

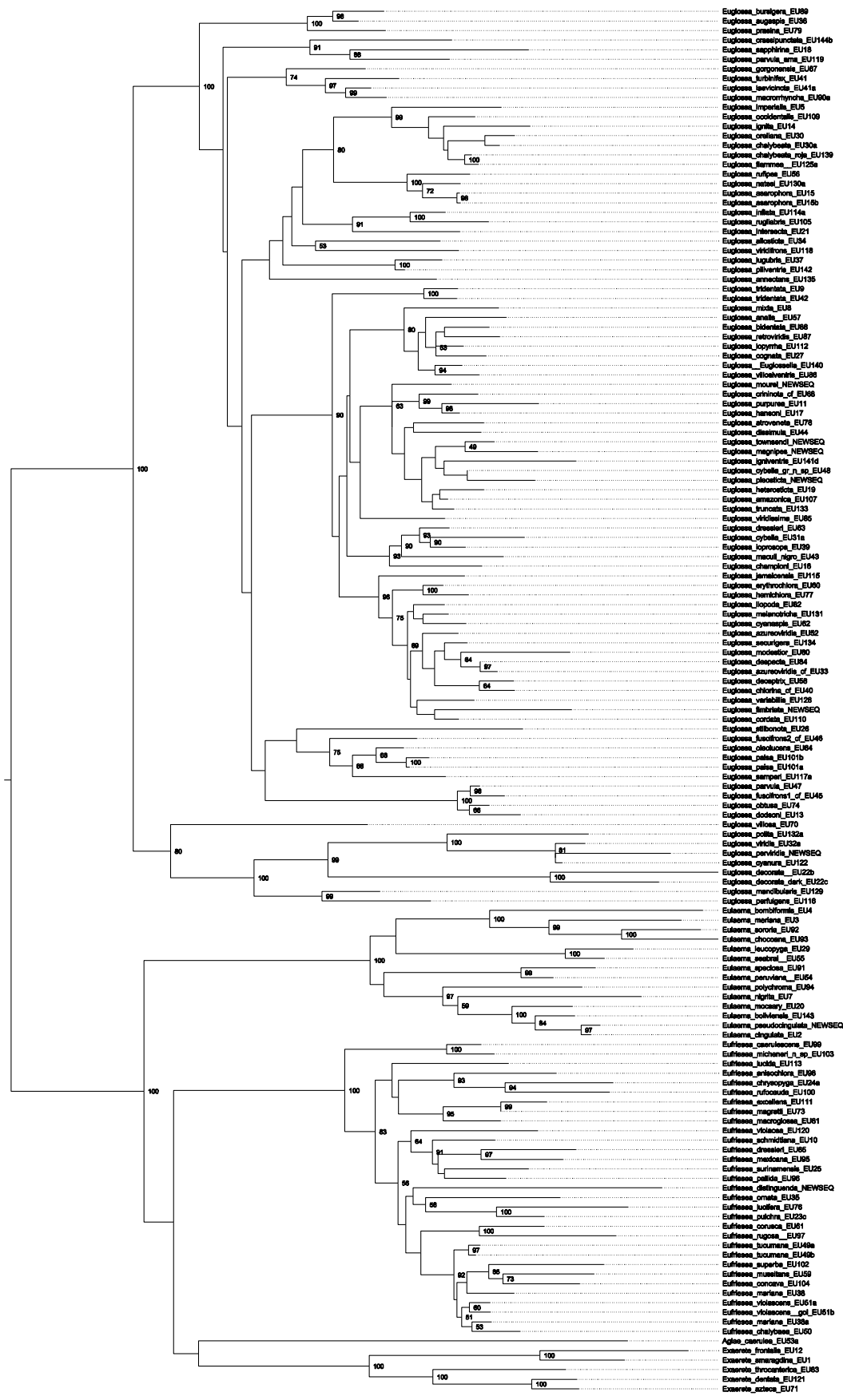
Ecography

ECOG-00417

Abrahamczyk, S., de Vos, J. M., Sedivy, C., Gottleuber, P. and Kessler, M. 2014. A humped latitudinal phylogenetic diversity pattern of orchid bees (Hymenoptera: Apidae: Euglossini) in western Amazonia: assessing the influence of climate and geologic history. – *Ecography* 37: xxx–xxx.

Supplementary material

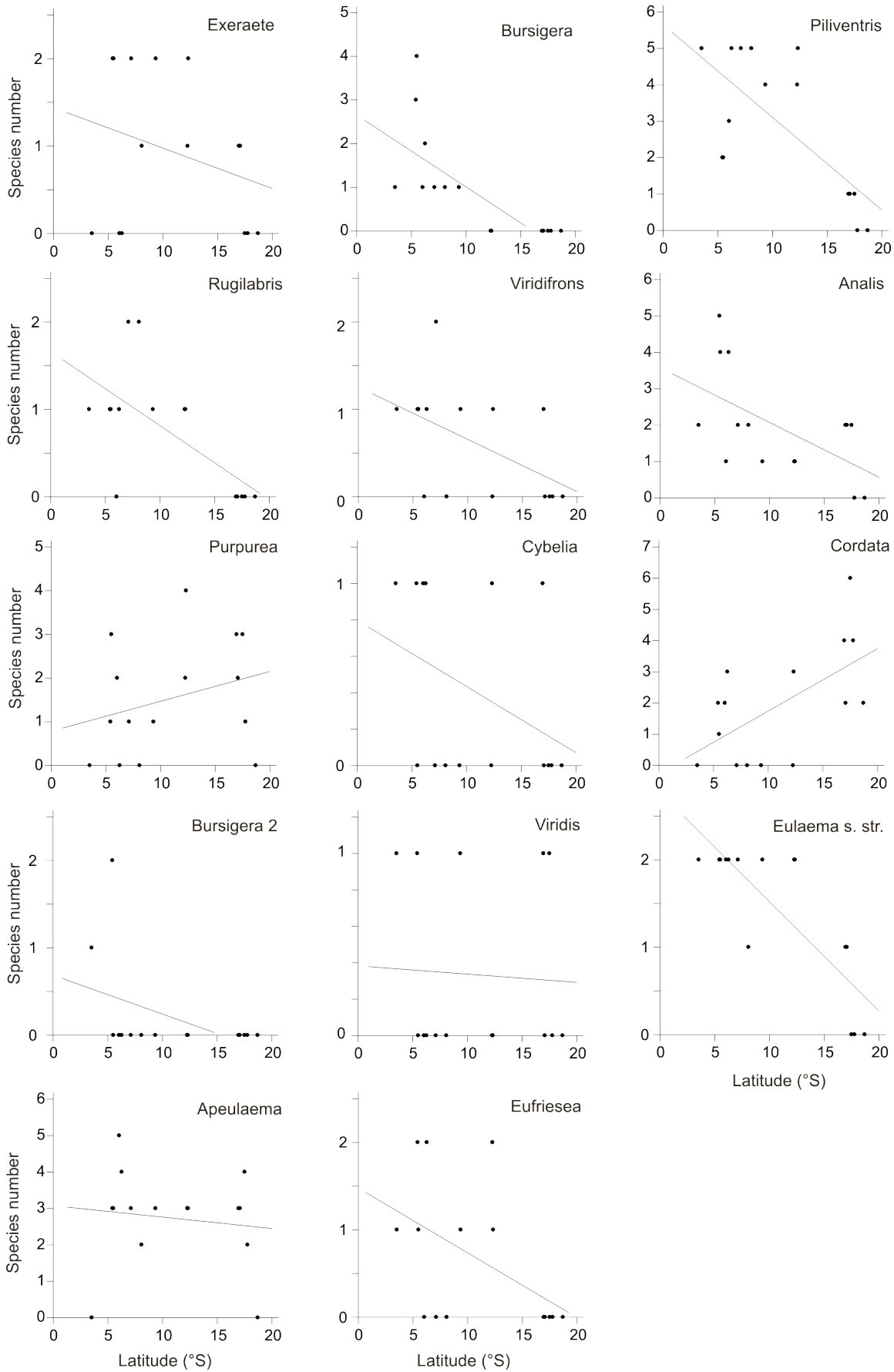
Appendix 1



2

3 Fig. A1: Maximum Likelihood tree of all orchid bee species available from GeneBank and eight
4 additionally sequenced species based on nuclear (*EF1- α* , *ArgK*, *Pol-II*) and mitochondrial (*COI*)
5 loci. Support values at the nodes were based on 1000 bootstrap replicates.

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8 Fig. A2: Species number of the single clades against latitude.

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10 Tabel A1: Collection data, taxonomic information, and NCBI *GenBank* accession numbers of
 11 newly sequenced samples used in the present study.

| Sample ID | Bee Species | Bee voucher | Collection Locality | Date Collected | COI GenBank Accession No/ |
|-----------|--------------------------------|-------------|---------------------------------|----------------|---------------------------|
| Seq1 | <i>Eufriesea distinguenda</i> | S302 | Río Tapiche I, Loreto Peru | 02/08/2008 | JQ844894 |
| Seq2 | <i>Euglossa fimbriata</i> | S747 | Sacta, Cochabamba Bolivia | 10/14/2008 | JQ844895 |
| Seq3 | <i>Euglossa magnipes</i> | S287 | Buena Vista, Santa Cruz Bolivia | 08/11/2008 | JQ844896 |
| Seq4 | <i>Euglossa mourei</i> | S540 | Buena Vista, Santa Cruz Bolivia | 12/18/2007 | JQ844897 |
| Seq5 | <i>Euglossa perviridis</i> | S1005 | Buena Vista, Santa Cruz Bolivia | 11/25/2007 | JQ844898 |
| Seq6 | <i>Euglossa pleosticta</i> | S905 | Buena Vista, Santa Cruz Bolivia | 08/12/2008 | JQ844899 |
| Seq7 | <i>Euglossa townsendi</i> | S1195 | Buena Vista, Santa Cruz Bolivia | 08/14/2008 | JQ844900 |
| Seq8 | <i>Eulaema pseudocingulata</i> | S44 | Buena Vista, Santa Cruz Bolivia | 08/11/2008 | JQ844901 |

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14 Table A2: GenBank accession numbers of sequences of the orchid bee alignment compiled by
 15 Ramirez *et al.* (2010) and used in this study.
 16

| Taxon | ID # | COI | ArgK | Pol-II | EF1-! |
|--------------------------------|-------------|------------|-------------|---------------|--------------|
| <i>Aglae caerulea</i> | EU53a | EU421542 | | EU421289 | EU421413 |
| <i>Eufriesea anisochlora</i> | EU98 | EU421583 | EU421710 | EU421325 | EU421456 |
| <i>Eufriesea caeruleascens</i> | EU99 | EU421584 | EU421711 | | |
| <i>Eufriesea chalybaea</i> | EU50 | EU421538 | EU421669 | EU421285 | EU421409 |
| <i>Eufriesea chrysopyga</i> | EU24a | EU421507 | EU421638 | EU421258 | EU421378 |
| <i>Eufriesea concava</i> | EU104 | EU421464 | EU421592 | EU421216 | EU421333 |
| <i>Eufriesea corusca</i> | EU61 | EU421549 | EU421678 | EU421296 | EU421421 |
| <i>Eufriesea dressleri</i> | EU65 | EU421552 | EU421682 | | EU421425 |
| <i>Eufriesea excellens</i> | EU111 | | EU421598 | | EU421339 |
| <i>Eufriesea lucida</i> | EU113 | EU421471 | EU421600 | EU421223 | EU421341 |
| <i>Eufriesea lucifera</i> | EU76 | EU421560 | EU421688 | EU421305 | EU421432 |
| <i>Eufriesea macroglossa</i> | EU81 | EU421565 | EU421693 | EU421311 | EU421438 |
| <i>Eufriesea magretti</i> | EU73 | EU421558 | EU421686 | EU421303 | EU421430 |
| <i>Eufriesea mariana</i> | EU38a | EU421522 | EU421653 | EU421269 | EU421393 |
| <i>Eufriesea mariana</i> | EU38 | EU421521 | EU421652 | | |
| <i>Eufriesea mexicana</i> | EU95 | EU421580 | EU421707 | | EU421453 |
| <i>Eufriesea micheneri</i> | EU103 | EU421463 | EU421591 | EU421215 | EU421332 |
| <i>Eufriesea mussitans</i> | EU59 | EU421547 | EU421676 | EU421294 | EU421419 |
| <i>Eufriesea ornata</i> | EU35 | EU421518 | EU421649 | | EU421390 |
| <i>Eufriesea pallida</i> | EU96 | EU421581 | EU421708 | | EU421454 |
| <i>Eufriesea pulchra</i> | EU23c | EU421506 | EU421637 | EU421257 | EU421377 |
| <i>Eufriesea rufocauda</i> | EU100 | EU421459 | EU421587 | EU421212 | EU421328 |
| <i>Eufriesea rugosa</i> | EU97 | EU421582 | EU421709 | | EU421455 |
| <i>Eufriesea schmidtiana</i> | EU10 | EU421458 | EU421586 | | EU421327 |
| <i>Eufriesea superba</i> | EU102 | EU421462 | EU421590 | EU421214 | EU421331 |
| <i>Eufriesea surinamensis</i> | EU25 | EU421508 | EU421639 | EU421259 | EU421379 |
| <i>Eufriesea tucumana</i> | EU49a | EU421535 | EU421666 | EU421282 | EU421406 |
| <i>Eufriesea tucumana</i> | EU49b | EU421536 | EU421667 | EU421283 | EU421407 |
| <i>Eufriesea violacea</i> | EU120 | EU421479 | EU421608 | EU421228 | EU421348 |
| <i>Eufriesea violascens</i> | EU51a | EU421539 | EU421670 | EU421286 | EU421410 |
| <i>Eufriesea violascens</i> | EU51b | EU421540 | EU421671 | EU421287 | EU421411 |
| <i>Euglossa allosticta</i> | EU34 | EU421517 | EU421648 | EU421266 | EU421389 |
| <i>Euglossa amazonica</i> | EU107 | EU421466 | EU421594 | EU421218 | EU421335 |
| <i>Euglossa analis</i> | EU57 | EU421545 | EU421674 | EU421292 | EU421417 |
| <i>Euglossa annectans</i> | EU135 | EU421488 | EU421619 | | EU421358 |
| <i>Euglossa</i> | EU15b | EU421496 | EU421628 | EU421248 | EU421367 |

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|---------------------------------|--------|----------|----------|----------|----------|
| <i>asarophora</i> | | | | | |
| <i>Euglossa asarophora</i> | EU15 | EU421495 | EU421627 | EU421247 | EU421366 |
| <i>Euglossa atroveneta</i> | EU78 | EU421562 | EU421690 | EU421307 | EU421434 |
| <i>Euglossa augaspis</i> | EU36 | EU421519 | EU421650 | EU421267 | EU421391 |
| <i>Euglossa bidentata</i> | EU88 | EU421572 | EU421700 | EU421318 | EU421445 |
| <i>Euglossa bursigera</i> | EU89 | EU421573 | EU421701 | EU421319 | EU421446 |
| <i>Euglossa chalybeata</i> | EU30a | EU421513 | EU421644 | | EU421385 |
| <i>Euglossa championi</i> | EU16 | EU421497 | EU421629 | EU421249 | EU421368 |
| <i>Euglossa chlorina</i> | EU40 | EU421525 | EU421656 | EU421272 | EU421396 |
| <i>Euglossa cognata</i> | EU27 | EU421510 | EU421640 | EU421261 | EU421381 |
| <i>Euglossa cordata</i> | EU110 | EU421469 | EU421597 | EU421221 | EU421338 |
| <i>Euglossa crassipunctata</i> | EU144b | EU421494 | EU421626 | EU421246 | EU421365 |
| <i>Euglossa crininota</i> | EU68 | EU421554 | EU421684 | EU421299 | |
| <i>Euglossa cyanaspis</i> | EU62 | EU421550 | EU421679 | EU421297 | EU421422 |
| <i>Euglossa cyanura</i> | EU122 | EU421481 | EU421610 | EU421230 | EU421350 |
| <i>Euglossa cybelia</i> | EU31a | EU421514 | EU421645 | EU421264 | EU421386 |
| <i>Euglossa deceptrix</i> | EU58 | EU421546 | EU421675 | EU421293 | EU421418 |
| <i>Euglossa decorata</i> | EU22b | EU421504 | EU421636 | EU421255 | EU421375 |
| <i>Euglossa decorata dark</i> | EU22c | EU421505 | | EU421256 | EU421376 |
| <i>Euglossa despecta</i> | EU84 | EU421568 | EU421696 | EU421314 | EU421441 |
| <i>Euglossa dissimula</i> | EU44 | EU421530 | EU421661 | EU421277 | EU421401 |
| <i>Euglossa dodsoni</i> | EU13 | EU421484 | EU421613 | EU421234 | EU421353 |
| <i>Euglossa dressleri</i> | EU63 | EU421551 | EU421680 | EU421298 | EU421423 |
| <i>Euglossa erythrochlora</i> | EU60 | EU421548 | EU421677 | EU421295 | EU421420 |
| <i>Euglossa chalybeate roja</i> | EU139 | EU421482 | | EU421231 | |
| <i>Euglossa flammea</i> | EU125a | EU421489 | EU421620 | EU421240 | EU421359 |
| <i>Euglossa fuscifrons</i> | EU46 | EU421532 | EU421663 | EU421279 | EU421403 |
| <i>Euglossa gorgonensis</i> | EU67 | EU421553 | EU421683 | | EU421426 |
| <i>Euglossa hansonii</i> | EU17 | EU421498 | EU421630 | EU421250 | EU421369 |
| <i>Euglossa hemichlora</i> | EU77 | EU421561 | EU421689 | EU421306 | EU421433 |
| <i>Euglossa heterosticta</i> | EU19 | EU421500 | EU421632 | EU421252 | EU421371 |
| <i>Euglossa ignita</i> | EU14 | EU421490 | EU421621 | EU421241 | EU421360 |
| <i>Euglossa igniventris</i> | EU141d | EU421492 | EU421623 | EU421243 | EU421362 |
| <i>Euglossa cybelia gr n sp</i> | EU48 | EU421534 | EU421665 | EU421281 | EU421405 |
| <i>Euglossa imperialis</i> | EU5 | EU421537 | EU421668 | EU421284 | EU421408 |
| <i>Euglossa inflata</i> | EU114a | EU421472 | EU421601 | | EU421342 |
| <i>Euglossa intersecta</i> | EU21 | EU421503 | EU421635 | | EU421374 |
| <i>Euglossa ioprosopa</i> | EU39 | EU421523 | EU421654 | EU421270 | EU421394 |

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|------------------------------|--------|----------|----------|----------|----------|
| <i>Euglossa iopyrrha</i> | EU112 | EU421470 | EU421599 | EU421222 | EU421340 |
| <i>Euglossa jamaicensis</i> | EU115 | EU421473 | EU421602 | EU421224 | EU421343 |
| <i>Euglossa laevicincta</i> | EU41a | EU421527 | EU421658 | EU421274 | EU421398 |
| <i>Euglossa liopoda</i> | EU82 | EU421566 | EU421694 | EU421312 | EU421439 |
| <i>Euglossa lugubris</i> | EU37 | EU421520 | EU421651 | EU421268 | EU421392 |
| <i>Euglossa macrorhyncha</i> | EU90a | EU421575 | | EU421321 | EU421448 |
| <i>Euglossa maculilabris</i> | EU43 | EU421529 | EU421660 | EU421276 | EU421400 |
| <i>Euglossa mandibularis</i> | EU129 | | EU421612 | EU421233 | |
| <i>Euglossa melanotricha</i> | EU131 | EU421485 | EU421615 | EU421236 | EU421354 |
| <i>Euglossa mixta</i> | EU8 | | | EU421309 | EU421436 |
| <i>Euglossa modestior</i> | EU80 | EU421541 | EU421672 | EU421288 | EU421412 |
| <i>Euglossa milenae</i> aff. | EU45 | EU421516 | EU421647 | EU421265 | EU421388 |
| <i>Euglossa parvula</i> | EU47 | EU421564 | EU421692 | EU421310 | EU421437 |
| <i>Euglossa natesi</i> | EU130a | | EU421614 | EU421235 | |
| <i>Euglossa obtusa</i> | EU74 | EU421531 | EU421662 | EU421278 | EU421402 |
| <i>Euglossa obtusa</i> | EU74 | EU421559 | EU421687 | EU421304 | EU421431 |
| <i>Euglossa occidentalis</i> | EU109 | EU421467 | EU421595 | EU421219 | EU421336 |
| <i>Euglossa oleolucens</i> | EU64 | | EU421681 | | EU421424 |
| <i>Euglossa orellana</i> | EU30 | | EU421643 | EU421263 | EU421384 |
| <i>Euglossa paisa</i> | EU101a | EU421460 | EU421588 | | EU421329 |
| <i>Euglossa paisa</i> | EU101b | EU421461 | EU421589 | EU421213 | EU421330 |
| <i>Euglossa parvula ama</i> | EU119 | EU421477 | EU421606 | EU421227 | EU421347 |
| <i>Euglossa perfulgens</i> | EU116 | EU421474 | EU421603 | EU421225 | EU421344 |
| <i>Euglossa piliventris</i> | EU142 | | EU421624 | EU421244 | EU421363 |
| <i>Euglossa polita</i> | EU132a | | EU421616 | EU421237 | EU421355 |
| <i>Euglossa prasina</i> | EU79 | EU421563 | EU421691 | EU421308 | EU421435 |
| <i>Euglossa purpurea</i> | EU11 | EU421468 | EU421596 | EU421220 | EU421337 |
| <i>Euglossa retroviridis</i> | EU87 | EU421571 | EU421699 | EU421317 | EU421444 |
| <i>Euglossa rufipes</i> | EU56 | EU421544 | EU421673 | EU421291 | EU421416 |
| <i>Euglossa rugilabris</i> | EU105 | EU421465 | EU421593 | EU421217 | EU421334 |
| <i>Euglossa samperi</i> | EU117a | EU421475 | EU421604 | EU421226 | EU421345 |
| <i>Euglossa sapphirina</i> | EU18 | EU421499 | EU421631 | EU421251 | EU421370 |
| <i>Euglossa securigera</i> | EU134 | EU421487 | EU421618 | EU421239 | EU421357 |
| <i>Euglossa stilbonota</i> | EU26 | EU421509 | | EU421260 | EU421380 |
| <i>Euglossa tridentata</i> | EU9 | EU421574 | EU421702 | EU421320 | EU421447 |
| <i>Euglossa tridentata</i> | EU42 | EU421528 | EU421659 | EU421275 | EU421399 |
| <i>Euglossa truncata</i> | EU133 | EU421486 | EU421617 | EU421238 | EU421356 |

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|--------------------------------|-------|----------|----------|----------|----------|----------|
| <i>Euglossa turbinifex</i> | EU41 | EU421526 | EU421657 | EU421273 | EU421391 | 77 |
| <i>Euglossa variabilis</i> | EU128 | EU421483 | EU421611 | EU421232 | EU421351 | 18 |
| <i>Euglossa villosa</i> | EU70 | EU421556 | | EU421301 | EU421428 | 89 |
| <i>Euglossa euglossella</i> | EU140 | EU421570 | EU421698 | EU421316 | EU421443 | 20 21 |
| <i>Euglossa villosiventris</i> | EU86 | EU421491 | EU421622 | EU421242 | EU421361 | 22 23 |
| <i>Euglossa viridifrons</i> | EU118 | EU421476 | EU421605 | | EU421344 | 44 |
| <i>Euglossa viridis</i> | EU32a | EU421515 | EU421646 | | EU421382 | 25 |
| <i>Euglossa viridissima</i> | EU85 | EU421569 | EU421697 | EU421315 | EU421442 | 26 27 |
| <i>Eulaema boliviensis</i> | EU143 | EU421493 | EU421625 | EU421245 | EU421362 | 28 |
| <i>Eulaema bombiformis</i> | EU4 | EU421524 | EU421655 | EU421271 | EU421395 | 29 30 |
| <i>Eulaema choacoana</i> | EU93 | EU421578 | EU421705 | EU421323 | EU421453 | 31 |
| <i>Eulaema cingulata</i> | EU2 | EU421501 | EU421633 | EU421253 | EU421372 | 32 |
| <i>Eulaema leucopyga</i> | EU29 | EU421511 | EU421641 | | EU421383 | 33 |
| <i>Eulaema meriana</i> | EU3 | EU421512 | EU421642 | EU421262 | EU421383 | 34 |
| <i>Eulaema mocsary</i> | EU20 | EU421502 | EU421634 | EU421254 | EU421373 | 35 |
| <i>Eulaema nigrata</i> | EU7 | EU421555 | EU421685 | EU421300 | EU421423 | 36 |
| <i>Eulaema peruviana</i> | EU54 | | | EU421290 | EU421413 | 37 |
| <i>Eulaema polychroma</i> | EU94 | EU421579 | EU421706 | EU421324 | EU421452 | 38 39 |
| <i>Eulaema seabrai</i> | EU55 | EU421543 | | | EU421414 | 40 |
| <i>Eulaema sororia</i> | EU92 | EU421577 | EU421704 | EU421322 | EU421450 | 41 |
| <i>Eulaema speciosa</i> | EU91 | EU421576 | EU421703 | | EU421442 | 42 |
| <i>Exaerete azteca</i> | EU71 | EU421557 | | EU421302 | EU421424 | 43 |
| <i>Exaerete dentata</i> | EU121 | EU421480 | EU421609 | EU421229 | EU421344 | 44 |
| <i>Exaerete frontalis</i> | EU12 | EU421478 | EU421607 | | EU421354 | 45 |
| <i>Exaerete smaragdina</i> | EU1 | EU421457 | EU421585 | EU421211 | EU421326 | 46 47 |
| <i>Exaerete trochanterica</i> | EU83 | EU421567 | EU421695 | EU421313 | EU421440 | 48 49 |

52 Table A3: Pairwise correlations (R^2 -values) between environmental variables; * $p \leq 0.05$, ** $p \leq$
 53 0.01, *** $p \leq 0.001$.

| | Latitude | Longitude | Mean temperature | Temperature seasonality | Mean precipitation | Precipitation seasonality | Climatic seasonality | Elevation |
|---------------------------|----------|-----------|------------------|-------------------------|--------------------|---------------------------|----------------------|-----------|
| Longitude | 0.90*** | x | | | | | | |
| Mean temperature | 0.13 | 0.01 | x | | | | | |
| Temperature seasonality | 0.92*** | 0.95*** | 0.10 | x | | | | |
| Mean precipitation | 0.00 | 0.00 | 0.07 | 0.00 | x | | | |
| Precipitation seasonality | 0.88*** | 0.68*** | 0.10 | 0.69*** | 0.00 | x | | |
| Climatic seasonality | 0.98*** | 0.88*** | 0.12 | x | 0.00 | x | x | |
| Elevation | 0.00 | 0.00 | 0.30* | 0.00 | 0.00 | 0.00 | 0.00 | x |
| Species number | 0.13 | 0.14 | 0.06 | 0.21 | 0.35* | 0.12 | 0.18 | 0.00 |

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