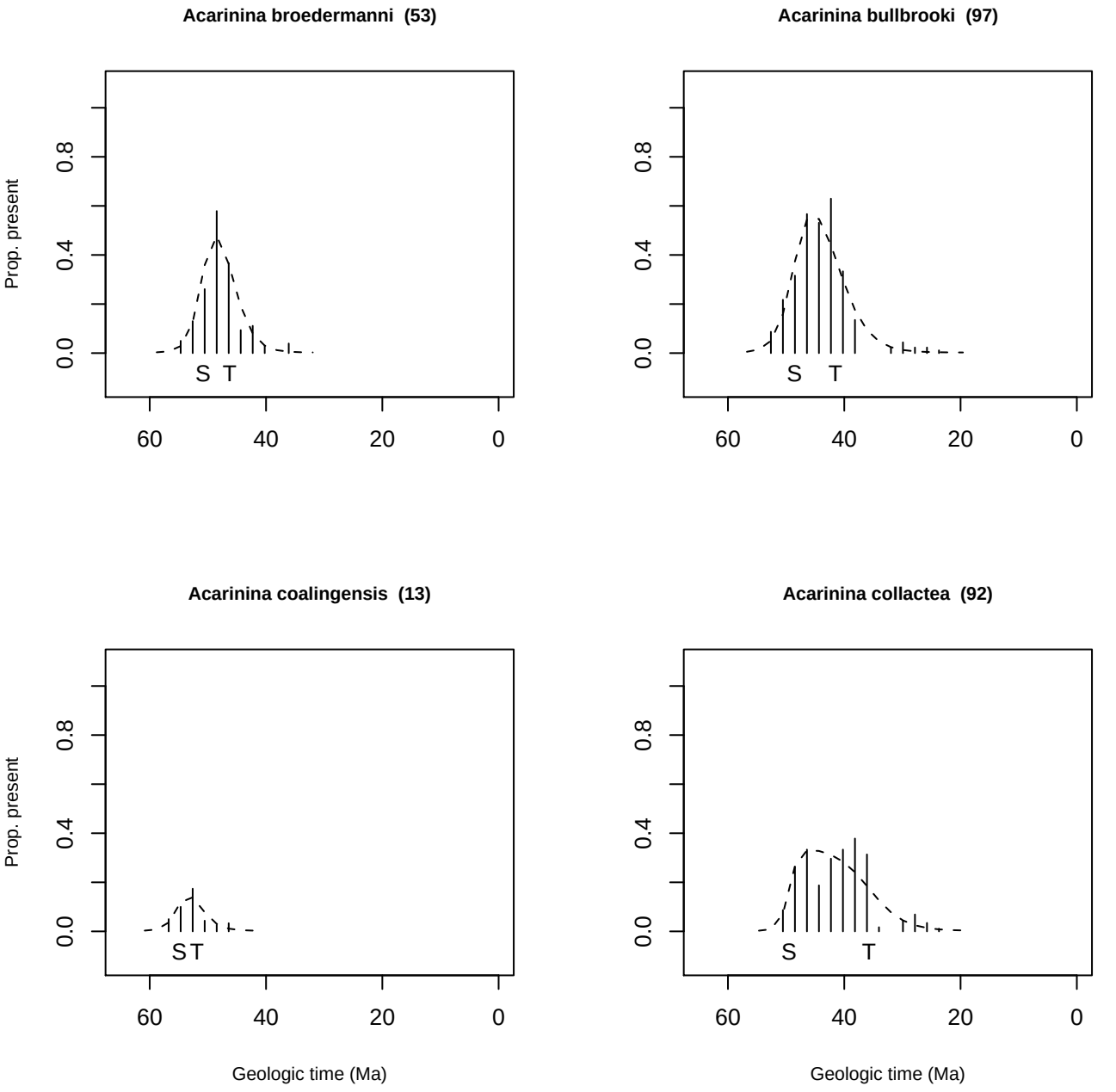
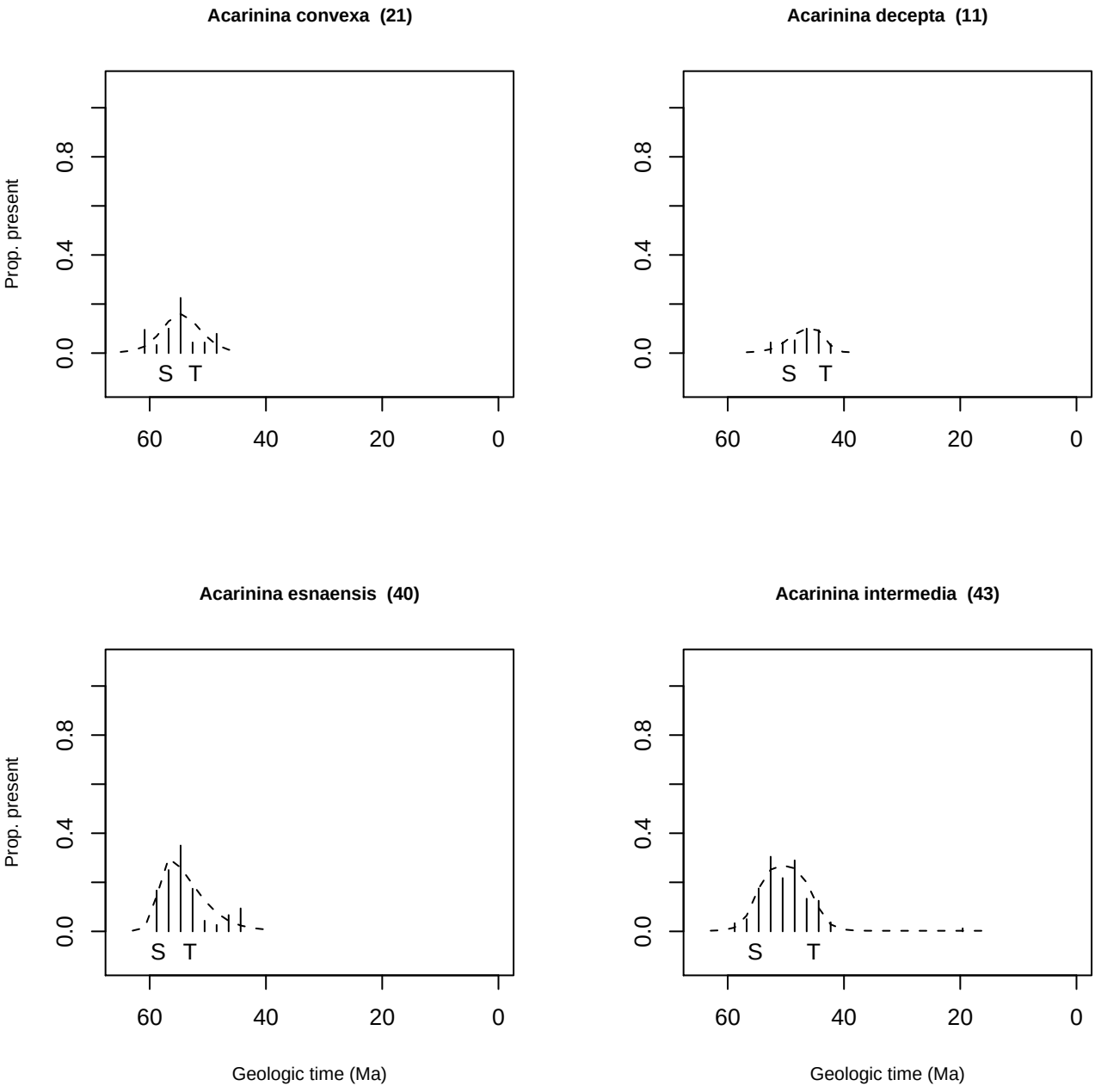
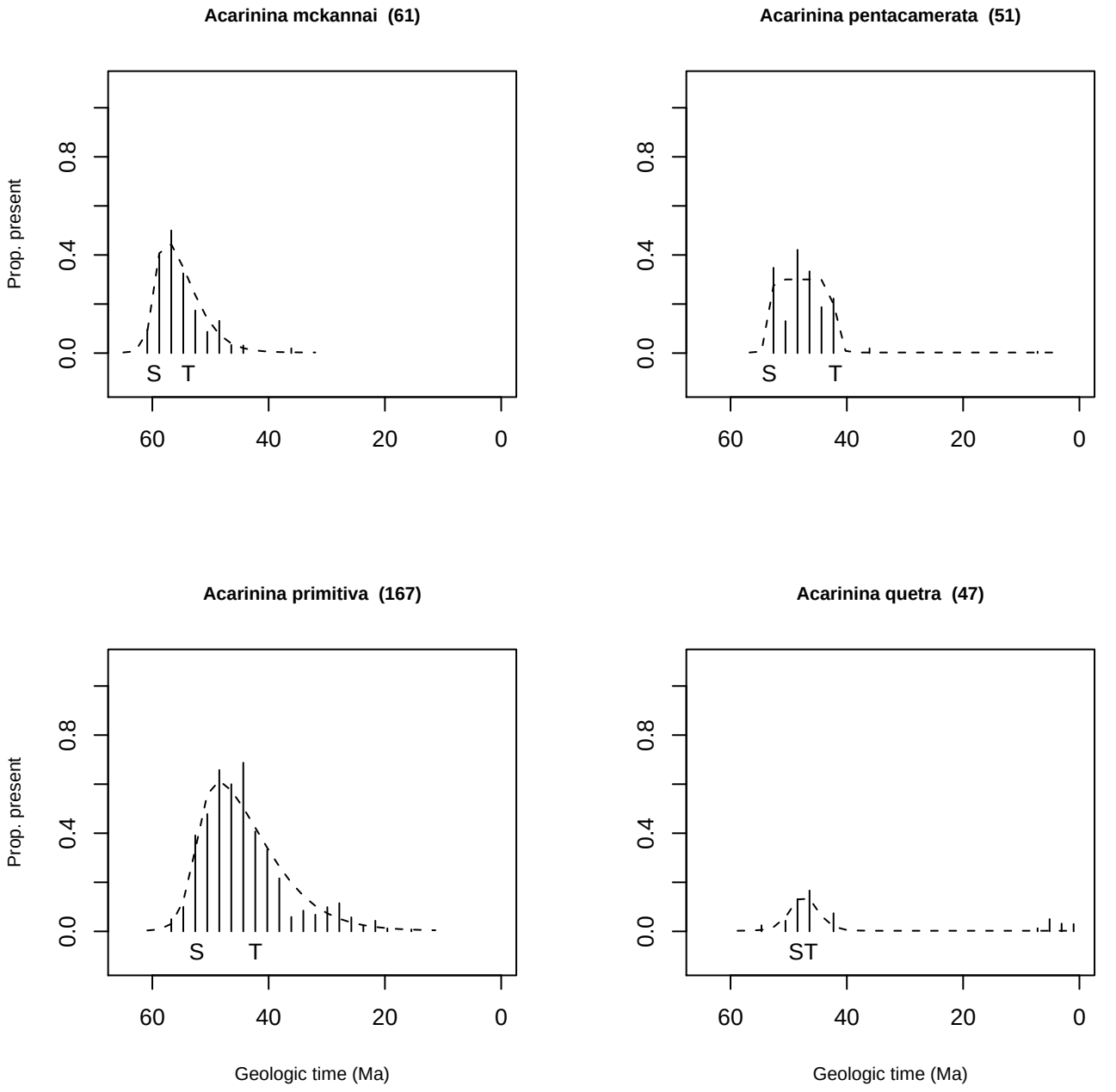
Supplementary Material: Planktic Foraminifers

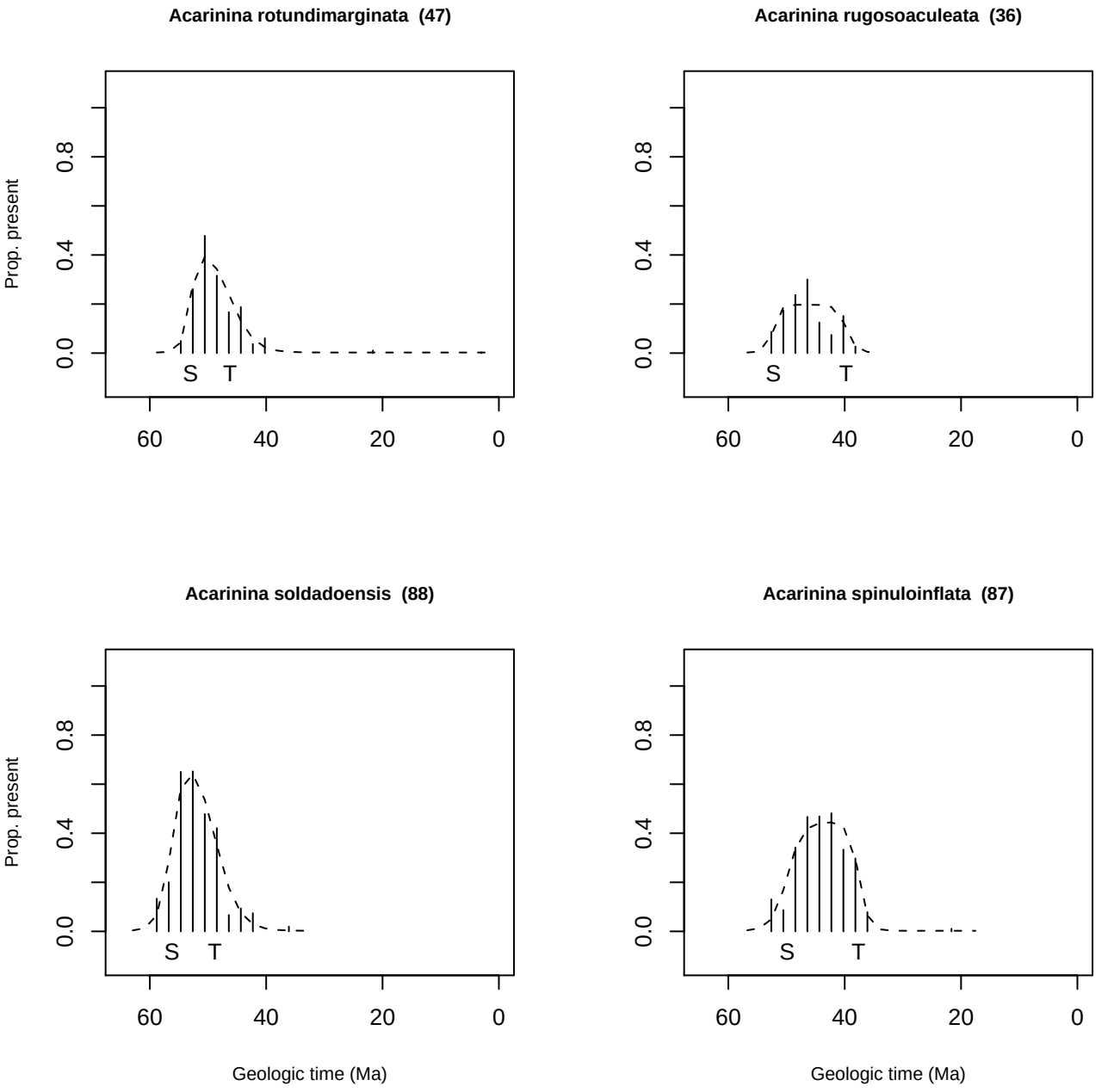
We first present plots of each of our model ("hat") fits to each foraminifer species. Vertical bars show the observed proportion of sites occupied by the species in 2 Myr bins. Dotted curves are the fitted curves. The labels "S" and "T" on each plot show the inflection points for the rise and fall of 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.

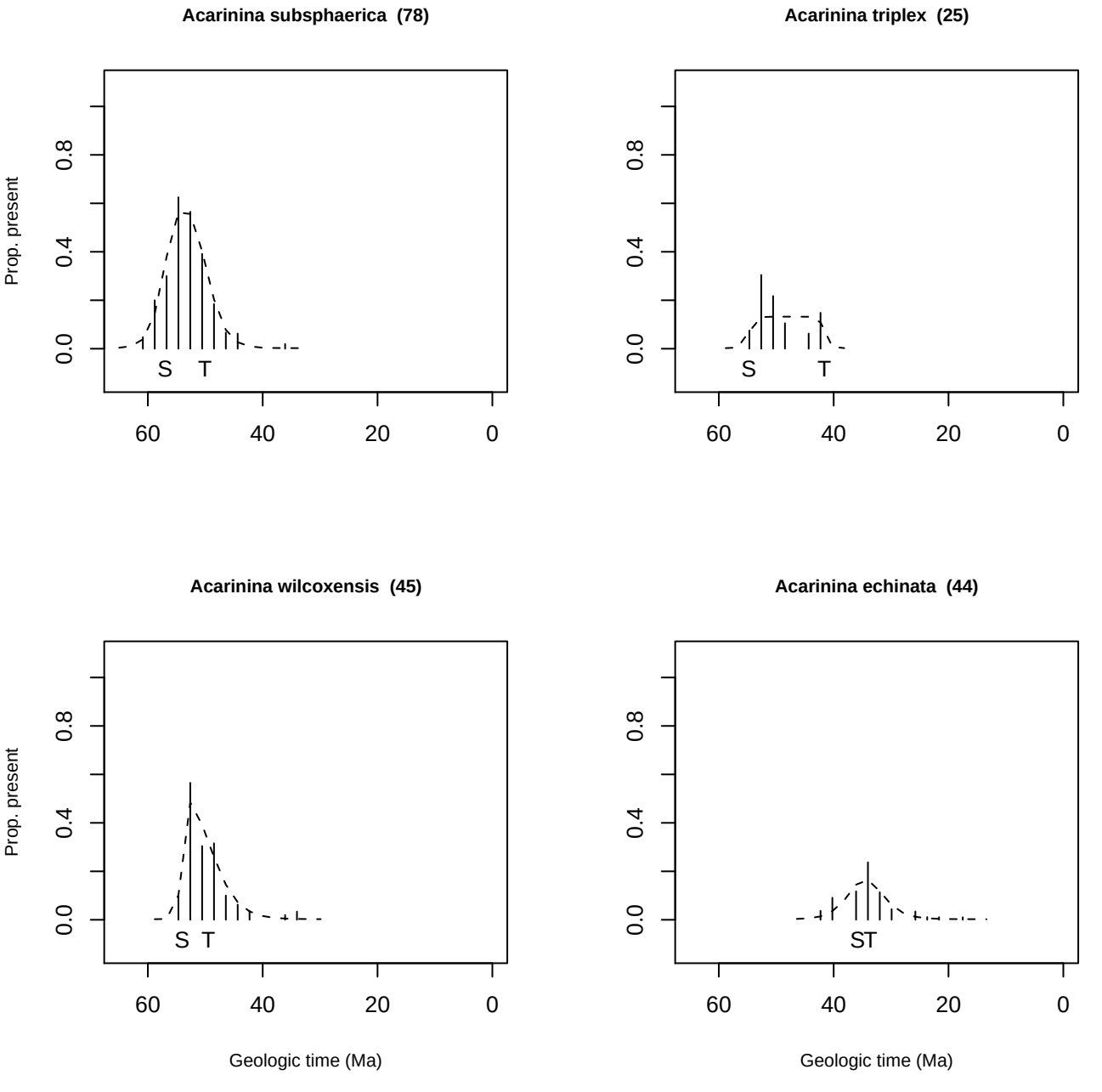
Note that our model does not fit all species perfectly and that the parameter p_0 deals with cases such as *Acarinina quetra* which has occurrences very close to the Recent even though the bulk of its occurrences are in the Paleogene with no intervening time periods where it occurs.

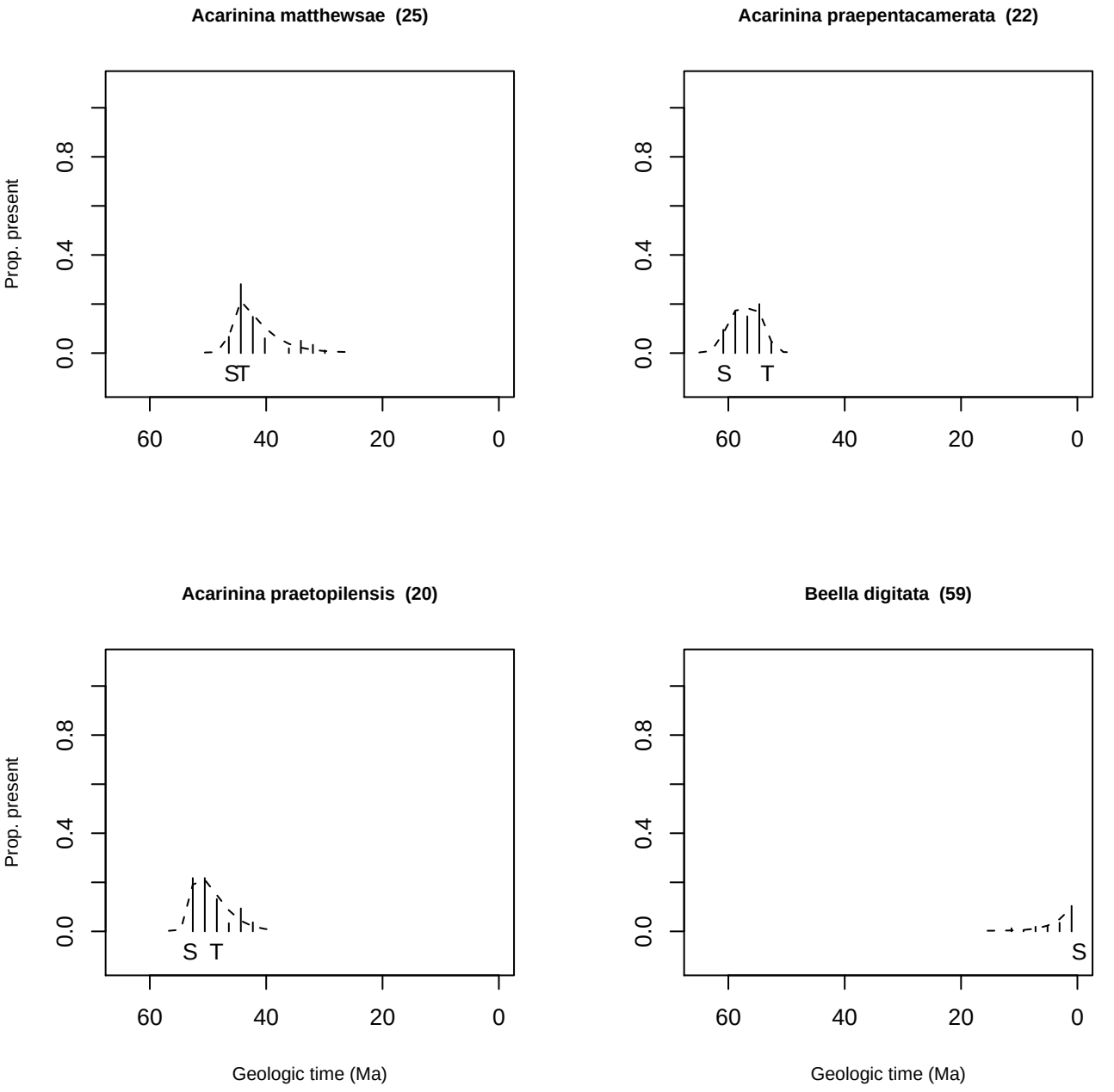

Acarinina broedermanni (53)
Acarinina bullbrooki (97)
Acarinina coalingensis (13)
Acarinina collactea (92)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Acarinina convexa (21)
Acarinina decepta (11)
Acarinina esnaensis (40)
Acarinina intermedia (43)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Acarinina mckannai (61)
Acarinina pentacamerata (51)
Acarinina primitiva (167)
Acarinina quetra (47)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)


Acarinina rotundimarginata (47)
Acarinina rugosoaculeata (36)
Acarinina soldadoensis (88)
Acarinina spinuloinflata (87)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Acarinina subsphaerica (78)
Acarinina triplex (25)
Acarinina wilcoxensis (45)
Acarinina echinata (44)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)


Acarinina matthewsae (25)
Acarinina praepentacamerata (22)
Acarinina praetopilensis (20)
Beella digitata (59)
Prop. present
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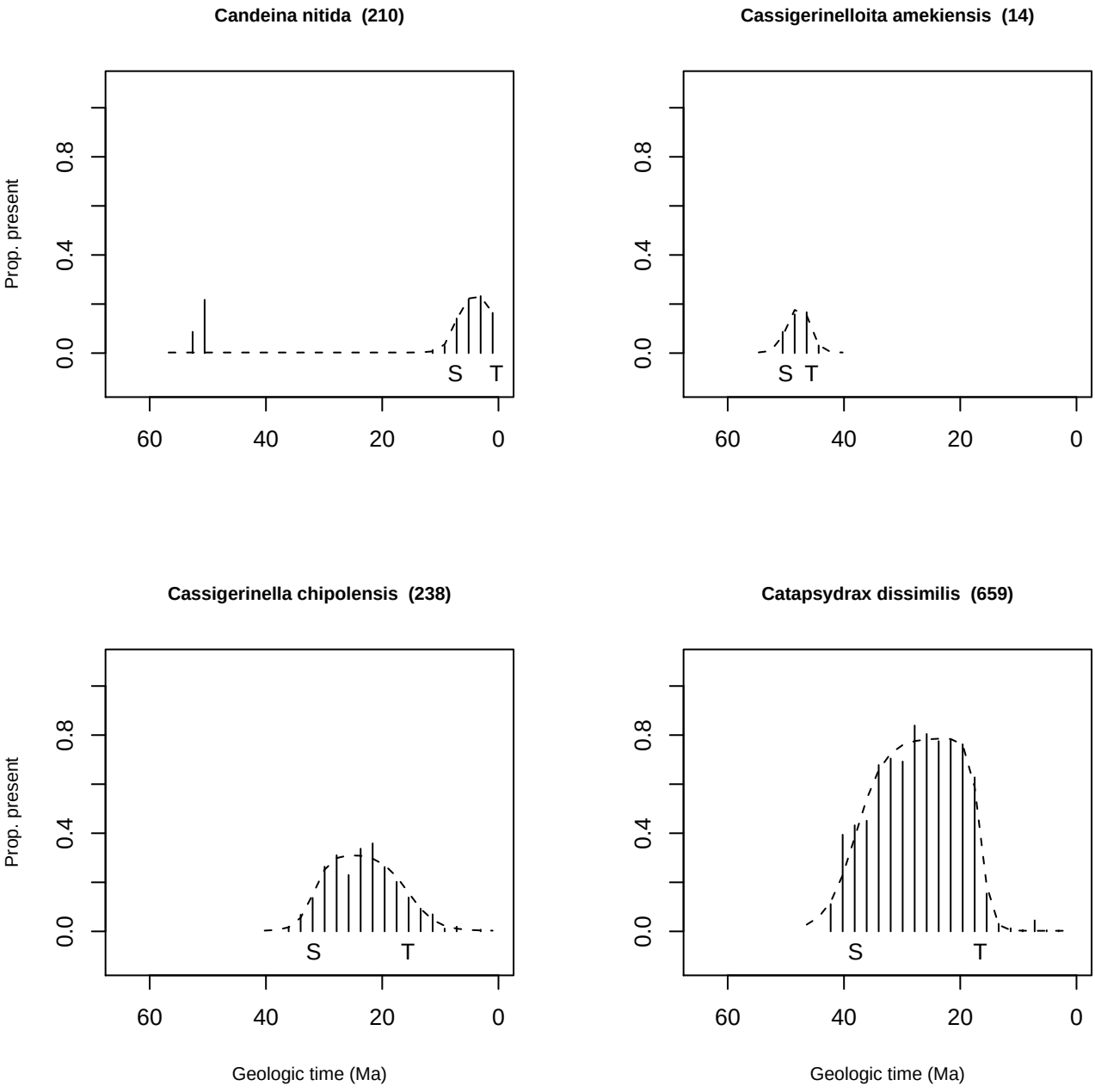
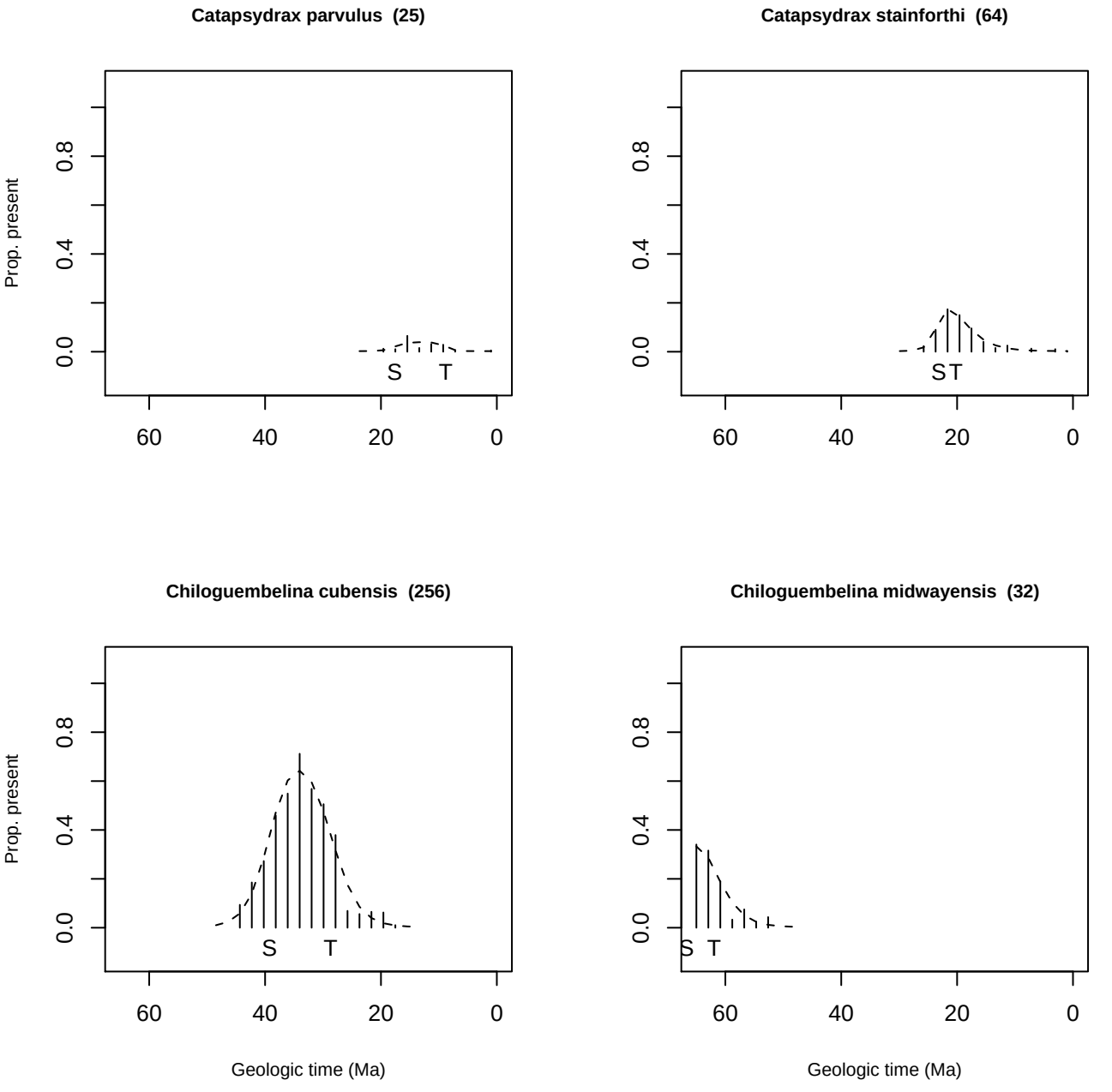
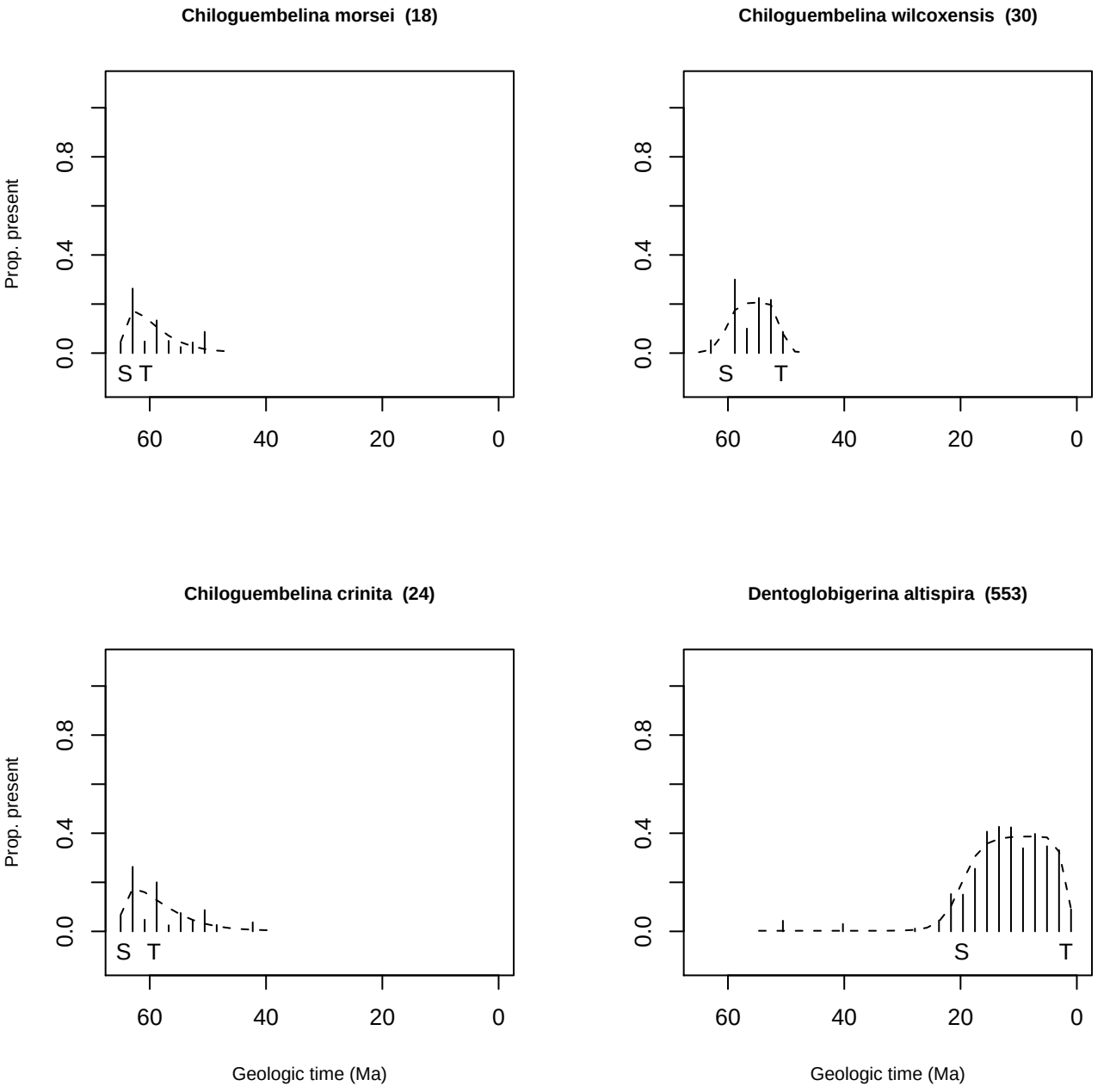
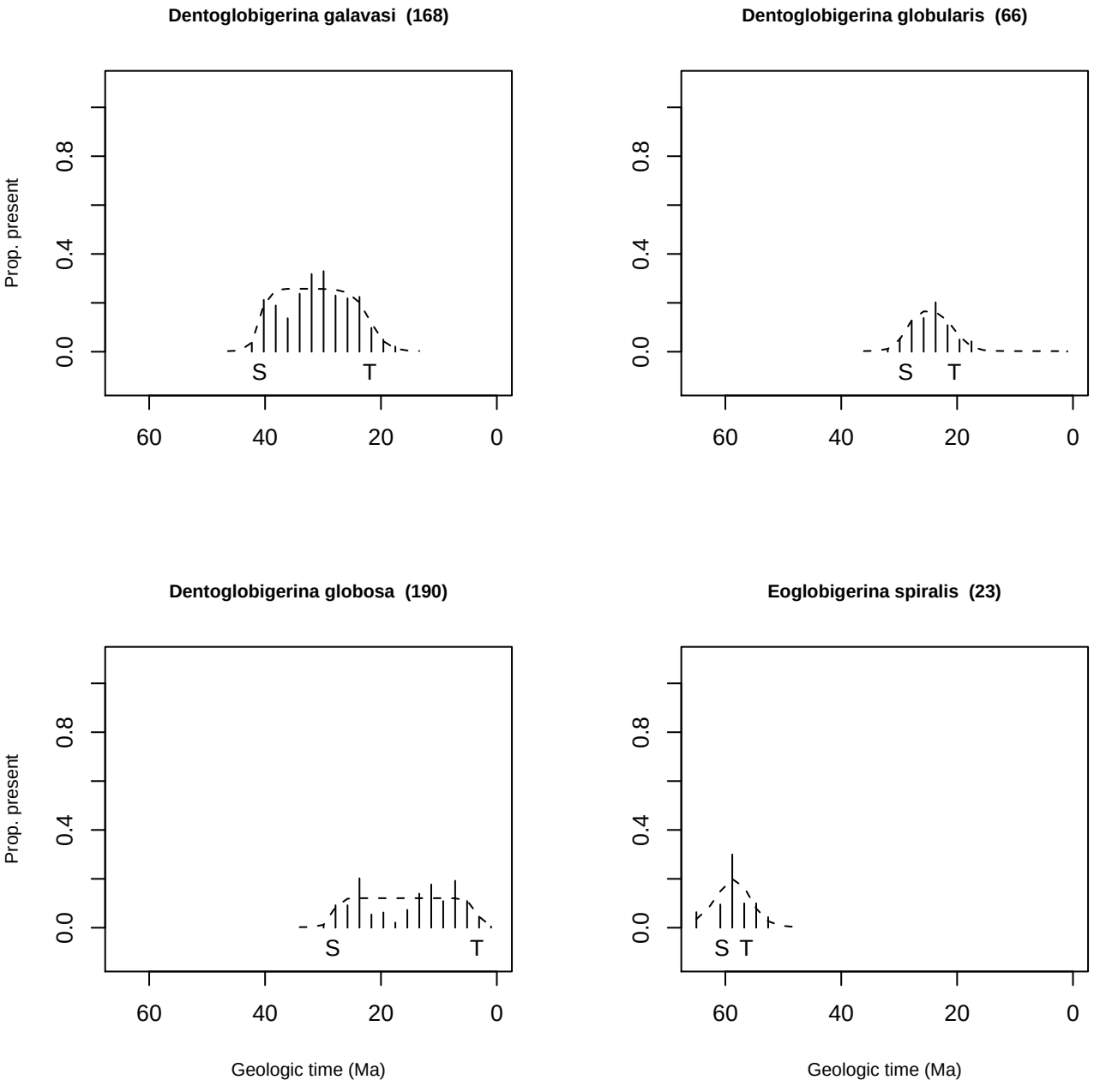
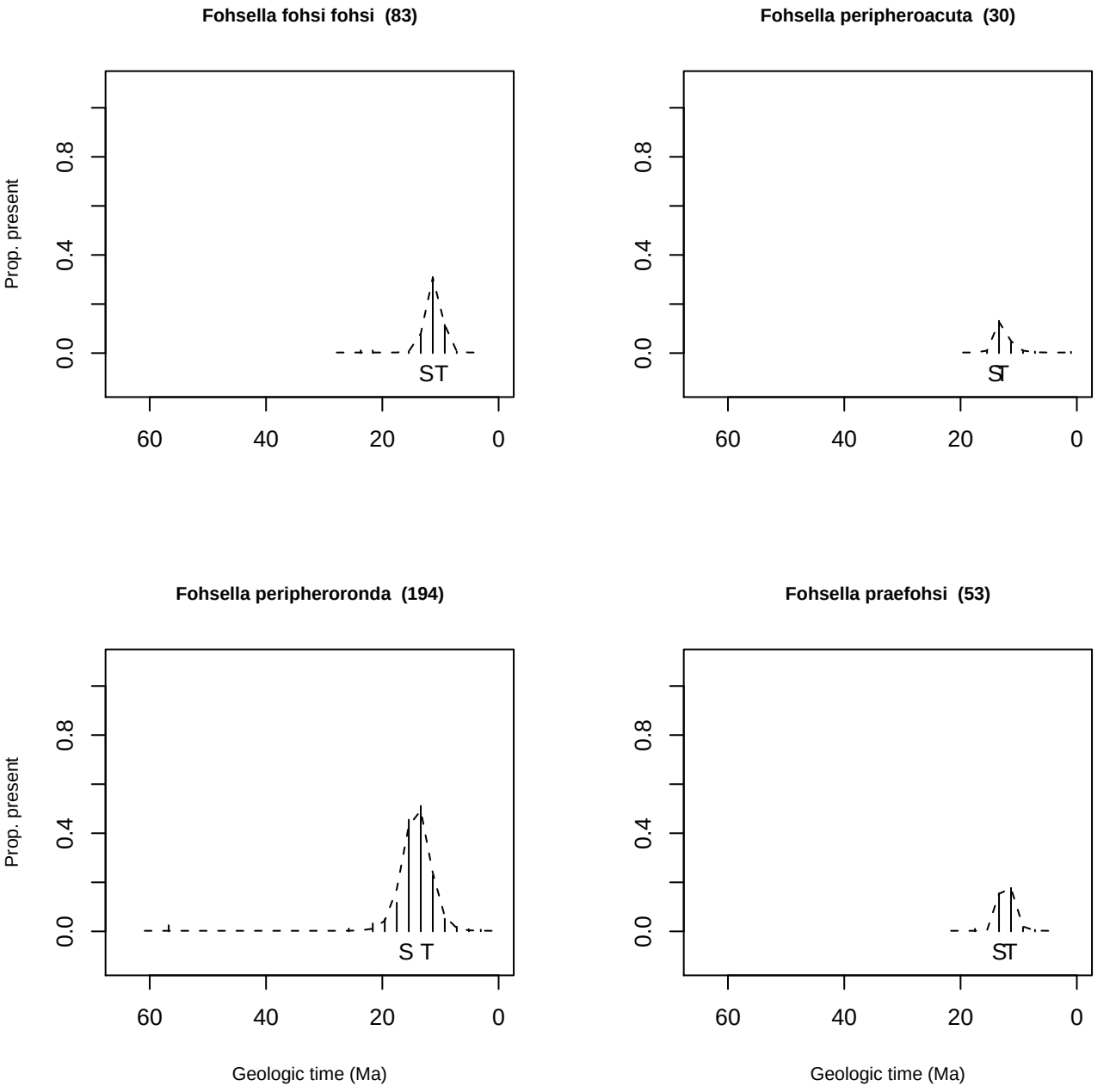
0.4
0.8
60
40
20
0
ST
S
T
S T
S
Geologic time (Ma)

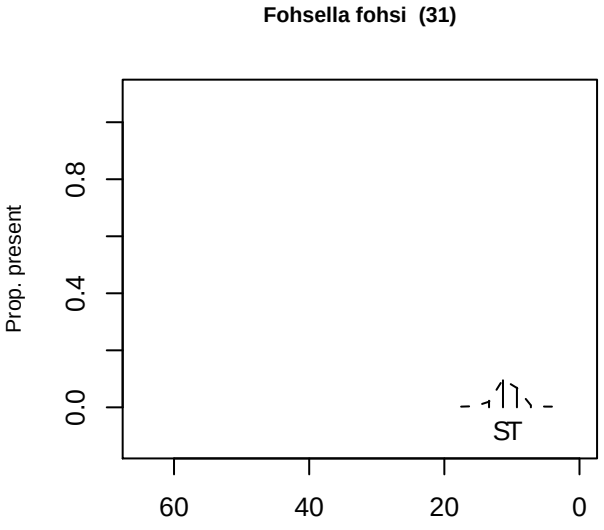

Candeina nitida (210)
Cassigerinelloita amekiensis (14)
Cassigerinella chipolensis (238)
Catapsydrax dissimilis (659)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

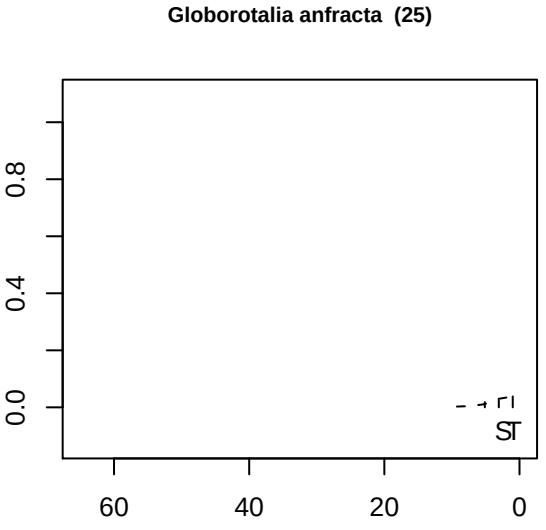

Catapsydrax parvulus (25)
Catapsydrax stainforthi (64)
Chiloguembelina cubensis (256)
Chiloguembelina midwayensis (32)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

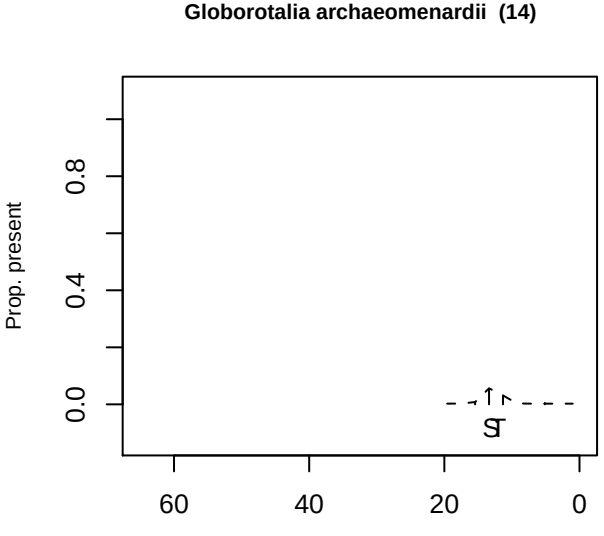

Chiloguembelina morsei (18)
Chiloguembelina wilcoxensis (30)
Chiloguembelina crinita (24)
Dentoglobigerina altispira (553)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

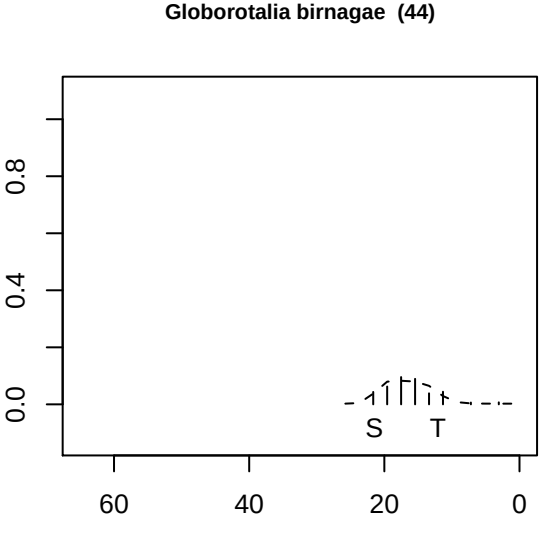

Dentoglobigerina galavasi (168)
Dentoglobigerina globularis (66)
Dentoglobigerina globosa (190)
Eoglobigerina spiralis (23)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

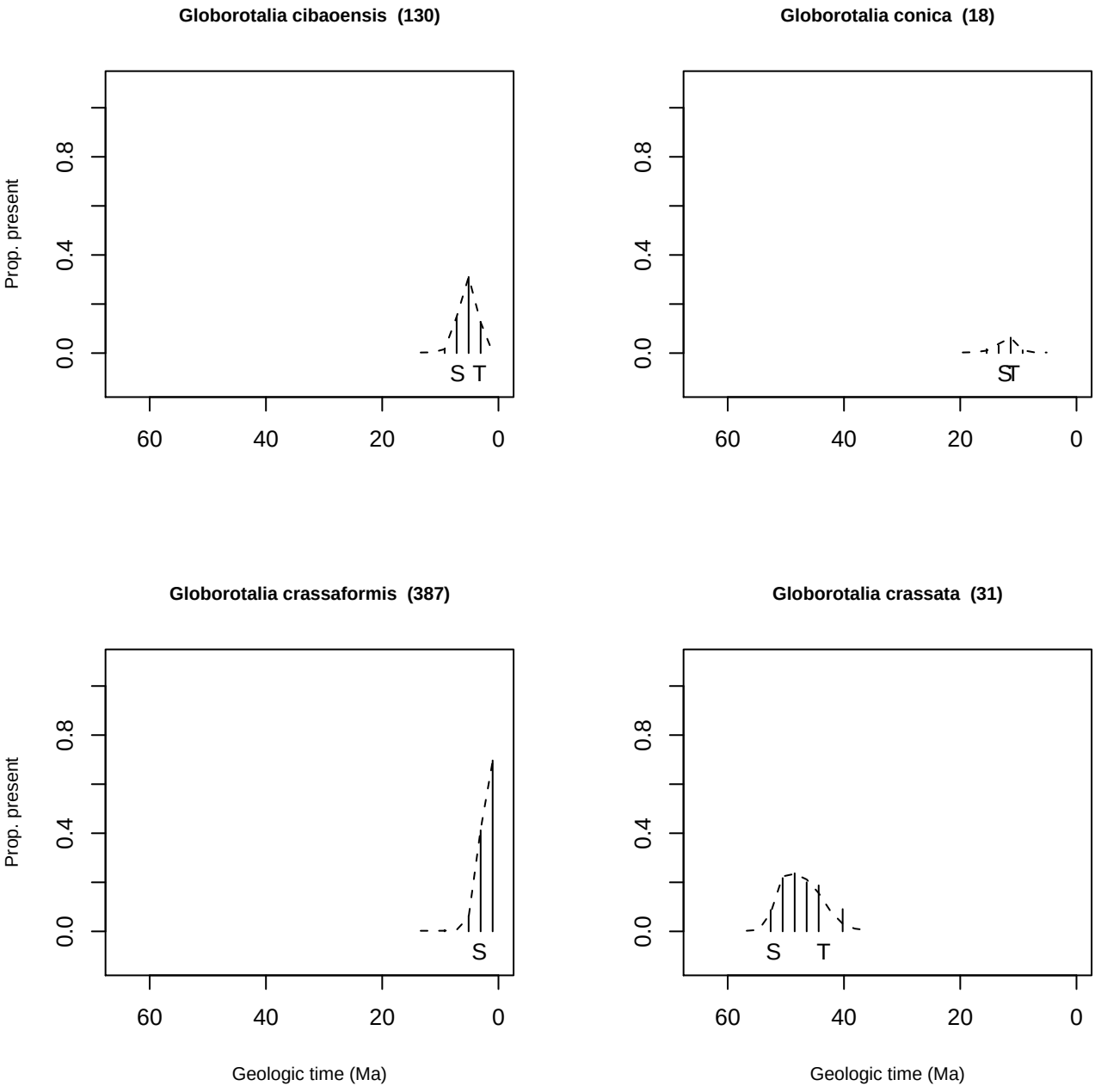

Fohsella fohsi fohsi (83)
Fohsella peripheroacuta (30)
Fohsella peripheroronda (194)
Fohsella praefohsi (53)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

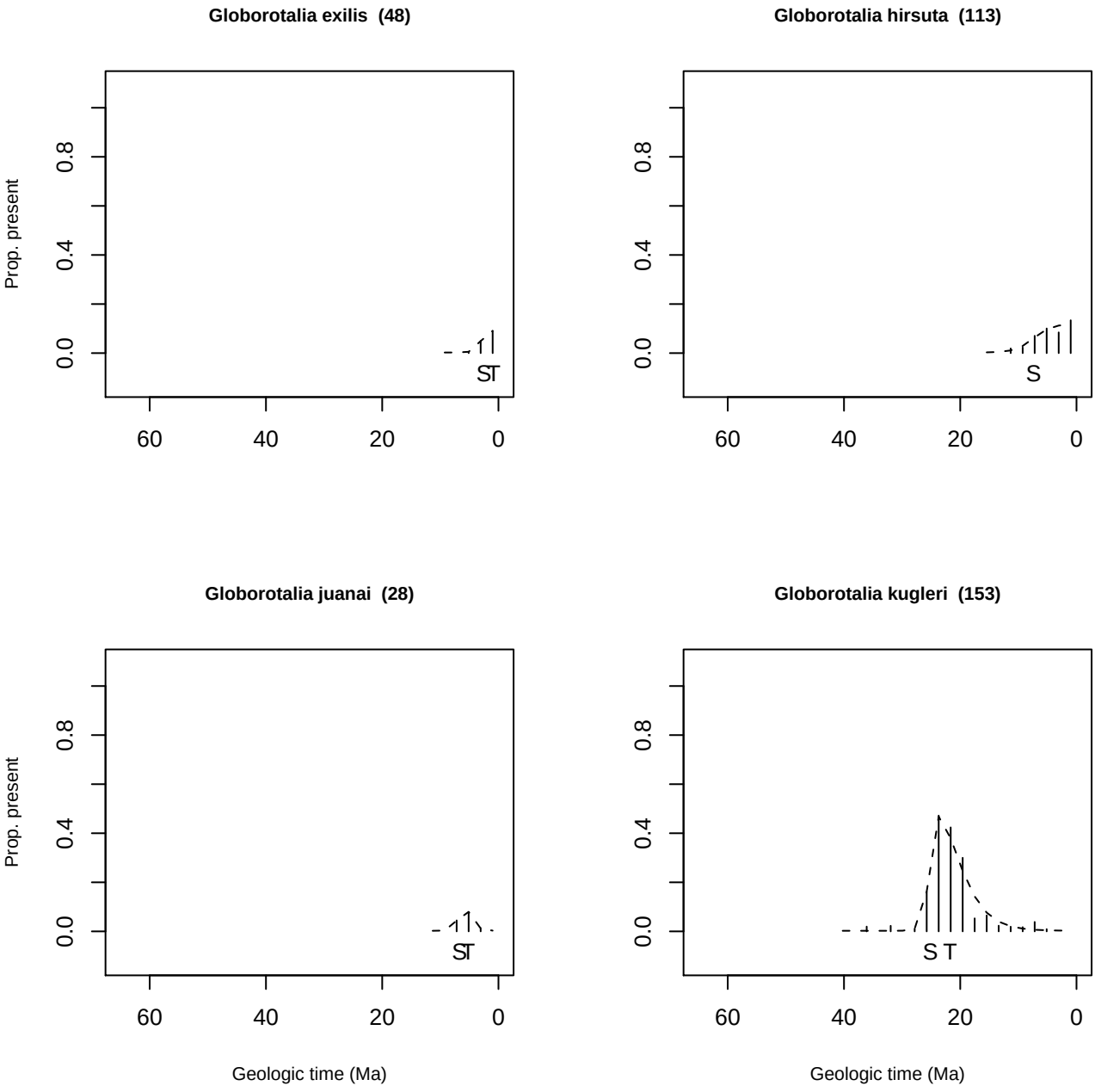

Fohsella fohsi (31)
Prop. present
0.0
0.4
0.8
ST
60
40
20
0

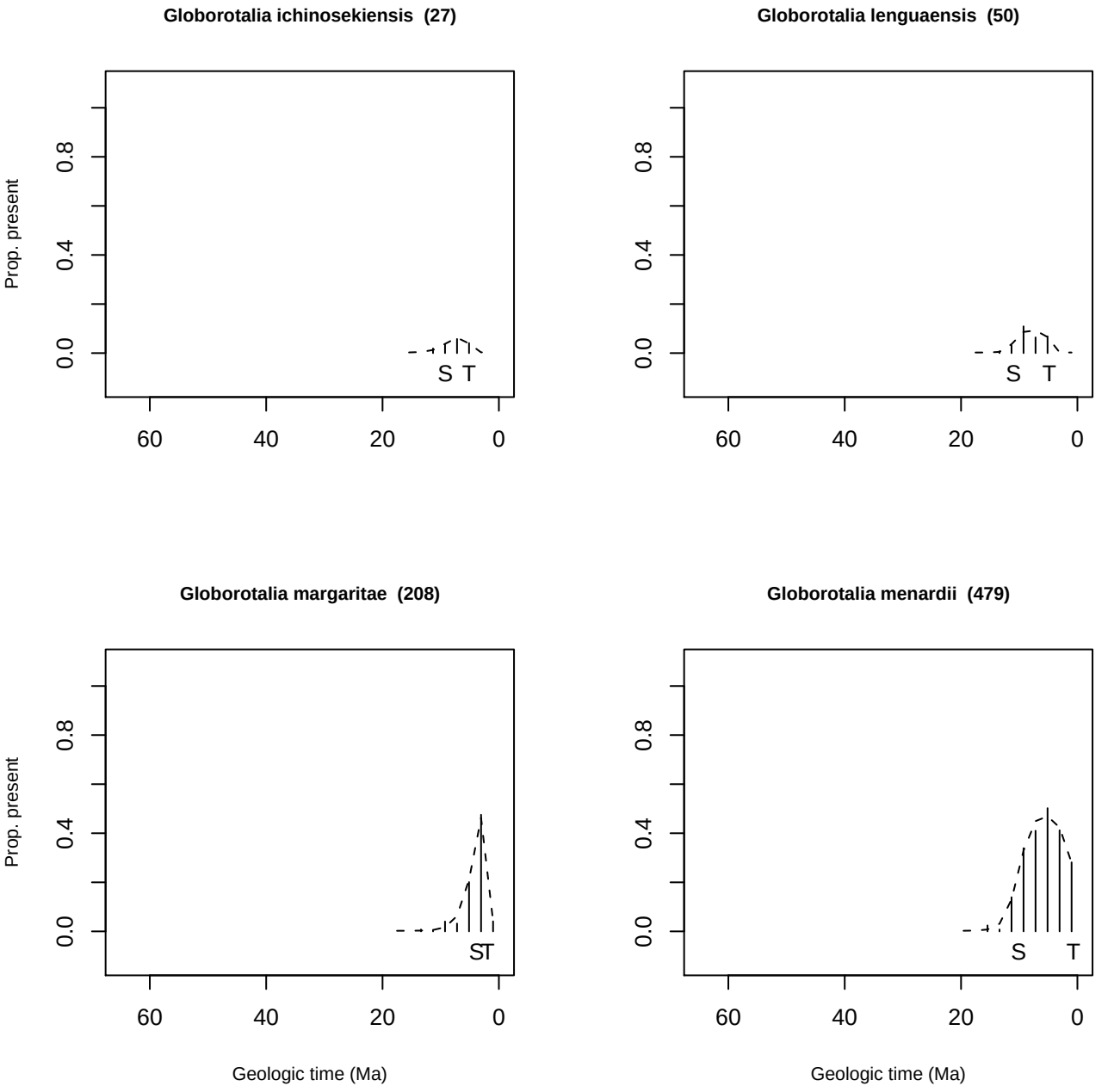

Globorotalia anfracta (25)
0.0
0.4
0.8
ST
60
40
20
0

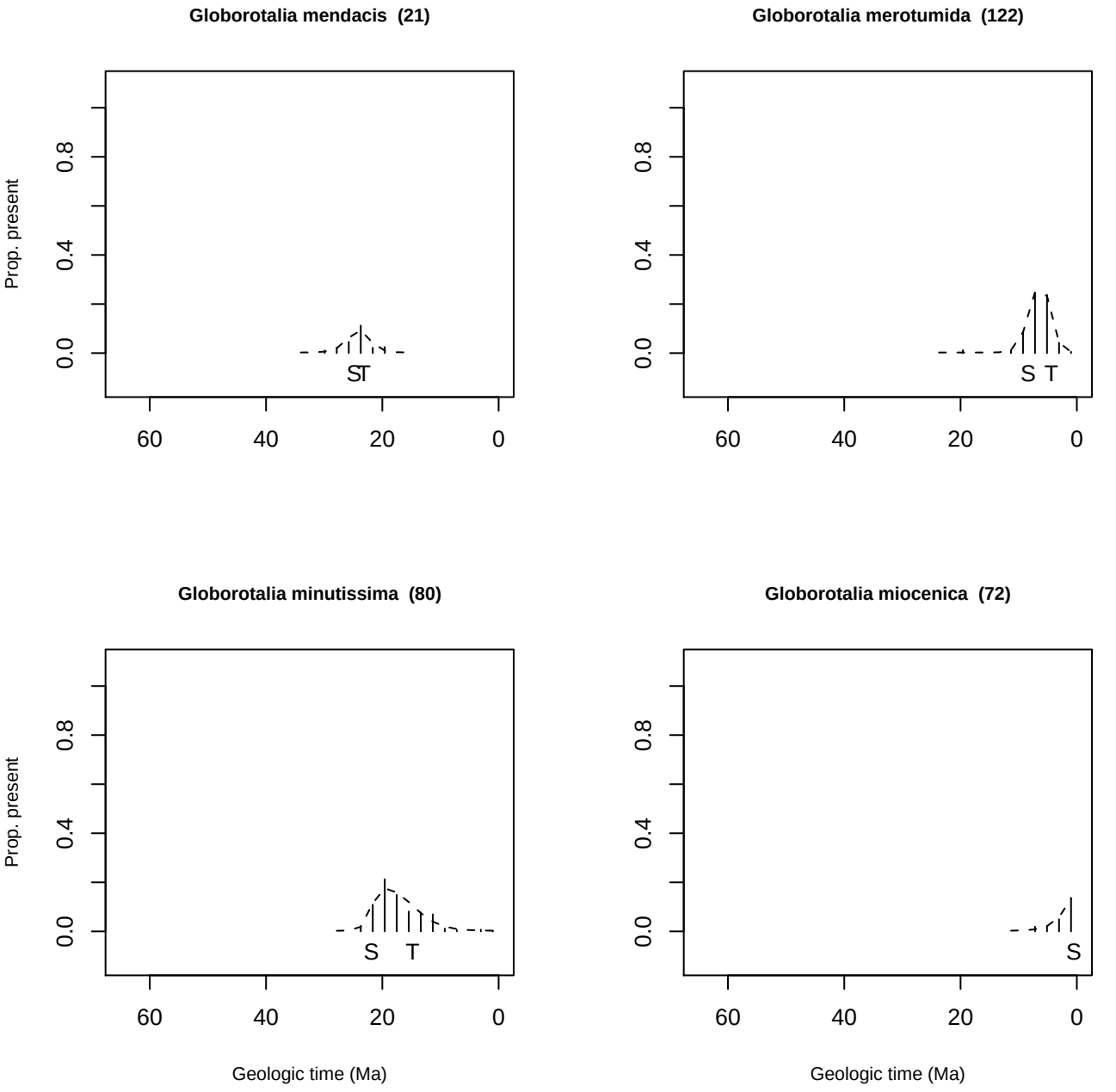

Globorotalia archaeomenardii (14)
Prop. present
0.0
0.4
0.8
ST
60
40
20
0
Geologic time (Ma)

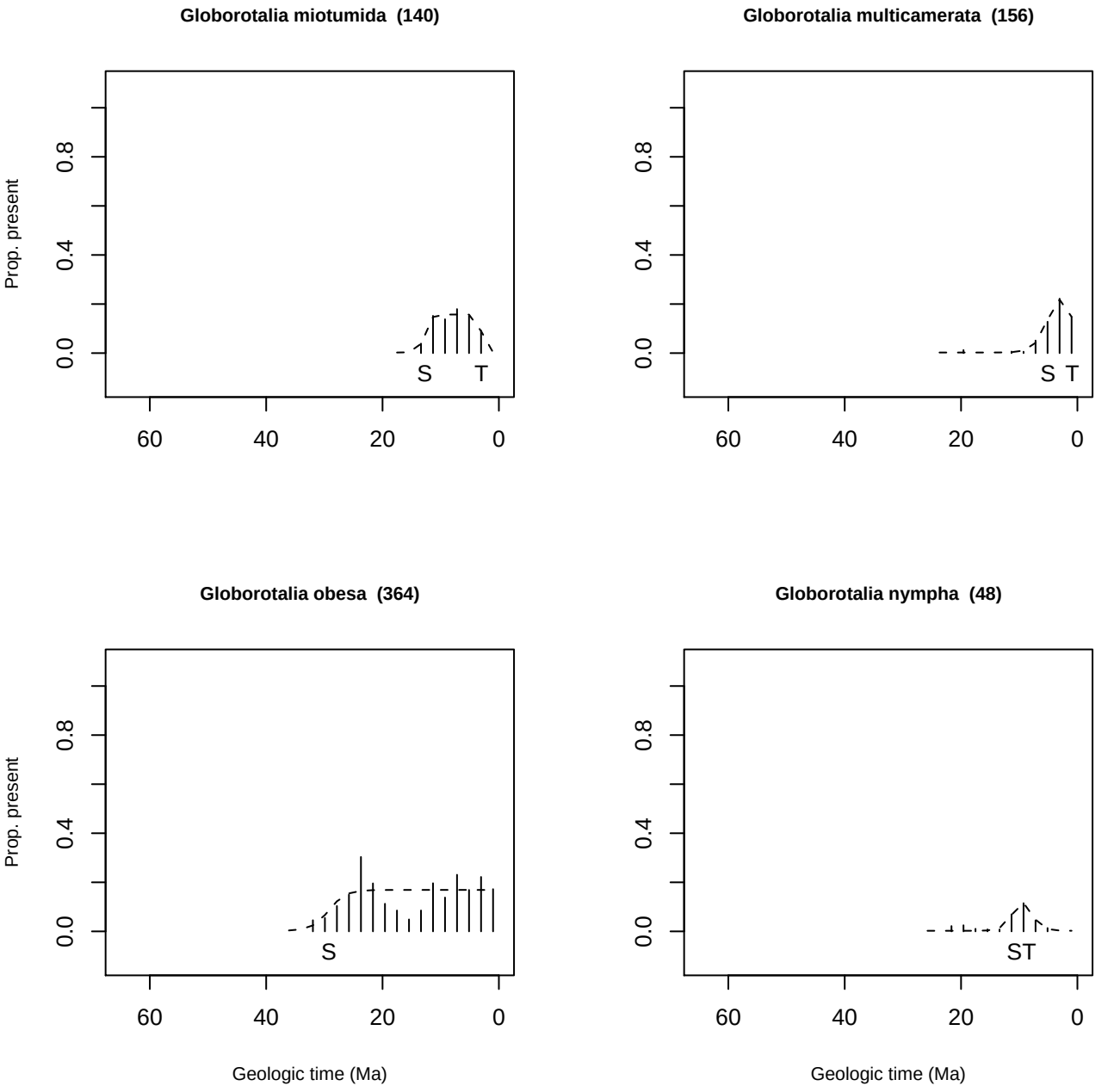

Globorotalia birnagae (44)
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

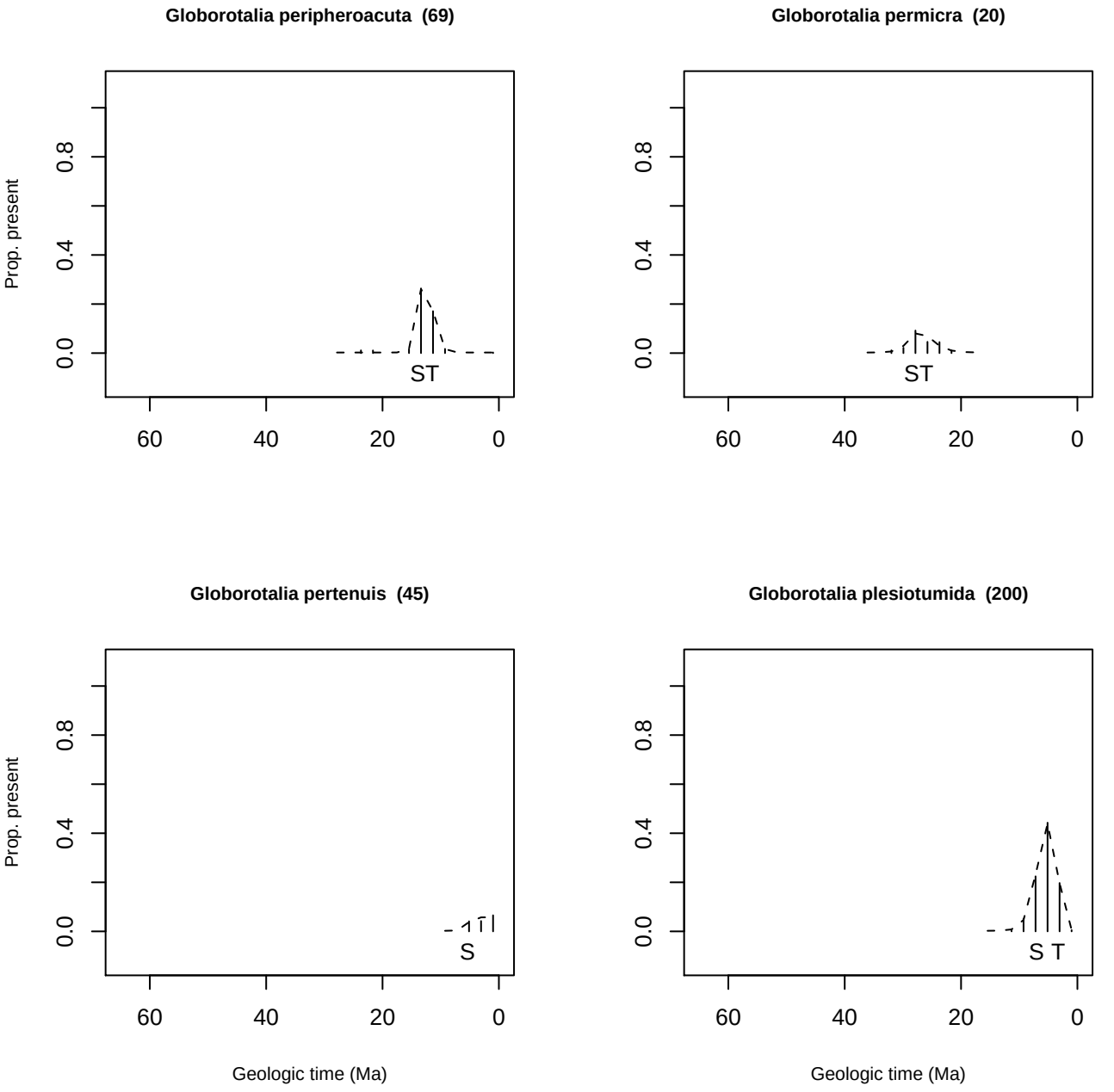

Globorotalia cibaoensis (130)
Globorotalia conica (18)
Globorotalia crassaformis (387)
Globorotalia crassata (31)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

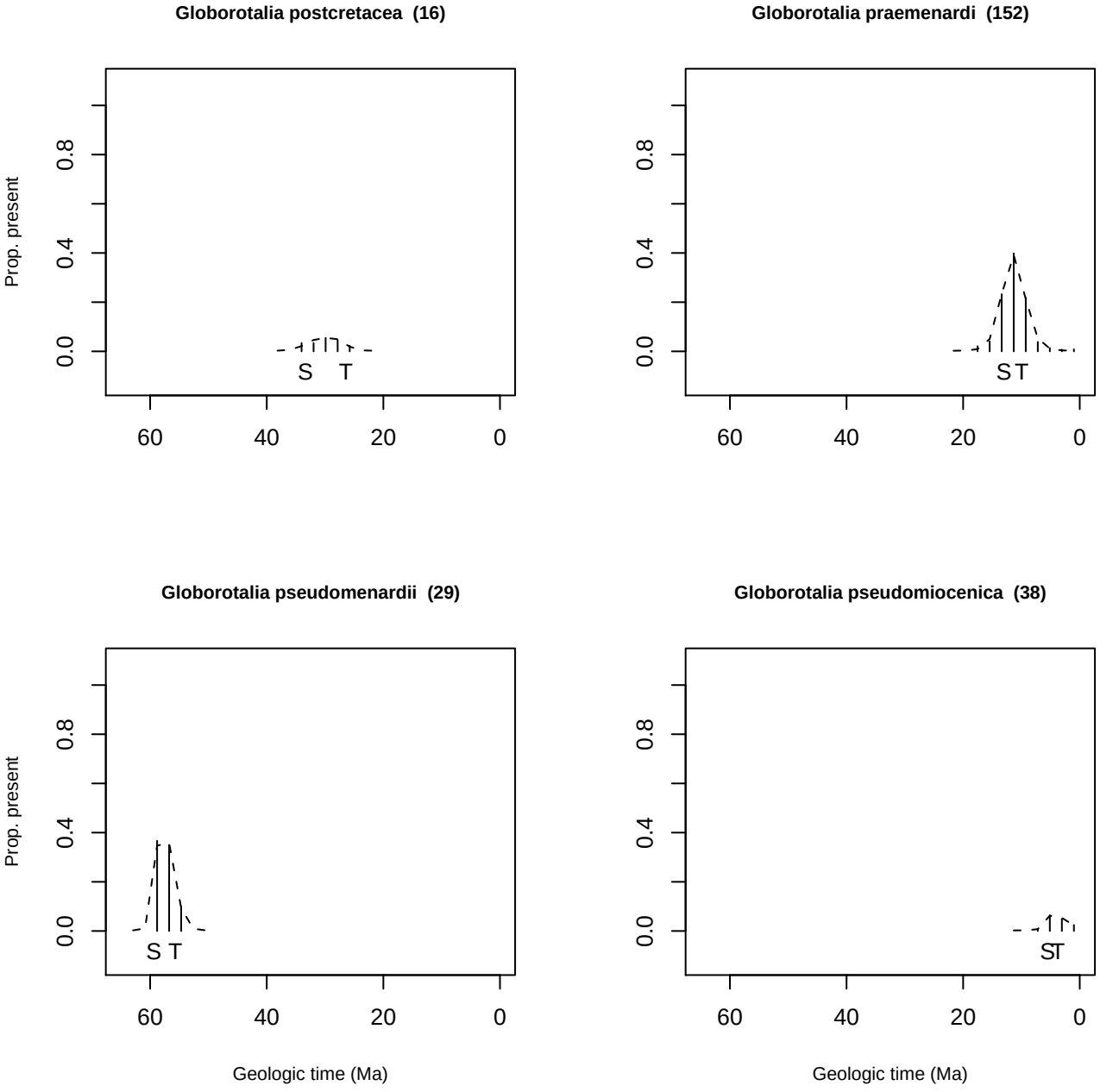

Globorotalia exilis (48)
Globorotalia hirsuta (113)
Globorotalia juanai (28)
Globorotalia kugleri (153)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

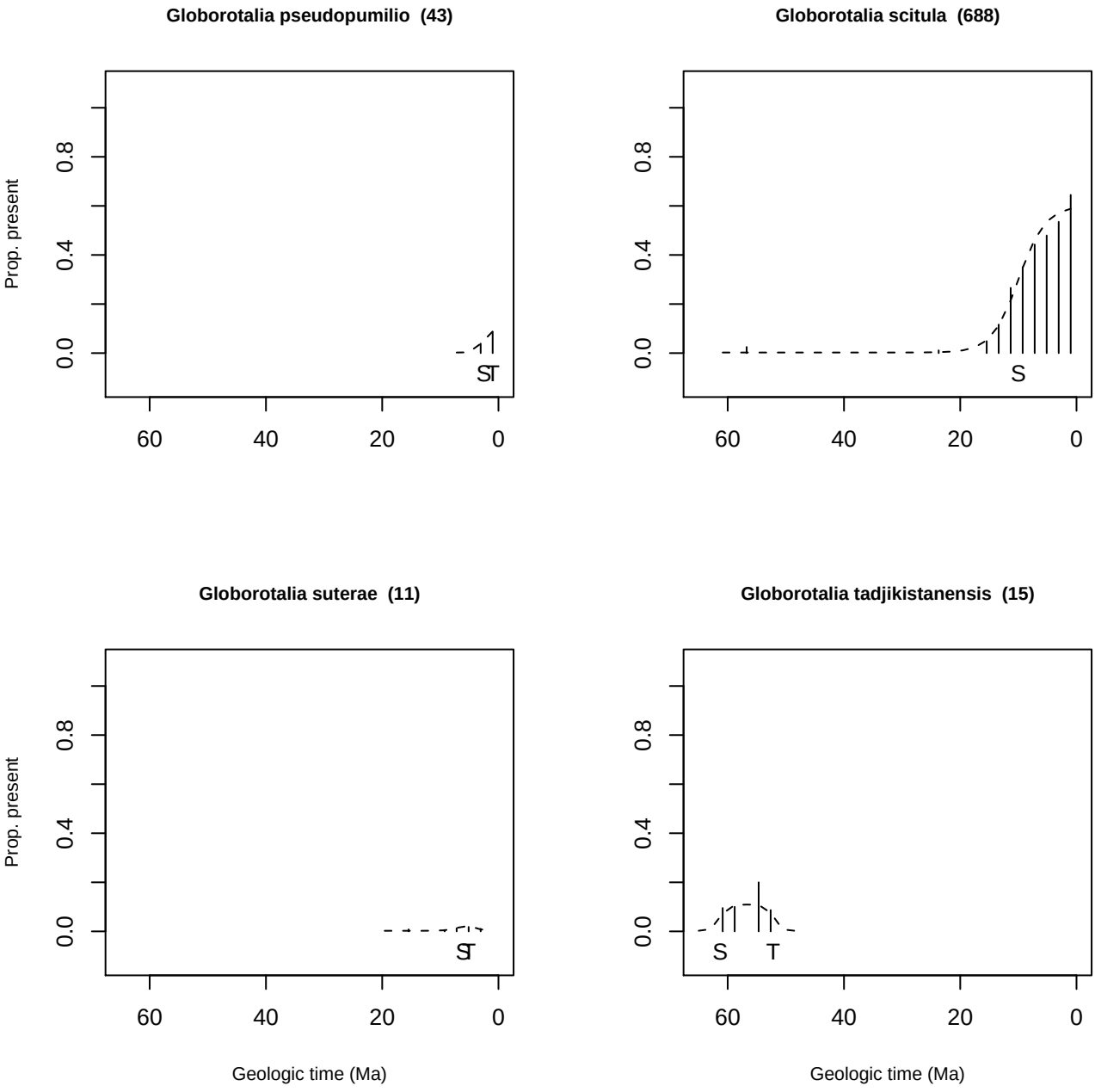

Globorotalia ichinosekiensis (27)
Globorotalia lenguaensis (50)
Globorotalia margaritae (208)
Globorotalia menardii (479)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
S T
ST
S T
Geologic time (Ma)
Geologic time (Ma)

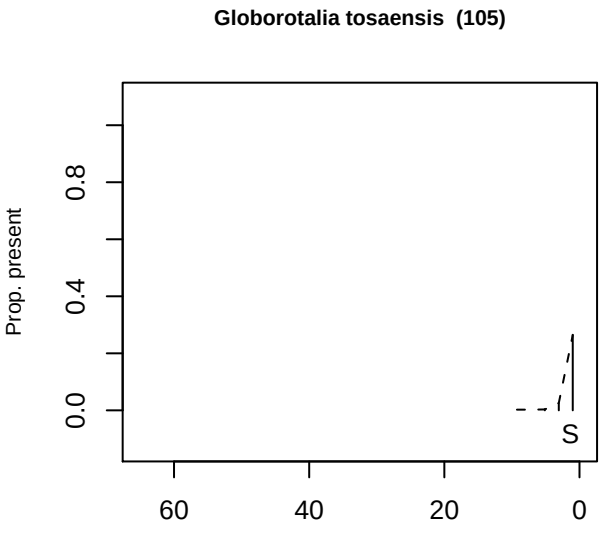

Globorotalia mendacis (21)
Globorotalia merotumida (122)
Globorotalia minutissima (80)
Globorotalia miocenica (72)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S T
S T
S
Geologic time (Ma)
Geologic time (Ma)

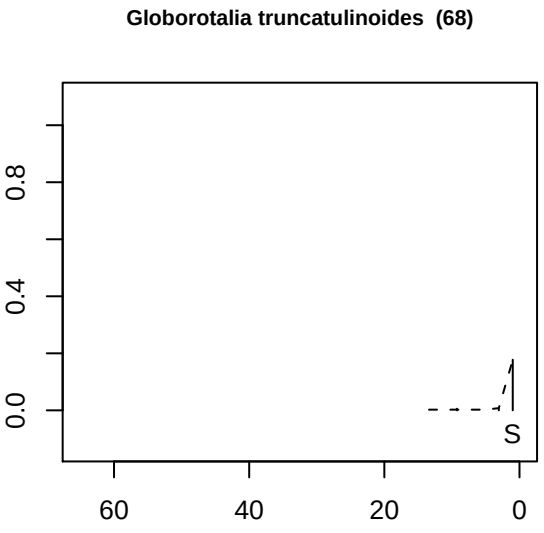

Globorotalia miotumida (140)
Globorotalia multicamerata (156)
Globorotalia obesa (364)
Globorotalia nympha (48)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

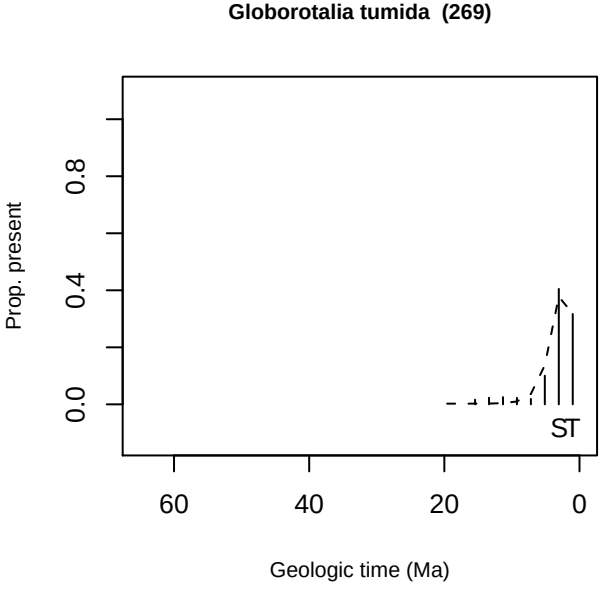

Globorotalia peripheroacuta (69)
Globorotalia permicra (20)
Globorotalia pertenuis (45)
Globorotalia plesiotumida (200)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
S T
Geologic time (Ma)

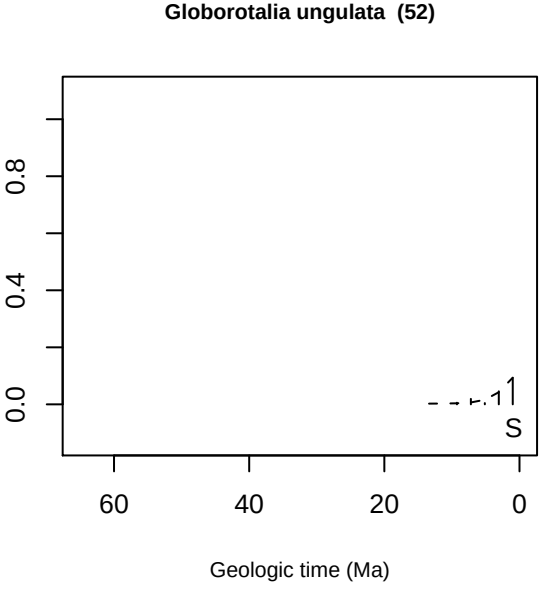

Globorotalia postcretacea (16)
Globorotalia praemenardi (152)
Globorotalia pseudomenardii (29)
Globorotalia pseudomiocenica (38)
Prop. present
0.0
0.4
0.8
S T
ST
60
40
20
0
Geologic time (Ma)

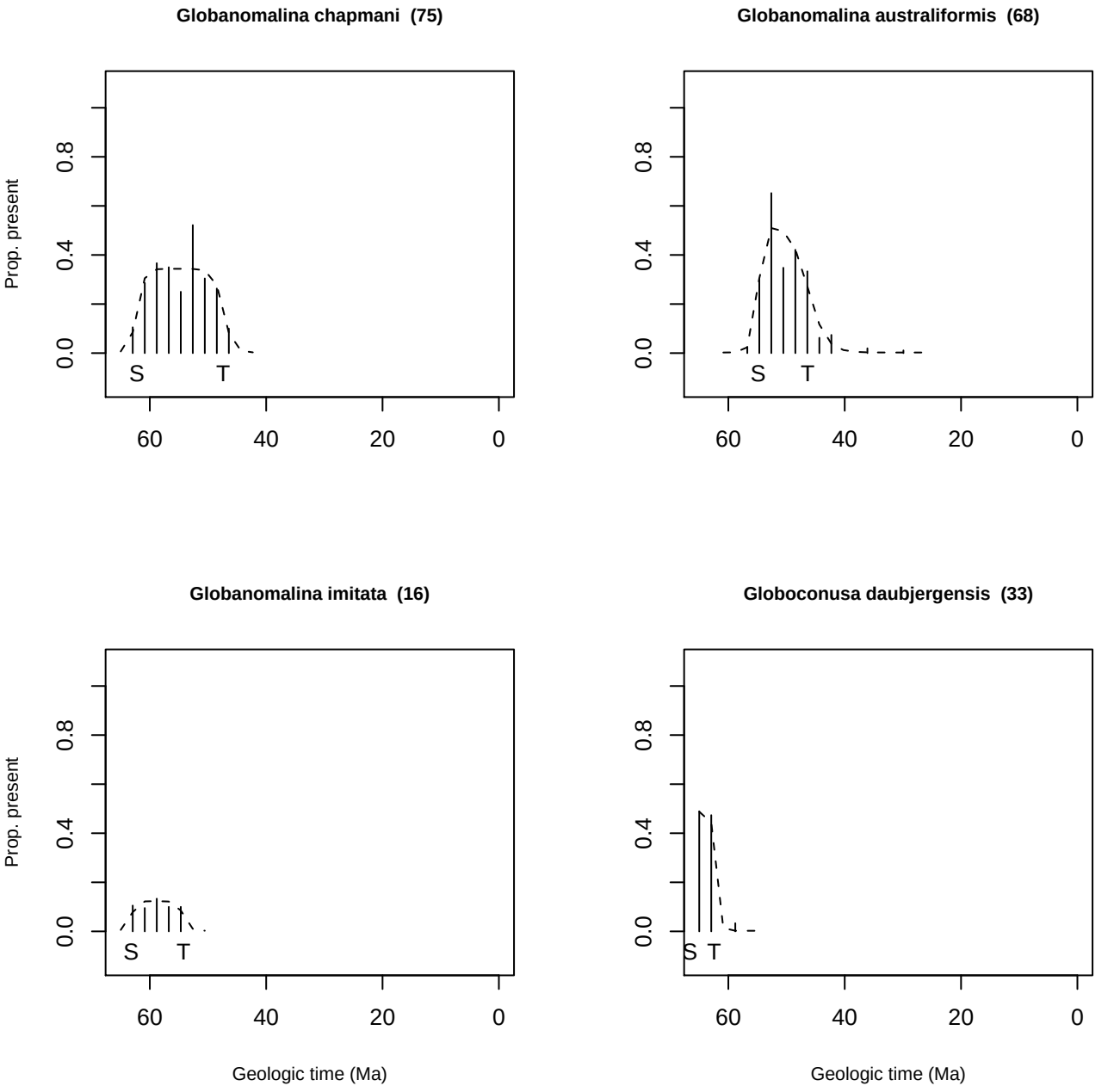

Globorotalia pseudopumilio (43)
Globorotalia scitula (688)
Globorotalia suterae (11)
Globorotalia tadjikistanensis (15)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

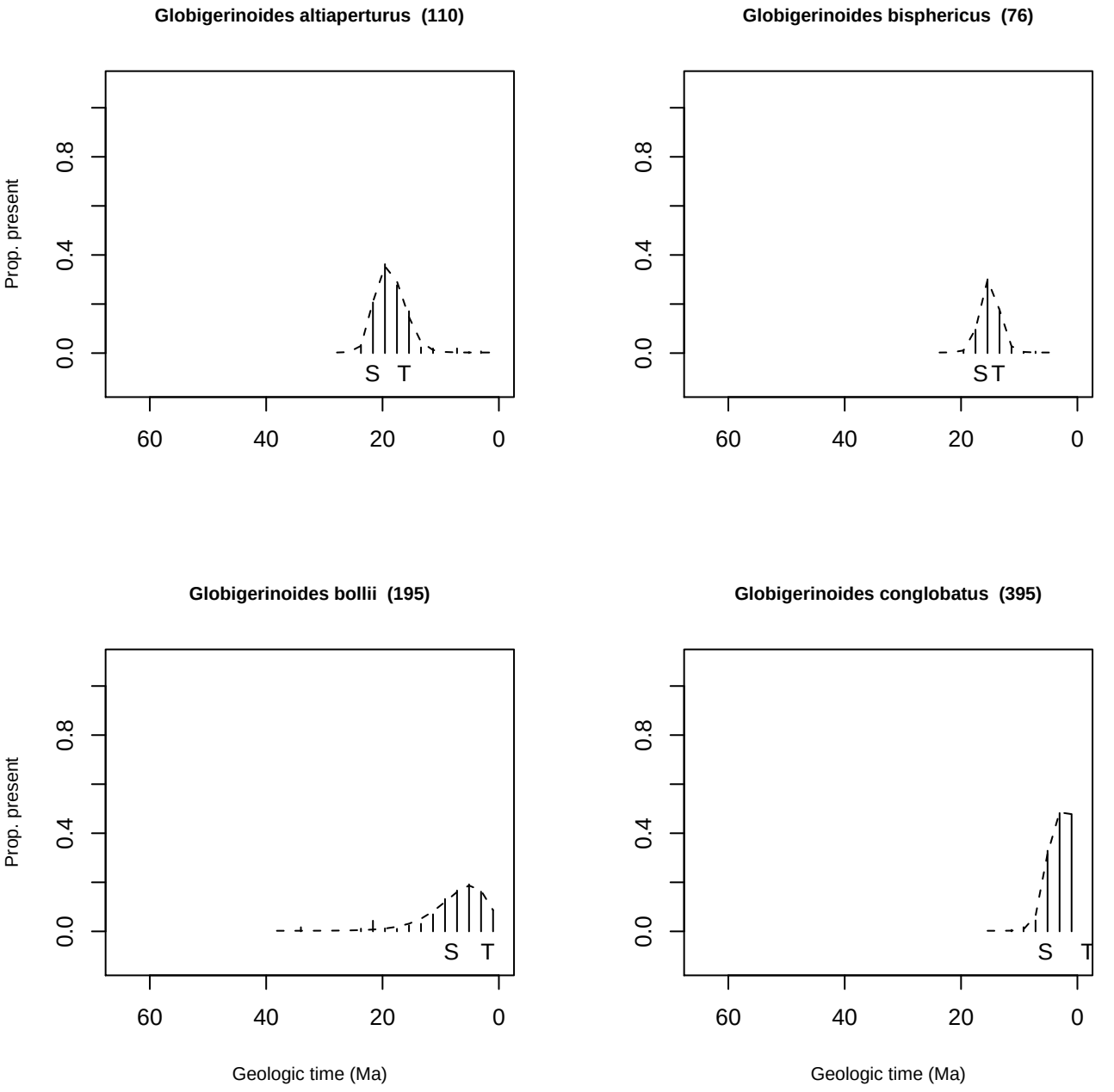

Globorotalia tosaensis (105)
Prop. present
0.0
0.4
0.8
S
60
40
20
0

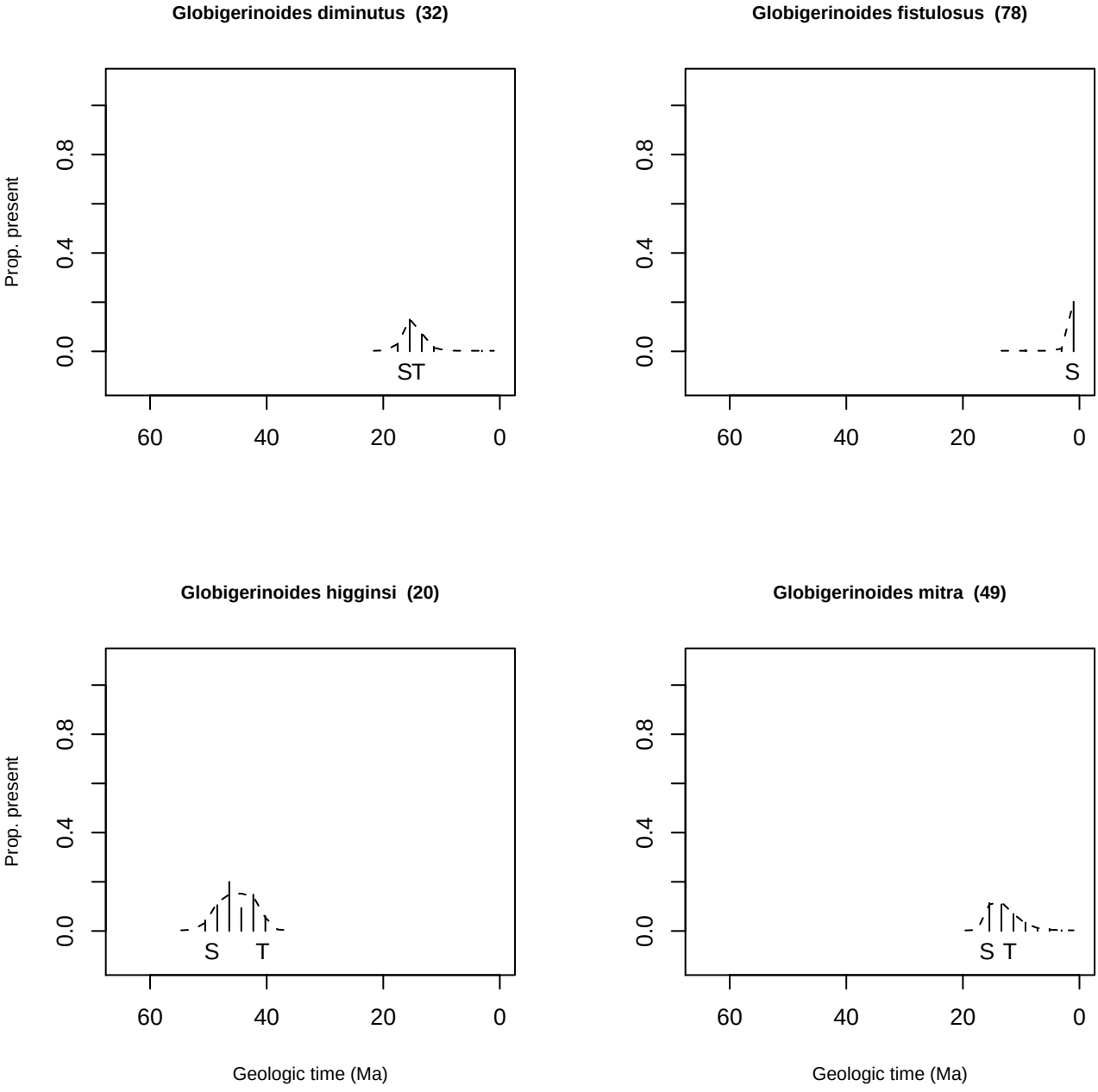

Globorotalia truncatulinoides (68)
0.0
0.4
0.8
S
60
40
20
0

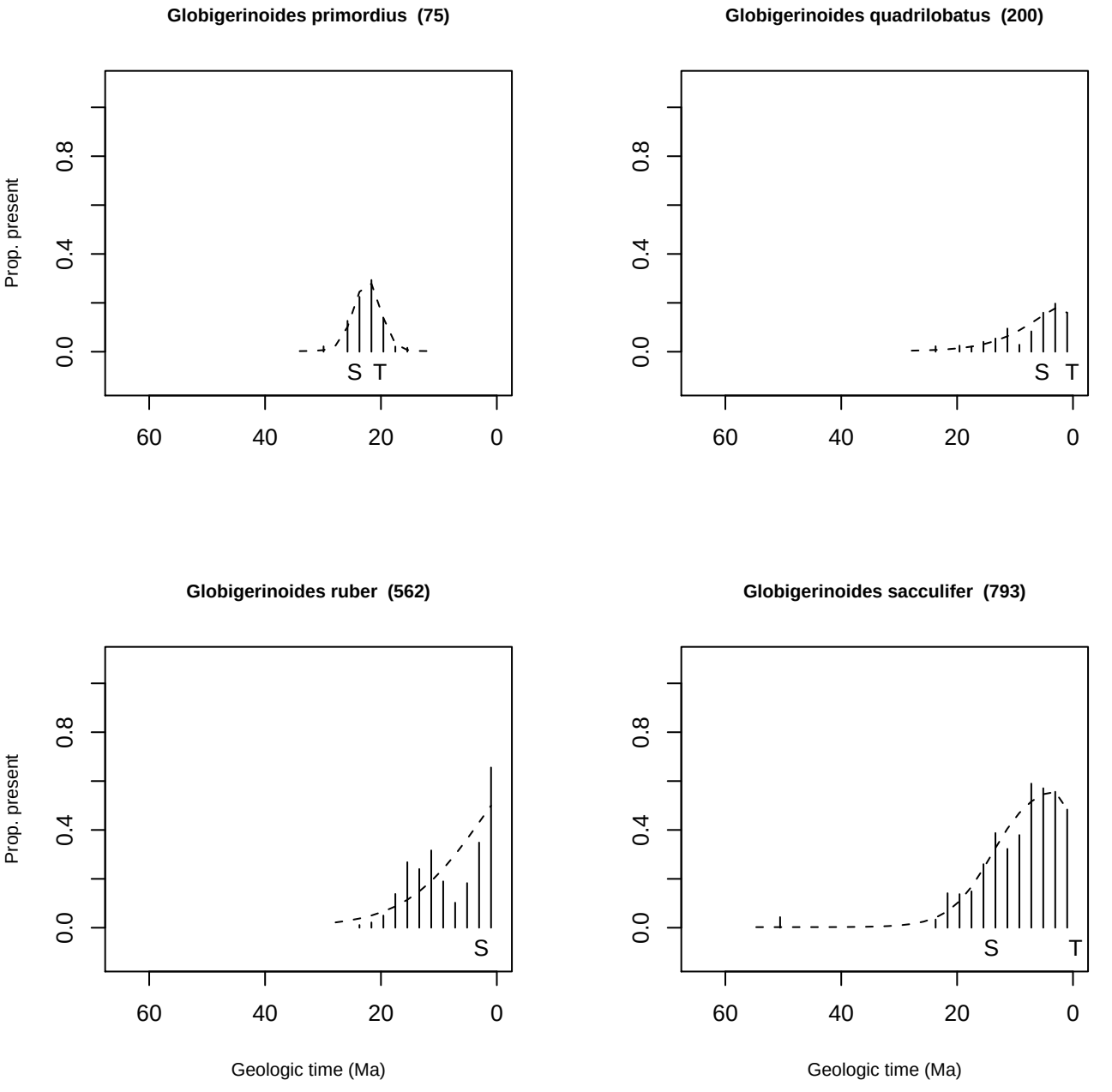

Globorotalia tumida (269)
Prop. present
0.0
0.4
0.8
ST
60
40
20
0
Geologic time (Ma)

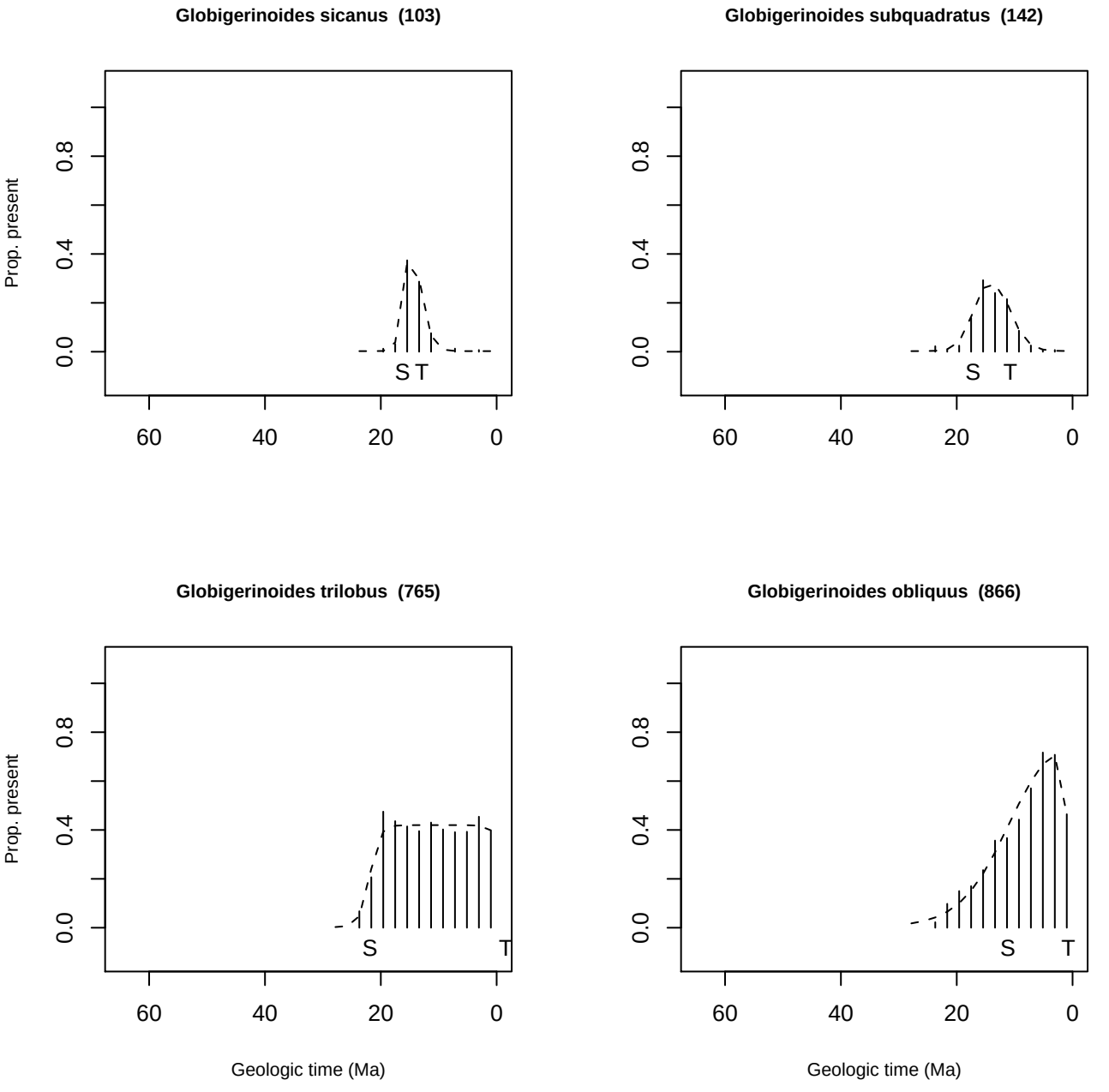

Globorotalia ungulata (52)
0.0
0.4
0.8
S
60
40
20
0
Geologic time (Ma)

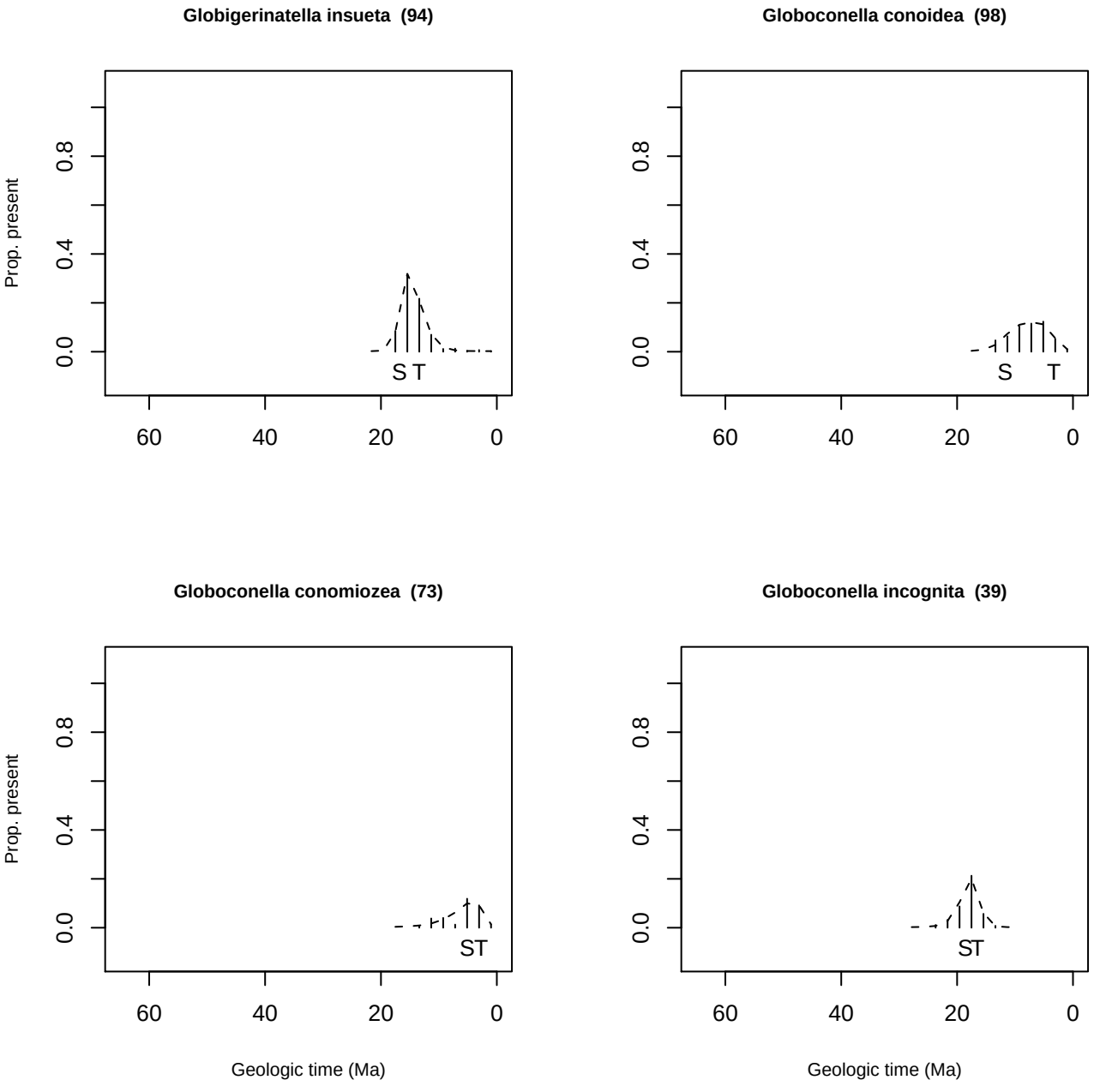

Globanomalina chapmani (75)
Globanomalina australiformis (68)
Globanomalina imitata (16)
Globoconusa daubjergensis (33)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

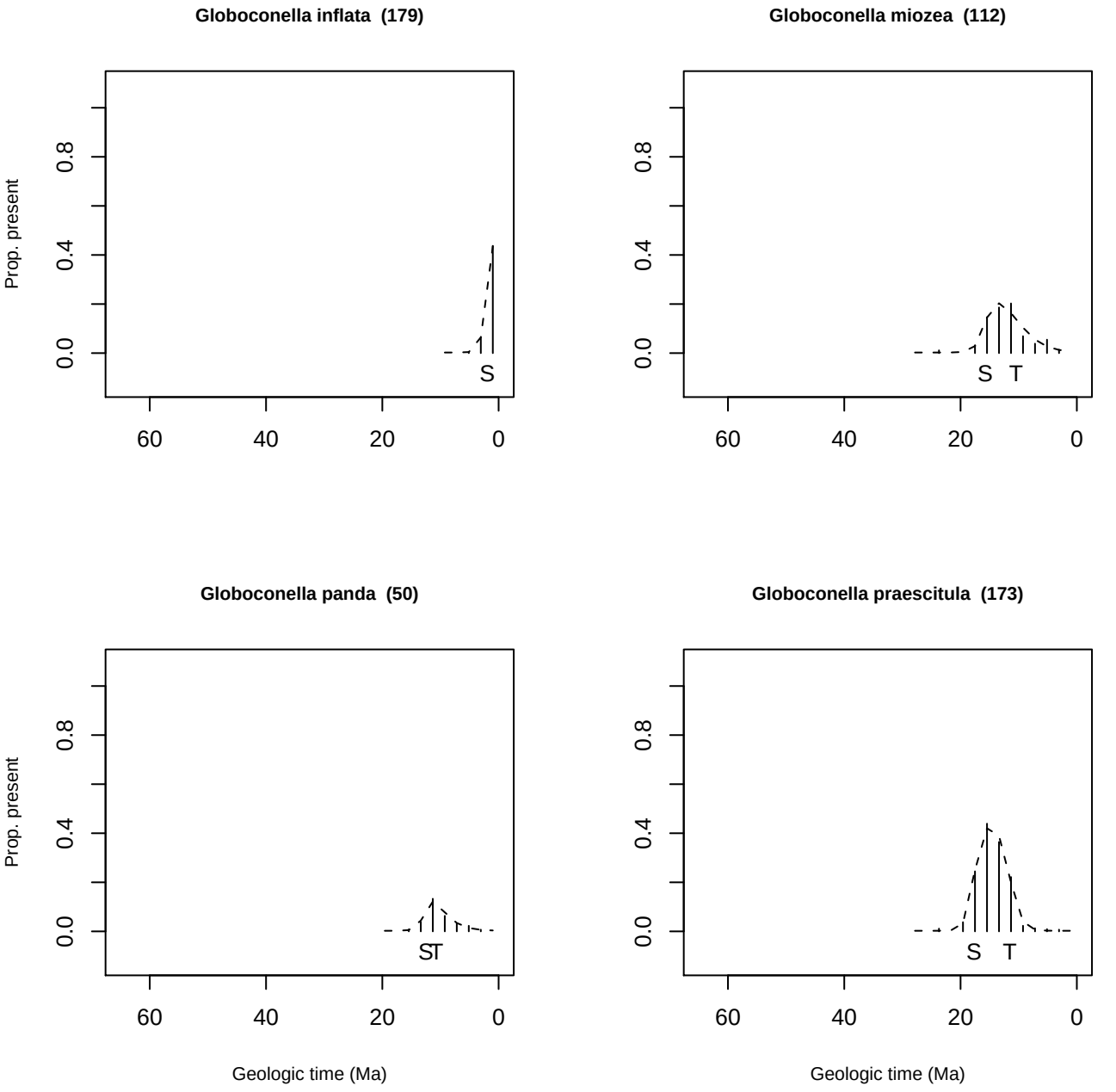

Globigerinoides altiaperturus (110)
Globigerinoides bisphericus (76)
Globigerinoides bollii (195)
Globigerinoides conglobatus (395)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

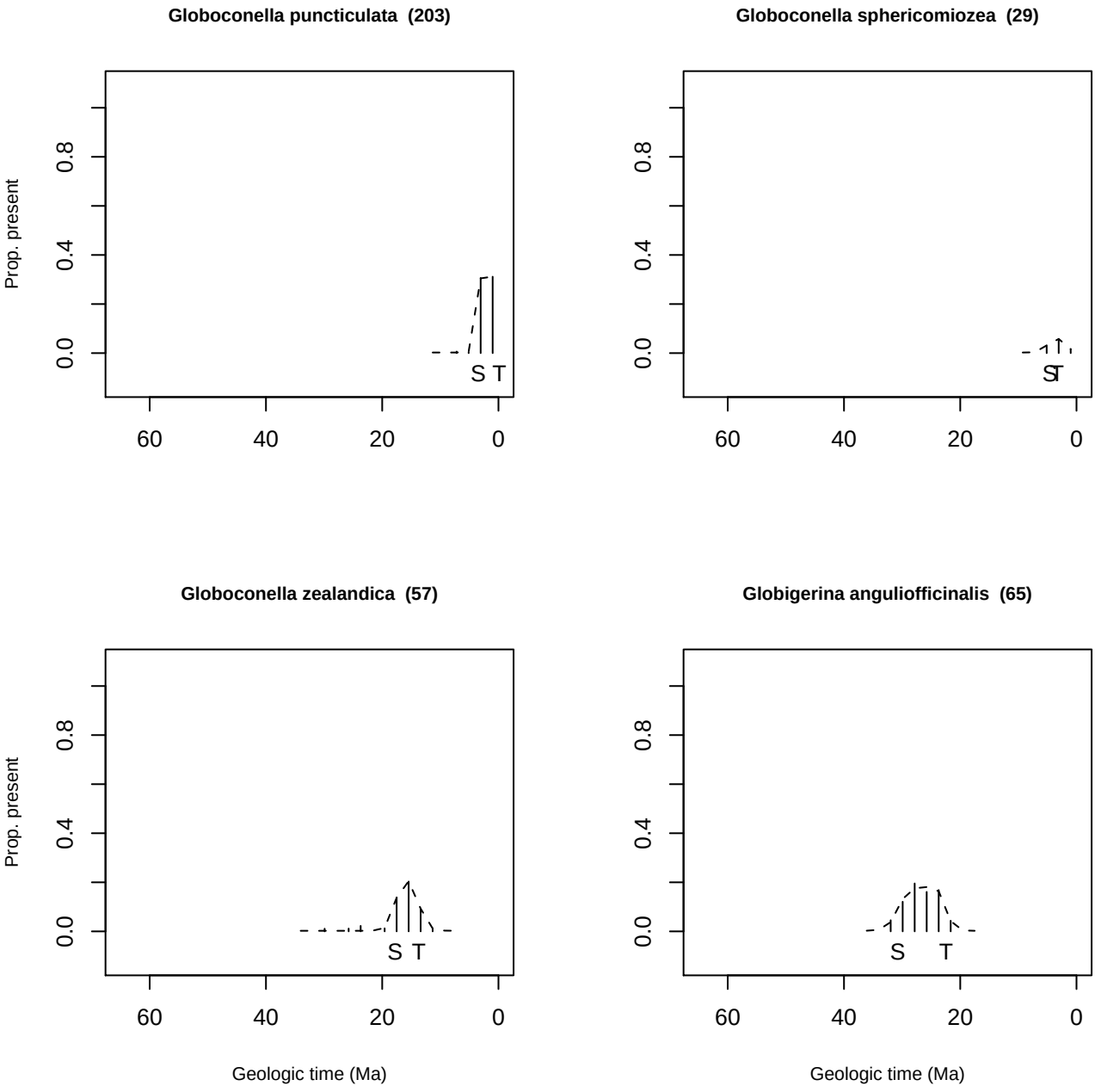

Globigerinoides diminutus (32)
Globigerinoides fistulosus (78)
Globigerinoides higginsi (20)
Globigerinoides mitra (49)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S
S
T
S T
Geologic time (Ma)
Geologic time (Ma)

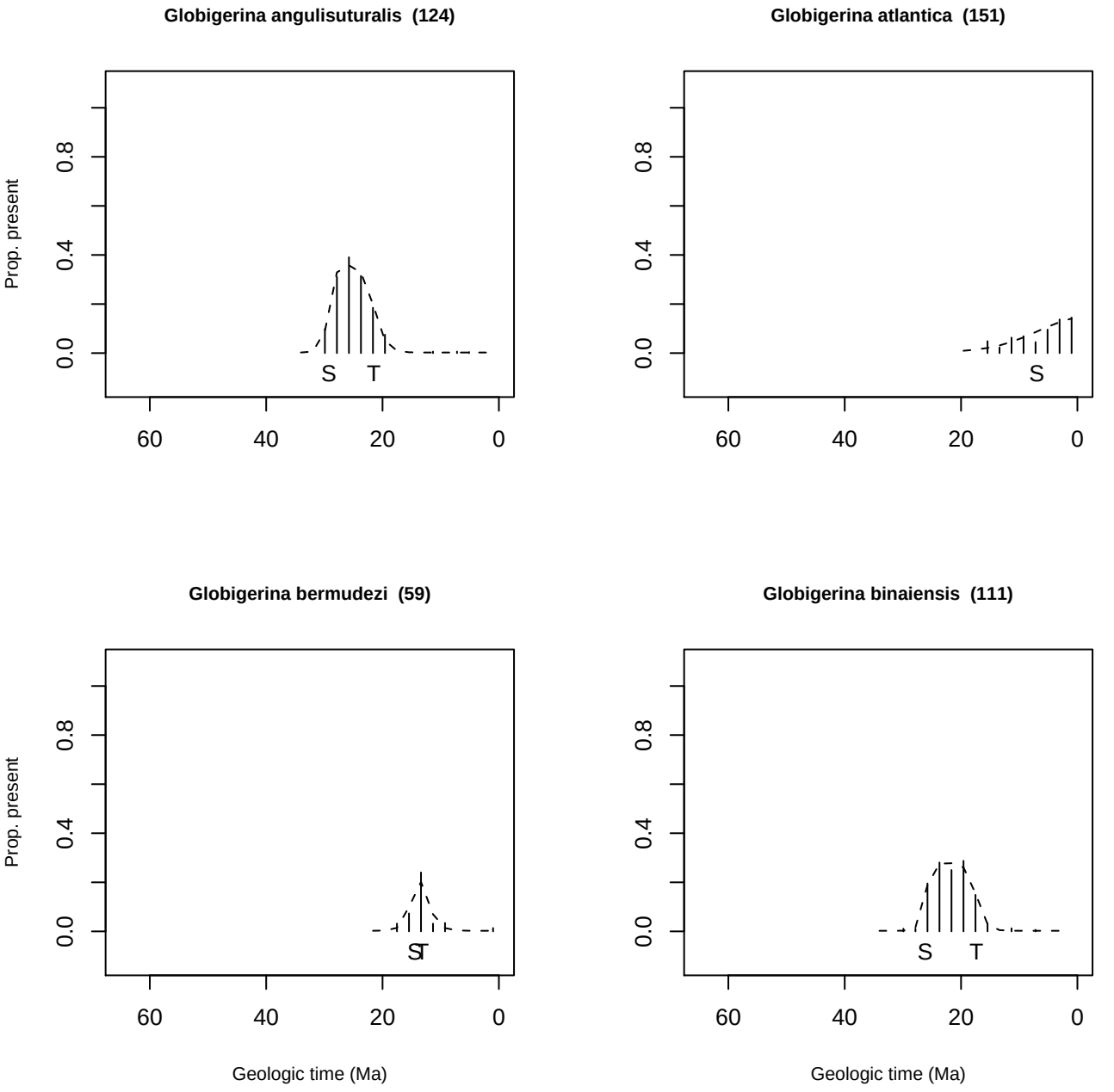

Globigerinoides primordius (75)
Globigerinoides quadrilobatus (200)
Globigerinoides ruber (562)
Globigerinoides sacculifer (793)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

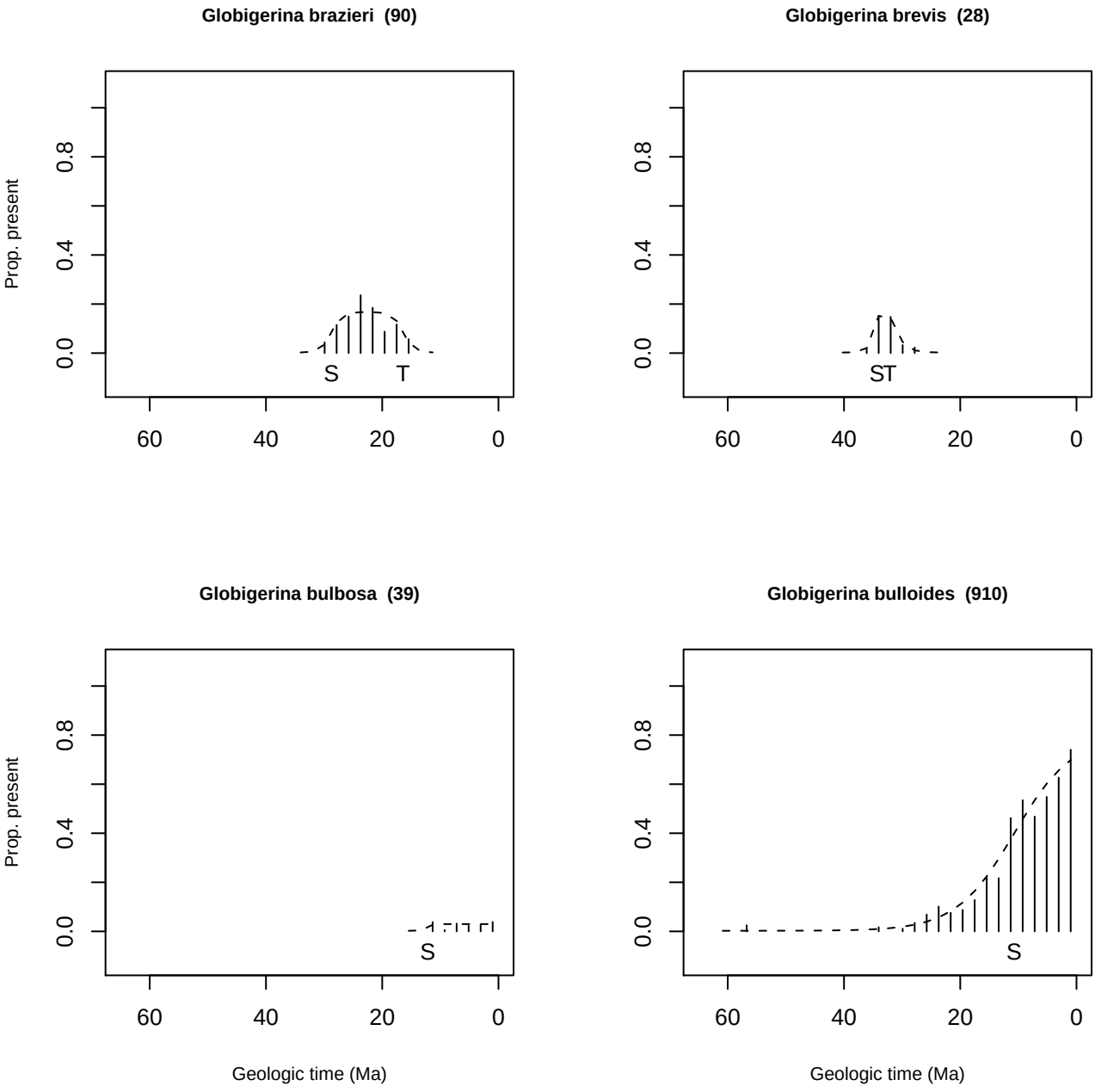

Globigerinoides sicanus (103)
Globigerinoides subquadratus (142)
Globigerinoides trilobus (765)
Globigerinoides obliquus (866)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Globigerinatella insueta (94)
Globoconella conoidea (98)
Globoconella conomiozea (73)
Globoconella incognita (39)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
S T
ST
ST
Geologic time (Ma)
Geologic time (Ma)


Globoconella inflata (179)
Globoconella miozea (112)
Globoconella panda (50)
Globoconella praescitula (173)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)


Globoconella puncticulata (203)
Globoconella sphericomiozea (29)
Globoconella zealandica (57)
Globigerina anguliofficinalis (65)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)


Globigerina angulisuturalis (124)
Globigerina atlantica (151)
Globigerina bermudezi (59)
Globigerina binaiensis (111)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Globigerina brazieri (90)
Globigerina brevis (28)
Globigerina bulbosa (39)
Globigerina bulloides (910)
Prop. present
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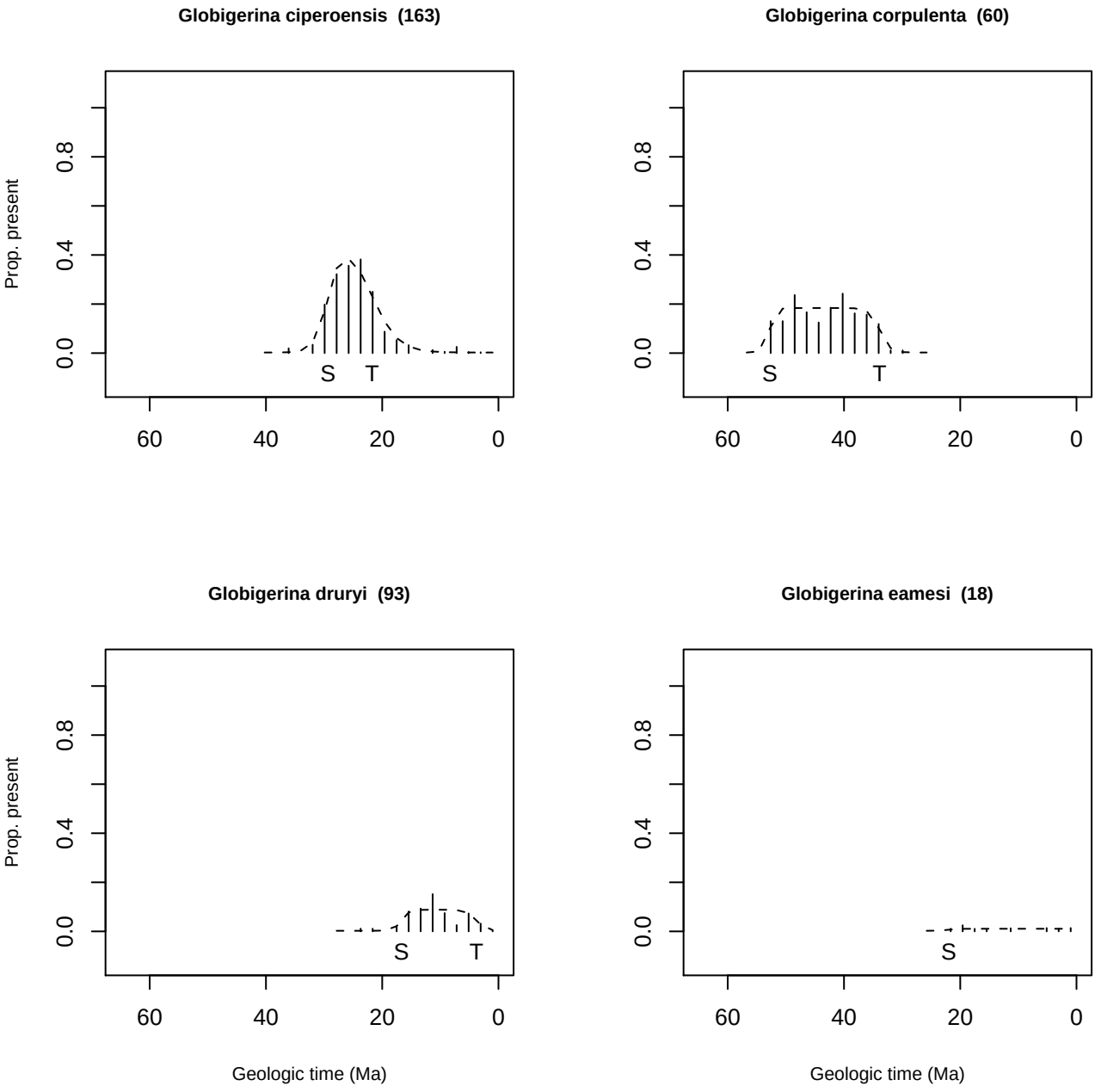
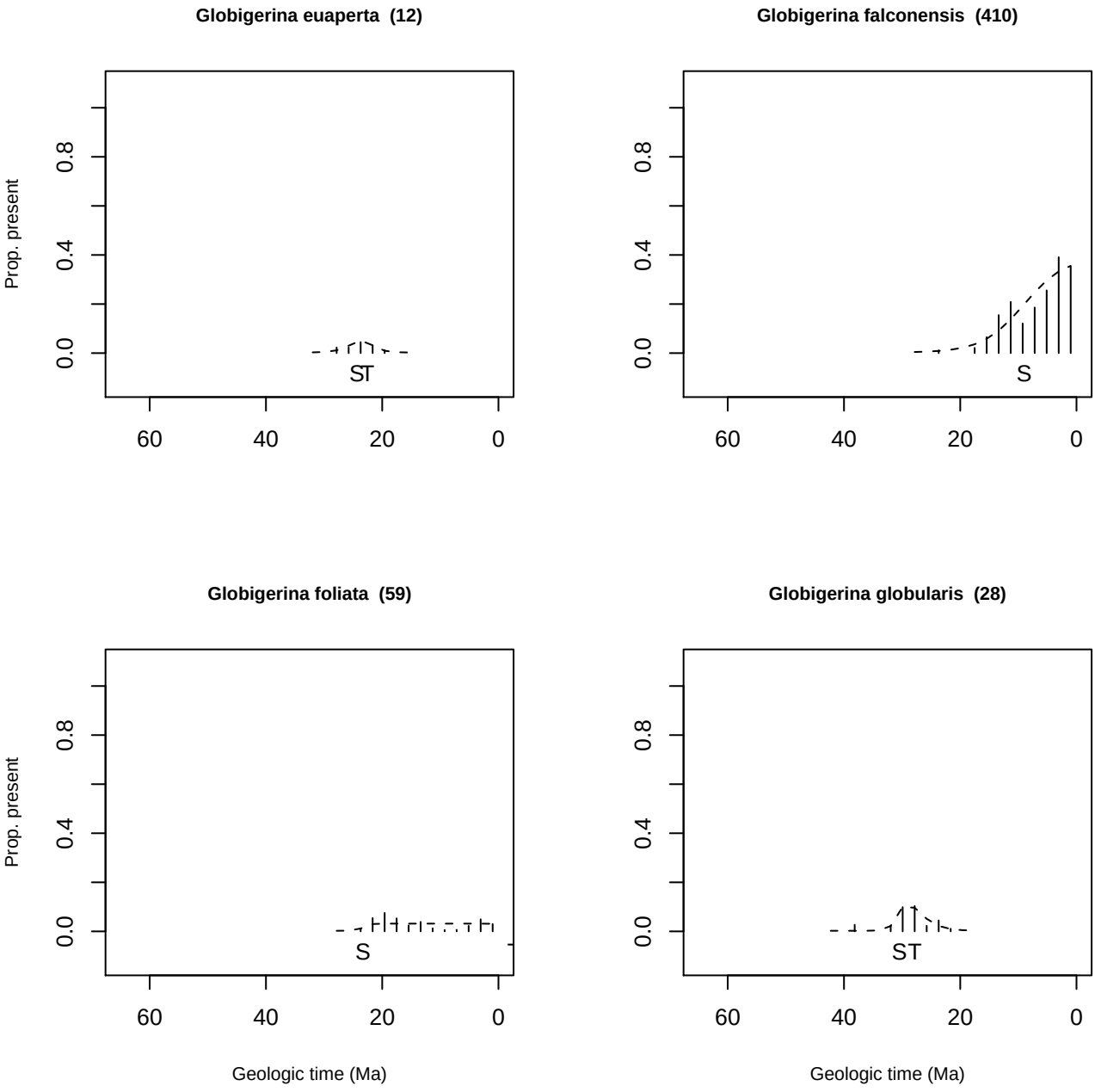
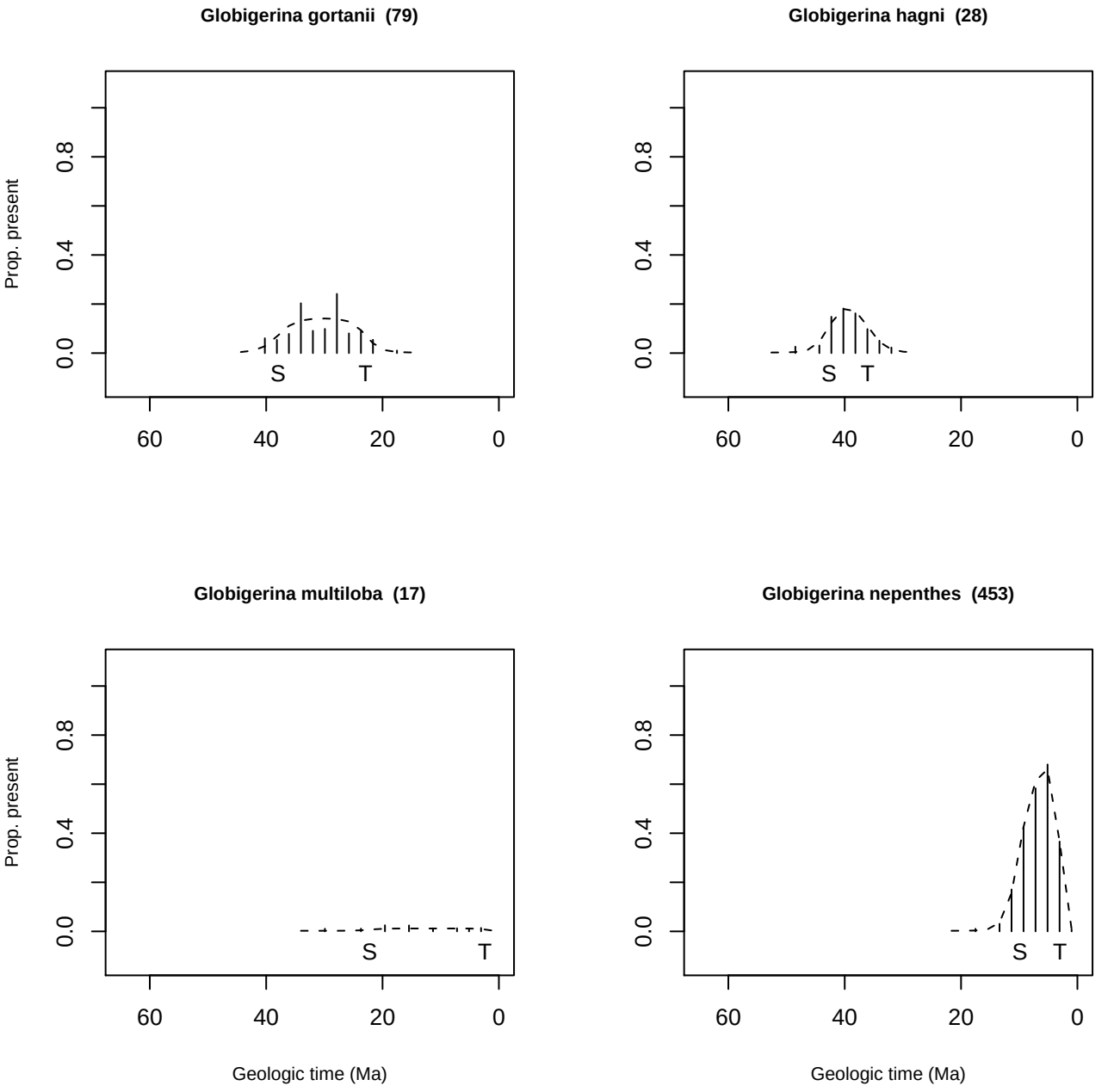
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)


Globigerina ciperoensis (163)
Globigerina corpulenta (60)
Globigerina druryi (93)
Globigerina eamesi (18)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)


Globigerina euaperta (12)
Globigerina falconensis (410)
Globigerina foliata (59)
Globigerina globularis (28)
Prop. present
0.0
0.4
0.8
ST
S
S
ST
60
40
20
0
Geologic time (Ma)


Globigerina gortanii (79)
Globigerina hagni (28)
Globigerina multiloba (17)
Globigerina nepenthes (453)
Prop. present
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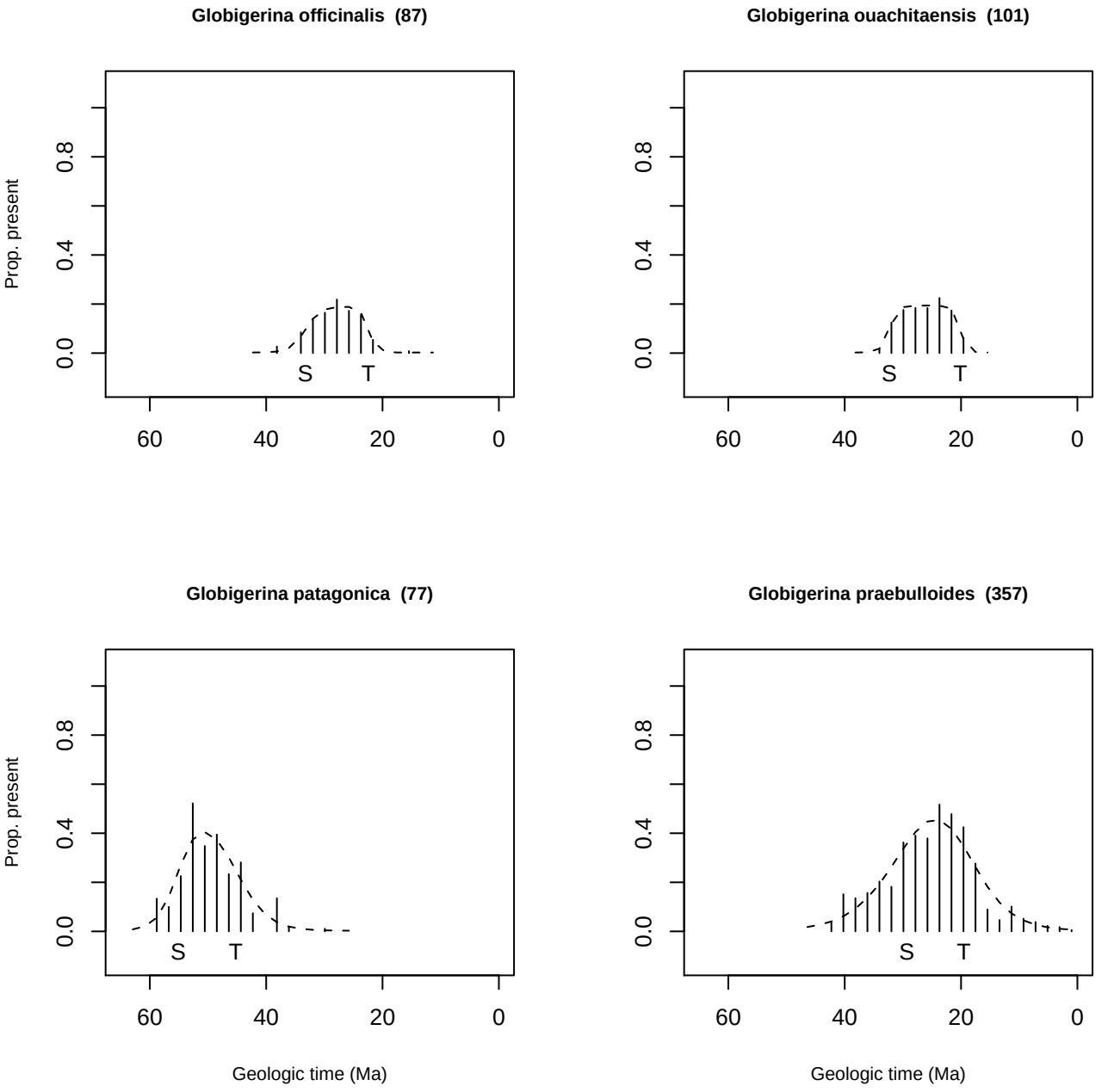
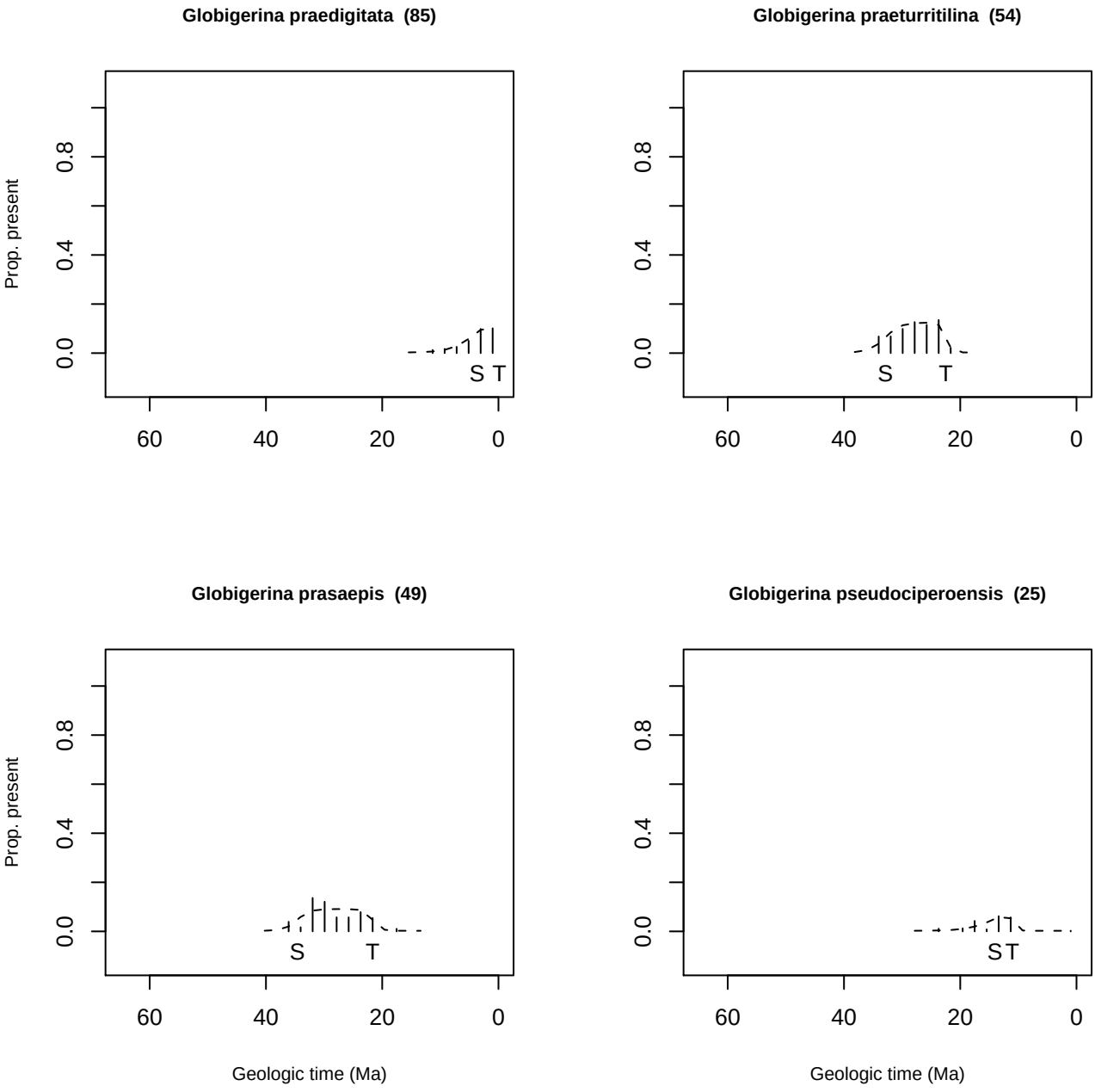
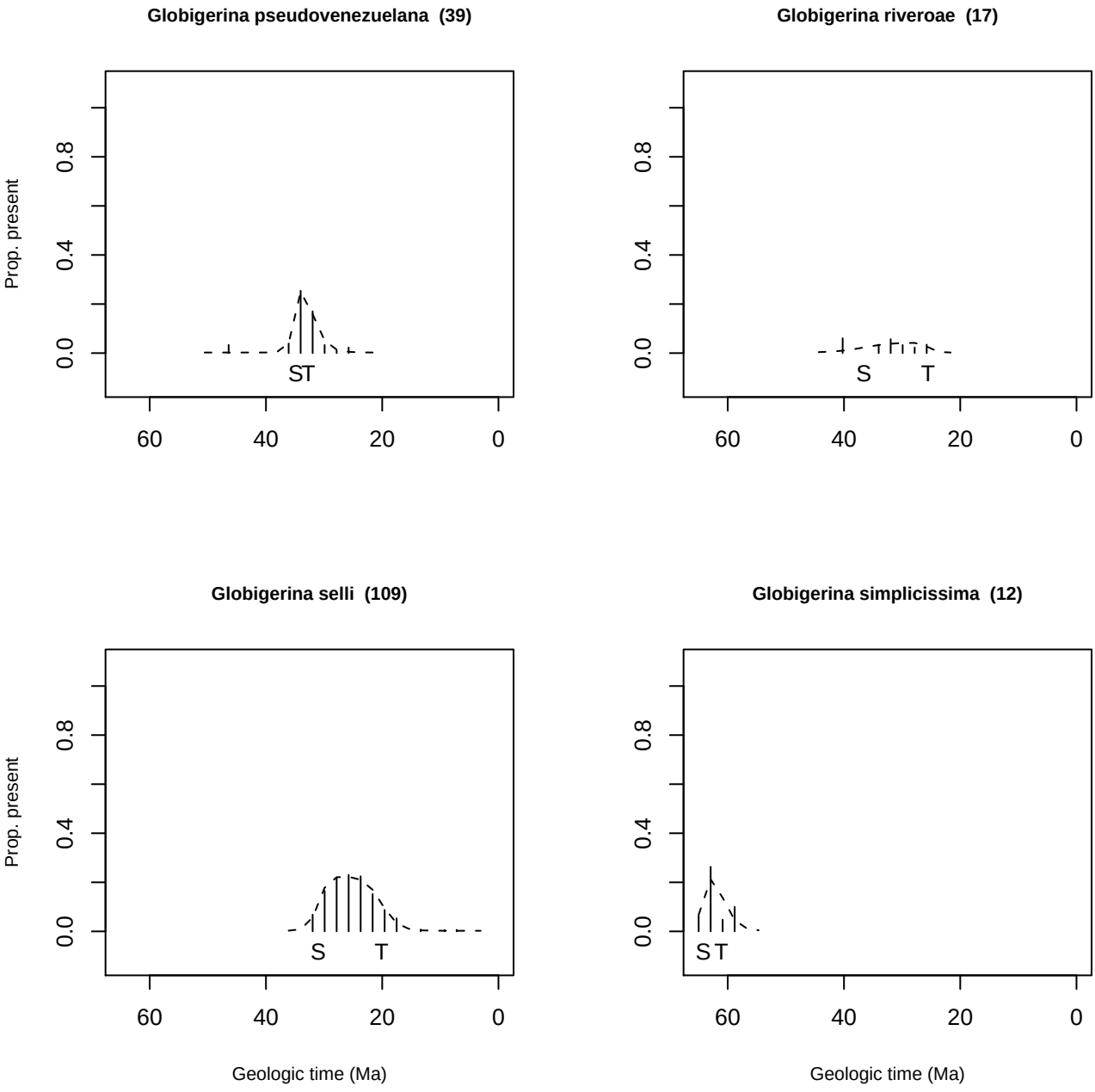
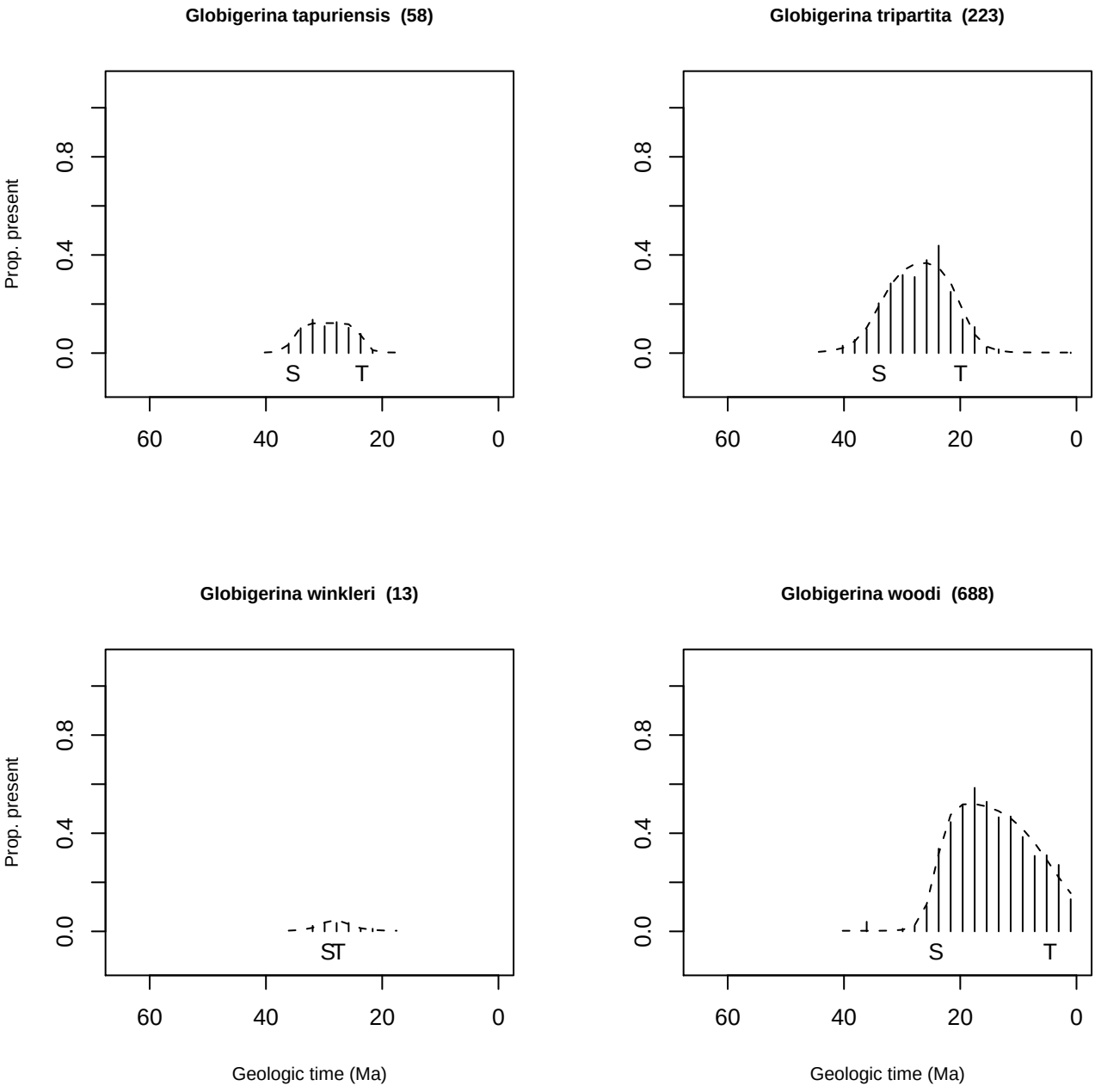
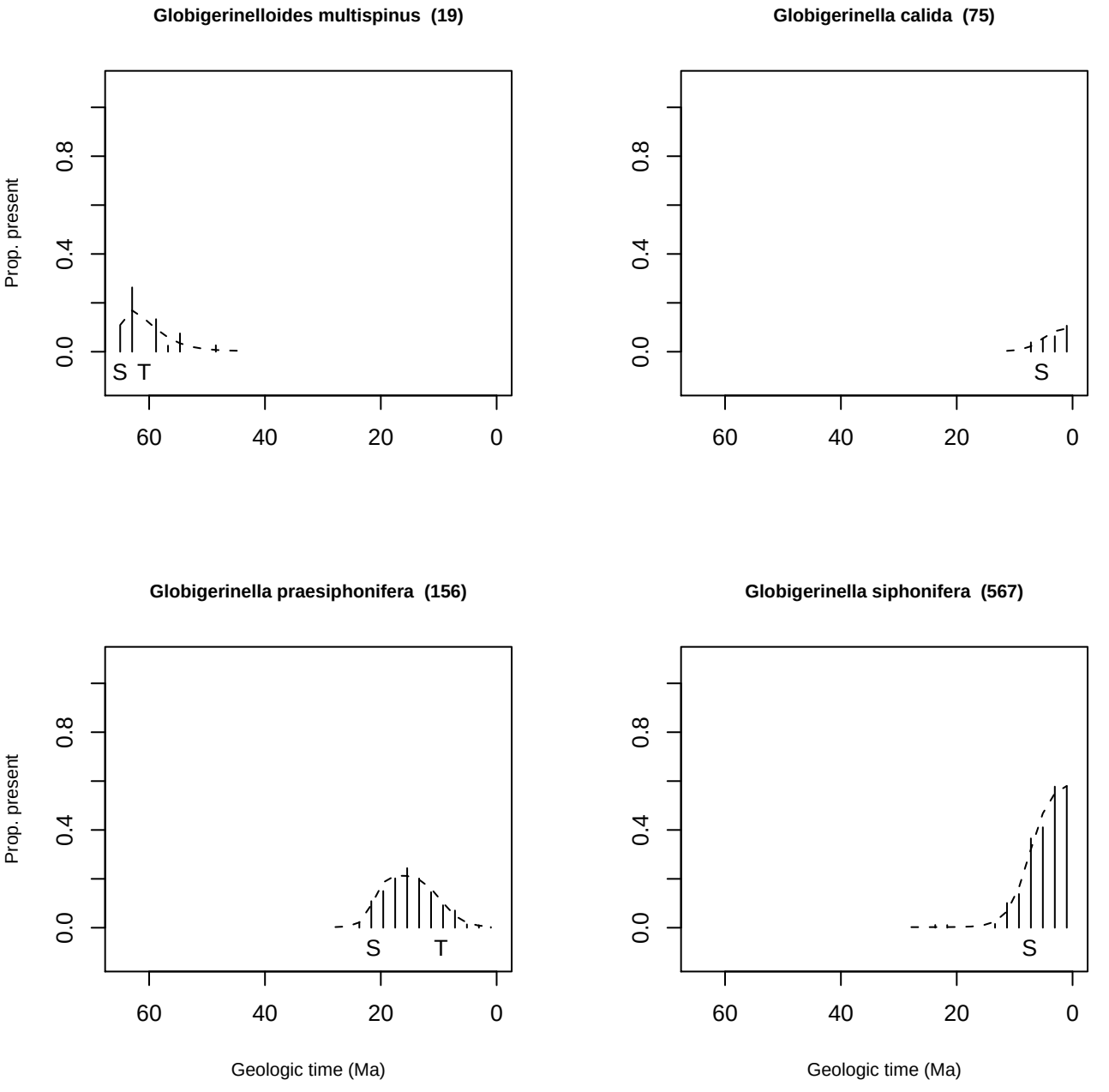
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

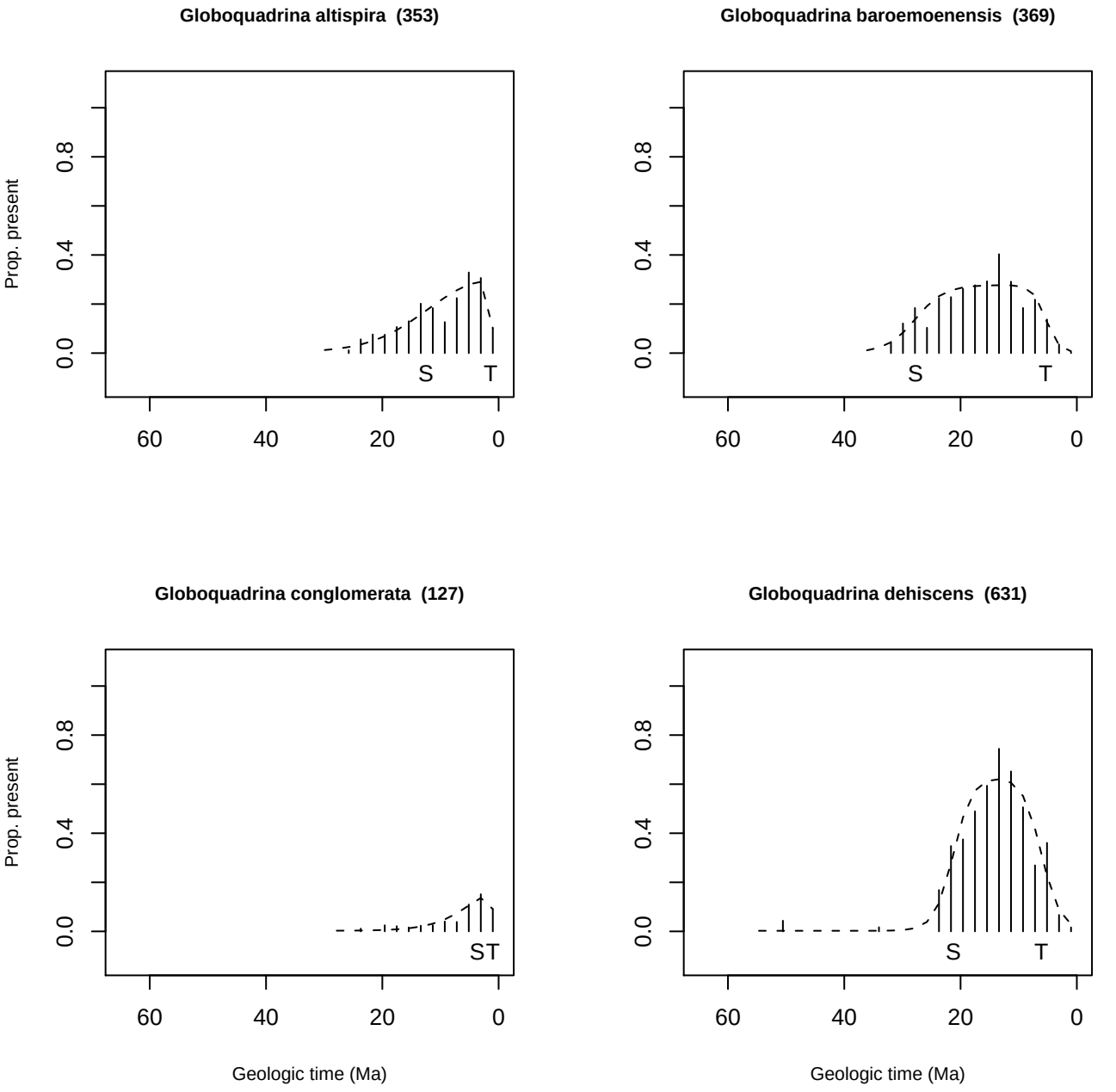

Globigerina officinalis (87)
Globigerina ouachitaensis (101)
Globigerina patagonica (77)
Globigerina praebulloides (357)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

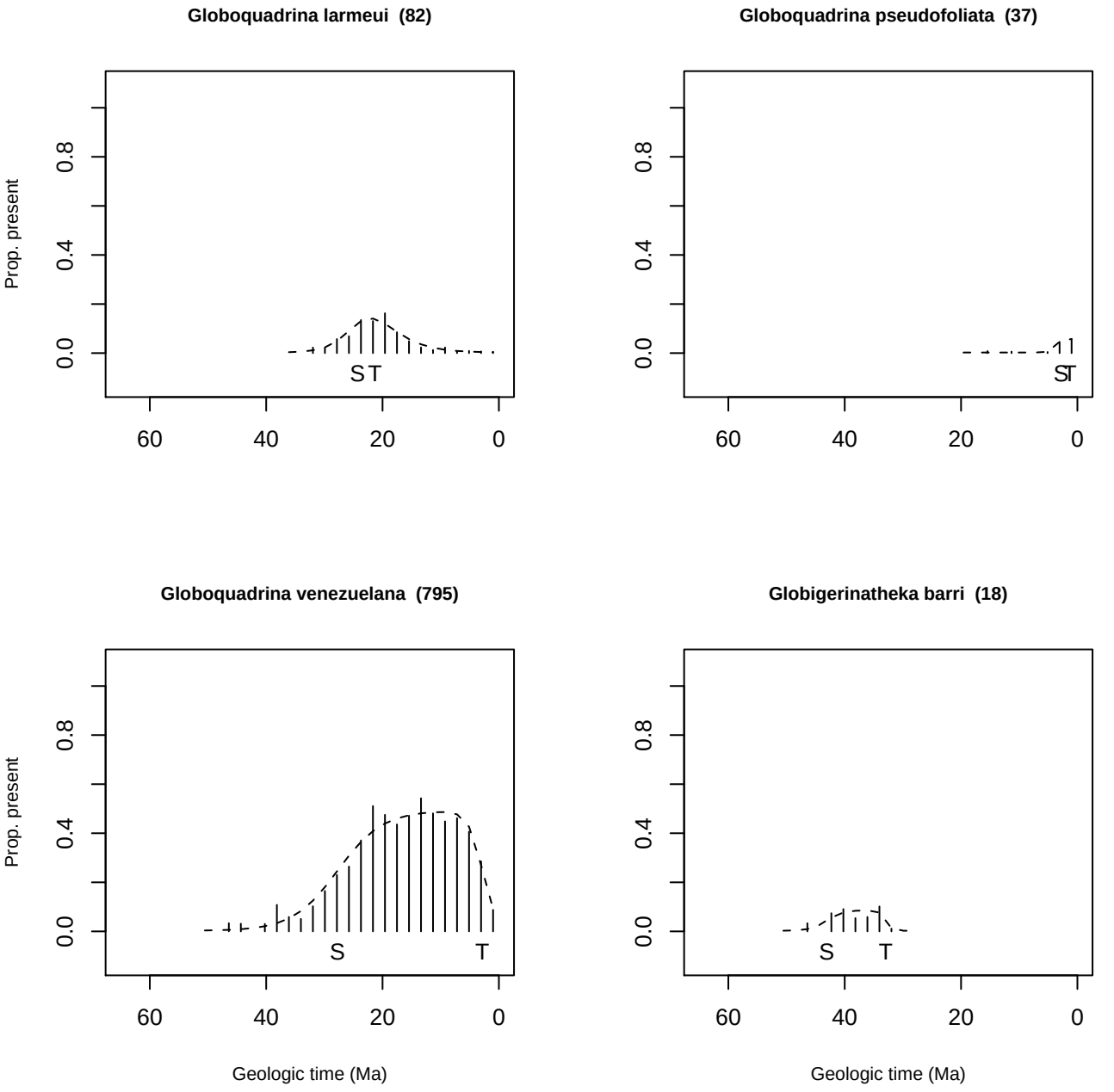

Globigerina praedigitata (85)
Globigerina praeturritilina (54)
Globigerina prasaepis (49)
Globigerina pseudociperoensis (25)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

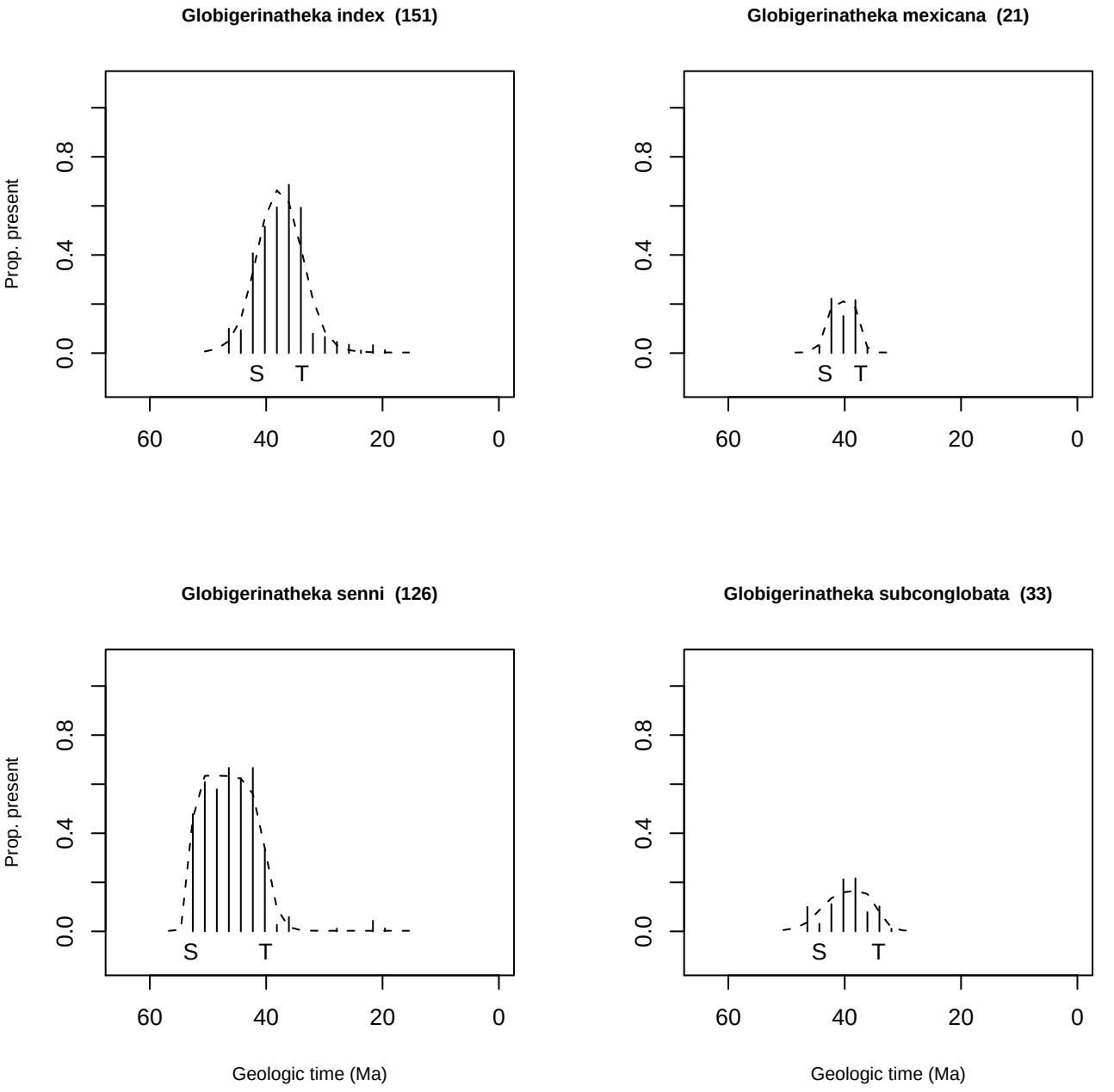

Globigerina pseudovenezuelana (39)
Globigerina riveroae (17)
Globigerina selli (109)
Globigerina simplicissima (12)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

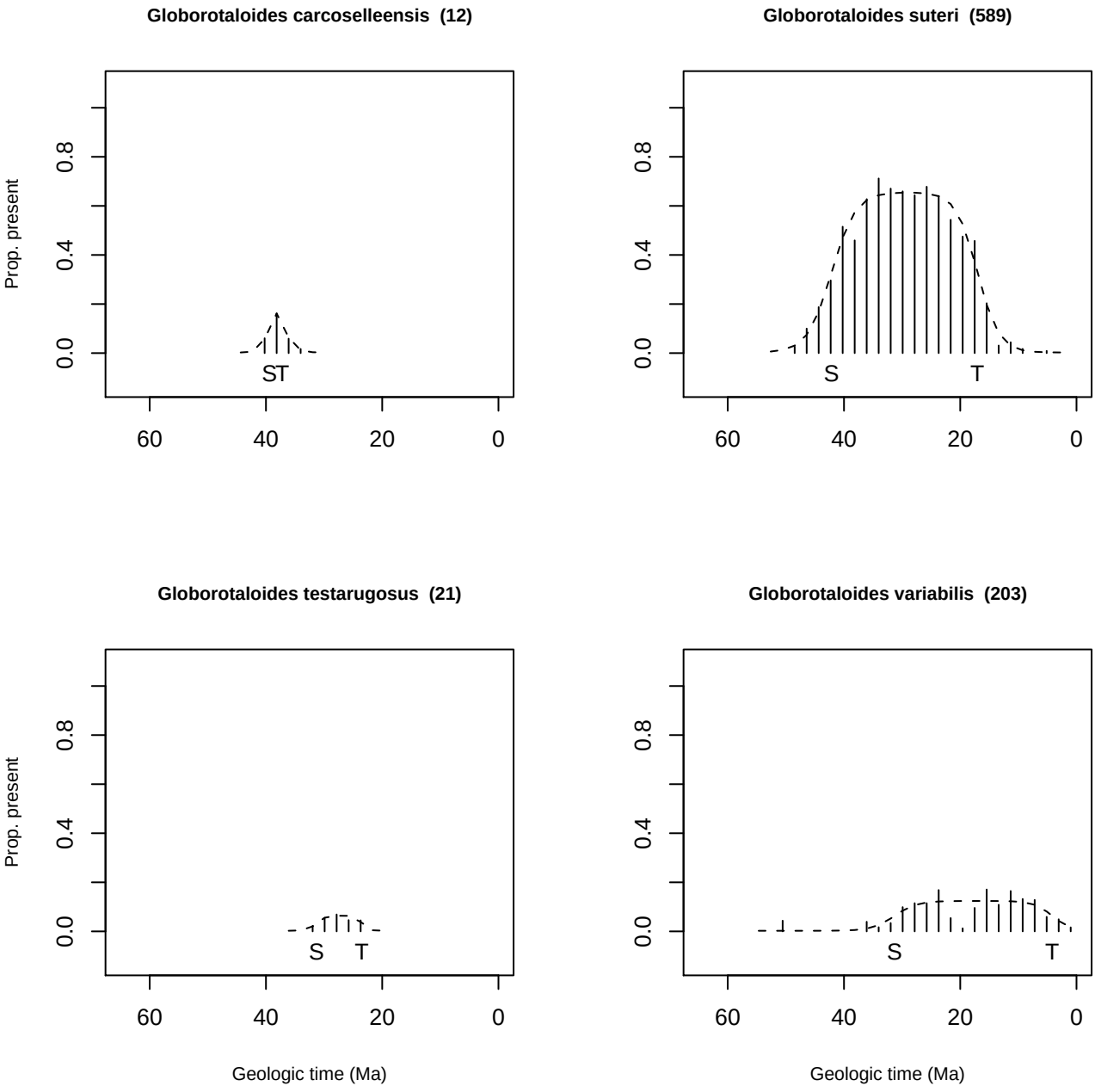

Globigerina tapuriensis (58)
Globigerina tripartita (223)
Globigerina winkleri (13)
Globigerina woodi (688)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

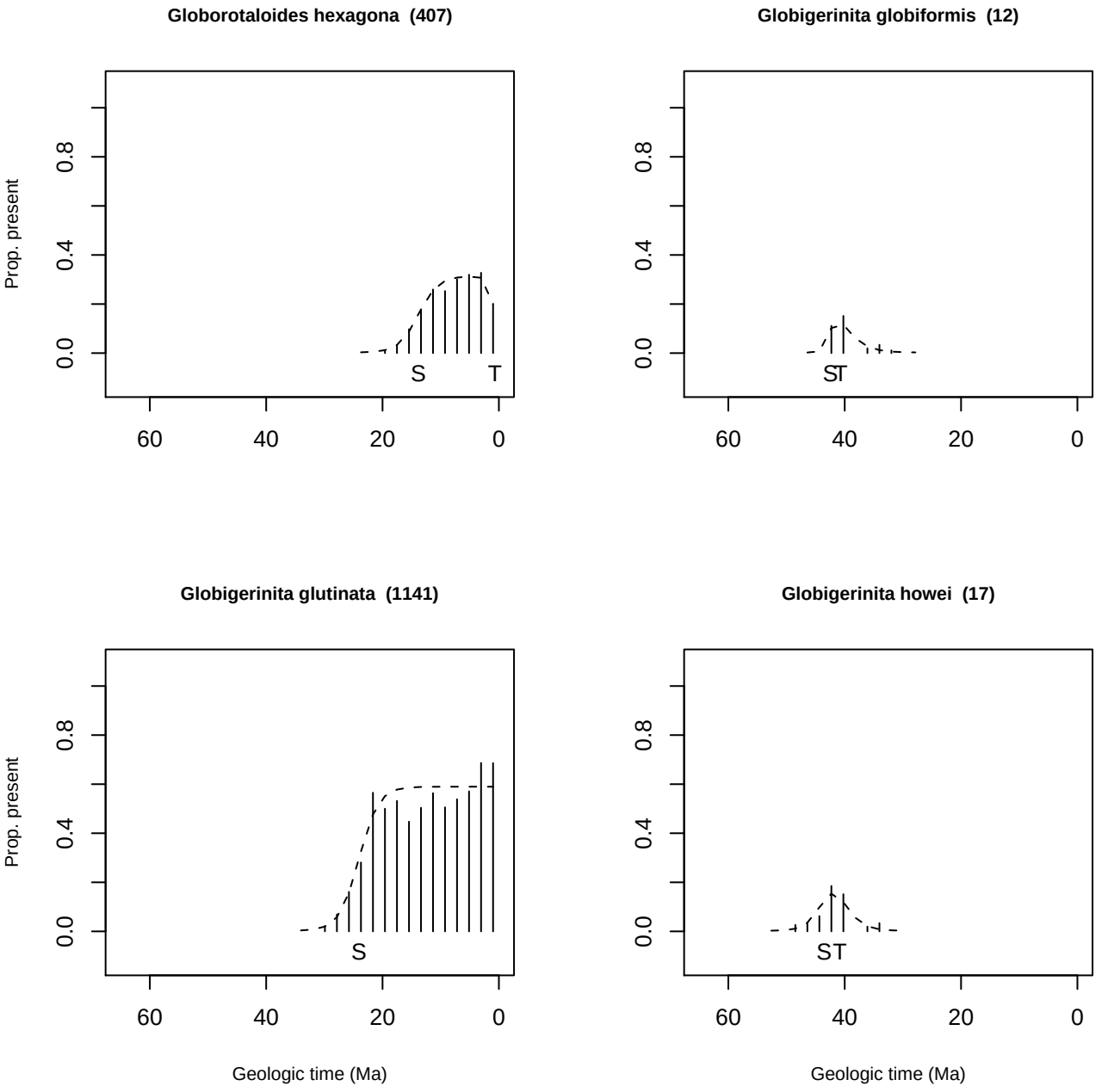

Globigerinelloides multispinus (19)
Globigerinella calida (75)
Globigerinella praesiphonifera (156)
Globigerinella siphonifera (567)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

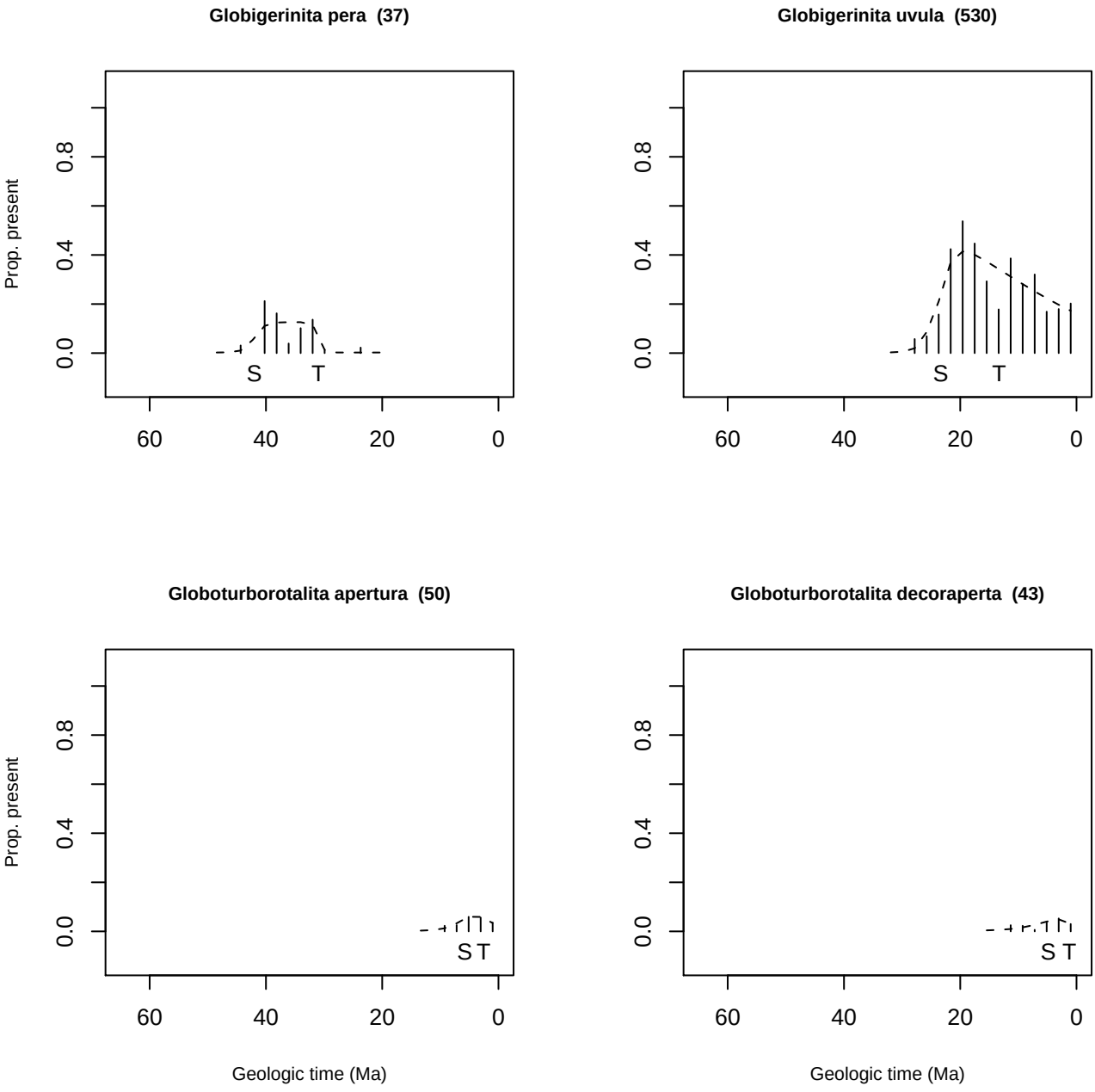

Globoquadrina altispira (353)
Globoquadrina baroemoenensis (369)
Globoquadrina conglomerata (127)
Globoquadrina dehiscens (631)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

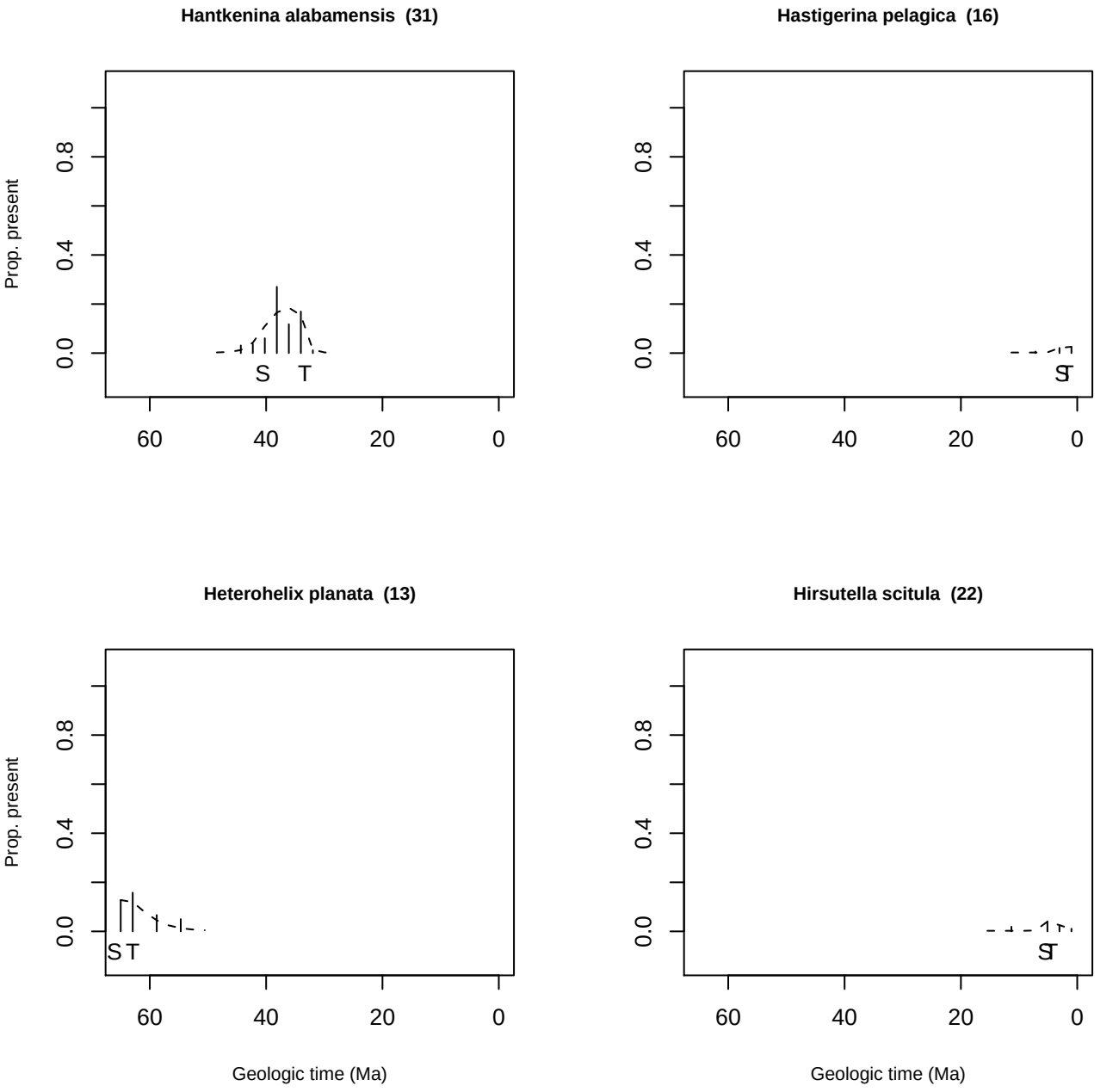

Globoquadrina larmeui (82)
Globoquadrina pseudofoliata (37)
Globoquadrina venezuelana (795)
Globigerinatheka barri (18)
Prop. present
0.0
0.4
0.8
60
40
20
0
S T
Geologic time (Ma)

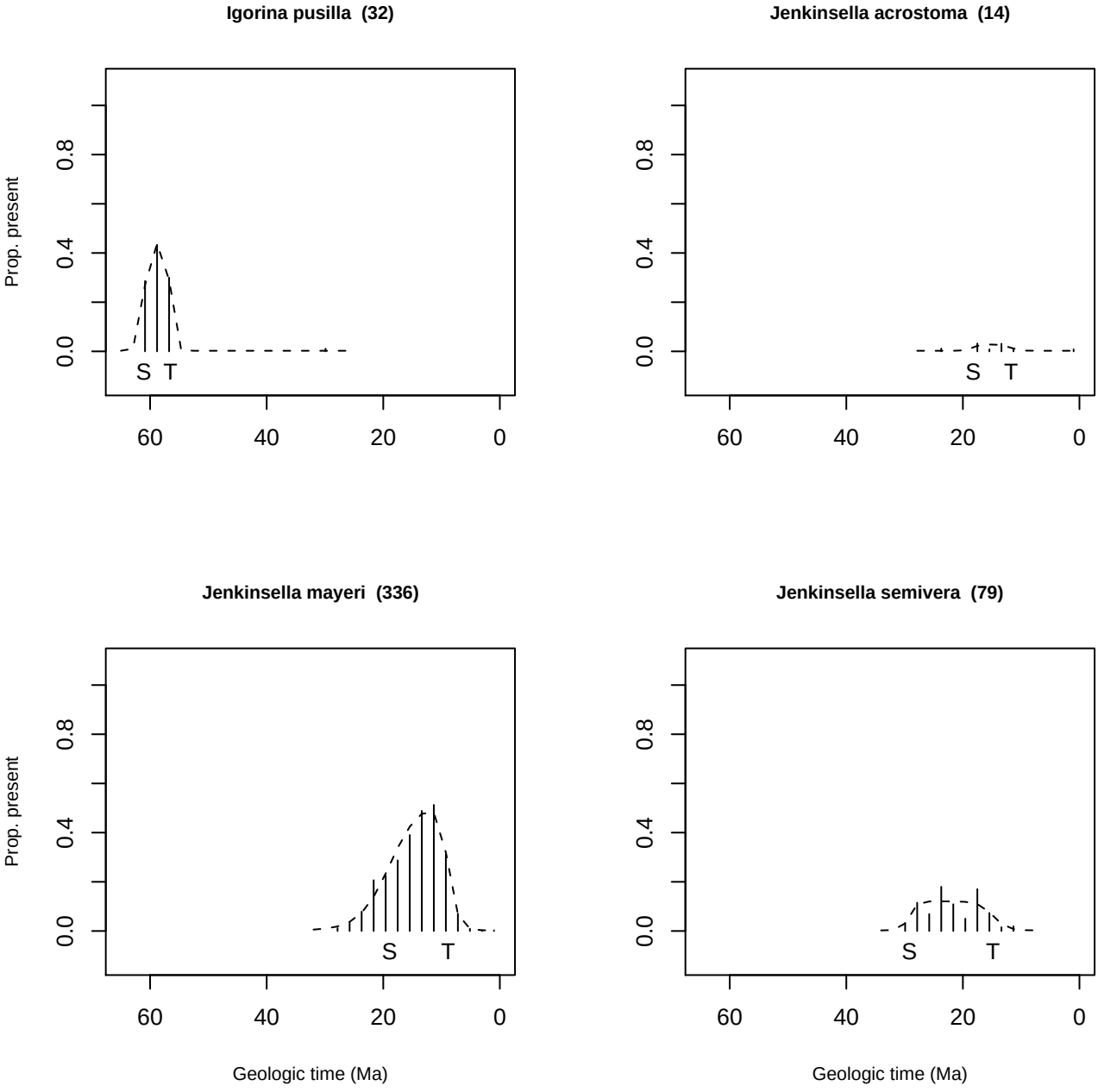

Globigerinatheka index (151)
Globigerinatheka mexicana (21)
Globigerinatheka senni (126)
Globigerinatheka subconglobata (33)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

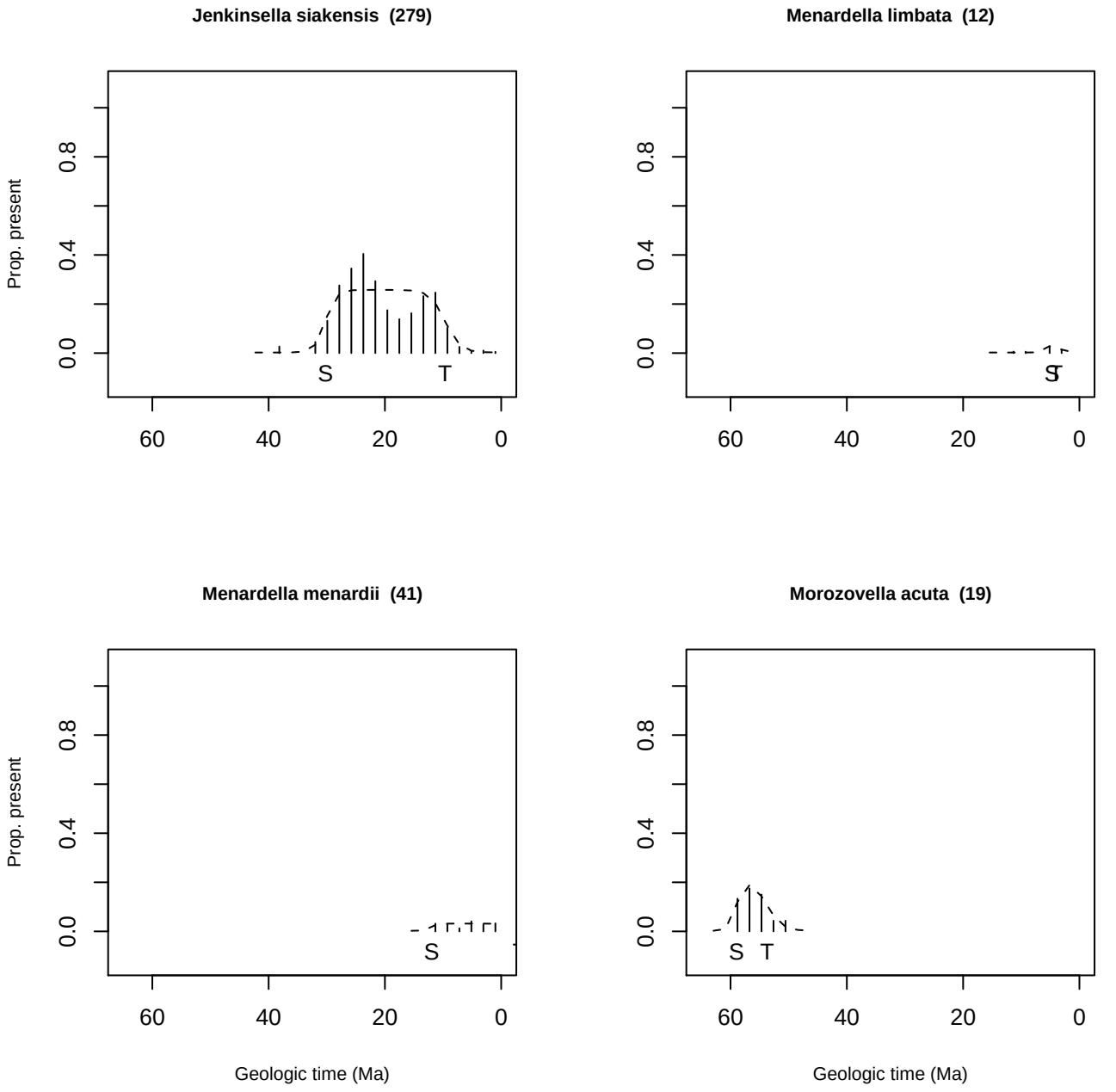

Globorotaloides carcoselleensis (12)
Globorotaloides suteri (589)
Globorotaloides testarugosus (21)
Globorotaloides variabilis (203)
Prop. present
0.0
0.4
0.8
ST
S
T
60
40
20
0
Geologic time (Ma)

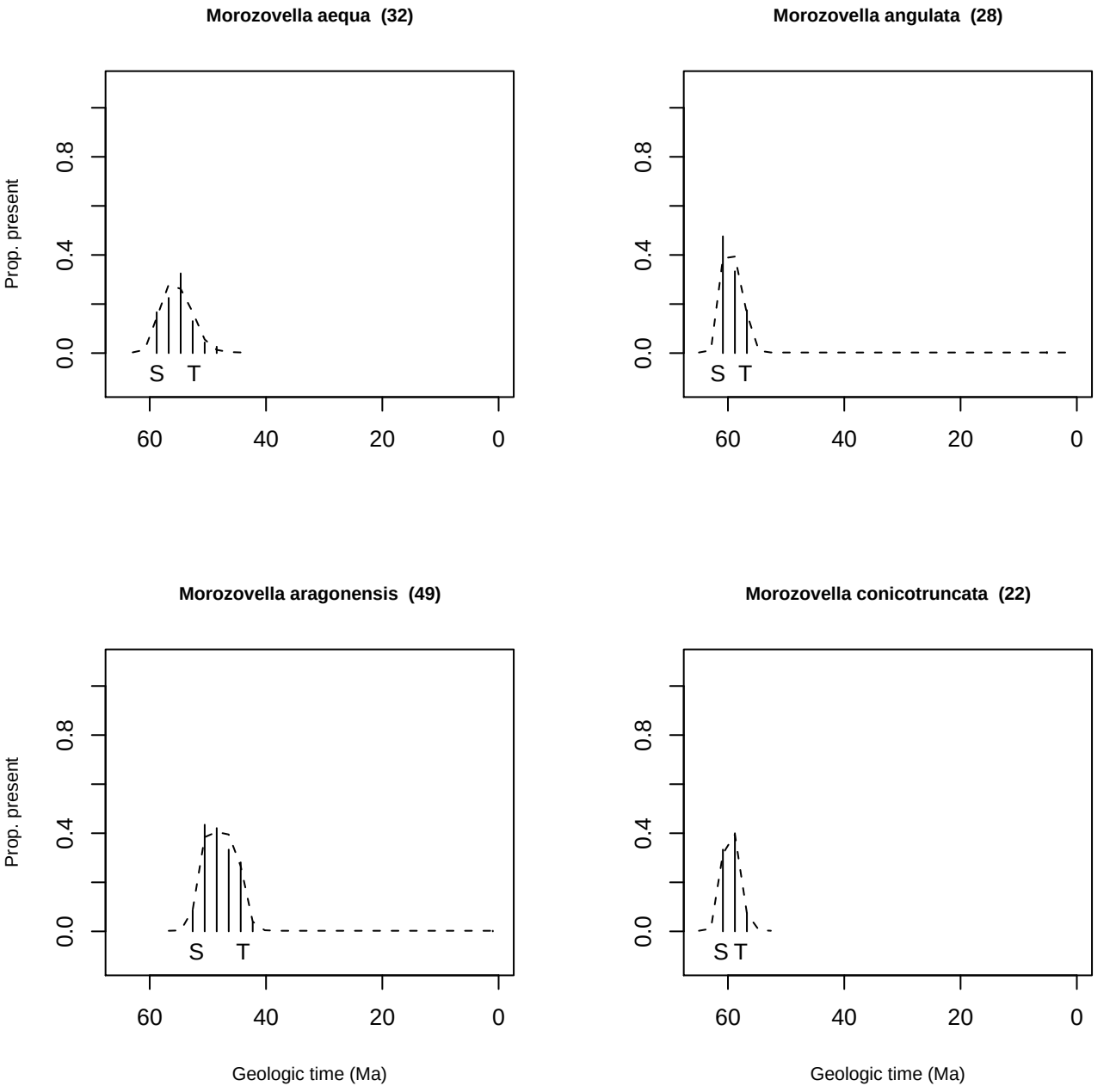

Globorotaloides hexagona (407)
Globigerinita globiformis (12)
Globigerinita glutinata (1141)
Globigerinita howei (17)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

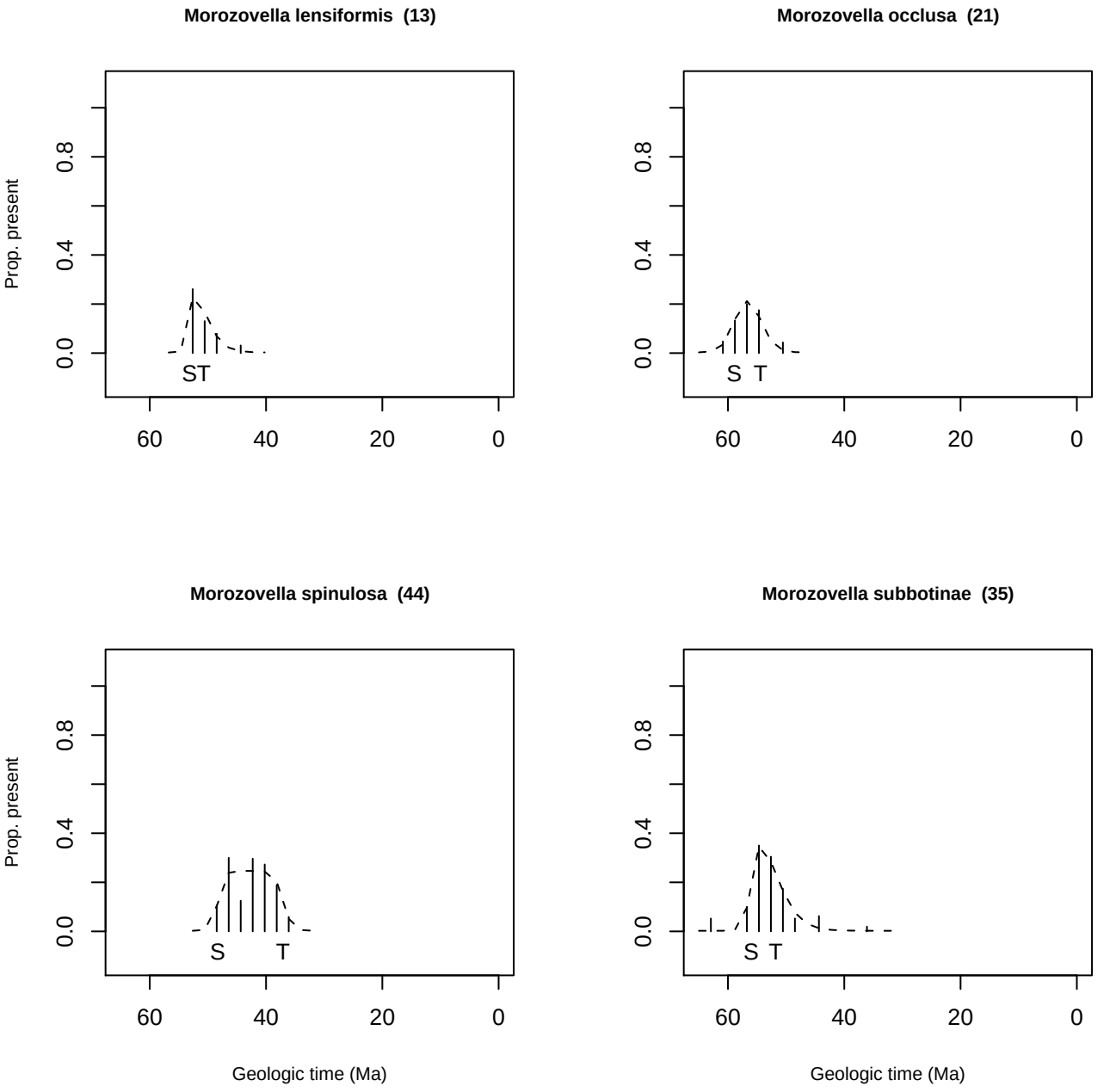

Globigerinita pera (37)
Globigerinita uvula (530)
Globoturborotalita apertura (50)
Globoturborotalita decoraperta (43)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

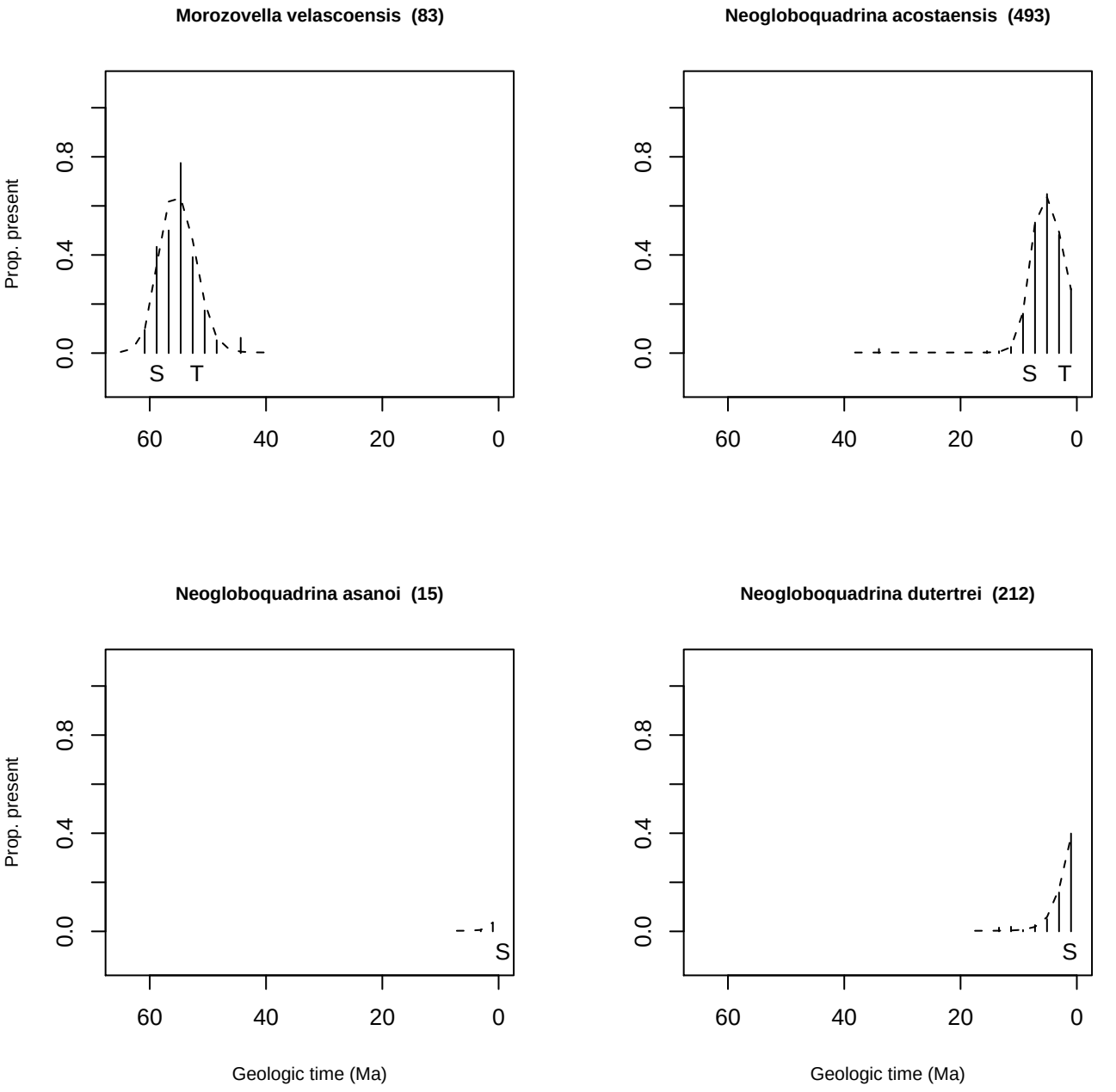

Hantkenina alabamensis (31)
Hastigerina pelagica (16)
Heterohelix planata (13)
Hirsutella scitula (22)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

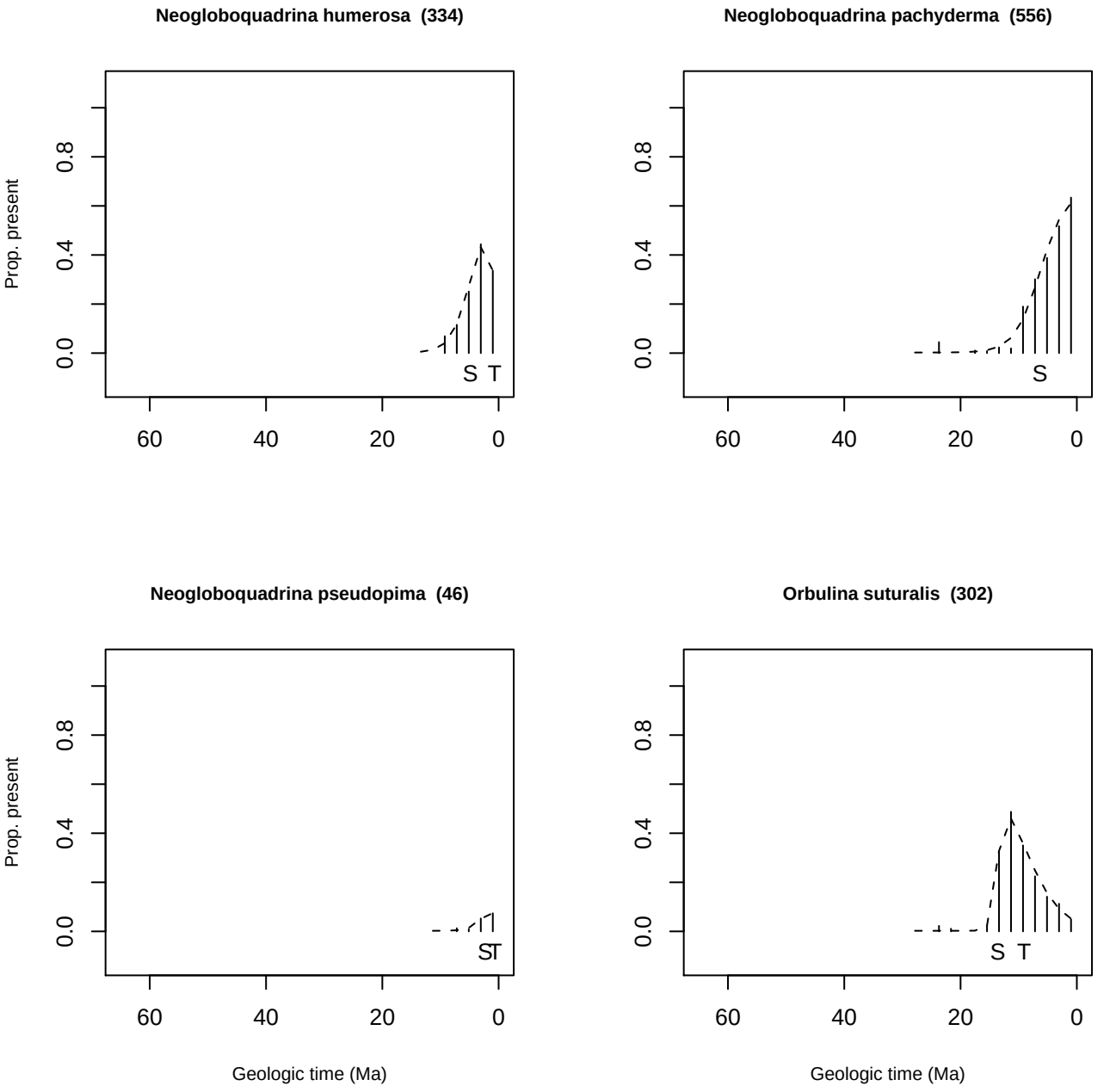

Igorina pusilla (32)
Jenkinsella acrostoma (14)
Jenkinsella mayeri (336)
Jenkinsella semivera (79)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

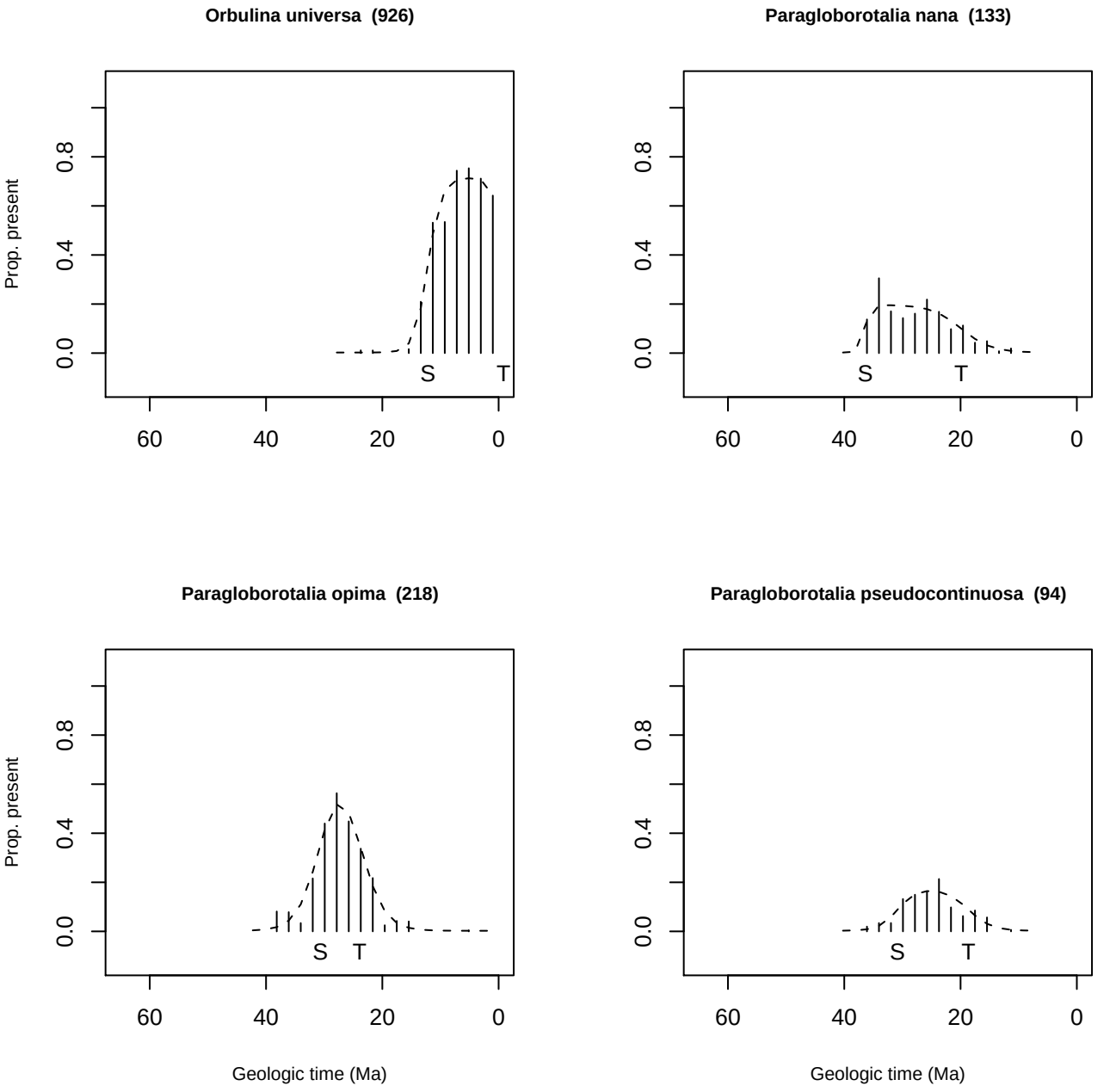

Jenkinsella siakensis (279)
Menardella limbata (12)
Menardella menardii (41)
Morozovella acuta (19)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

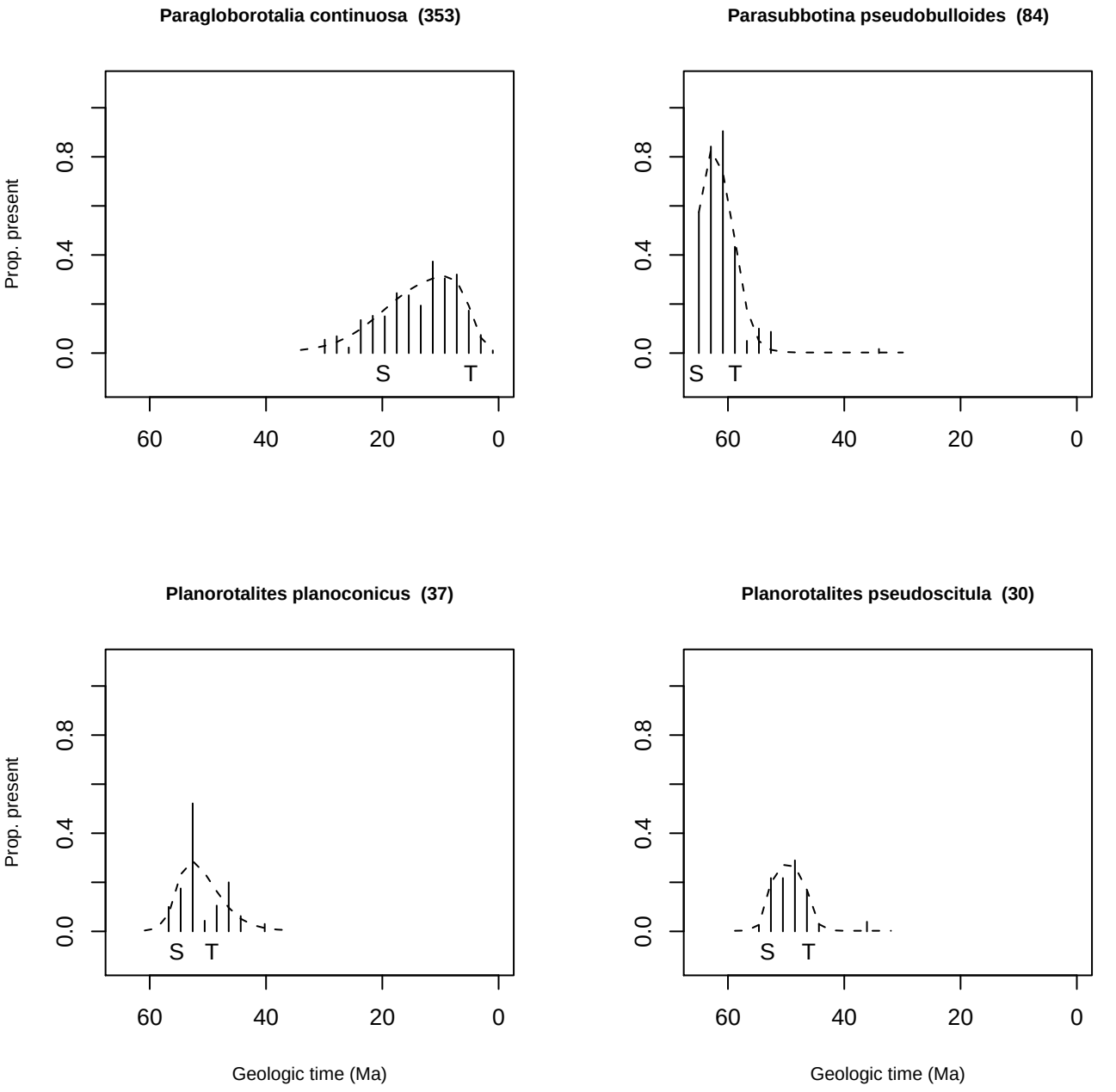

Morozovella aequa (32)
Morozovella angulata (28)
Morozovella aragonensis (49)
Morozovella conicotruncata (22)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

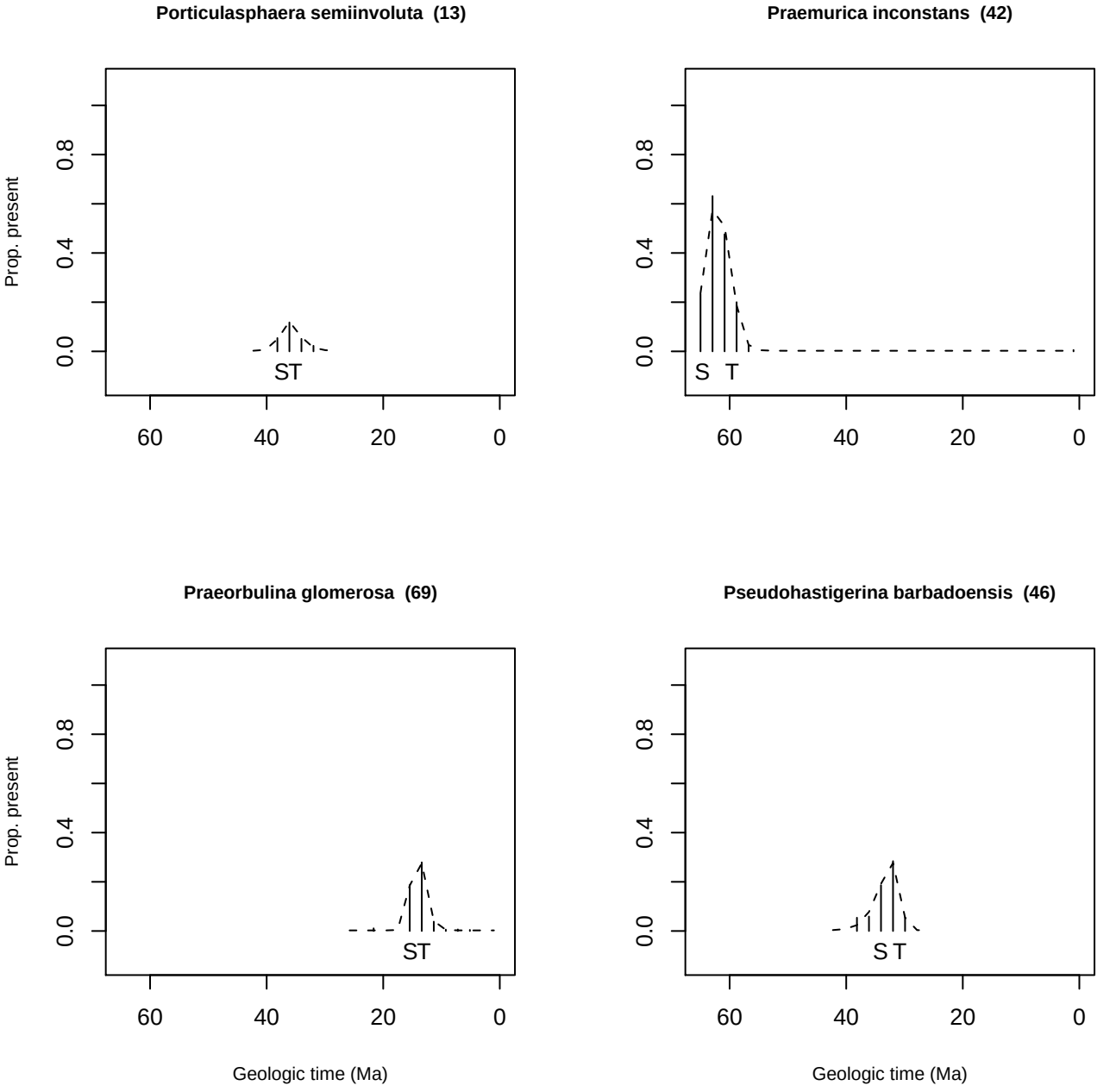

Morozovella lensiformis (13)
Morozovella occlusa (21)
Morozovella spinulosa (44)
Morozovella subbotinae (35)
Prop. present
0.0
0.4
0.8
60
40
20
0
ST
S T
S T
S T
Geologic time (Ma)
Geologic time (Ma)

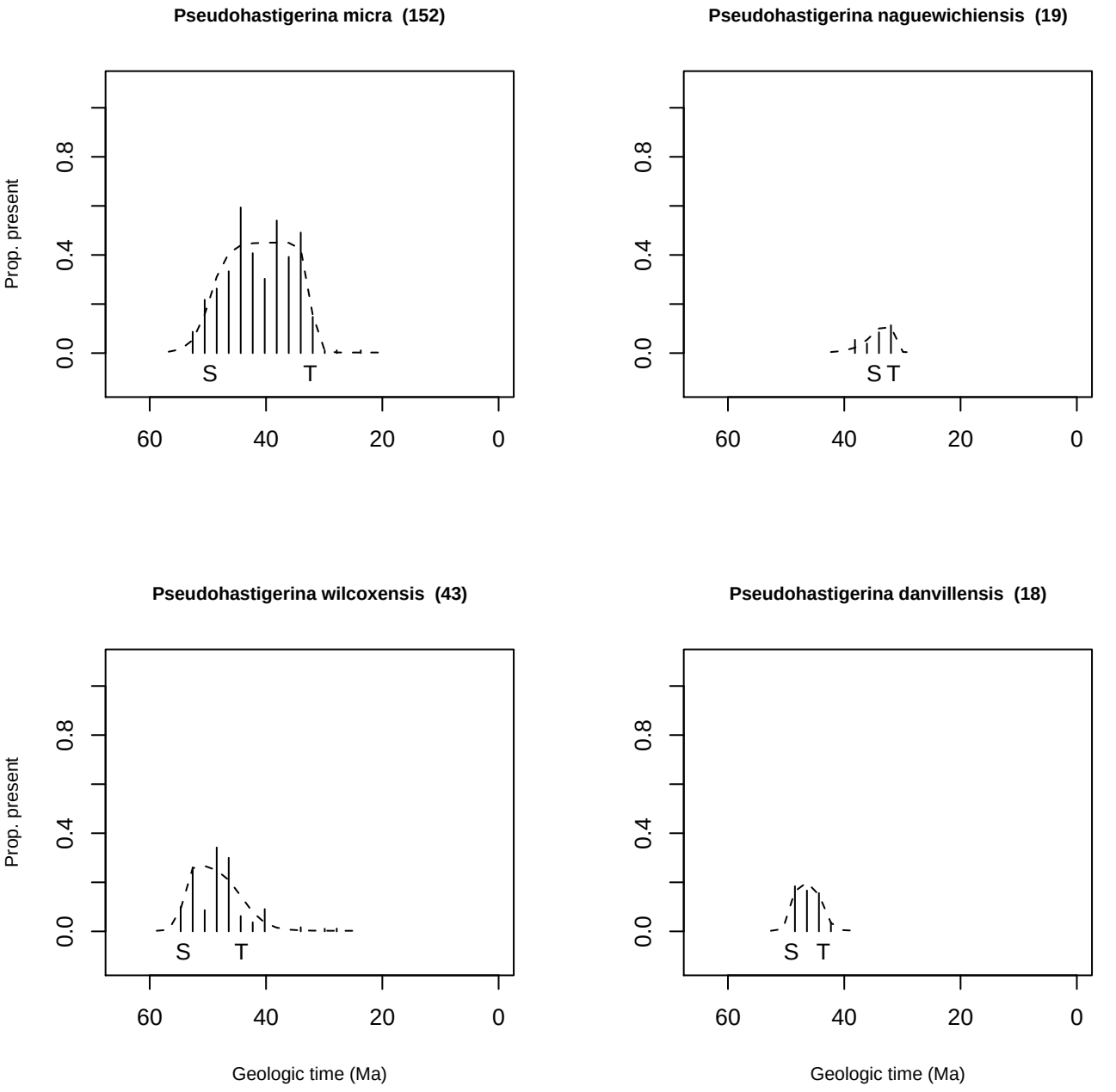

Morozovella velascoensis (83)
Neogloboquadrina acostaensis (493)
Neogloboquadrina asanoi (15)
Neogloboquadrina dutertrei (212)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

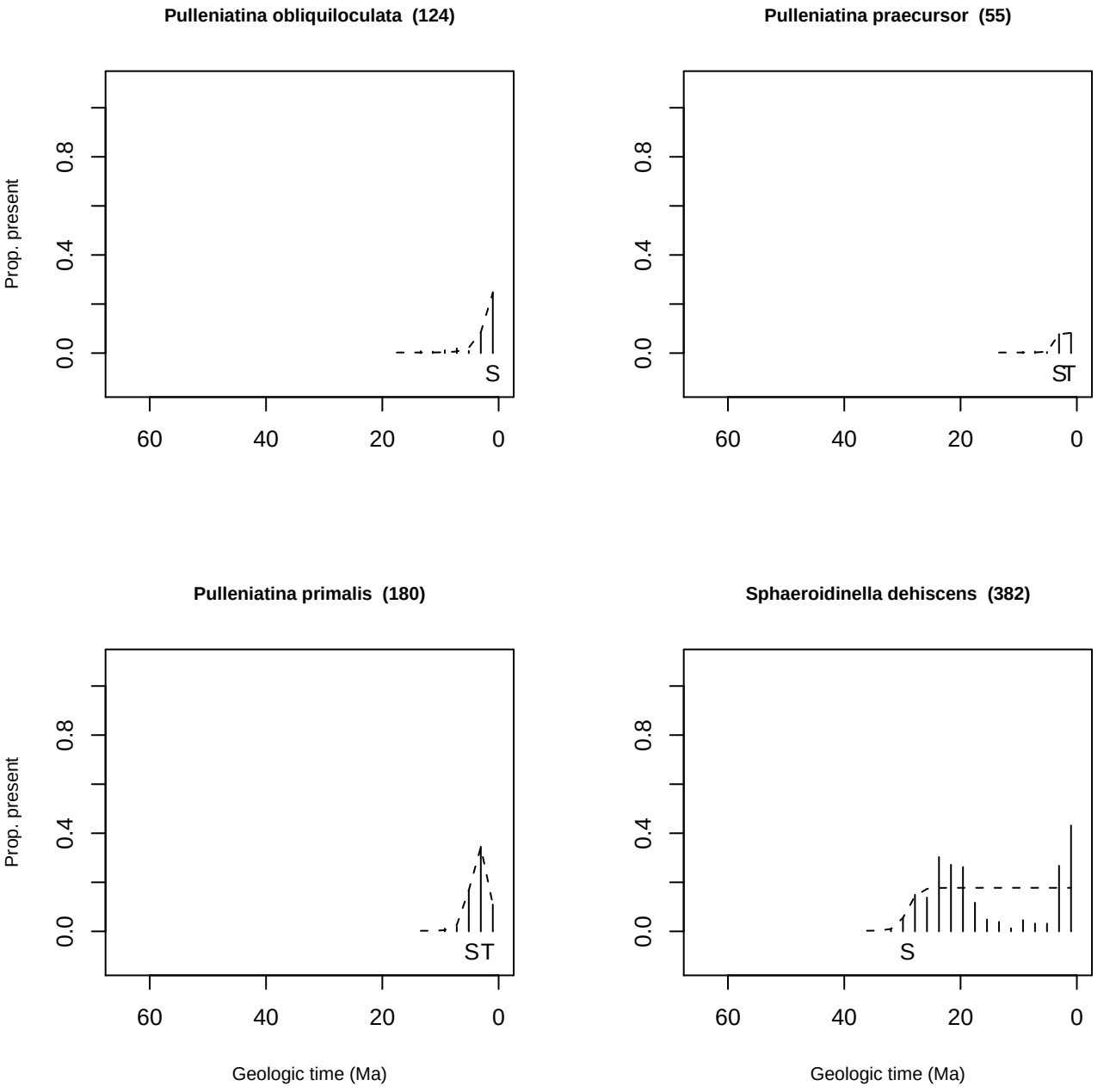

Neogloboquadrina humerosa (334)
Neogloboquadrina pachyderma (556)
Neogloboquadrina pseudopima (46)
Orbulina suturalis (302)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

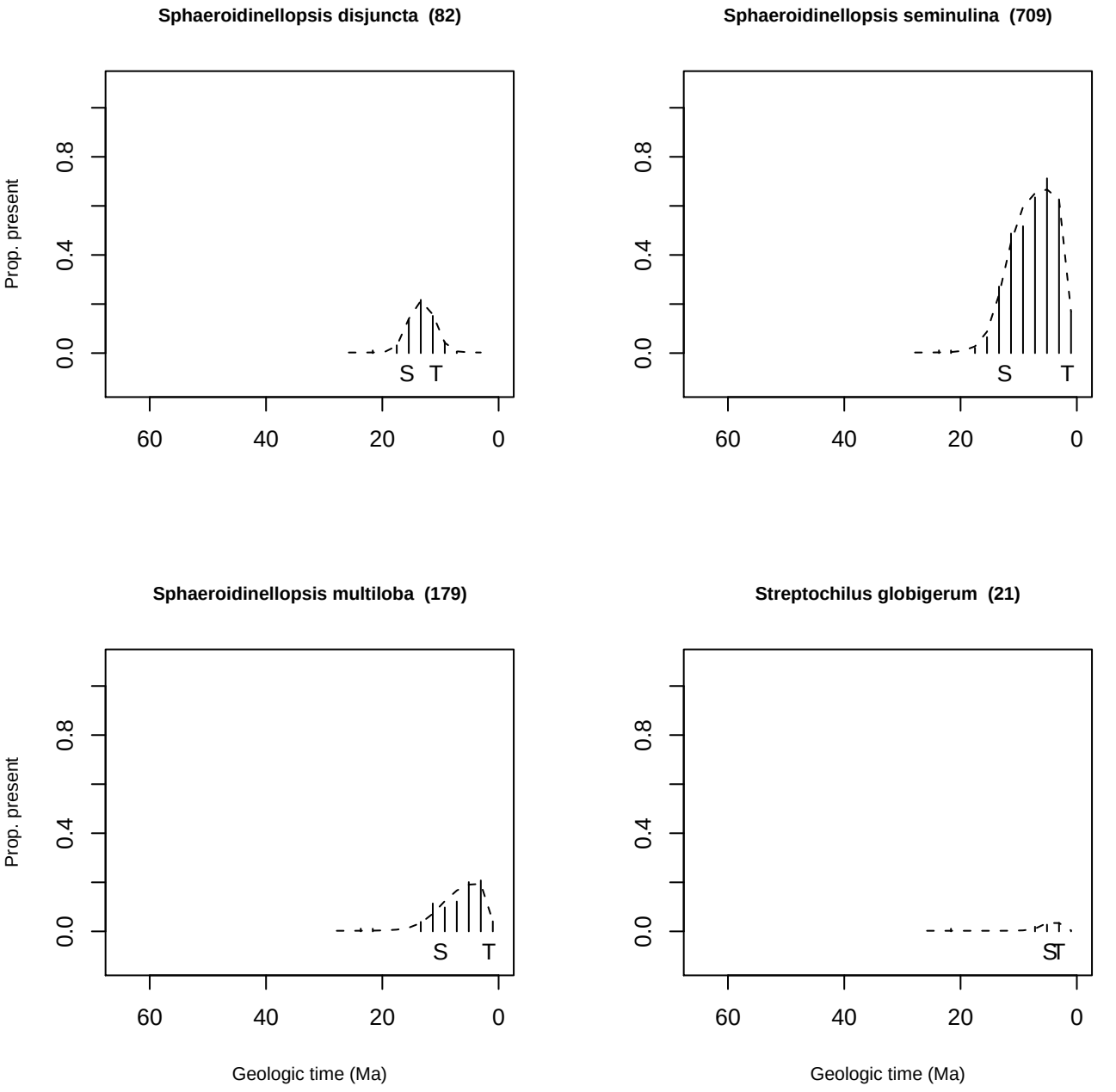

Orbulina universa (926)
Paragloborotalia nana (133)
Paragloborotalia opima (218)
Paragloborotalia pseudocontinuosa (94)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

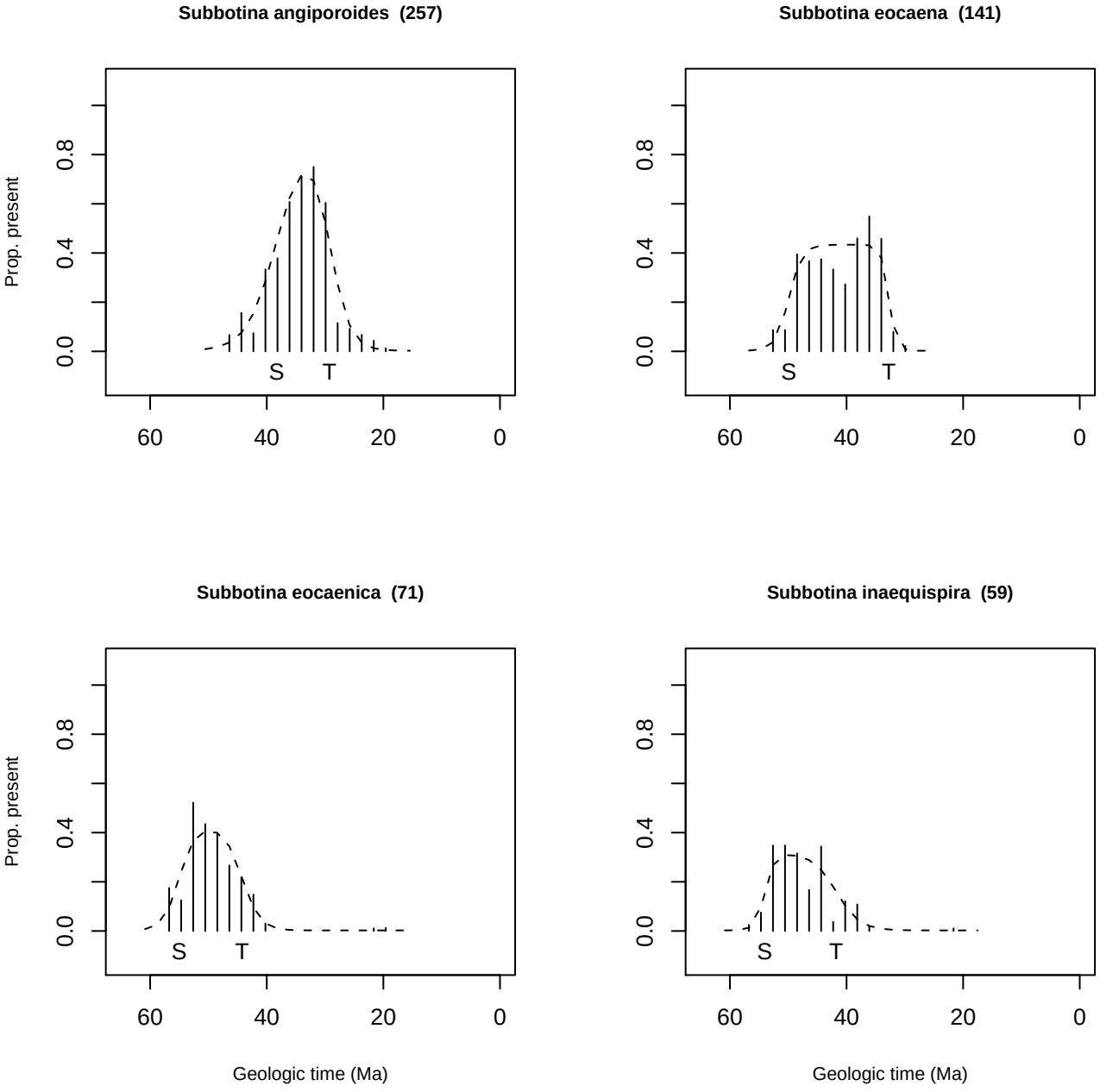

Paragloborotalia continuosa (353)
Parasubbotina pseudobulloides (84)
Planorotalites planoconicus (37)
Planorotalites pseudoscitula (30)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

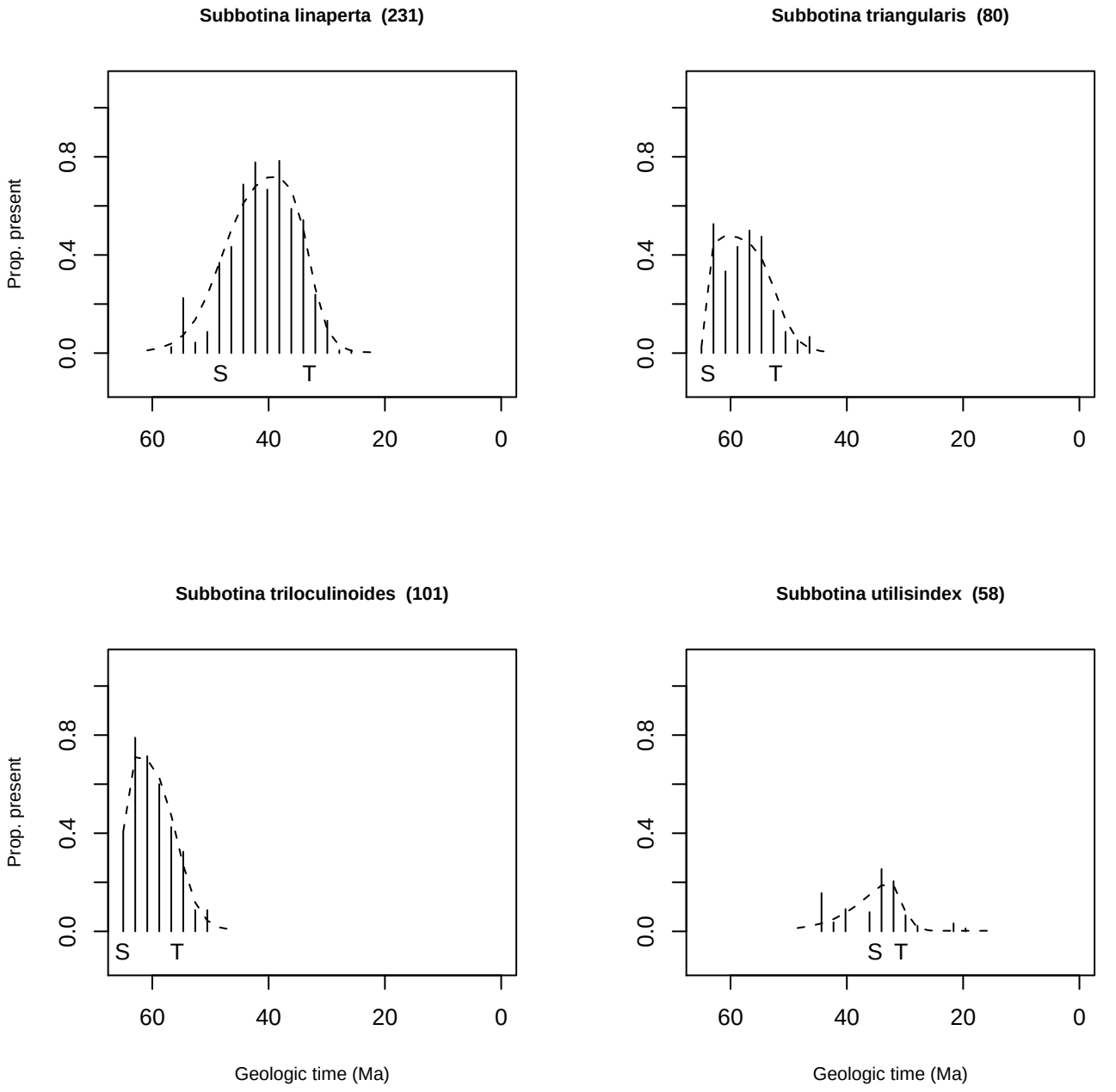

Porticulasphaera semiinvoluta (13)
Praemurica inconstans (42)
Praeorbulina glomerosa (69)
Pseudohastigerina barbadoensis (46)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
ST
Geologic time (Ma)

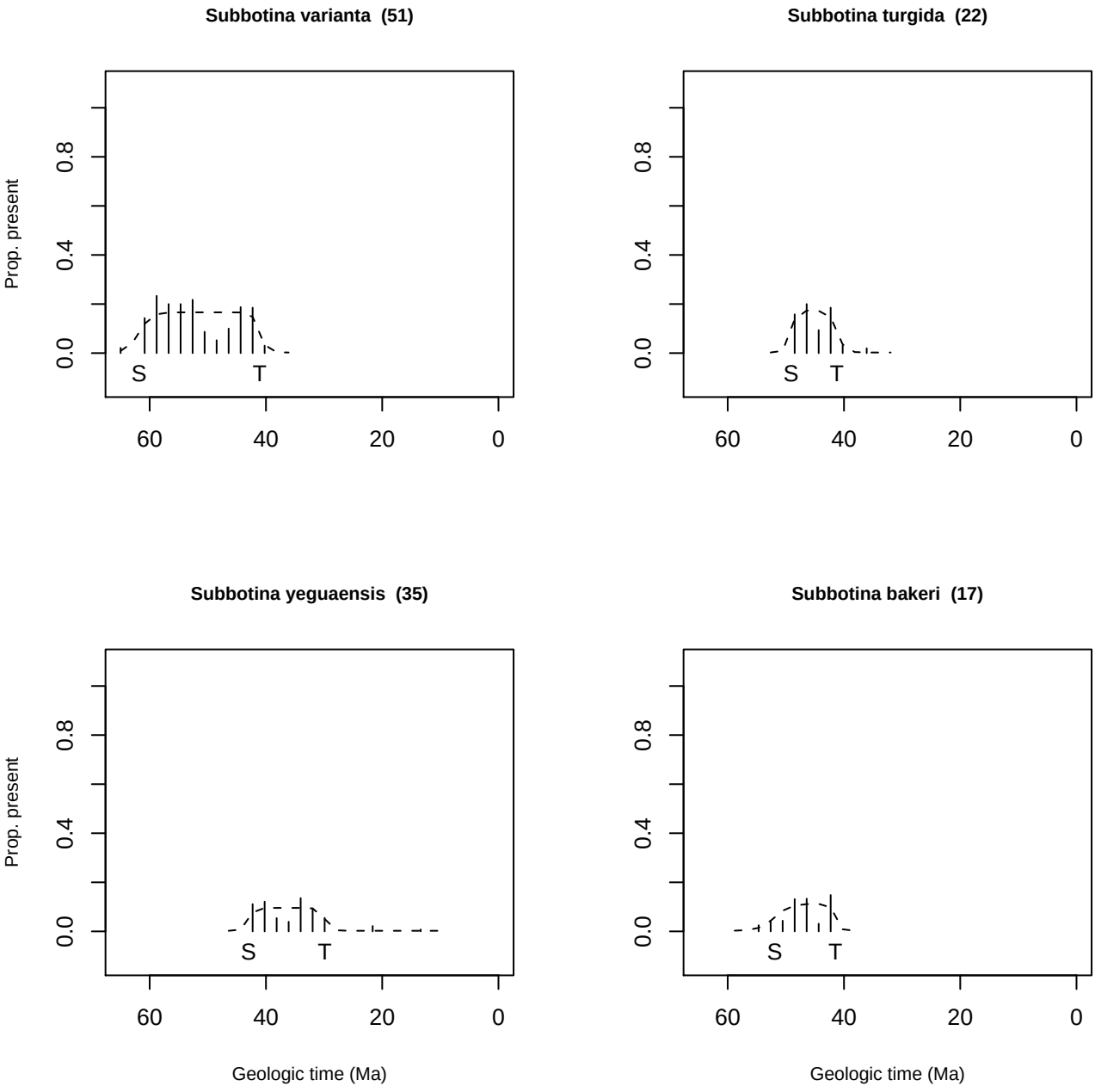

Pseudohastigerina micra (152)
Pseudohastigerina naguewichiensis (19)
Pseudohastigerina wilcoxensis (43)
Pseudohastigerina danvillensis (18)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

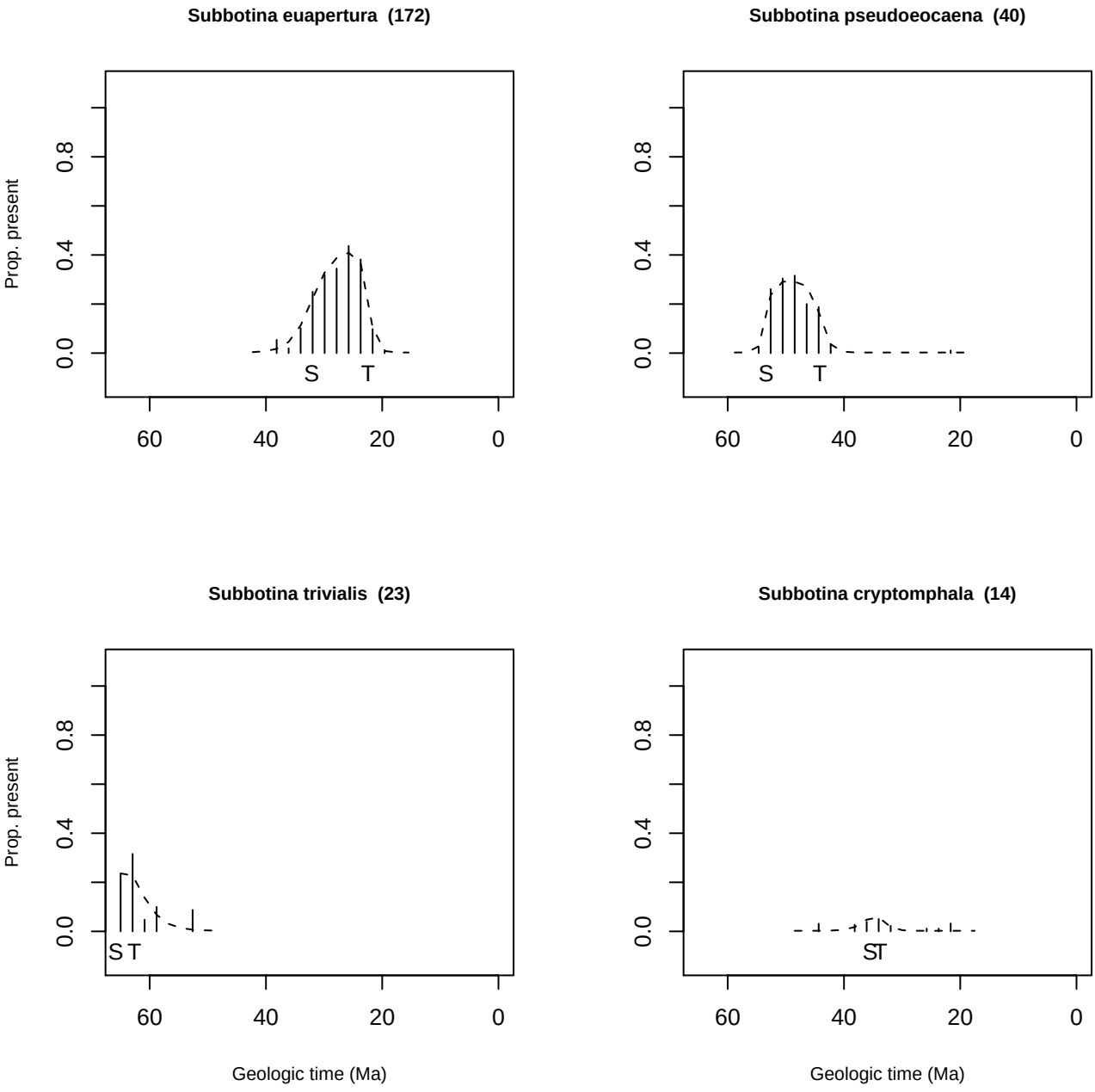

Pulleniatina obliquiloculata (124)
Pulleniatina praecursor (55)
Pulleniatina primalis (180)
Sphaeroidinella dehiscens (382)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
ST
Geologic time (Ma)

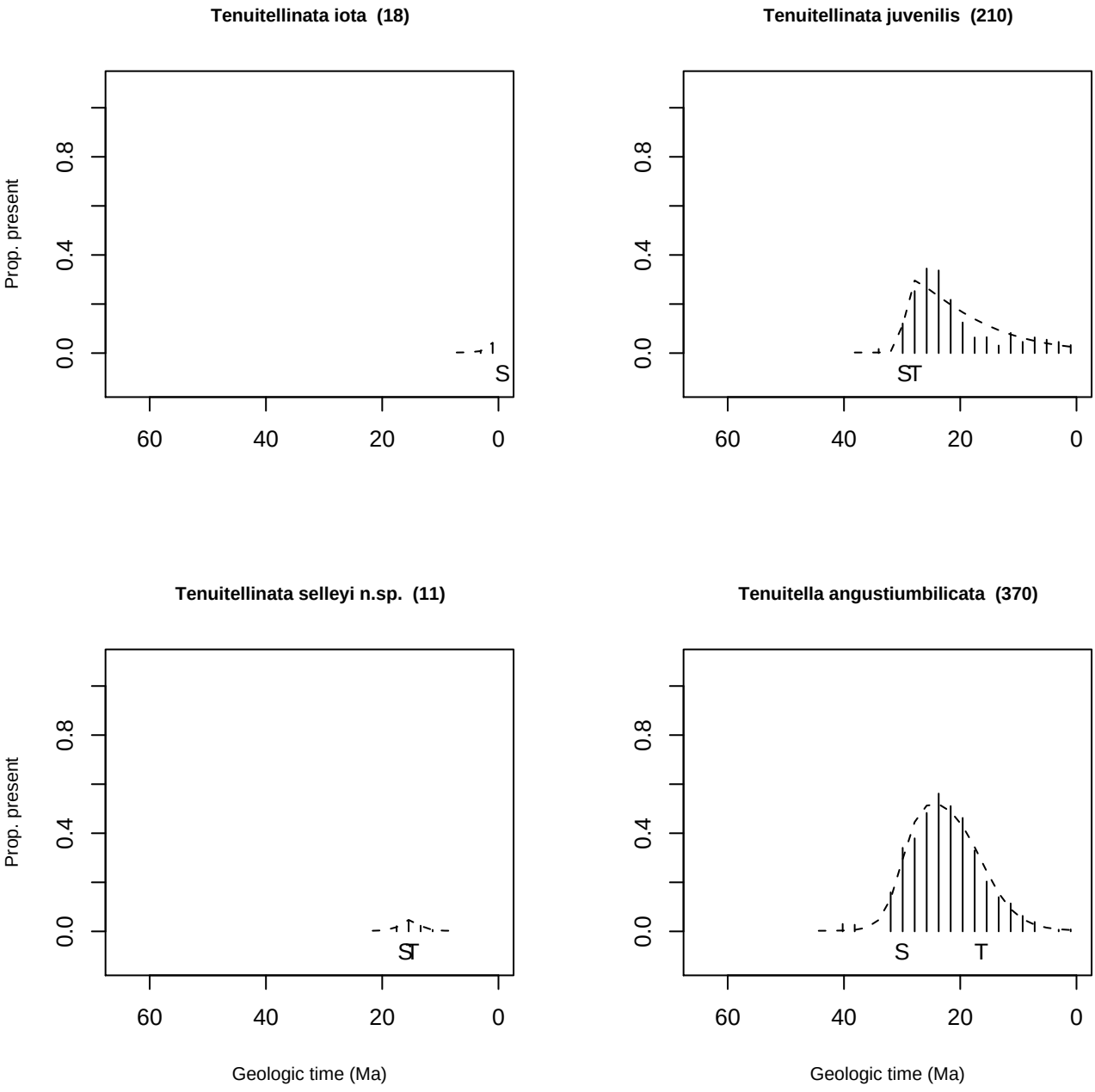

Sphaeroidinellopsis disjuncta (82)
Sphaeroidinellopsis seminulina (709)
Sphaeroidinellopsis multiloba (179)
Streptochilus globigerum (21)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

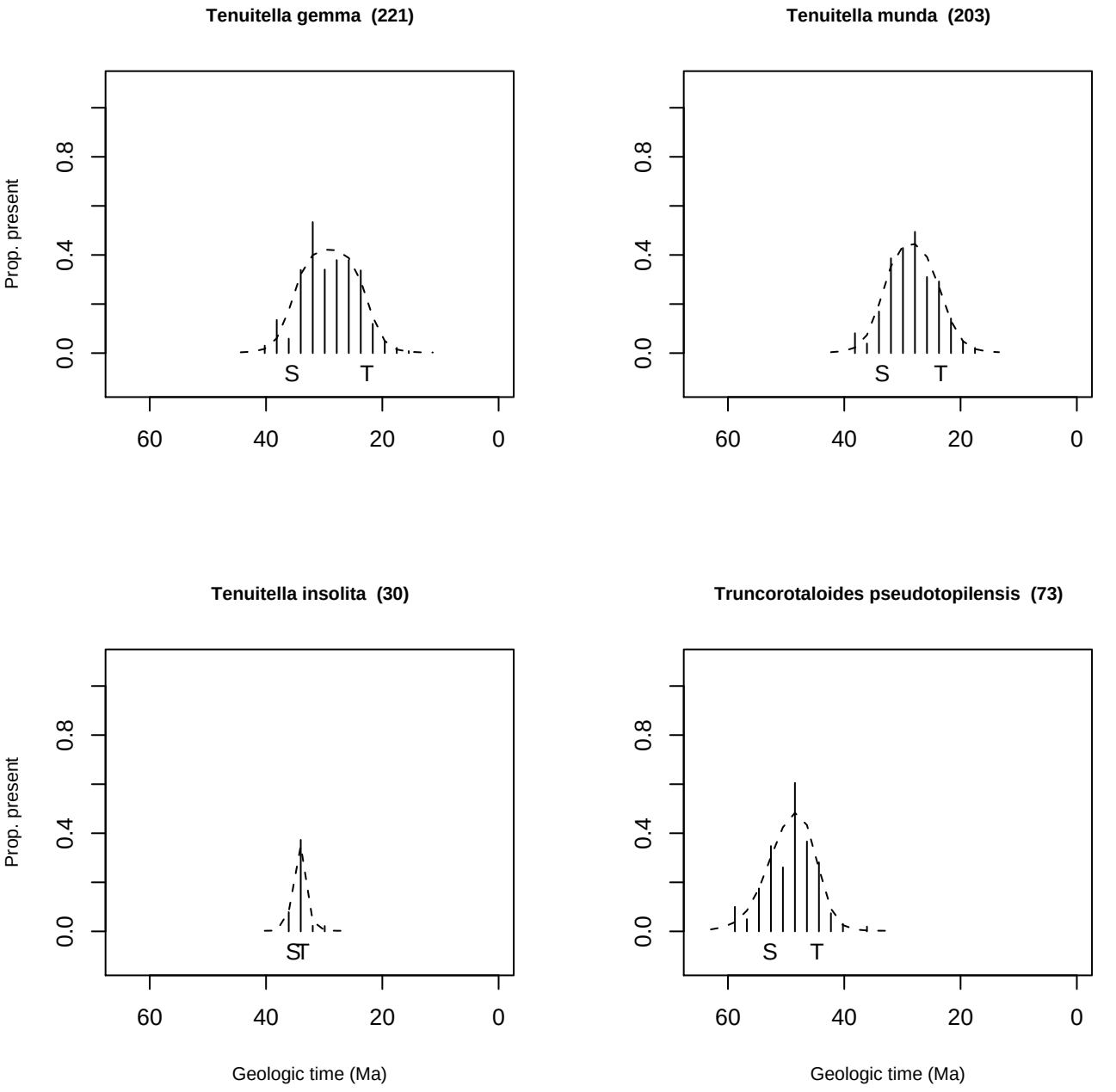

Subbotina angiporoides (257)
Subbotina eocaena (141)
Subbotina eocaenica (71)
Subbotina inaequispira (59)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

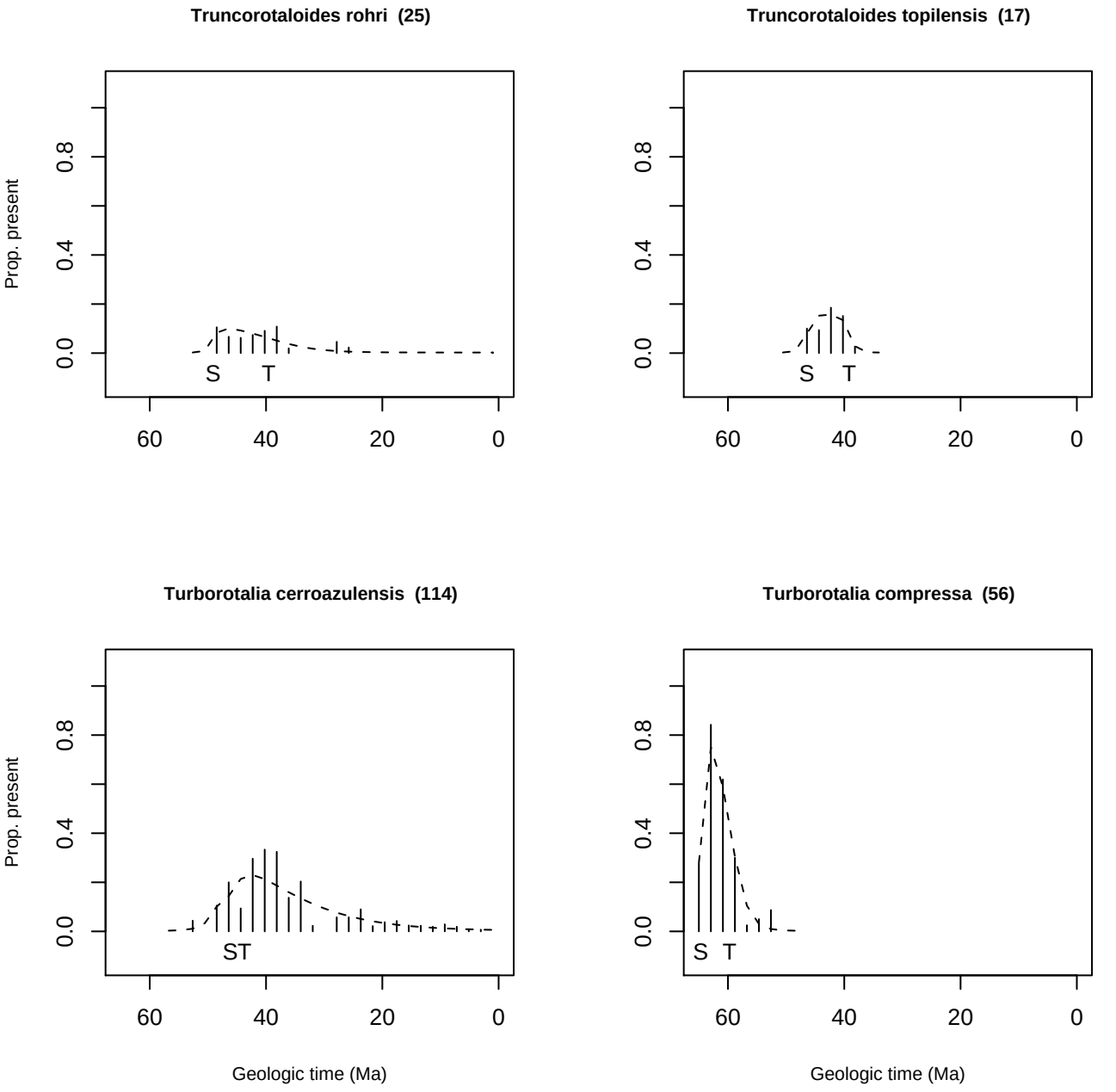

Subbotina linaperta (231)
Subbotina triangularis (80)
Subbotina triloculinoides (101)
Subbotina utilisindex (58)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

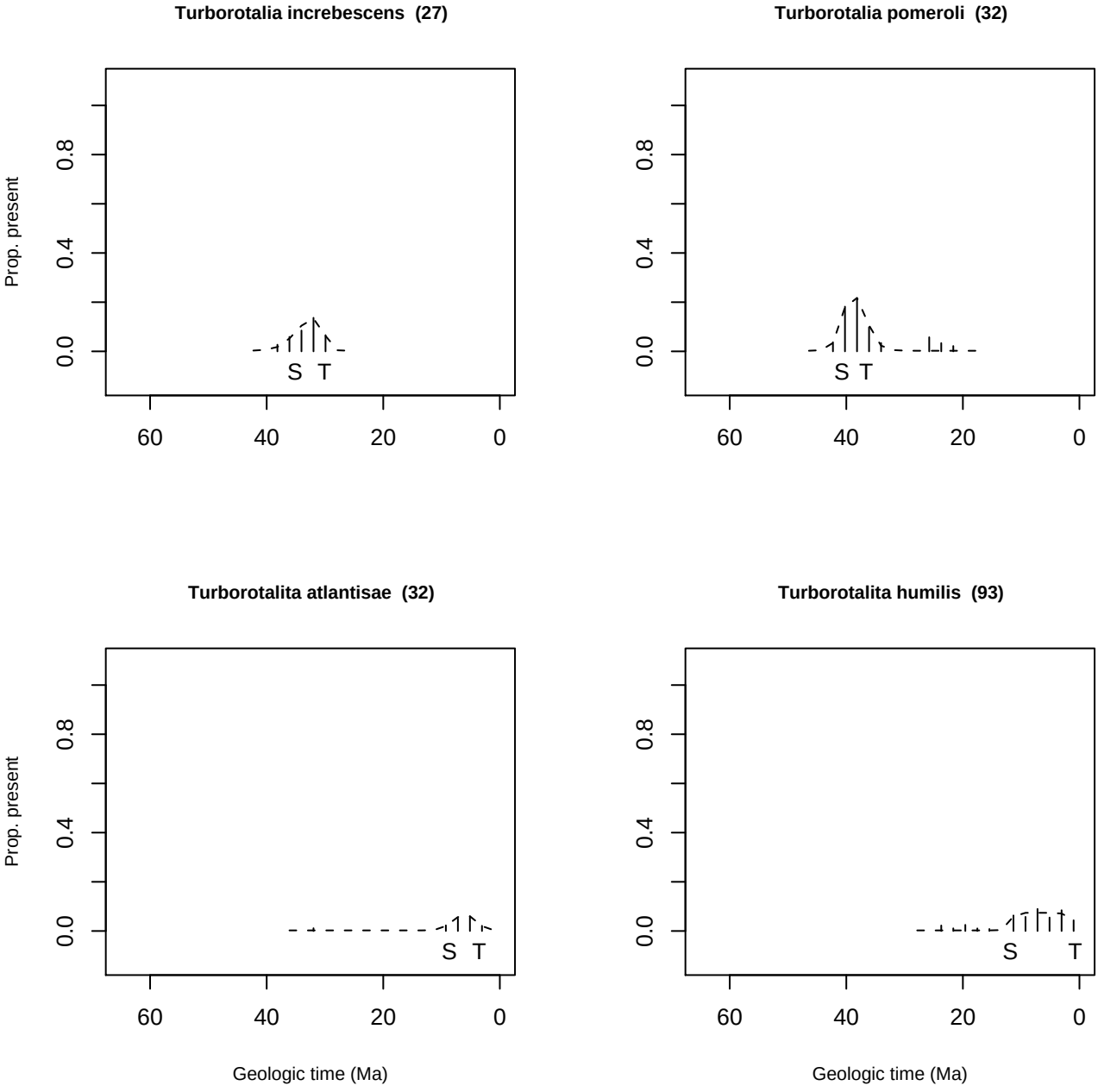

Subbotina varianta (51)
Subbotina turgida (22)
Subbotina yeguaensis (35)
Subbotina bakeri (17)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

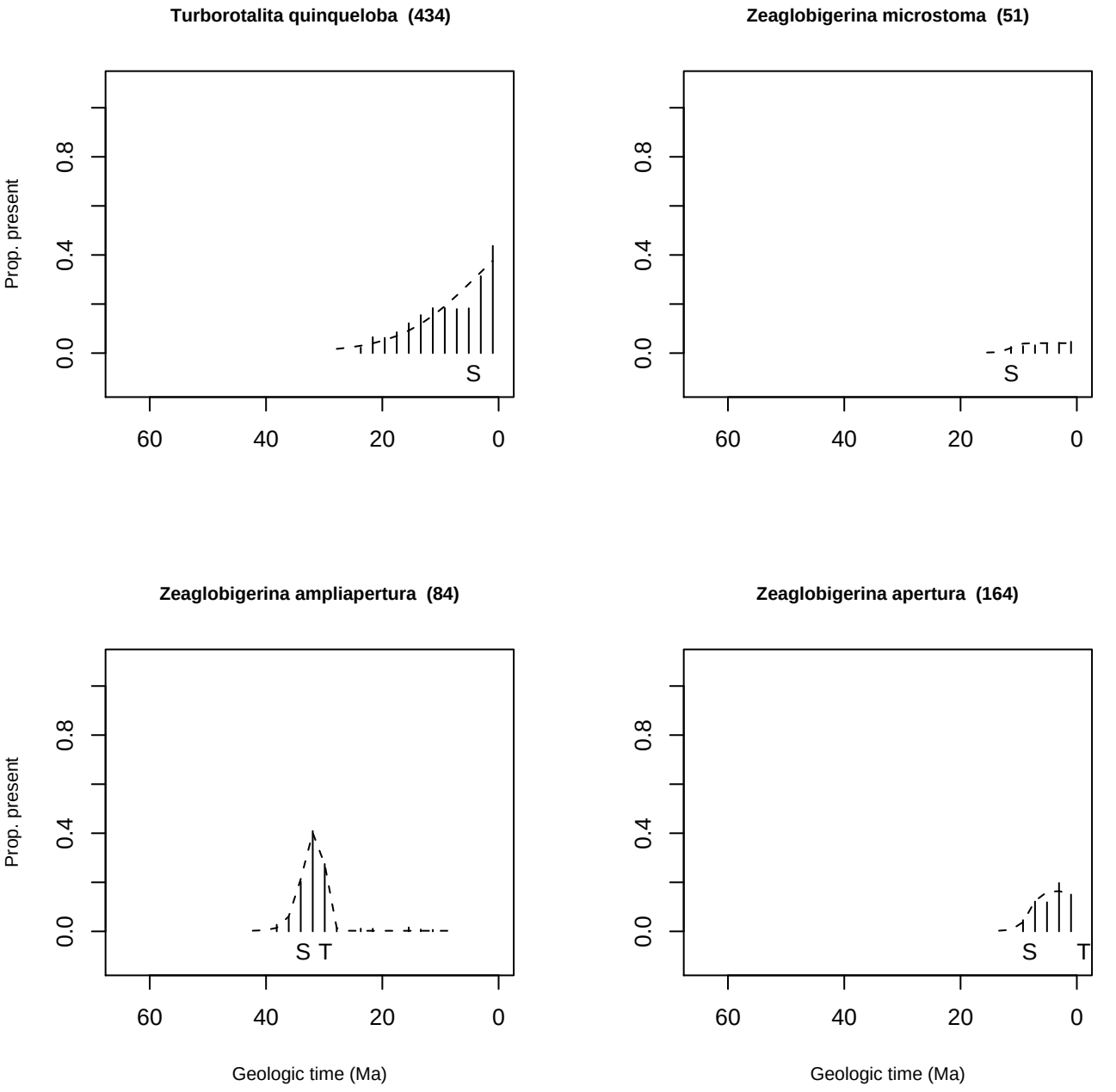

Subbotina euapertura (172)
Subbotina pseudoeocaena (40)
Subbotina trivialis (23)
Subbotina cryptomphala (14)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

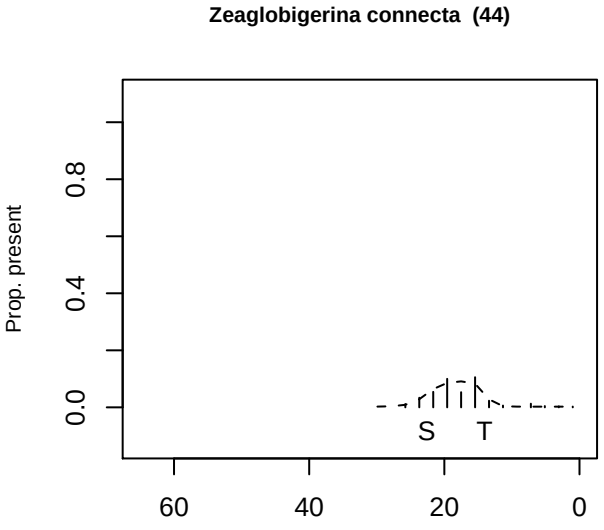

Tenuitellinata iota (18)
Tenuitellinata juvenilis (210)
Tenuitellinata selleyi n.sp. (11)
Tenuitella angustiumbilicata (370)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
ST
T
Geologic time (Ma)

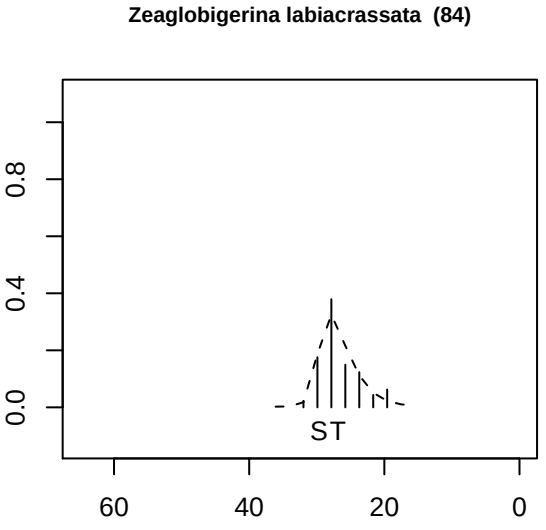

Tenuitella gemma (221)
Tenuitella munda (203)
Tenuitella insolita (30)
Truncorotaloides pseudotopilensis (73)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

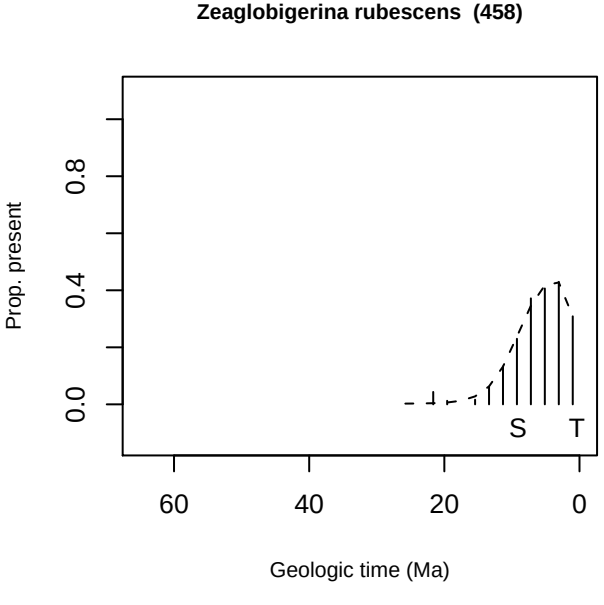

Truncorotaloides rohri (25)
Truncorotaloides topilensis (17)
Turborotalia cerroazulensis (114)
Turborotalia compressa (56)
Prop. present
0.0
0.4
0.8
S
T
ST
60
40
20
0
Geologic time (Ma)

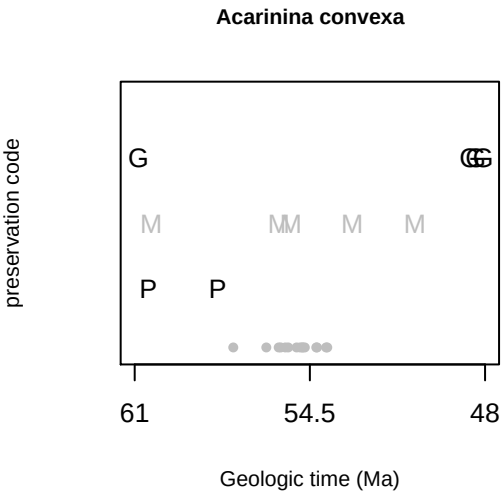

Turborotalia increbescens (27)
Turborotalia pomeroli (32)
Turborotalita atlantisae (32)
Turborotalita humilis (93)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

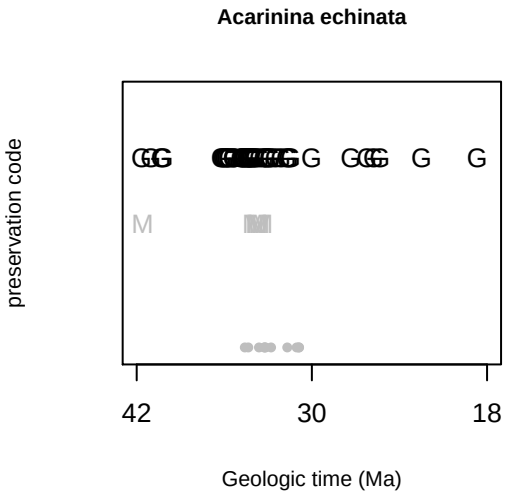

Turborotalita quinqueloba (434)
Zeaglobigerina microstoma (51)
Zeaglobigerina ampliapertura (84)
Zeaglobigerina apertura (164)
Prop. present
0.0
0.4
0.8
60
40
20
0
S
T
Geologic time (Ma)

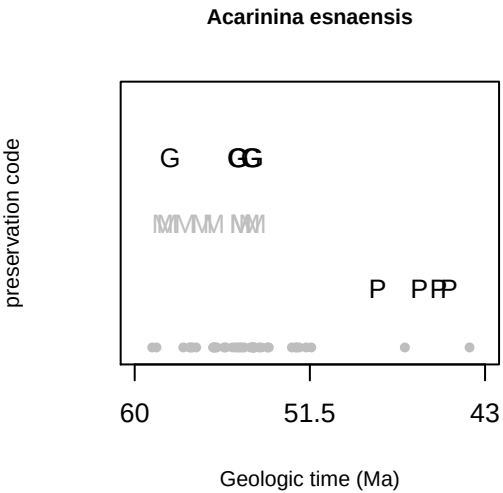

Zeaglobigerina connecta (44)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0

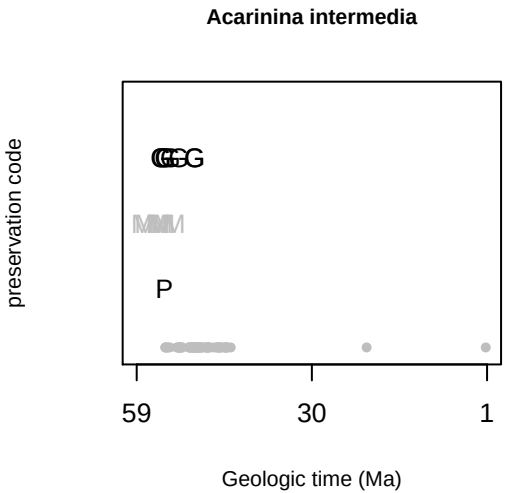

Zeaglobigerina labiacrassata (84)
0.0
0.4
0.8
ST
60
40
20
0

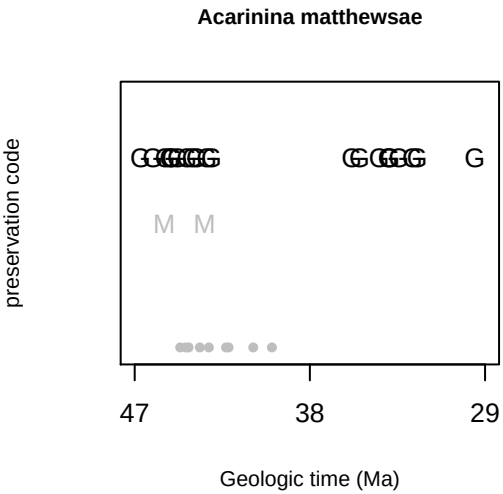

Zeaglobigerina rubescens (458)
Prop. present
0.0
0.4
0.8
S
T
60
40
20
0
Geologic time (Ma)

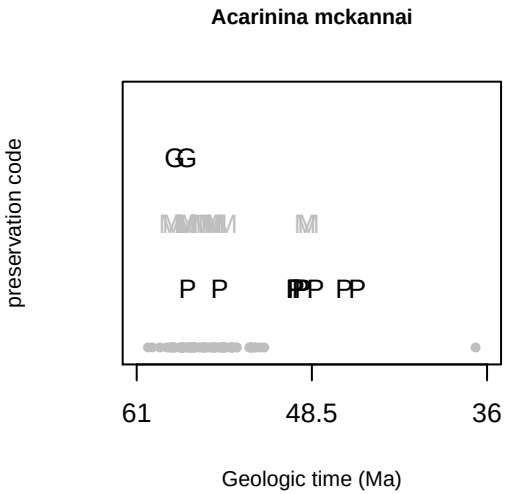

Acarinina convexa
preservation code
G
M
P
61
54.5
48
Geologic time (Ma)

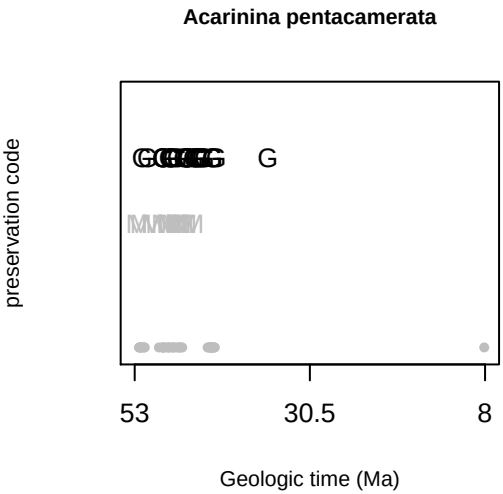

Acarinina echinata
preservation code
G
M
42
30
18
Geologic time (Ma)

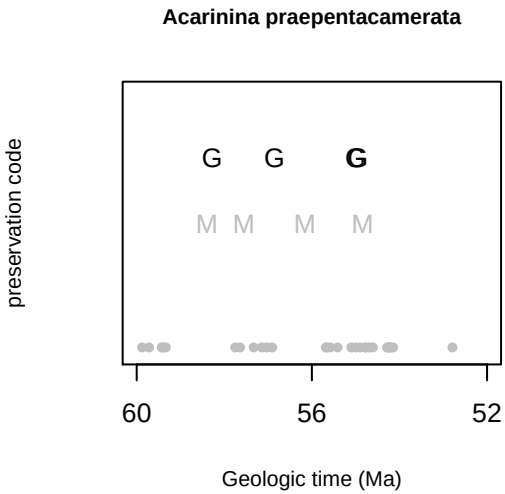

Acarinina esnaensis
preservation code
G
M
P
60
51.5
43
Geologic time (Ma)

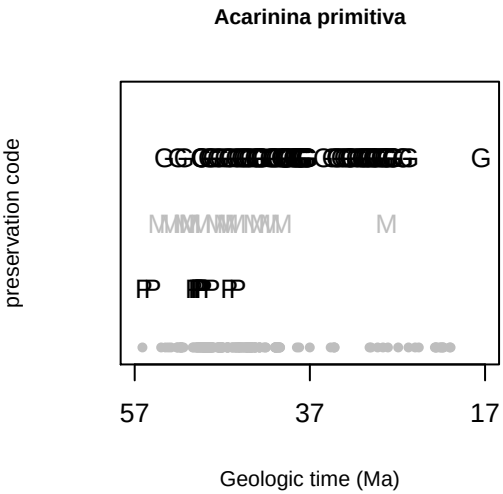

Acarinina intermedia
preservation code
G
M
P
59
30
1
Geologic time (Ma)

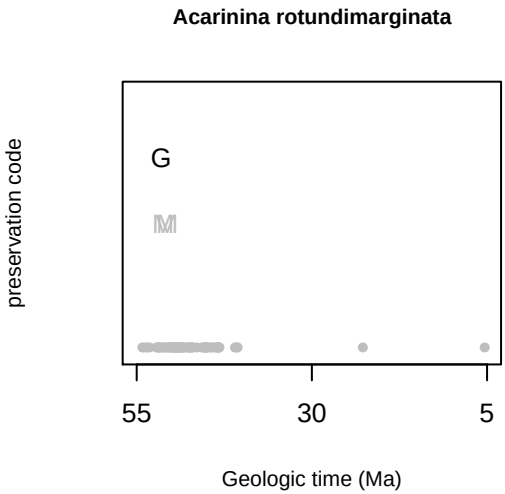

Acarinina matthewsae
preservation code
47
38
29
Geologic time (Ma)

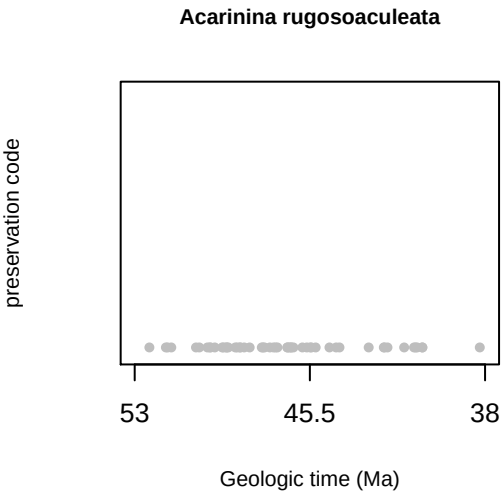

Acarinina mckannai
preservation code
61
48.5
36
Geologic time (Ma)

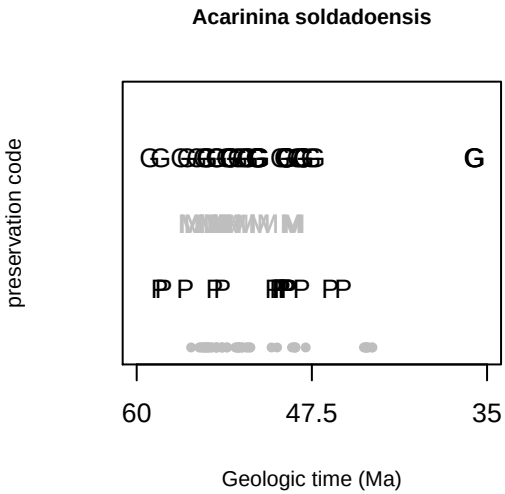

Acarinina pentacamerata
preservation code
53
30.5
8
Geologic time (Ma)

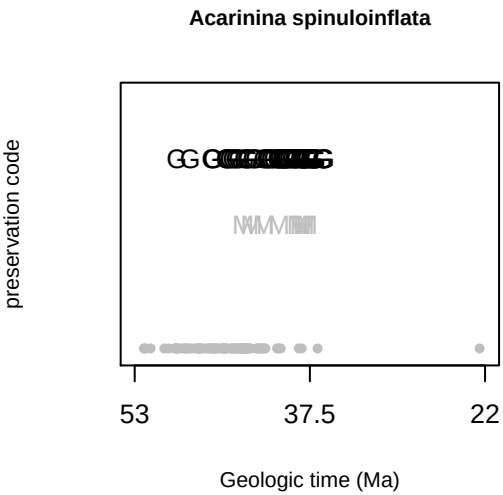

Acarinina praepentacamerata
preservation code
60
56
52
Geologic time (Ma)

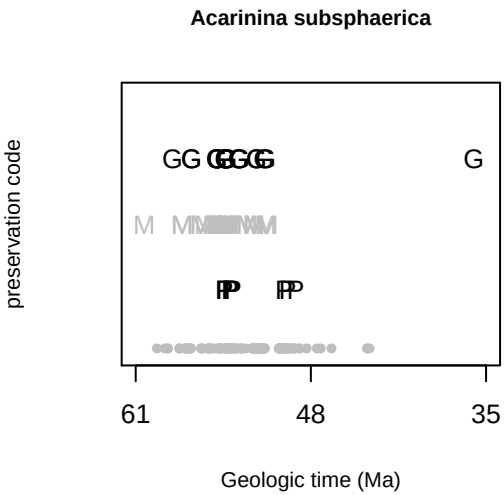

Acarinina primitiva
preservation code
G
M
P
57
37
17
Geologic time (Ma)

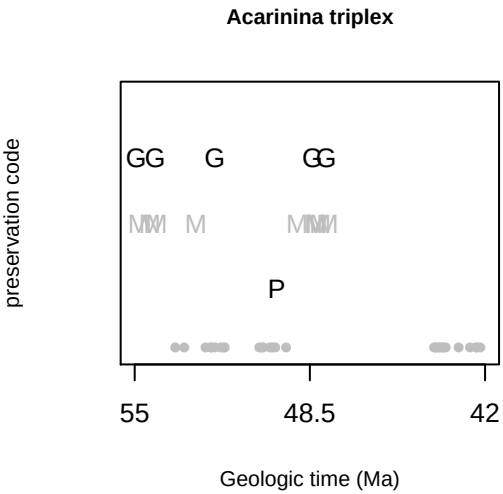

Acarinina rotundimarginata
preservation code
G
M
55
30
5
Geologic time (Ma)

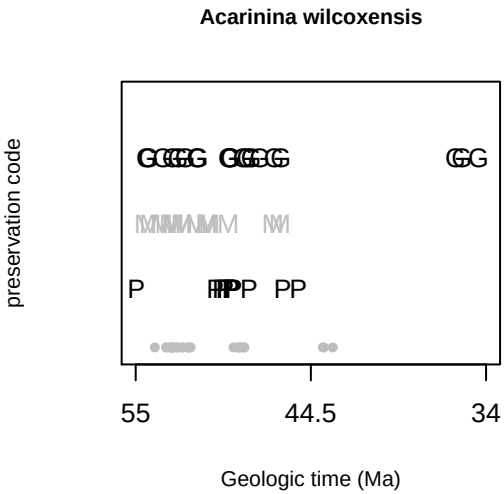

Acarinina rugosoaculeata
preservation code
53
45.5
38
Geologic time (Ma)

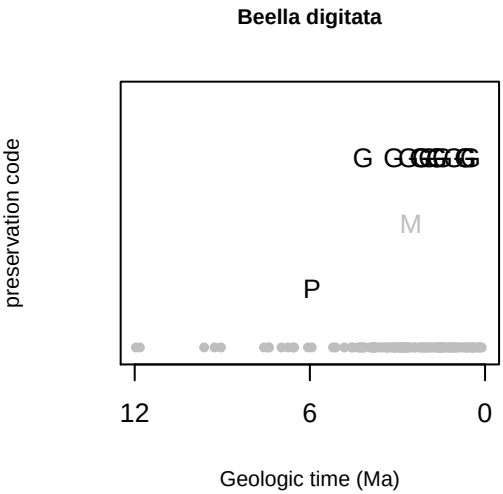

Acarinina soldadoensis
preservation code
G
M
P
60
47.5
35
Geologic time (Ma)

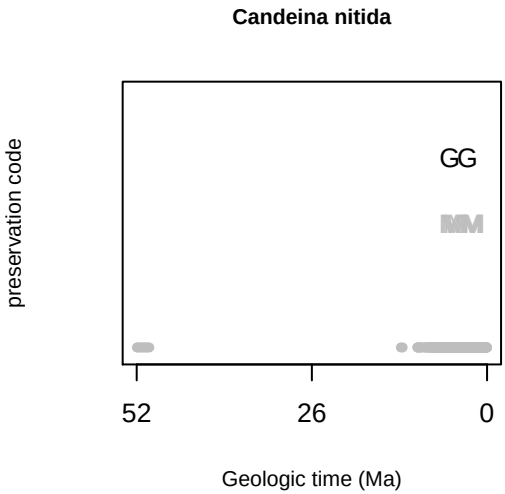

Acarinina spinuloinflata
preservation code
53
37.5
22
Geologic time (Ma)

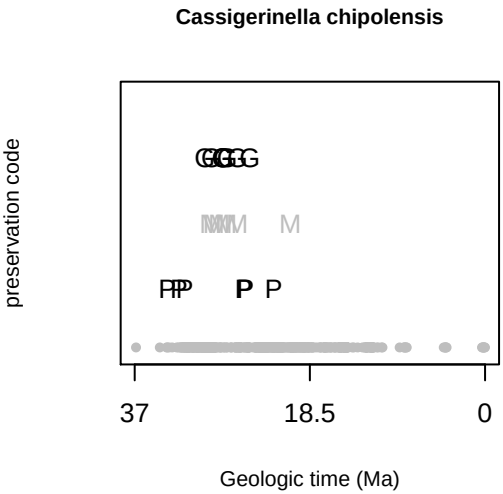

Acarinina subsphaerica
preservation code
61
48
35
Geologic time (Ma)

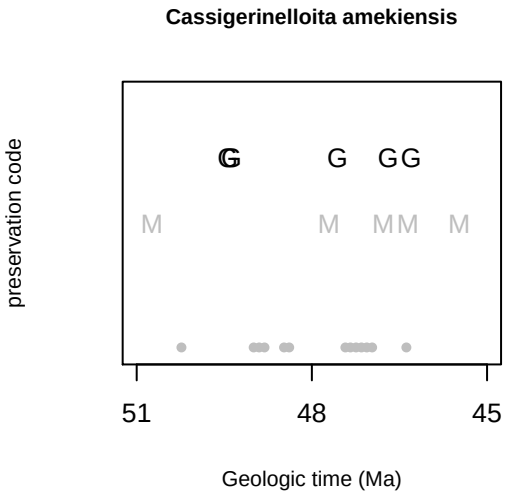

Acarinina triplex
preservation code
55
48.5
42
Geologic time (Ma)

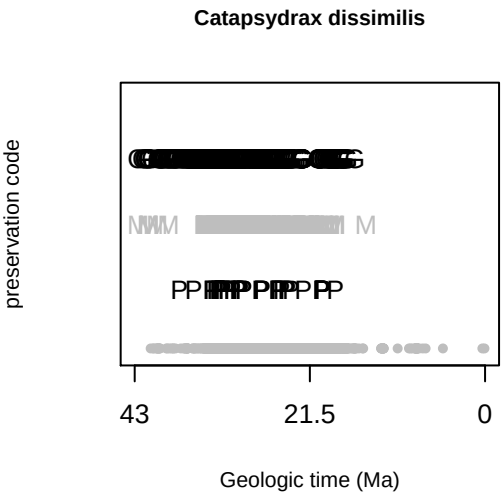

Acarinina wilcoxensis
preservation code
55
44.5
34
Geologic time (Ma)

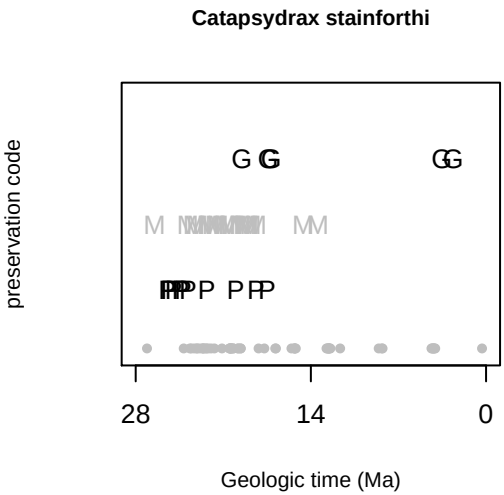

Beella digitata
preservation code
G
M
P
12
6
0
Geologic time (Ma)

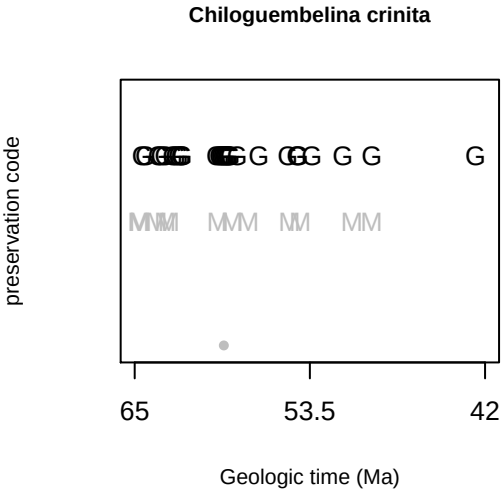

Candeina nitida
preservation code
G
M
52
26
0
Geologic time (Ma)

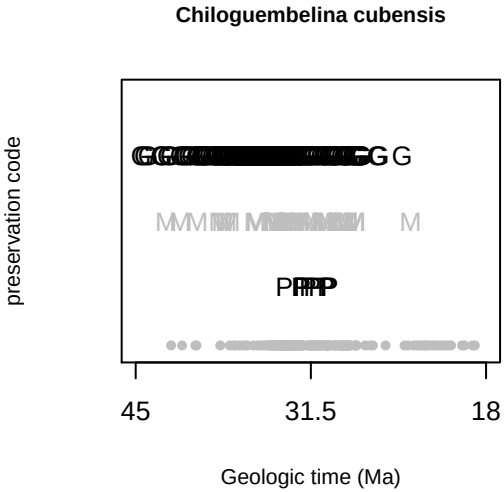

Cassigerinella chipolensis
preservation code
G
M
P
37
18.5
0
Geologic time (Ma)

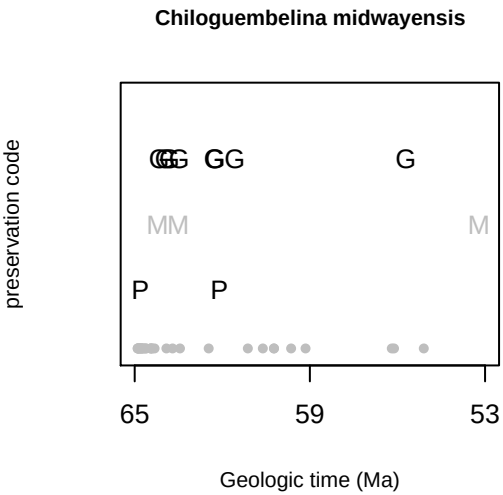

Cassigerinelloita amekiensis
preservation code
G
M
51
48
45
Geologic time (Ma)

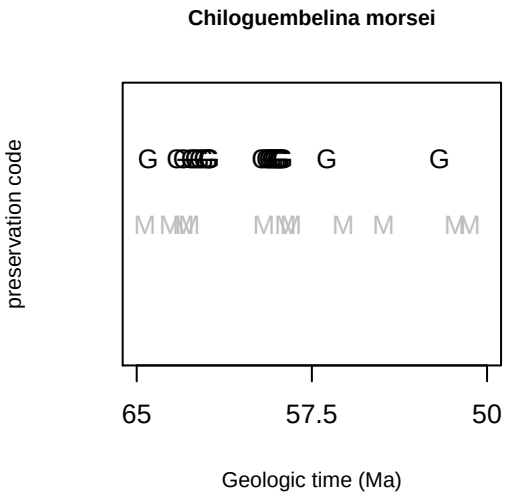

Catapsydrax dissimilis
preservation code
43
21.5
0
Geologic time (Ma)

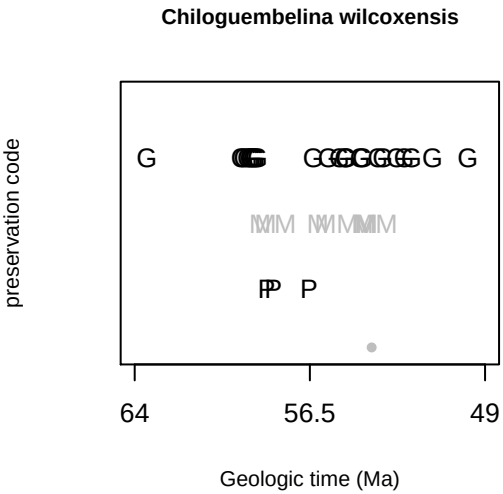

Catapsydrax stainforthi
preservation code
28
14
0
Geologic time (Ma)

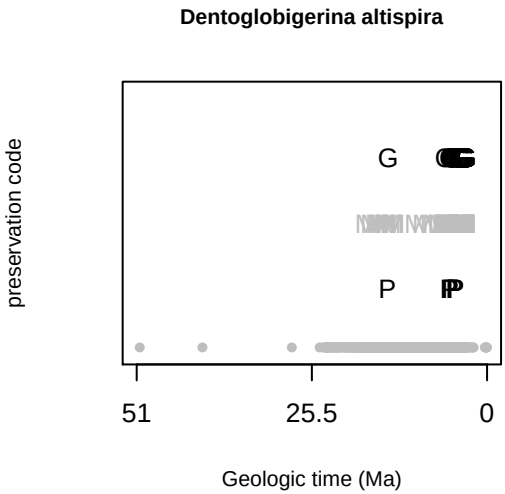

Chiloguembelina crinita
preservation code
65
53.5
42
Geologic time (Ma)

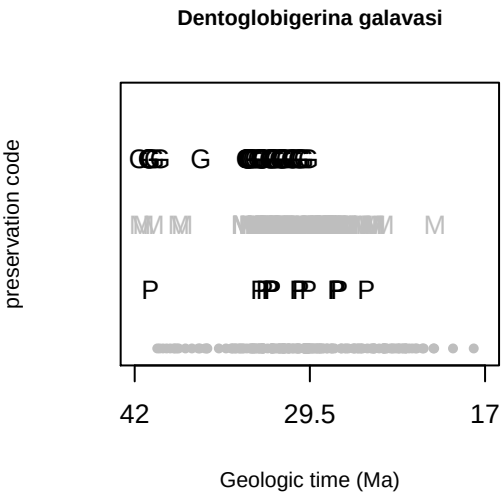

Chiloguembelina cubensis
preservation code
45
31.5
18
Geologic time (Ma)

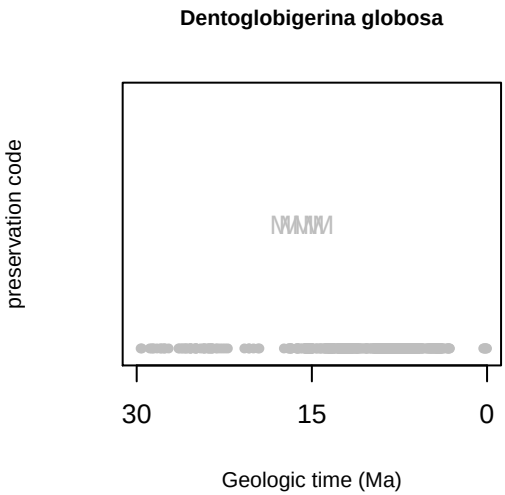

Chiloguembelina midwayensis
preservation code
G
M
P
65
59
53
Geologic time (Ma)

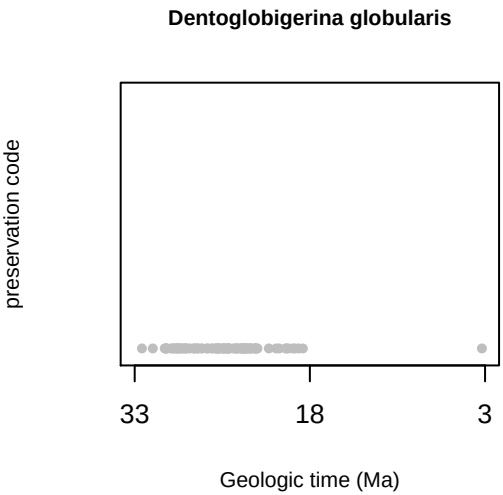

Chiloguembelina morsei
preservation code
G
M
65
57.5
50
Geologic time (Ma)

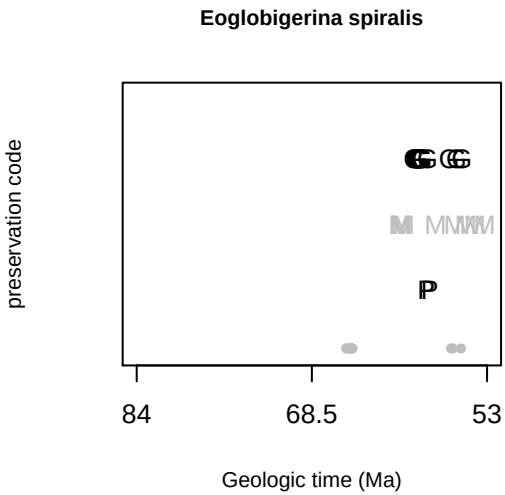

Chiloguembelina wilcoxensis
preservation code
G
M
P
64
56.5
49
Geologic time (Ma)

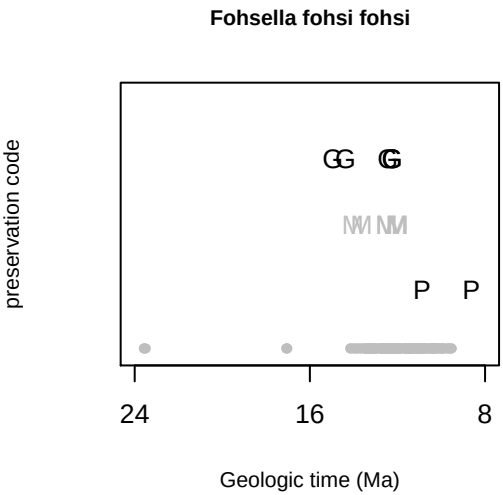

Dentoglobigerina altispira
preservation code
G
P
51
25.5
0
Geologic time (Ma)

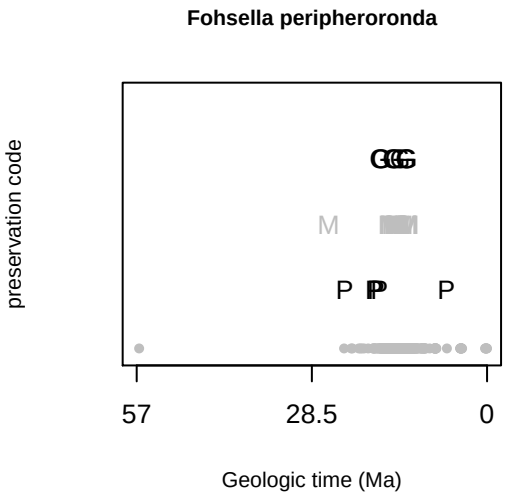

Dentoglobigerina galavasi
preservation code
G
M
P
42
29.5
17
Geologic time (Ma)

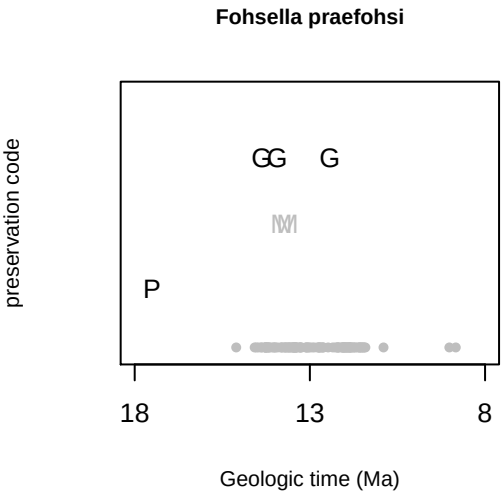

Dentoglobigerina globosa
preservation code
30
15
0
Geologic time (Ma)

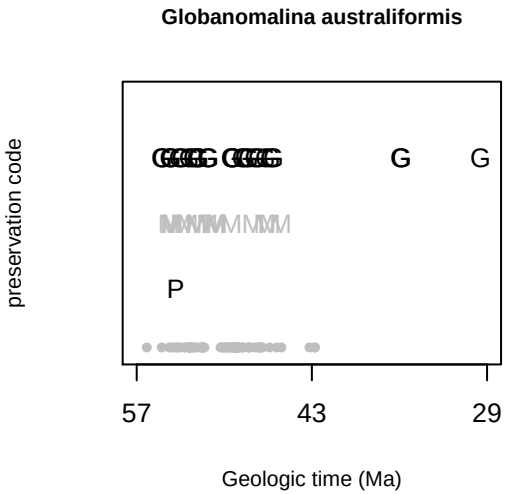

Dentoglobigerina globularis
preservation code
33
18
3
Geologic time (Ma)

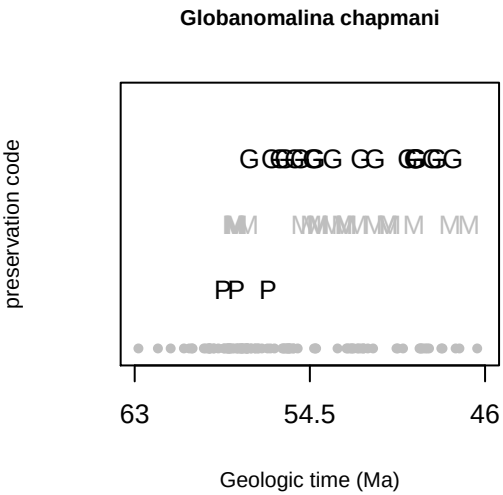

Eoglobigerina spiralis
preservation code
84
68.5
53
Geologic time (Ma)

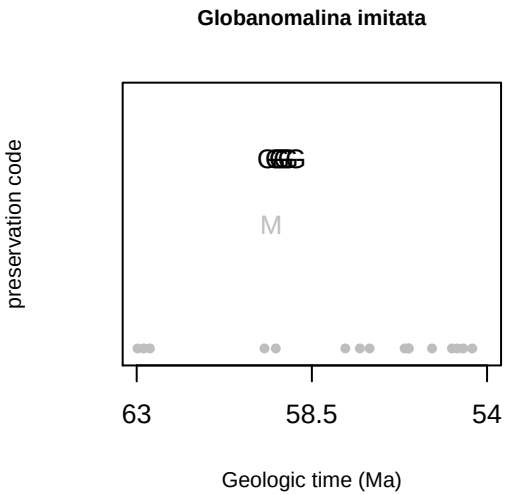

Fohsella fohsi fohsi
preservation code
24
16
8
Geologic time (Ma)

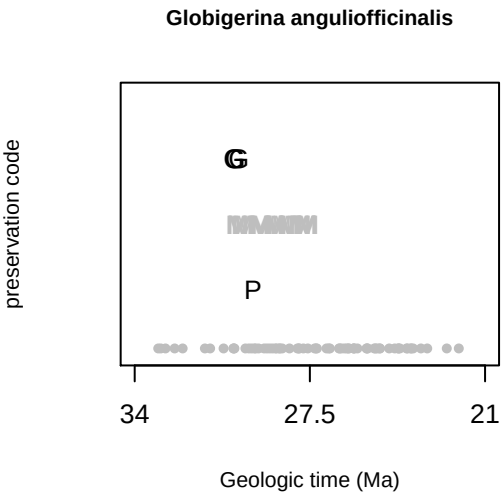

Fohsella peripheroronda
preservation code
57
28.5
0
Geologic time (Ma)

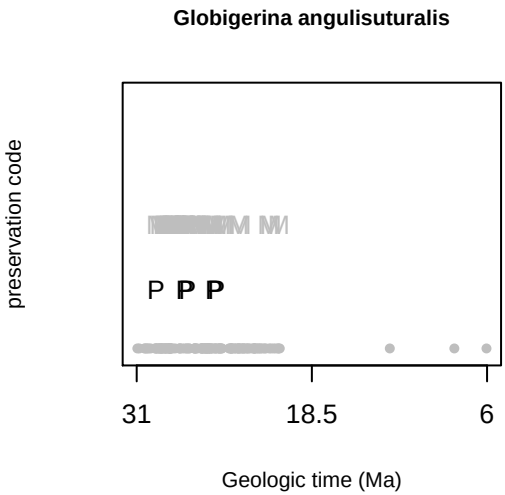

Fohsella praefohsi
preservation code
18
13
8
Geologic time (Ma)

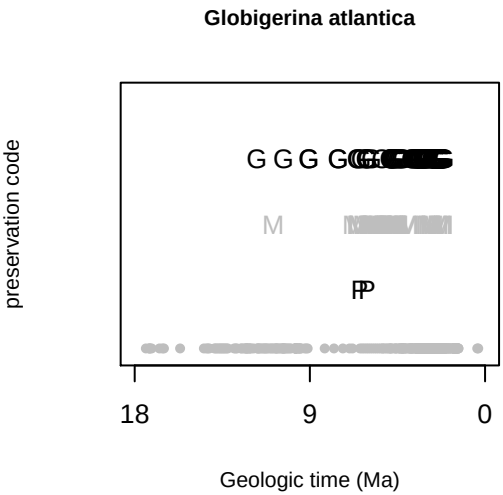

Globanomalina australiformis
preservation code
57
43
29
Geologic time (Ma)

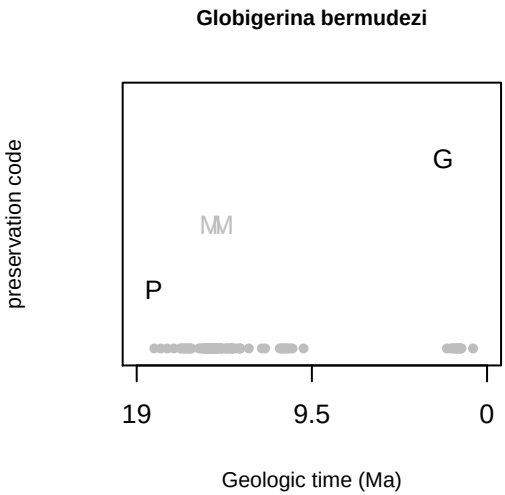

Globanomalina chapmani
preservation code
63
54.5
46
Geologic time (Ma)

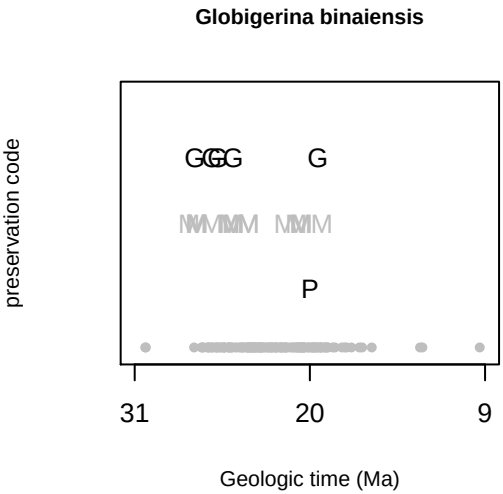

Globanomalina imitata
preservation code
63
58.5
54
Geologic time (Ma)

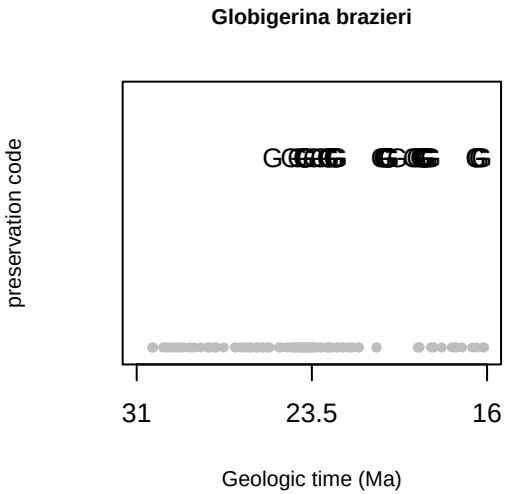

Globigerina anguliofficinalis
preservation code
34
27.5
21
Geologic time (Ma)

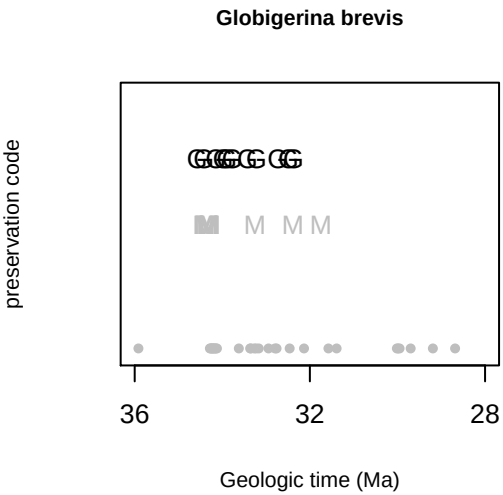

Globigerina angulisuturalis
preservation code
31
18.5
6
Geologic time (Ma)

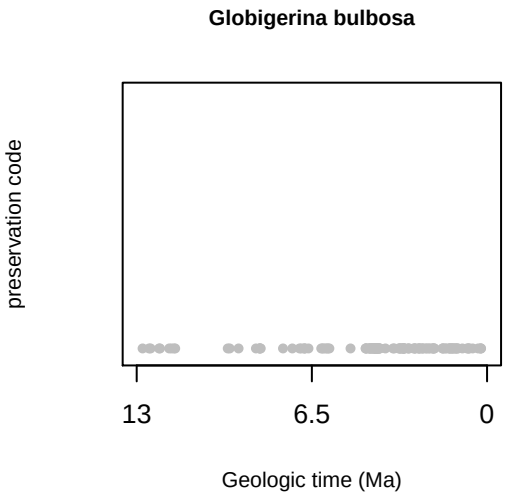

Globigerina atlantica
preservation code
G G G G
M
P
18
9
0
Geologic time (Ma)

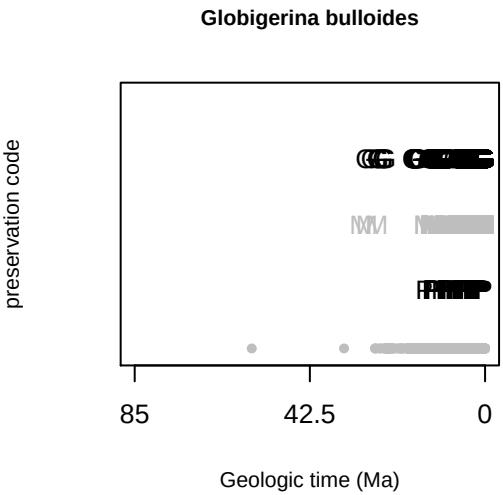

Globigerina bermudezi
preservation code
G
M
P
19
9.5
0
Geologic time (Ma)

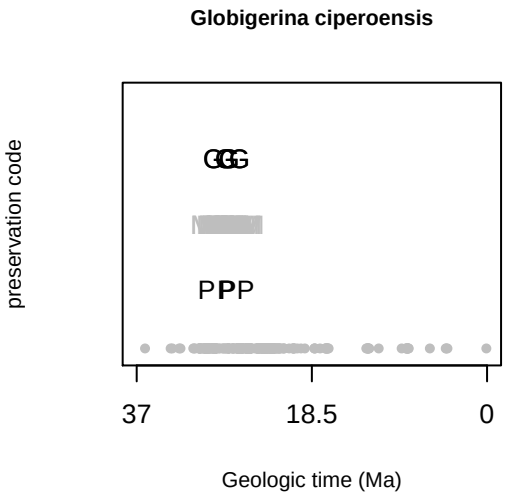

Globigerina binaiensis
preservation code
G
M
P
31
20
9
Geologic time (Ma)

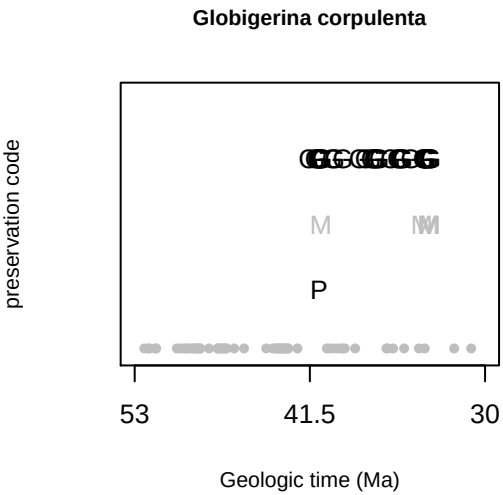

Globigerina brazieri
preservation code
G
31
23.5
16
Geologic time (Ma)

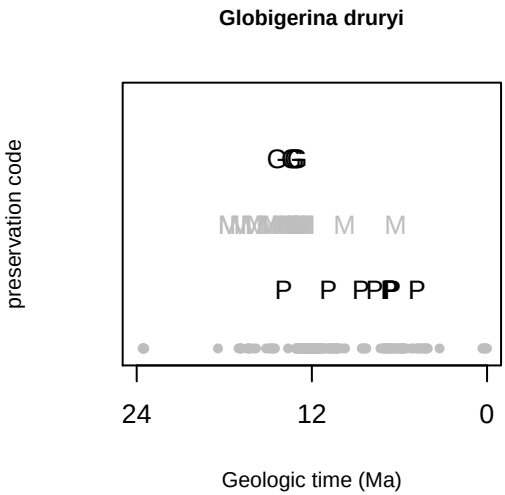

Globigerina brevis
preservation code
M M M
36
32
28
Geologic time (Ma)

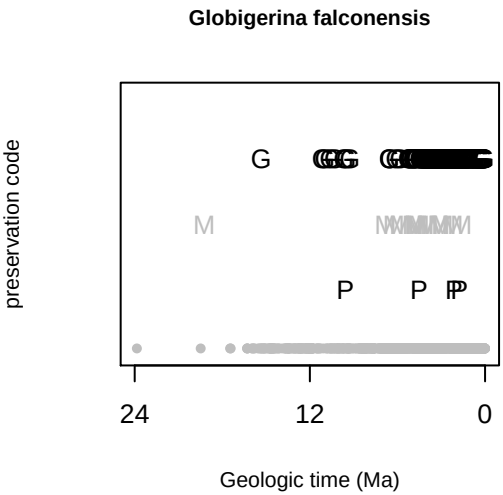

Globigerina bulbosa
preservation code
13
6.5
0
Geologic time (Ma)

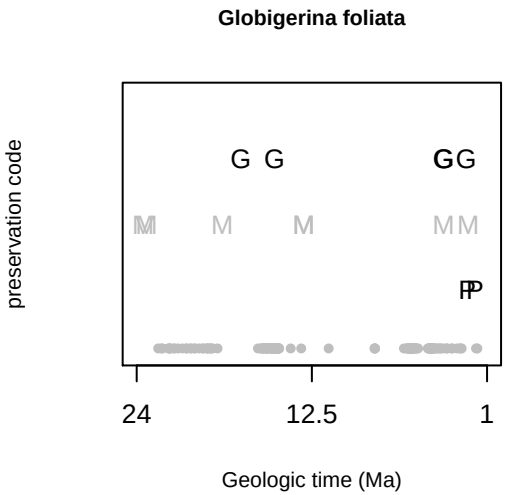

Globigerina bulloides
preservation code
85
42.5
0
Geologic time (Ma)

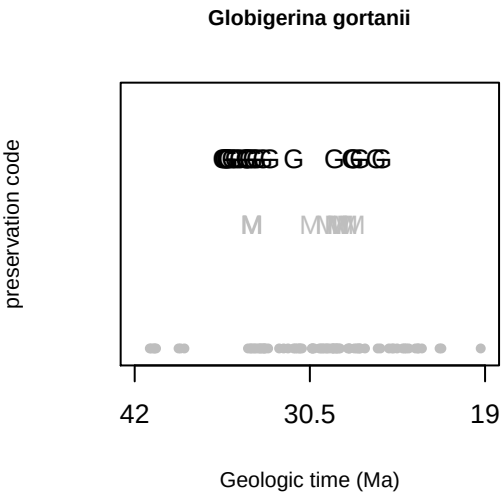

Globigerina ciperoensis
preservation code
P P P
37
18.5
0
Geologic time (Ma)

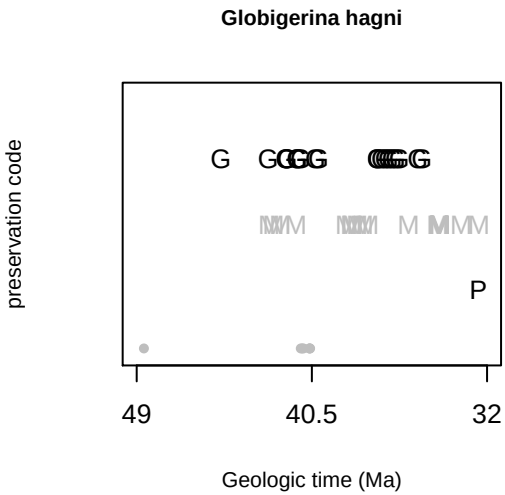

Globigerina corpulenta
preservation code
53
41.5
30
Geologic time (Ma)

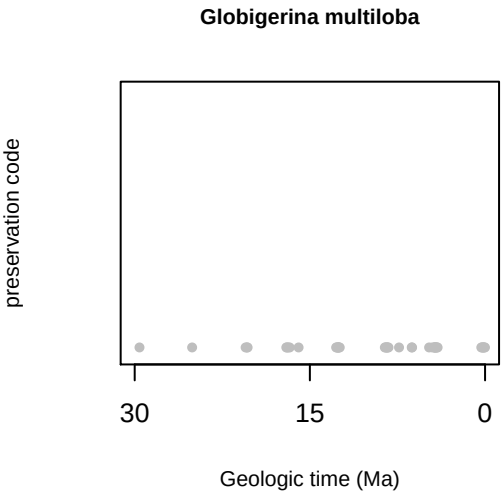

Globigerina druryi
preservation code
24
12
0
Geologic time (Ma)

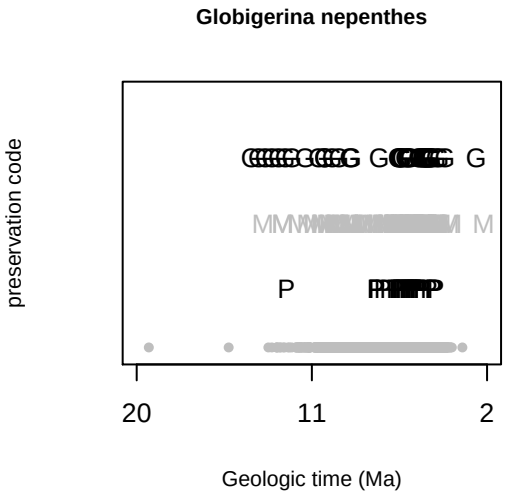

Globigerina falconensis
preservation code
24
12
0
Geologic time (Ma)

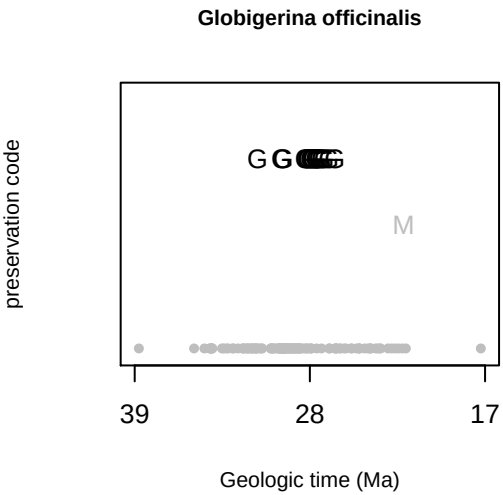

Globigerina foliata
preservation code
24
12.5
1
Geologic time (Ma)

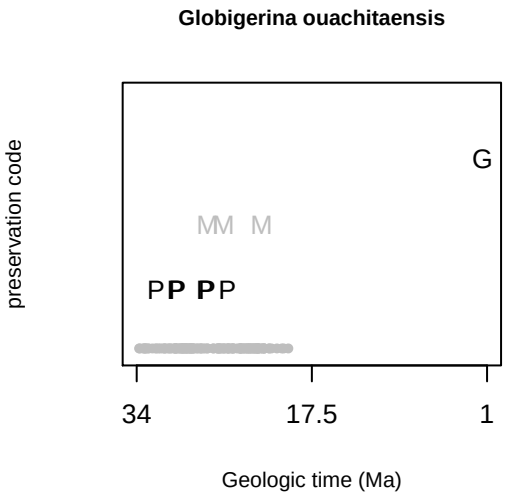

Globigerina gortanii
preservation code
G
M
42
30.5
19
Geologic time (Ma)

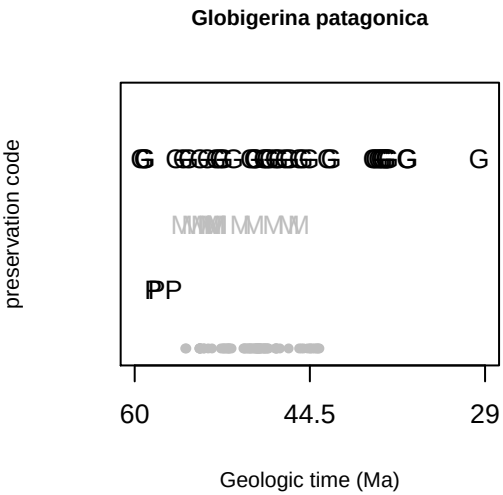

Globigerina hagni
preservation code
G
M
P
49
40.5
32
Geologic time (Ma)

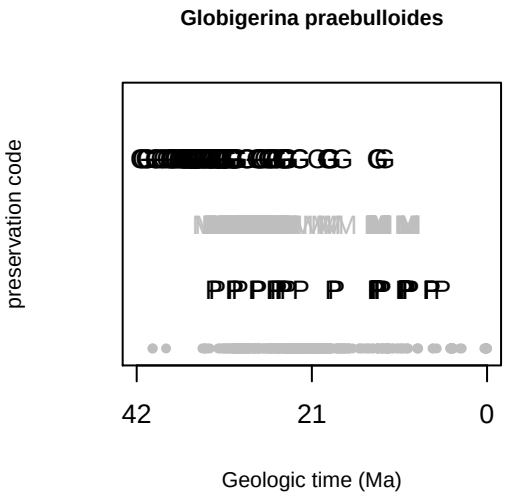

Globigerina multiloba
preservation code
30
15
0
Geologic time (Ma)

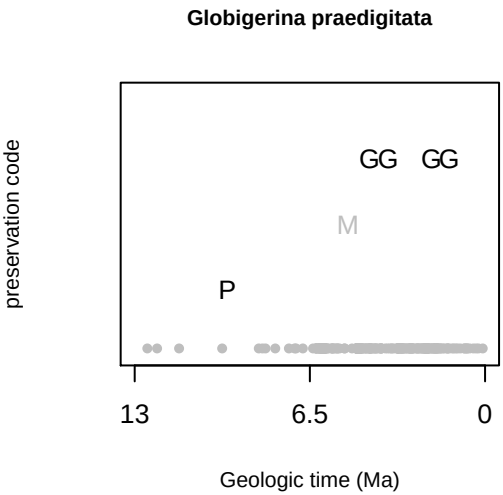

Globigerina nepenthes
preservation code
G
M
P
20
11
2
Geologic time (Ma)

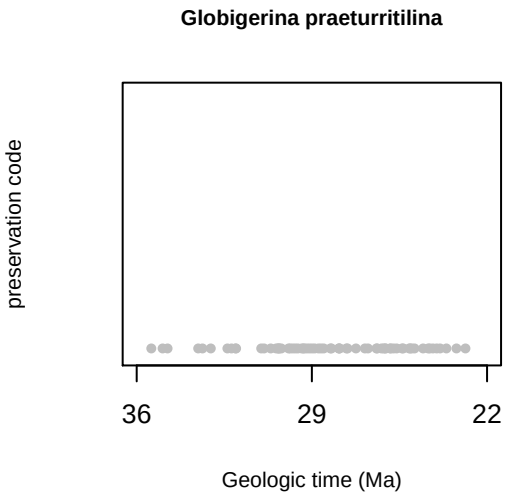

Globigerina officinalis
preservation code
39
28
17
Geologic time (Ma)

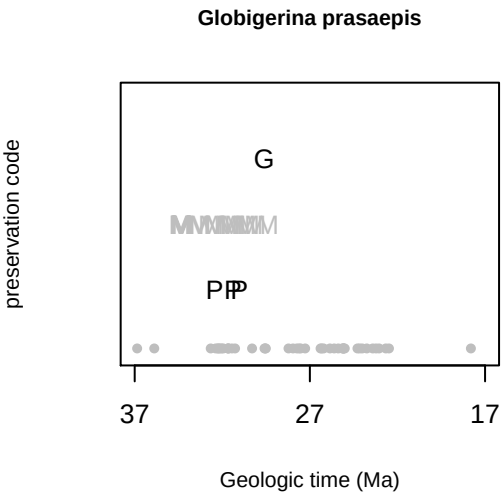

Globigerina ouachitaensis
preservation code
34
17.5
1
Geologic time (Ma)

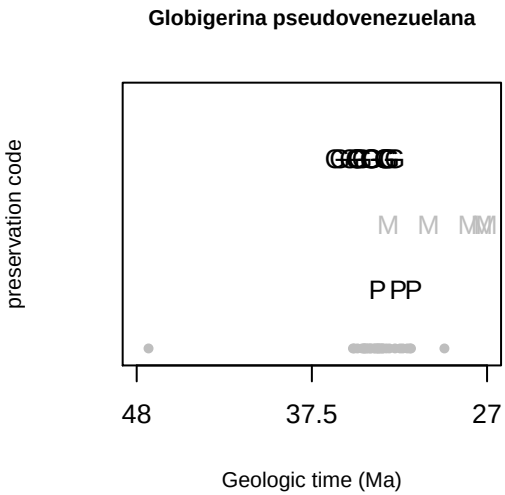

Globigerina patagonica
preservation code
60
44.5
29
Geologic time (Ma)

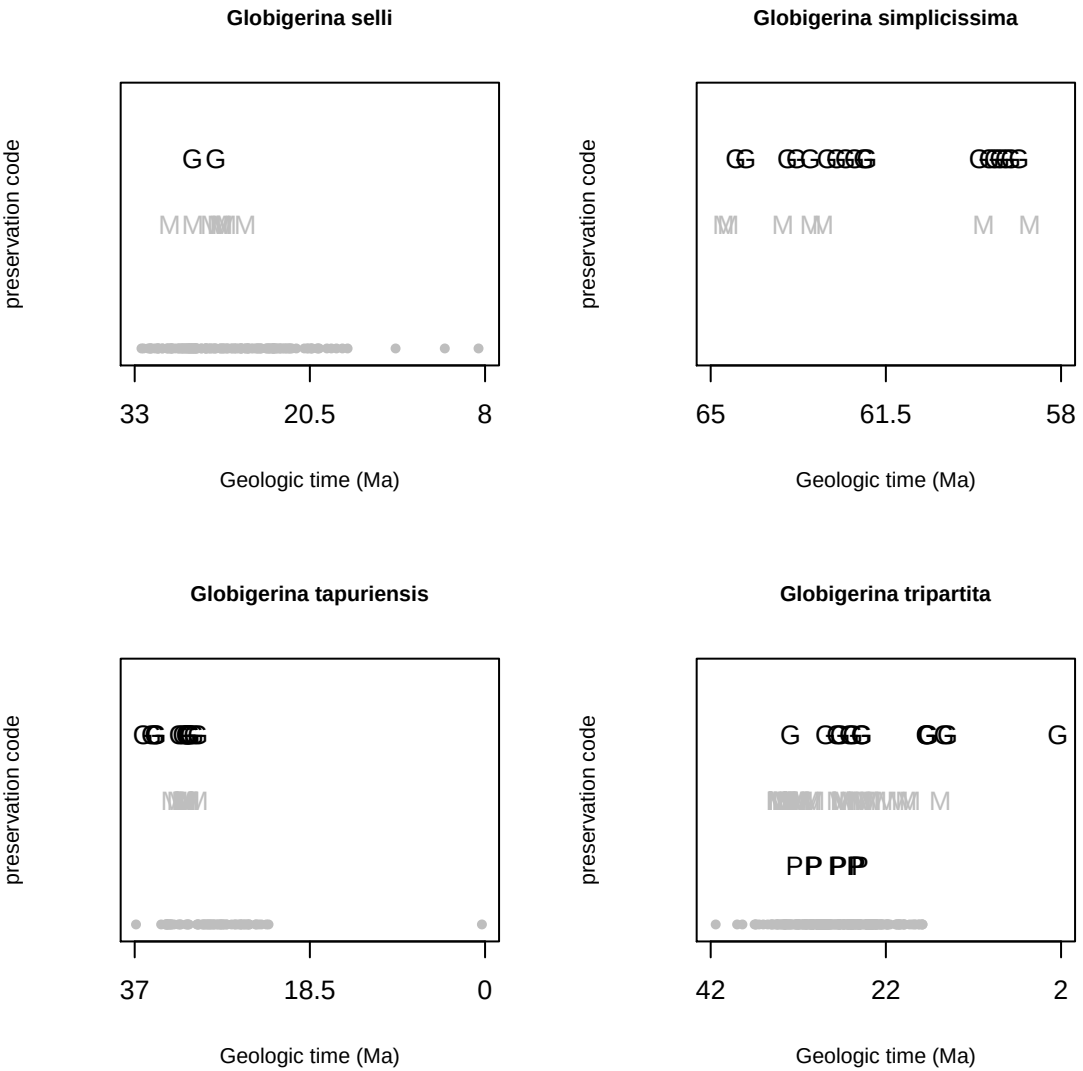

Globigerina praebulloides
preservation code
42
21
0
Geologic time (Ma)

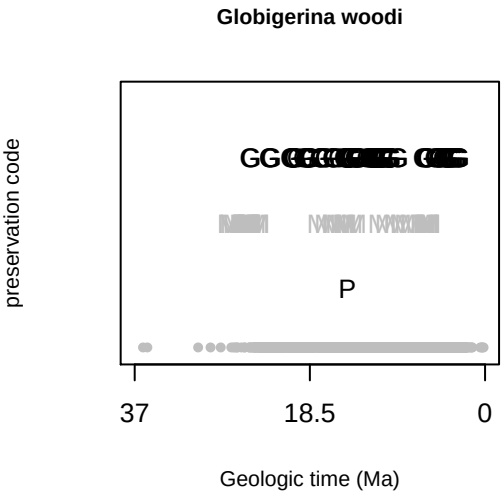

Globigerina praedigitata
preservation code
GG GG
M
P
13
6.5
0
Geologic time (Ma)


Globigerina praeturritilina
preservation code
36
29
22
Geologic time (Ma)


Globigerina prasaepis
preservation code
G
M
P
37
27
17
Geologic time (Ma)


Globigerina pseudovenezuelana
preservation code
M M
P PP
48
37.5
27
Geologic time (Ma)


Globigerina selli
preservation code
33
20.5
8
Geologic time (Ma)
Globigerina simplicissima
preservation code
65
61.5
58
Geologic time (Ma)
Globigerina tapuriensis
preservation code
37
18.5
0
Geologic time (Ma)
Globigerina tripartita
preservation code
42
22
2
Geologic time (Ma)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preservation code
P
37
18.5
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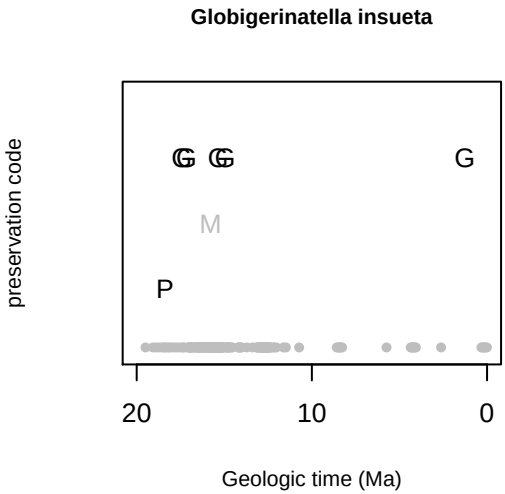
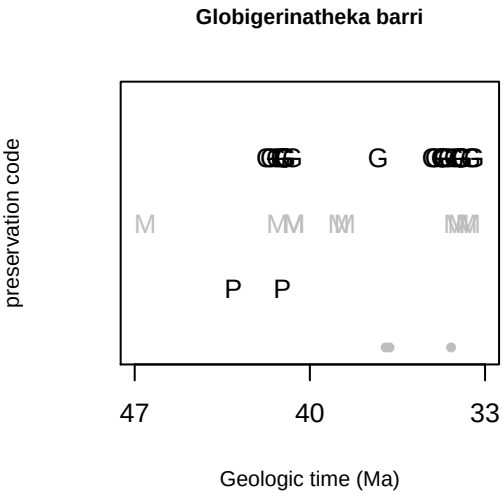
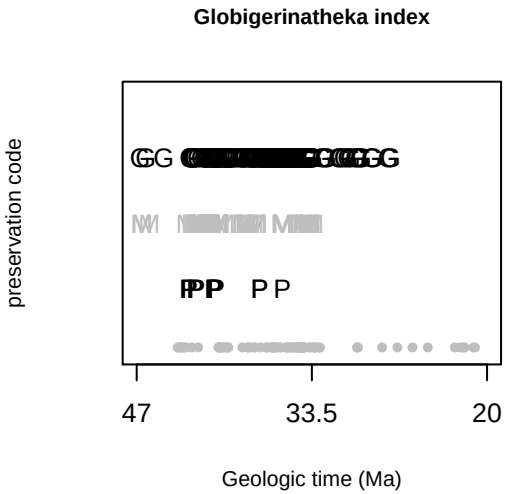
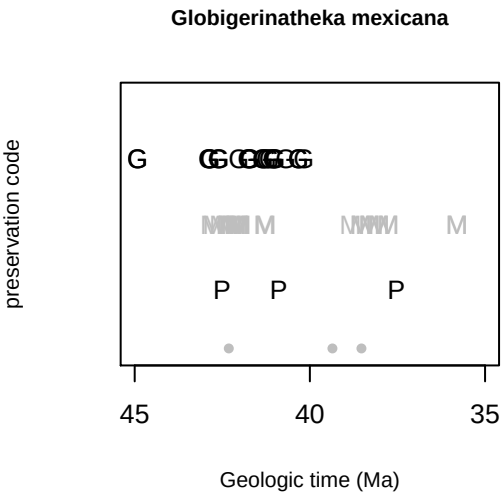
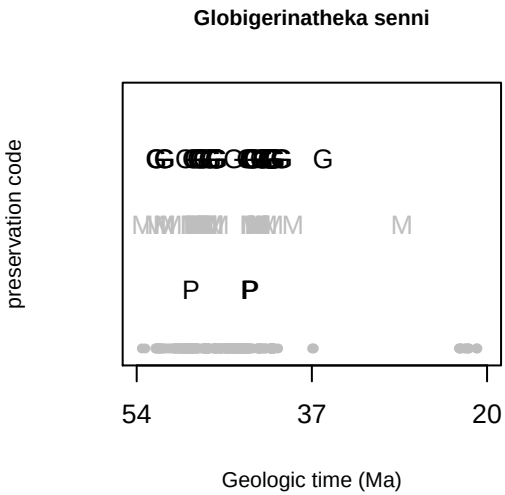
Geologic time (Ma)

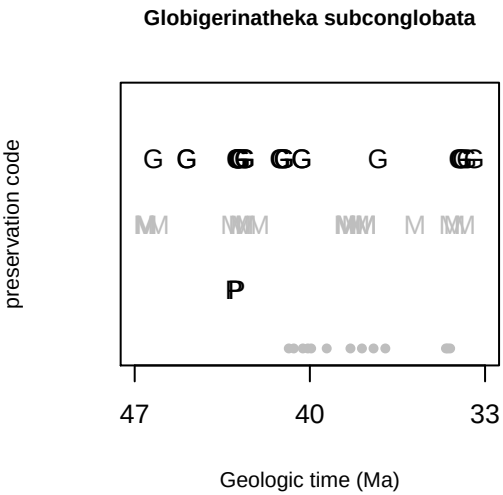

Globigerinatella insueta
preservation code
G
M
P
20
10
0
Geologic time (Ma)

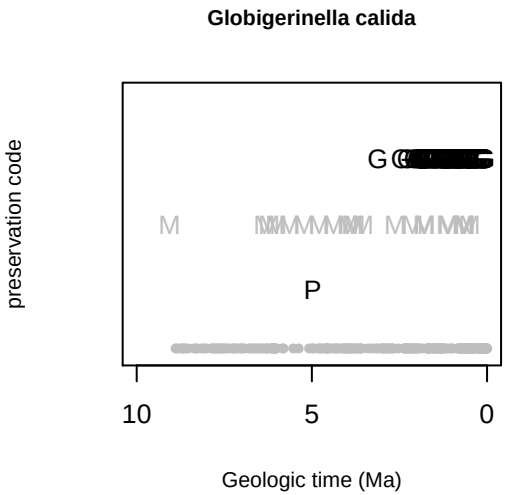

Globigerinatheka barri
preservation code
G
M
P P
47
40
33
Geologic time (Ma)

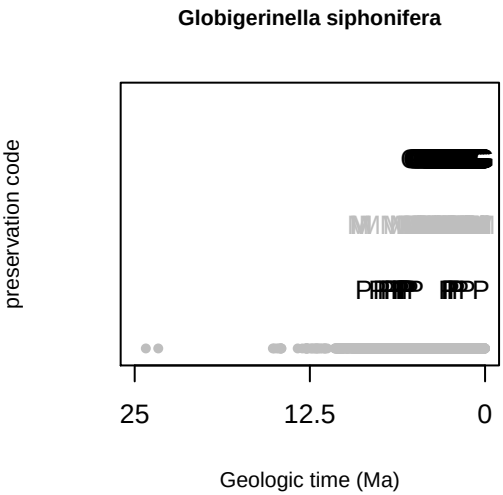

Globigerinatheka index
preservation code
G
P P
47
33.5
20
Geologic time (Ma)

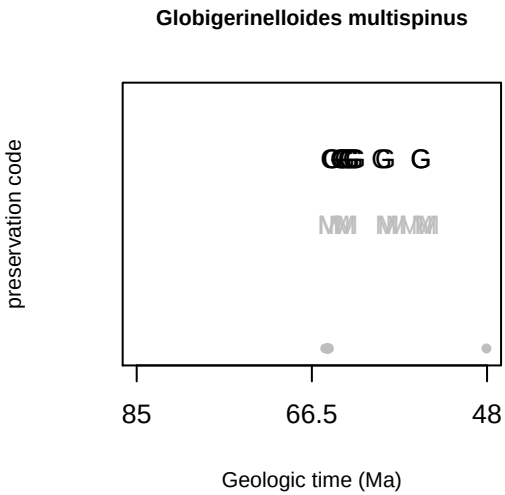

Globigerinatheka mexicana
preservation code
G
M
P
45
40
35
Geologic time (Ma)

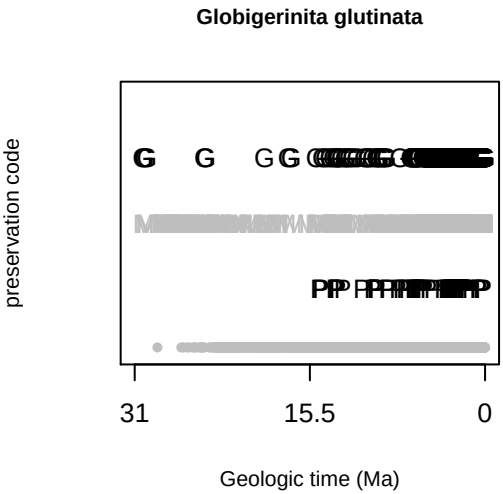

Globigerinatheka senni
preservation code
G
M
P
54
37
20
Geologic time (Ma)

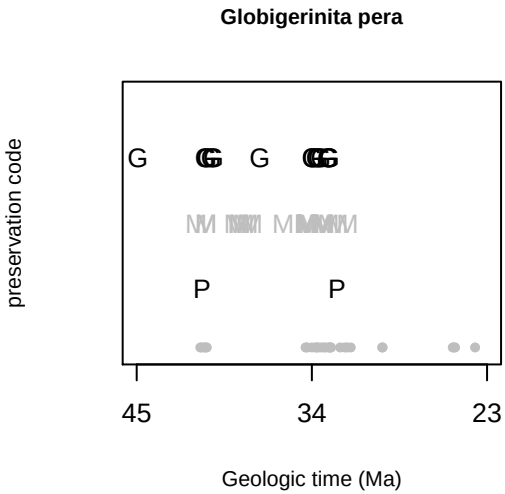

Globigerinatheka subconglobata
preservation code
G
M
P
47
40
33
Geologic time (Ma)

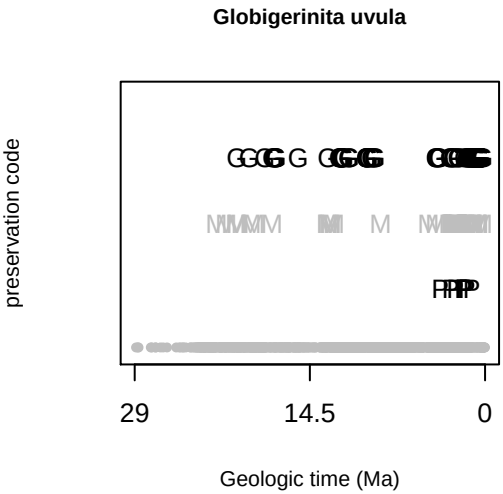

Globigerinella calida
preservation code
G
M
P
10
5
0
Geologic time (Ma)

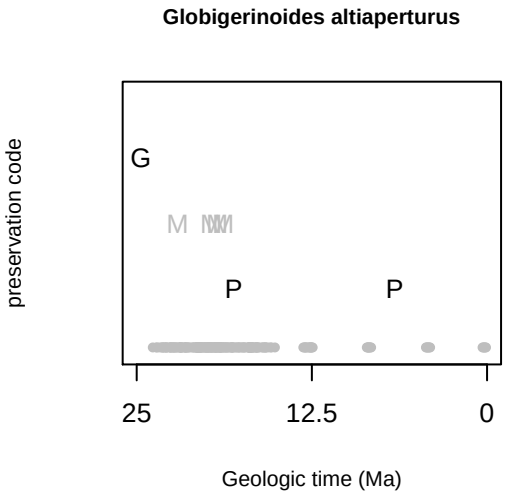

Globigerinella siphonifera
preservation code
25
12.5
0
Geologic time (Ma)

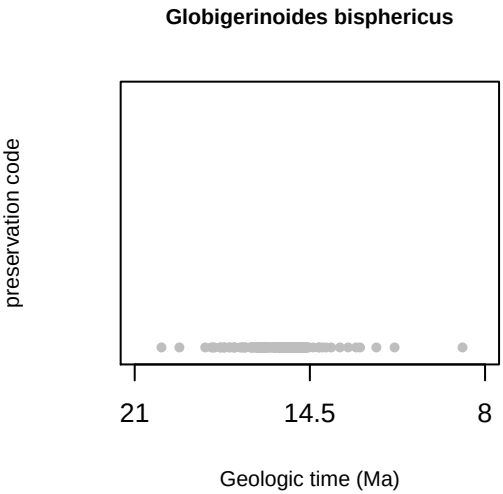

Globigerinelloides multispinus
preservation code
85
66.5
48
Geologic time (Ma)

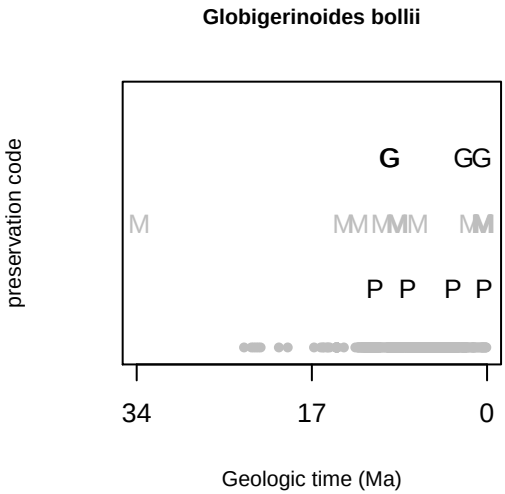

Globigerinita glutinata
preservation code
31
15.5
0
Geologic time (Ma)

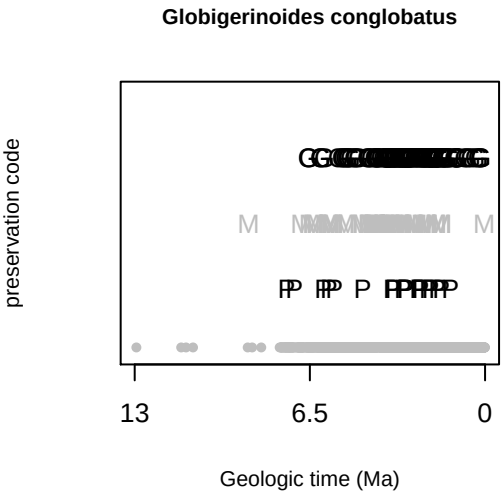

Globigerinita pera
preservation code
45
34
23
Geologic time (Ma)

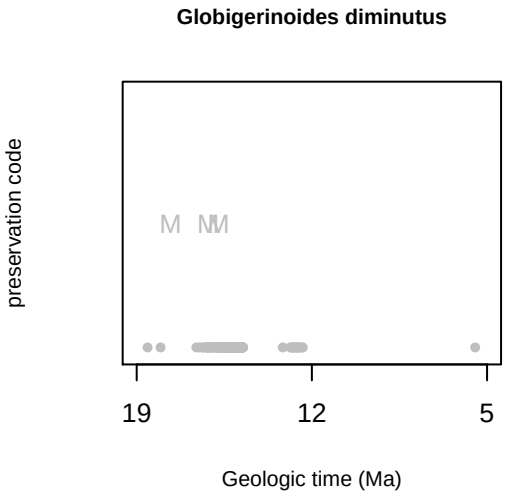

Globigerinita uvula
preservation code
29
14.5
0
Geologic time (Ma)

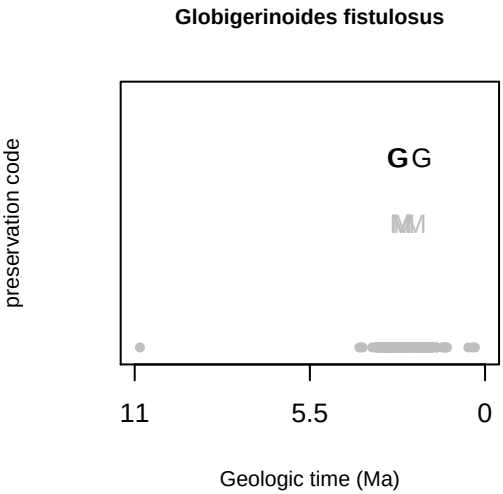

Globigerinoides altiaperturus
preservation code
G
M
P
P
25
12.5
0
Geologic time (Ma)

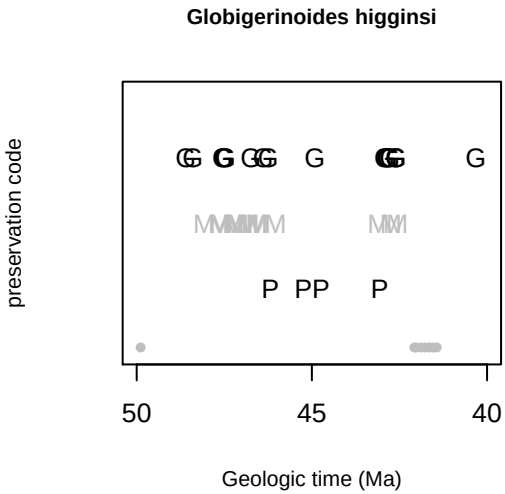

Globigerinoides bisphericus
preservation code
21
14.5
8
Geologic time (Ma)

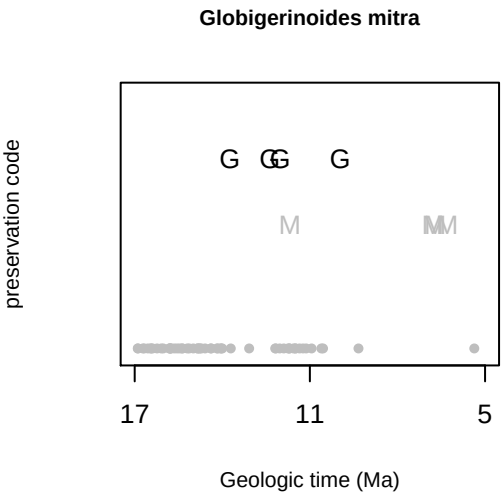

Globigerinoides bollii
preservation code
G
GG
M
P P P P
34
17
0
Geologic time (Ma)

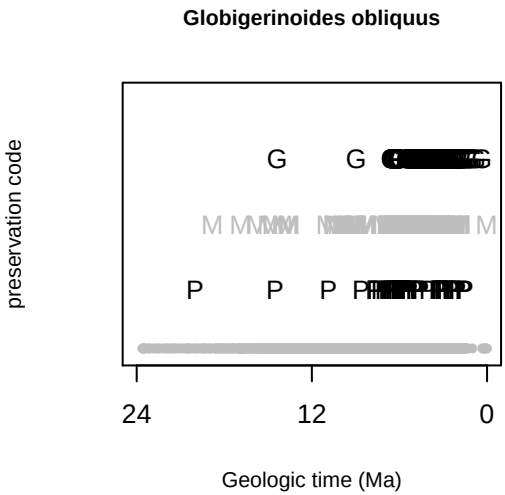

Globigerinoides conglobatus
preservation code
13
6.5
0
Geologic time (Ma)

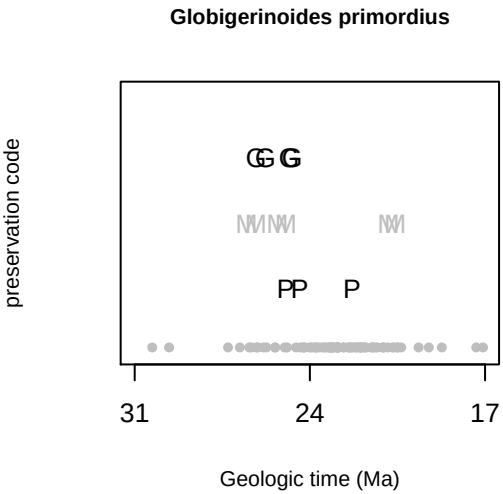

Globigerinoides diminutus
preservation code
19
12
5
Geologic time (Ma)

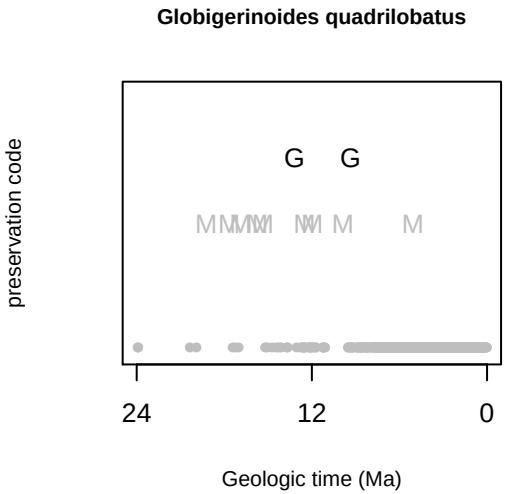

Globigerinoides fistulosus
preservation code
11
5.5
0
Geologic time (Ma)

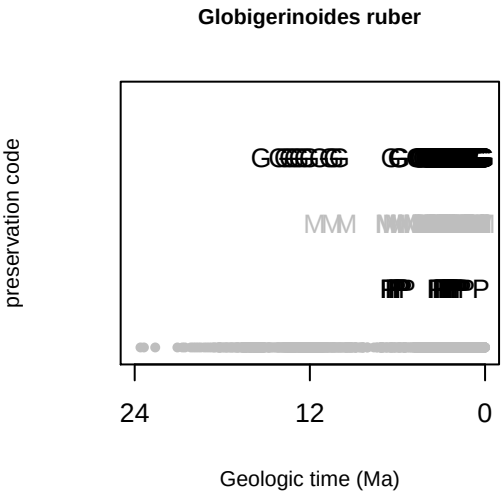

Globigerinoides higginsi
preservation code
50
45
40
Geologic time (Ma)

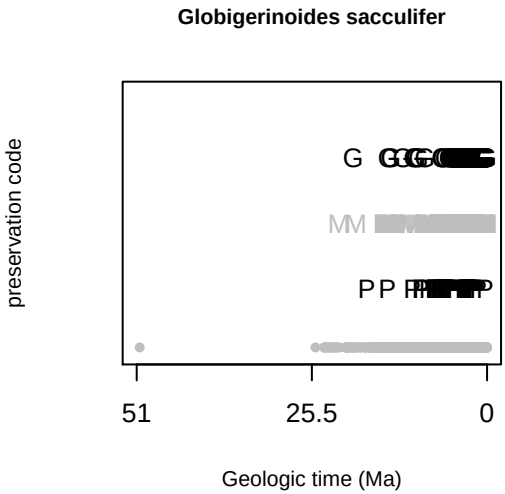

Globigerinoides mitra
preservation code
G
M
17
11
5
Geologic time (Ma)

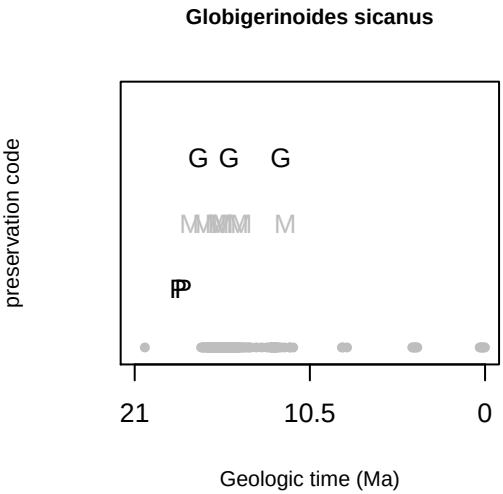

Globigerinoides obliquus
preservation code
G
M
P
24
12
0
Geologic time (Ma)

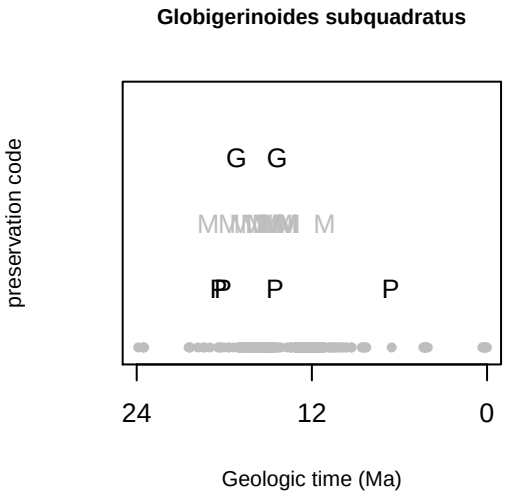

Globigerinoides primordius
preservation code
G
M
P
31
24
17
Geologic time (Ma)

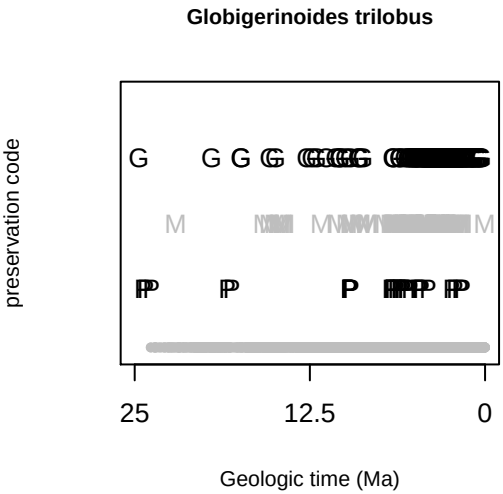

Globigerinoides quadrilobatus
preservation code
G
M
24
12
0
Geologic time (Ma)

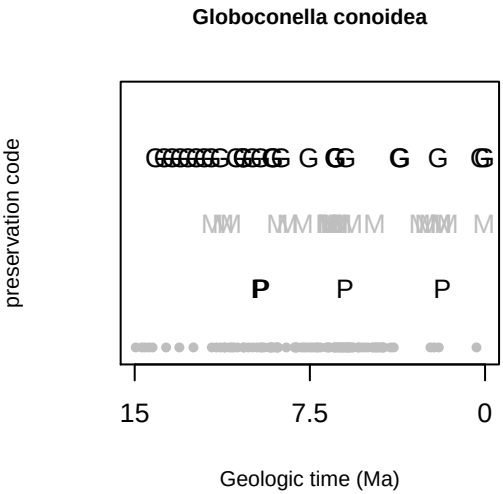

Globigerinoides ruber
preservation code
24
12
0
Geologic time (Ma)

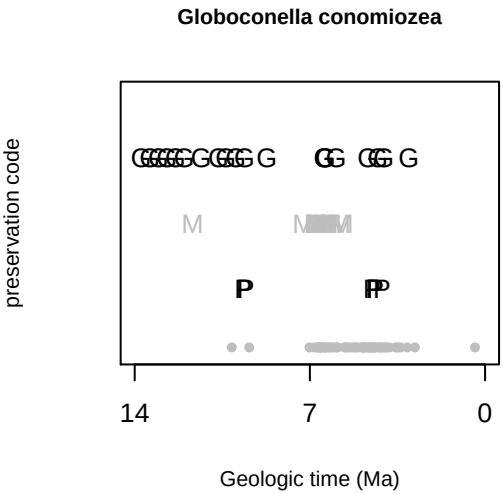

Globigerinoides sacculifer
preservation code
51
25.5
0
Geologic time (Ma)

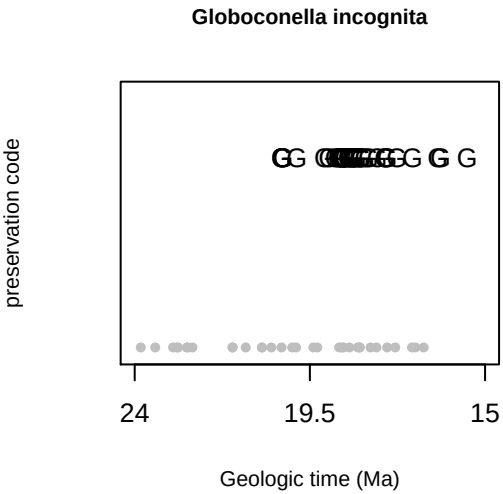

Globigerinoides sicanus
preservation code
21
10.5
0
Geologic time (Ma)

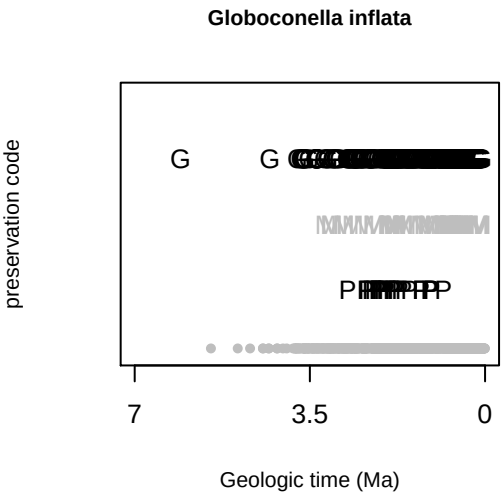

Globigerinoides subquadratus
preservation code
24
12
0
Geologic time (Ma)

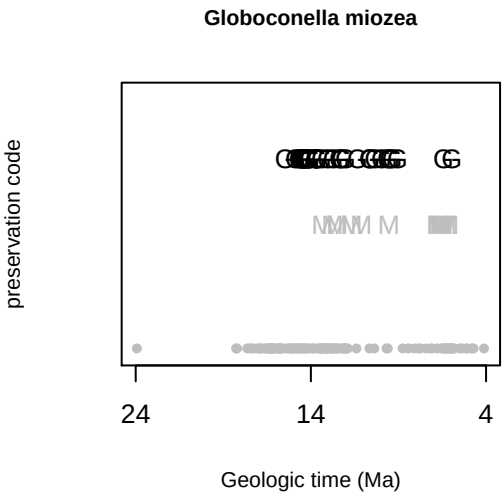

Globigerinoides trilobus
preservation code
G
M
P
25
12.5
0
Geologic time (Ma)

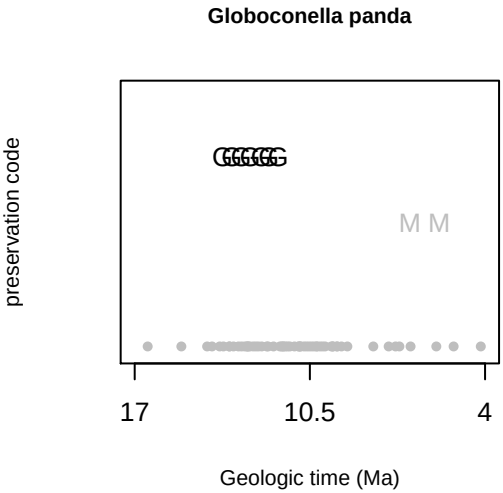

Globoconella conoidea
preservation code
G
M
P
15
7.5
0
Geologic time (Ma)

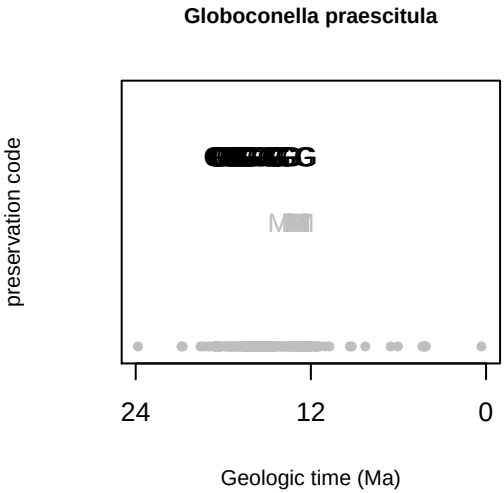

Globoconella conomiozea
preservation code
G
M
P
14
7
0
Geologic time (Ma)

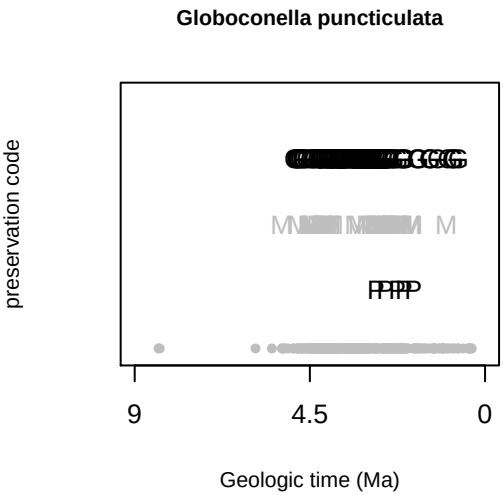

Globoconella incognita
preservation code
G
24
19.5
15
Geologic time (Ma)

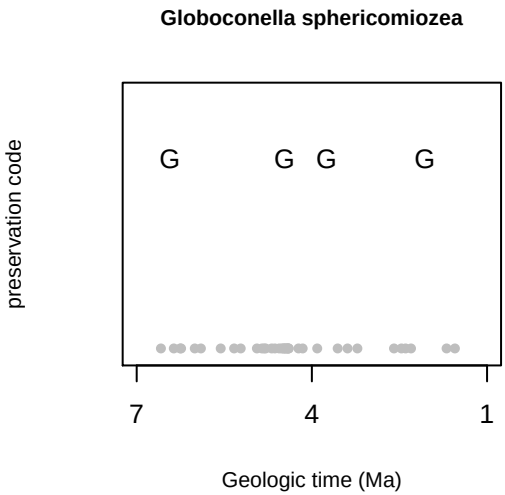

Globoconella inflata
preservation code
G
G
M
P
7
3.5
0
Geologic time (Ma)

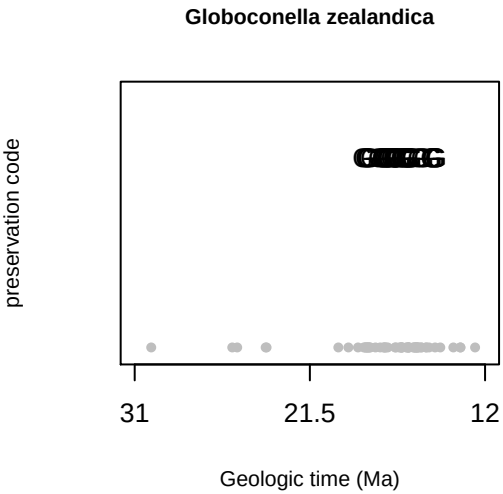

Globoconella miozea
preservation code
G
G
M
M
24
14
4
Geologic time (Ma)

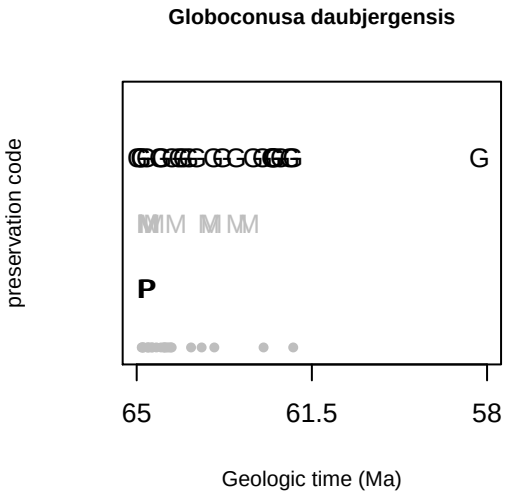

Globoconella panda
preservation code
G
M
M
17
10.5
4
Geologic time (Ma)

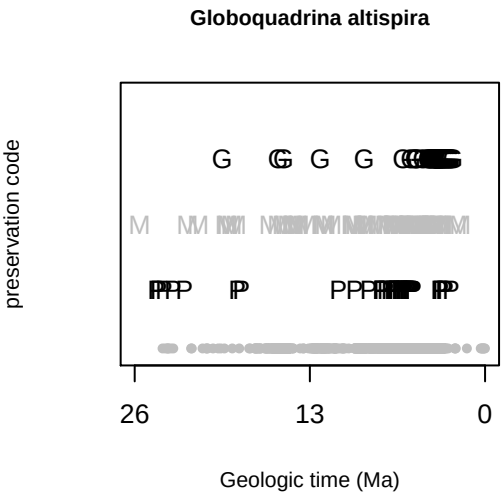

Globoconella praescitula
preservation code
G
M
24
12
0
Geologic time (Ma)

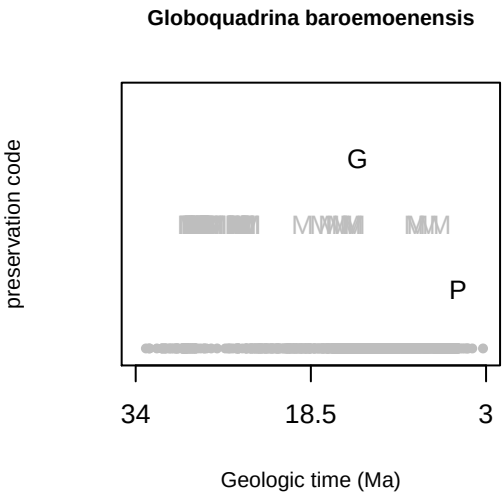

Globoconella puncticulata
preservation code
9
4.5
0
Geologic time (Ma)

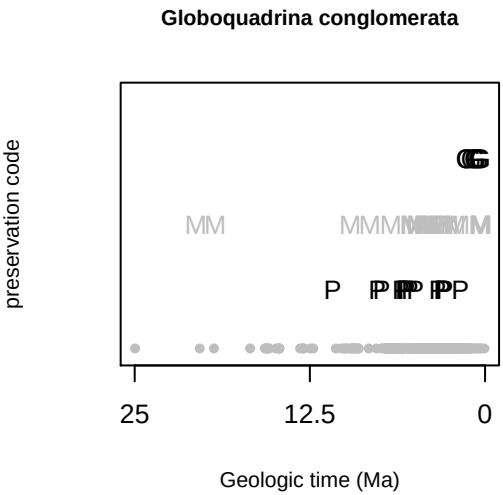

Globoconella sphericomiozea
preservation code
G
G
G
G
7
4
1
Geologic time (Ma)

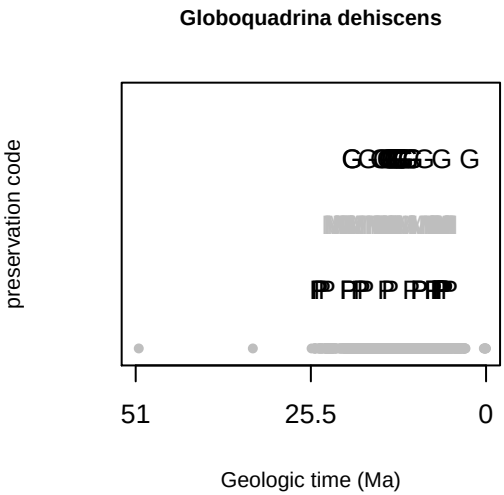

Globoconella zealandica
preservation code
31
21.5
12
Geologic time (Ma)

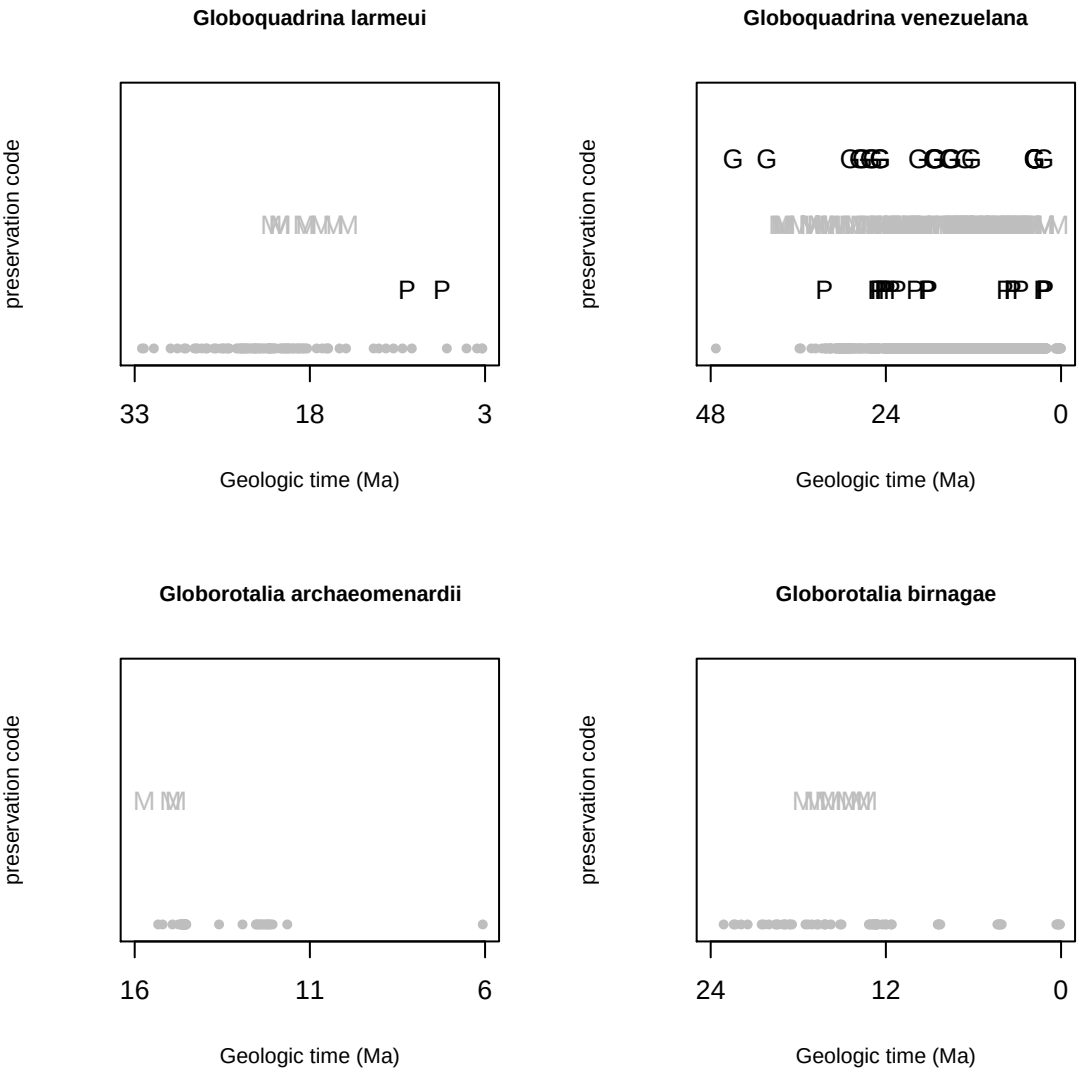

Globoconusa daubjergensis
preservation code
G
P
65
61.5
58
Geologic time (Ma)

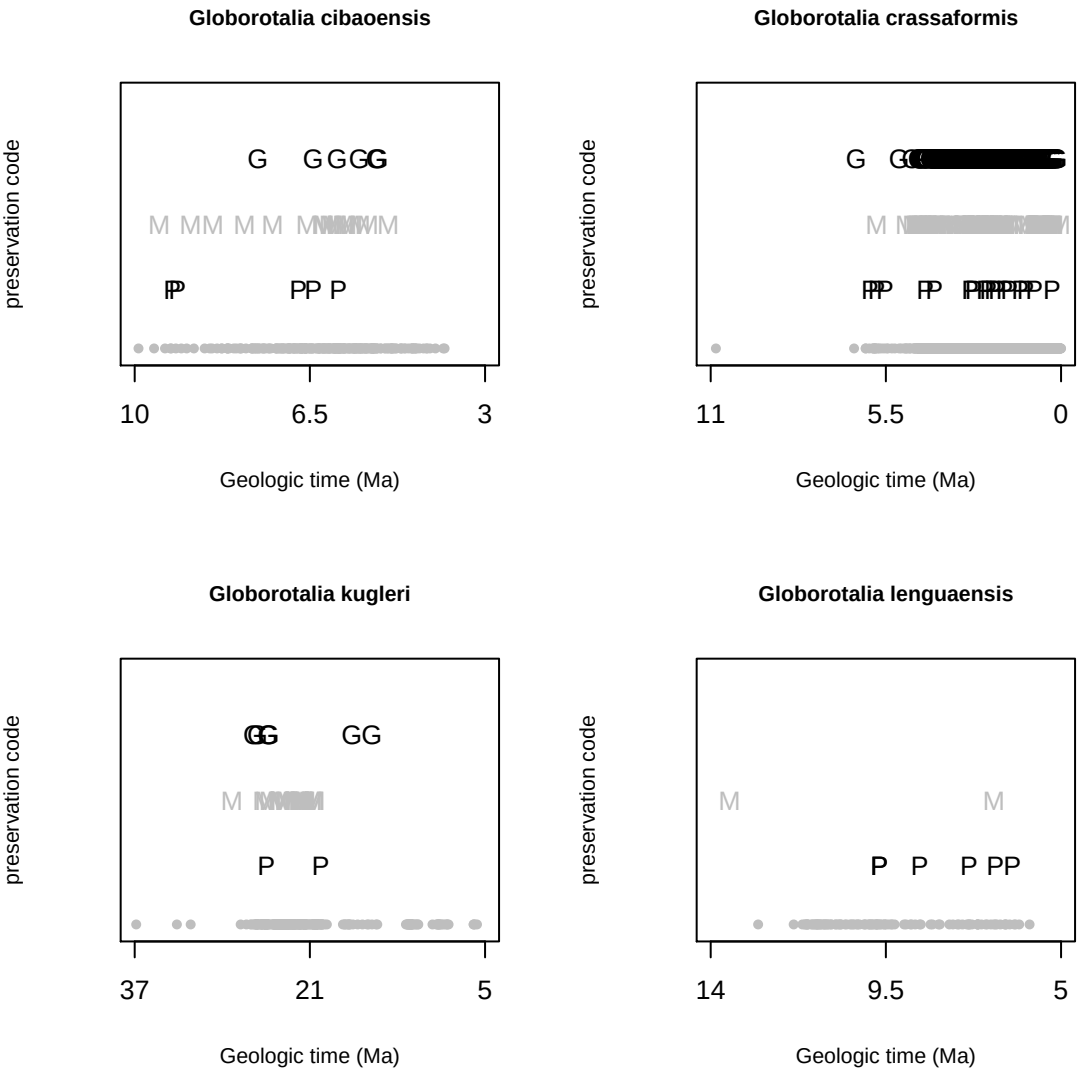

Globoquadrina altispira
preservation code
26
13
0
Geologic time (Ma)

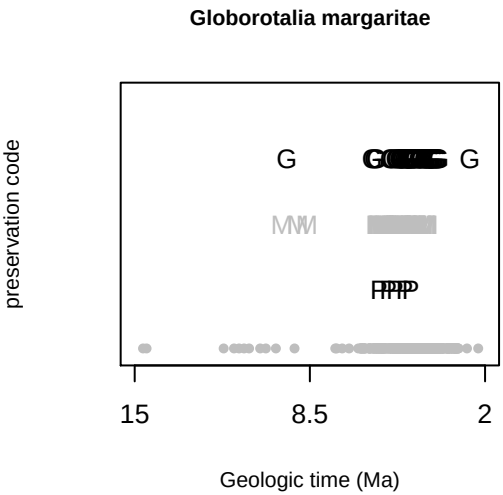

Globoquadrina baroemoenensis
preservation code
34
18.5
3
Geologic time (Ma)

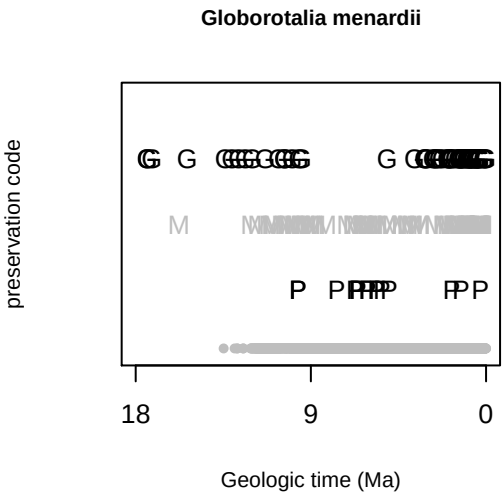

Globoquadrina conglomerata
preservation code
25
12.5
0
Geologic time (Ma)

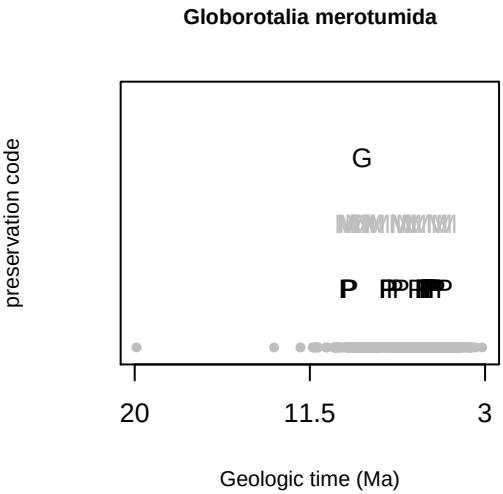

Globoquadrina dehiscens
preservation code
51
25.5
0
Geologic time (Ma)

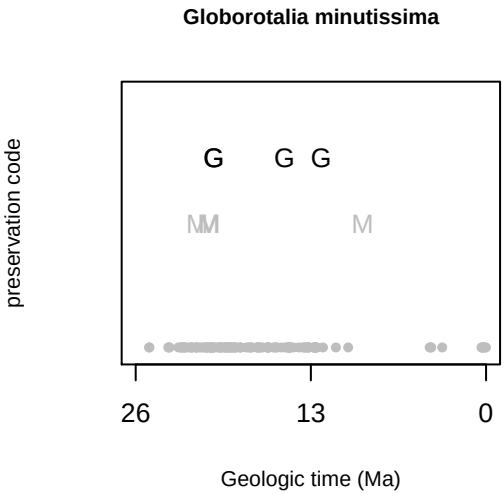

Globoquadrina larmeui
preservation code
33
18
3
Geologic time (Ma)
Globoquadrina venezuelana
preservation code
48
24
0
Geologic time (Ma)
Globorotalia archaeomenardii
preservation code
16
11
6
Geologic time (Ma)
Globorotalia birnagae
preservation code
24
12
0
Geologic time (Ma)

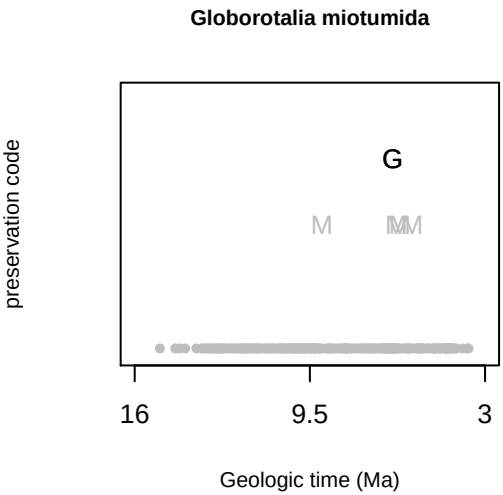

Globorotalia cibaoensis
preservation code
G G G G G
M M M M M M M M M M
P P P P
10
6.5
3
Geologic time (Ma)
Globorotalia crassaformis
preservation code
G G G
M M
P P P P P P P P P
11
5.5
0
Geologic time (Ma)
Globorotalia kugleri
preservation code
G G G G G
M M M M M
P P
37
21
5
Geologic time (Ma)
Globorotalia lenguaensis
preservation code
M M
P P P P P
14
9.5
5
Geologic time (Ma)

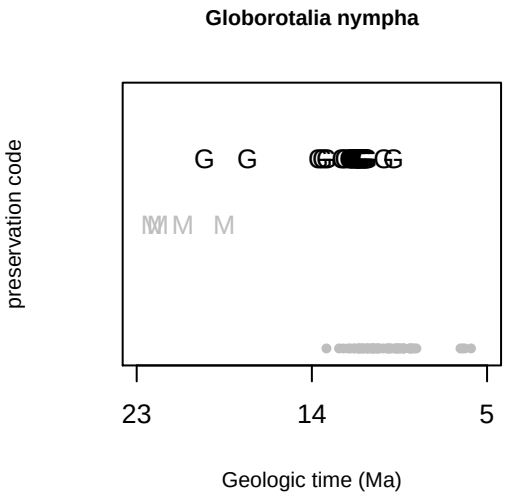

Globorotalia margaritae
preservation code
G
G
M
P
15
8.5
2
Geologic time (Ma)

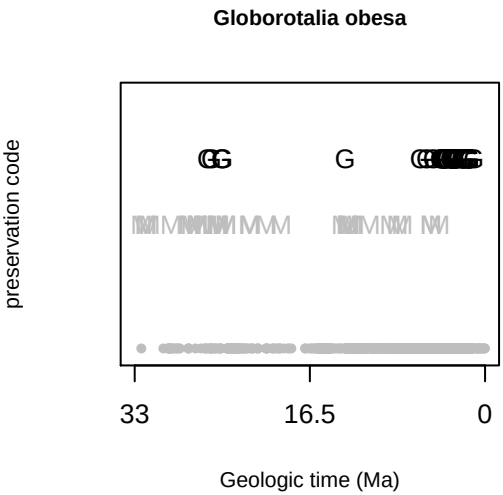

Globorotalia menardii
preservation code
G
G
G
M
P
P
P
18
9
0
Geologic time (Ma)

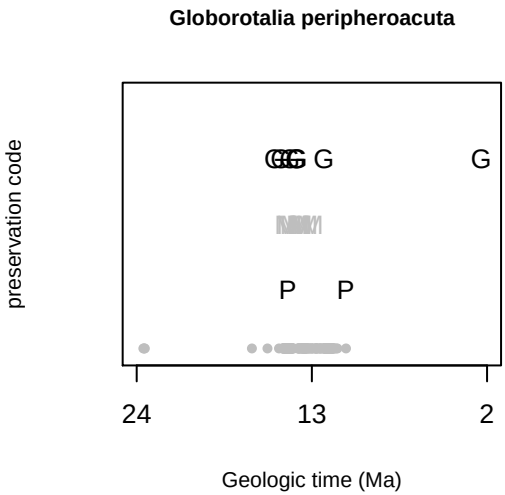

Globorotalia merotumida
preservation code
G
P
20
11.5
3
Geologic time (Ma)

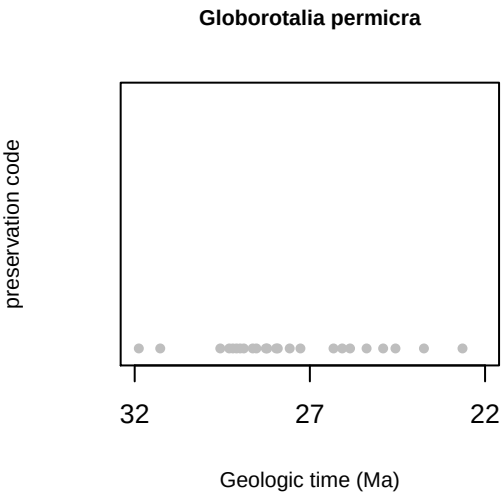

Globorotalia minutissima
preservation code
G
G
G
M
26
13
0
Geologic time (Ma)

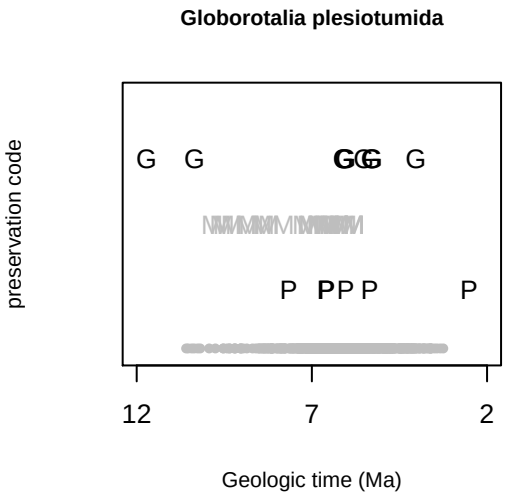

Globorotalia miotumida
preservation code
G
M
16
9.5
3
Geologic time (Ma)

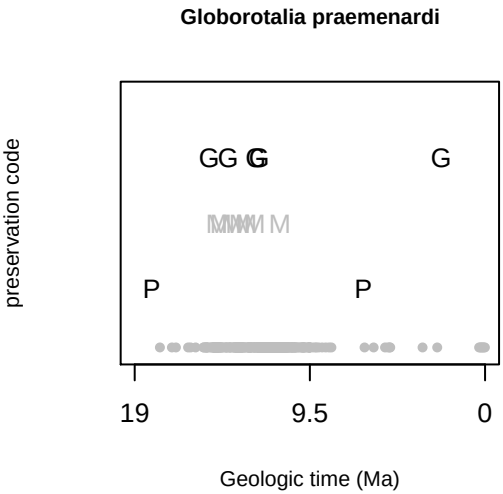

Globorotalia nympha
preservation code
G
G
M
M
23
14
5
Geologic time (Ma)

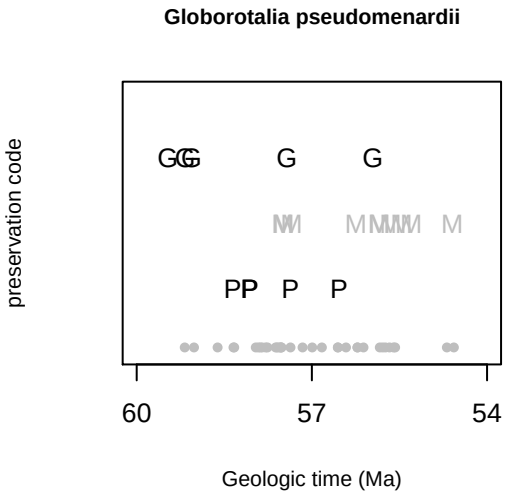

Globorotalia obesa
preservation code
G
G
M
33
16.5
0
Geologic time (Ma)

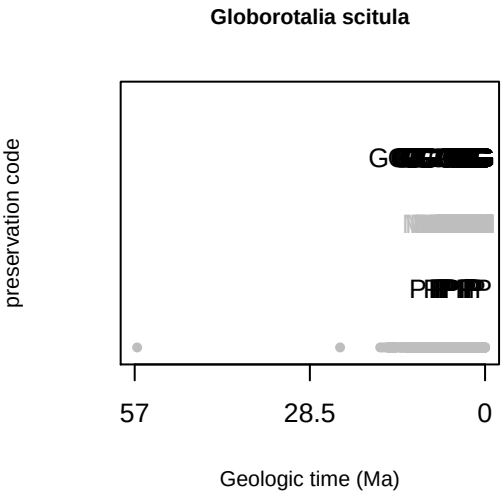

Globorotalia peripheroacuta
preservation code
G
G
P
P
24
13
2
Geologic time (Ma)

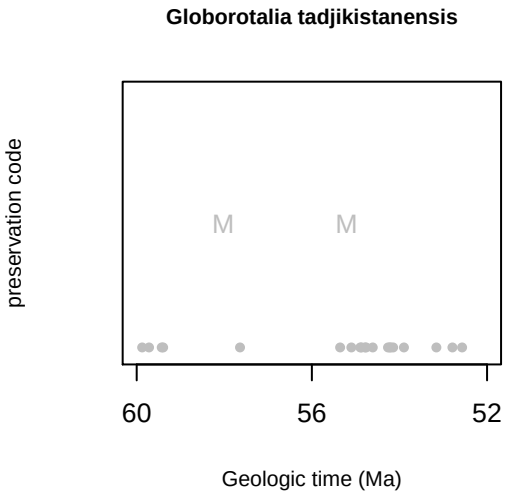

Globorotalia permicra
preservation code
32
27
22
Geologic time (Ma)

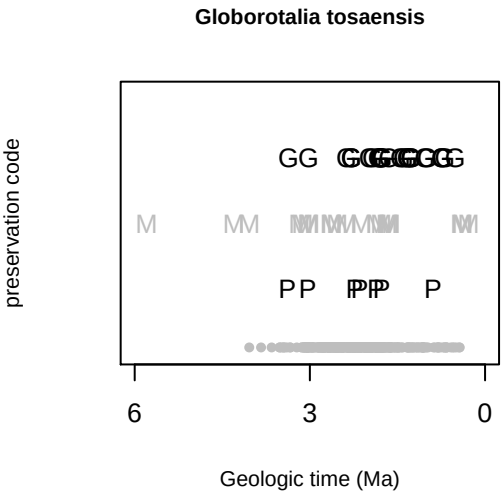

Globorotalia plesiotumida
preservation code
G G G G G G
P P P P P
12
7
2
Geologic time (Ma)

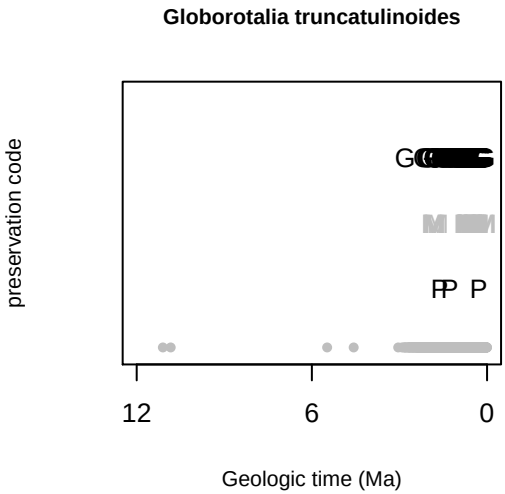

Globorotalia praemenardi
preservation code
G G G G G
P P
19
9.5
0
Geologic time (Ma)

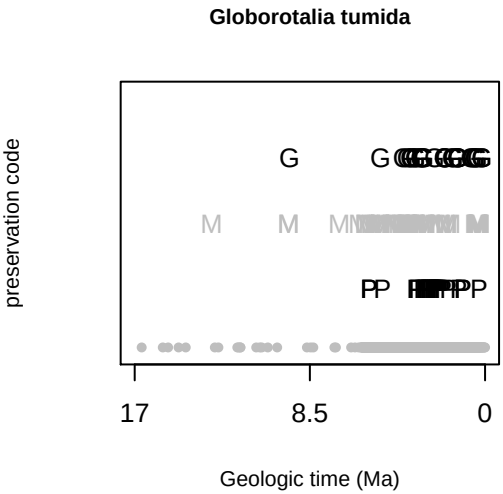

Globorotalia pseudomenardii
preservation code
G G G G G
P P P P
60
57
54
Geologic time (Ma)

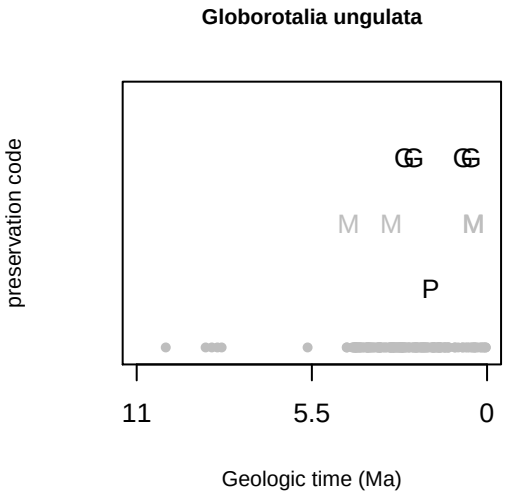

Globorotalia scitula
preservation code
G
M
P
57
28.5
0
Geologic time (Ma)

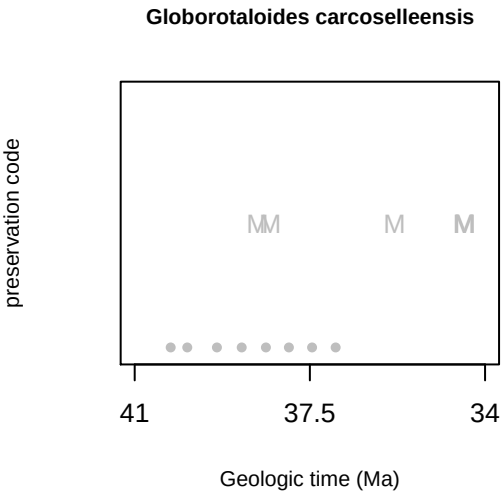

Globorotalia tadjikistanensis
preservation code
M
M
60
56
52
Geologic time (Ma)

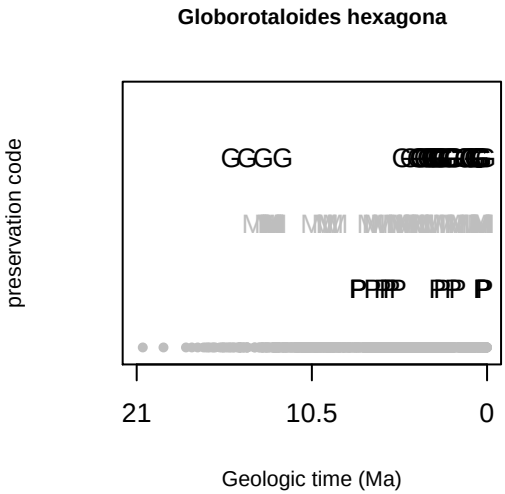

Globorotalia tosaensis
preservation code
GG
M
M
P P
P
6
3
0
Geologic time (Ma)

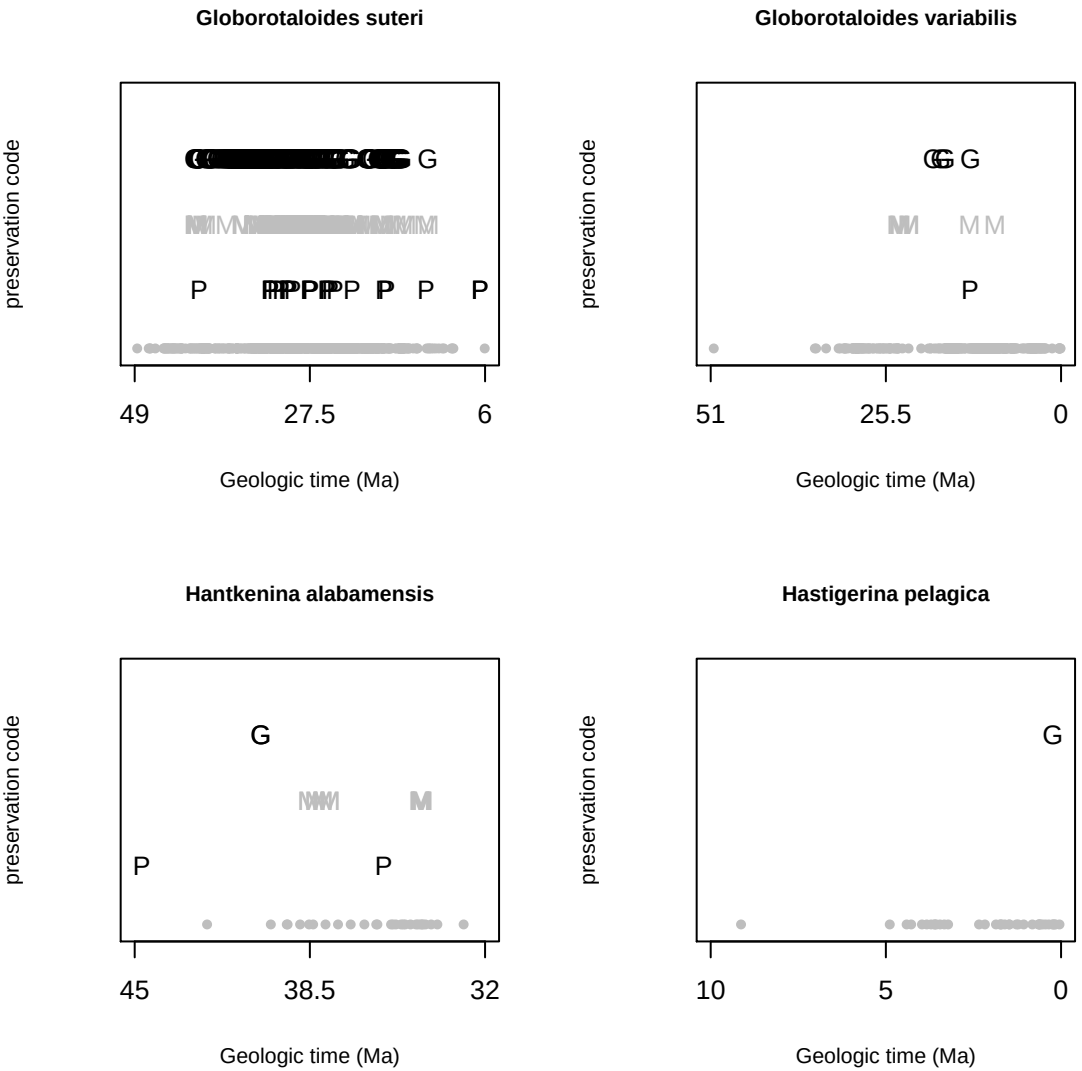

Globorotalia truncatulinoides
preservation code
G
P P
12
6
0
Geologic time (Ma)

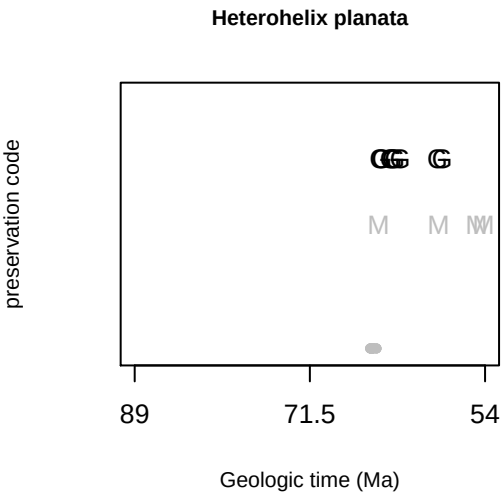

Globorotalia tumida
preservation code
G
G
M
M
M
PP
P
17
8.5
0
Geologic time (Ma)

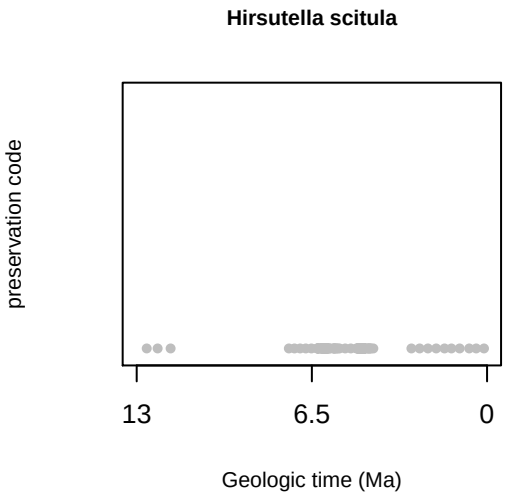

Globorotalia ungulata
preservation code
G
G
M
M
M
P
11
5.5
0
Geologic time (Ma)

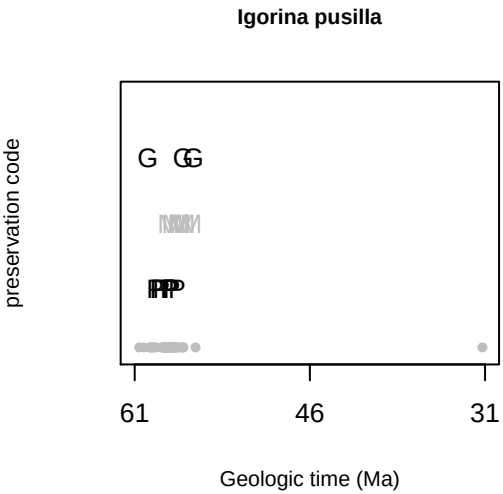

Globorotaloides carcoselleensis
preservation code
M
M
M
M
41
37.5
34
Geologic time (Ma)

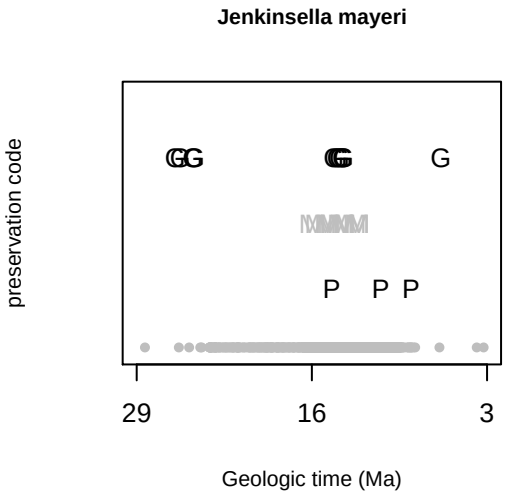

Globorotaloides hexagona
preservation code
GGGG
M
P
P
P
21
10.5
0
Geologic time (Ma)

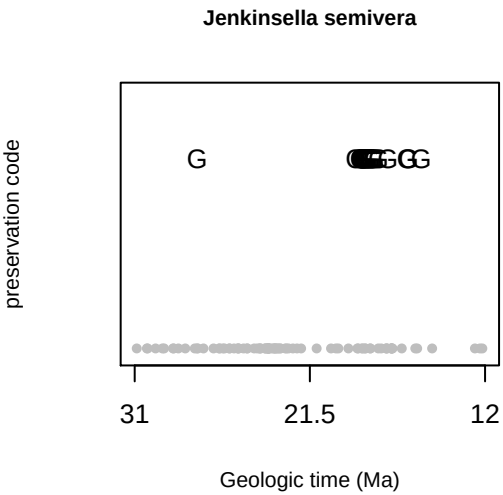

Globorotaloides suteri
preservation code
G
M
P
49
27.5
6
Geologic time (Ma)
Globorotaloides variabilis
preservation code
G
M
P
51
25.5
0
Geologic time (Ma)
Hantkenina alabamensis
preservation code
G
M
P
45
38.5
32
Geologic time (Ma)
Hastigerina pelagica
preservation code
G
10
5
0
Geologic time (Ma)

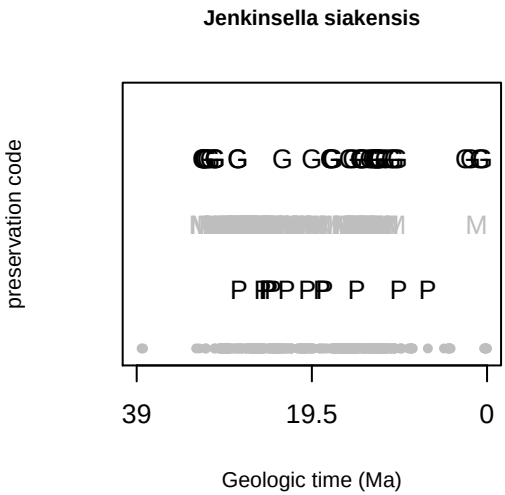

Heterohelix planata
preservation code
89
71.5
54
Geologic time (Ma)

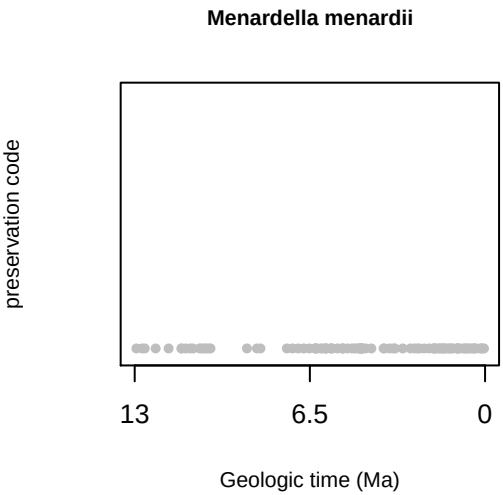

Hirsutella scitula
preservation code
13
6.5
0
Geologic time (Ma)

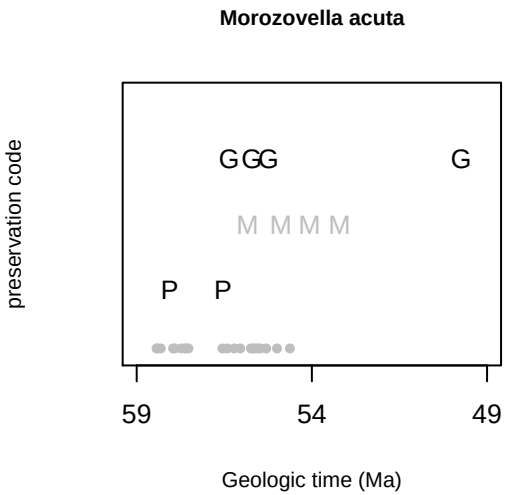

Igorina pusilla
preservation code
61
46
31
Geologic time (Ma)

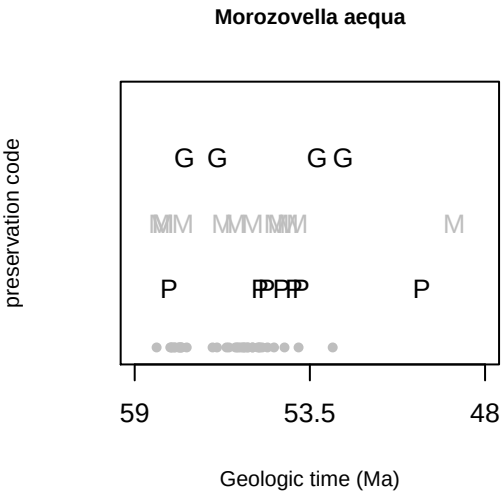

Jenkinsella mayeri
preservation code
29
16
3
Geologic time (Ma)

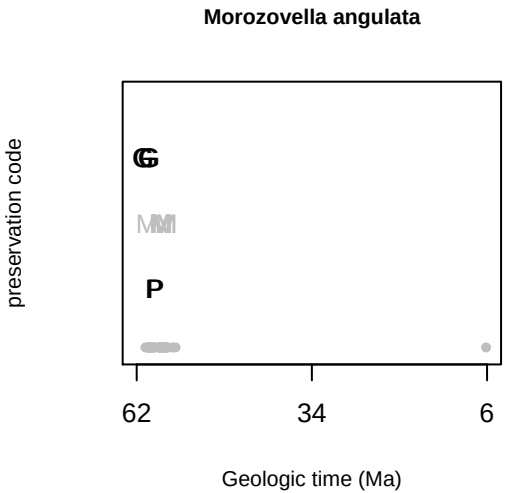

Jenkinsella semivera
preservation code
G
31
21.5
12
Geologic time (Ma)

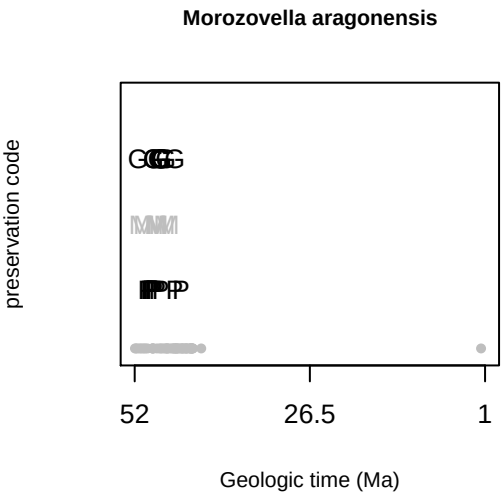

Jenkinsella siakensis
preservation code
G
M
P
39
19.5
0
Geologic time (Ma)

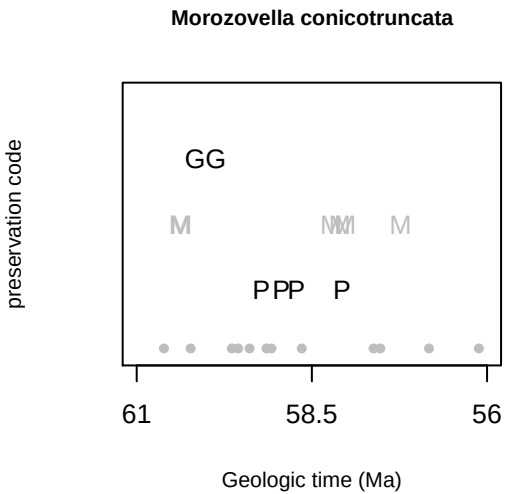

Menardella menardii
preservation code
13
6.5
0
Geologic time (Ma)

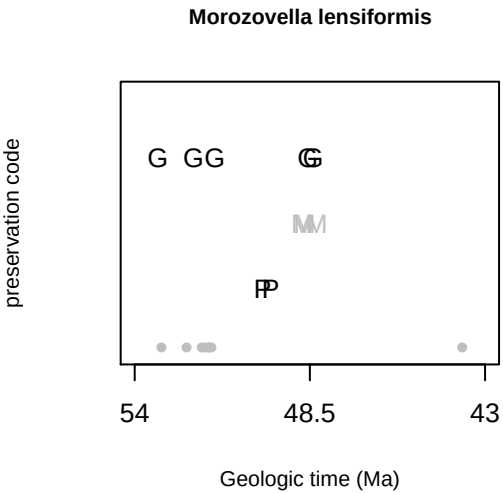

Morozovella acuta
preservation code
G
M
P
59
54
49
Geologic time (Ma)

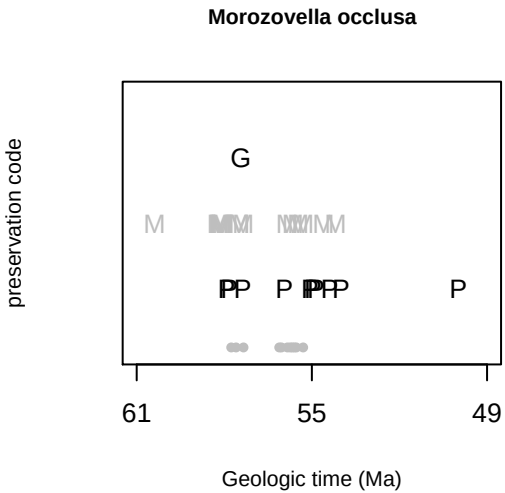

Morozovella aequa
preservation code
G G G G
M M M M M M M M
P P P P P P
59
53.5
48
Geologic time (Ma)

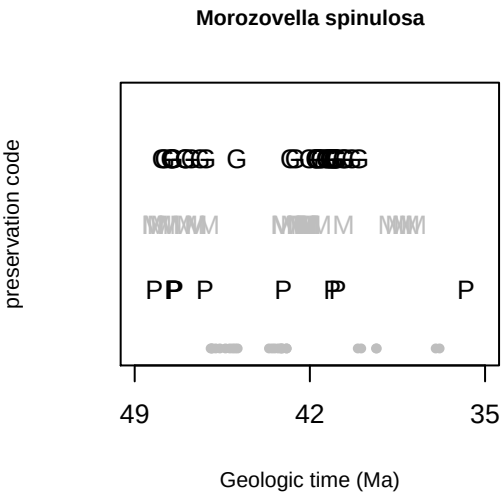

Morozovella angulata
preservation code
G G
M M
P
62
34
6
Geologic time (Ma)

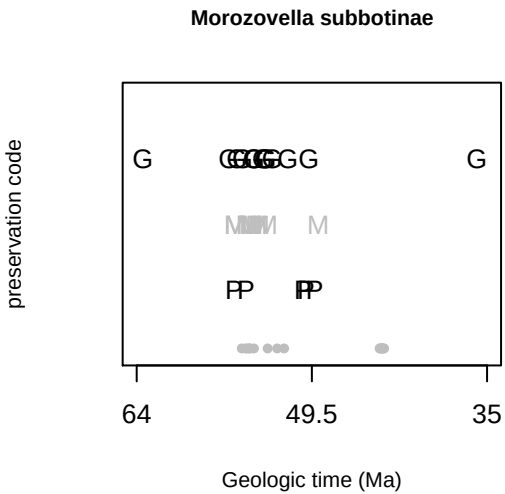

Morozovella aragonensis
preservation code
G G G G
M M M M
P P P P
52
26.5
1
Geologic time (Ma)

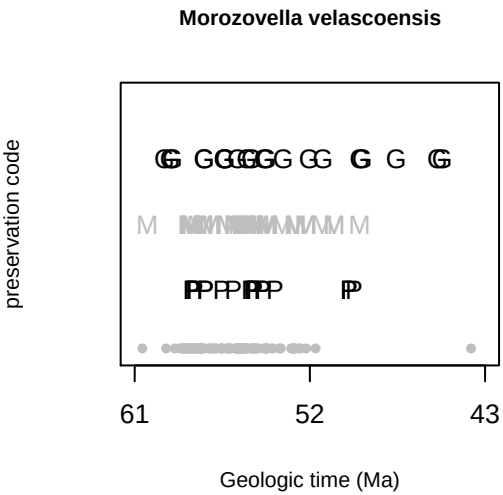

Morozovella conicotruncata
preservation code
G G
M M M M
P P P P
61
58.5
56
Geologic time (Ma)

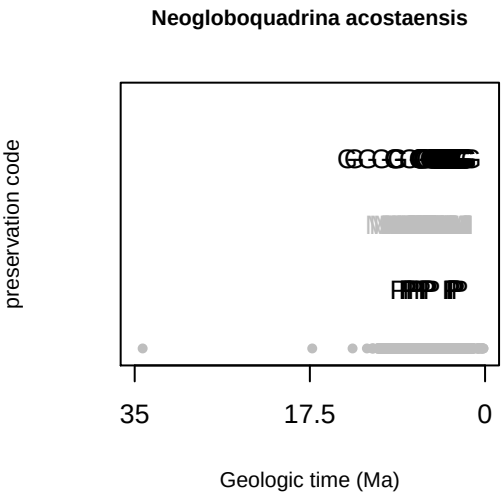

Morozovella lensiformis
preservation code
54
48.5
43
Geologic time (Ma)

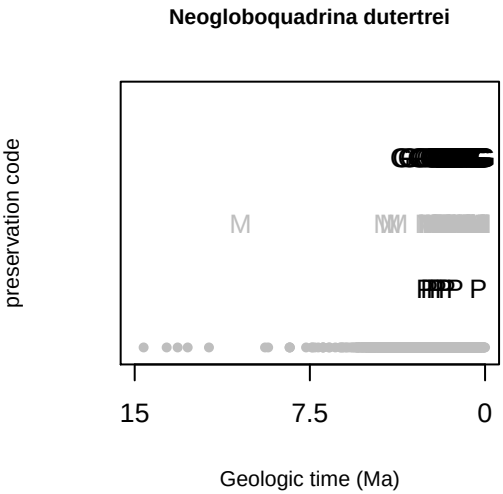

Morozovella occlusa
preservation code
61
55
49
Geologic time (Ma)

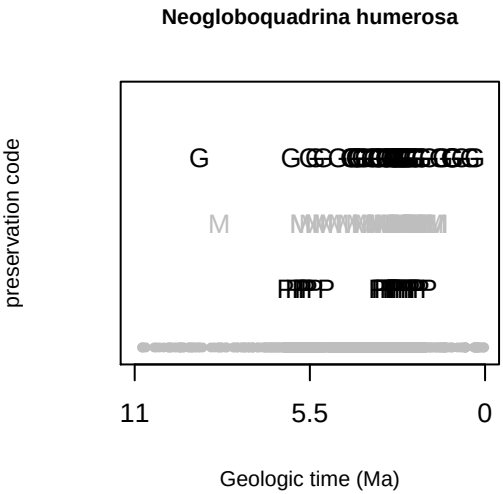

Morozovella spinulosa
preservation code
49
42
35
Geologic time (Ma)

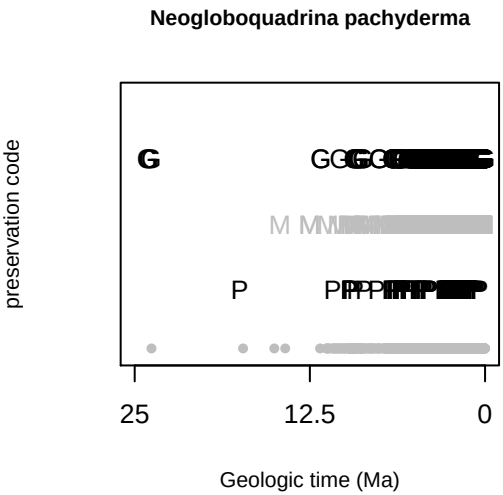

Morozovella subbotinae
preservation code
64
49.5
35
Geologic time (Ma)

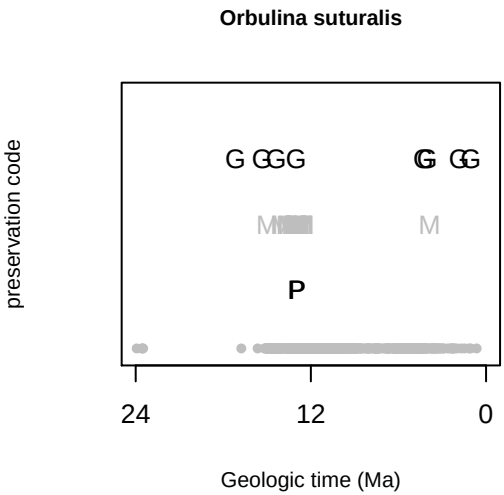

Morozovella velascoensis
preservation code
61
52
43
Geologic time (Ma)

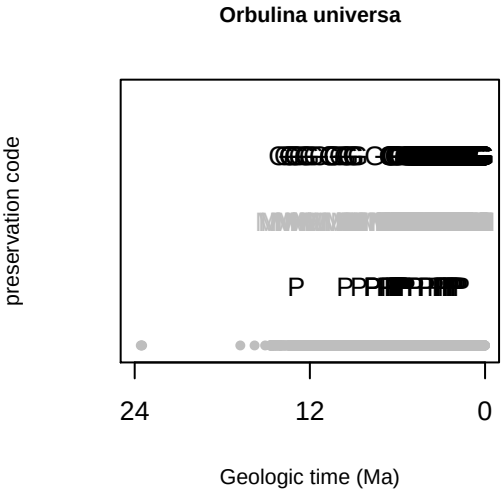

Neogloboquadrina acostaensis
preservation code
35
17.5
0
Geologic time (Ma)

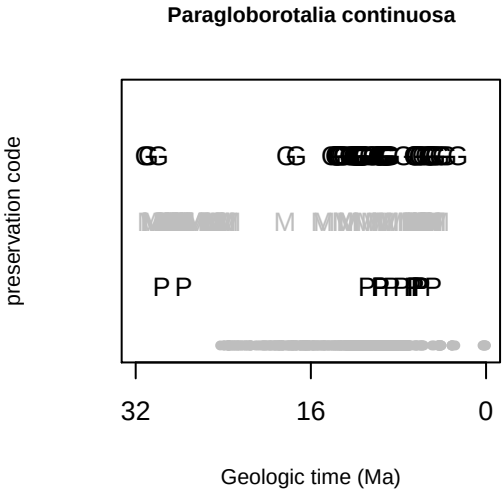

Neogloboquadrina dutertrei
preservation code
15
7.5
0
Geologic time (Ma)

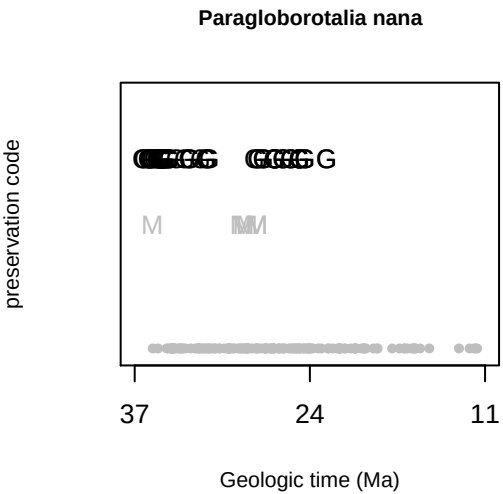

Neogloboquadrina humerosa
preservation code
11
5.5
0
Geologic time (Ma)

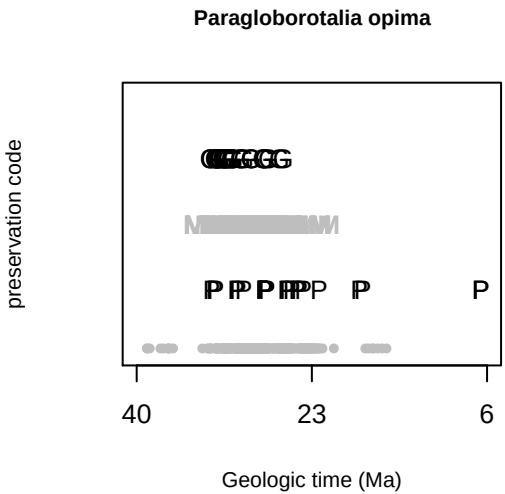

Neogloboquadrina pachyderma
preservation code
G
GG
M
P
25
12.5
0
Geologic time (Ma)

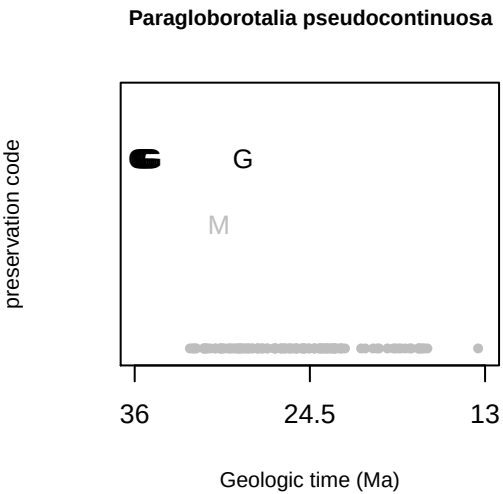

Orbulina suturalis
preservation code
G
M
P
24
12
0
Geologic time (Ma)

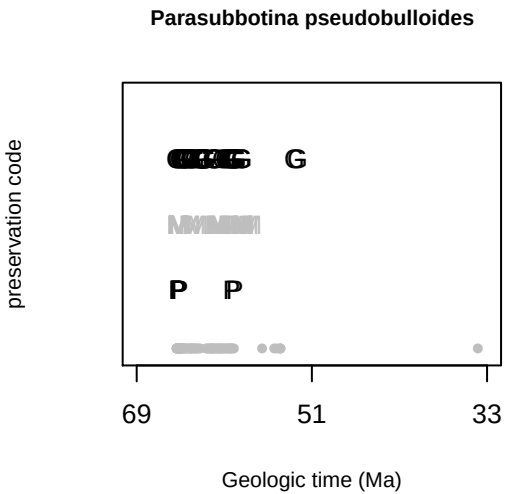

Orbulina universa
preservation code
P
24
12
0
Geologic time (Ma)

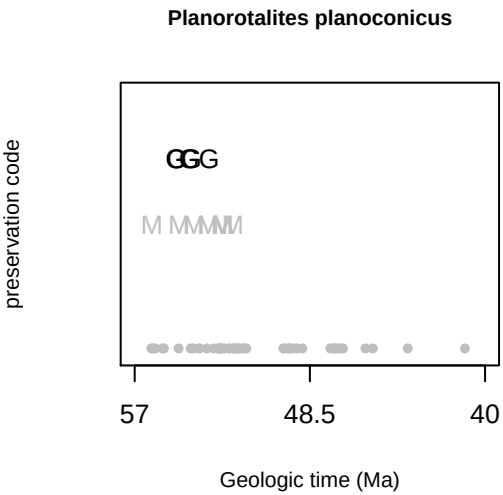

Paragloborotalia continuosa
preservation code
G
M
P
32
16
0
Geologic time (Ma)

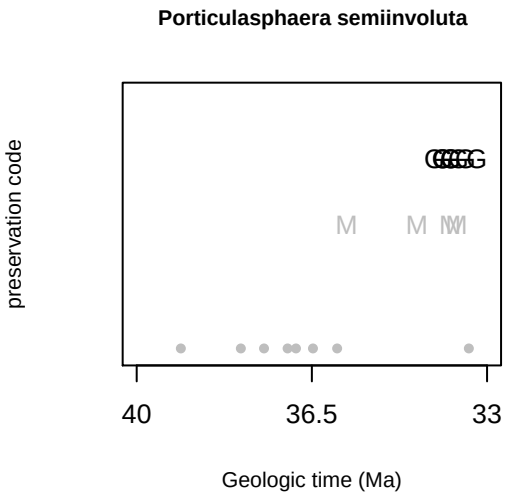

Paragloborotalia nana
preservation code
G
M
37
24
11
Geologic time (Ma)

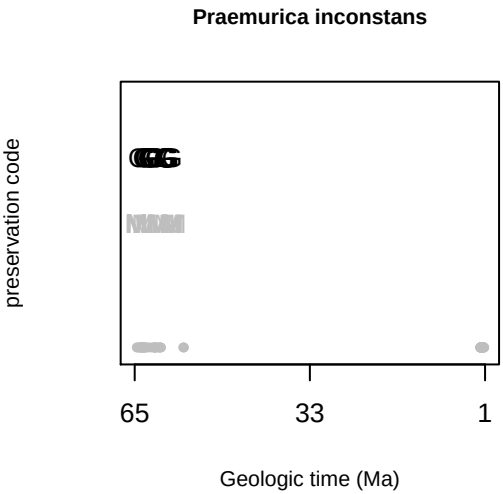

Paragloborotalia opima
preservation code
G
M
P
40
23
6
Geologic time (Ma)

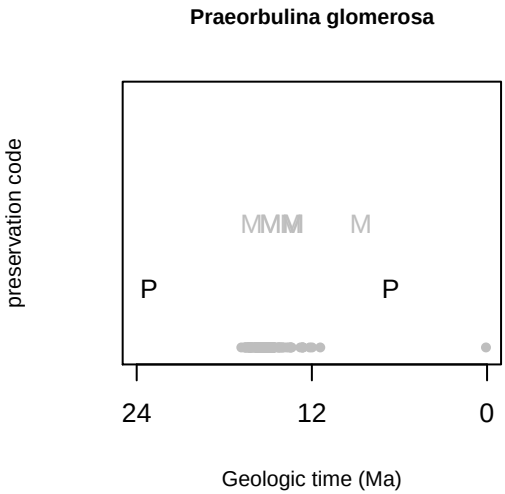

Paragloborotalia pseudocontinuosa
preservation code
G
M
36
24.5
13
Geologic time (Ma)

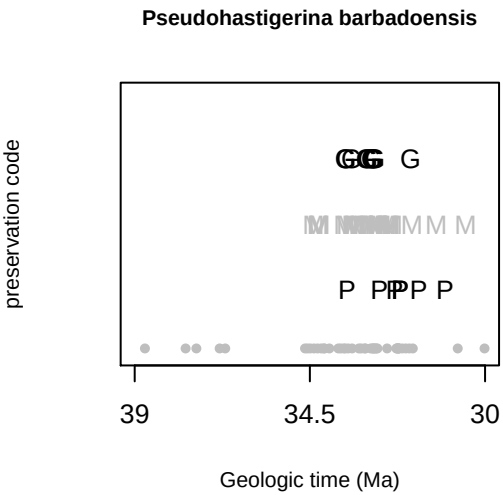

Parasubbotina pseudobulloides
preservation code
G
M
P
69
51
33
Geologic time (Ma)

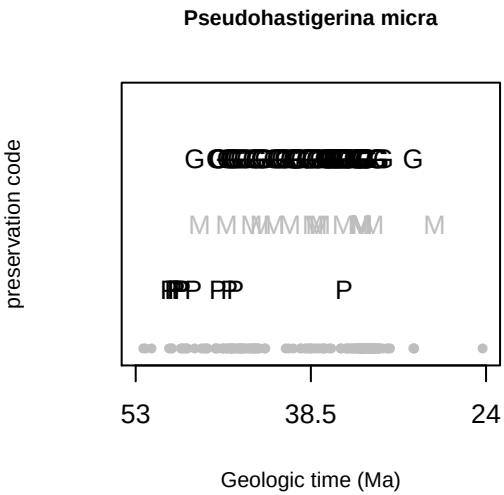

Planorotalites planoconicus
preservation code
Geologic time (Ma)
57
48.5
40

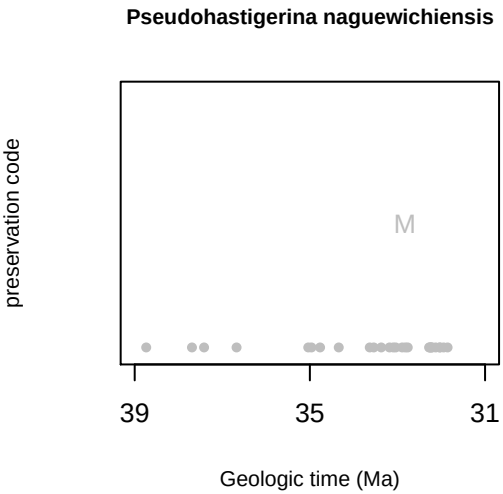

Porticulasphaera semiinvoluta
preservation code
Geologic time (Ma)
40
36.5
33

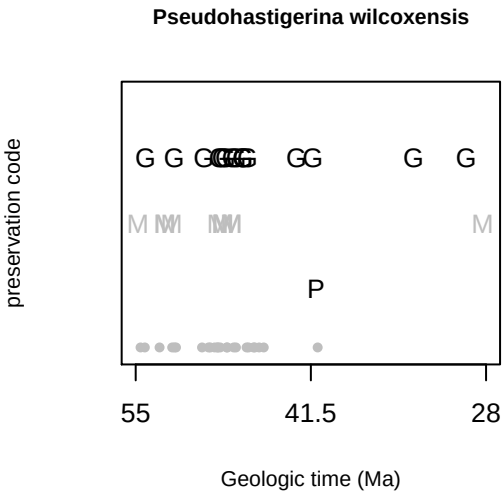

Praemurica inconstans
preservation code
Geologic time (Ma)
65
33
1

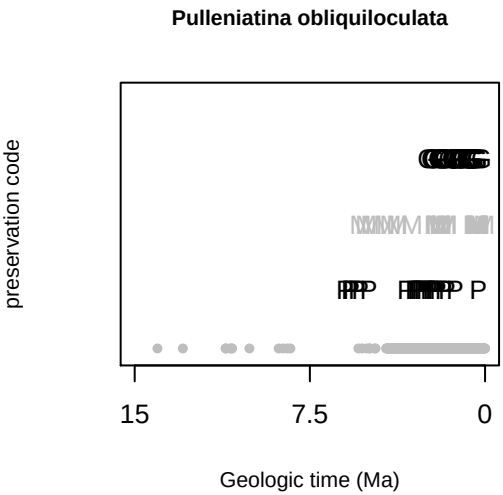

Praeorbulina glomerosa
preservation code
Geologic time (Ma)
24
12
0

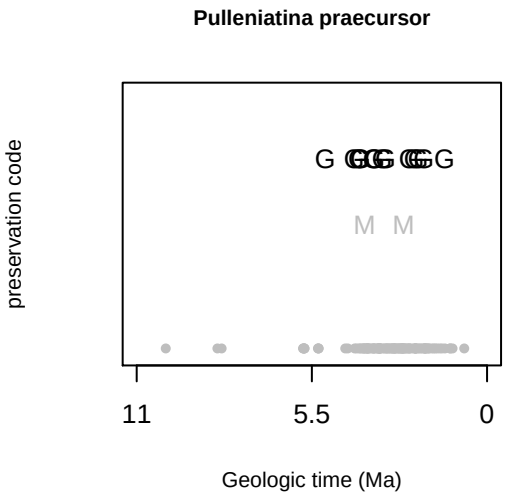

Pseudohastigerina barbadoensis
preservation code
39
34.5
30
Geologic time (Ma)

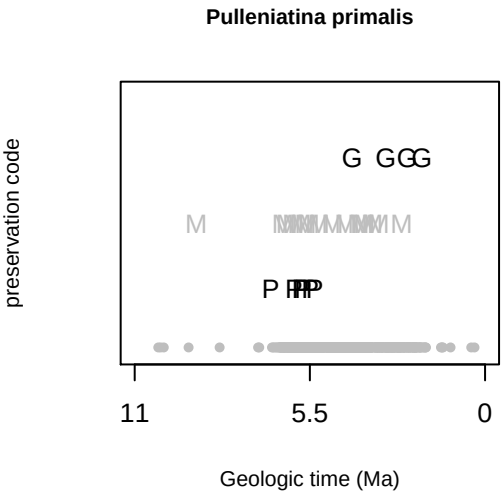

Pseudohastigerina micra
preservation code
53
38.5
24
Geologic time (Ma)

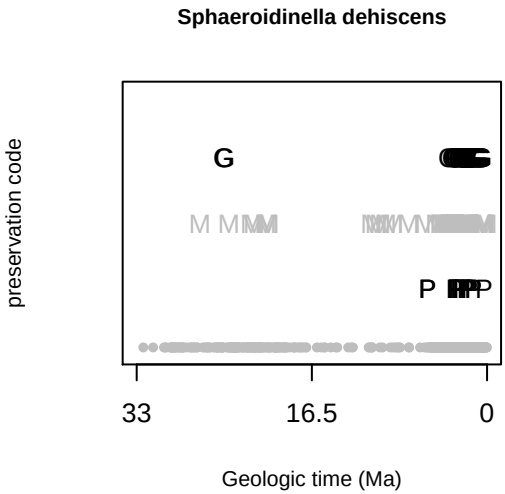

Pseudohastigerina naguewichiensis
preservation code
39
35
31
Geologic time (Ma)

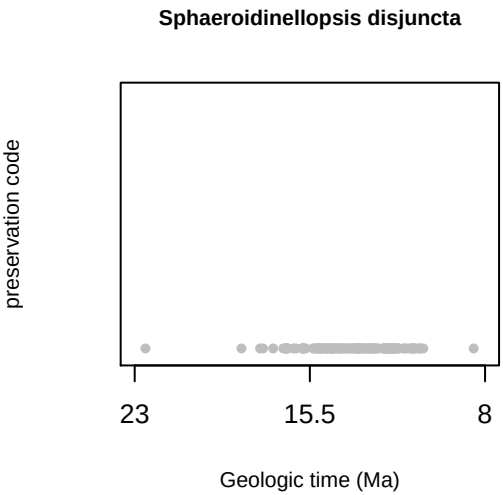

Pseudohastigerina wilcoxensis
preservation code
55
41.5
28
Geologic time (Ma)

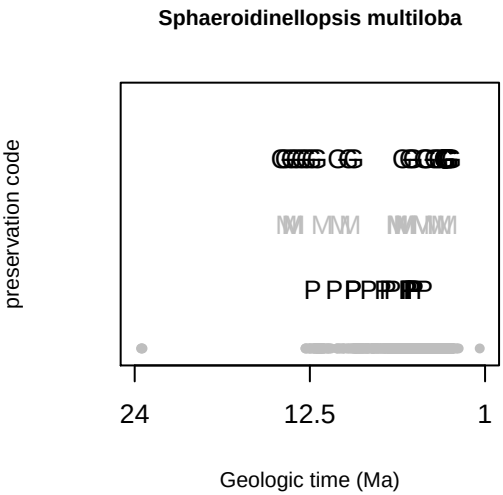

Pulleniatina obliquiloculata
preservation code
15
7.5
0
Geologic time (Ma)

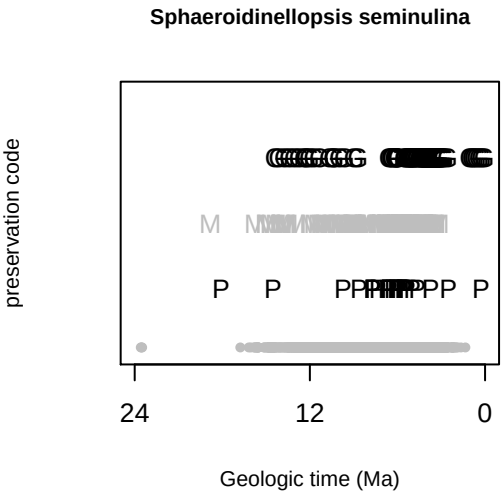

Pulleniatina praecursor
preservation code
G
M M
11
5.5
0
Geologic time (Ma)

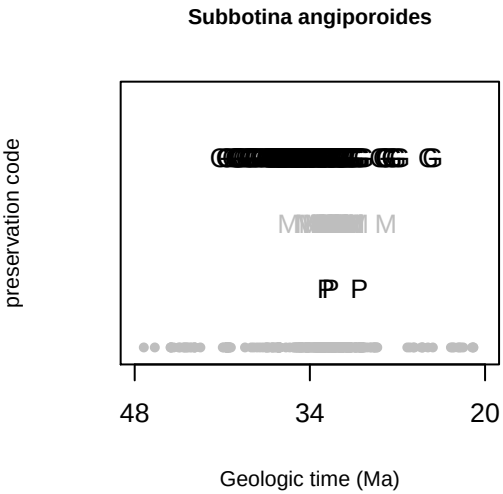

Pulleniatina primalis
preservation code
G
M
P
11
5.5
0
Geologic time (Ma)

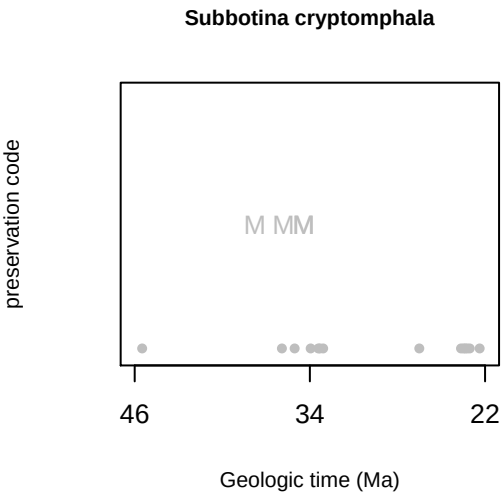

Sphaeroidinella dehiscens
preservation code
G
M M
P
33
16.5
0
Geologic time (Ma)

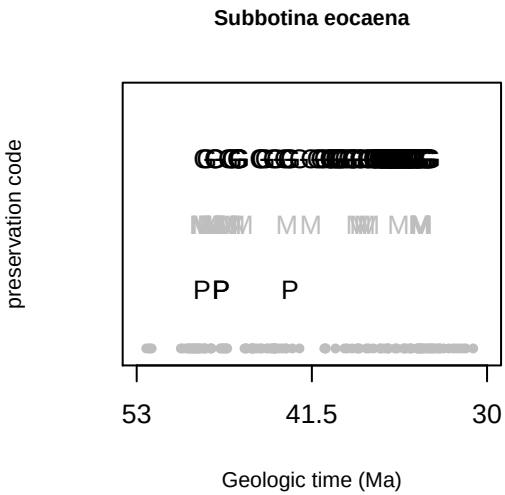

Sphaeroidinellopsis disjuncta
preservation code
23
15.5
8
Geologic time (Ma)

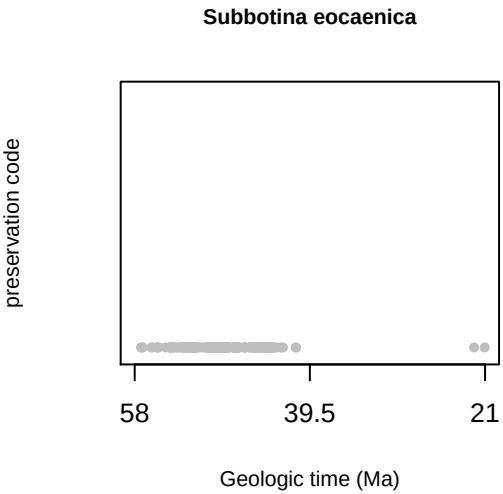

Sphaeroidinellopsis multiloba
preservation code
24
12.5
1
Geologic time (Ma)

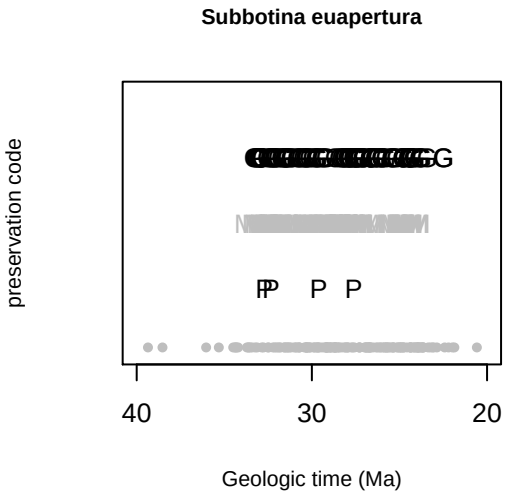

Sphaeroidinellopsis seminulina
preservation code
24
12
0
Geologic time (Ma)

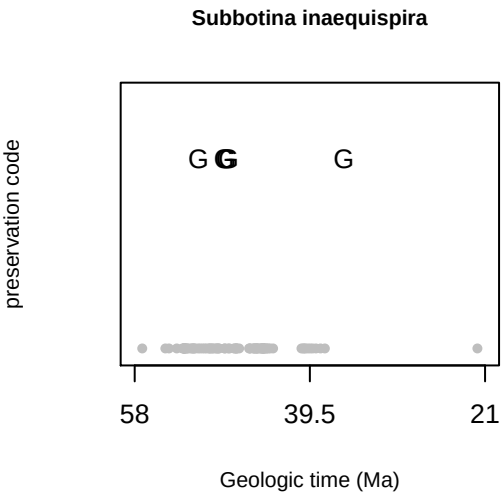

Subbotina angiporoides
preservation code
48
34
20
Geologic time (Ma)

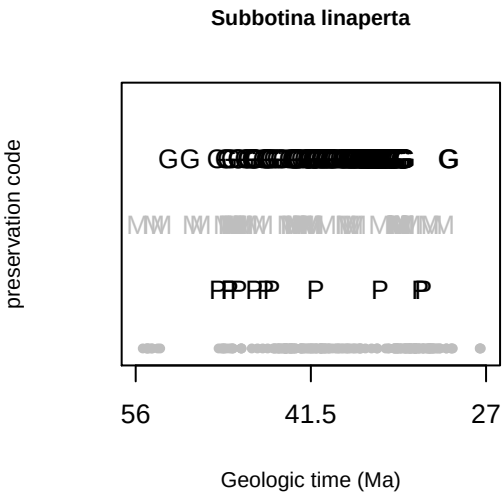

Subbotina cryptomphala
preservation code
M MM
46
34
22
Geologic time (Ma)

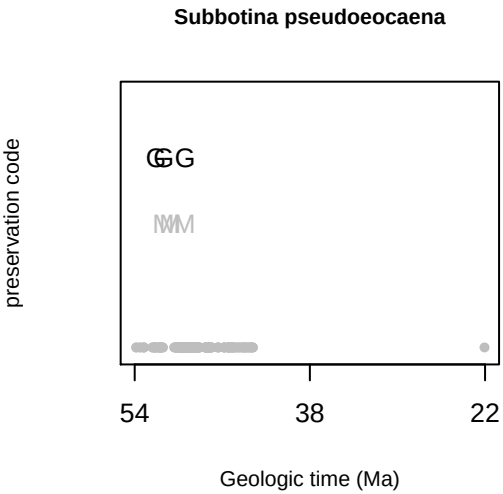

Subbotina eocaena
preservation code
MM
MM
PP
P
53
41.5
30
Geologic time (Ma)

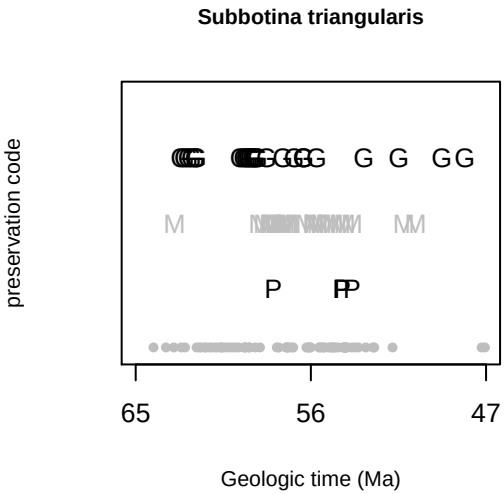

Subbotina eocaenica
preservation code
58
39.5
21
Geologic time (Ma)

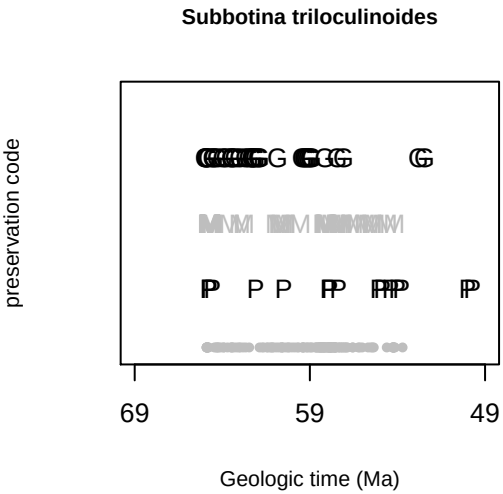

Subbotina euapertura
preservation code
P
P
P
40
30
20
Geologic time (Ma)

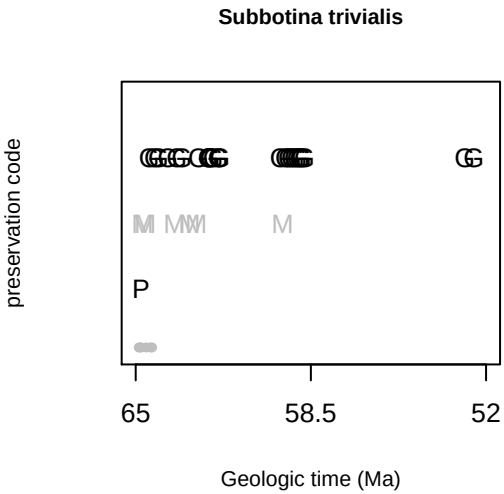

Subbotina inaequispira
preservation code
G G G
58
39.5
21
Geologic time (Ma)

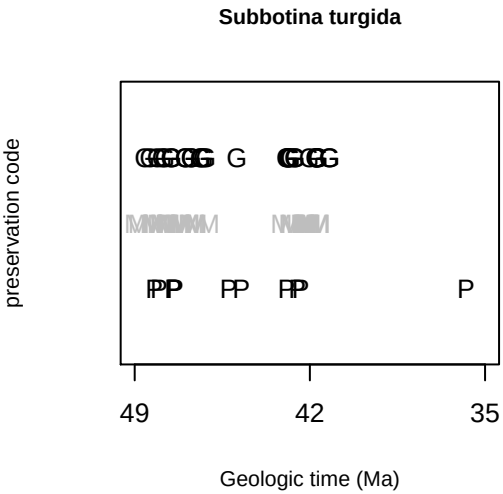

Subbotina linaperta
preservation code
GG G
P P P
56
41.5
27
Geologic time (Ma)

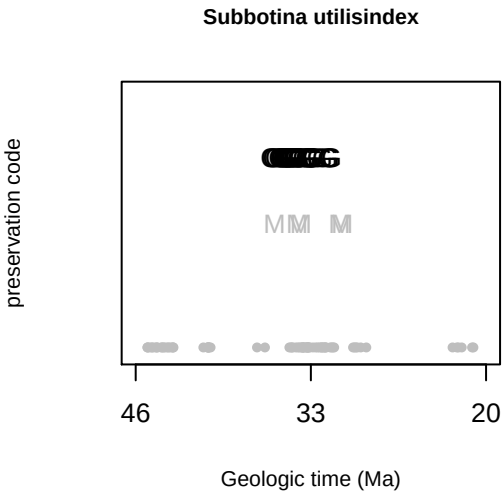

Subbotina pseudoeocaena
preservation code
G G
54
38
22
Geologic time (Ma)

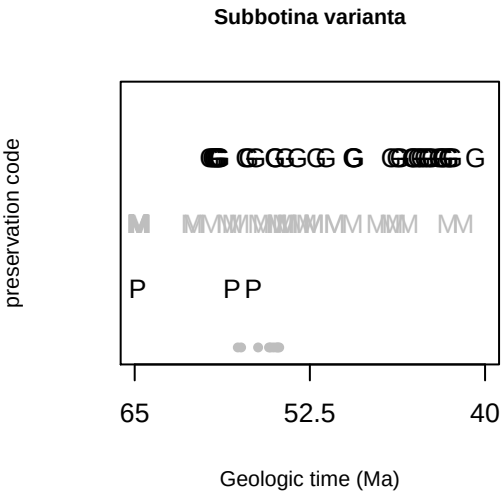

Subbotina triangularis
preservation code
G G GG
P
65
56
47
Geologic time (Ma)

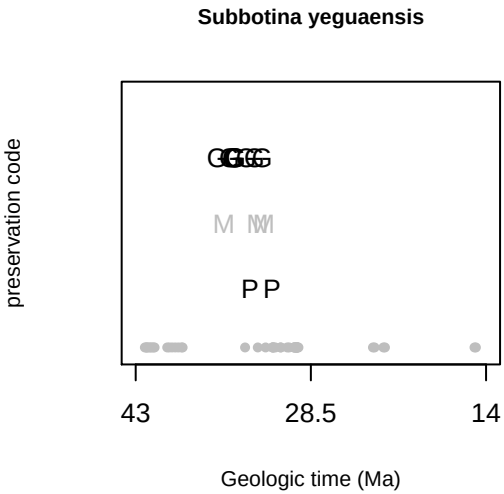

Subbotina triloculinoides
preservation code
69
59
49
Geologic time (Ma)

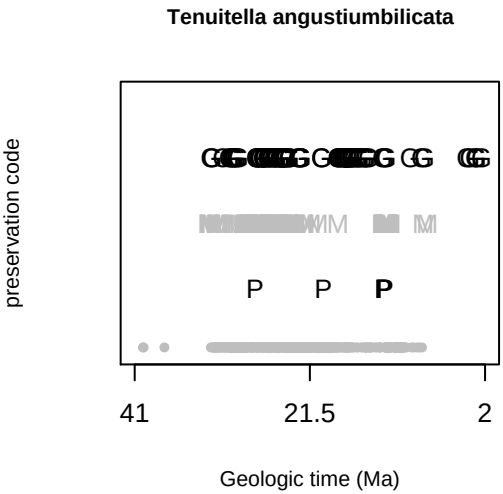

Subbotina trivialis
preservation code
65
58.5
52
Geologic time (Ma)

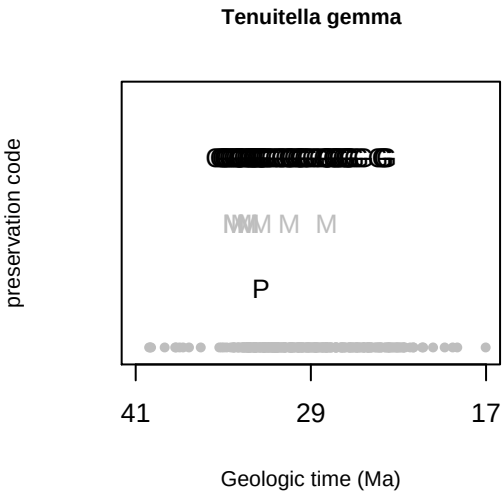

Subbotina turgida
preservation code
49
42
35
Geologic time (Ma)

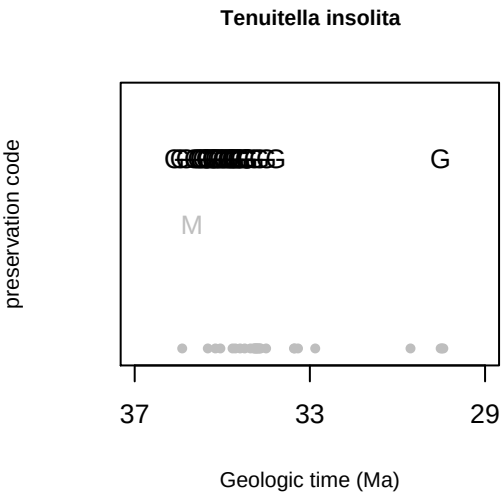

Subbotina utilisindex
preservation code
46
33
20
Geologic time (Ma)


Subbotina varianta
preservation code
G
M
P
65
52.5
40
Geologic time (Ma)


Subbotina yeguaensis
preservation code
G
M
P
43
28.5
14
Geologic time (Ma)


Tenuitella angustiumbilicata
preservation code
G
M
P
41
21.5
2
Geologic time (Ma)


Tenuitella gemma
preservation code
G
M
P
41
29
17
Geologic time (Ma)


Tenuitella insolita
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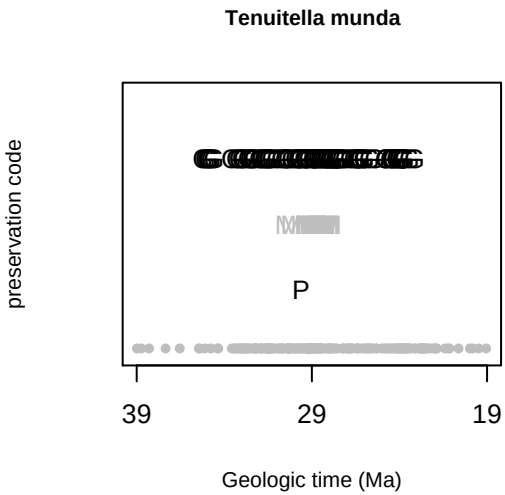
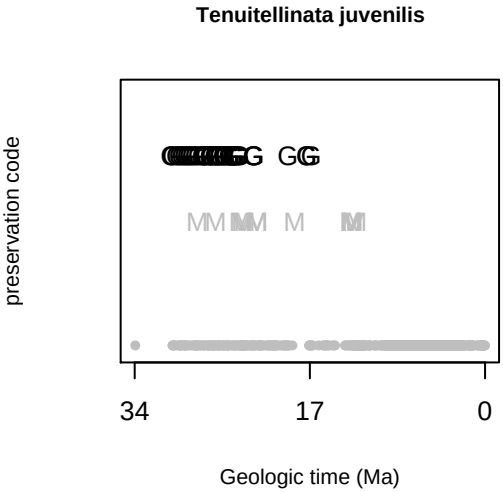
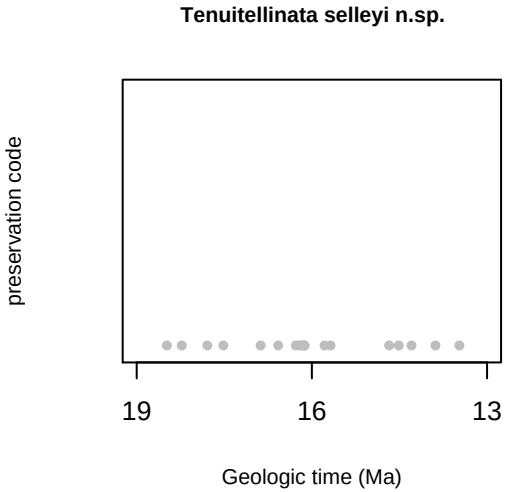
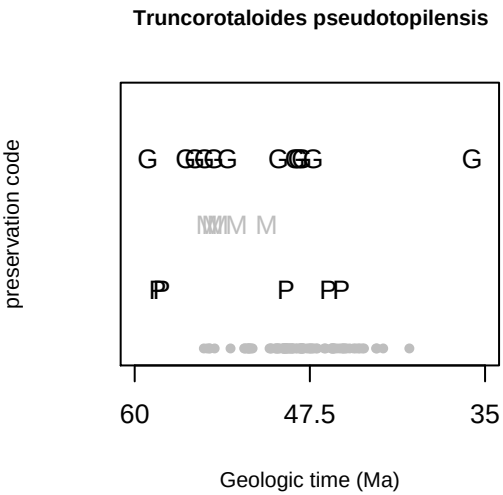
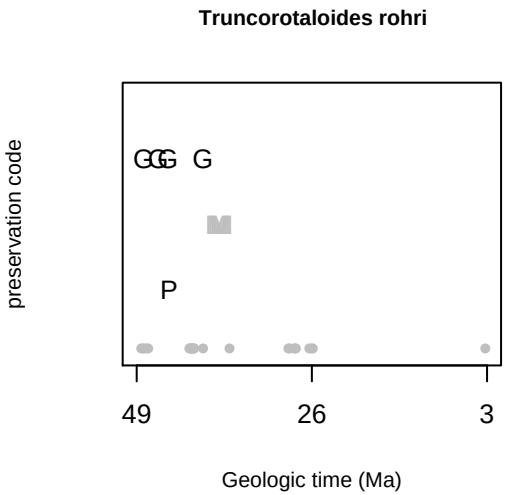
G
M
37
33
29
Geologic time (Ma)

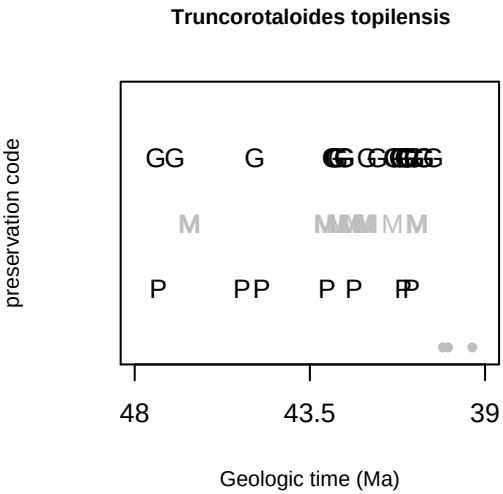

Tenuitella munda
preservation code
P
39
29
19
Geologic time (Ma)

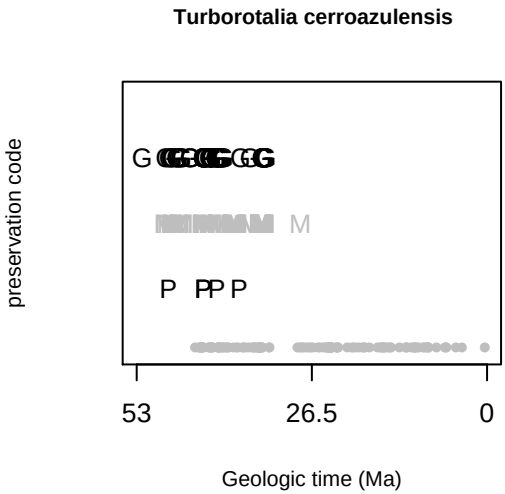

Tenuitellinata juvenilis
preservation code
G
M
34
17
0
Geologic time (Ma)


Tenuitellinata selleyi n.sp.
preservation code
19
16
13
Geologic time (Ma)


Truncorotaloides pseudotopilensis
preservation code
60
47.5
35
Geologic time (Ma)


Truncorotaloides rohri
preservation code
49
26
3
Geologic time (Ma)


Truncorotaloides topilensis
preservation code
48
43.5
39
Geologic time (Ma)


Turborotalia cerroazulensis
preservation code
53
26.5
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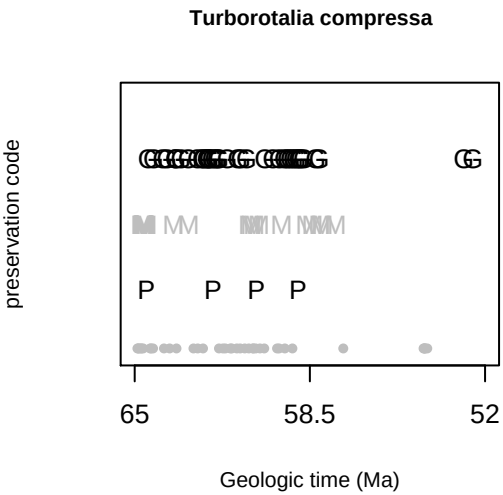
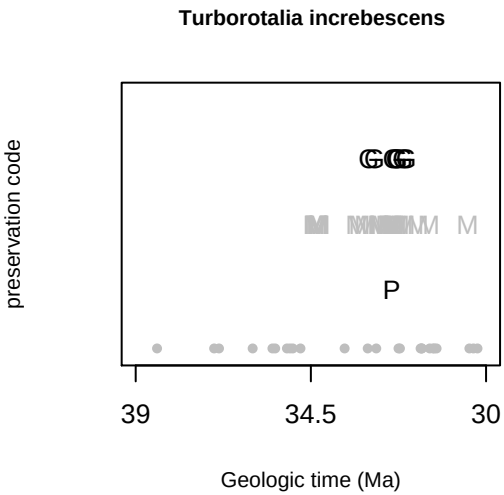
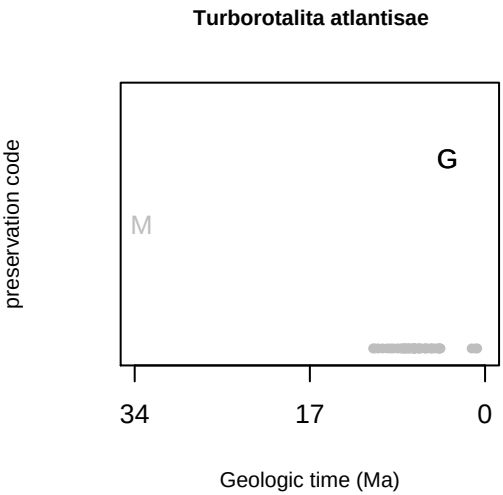
Geologic time (Ma)


Turborotalia compressa
preservation code
G
M
P
65
58.5
52
Geologic time (Ma)


Turborotalia increbescens
preservation code
G
M
P
39
34.5
30
Geologic time (Ma)


Turborotalita atlantisae
preservation code
G
M
34
17
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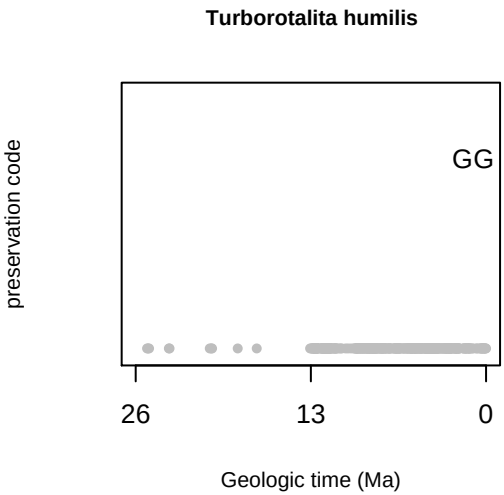
Geologic time (Ma)


Turborotalita humilis
preservation code
GG
26
13
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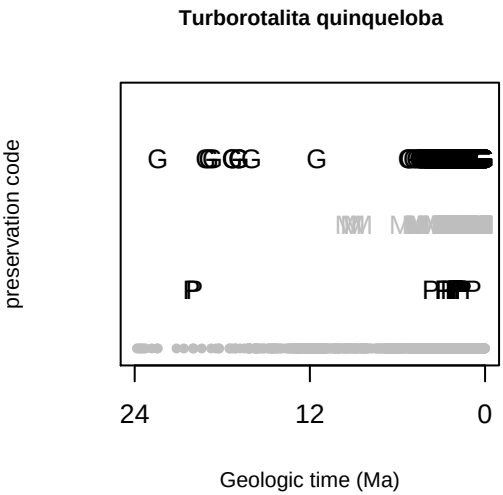
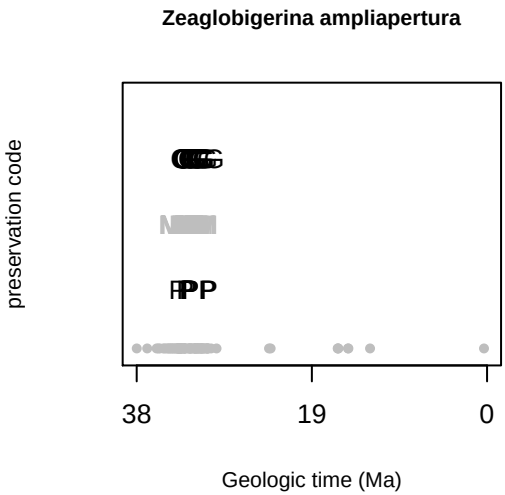
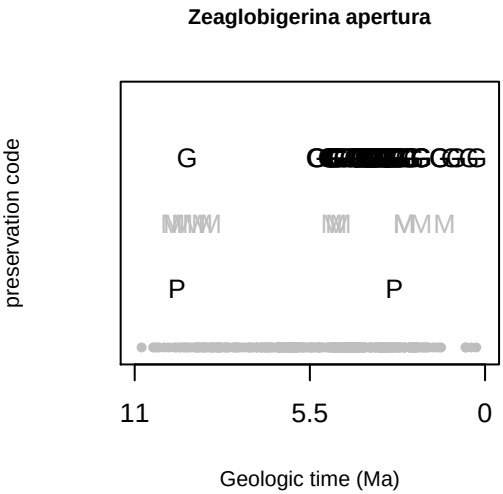
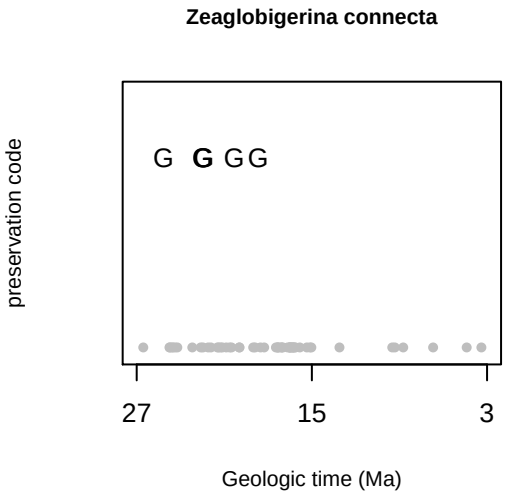
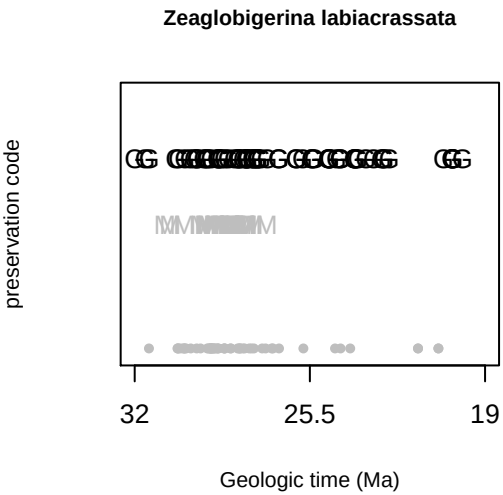
Geologic time (Ma)

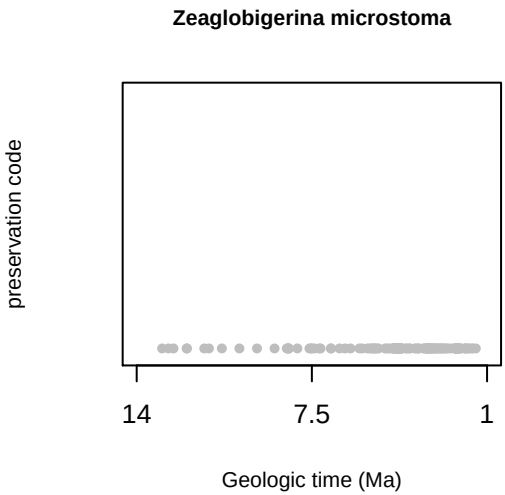

Turborotalita quinqueloba
preservation code
Geologic time (Ma)
24
12
0

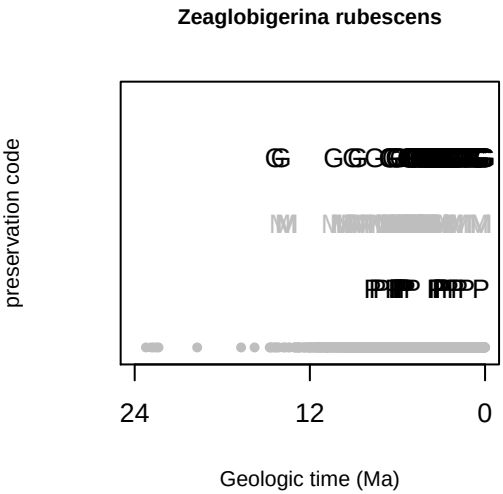

Zeaglobigerina ampliapertura
preservation code
Geologic time (Ma)
38
19
0

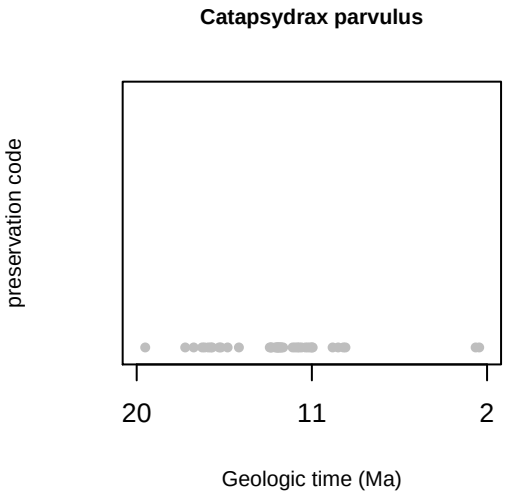

Zeaglobigerina apertura
preservation code
Geologic time (Ma)
11
5.5
0

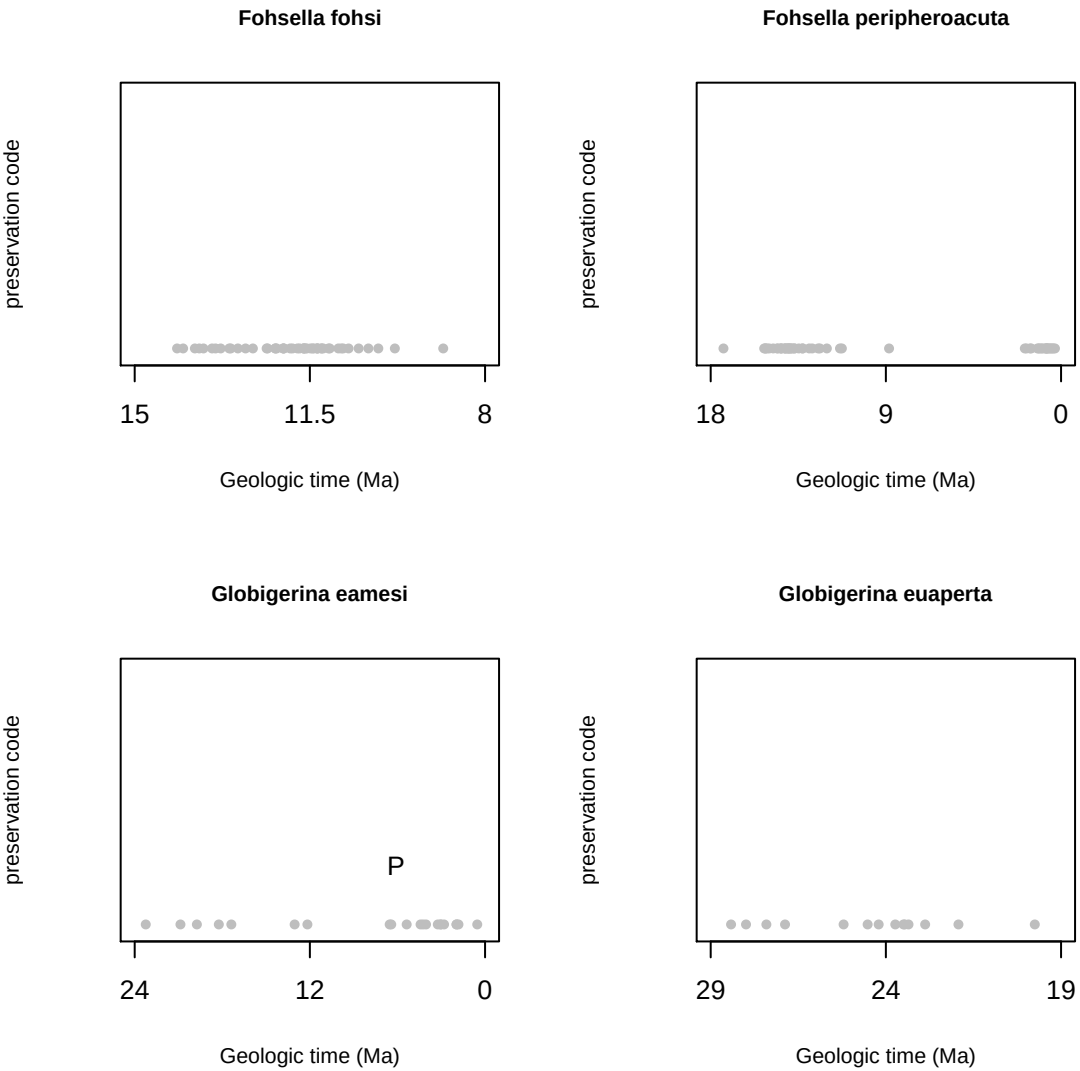

Zeaglobigerina connecta
preservation code
Geologic time (Ma)
27
15
3

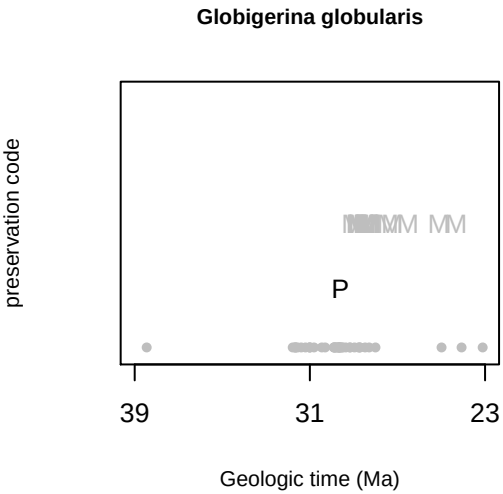

Zeaglobigerina labiacrassata
preservation code
32
25.5
19
Geologic time (Ma)

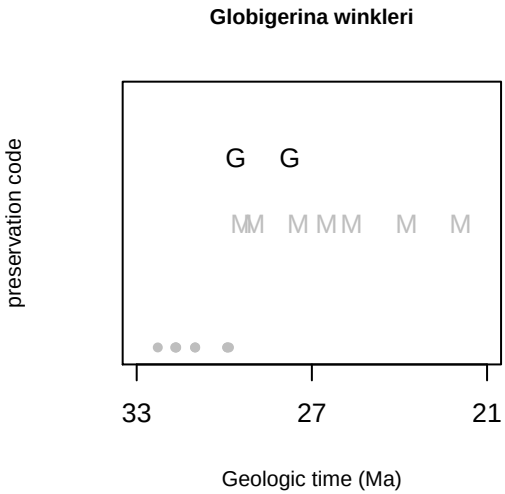

Zeaglobigerina microstoma
preservation code
14
7.5
1
Geologic time (Ma)

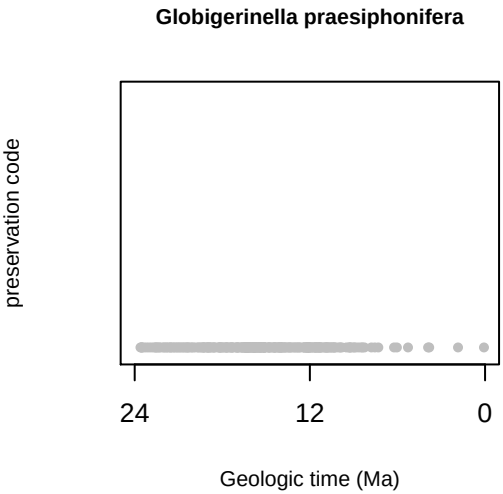

Zeaglobigerina rubescens
preservation code
24
12
0
Geologic time (Ma)

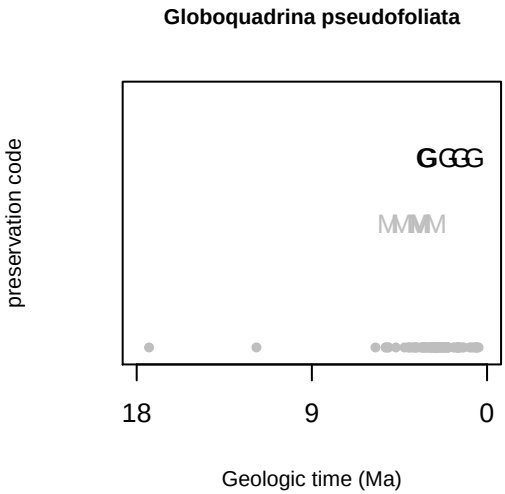

Catapsydrax parvulus
preservation code
20
11
2
Geologic time (Ma)

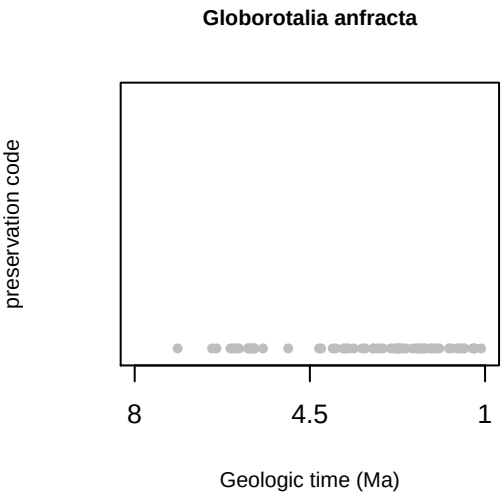

Fohsella fohsi
preservation code
15
11.5
8
Geologic time (Ma)
Fohsella peripheroacuta
preservation code
18
9
0
Geologic time (Ma)
Globigerina eamesi
preservation code
P
24
12
0
Geologic time (Ma)
Globigerina euaperta
preservation code
29
24
19
Geologic time (Ma)

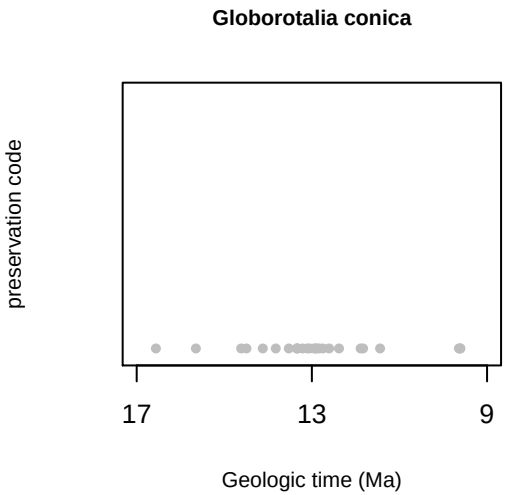

Globigerina globularis
preservation code
P
39
31
23
Geologic time (Ma)

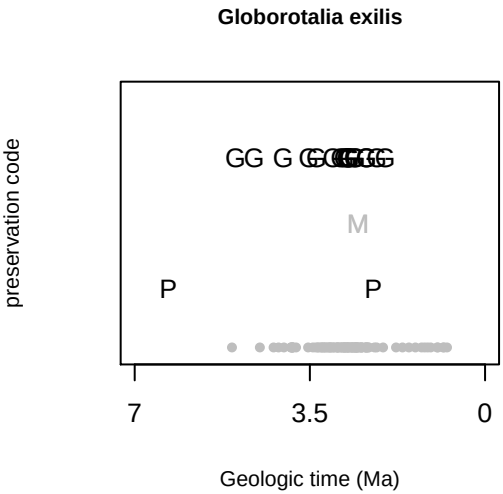

Globigerina winkleri
preservation code
G G
33
27
21
Geologic time (Ma)

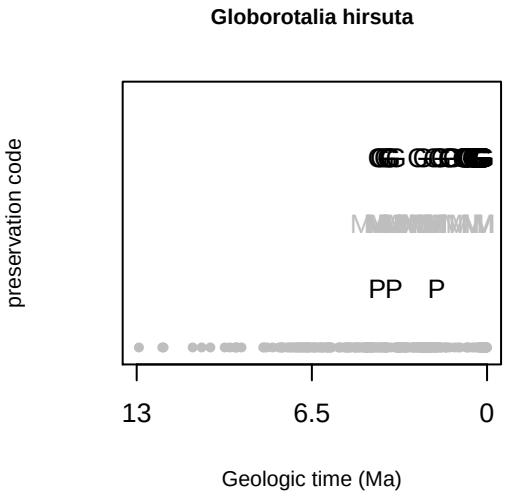

Globigerinella praesiphonifera
preservation code
24
12
0
Geologic time (Ma)

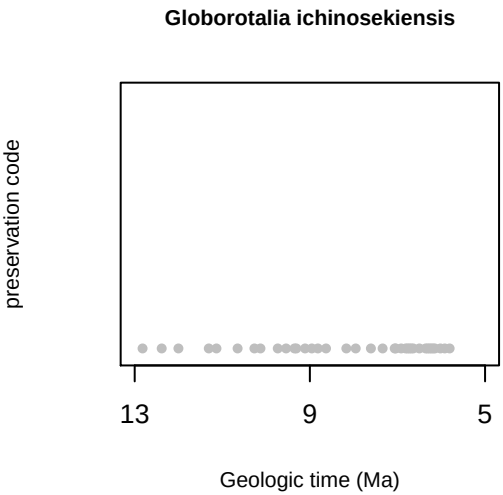

Globoquadrina pseudofoliata
preservation code
18
9
0
Geologic time (Ma)

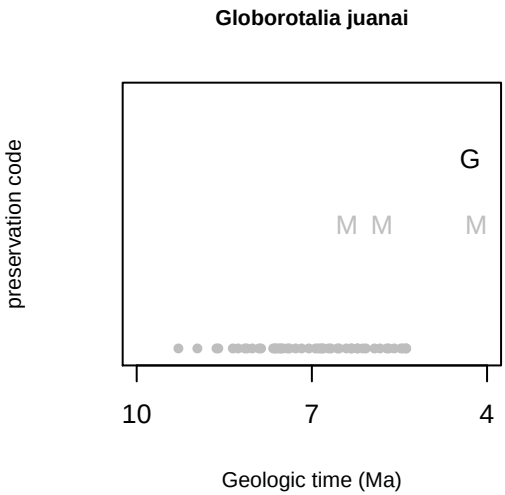

Globorotalia anfracta
preservation code
8
4.5
1
Geologic time (Ma)

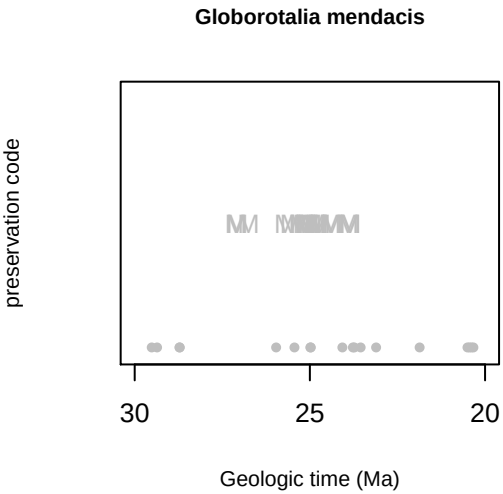

Globorotalia conica
preservation code
17
13
9
Geologic time (Ma)

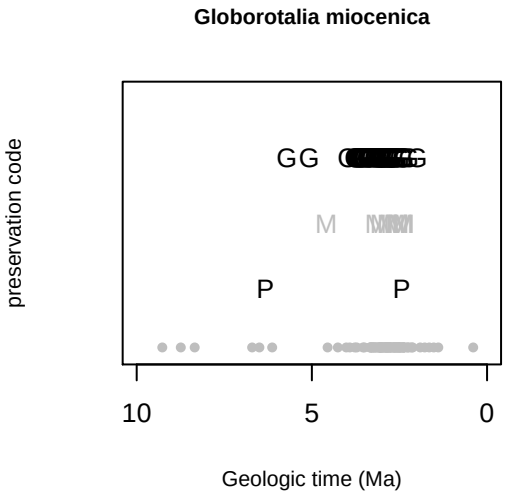

Globorotalia exilis
preservation code
GG G
M
P
P
7
3.5
0
Geologic time (Ma)

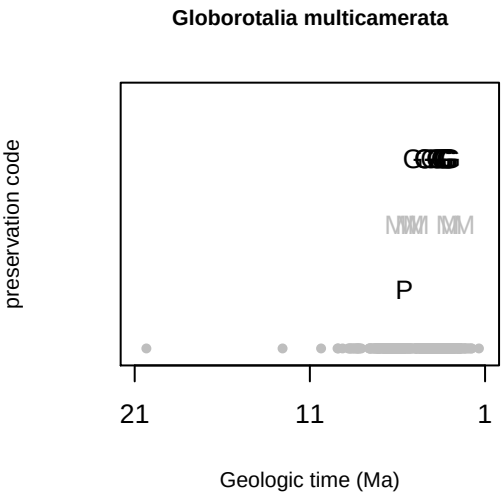

Globorotalia hirsuta
preservation code
PP P
13
6.5
0
Geologic time (Ma)

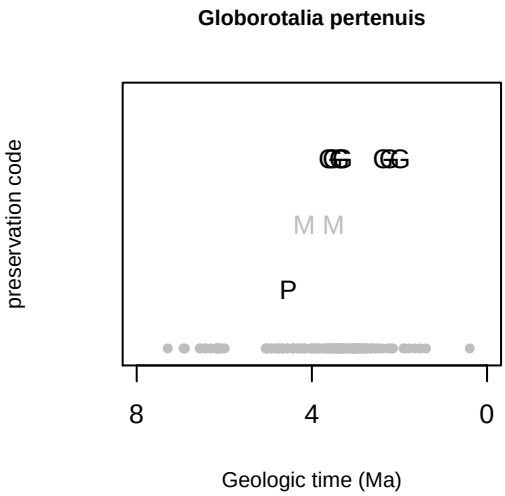

Globorotalia ichinosekiensis
preservation code
13
9
5
Geologic time (Ma)

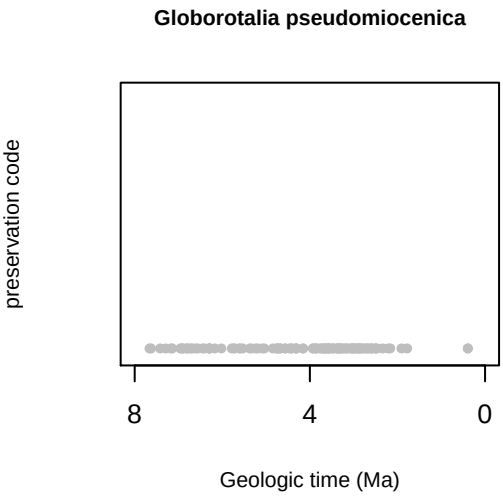

Globorotalia juanai
preservation code
G
M M
M
10
7
4
Geologic time (Ma)

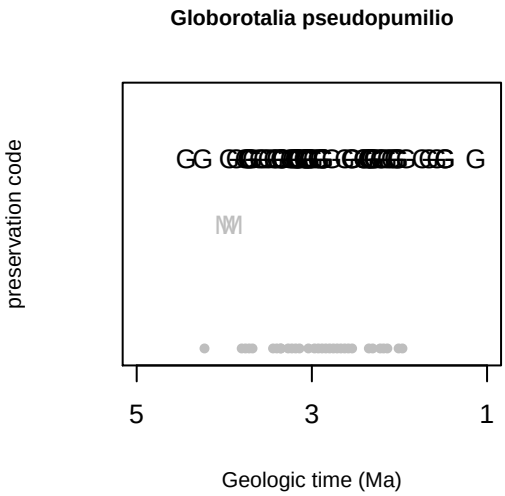

Globorotalia mendacis
preservation code
30
25
20
Geologic time (Ma)

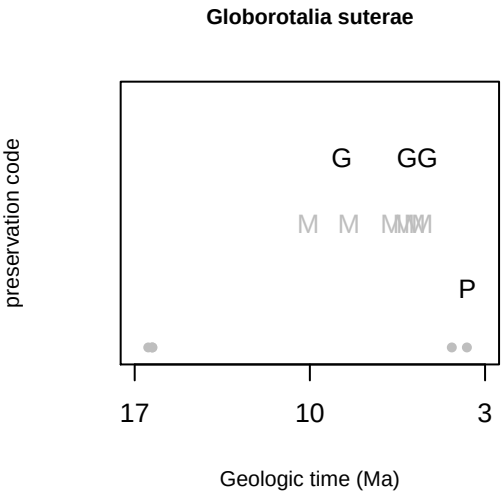

Globorotalia miocenica
preservation code
GG
M
P
P
10
5
0
Geologic time (Ma)

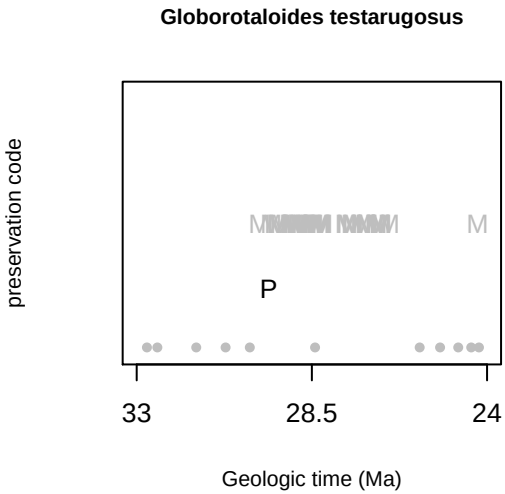

Globorotalia multicamerata
preservation code
P
21
11
1
Geologic time (Ma)

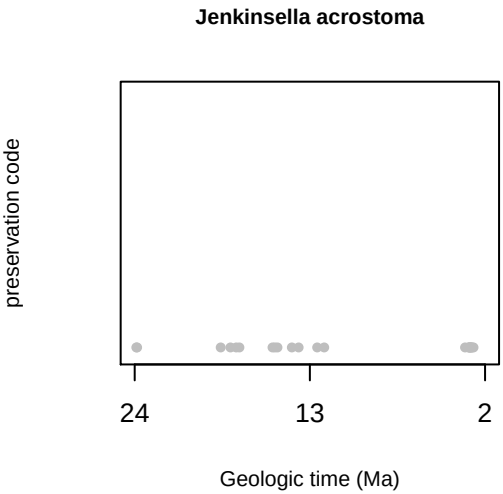

Globorotalia pertenuis
preservation code
M M
P
8
4
0
Geologic time (Ma)

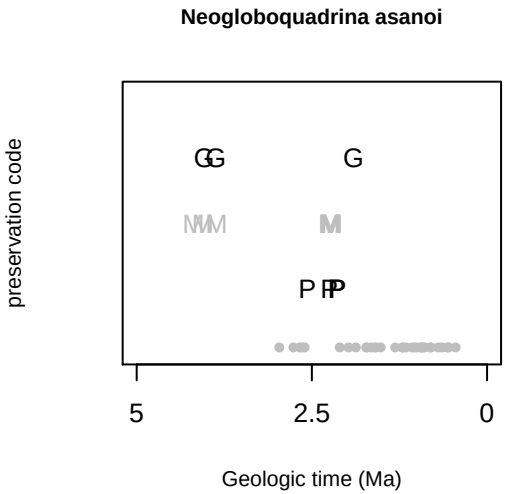

Globorotalia pseudomiocenica
preservation code
8
4
0
Geologic time (Ma)

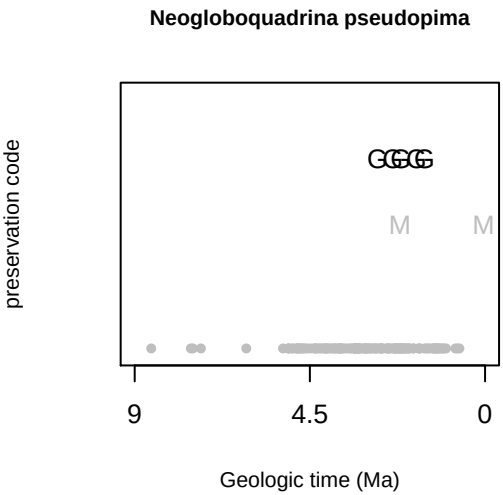

Globorotalia pseudopumilio
preservation code
5
3
1
Geologic time (Ma)

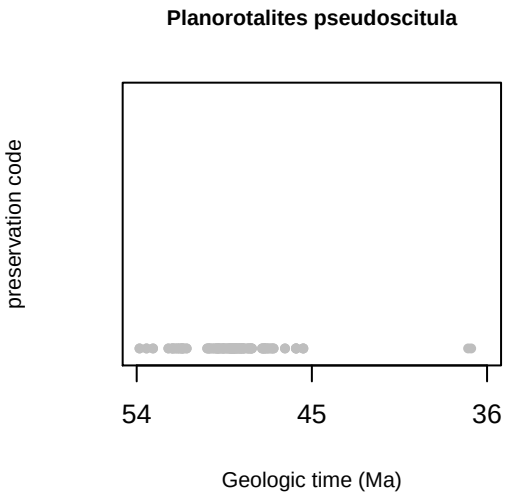

Globorotalia suterae
preservation code
G
GG
M
M
P
17
10
3
Geologic time (Ma)

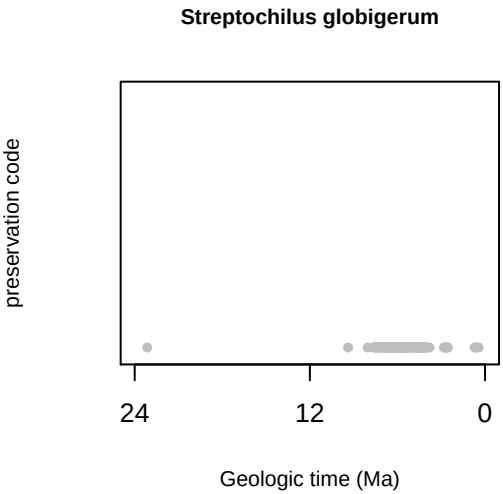

Globorotaloides testarugosus
preservation code
M
P
33
28.5
24
Geologic time (Ma)

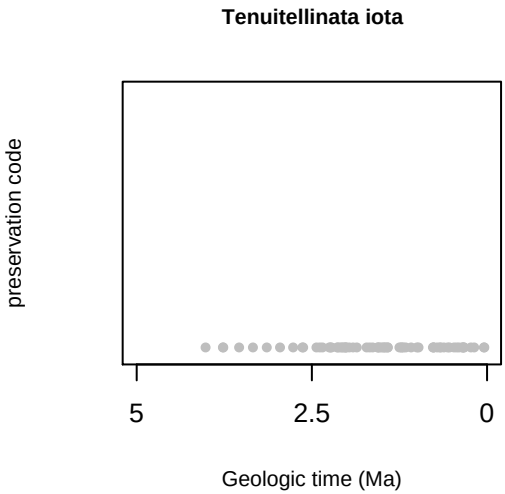

Jenkinsella acrostoma
preservation code
24
13
2
Geologic time (Ma)

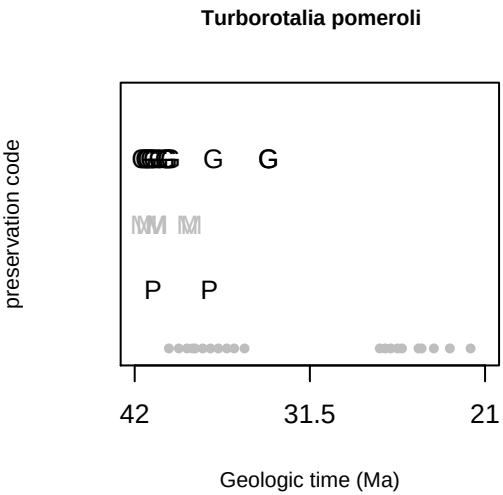

Neogloboquadrina asanoi
preservation code
G
G
P
5
2.5
0
Geologic time (Ma)

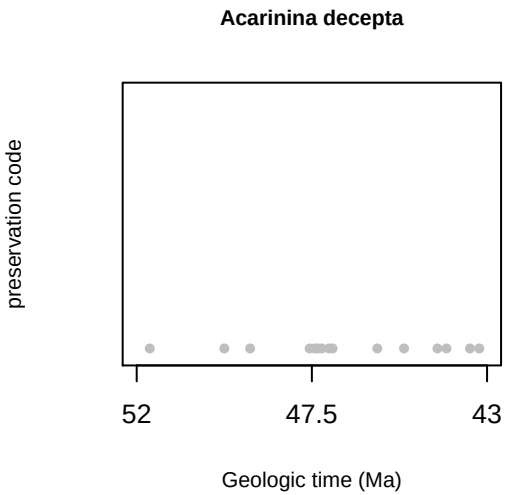

Neogloboquadrina pseudopima
preservation code
G G G G
M
M
9
4.5
0
Geologic time (Ma)

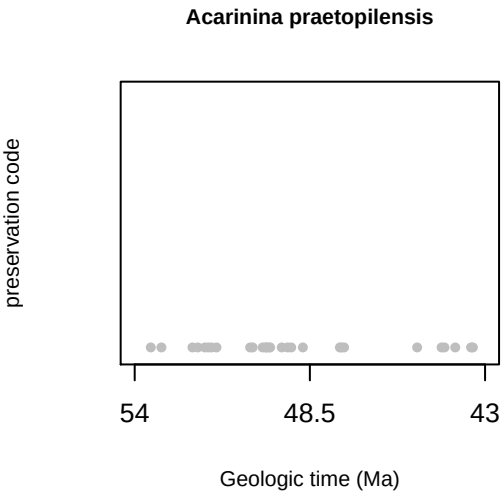

Planorotalites pseudoscitula
preservation code
54
45
36
Geologic time (Ma)

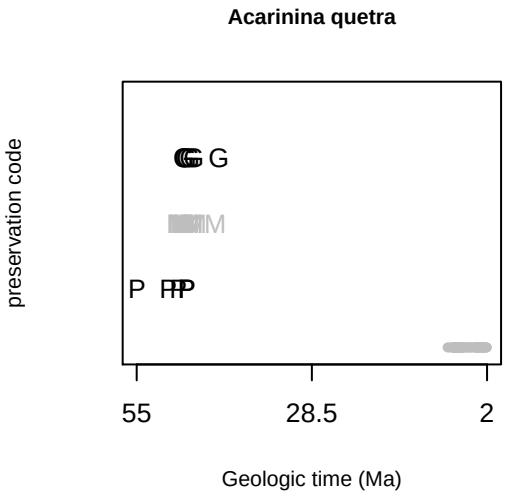

Streptochilus globigerum
preservation code
24
12
0
Geologic time (Ma)

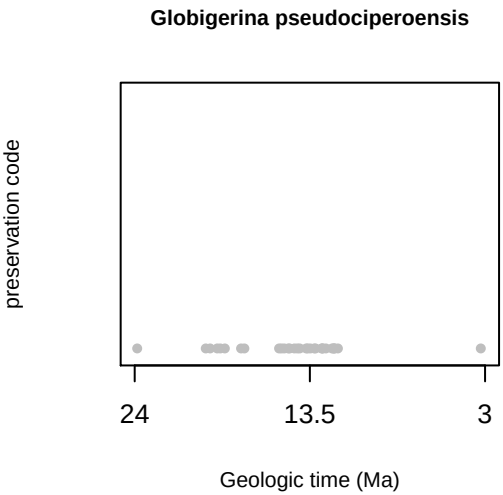

Tenuitellinata iota
preservation code
5
2.5
0
Geologic time (Ma)

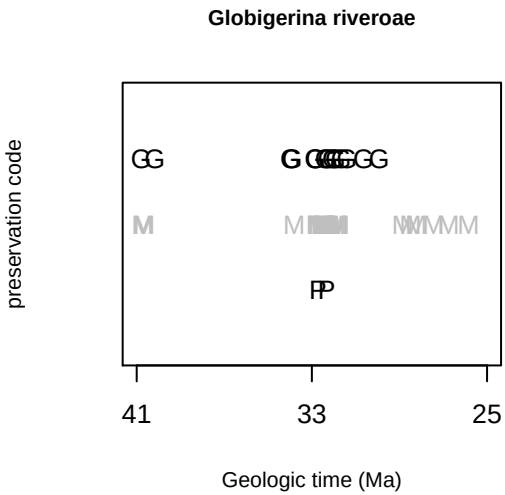

Turborotalia pomeroli
preservation code
G G
M M
P P
42
31.5
21
Geologic time (Ma)

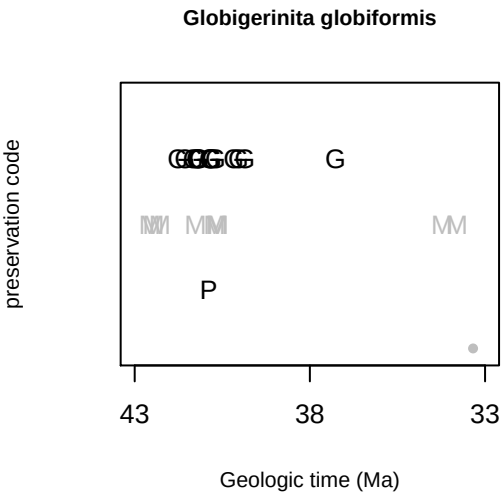

Acarinina decepta
preservation code
52
47.5
43
Geologic time (Ma)

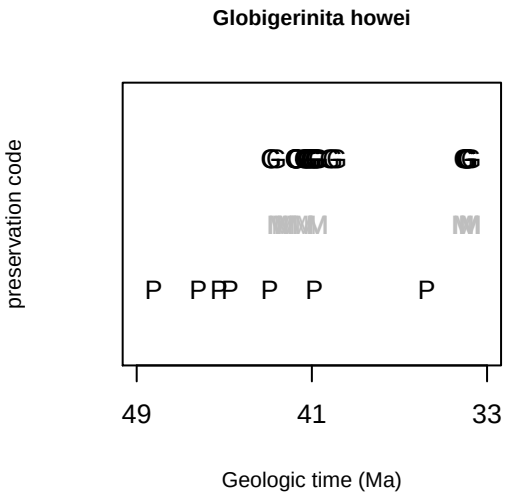

Acarinina praetopilensis
preservation code
54
48.5
43
Geologic time (Ma)

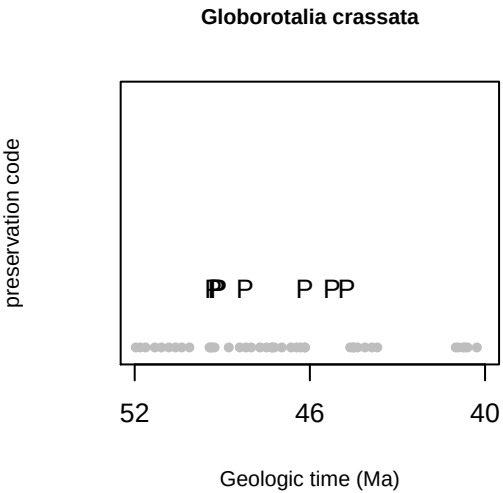

Acarinina quetra
preservation code
G
M
P
55
28.5
2
Geologic time (Ma)

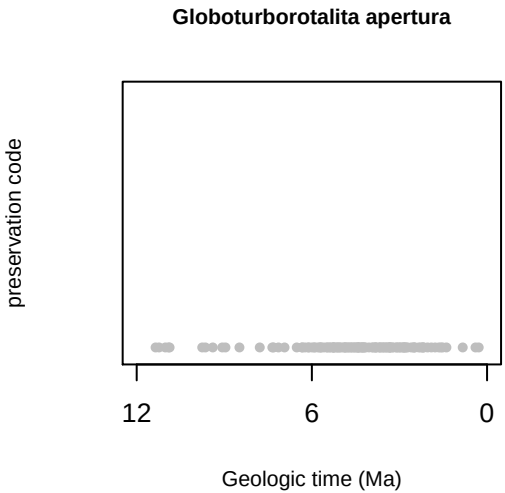

Globigerina pseudociperoensis
preservation code
24
13.5
3
Geologic time (Ma)

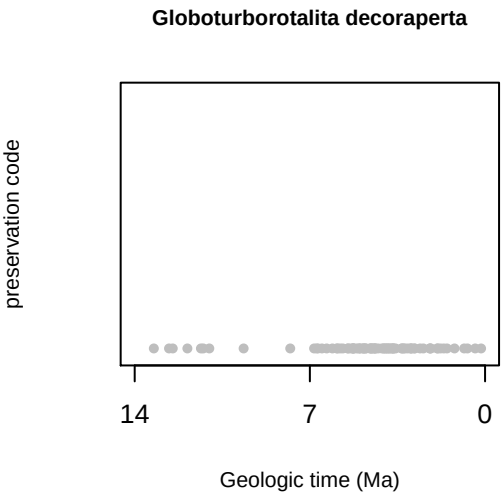

Globigerina riveroae
preservation code
41
33
25
Geologic time (Ma)

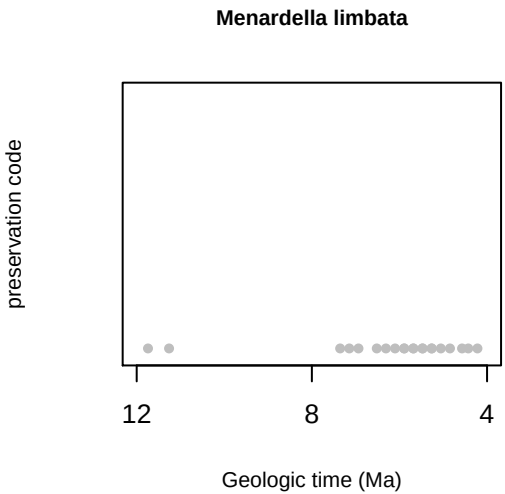

Globigerinita globiformis
preservation code
43
38
33
Geologic time (Ma)

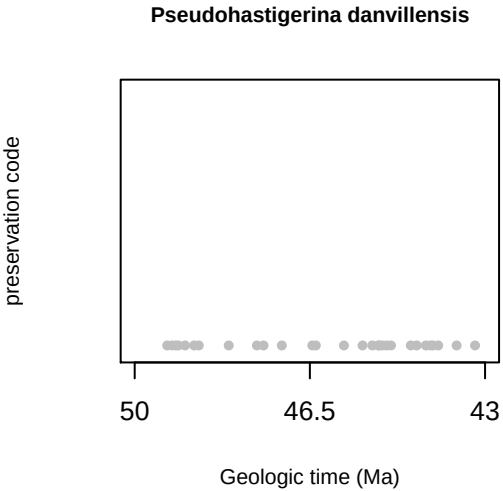

Globigerinita howei
preservation code
49
41
33
Geologic time (Ma)

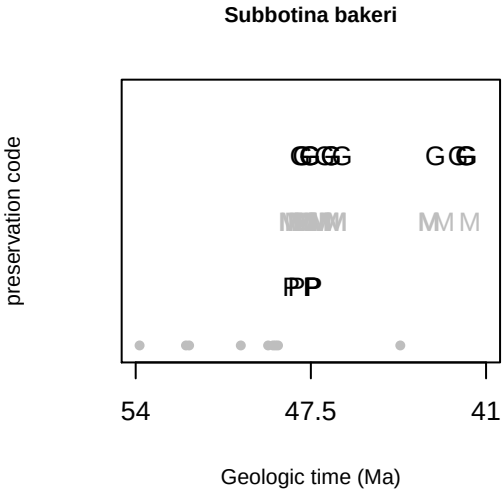

Globorotalia crassata
preservation code
P P P PP
52
46
40
Geologic time (Ma)

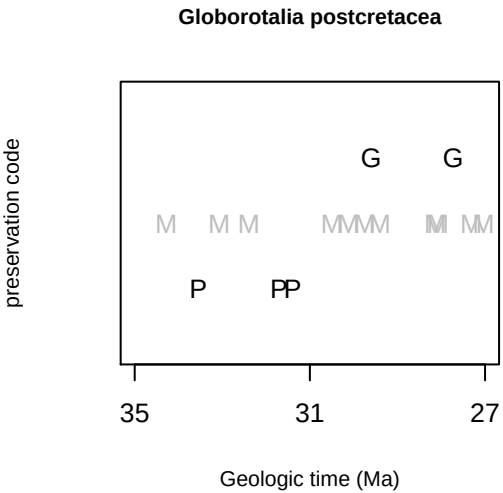

Globoturborotalita apertura
preservation code
12
6
0
Geologic time (Ma)


Globoturborotalita decoraperta
preservation code
14
7
0
Geologic time (Ma)


Menardella limbata
preservation code
12
8
4
Geologic time (Ma)


Pseudohastigerina danvillensis
preservation code
50
46.5
43
Geologic time (Ma)


Subbotina bakeri
preservation code
54
47.5
41
Geologic time (Ma)


Globorotalia postcretacea
preservation code
35
31
27
Geologic time (Ma)