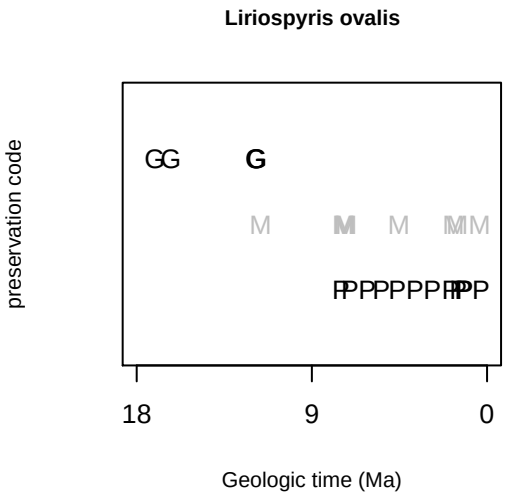

Lipmanella dictyoceras
preservation code
Geologic time (Ma)
14
7
0

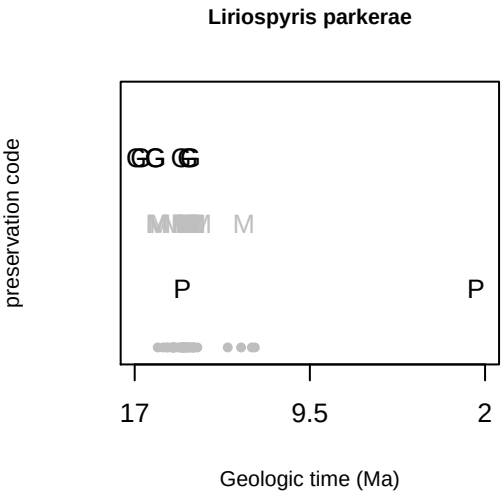

Liriospyris clathrata
preservation code
Geologic time (Ma)
42
32.5
23

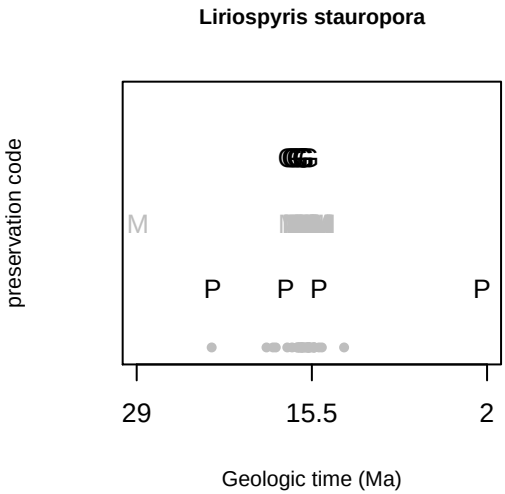

Liriospyris elevata
preservation code
Geologic time (Ma)
29
19
9

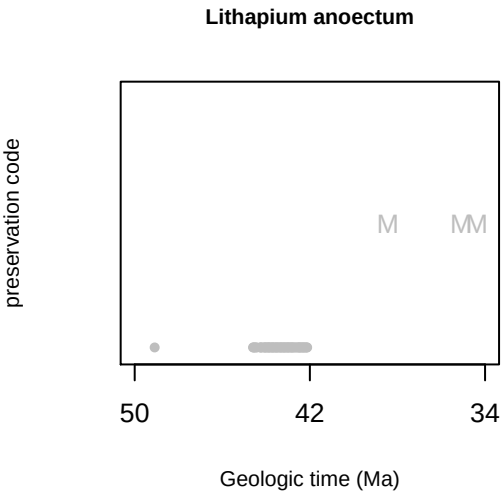

Liriospyris geniculosa
preservation code
Geologic time (Ma)
42
32.5
23

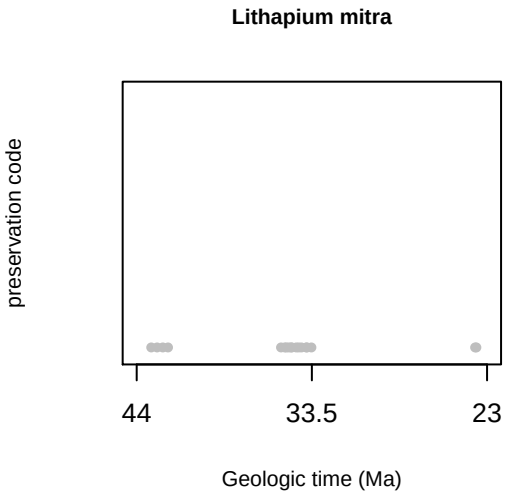

Liriospyris mutuaria
preservation code
Geologic time (Ma)
40
25.5
11

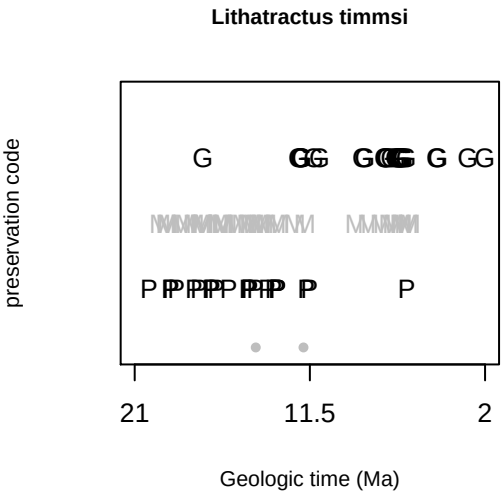

Liriospyris ovalis
preservation code
Geologic time (Ma)
18
9
0

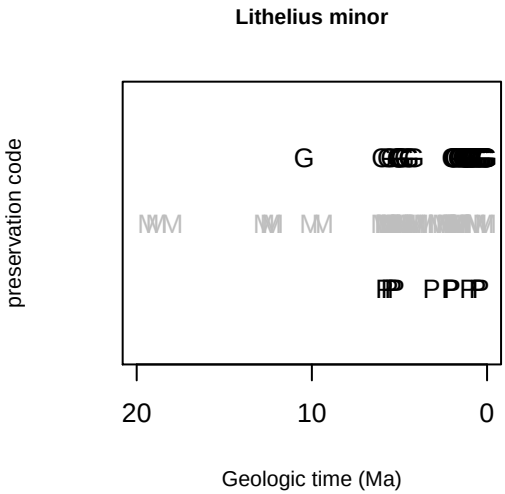

Liriospyris parkerae
preservation code
Geologic time (Ma)
17
9.5
2

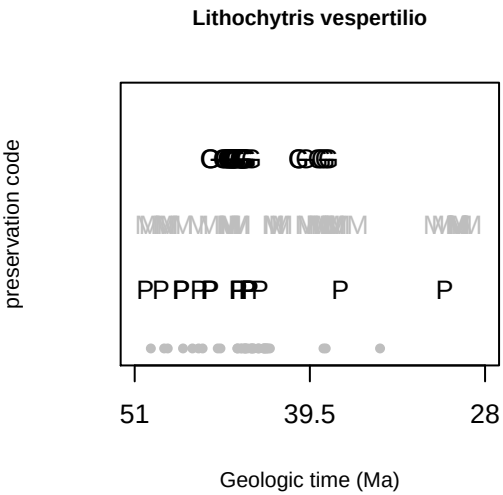

Liriospyris stauropora
preservation code
Geologic time (Ma)
29
15.5
2

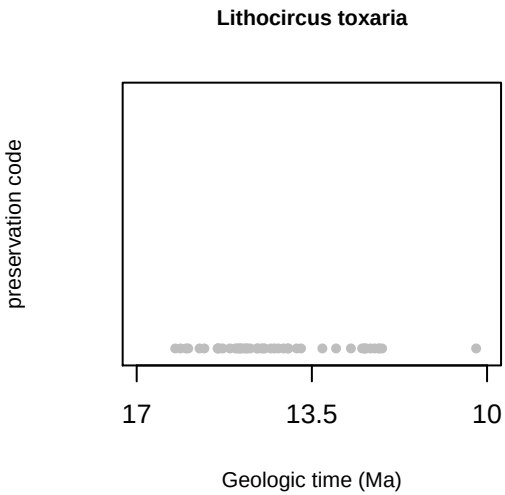

Lithapium anoectum
preservation code
M
MM
50
42
34
Geologic time (Ma)

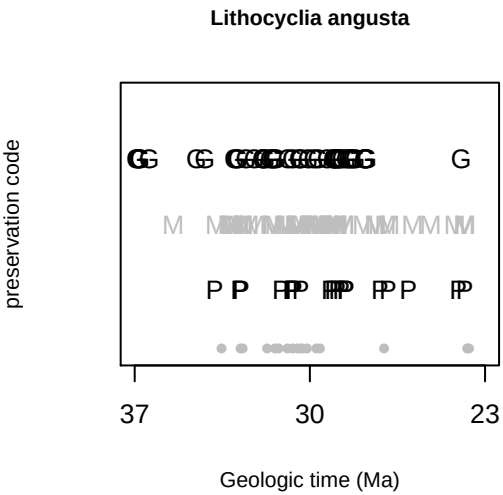

Lithapium mitra
preservation code
44
33.5
23
Geologic time (Ma)

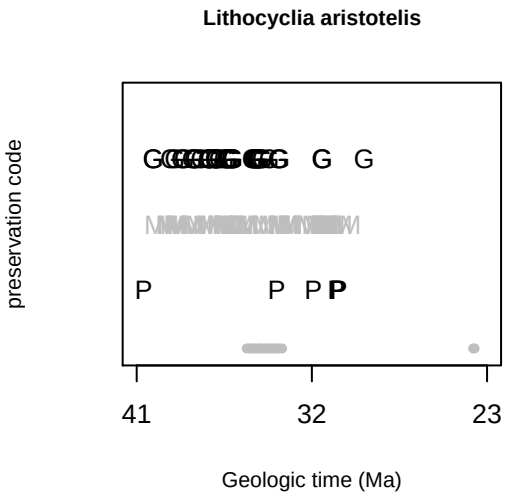

Lithatractus timmsi
preservation code
G
GG
GG
G
GG
M
MM
P
PP
PP
PP
P
P
21
11.5
2
Geologic time (Ma)

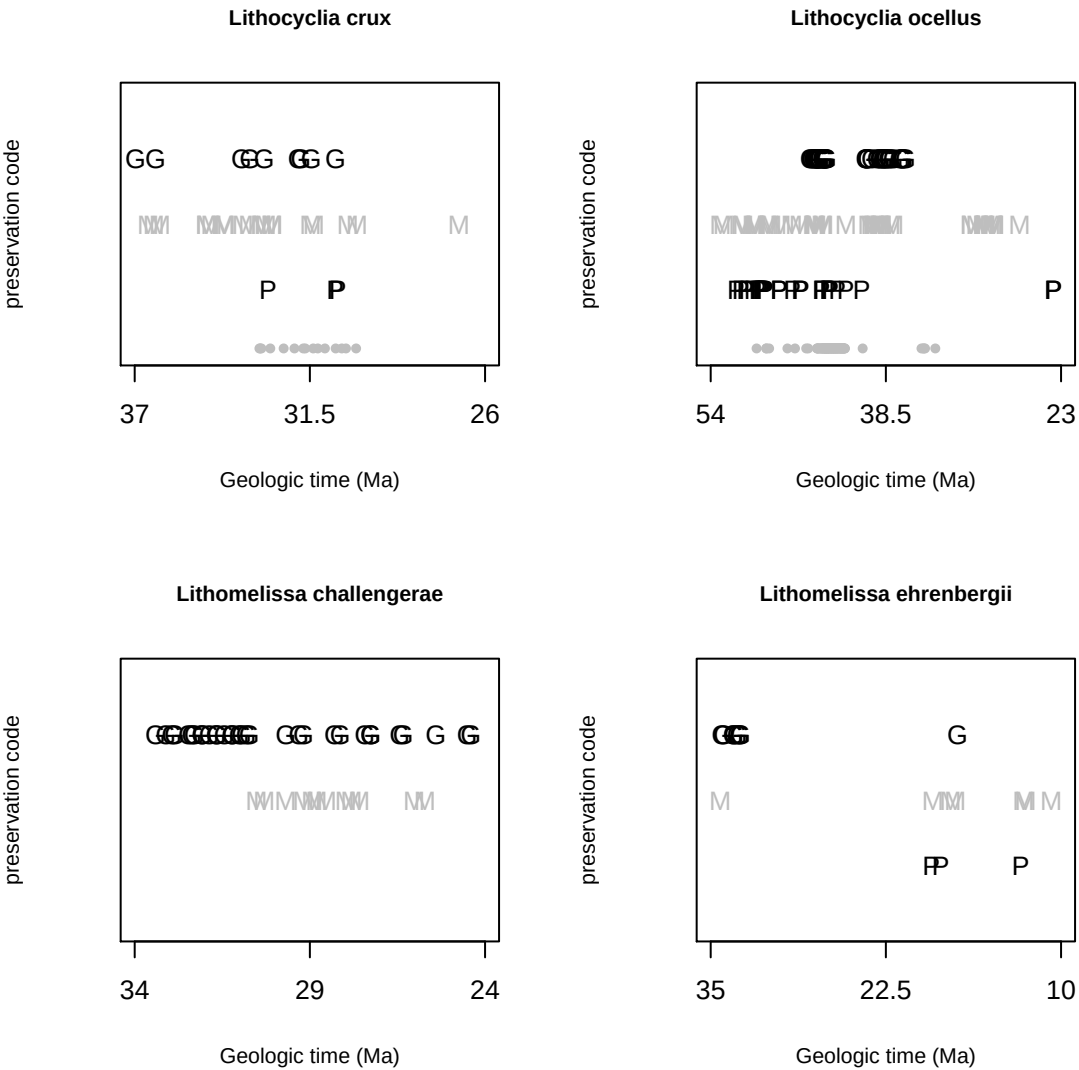

Lithelius minor
preservation code
G
GG
GG
M
MM
MM
MM
P
PP
PP
20
10
0
Geologic time (Ma)

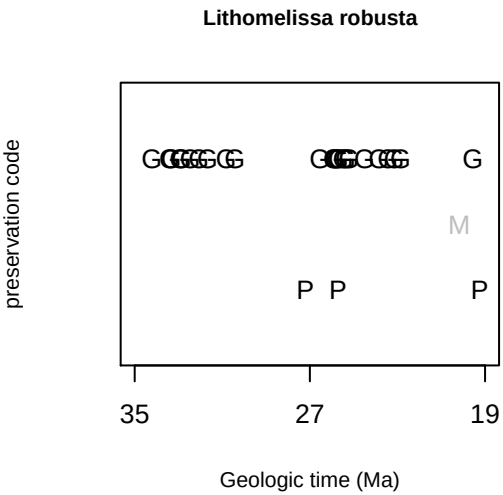

Lithochytris vespertilio
preservation code
51
39.5
28
Geologic time (Ma)

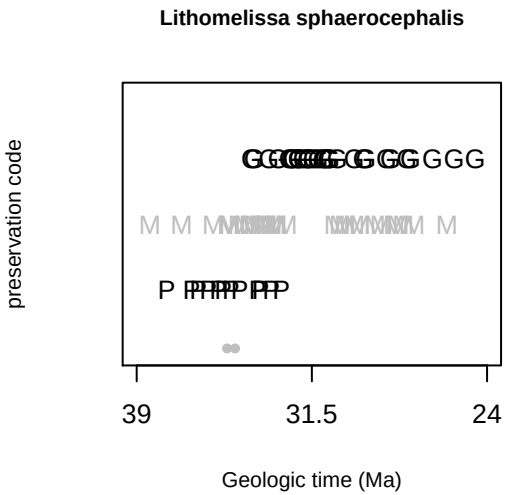

Lithocircus toxaria
preservation code
17
13.5
10
Geologic time (Ma)

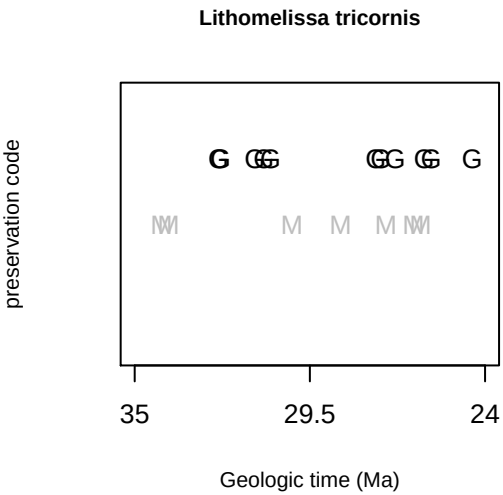

Lithocyclia angusta
preservation code
37
30
23
Geologic time (Ma)

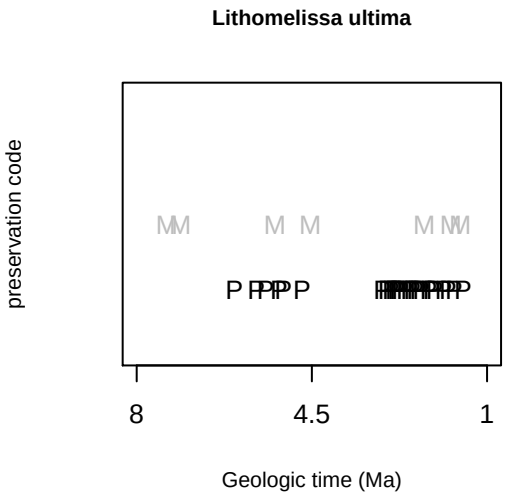

Lithocyclia aristotelis
preservation code
41
32
23
Geologic time (Ma)

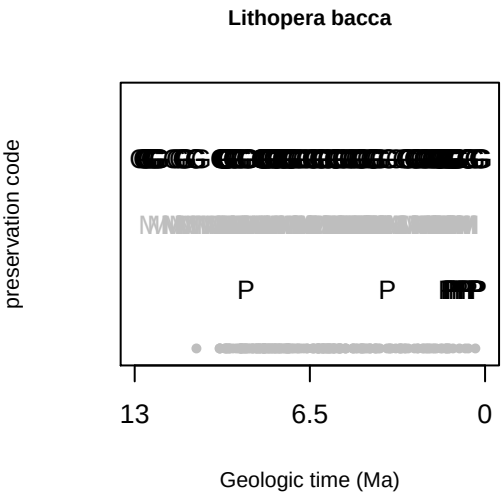

Lithocyclia crux
preservation code
37
31.5
26
Geologic time (Ma)
Lithocyclia ocellus
preservation code
54
38.5
23
Geologic time (Ma)
Lithomelissa challengerae
preservation code
34
29
24
Geologic time (Ma)
Lithomelissa ehrenbergii
preservation code
35
22.5
10
Geologic time (Ma)

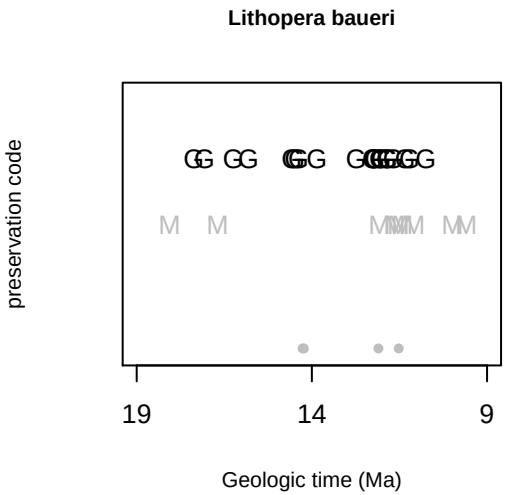

Lithomelissa robusta
preservation code
35
27
19
Geologic time (Ma)

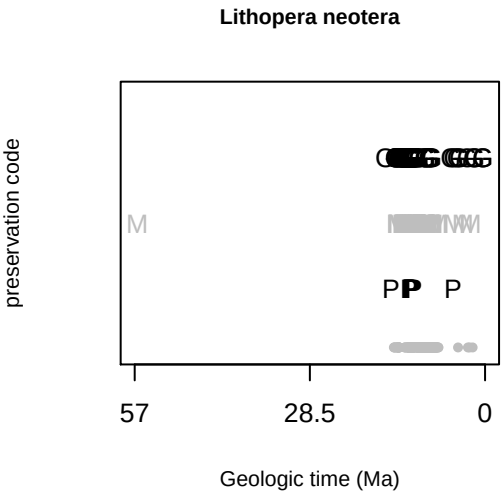

Lithomelissa sphaerocephalis
preservation code
39
31.5
24
Geologic time (Ma)

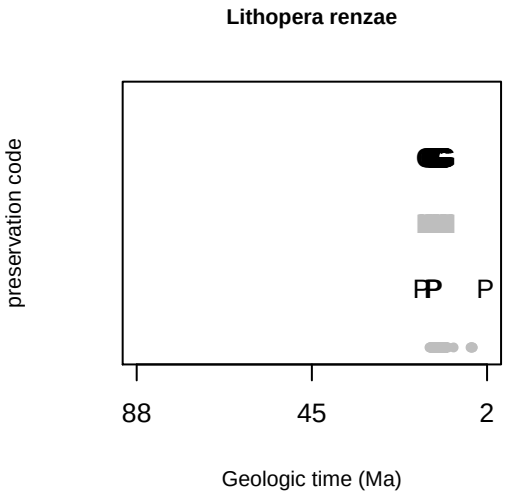

Lithomelissa tricornis
preservation code
35
29.5
24
Geologic time (Ma)

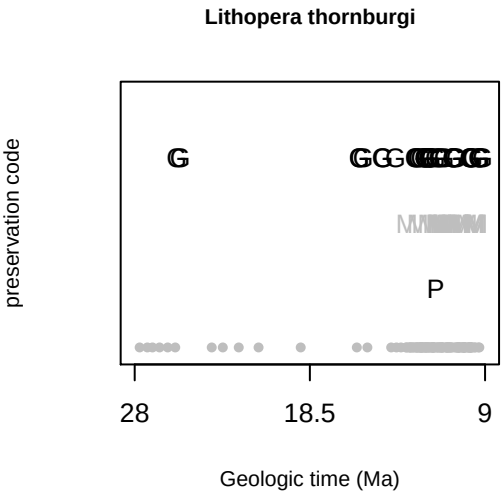

Lithomelissa ultima
preservation code
8
4.5
1
Geologic time (Ma)

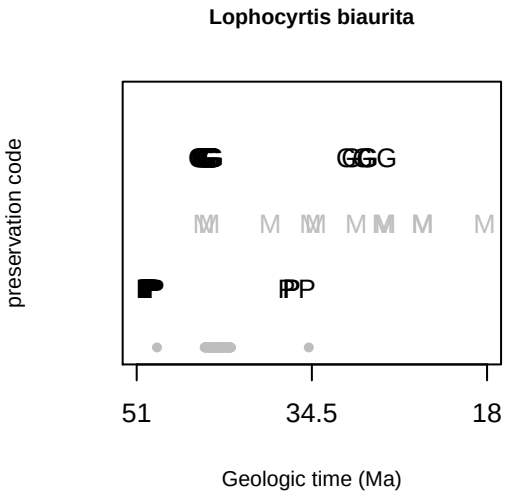

Lithopera bacca
preservation code
P
P
13
6.5
0
Geologic time (Ma)

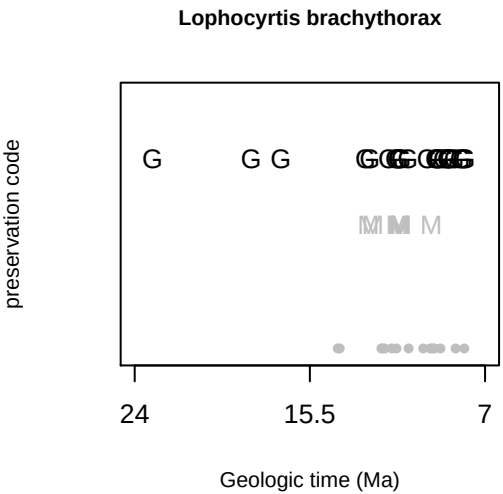

Lithopera baueri
preservation code
M
M
19
14
9
Geologic time (Ma)

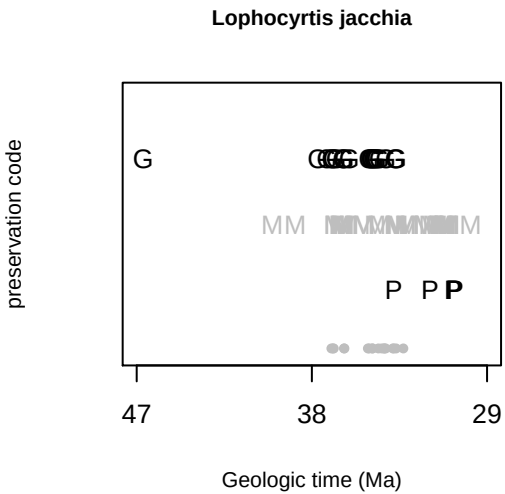

Lithopera neotera
preservation code
M
P
P
57
28.5
0
Geologic time (Ma)

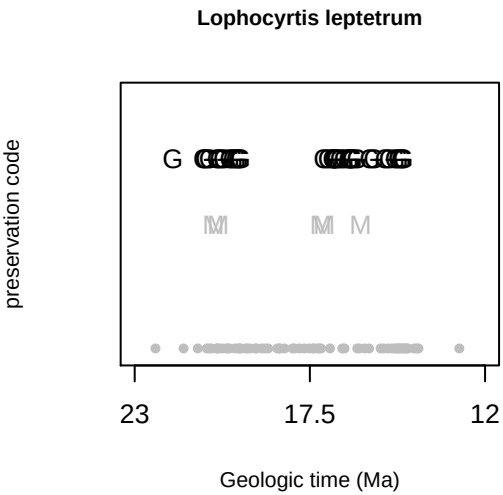

Lithopera renzae
preservation code
P
P
88
45
2
Geologic time (Ma)

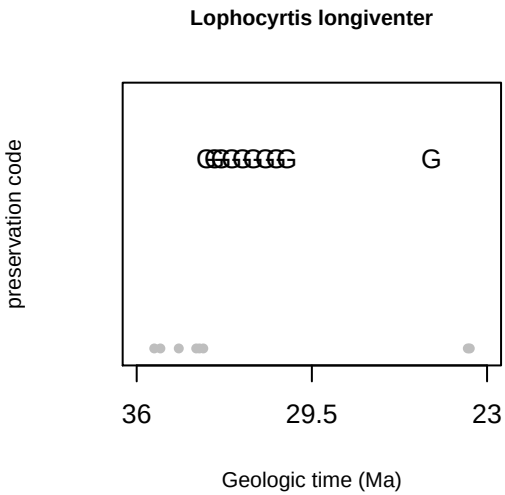

Lithopera thornburgi
preservation code
28
18.5
9
Geologic time (Ma)

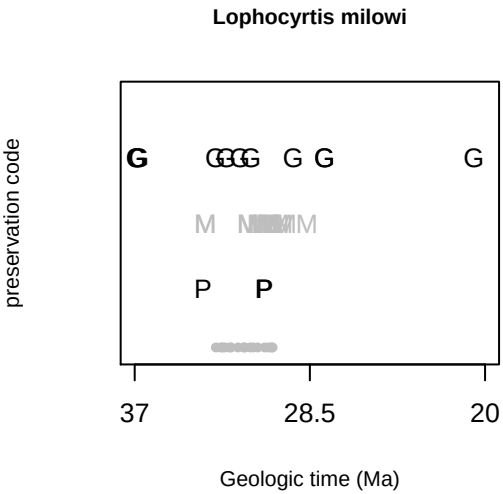

Lophocyrtis biaurita
preservation code
51
34.5
18
Geologic time (Ma)

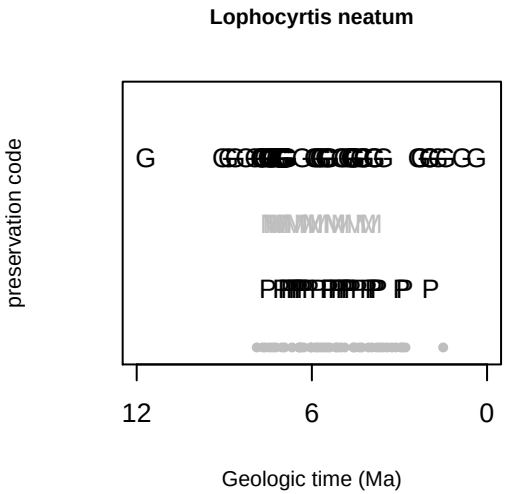

Lophocyrtis brachythorax
preservation code
24
15.5
7
Geologic time (Ma)

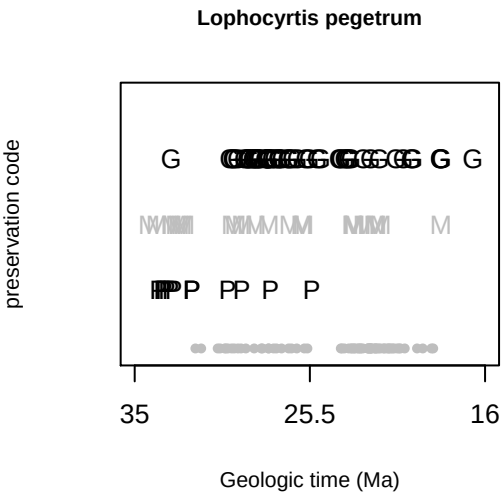

Lophocyrtis jacchia
preservation code
47
38
29
Geologic time (Ma)

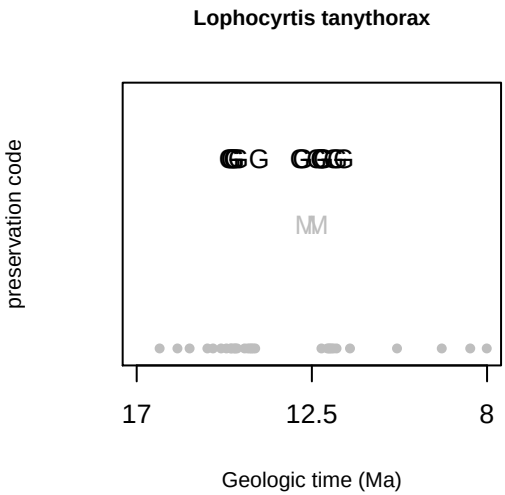

Lophocyrtis leptetrum
preservation code
G
M
23
17.5
12
Geologic time (Ma)

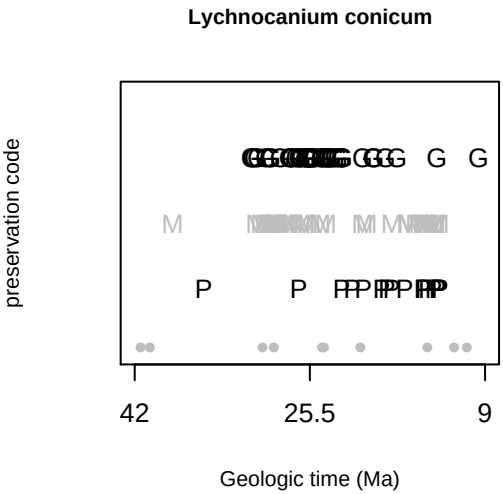

Lophocyrtis longiventer
preservation code
G
36
29.5
23
Geologic time (Ma)

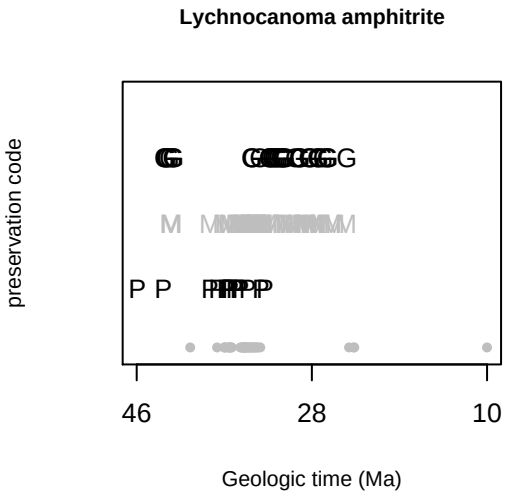

Lophocyrtis milowi
preservation code
G
M
P
37
28.5
20
Geologic time (Ma)

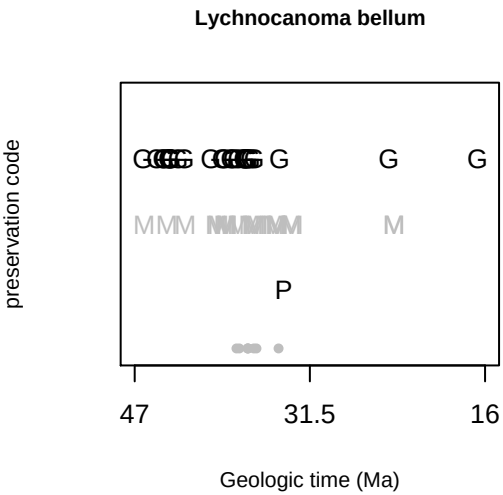

Lophocyrtis neatum
preservation code
G
M
P
12
6
0
Geologic time (Ma)

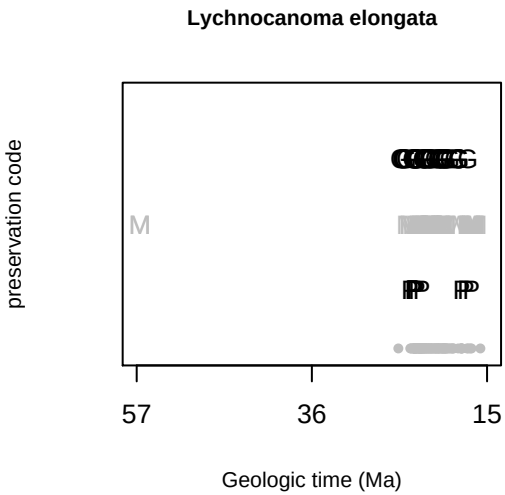

Lophocyrtis pegetrum
preservation code
35
25.5
16
Geologic time (Ma)

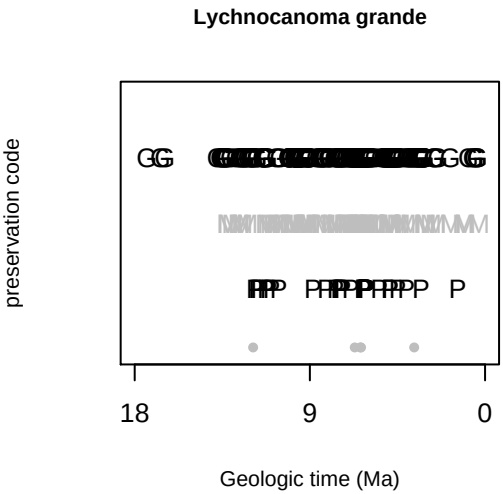

Lophocyrtis tanythorax
preservation code
17
12.5
8
Geologic time (Ma)

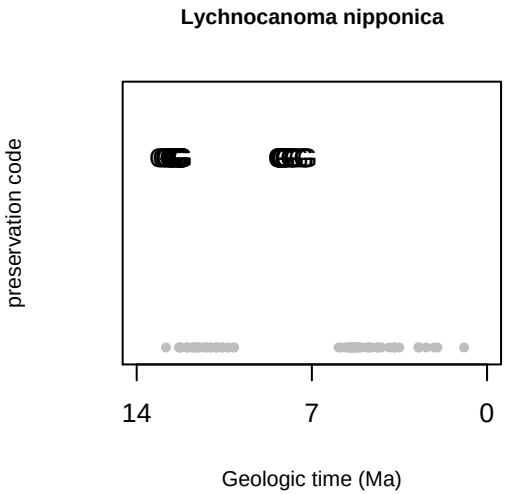

Lychnocanium conicum
preservation code
42
25.5
9
Geologic time (Ma)

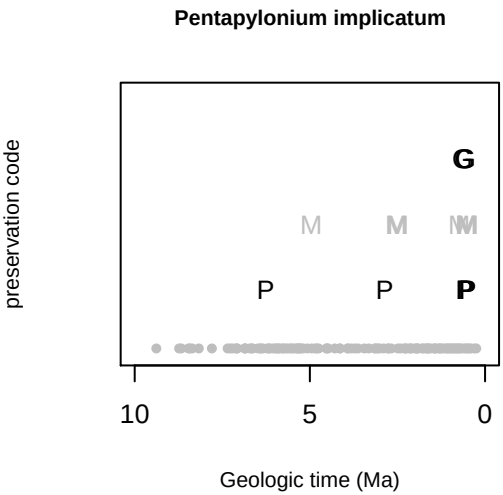

Lychnocanoma amphitrite
preservation code
46
28
10
Geologic time (Ma)

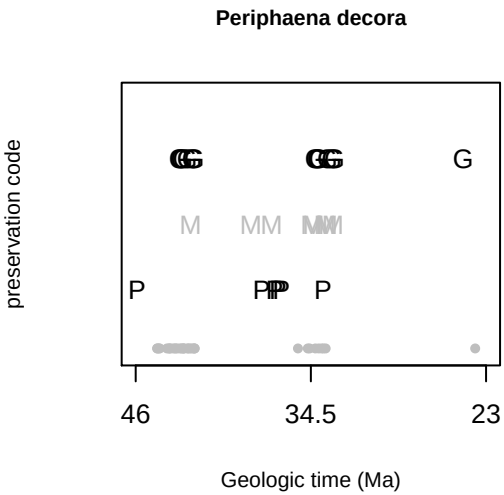

Lychnocanoma bellum
preservation code
G
M
P
47
31.5
16
Geologic time (Ma)

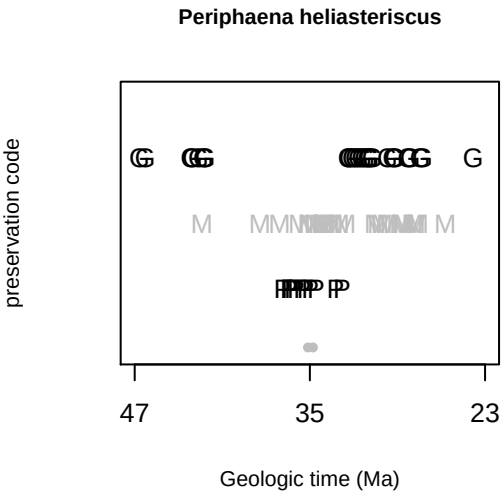

Lychnocanoma elongata
preservation code
G
M
P
57
36
15
Geologic time (Ma)

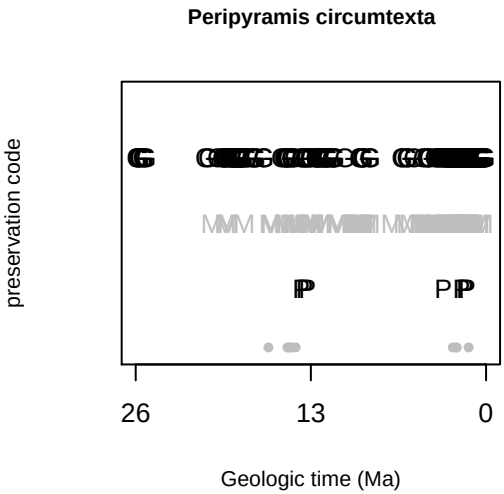

Lychnocanoma grande
preservation code
G
M
P
18
9
0
Geologic time (Ma)

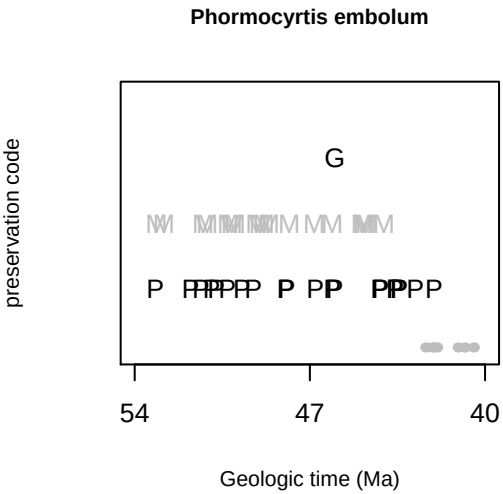

Lychnocanoma nipponica
preservation code
G
14
7
0
Geologic time (Ma)

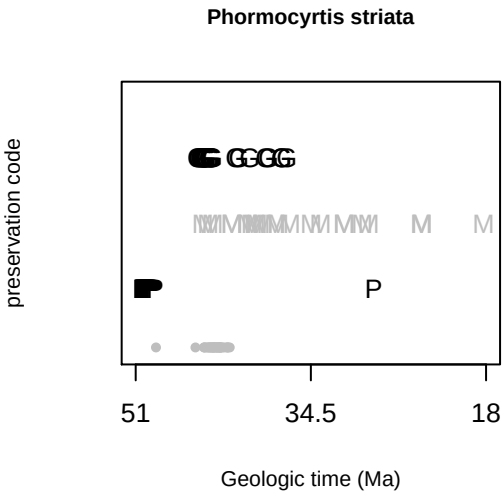

Pentapylonium implicatum
preservation code
G
M
P
10
5
0
Geologic time (Ma)

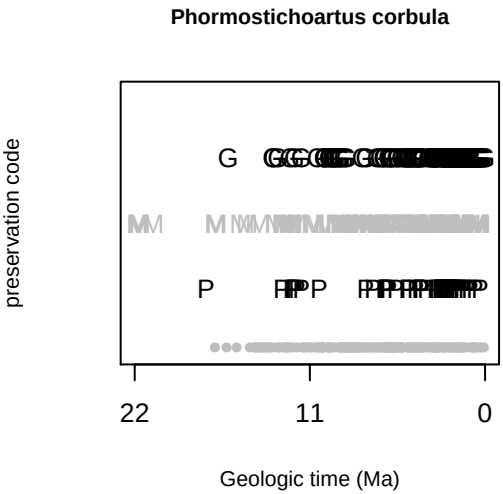

Periphaena decora
preservation code
G
M
P
46
34.5
23
Geologic time (Ma)

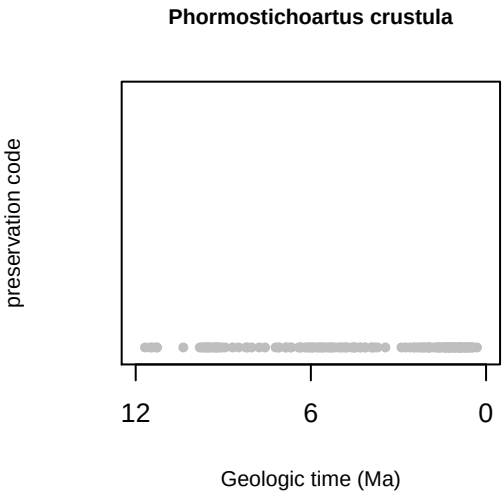

Periphaena heliasteriscus
preservation code
G
M
P
47
35
23
Geologic time (Ma)

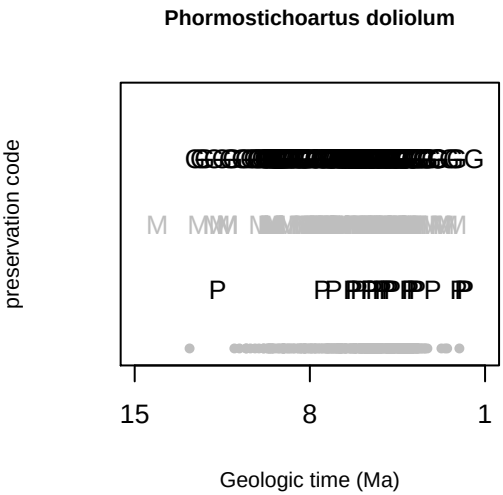

Peripyramis circumtexta
preservation code
G
M
P
26
13
0
Geologic time (Ma)

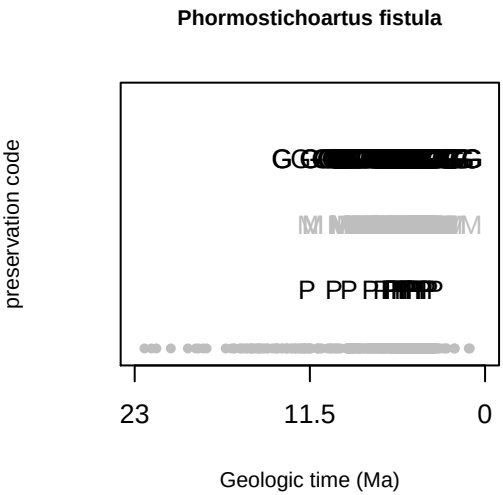

Phormocyrtis embolum
preservation code
G
M
P
54
47
40
Geologic time (Ma)

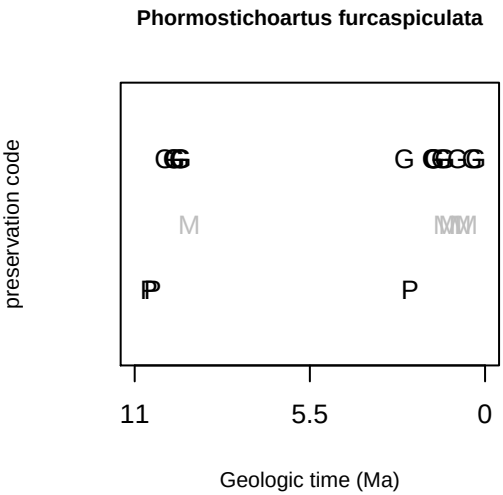

Phormocyrtis striata
preservation code
G
M
P
51
34.5
18
Geologic time (Ma)

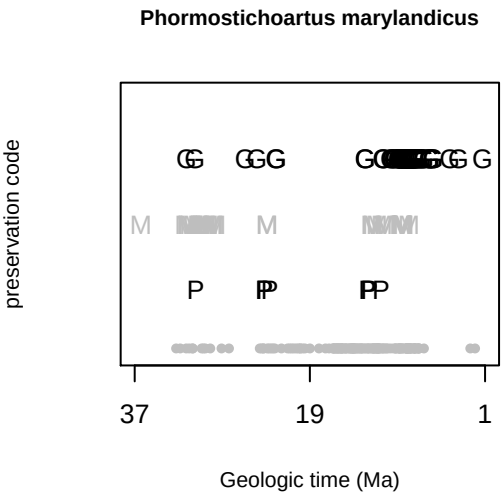

Phormostichoartus corbula
preservation code
G
M
P
22
11
0
Geologic time (Ma)

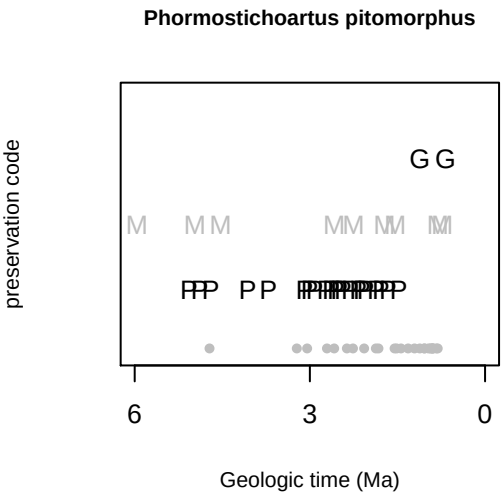

Phormostichoartus crustula
preservation code
12
6
0
Geologic time (Ma)

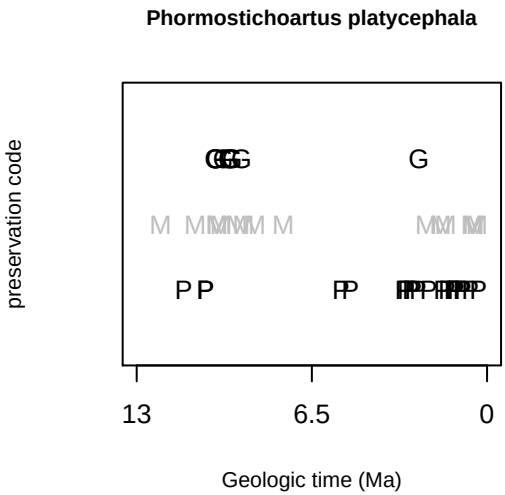

Phormostichoartus doliolum
preservation code
15
8
1
Geologic time (Ma)

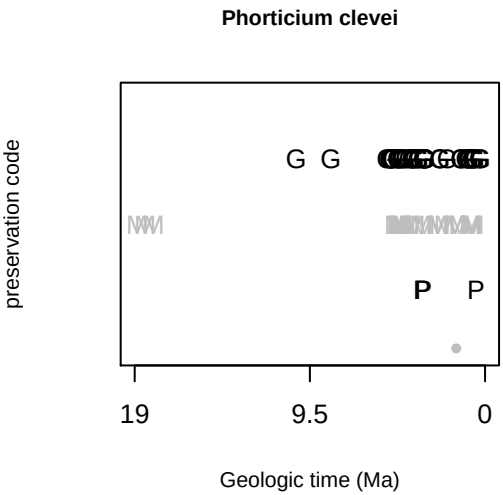

Phormostichoartus fistula
preservation code
23
11.5
0
Geologic time (Ma)

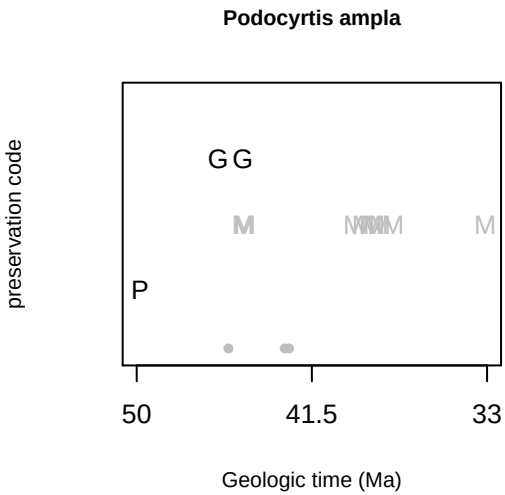

Phormostichoartus furcaspiculata
preservation code
11
5.5
0
Geologic time (Ma)

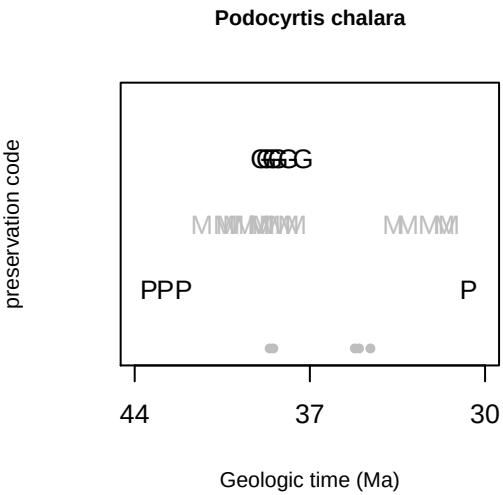

Phormostichoartus marylandicus
preservation code
37
19
1
Geologic time (Ma)

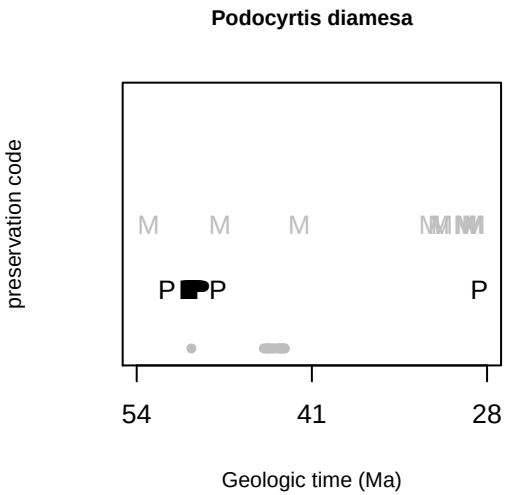

Phormostichoartus pitomorphus
preservation code
Geologic time (Ma)
6
3
0

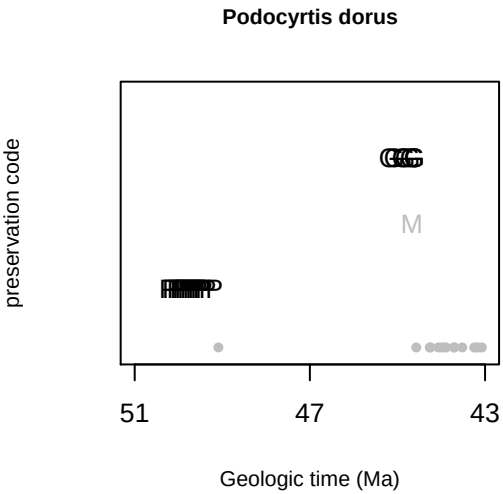

Phormostichoartus platycephala
preservation code
Geologic time (Ma)
13
6.5
0

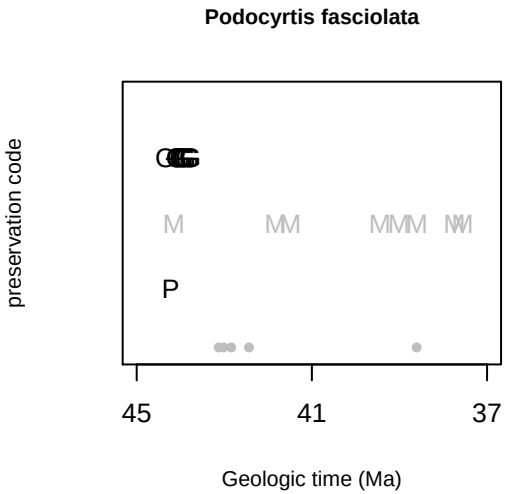

Phorticium clevei
preservation code
Geologic time (Ma)
19
9.5
0

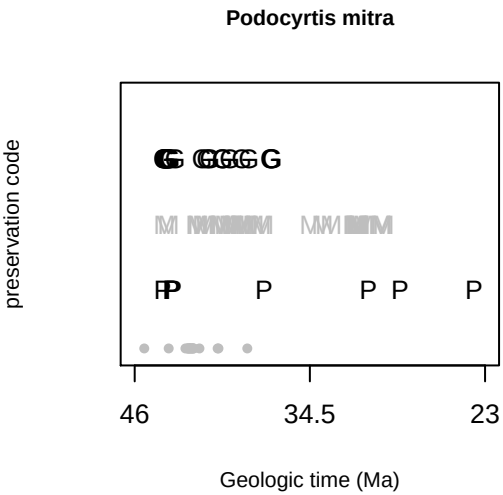

Podocyrtis ampla
preservation code
Geologic time (Ma)
50
41.5
33

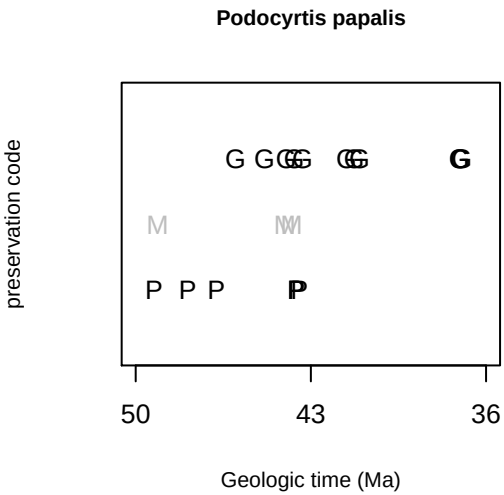

Podocyrtis chalara
preservation code
44
37
30
Geologic time (Ma)

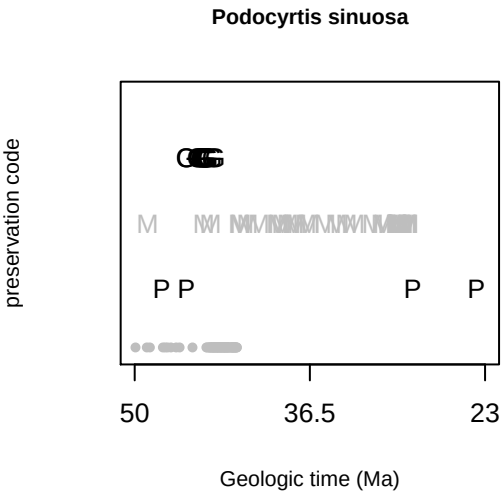

Podocyrtis diamesa
preservation code
54
41
28
Geologic time (Ma)

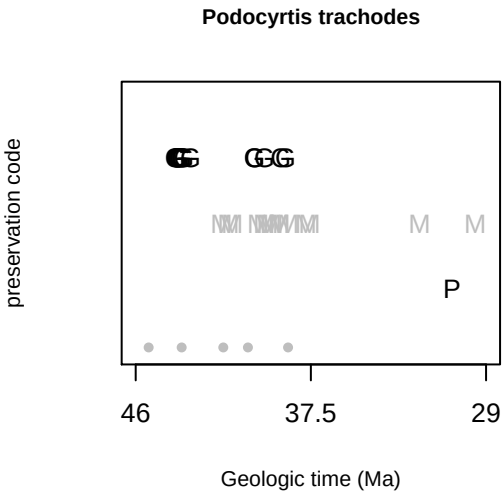

Podocyrtis dorus
preservation code
51
47
43
Geologic time (Ma)

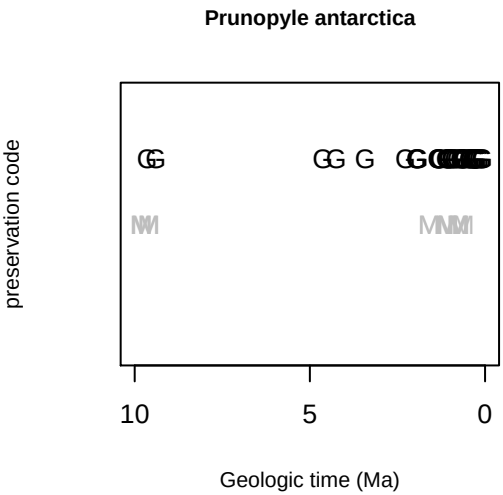

Podocyrtis fasciolata
preservation code
45
41
37
Geologic time (Ma)

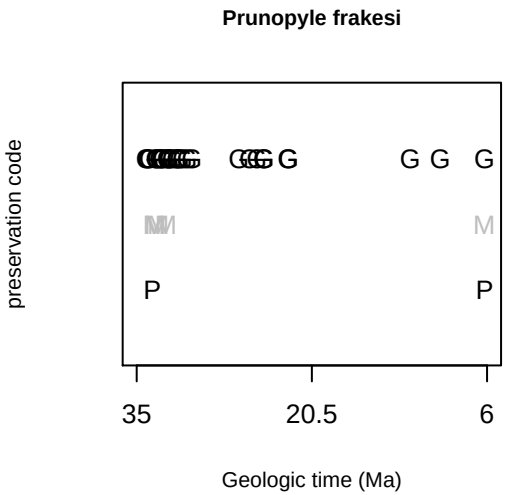

Podocyrtis mitra
preservation code
46
34.5
23
Geologic time (Ma)

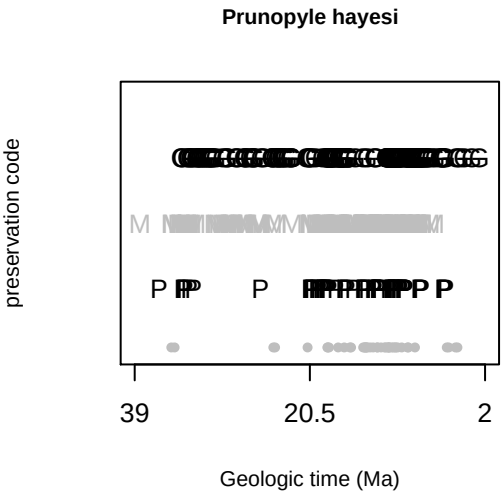

Podocyrtis papalis
preservation code
50
43
36
Geologic time (Ma)

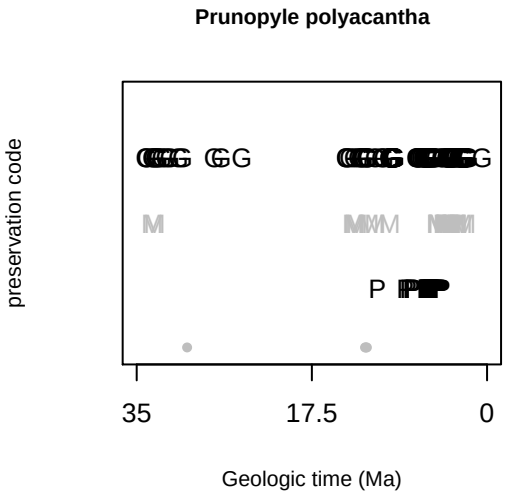

Podocyrtis sinuosa
preservation code
50
36.5
23
Geologic time (Ma)

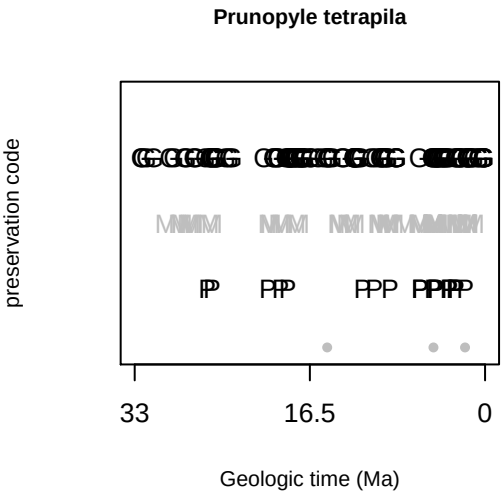

Podocyrtis trachodes
preservation code
46
37.5
29
Geologic time (Ma)

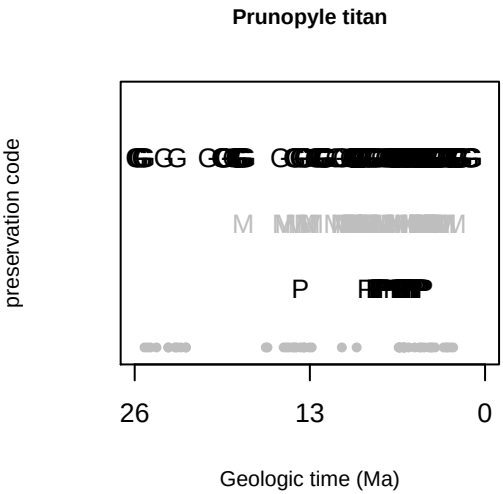

Prunopyle antarctica
preservation code
10
5
0
Geologic time (Ma)

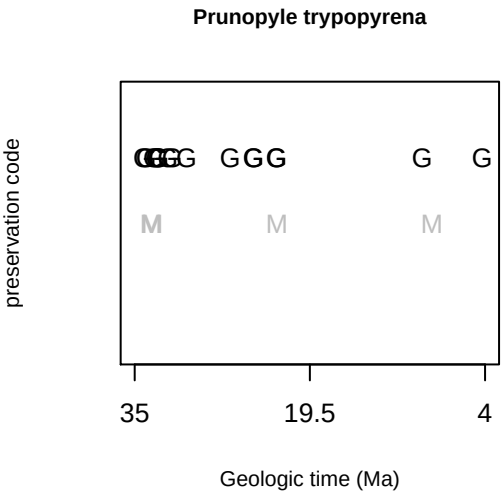

Prunopyle frakesi
preservation code
35
20.5
6
Geologic time (Ma)

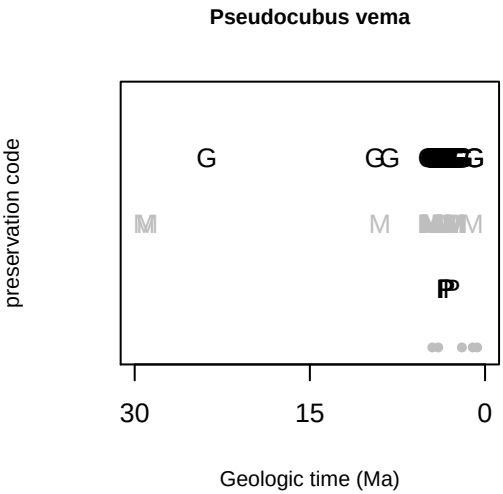

Prunopyle hayesi
preservation code
39
20.5
2
Geologic time (Ma)

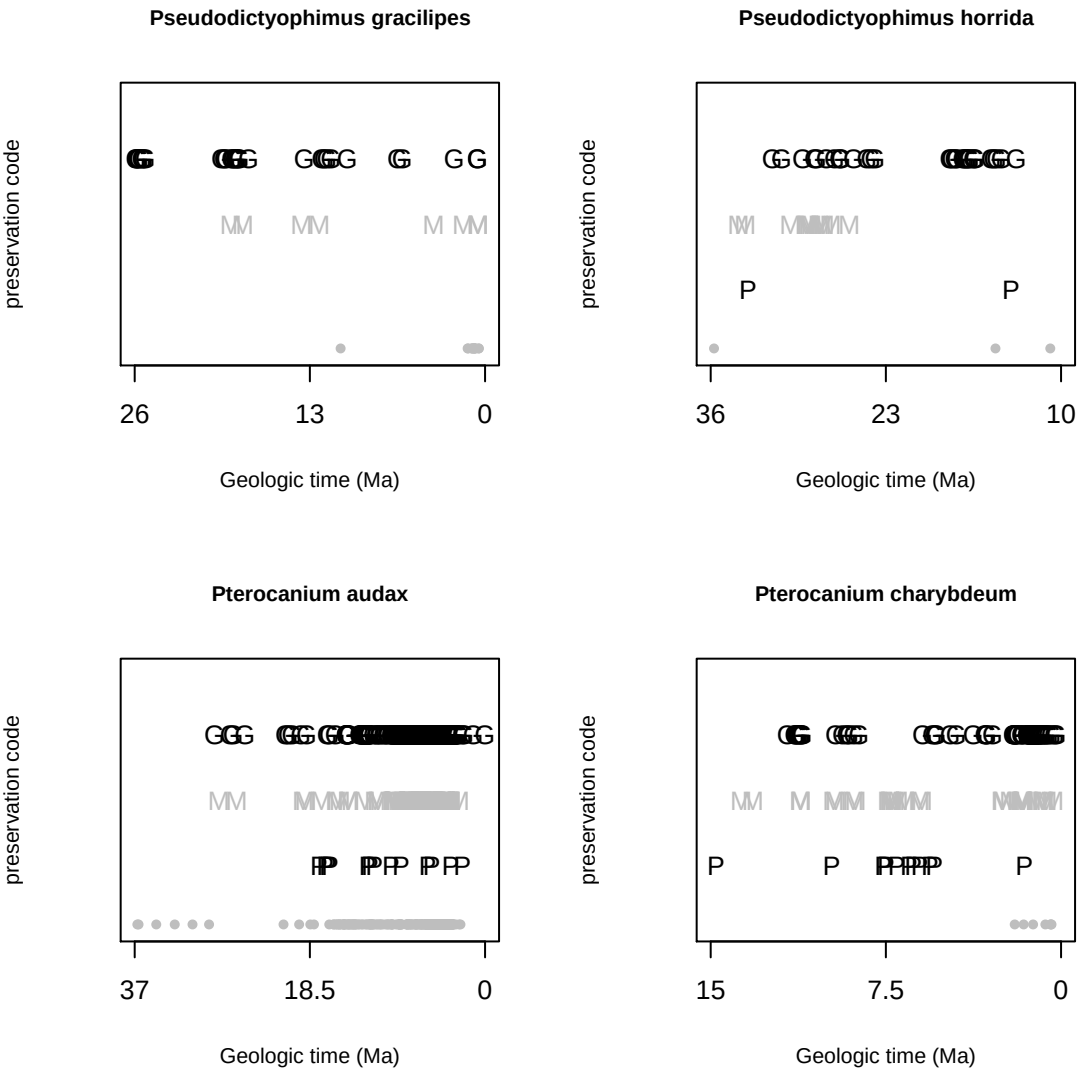

Prunopyle polyacantha
preservation code
35
17.5
0
Geologic time (Ma)

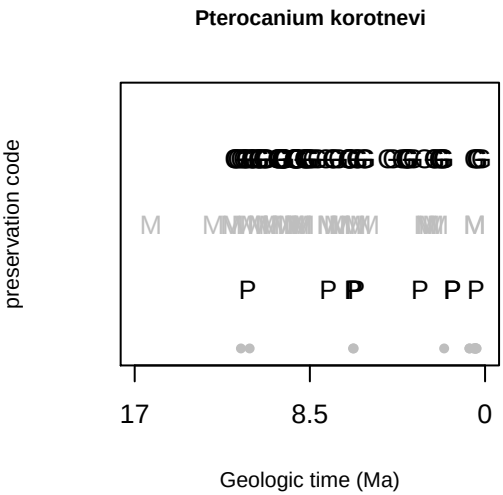

Prunopyle tetrapila
preservation code
33
16.5
0
Geologic time (Ma)

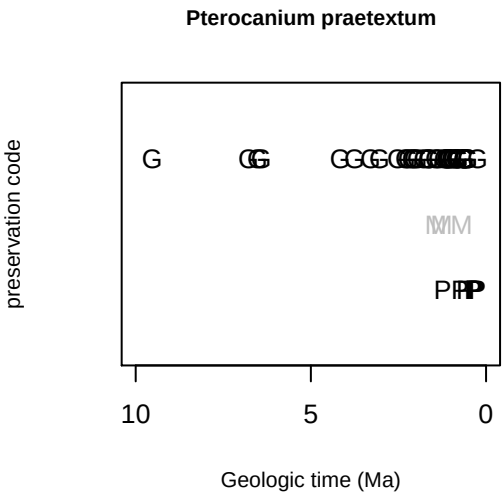

Prunopyle titan
preservation code
26
13
0
Geologic time (Ma)

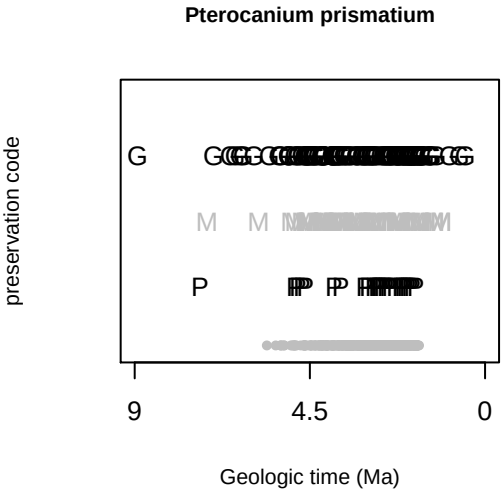

Prunopyle trypopyrena
preservation code
35
19.5
4
Geologic time (Ma)

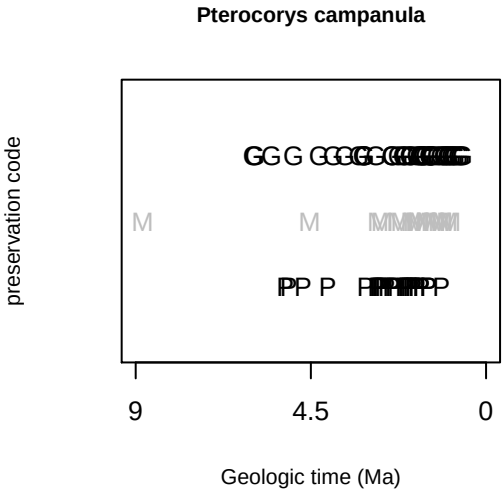

Pseudocubus vema
preservation code
30
15
0
Geologic time (Ma)

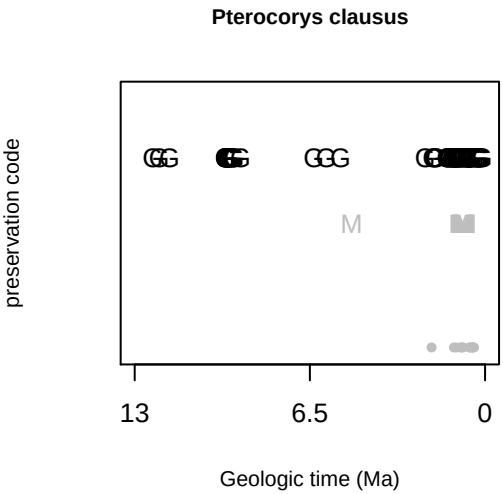

Pseudodictyophimus gracilipes
preservation code
26
13
0
Geologic time (Ma)
Pseudodictyophimus horrida
preservation code
36
23
10
Geologic time (Ma)
Pterocanium audax
preservation code
37
18.5
0
Geologic time (Ma)
Pterocanium charybdeum
preservation code
15
7.5
0
Geologic time (Ma)

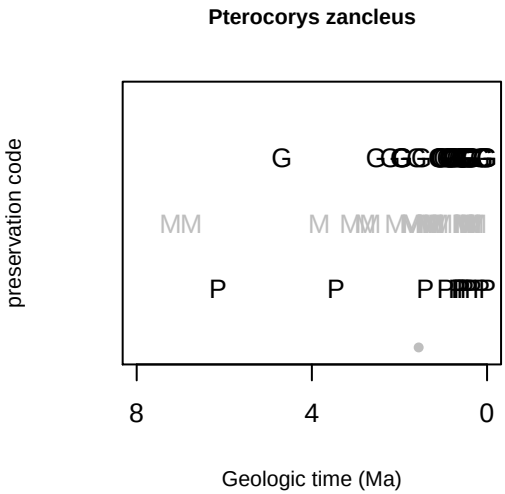

Pterocanium korotnevi
preservation code
G
M
P
17
8.5
0
Geologic time (Ma)

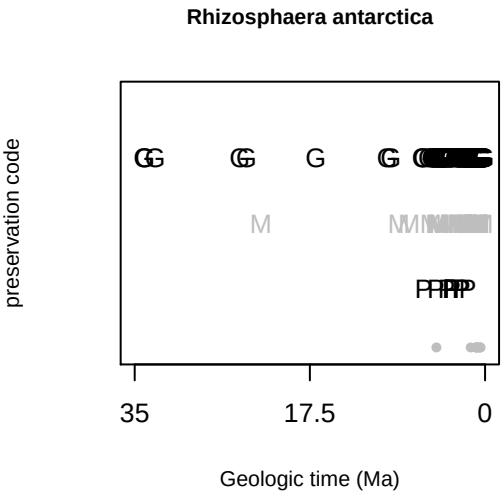

Pterocanium praetextum
preservation code
G
M
P
10
5
0
Geologic time (Ma)

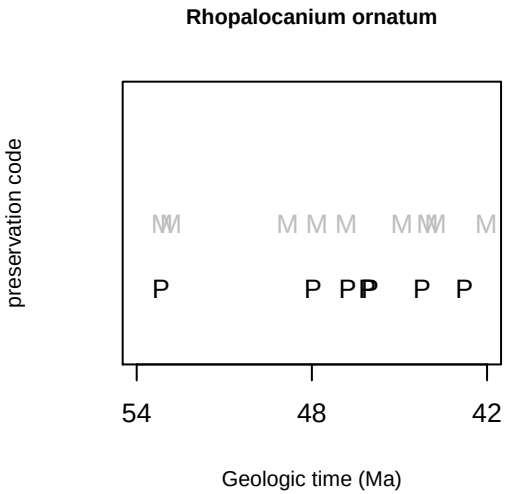

Pterocanium prismatium
preservation code
G
M
P
9
4.5
0
Geologic time (Ma)

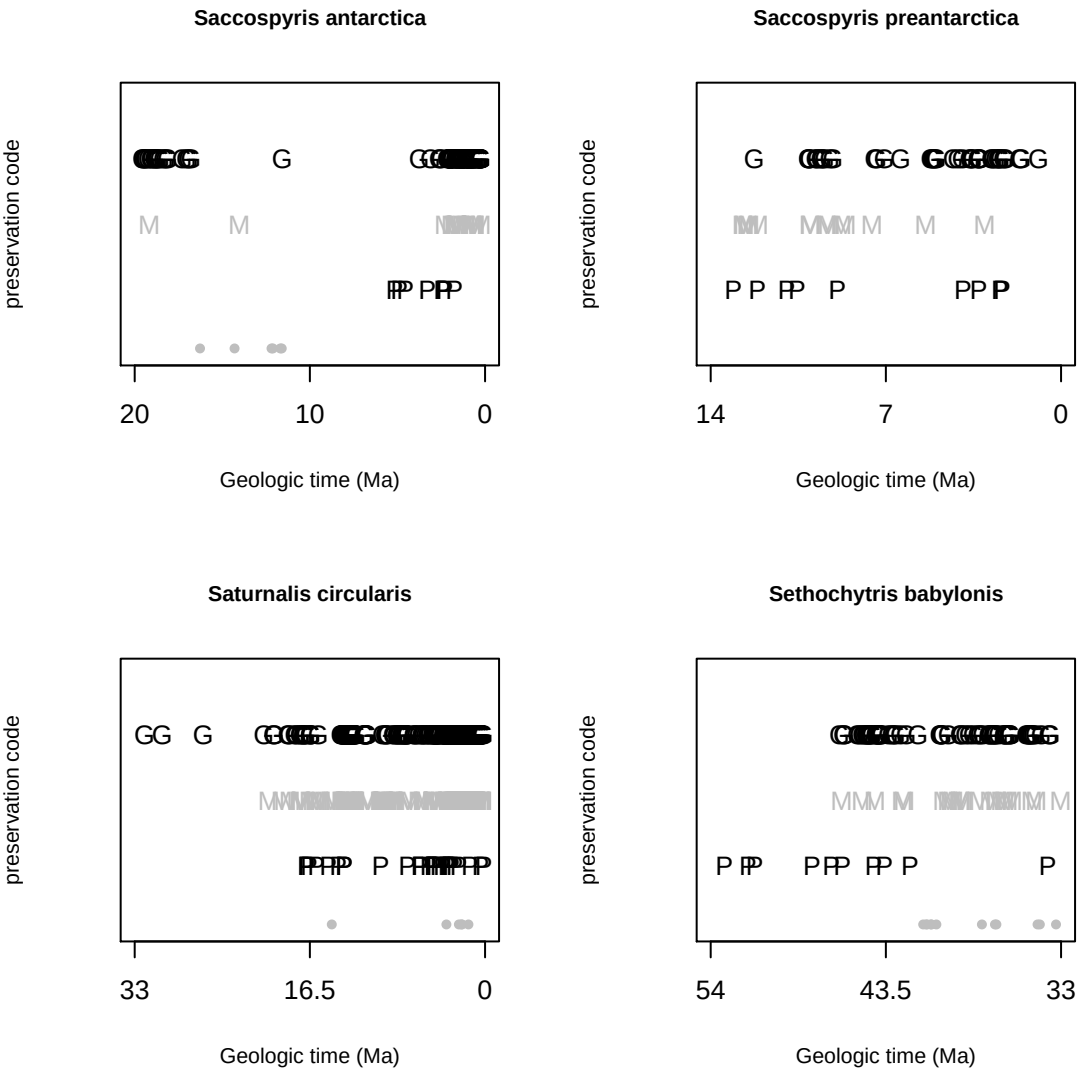

Pterocorys campanula
preservation code
G
M
P
9
4.5
0
Geologic time (Ma)

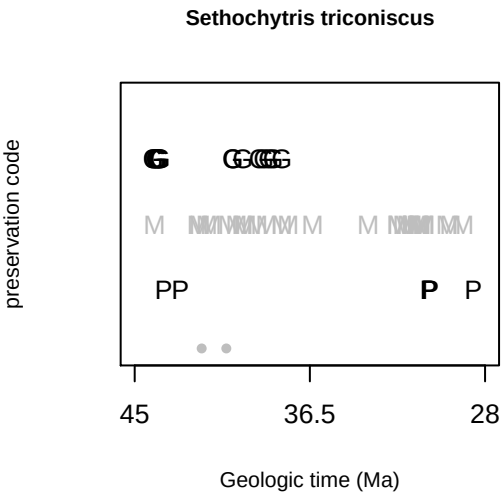

Pterocorys clausus
preservation code
13
6.5
0
Geologic time (Ma)

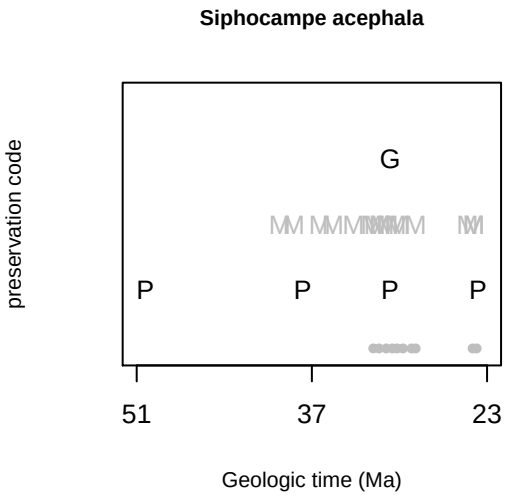

Pterocorys zancleus
preservation code
8
4
0
Geologic time (Ma)

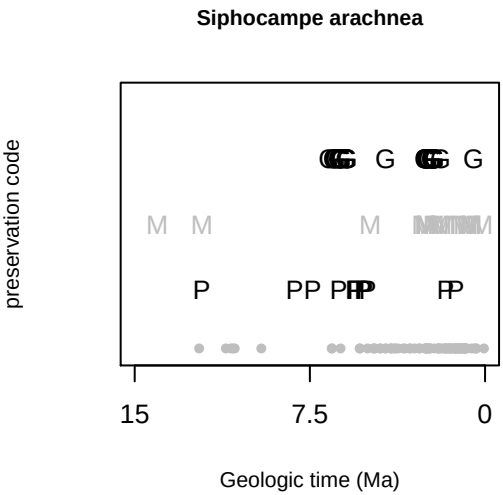

Rhizosphaera antarctica
preservation code
35
17.5
0
Geologic time (Ma)

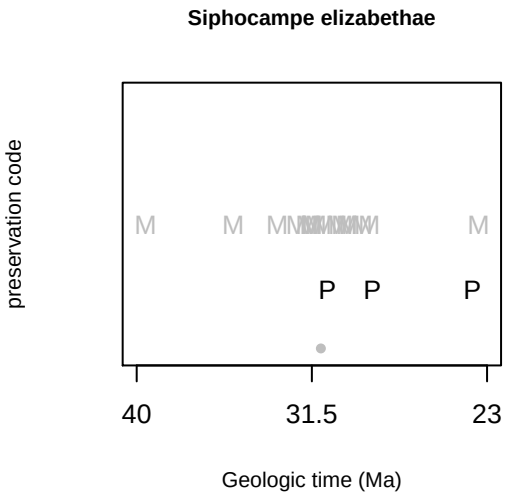

Rhopalocanium ornatum
preservation code
54
48
42
Geologic time (Ma)

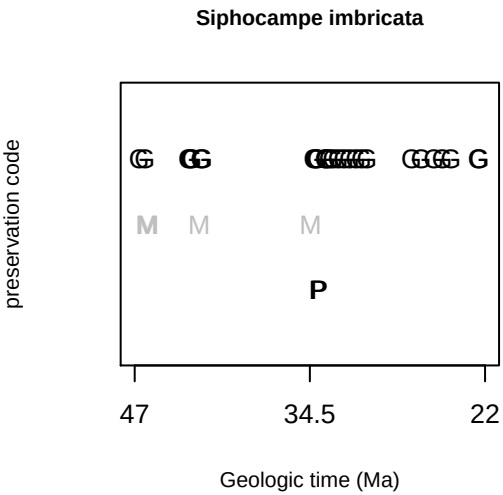

Saccospyris antarctica
preservation code
20
10
0
Geologic time (Ma)
Saccospyris preantarctica
preservation code
14
7
0
Geologic time (Ma)
Saturnalis circularis
preservation code
33
16.5
0
Geologic time (Ma)
Sethochytris babylonis
preservation code
54
43.5
33
Geologic time (Ma)

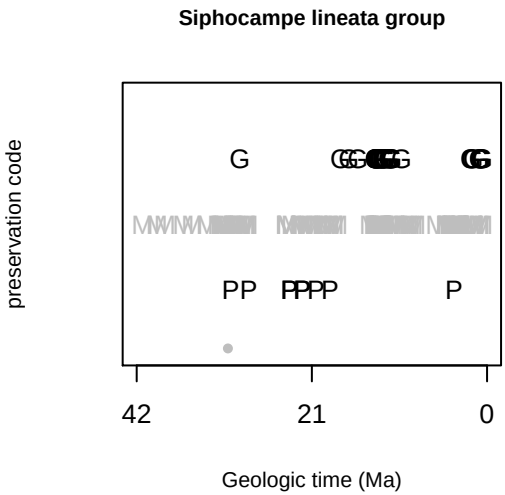

Sethochytris triconiscus
preservation code
45
36.5
28
Geologic time (Ma)

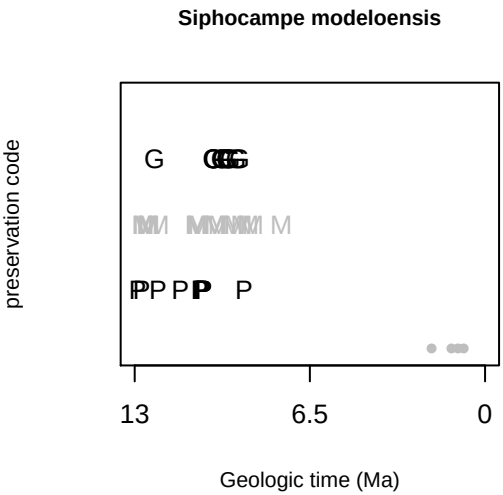

Siphocampe acephala
preservation code
51
37
23
Geologic time (Ma)

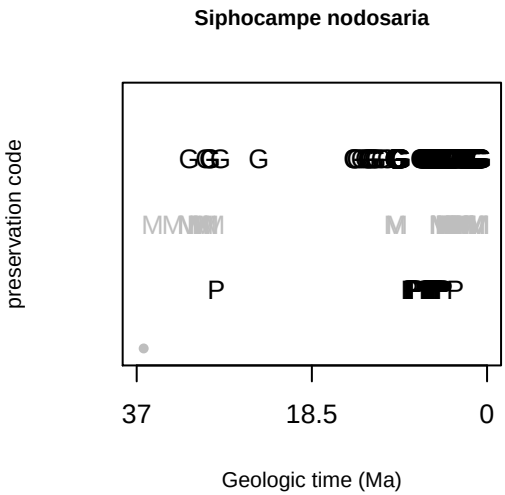

Siphocampe arachnea
preservation code
15
7.5
0
Geologic time (Ma)

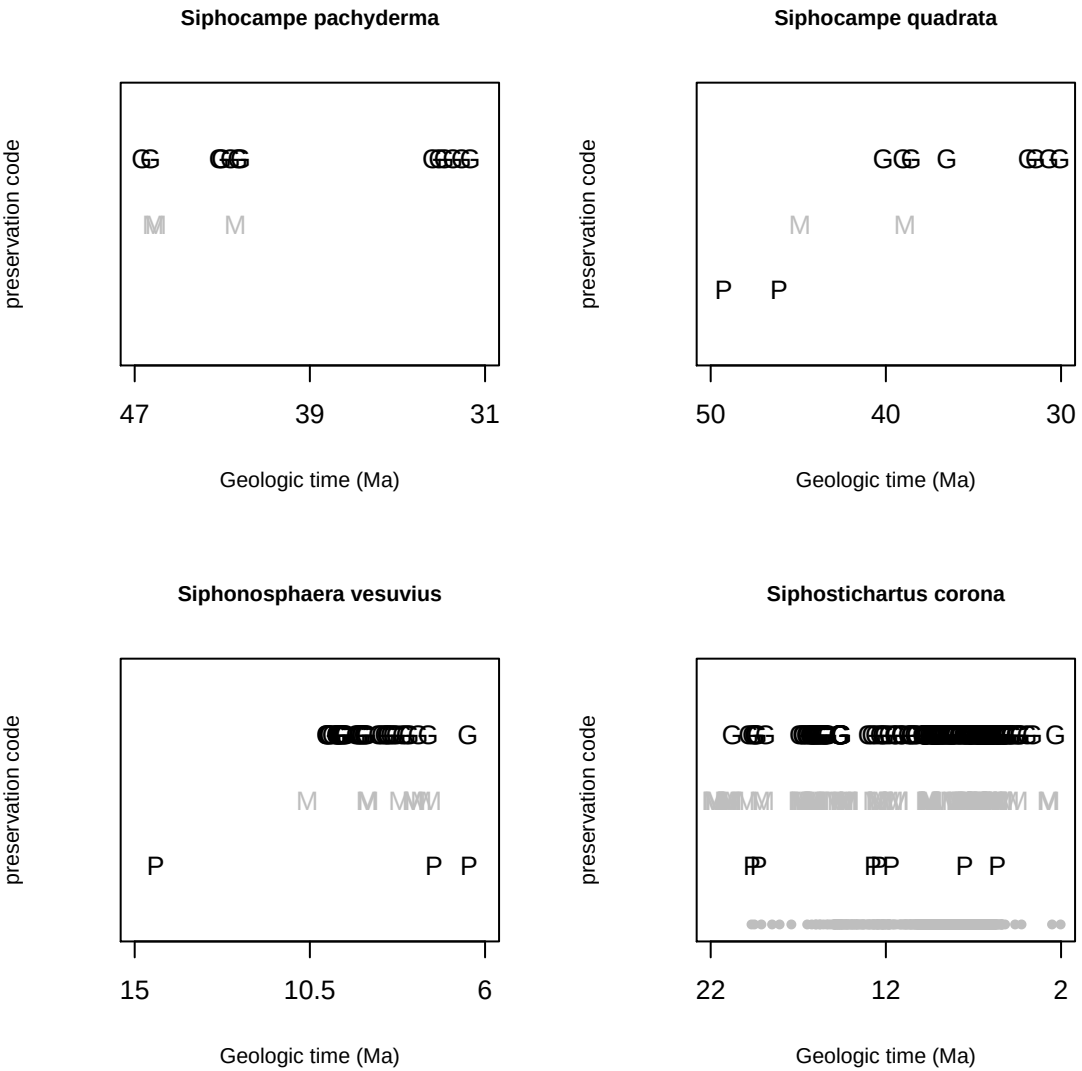

Siphocampe elizabethae
preservation code
40
31.5
23
Geologic time (Ma)


Siphocampe imbricata
preservation code
47
34.5
22
Geologic time (Ma)

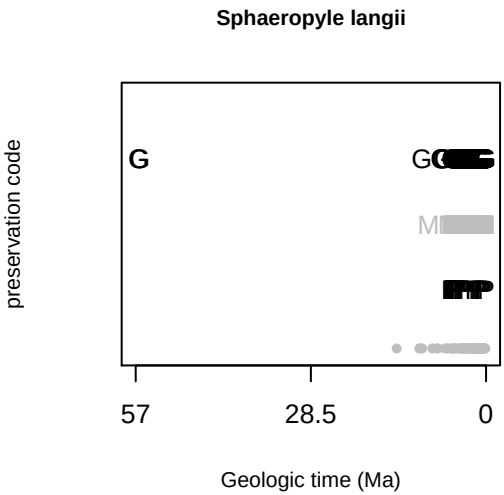

Siphocampe lineata group
preservation code
42
21
0
Geologic time (Ma)

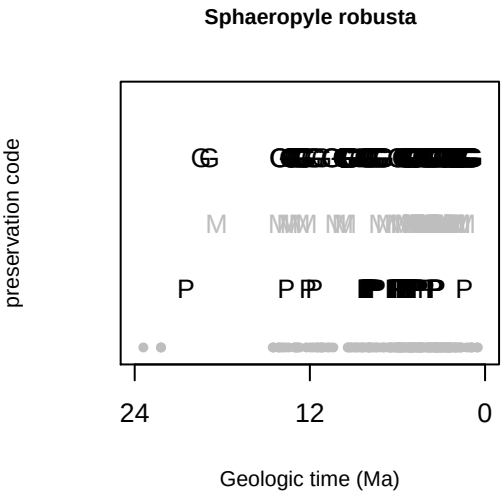

Siphocampe modeloensis
preservation code
13
6.5
0
Geologic time (Ma)

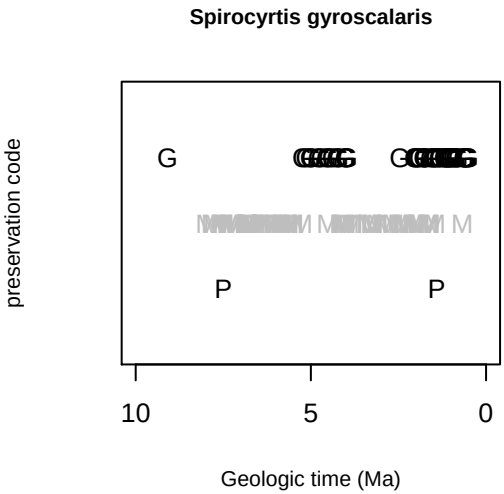

Siphocampe nodosaria
preservation code
37
18.5
0
Geologic time (Ma)

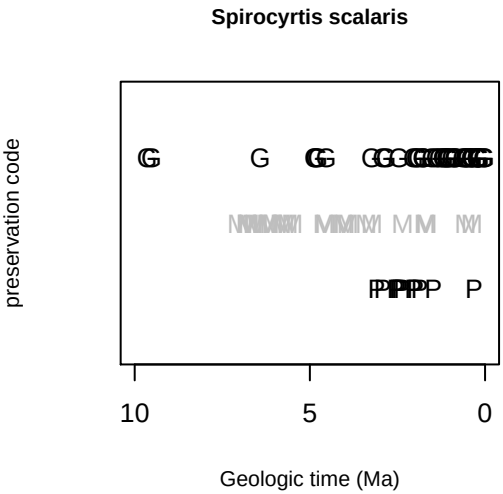

Siphocampe pachyderma
preservation code
47
39
31
Geologic time (Ma)
Siphocampe quadrata
preservation code
50
40
30
Geologic time (Ma)
Siphonosphaera vesuvius
preservation code
15
10.5
6
Geologic time (Ma)
Siphostichartus corona
preservation code
22
12
2
Geologic time (Ma)

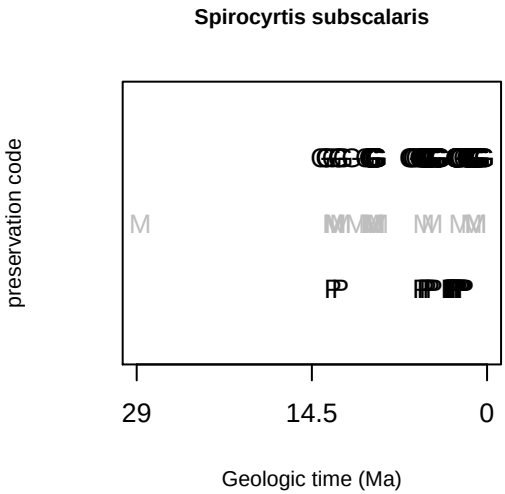
Solenosphaera omnitubus
preservation code
G
M
M
M
10
6
2
Geologic time (Ma)

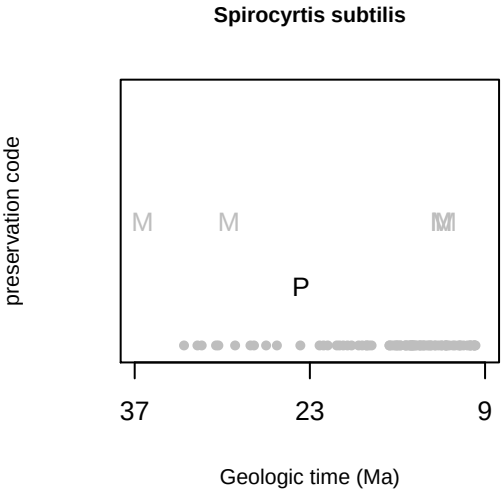

Sphaeropyle langii
preservation code
G
G
M
57
28.5
0
Geologic time (Ma)

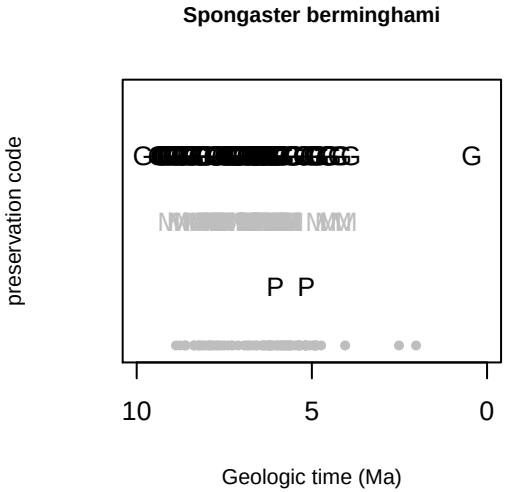

Sphaeropyle robusta
preservation code
G
M
P
P
P
P
24
12
0
Geologic time (Ma)

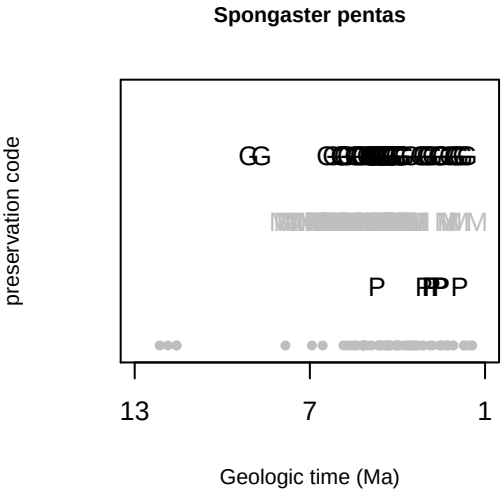

Spirocyrtis gyroscalaris
preservation code
G
G
M
M
P
P
10
5
0
Geologic time (Ma)

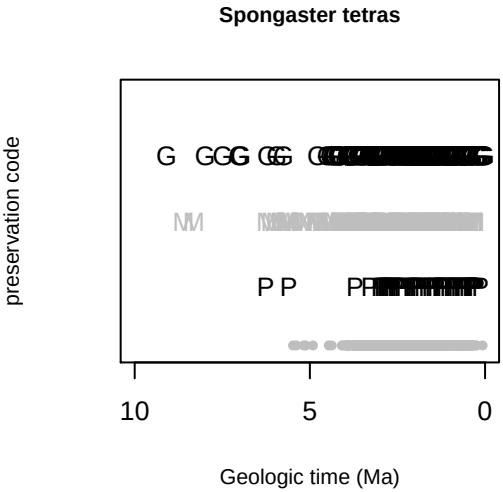

Spirocyrtis scalaris
preservation code
G
M
P
10
5
0
Geologic time (Ma)

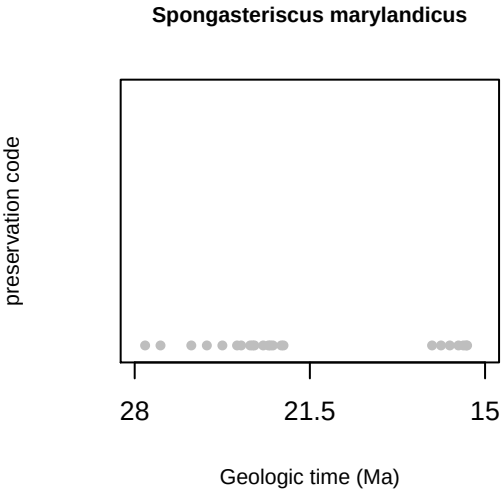

Spirocyrtis subscalaris
preservation code
M
P
29
14.5
0
Geologic time (Ma)

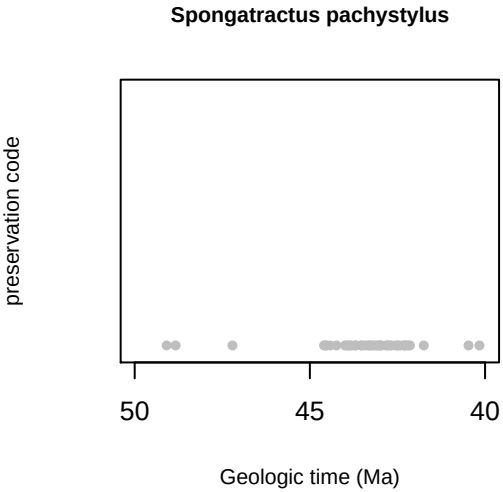

Spirocyrtis subtilis
preservation code
M
P
37
23
9
Geologic time (Ma)

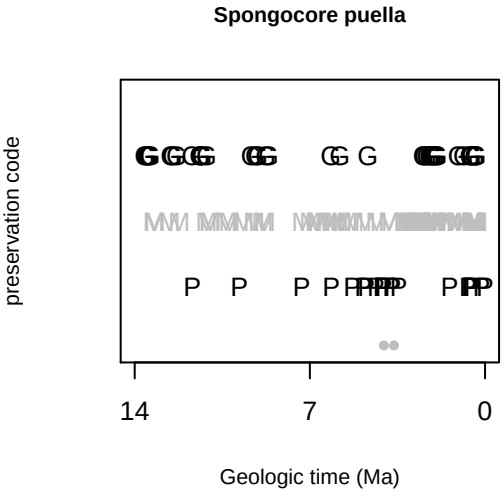

Spongaster berminghami
preservation code
G
M
P
10
5
0
Geologic time (Ma)

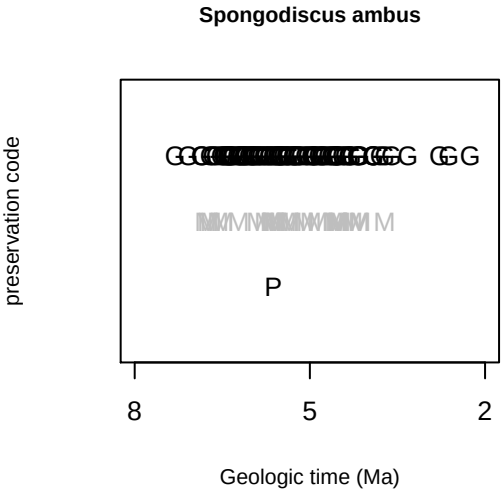

Spongaster pentas
preservation code
13
7
1
Geologic time (Ma)

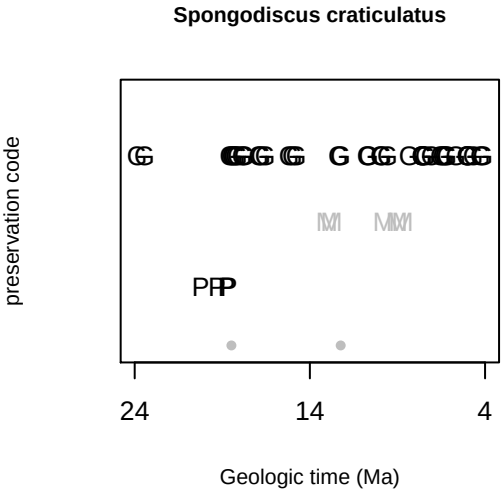

Spongaster tetras
preservation code
10
5
0
Geologic time (Ma)

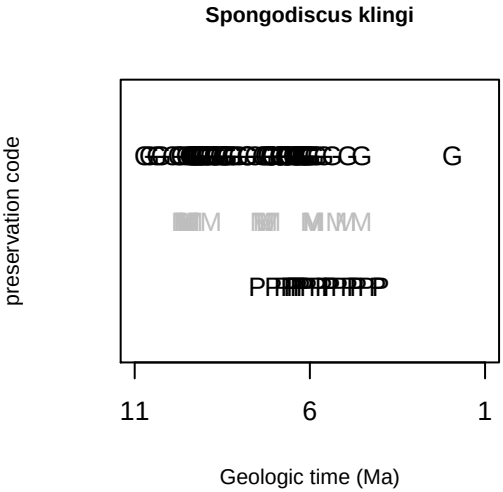

Spongasteriscus marylandicus
preservation code
28
21.5
15
Geologic time (Ma)

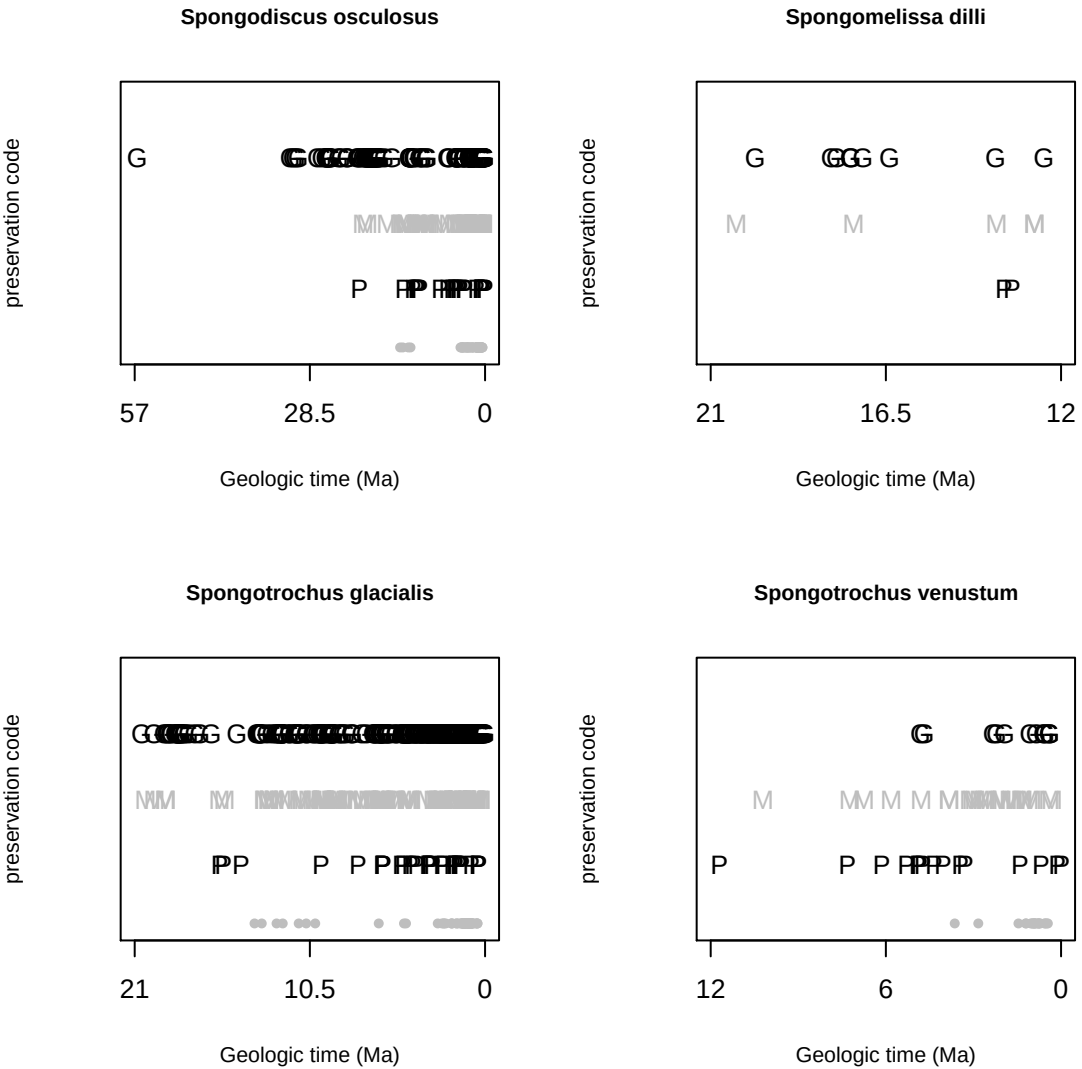

Spongatractus pachystylus
preservation code
50
45
40
Geologic time (Ma)

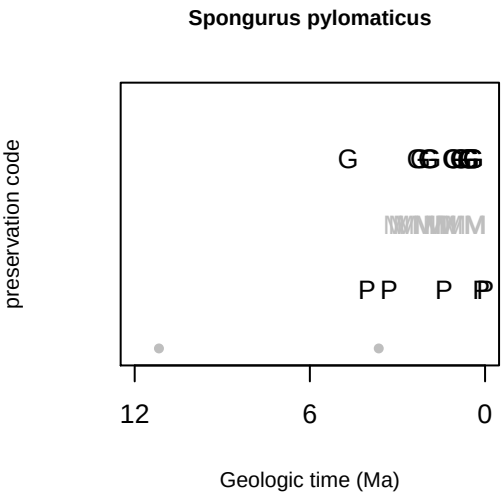

Spongocore puella
preservation code
14
7
0
Geologic time (Ma)

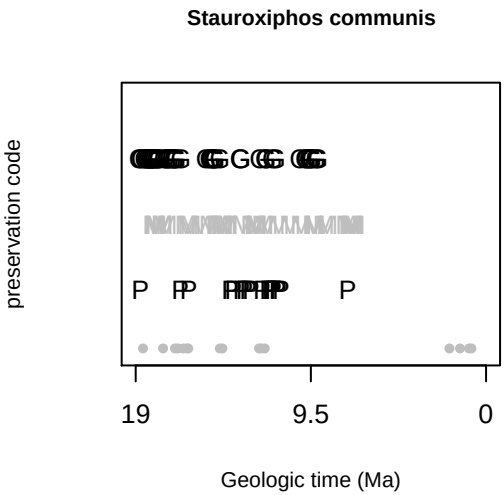

Spongodiscus ambus
preservation code
8
5
2
Geologic time (Ma)

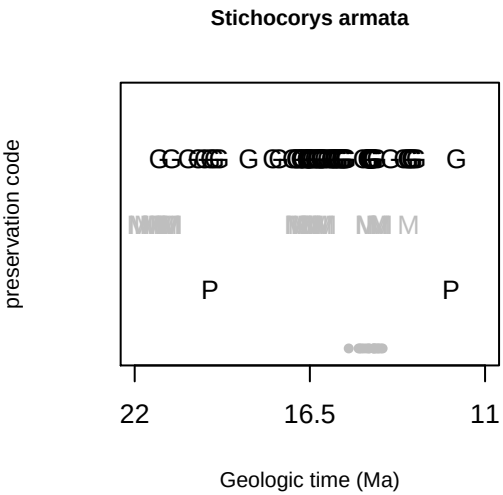

Spongodiscus craticulatus
preservation code
24
14
4
Geologic time (Ma)

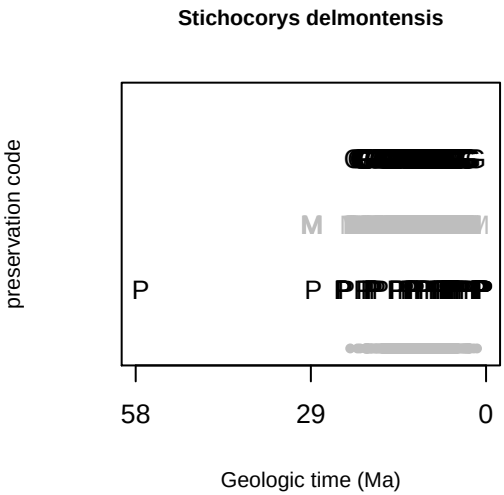

Spongodiscus klingi
preservation code
11
6
1
Geologic time (Ma)

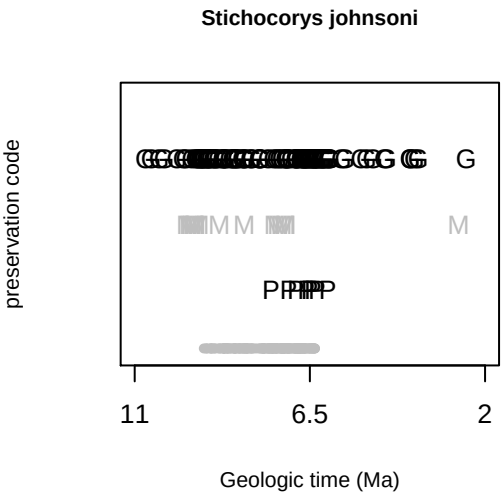

Spongodiscus osculosus
preservation code
57
28.5
0
Geologic time (Ma)
Spongomelissa dilli
preservation code
21
16.5
12
Geologic time (Ma)
Spongotrochus glacialis
preservation code
21
10.5
0
Geologic time (Ma)
Spongotrochus venustum
preservation code
12
6
0
Geologic time (Ma)

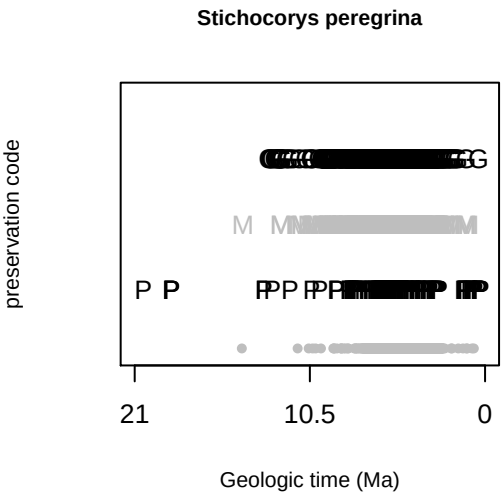

Spongurus pylomaticus
preservation code
G
M
P
12
6
0
Geologic time (Ma)

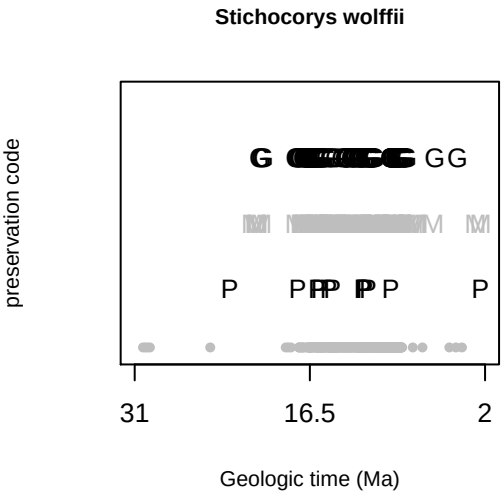

Stauroxiphos communis
preservation code
G
M
P
19
9.5
0
Geologic time (Ma)

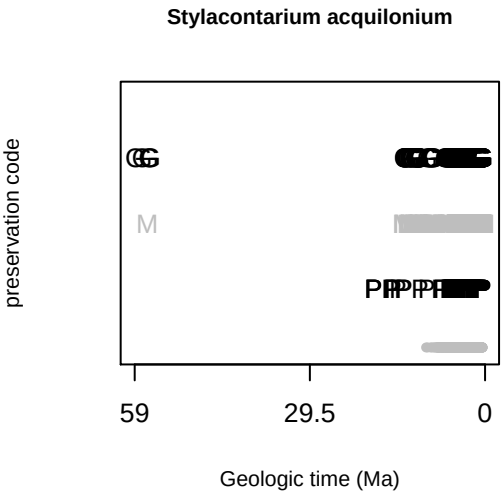

Stichocorys armata
preservation code
G
M
P
22
16.5
11
Geologic time (Ma)

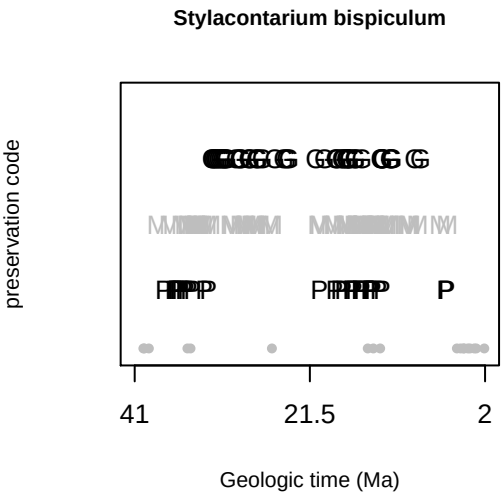

Stichocorys delmontensis
preservation code
G
M
P
58
29
0
Geologic time (Ma)

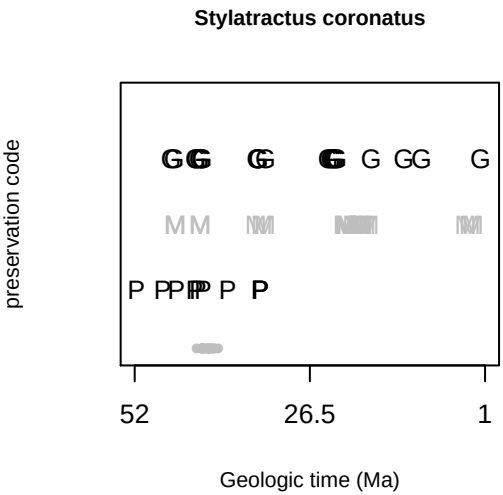

Stichocorys johnsoni
preservation code
G
M
P
11
6.5
2
Geologic time (Ma)

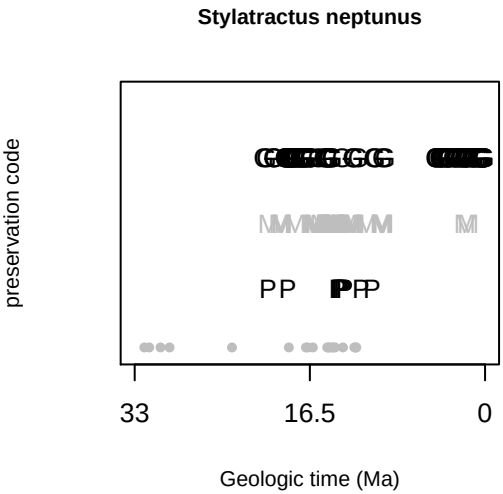

Stichocorys peregrina
preservation code
G
M
P
21
10.5
0
Geologic time (Ma)

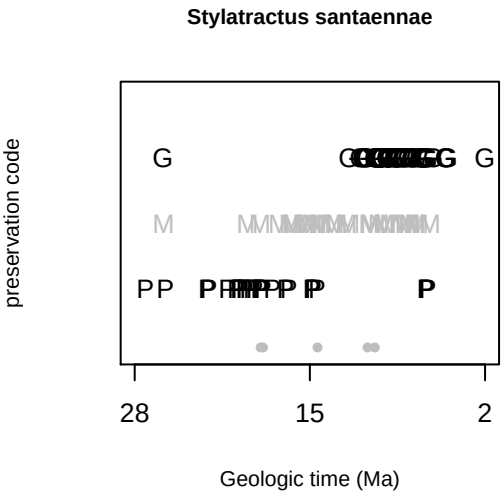

Stichocorys wolffii
preservation code
G
M
P
31
16.5
2
Geologic time (Ma)

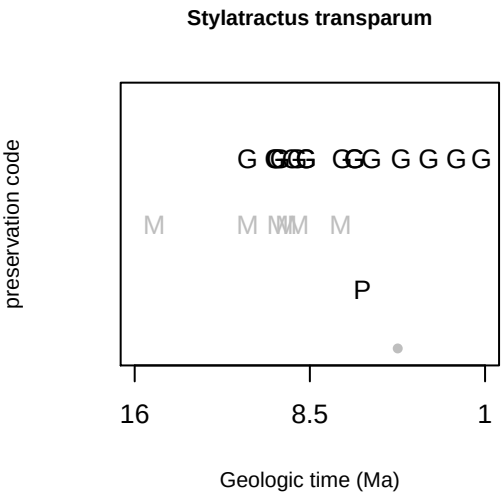

Stylacontarium acquilonium
preservation code
G
M
P
59
29.5
0
Geologic time (Ma)

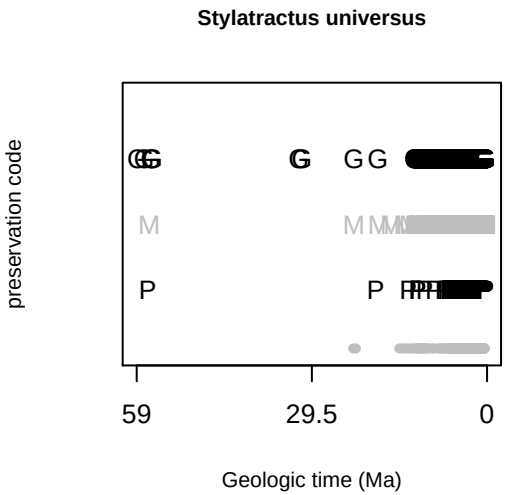

Stylacontarium bispiculum
preservation code
41
21.5
2
Geologic time (Ma)

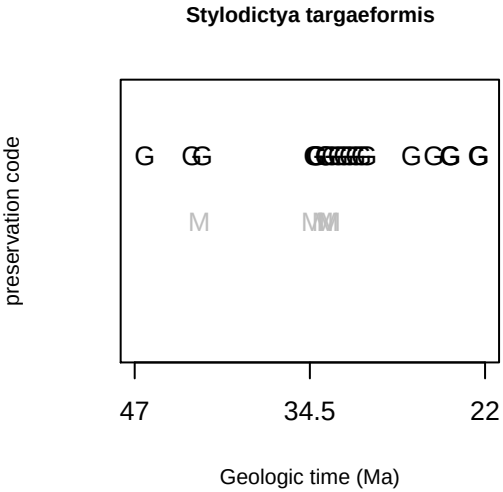

Stylatractus coronatus
preservation code
52
26.5
1
Geologic time (Ma)

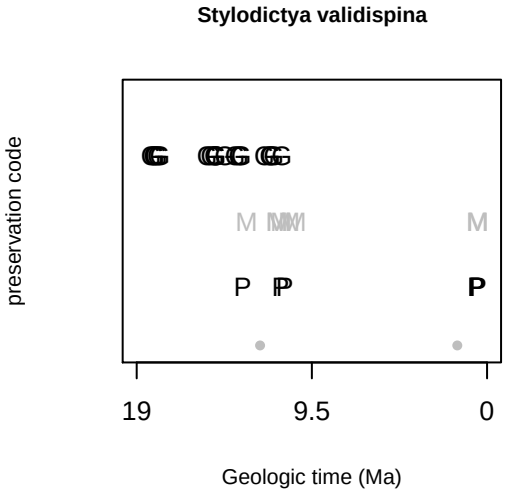

Stylatractus neptunus
preservation code
33
16.5
0
Geologic time (Ma)

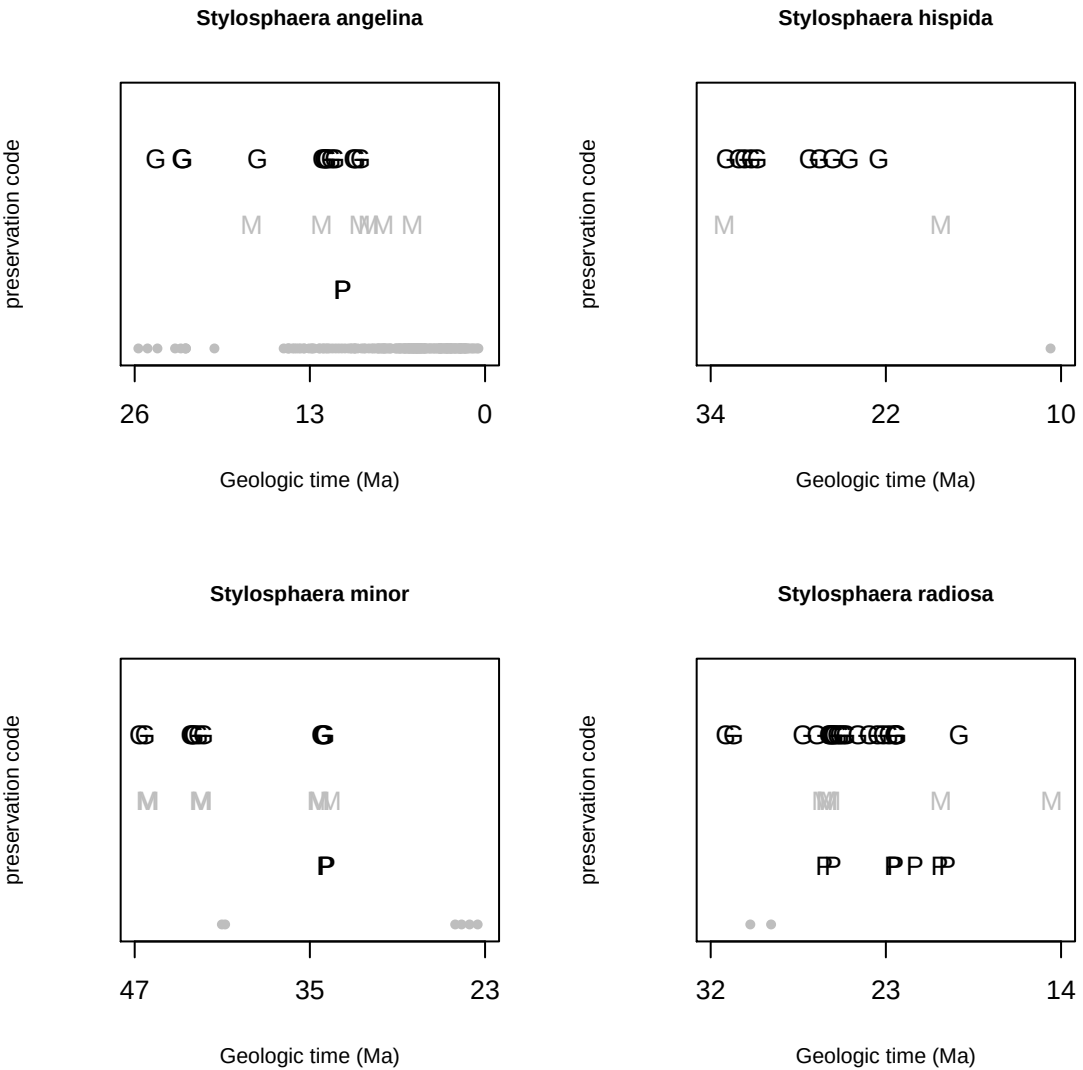

Stylatractus santaennae
preservation code
28
15
2
Geologic time (Ma)

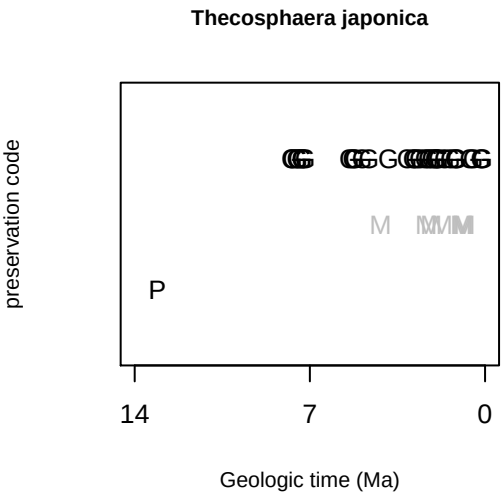

Stylatractus transparum
preservation code
Geologic time (Ma)
16
8.5
1

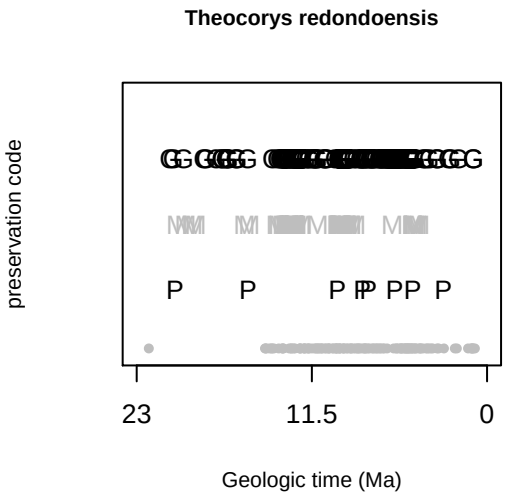

Stylatractus universus
preservation code
Geologic time (Ma)
59
29.5
0

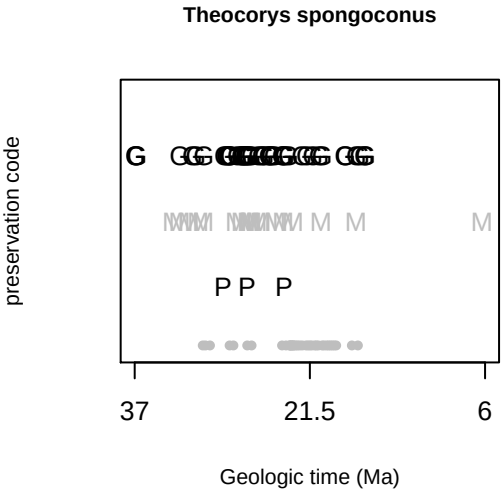

Stylodictya targaeformis
preservation code
Geologic time (Ma)
47
34.5
22

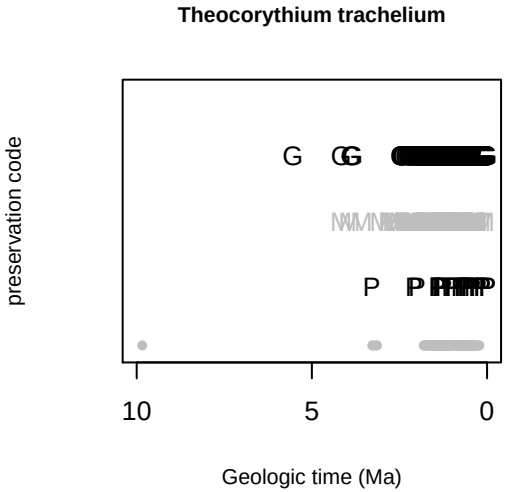

Stylodictya validispina
preservation code
Geologic time (Ma)
19
9.5
0

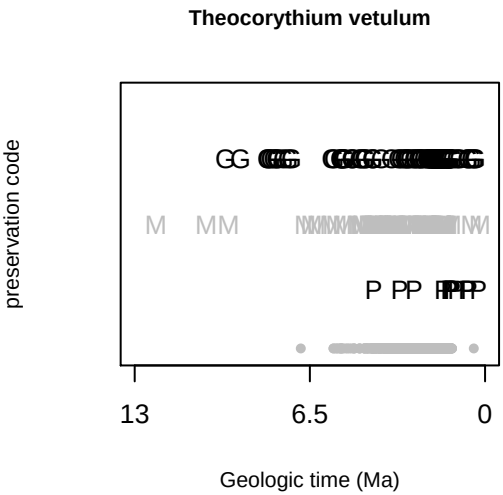

Stylosphaera angelina
preservation code
26
13
0
Geologic time (Ma)
Stylosphaera hispida
preservation code
34
22
10
Geologic time (Ma)
Stylosphaera minor
preservation code
47
35
23
Geologic time (Ma)
Stylosphaera radiosa
preservation code
32
23
14
Geologic time (Ma)

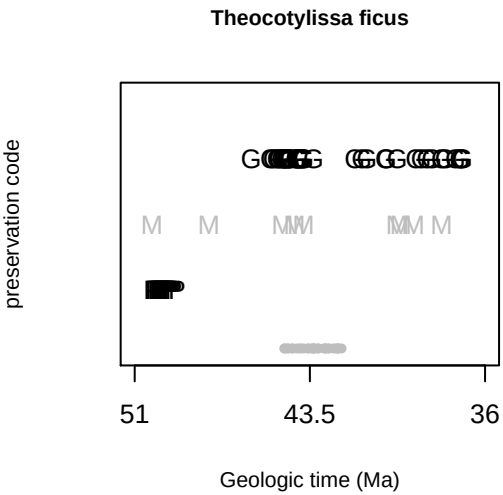

Thecosphaera japonica
preservation code
14
7
0
Geologic time (Ma)

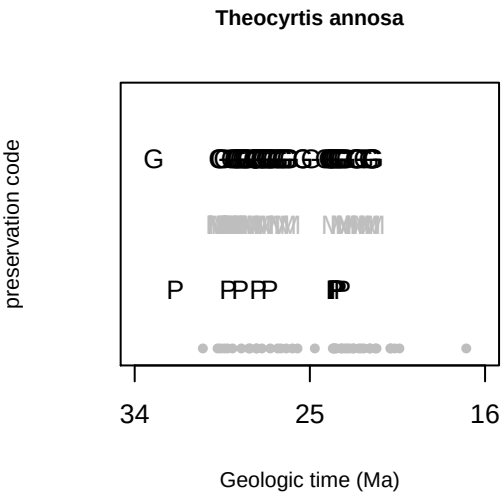

Theocorys redondoensis
preservation code
23
11.5
0
Geologic time (Ma)

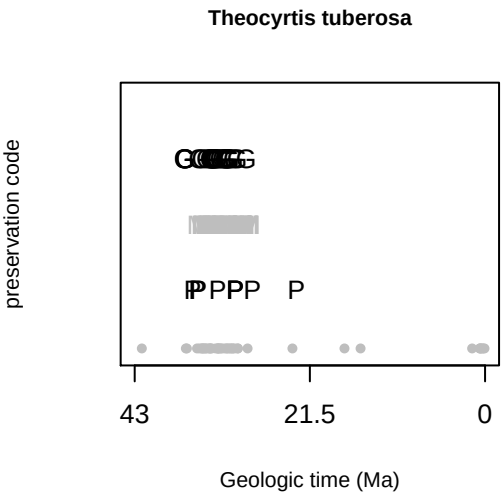

Theocorys spongoconus
preservation code
37
21.5
6
Geologic time (Ma)

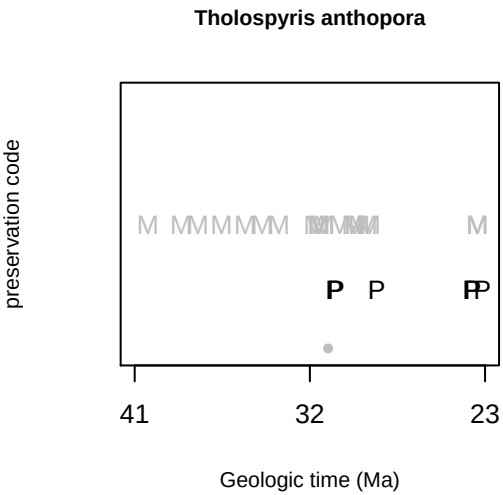

Theocorythium trachelium
preservation code
10
5
0
Geologic time (Ma)

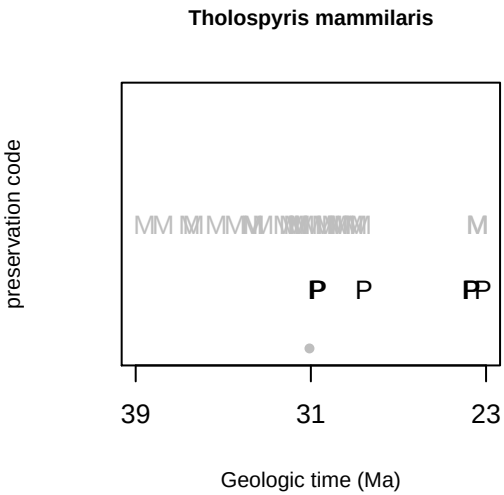

Theocorythium vetulum
preservation code
13
6.5
0
Geologic time (Ma)

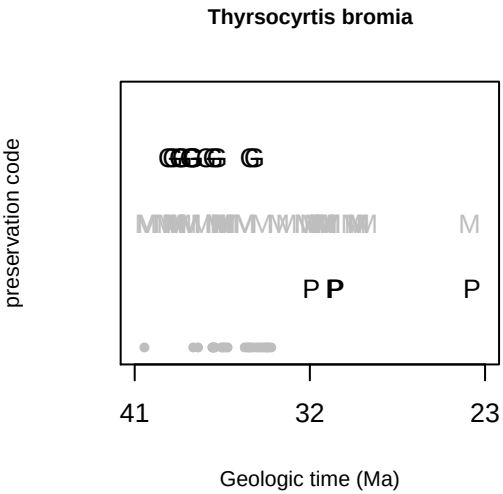

Theocotylissa ficus
preservation code
51
43.5
36
Geologic time (Ma)

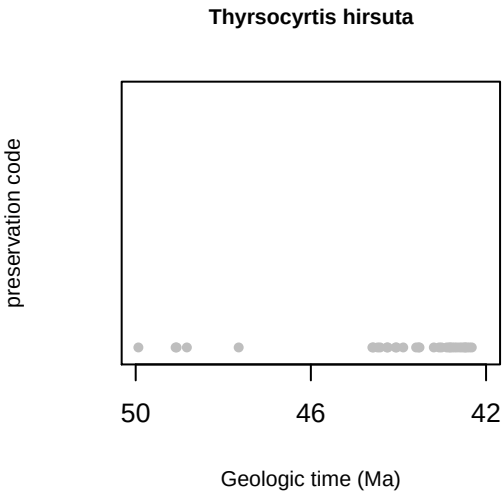

Theocyrtis annosa
preservation code
34
25
16
Geologic time (Ma)

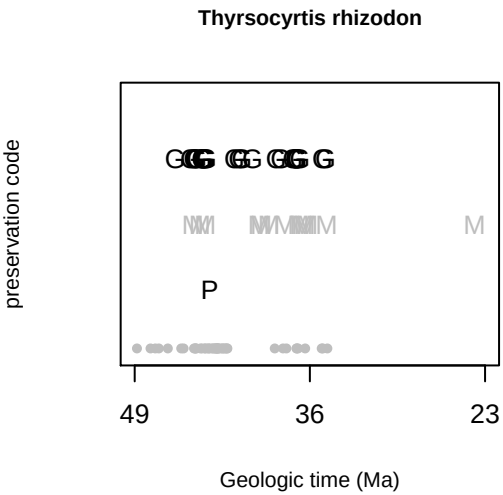

Theocyrtis tuberosa
preservation code
43
21.5
0
Geologic time (Ma)

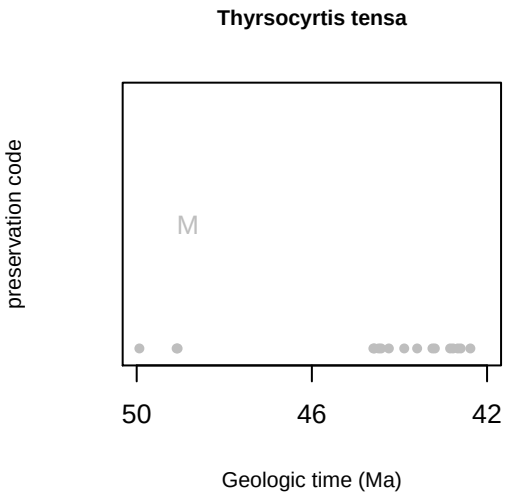

Tholospyris anthopora
preservation code
41
32
23
Geologic time (Ma)

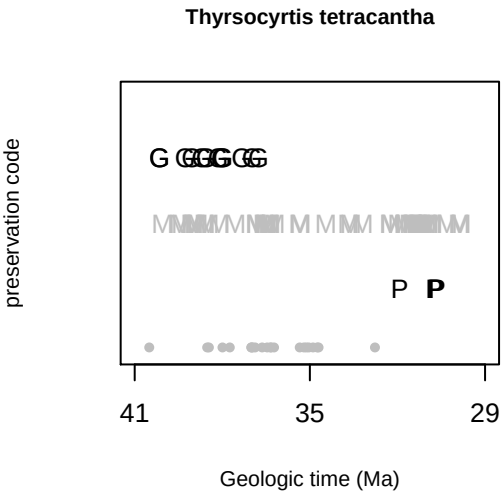

Tholospyris mammilaris
preservation code
39
31
23
Geologic time (Ma)

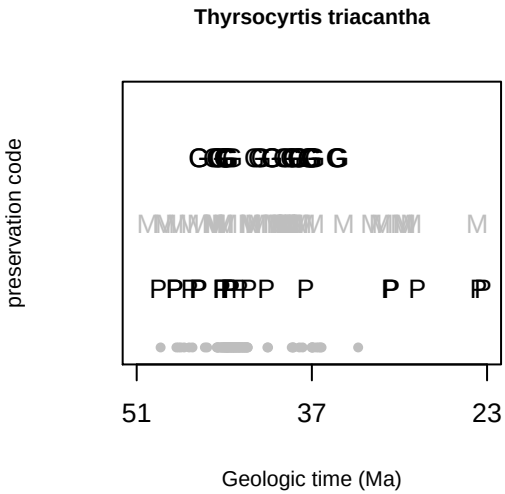

Thyrsocyrtis bromia
preservation code
41
32
23
Geologic time (Ma)

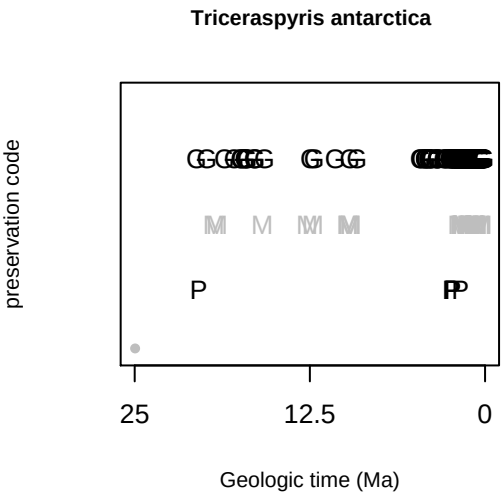

Thyrsocyrtis hirsuta
preservation code
50
46
42
Geologic time (Ma)

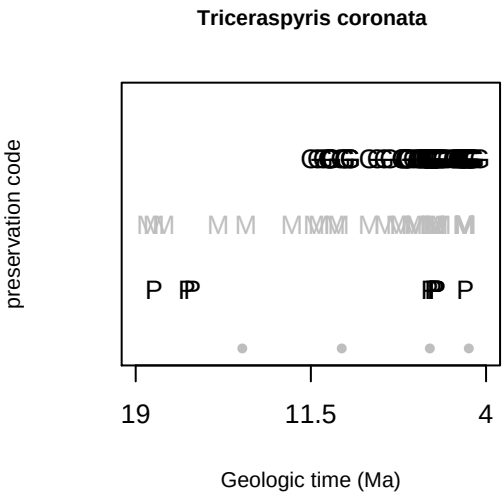

Thyrsocyrtis rhizodon
preservation code
49
36
23
Geologic time (Ma)

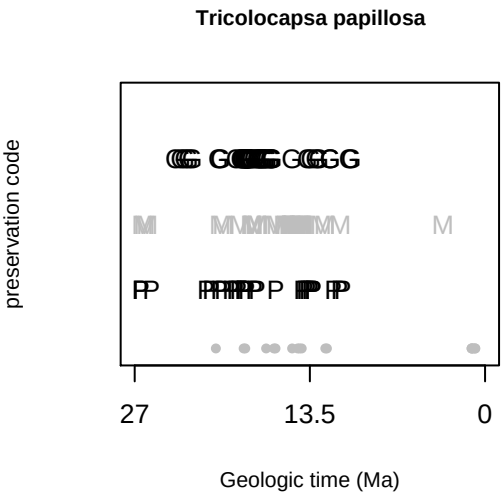

Thyrsocyrtis tensa
preservation code
50
46
42
Geologic time (Ma)

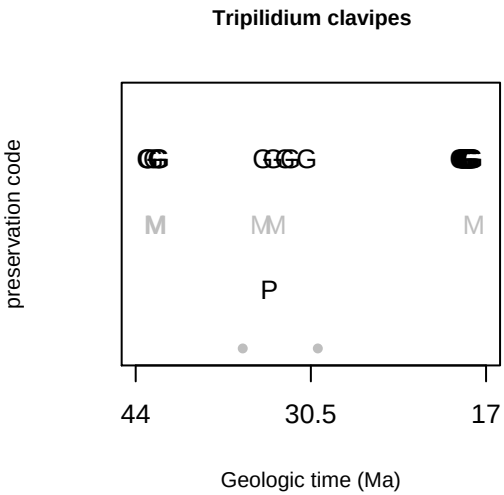

Thyrsocyrtis tetracantha
preservation code
41
35
29
Geologic time (Ma)

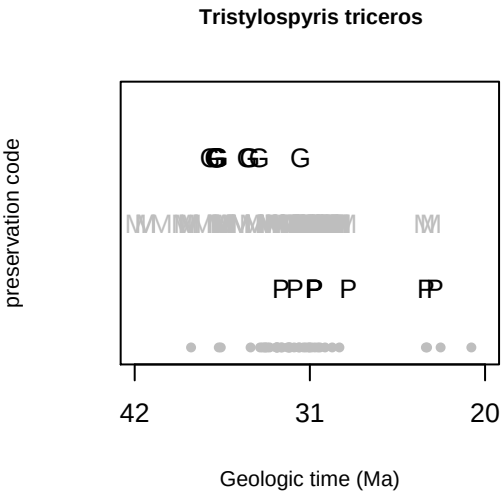

Thyrsocyrtis triacantha
preservation code
51
37
23
Geologic time (Ma)

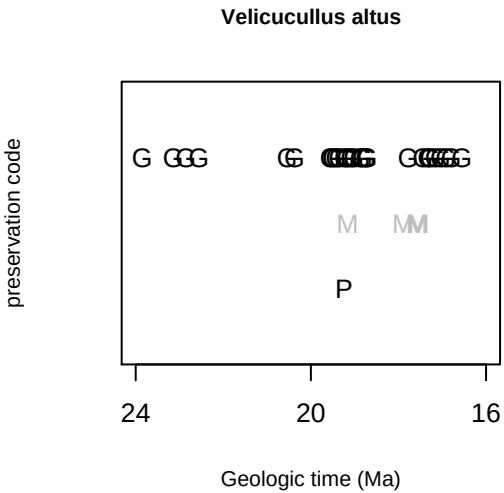

Triceraspyris antarctica
preservation code
25
12.5
0
Geologic time (Ma)


Triceraspyris coronata
preservation code
19
11.5
4
Geologic time (Ma)


Tricolocapsa papillosa
preservation code
27
13.5
0
Geologic time (Ma)


Tripilidium clavipes
preservation code
44
30.5
17
Geologic time (Ma)


Tristylospyris triceros
preservation code
42
31
20
Geologic time (Ma)


Velicucullus altus
preservation code
24
20
16
Geologic time (Ma)