#NEXUS

[written Sun Jun 11 14:43:23 CEST 2023 by Mesquite version 3.70 (build 940) at GSE31172/130.223.66.9]

BEGIN TAXA;

 TITLE Taxa;

 DIMENSIONS NTAX=162;

BEGIN CHARACTERS;

 TITLE Character\_Matrix;

 DIMENSIONS NCHAR=259;

 FORMAT DATATYPE = STANDARD RESPECTCASE GAP = - MISSING = ? SYMBOLS = " 0 1 2 3 4 5 6 7 8";

 MATRIX

 Fuxianhuia\_protensa 00?0--1?00?0---------000-010000--------000-----0-00000?0--0--000010----00000000000--13-0000-00000010---10000-1-010000--00100--0-----0?0?0-0-?0?00???0??00?0000??0-000?0-0??0000000000----0000??0?-??0000---0----0???0???0??0-00-----00?00000?000000000?0-0000002000

 Leanchoilia\_illecebrosa 11?0000???10----0----000-010?00--------000-----0-0?0???1--0--000000----00000000000------000-00000001---1000??1-01000001111211?00????000?0-0-00000??00??00?0000001-000?0-00-0000000000----0100?02?00000110-?0-00000??012?0??0-00-----00?00000?0000?0000?0-00000?2000

 Alalcomenaeus\_cambricus 10?0000?0010----0----000-010000--------000-----0-00010?1--0--000000----00000000000------000-000000?1---??000-1-01000001111211?00????000?0-0-?0000??00??00?0000001-000?0-00-0000000000----0100?02?00000110-00-00000??01000??0-00-----00?00000?000030000?0-0000002000

 Yohoia\_tenuis 10?0000????0----0----000-?0---0--------000-----0-0?????2--0--000010----00000000000--00-0000-00000010---10200-1-010000-1111210?00????000?0-0-?0000??????????000001-000?????????????00?????0????????0????10-00-000?0??01??0??0-00-----0??00000?000030000?0-00000?2000

 Emeraldella\_brocki ?0?0000?1-??----0----000-00---0--------000-----0-0001??3--0--000000----00000000000------000-00000000---10000-1-0100000-02110--0-----1?0?0-0-00000??00?00000000001-00000-00-0000000000----0100?01000021010-00-000111?01??0??0-00-----00?00000?00110000004-00011?2000

 Sydneyia\_inexpectans ?0?0000?1-00----0----000-00---0--------000-----0-00????4--0--000010----00000000000--00-0000-00000010---10000-1-010000--02110--0-----1?0?0-0-?0?????????????000?01-00000-00-0000000000----0200?11??0021010-01100012??01??0??0-00-----0??0?????000100000?0-00000?2000

 Olenoides\_serratus 10?0000?1-01100010000000-210000--------0010000-0-00010?2--0--000000----00000000000------000-00000000---2-11101-0100000-02110--0-----110?0-0-?0000??00?00000000001-00000-00-0000000000----0100?01000021010-011000120-01?00000-00-----00?00000?001110000?0-0010012000

 Pycnogonum\_litorale 1--01-000102-------------0----0-------------------112-05--0--000-20----0-0----------0---000------0-----0-------0----------------------200-0-000010000?00000000--1-30-00-00-0000000000----124-0???????000--11000003121--0-00-------------0000--0-------05------02000

 Haliestes\_dasos 1--01-0????2-------------0----0-------------------112-?5--0--000-20----0-0----------0---000------0-----0-------0------101-21200-????0-2?0-0-?0001??????????000--1-30-00-00-0000000000----1?4-????????0???-01000003101--0-00-------------0000--0-------?5------?????

 Palaeoisopus\_problematicus 1--01-0?01?2-------------0----0-------------------112-?6--0--000-10----0-0----------01-0000------0-----0-------0------101-21200-????0-2?0-0-00001??00?00000000--1-30-00-00-0000000000----114-????????0010-010000030-1--?-00-------------0000?00--3000001000100?2000

 Offacolus\_kingi 20?0002????2----0----000-0????0--0-????0010000-0-00?1??1001??000010----00000000000--0???000-0011--00---??0???0-000000010?12?2?0?????021?0-10?0000??????????000001-10100-0???000???100----0?00????????????????????0??0?1?0000-?0-----0-001110?000030000????0011????0

 Dibasterium\_durgae 20?0000????2----0----000-010?00--0-----1010000-0-00?1??2001??000010----00000000000--00-0000-00000010---??0???0-010000010?12?2?0?????021?0-10?0000??????????000001-20100-0???000???110----0?00??1100?21?0---0----000-0?100??0-2------0-001111?000030000?10?0001????0

 Anderella\_parva ?0?0000?????????1?00?0010010?01000-00001?10000-0-0??????00???000010----00000000100--00-0000-0000002----??0???00000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?001?2000

 Weinbergina\_opitzi 20?0000?????????1?00?0010010?01000-00001020000-0-0??1??2001??000010----00000000000--00-0000-00000000---1300??000010000?011202?0?????021?0-10?0000??????????000001-20??0-00-0000000110----0?00?01100?2????????????00-0110???0-?0-----0-00?????000030000?1000001?2000

 Camanchia\_grovensis 20?0000??????????????0010010201000-00001020000-0-0??1???00???000010----00000000100--00-0000-0000002----13000-00010000-00?0?0??0???????????????????????????????????????????????????11?????0????????????????????????????????????????????????????????0000?????0???2000

 Venustulus\_waukeshaensis 20?0000?01??????1000?0010010?0?000-????1020000-0-0??1???00???000010----00000000100--00-0000-0000002----130?0-00010000-00?0?0??0??????3??0-?????????????????00010??????0-0?????????11?????0???????????????????????0????2????0-?????????????????????0000?100?001?2000

 Legrandella\_lombardi ?1?0000?01?11000100000010110?01000-00001?20000-0-00????200100000010----00000000000--00-0000-00000010---13200-000000000???????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????30000?100?00??2000

 Bembicosoma\_pomphicus ?0?0000??????????????000-1????1001-00001?20000-0-0??????00100200?10----00000000000--00-0000-00000010---??20??100100001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?000?1000

 Bunodes\_lunula ?0?0000??1???????????010-1????1001-00001?10000-0-0??????00100200?10----00000000010--00-0000-0001002----1320??10010000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?001?1000

 Limuloides\_limuloides ?0?0000?01????0010000010-1????1001-00001?10000-100?????2001??200010----00000000010--00-0000-00010010---1320??100010001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?001?2000

 Pasternakevia\_podolica ?0?0000??????????????000-1????1001-00001?10010-0-1??????00100200010----00000000010--05-0000-00000?01---1320??100100001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?000?2000

 Cyamocephalus\_loganensis ?1?0000?0??110?01000?000-?????1001-00001?10000-0-1??????001??000010----00000000010--00-0000-00100001---1320??100100001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?000?2000

 Pseudoniscus\_roosevelti ?1?0000?????????1000?000-1????1001-00001?10000-0-1??????001??000010----00000000010--00-0000-00100001---??20??110100001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?000?2000

 Winneshiekia\_youngae ?0?0000?01?1100010000000-?????1000-00001???????0-0??????00100100010----00200000000--01-0000-00000010---1320??100100001????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?????0???2000

 Houia\_yueya ?0?0000????11000??0??000-110201000-00001?10000-0-0??????0?10?100?10----0001---------0?-0000-00000010---??--0-12010000-????????????????????????????????????????????????????????????101110??????????????????????????????????????????????????????????0000?100?001?2000

 Euproops\_anthrax 20?0002?01?1400011100000-110?0110000000111000101100?1??2001??0000111000000000000-110-41---0-----11000001-2?1101000000-?0?0?0????????031?0-10?0000??????????000101-??1?0-0????????????????0?????????????0---0----0?????2??????????????????????????31000?100?00102000

 Euproops\_mariae ?0?0002????1400011100000-11???1100001001?100010110??????00???0000111000000000000-110-41---0-----11???0???2?1101000000??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Euproops\_danae 20?0002?01?1100011100000-110?0110000000111000101100?1??2001??0000111000000000000-100-41---0-----1100000??2?1101000000-?0?0??????????031?0-10?0000??????????000101-????0-00-0000000???????0?????????????0---0----0?????2??????????????????????????31000?100?00102000

 Euproops\_rotundatus ?0?0002?01?1400011100000-11???1100001001?100010110??????00???0000111000000000000-110-41---0-----1100000??2?1101000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????1000?100?00102000

 Euproops\_sp 20?0002?01?1400011100000-110?0110000000111000101100?1??2001??0000111000000000000-100-41---0-----11000001-2?1101000000-?0?0?0????????031?0-10?0000??????????000101-????0-0?????????110----0?????????????0---0----0?????2??????????????????????????31000?100000102000

 Bellinurus\_lunatus ?0?0002????1100011100000-11???1100000001?100010100??????00???0000111000000000002-0-0-41---0-----1100000??2?1101000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????1000?100?00102000

 Bellinurus\_arcuatus ?0?0002????1100011100000-11???1100000001?100010100??????00???000011100000000000?-0-0-41---0-----1100000??2?1101000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Bellinurus\_reginae ?0?0002????1100011100000-11???1100000001?1020100-0??????00???0000111000000000002-0-0-41---0-----1100000??2?1100000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?10??00102000

 Bellinurus\_truemanii ?0?0002????1100011100000-11???1100000001?1020100-0??????00???000011100000000000?-0-0-41---0-----1100000??2?1100000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100??0102000

 Bellinurus\_bellulus ?0?0002????1100010100000-1????1100000001?1000100-0??????00???01?0?11000000000002-0-?-41---0-----1100000??2?1101000000-?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????000?100?00102000

 Bellinurus\_trilobitoides ?0?0002????1100010100000-1????1100000001?1000100-0??1???00???0100?11000000000002-0-0-41---0-----1100000??2?1101000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Anacontium\_carpenteri ?0?0000????1400011100000-1????1100010001?2000100-0?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Liomesaspis\_laevis ?0?0002?01?1400011100000-11???1100010001?200010110??????00???0000?111000-11????--110-41---0-----112--0-??-?1101000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????1000?100?00102000

 Stilpnocephalus\_pontebbanus ?0?0000????2----0----000-?????110021000112000??0-0?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Prolimulus\_Woodwardi ????000??????????????0????1??????????????0???????0????????????????101?????????????????????0-----11???1???????0??????????????????????0??????????????????????????????????????????????????????????????????????????????????????????????????????????????????12????1?????

 Alanops\_magnifica 20?0000?01?140000----000-11020110021000112000100-00???1?001??00001111000-11????--110-40---0-----112--0-1???1001010000-?010????0?????031?0-1000000?0???0????000101-10??0?0???000000110----0?00??1100???00---0----00??0?2?0000-2------0-00?????0?0?31000?100000102000

 Pringlia\_birtwelli ?0?0000????140000----000-11???1100010001?2000100-0??????00??????01111000-11????--110-40---0-----112--0-????1001010000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????1000????????02000

 Kasibelinurus\_amoricum ?0?0000????110??1000?000-1????1100000001?10001?0-0??????001??0000111000000000000-0-0041---0-----1100???132110010100000????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00??2000

 Kasibelinurus\_randalli ?0?0002?????????1010?000-1????1100000001?1000100-0??????00???000??11000000000002-0-0041---0-----110?000??211001010000?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000???????1?2000

 Pickettia\_carteri ????000????1100010???000-?????110?00?001?1000100-0??????00???000?111000000000000-0-0041---0-----1100?001-21?0000100000????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?0?1????0

 Lunataspis\_aurora ?0?0000?01?1100010000000-1????100000000111000100-0??1???001??000?111000000000000-0-000-0--0-----012----1-211001001000-???????????????????????????????????????????????????????????????????0????????????????????????????????????????????????????????0000?100?001?2000

 Limulus\_polyphemus 200000200111100010110000-11020110010000111000110-00011120011-3000110100--1011100-0-0-40---10----112-0001-211001100000-0010202000000003110-10000000000000000000101-20110-00-0000000110----020001110013100---0----001001210000-00-----0-00111100000300000100000102000

 Limulus\_darwini ?0?0002?01?1100010110000-11???1100100001?1000110-0??????00???3000110100--1010000-0-1-40---??----112-0001-21??01100000-?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Limulus\_coffini ????????????????????????????????????????????????????????00???3000110100--1011100-0-0-40---??----112-000??2???0?100000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000????????02000

 Crenatolimulus\_paluxyensis ?0?0002?01?1100010110000-?????1100100001?1000110-0??????00???3000110100--1010000-0-1-40---??----112-?00??2???01100000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000????????02000

 Carcinoscorpius\_rotundicauda 200000200111100010110000-11021110000000111000111000011120011-3000110100--1010000-0-0-40---10----112-1101-211001100000-0010202000000003110-10000001000000000000101-20110-00-0000000110----020001110013100---0----001001210000-00-----0-00111100000300000100100102000

 Heterolimulus\_gadeai ?0?0002?01?1100010110000-11???1100000001?100011000??????00???3000110100--1010000-0-0-40---??----112-1101-211011100010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?1001001?????

 Tachypleus\_gigas 200000200111100010111000-11021110000000111000111000011120011-3010110100--1012000-0-0-40---11----112-1101-211001100000-0010202000000003110-10000001000000000000101-20110-00-0000000110----020001110013100---0----001001210000-00-----0-00111100000300000100100102000

 Tachypleus\_decheni ?000002?01?1100010111000-11???1100000001?100010100??????00???3010110100--1012000-0-0-40---??----112-1101-21??01100000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?0??02000

 Tachypleus\_syriacus ?010002?01?1100010111000-1102?1100000001?100011100??????00???3010110100--1000000-0-0-40---1?----112-1101-211001100100-?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????1??????0001?100?0010(1 2)???

 Tachypleus\_tridentatus 201000200111100010111000-11021110000000111000111000011120011-3010110100--1000000-0-0-40---11----112-1101-211001100000-0010202000000003110-10000001000000000000101-20110-00-0000000110----020001110013100---0----001001210000-00-----0-00111100000300010100100102000

 Yunnanolimulus\_luopingensis 2000002????1100010110000-1102?110000000111000100-00?????0011-3000110100--0000000-0-0-41---10----112-0001-211001100100-00102020000??003110-10000001000000000000101-20??0-00-0000000110----0200?????0?3?00---0----00??012?0?00-?0-----0-001111?0?0030000?100?00102000

 Xaniopyramis\_linseyi 20?0002????11000101001010?????1100000001?10?0100-???????00???3000?110?0?00?0001????0??????1?----?????????????01000100?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????02000

 Moravurus\_rehori ?????????????????????????????????????????????????????????????300??110?0?0000001??0-0????????----????????????0??000100??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Paleolimulus\_woodae ?0?0002????11000101001000?????1100000001?1000100-0??????00???3000111000000000000-0-0-41---??----112-000??211001010100-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000????????02000

 Paleolimulus\_signatus 20?0002???11100010100101111020110000000111000100-00?1?120011-3000111000000000000-0-0-41---1?----112-0001-211001000100-?0?0?0??0?????031?0-10?0000???0?00000000101-20110-00-0000000110----0?00?1?????3????????????0100?21?000-?0-----0-001111?0000300000100000102000

 Paleolimulus\_kunguricus ?0?0002????11000101001011110201100000001?1000100-0??????00???3000111000000000000-0-0-41---1?----112-0001-211001000100-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????00000100000102000

 Bellinuroopsis\_rossicus ?0?0002????1100010100000-?????1100000001?1000100-0??????00???0000111000000000000-0-0-41---0?----112-000??21??01000100-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Rolfeia\_fouldenensis ?0?0002?01?1100010101000-11020110000000111000100-0??????00???0000111000000000000-0-0-41---1?----112-000??2110010?0100-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Tarracolimulus\_rieki ?0?0002?????????1011?001011???1100000001?1000100-0??????00???3000110100--0010000-0-0-40---1?----112-000??2?1001100000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Casterolimulus\_kletti ?0?0002????1500010110000-?????1110000111?1000100-0?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Limulitella\_vicensis ?0?0002????1100010110000-11???1100000101?1000100-0??????00???3000?10100--1010000?0-0????--??----11?????1-2?1001110000??????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Victalimulus\_mcqueeni 20?0002?01?1500010110000-11020111000011111000100-00?????00???3000110100--1010000-0-0-40---1?----112-000??2?1001100000-?0?0??????????031?0-10?0000???0??????0001?1-20????0???????????????????????????????????????????0?2???????????????00?????0?0030000????????02000

 Limulus\_woodwardi ?0?0002????1500010110000-?????11000001?1?1000100-0?????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????

 Mesolimulus\_crespelli ?0?0002?????????1011?000-?????11000001?1?1000100-0??????00???3000110100--?010000-0-0-40---??----112-000??2?1001100010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?10?00010????

 Mesolimulus\_tafraoutensis ?0?0002????1100010110000-11???1100000111?1000100-0??????00???3000110100--1010000-0-0-40---??----112-000??2?1101100110-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?????0??02000

 Mesolimulus\_walchi 20?0002?0111100010110000-11020110000011111000100-00?1??20011-3000110100--1010000-0-0-40---1?----112-0001-211101100110-?0?0??????????031?0-10?0000???0?00000000101-20110-00-0000000?1?????0200?1?????3????????????0100?21?000-?0-----0-00?????000030000?100000102000

 Mesolimulus\_sibiricus ?0?0002????1100010110000-?????1100000111?10001?0-0??????00???300?110100--101000??0-0-40---??----112-000????1101100010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?1000001?????

 Panduralimulus\_babcocki ?0?0002?01?1100010100000-110201100000001?1000100-0??1???00???3000111100--010000--0-0-41---1?----112-001??--1001110000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Tasmaniolimulus\_patersoni ?0?0002????1100010100000-1102?110000000111020100-0??????00???300??11100--110000----0????--??----112-?????--?001110000-????????????????1????????????????????000??1-????????????????????????????????????????????????????????????????????????????????0????????????2000

 Austrolimulus\_fletcheri ?0?0002????150011011?000-110201100000001?1110100-0??????00???3000?11100--110000----0?41---??----112-000??--1001010000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Vaderlimulus\_tricki ?0?0002????1500110110000-110201100000001?1110100-0??????00???3000111100--110000----0-41---??----112-00???--1001010000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?00102000

 Psammolimulus\_gottingensis 20?0002?01?1100110100000-11020110000000111000100-00?????00???3000110100--110000----0-41---1?----112-0011---1001110000-?0?0??????????031?0-?????00??????????0001??-20??0-0???000000????????????????????????????????????????????????????????????????0000?100?00102000

 Limulitella\_bronni 20?0002????1100110100000-11???110000000111000100-0??????00???3000110100--110000----0-40---1?----112-000??--1001110010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?0???2000

 Limulitella\_tejraensis ?0?0002????1100110100000-11???1100000001?1000100-0??????00???3000110100--11????----0-40---??----112-001??--1001110010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?????????2000

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 Madagascan\_limulid ????00?????1100010110000-110??1100000001?1000110-0??????00???300?1?0100--101000??0-0-4?---??----112-100??2?10011?0000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?10??00??????

 Paleolimulus\_fuchsbergensis 20?0002?01?1500110100000-11020110000000111000100?0??????00???3000111100--110000----0-41---1?----112-001??--1001110010-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0

 Dubbolimulus\_peetae 20?0002?01?1500110110000-11020110000000111100100-0??????00???3000?11100--11????----0????--??----112-001??--1001110000-???????????????3??0-?????00??????????0001??-??????0?????????????????????????????????????????????????????????????????????????0000????????02000

 Paleolimulus\_longispinus 20?0002?01?1100010100000-11???110000000111000100-0??????00???3000111100--01????----0-41---1?----112-000??--1001110000-???????????????31?0-1????00??????????0001??-??????0??????????????????????????????????????????????????????????????????????????0???100000102000

 Paleolimulus\_jakovlevi ?0?0002????1100010100000-?????1100000001?1000100-0??????00???300?111100000100000-0-0-4?---??----112-000??--?001?10000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?????0???????

 Valloisella\_lievinensis ?0?0002?01?1100010100000-11???1100000001?1020100-0??????00???30001111000-0000000-0-0-41---1?----112-0001-211001000000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?100?0??02000

 Stoermeropterus\_conicus 2000000????110000----000-110001000-0000000-----0-00010?7001??100010----0001---------01-0010000000010---13200-120100001?010202000????03000-0-?00000?00?00000100101000211000-000000011100000200?01101?10012010-00000110?21101101100?110-00?????000030000?100000010000

 Moselopterus\_ancylotelson 2000000?01?110000----000-110201000-0000000-----0-00?11?7001??100010----0001---------01-0010-0000002----13--0-12010000-?0102?2000????03000-0-000000?00?00000100101000211000-000000011100000200?01101?10011000-00000110?21101101100?110-00?????000030000?110000002000

 Onychopterella\_kokomoensis 20?0000?01?110000----000-110201000-0000000-----0-00?11?7001??100010----0001---------01-0000-00000010---??200-120100001?0102?2000????030?0-0-?0000???0?000000001010002?1010-000010011100000?00?01?01?10011000-00000110?2110110110010?0-00?????0000300000100000000000

 Eurypterus\_tetragonophthalmus 2000000?01?110100----000-110101000-00000030000-0-000110700101100010----0001---------01-0000-0000002----11--0-12010000-00102020000?00030?0-0-00000?0000000000011010012111110101011011100000200?01101110211000-000001101211111011001000-00????00000300000100000010000

 Erieopterus\_macrophthalmus 20?0000?01?110100----000-110201000-00000030000-0-00?11?7001??100010----0001---------01-0000-0000002----1?--0-12010000-?0102?2000????030?0-0-?0000?????000000011010002111110100011011101000?00?01101?10011010-00000110?2111110110010?0-00?????000030000?1000000?0000

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 Dolichopterus\_macrocheirus 2000000?01?120000----000-110101000-0000000-----0-00?11?7001??100010----0001--------?01-0000-00000010---13200-1201000010010202000????03000-0-?00000?00?000000001010012110110102010011111000200?01101?10011000-00000110?211111011001100-00?????000030000?100000000000

 Carcinosoma\_newlini 20?0000?01?120100----000-110??1000-0000000-----0-00?1??7001??100010----0001---------11-0000-0000002----??--0-12010000-0010202000????030?100-00000???0?000000001010012111111101011011100000200?01101?10011200-01100110?2112-22110000?0-00?????000030000?100000000000

 Megalograptus\_ohioensis 2000000?01?140100----000-110001000-00000030000-0-00?10?7001??100010----0001---------12-0000-0000002----11--0-12010001-0010202000????0300100-?00000?00?000000011010012111110100011011103000200?01101?10011000-01100110?2112-2111000000-00?????000000100?100000000000

 Mixopterus\_kiaeri 20?0000?01?140100----000-110??1000-0000000-----0-00?1??7001??100010----0001---------11-0000-0000002----??--0-12010001-0010202000????030?100-?0000???0?000000001010012111111100011011100000200?01101?10011200-01100110?2112-22110000?0-00?????000030000?110000000000

 Orcanopterus\_manitoulinensis ?0?0000?01?120100----000-11???1000-0000000-----0-00?1???001??100010----0001---------01-0000-0000002----??--0-12010000-???0??????????030?0-0-?0?00??????????0001010012?111???0001001111100?????????????011200-00000??0?2?12-21110???00-00???????0030000?100000010100

 Adelophthalmus\_sievertsi ?100000?01?110100----000-110001000-0000000-----0-00?10??001??100010----00000000000--01-0000-0000002----12200-120000001???0??????????0?000-0-?0???0????000000001010012111111101111111100000200?01??1?1000---0-----0??0???12-2211000100-00?????000030000?1000001?0110

 Nanahughmilleria\_norvegica 2000000?01?110100----000-110001000-0000000-----0-00?10?7001??100010----0001---------01-0000-00000010---11200-1201000010010202000????03000-0-?00000?00?000000001010012111111101111111110000200?01101?10011200-00000110?2112-2211000110-00?????0000300???100000010110

 Hughmilleria\_socialis 2000000?11?121100----000-110001000-0000000-----0-00?10?7001??100010----0001---------01-0000-0000002----??--0-12010000-0011202000????03000-0-?00000?00?000000001010012111111100011111101000200?01101?10011200-0000011012112-2211000010-00?????000030000?100000000110

 Slimonia\_acuminata 2000000?01?121100----000-11???1000-0000000-----0-00?1??7001??100010----0001---------01-0000-0000002----??--0-12010000-0011202000????03000-0-000000?00?000000001010012111111100011111110000200?01101110211200-0000011012112-2211000000-00?????000030000?121000000110

 Erettopterus\_bilobus 2000000?01?121110----000-010001000-0000000-----0-00?10?7001??100010----0001-------?-01-0000-00000010---11200-1201000010111202000????03000-0-?00000????000000001010012111111121011111110000210?0100111000---0-----0110?2112-221111?010-00?????000030110?121000000110

 Pterygotus\_anglicus 2000000?01?121110----000-010001000-0000000-----0-00?10?7001??100010----0001---------01-0000-00000010---11200-1201000010111202000????03000-0-?0?000????000000001010012111111121011111100000????01??1?1000---0-----0110?2112-2211110000-00?????0?0030110?121000000110

 Brachyopterus\_stubblefieldi 20?0000?01?110000----000-?????1000-0000000-----0-0??1??700???100010----0001---------01-0000-00000010---??20??120100001???????????????30?0-0-?0?00???0?000001001010002?0-00-0000000111????0????????1?10011010-00000??0?2?10010110???00-00?????0?0?30000?1000000?-000

 Rhenopterus\_diensti 2000000?01?110000?---000-1111?1000-0000000-----0-00011?7001??100010----0001---------12-0000-00000010---13200-120100001?010202000????03000-0-000000?00?00000100101000200-00-000000011100000200?01101?10012010-00000110?2110010110?0000-00?????000030000?110000000000

 Parastylonurus\_ornatus 2000000????100000----000-11110?0?0?????000-----0-00011?7001??100010----0001---------01-0100-00000010---13200-120100001?010202000????03000-0-000000?00?00000000101200200-00-000000011111000?00?01101?10211000-000001?0?2?1001011000100-00?????000030000?1000000?0000

 Laurieipterus\_elegans 20?0000?01?100000----000-111001000-0000000-----0-00?10??001??1000?0----0001---------??-???0-0???????---????0-12010000????????????????30?0-0-?0000???0?00000000101200200-00-000000011111000?00?01101?10011010-0000???0?2???????????????????????????????????????0000?

 Kokomopterus\_longicaudatus 20?0000????110000----000-11???1000-0000000-----0-00?1??7001??100010----0001---------01-0100-00000010---13200-120100011?0?0??????????030?0-0-?0000???0?00000010101000200-00-000000011111000?00?01101?10011100-00000110?2110010110???00-00?????000030000?100000002000

 Hardieopterus\_macrophthalmus ?0?0000?01?110000----000-111101000-0000000-----0-00?11??001??100010----0001---------01-0100-00000000---13200-120100011?????????????????????????????????0000010101000200-00-000000011111000?00?01101?10011100-???00??0???1?????????????0??????000?30000?100000002000

 Drepanopterus\_pentlandicus 2000000?01?110000----000-111101000-00000030000-0-00?11?7001??100010----0021---------01-0000-00000010---13200-1201000010010202000????030?0-0-?0000???0?00000010101000200-00-000000011111100?00?01101?100120(0 1)0-10000110?211001011?0?110-00?????000030000?100000002000

 Hibbertopterus\_scouleri 20?0000?01?130000----000-111101000-00001030000-0-00?11?7001??100010----0001--------?01-0100-00000010---1?200-1201000010010202000????030?0-0-00000??00?00000010111000200-00-000000011111100?00?01101?10011000-10000110?211001011????10-00?????000030000?100000000010

 Megarachne\_servinei ?0?0001?01?130000----000-11???1000-0000000-----0-0??1???0????1000?0----?00????-????-??-?????0???????---?????????????????????????????????0-?????????????????01011?0??????0?????????????????????01??????0120(0 1)0-1000??????????????????????????????????????????????0???

 Chasmataspis\_laurencii ?0?0000?01?11000?????000-?????1000-00000?10000-0-0??????0?10010011210000021---------06-0000--0000010---13-0??1?0100011????????????????????????????????0000000???1?10110-00-0000000???????0????01??1?2000-?-0-???0???0????????????????????????????30000?1000000?1000

 Loganamaraspis\_dunlopi 20?0??????????????????????10?0?????????0010000-0-00????70?100100?1210000101---------06-0000--000002----13--1012010000-?0?0??????????????0-????000???0?0000000010?0????0-0?????????11102000?00?0??01???00---0----00??0?2?0000-110000?0-00?????000?30000?1000000?-000

 Achanarraspis\_reedi ?0?0000?01?10000?????000-?????1000-00000010000-0-0??????0?100000?1210010101---------06-0000--000000?---??20??12010000???????????????????????????????????????????????????1????????????????????????????????????????????????????????????????????????30000?0-0?000?2000

 Heteroaspis\_stoermeri ?0?0000?01?1000010000000-110201000-00000010000-0-0??2-??0?10010011210111101---------06-1000--000002----13--??12010000-????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????0000?????????2000

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 Diploaspis\_muelleri ?0?0000?01?10000?????000-?????1000-00000010000-0-0??????0?10010011210011101---------06-1000--000002----13--??12010000-???????????????????????????????????????????????????????????????????????????????????????????????????????????????????????????30000?0-10000?1002

 Hoplitaspis\_hiawathai 20?0000?01?12010?????000-??????????????0010000-0-0??????0?10010011210010101---------06-0000--000002----13--??1?010000-????????????????0?0-0-?0?00???0?00000000??1002??101??0000000????0?????????????2?00---0----0????????????????????????????????30000?10??0??????0

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 Centruroides\_vittatus 200001100101202-0----000-10---0--------000-----0-0012-0700101100010----0001--------?11-0000-0000002----13--0-1-010000-0011202000000003001011000000000000001000102300200-00-000001011100000210001111020010-00-000001000201000-2------0-011011000003000003-0000002001

 Androctonus\_australis 200001100101202-0----000-10---0--------000-----0-0012-0700101100010----0001---------11-0000-0000002----13--0-1-010000-0011202000000003001011000000000000001000102300200-00-000001011101000210001111020010-00-000001000201000-2------0-011011000003000003-0000002001

 Proscorpius\_osborni 20?0000?01?120000----000-?0---0--------000-----0-001?-?700???100010----0001---------11-0000-0000002----13--0-1-010000-0011202000????030?1011?0?00??00?0000?000102300200-00-000001011101000210?00?-1020010-00-00000100?201000-2------0-00?????000030000?3-0000002001

 Palaeophonus\_nuncius 20?0011?01?120000----000-?0---0--------000-----0-00????700???100010----0001---------11-0000-0000002----13--0-1-010000-?01120200?????030?1011?0000???0?0000?000101300??0-00-000001011?????0??????????2?010-00-00000100?201000-2------?-?????????0030000?3-0000002001

 Caddo\_agilis 200001010102----0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-0011202000100003000-0-000000000000011000102300200-00-00000101110100020000111102000---0----00100020100??2------0-000000001??3000006-0-00002000

 Chileogovea\_oedipus 20000?01??0?????0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-0011202000100003000-0-000000000000000000102300200-00-00000101110100021000111102000---0----00100020100??2------0-000000001??3000006-0-00002000

 Cyphophthalmus\_duricorius 20000?01??0?????0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-0011202000100003000-0-000000000000000000102300200-00-00000101110100021000111102000---0----00100020100??2------0-000000001??3000006-0-00002000

 Gonyleptes\_horridus 200000010102----0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-001120200010000300112-000000000000011000102300200-00-00000101110100020000111102000---0----00100020100??2------0-000000001??3000006-0-00001000

 Leiobunum\_rotundum 200001010102----0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-0011202000100003000-0-000000000000011000102300200-00-00000101110100020000111102000---0----00100020100??2------0-000000001??3000006-0-00002000

 Sclerobunus\_robustus 200000010102----0----000-10---0--------000-----0-0012-0100???100000----0001-------------000-0000002----0---0-1-010000-001120200010000300112-000000000000011000102300200-00-00000101110100020000111102000---0----00100020100??2------0-000000001??3000006-0-00002000

 Allothrombium\_simoni (1 2)00001001-01002-0----000-10---0--------000-----0-0002-0?00??????000----?001-------------000-00000?2----0---0-1-010000-0010202200000003000-0-001000000000000000102300200-00-00000102------02010000-102000---0----0?1300201????2------0-100000004??3000005------02000

 Amblyomma\_americanum (0 2)00000001-01002-0----000-10---0--------000-----0-0002-0600??????000----?001-------------000-00----2----0---0-1-010000-0010202200000003000-0-001000000000000000102300200-00-00000102------02010000-102000---0----0?1300201????2------0-100000003??3000005------02000

 Neocarus\_texanus 200000001-01102-0----000-10---0--------000-----0-0002-0200???100000----0001-------------000-0000002----0---0-1-010000-0010202200000003000-0-001000001000010000102300200-00-00000102------02010000-102000---0----0?130020100??2------0-100000005??3000005------02000

 Cryptocellus\_goodnighti 200100001-01003-0----000-10---0--------000-----0-0012-0721???100000----0001---------00-0000-01101-2----0---0-1-010001-0010232000000003000-10001000100000010000102300200-00-0000010111010002211000-102000---0----001100201000-2------00?00000003003000005------02000

 Poliochera\_punctulata 2001000?1-01002-0----000-?0---0--------000-----0-0012-?7?1???100000----0001---------00-0000-01101-2----0---0-1-010001-0010232???????03?00-????1?00?00??????00010?3??20???0-???????11101000221?000-10?000---0----0?????2??000-2------00?0?????0???30000?5------02000

 Ricinoides\_atewa 200100101-01003-0----000-10---0--------000-----0-0012-0721???100000----0001---------00-0000-01101-2----0---0-1-010001-0010232000000003000-10001000100000010000102300200-00-0000010111010002211000-102000---0----001100201000-2------00?00000003003000005------02000

 Anthracomartus\_hindi 22?000100101202-0----000-?0---0--------000-----0-0012-0701???100000----0001---------05-0000-1000002----??--0-1-010001-00102???0?????030?0-??00000??00000?0?000102300200-00-000001011102000201?01101020?0---0----00100?201000-2------11?0????0000030000?5------02000

 Eophrynus\_prestvicii 22?000100101202-0----000-?0---0--------000-----0-0012-0701???100000----0001---------05-0000-10000010---??200-1-001?01100102???0?????030?0-??00000??00000?0?000102300200-00-000001011102000201?000-1020?0---0----00100?201000-2------11?0????0000030000?5------01000

 Gilboarachne\_griersoni 22?000000101202-0----000-10---0--------000-----0-0012-0701???100000----0001---------05-0000-1000002----13--0-1-010001-0010232100????030?0-??00000??00000?0?000102300200-00-000001011100000201?000-102010---0----00??00201000-2------11?011000000030000?5------02000

 Palaeocharinus\_sp\_ 22?000000101202-0----000-10---0--------000-----0-0012-0701???100000----0021---------05-0000-1000002----13--0-1-010001-00102321000000030?0-1000000?100000000000102300200-00-000001011100000201?000-102000---0----001000201000-2------111011000000030000?5------02000

 Mesotarbus\_peteri 20?0001?0101402-0----000-10---0--------000-----0-0012-0200???100000----0001---------04--000-0000112-?-?0---0-1-010000-?010????0?????03??0-????000???0?0??0?10010?3??200-00-00?????11101010201?000-10?000---0----00??0?2?1000-2------0??0????0020030000?5------02000

 Plesiosiro\_madeleyi 21?0001?0101202-1-00-000-10---0--------000-----0-0012-0700???100000----0021---------05-0000-0000002----0---0-1-010000-?010232?0?????03??0-????000???0?0??1?10010?3??200-00-000001?11101010201?000-10?000---0----00??0?2?1000-2------1??0????00?0030000?5------02000

 Eukoenenia\_mirabilis (1 2)00001001-02----0----000-10---0--------000-----0-0012-0200???100000----0001---------00-0000-0000002----0---0-1-010000-0011202000000003000-0-000000100000010000102300200-00-0000010111010002011000-102000---0----001300201000-2------1-100000000003000002---01102000

 Prokoenenia\_wheeleri (1 2)00001001-02----0----000-10---0--------000-----0-0012-0200???100000----0001---------00-0000-0000002----0---0-1-010000-0011202000000003000-0-000000100000010000102300200-00-0000010111010002011000-102000---0----001300201000-2------1-100000000003000002---01102000

 Mastigoproctus\_giganteus 210000000101202-10000000-10---0--------000-----0-0012-0700???100000----0001---------00-0000-0000002----0---0-1-010000-001023210000000300102-001100111000010000102300200-00-0000010111040102211001-102000---0----001300211000-2------11201100000003000012---01102000

 Thelyphonus\_caudatus 210000000101202-0----000-10---0--------000-----0-0012-0700???100000----0001---------00-0000-0000002----0---0-1-010000-001023210000000300102-001100111000010000102300200-00-0000010111040102211001-102000---0----001300211000-2------11201100000003000012---01102000

 Hubbardia\_pentapeltis (1 2)10001001-01202-0----000-10---0--------000-----0-0012-0700???100000----0001---------00-0000-0000002----0---0-1-010000-001023210000000300112-001100111000010000102300200-00-0000010111010102211000-102000---0----001300211000-2------11201000000003000012---01002000

 Schizomus\_crassicaudatus (1 2)10001001-01202-0----000-10---0--------000-----0-0012-0700???100000----0001---------00-0000-0000002----0---0-1-010000-001023210000000300112-001100111000010000102300200-00-0000010111010102211000-102000---0----001300211000-2------11201000000003000012---01002000

 Permarachne\_novokshonovi 2?????????0???????????????0---????????-00?????????012-0?????????000----?????????????----??0-000000??---????0-1????????00112331000?01030?0-0-?00?????0?0??0?000102300200-00-00000101110?000201?000-102000---0----0?????20?00??2------???0?????00??300???2---011?????

 Attercopus\_filmbriunguis ??????????????????????????????????????-?????????????????????????0?????????????????????-?????????????---???????????????001?2331000001030?0-0-00??????0000000000102?????????????????1110100?????00?-102000---0----0?????????????????????1?????10????000002---01102000

 Liphistius\_malayanus 200000000101402-0----000-10---0--------000-----0-0012-0710???100000----0001-------------000-1000002----0---0-1-010000-0010233100001103000-0-000000110100000000102300200-00-0000010111000002011000-102000---0----001300201----2------11101100110003000005------0200-

 Aphonopelma\_hentzi 200000000101402-0----000-10---0--------000-----0-0012-0710???---000------0----------------0-111111-----0---0-1-010000-0010233100001103000-0-000000110100000000102300200-00-0000010111000002011000-102000---0----001300201----2------10101100110003000005------0200-

 Hypochilus\_pococki 200000000101402-0----000-10---0--------000-----0-0012-0710???---000------0----------------0-111111-----0---0-1-010000-0010233110001103000-0-000000110100000000102300200-00-0000010111000002011000-102000---0----001300201----2------10101100110003000005------0200-

 Cupienius\_getazi 200000?00101402-0----000-10---0--------000-----0-0012-0710???---000------0----------------0-111111-----0---0-1-010000-0010233110001103000-0-000000110100000000102300200-00-0000010111000002011000-102000---0----001300201----2------10101100110003000005------0200-

 Neobisium\_maritimum (1 2)00001001-01202-0----000-10---0--------000-----0-0012--700???100000----0001-------------000-0000002----0---0-1-010000-0010232201010003001011000000000000000000102300200-00-00000102------02300001-102000---0----0013??21?00??2------0-000000002??3000005------0200-

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 Phrynus\_marginemaculatus 210000100101202-0----000-10---0--------000-----0-0012--700???100000----0001---------00?0000-0000002----0---0-1-010000-001023210000000300102-100100110011010000102300200-00-0000010111010102011000-102000---0----001300211000-2------11101100000003000015------02000

 Charinus\_victori 210000000101202-0----000-10---0--------000-----0-0012--700???100000----0001---------00-0000-0000002----0---0-1-010000-001023210000000300102-100100110011010000102300200-00-0000010111010101011000-102000---0----001300211000-2------11101100000003000?15------02000

;

END;

BEGIN MRBAYES;

OUTGROUP Fuxianhuia\_protensa;

set autoclose = yes nowarn = yes;

CTYPE UNORDERED : 1 -259;

LSET coding = variable rates = gamma;

mcmc ngen = 10000000 append = no printfreq = 1000 nruns = 4 samplefreq = 1000 nchains = 4 savebrlens = yes filename = xiphbayesFrontiers;

sumt burnin = 25000 contype = allcompat;

sump burnin = 25000;

END;