

**Table S2.** Representative terrain, vegetation types, and pollinating butterflies in the nine distribution zones.

| Zone/subzone   | Name                           | Terrain         | Vegetation types    | Representative pollinating butterflies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| A <sub>1</sub> | Dehong-Banna<br>Border Subzone | lowlands, hills | tropical dry forest | <i>Graphium (Pathysa) antiphates</i> , <i>G. (P.) agetes</i> , <i>G. eurypylus</i> , <i>G. evemon</i> , <i>G. doson</i> , <i>G. xenocles</i> , <i>G. macareus</i> , <i>Troides helena</i> , <i>Atrophaneura aidoneus</i> , <i>A. varuna</i> , <i>Byasa crassipes</i> , <i>B. impediens</i> , <i>P. castor</i> , <i>P. slateri</i> , <i>P. paradoxa</i> , <i>P. noblei</i> , <i>Meandrusa payeni</i> , <i>Eurema ada</i> , <i>E. andersoni</i> , <i>Gandaca harina</i> , <i>Dercas verhuelli</i> , <i>Pareronia avatar</i> , <i>Leptosia nina</i> , <i>Appias libythea</i> , <i>A. indra</i> , <i>A. pandione</i> , <i>A. lyncida</i> , <i>A. galba</i> , <i>Talbotia naganum</i> , <i>Prioneris philonome</i> , <i>Delias acalis</i> , <i>D. hyparete</i> , <i>D. agostina</i> , <i>D. descombesi</i> , <i>Poritia ericynoides</i> , <i>Miletus bannanus</i> , <i>Allotinus drumila</i> , <i>Logania marmorata</i> , <i>Spalgis epius</i> , <i>Iraota timoleon</i> , <i>Hypolycaena erylus</i> , <i>Zeltus amasa</i> , <i>Chliaria othona</i> , <i>Sinthus menglaensis</i> , <i>Araotes lapithis</i> , <i>Bindahara phocides</i> , <i>Chrysozephyrus scintillans</i> , <i>Rapala hades</i> , <i>Yasoda androconifera</i> , <i>Y. tripunctata</i> , <i>Pratapa deva</i> , <i>Tajuria cippus</i> , <i>Dacalana penicilligera</i> , <i>Creon cleobis</i> , <i>Suasa lisides</i> , <i>Charana mandarinus</i> , <i>Arhopala dispar</i> , <i>A. ganesa</i> , <i>Thaduka multicaudata</i> , <i>Flos asoka</i> , <i>Mota massyla</i> , <i>Horaga syrinx</i> , <i>Ticherra acte</i> , <i>Remelana jangala</i> , <i>Niphanda asialis</i> , <i>Anthene emolus</i> , <i>A. lycaenina</i> , <i>Petrelaea dana</i> , <i>Nacaduba pactolus</i> , <i>N. hermus</i> , <i>N. berenice</i> , <i>Ionolyce helicon</i> , <i>Prosotas aluta</i> , <i>P. lutea</i> , <i>P. bhutea</i> , <i>P. pia</i> , <i>Caleta decidia</i> , <i>Jamides alecto</i> , <i>Zizeeria karsandra</i> , <i>Zizula hylax</i> , <i>Abisara chelina</i> , <i>Dodona egeon</i> , <i>Dodona deodata</i> , <i>Parantica melaneus</i> , <i>Ideopsis vulgaris</i> , <i>Euploea midamus</i> , <i>E. eunice</i> , <i>E. sylvester</i> , <i>E. radamantha</i> , <i>E. klugii</i> , <i>E. algea</i> , <i>Phalanta alcippe</i> , <i>Cirrochroa aoris</i> , <i>Symbrenthia hypselis</i> , <i>Hasora schoenherr</i> , <i>H. chromus</i> , <i>H. taminatus</i> , <i>Choaspes stigmata</i> , <i>C. subcaudatus</i> , <i>Seseria</i> |

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|                |                                        |                                            |                                             | <i>dohertyi</i> , <i>Celaenorrhinus vietnamicus</i> , <i>C. leucocera</i> , <i>Mooreana trichoneura</i> , <i>Gerosis phisara</i> , <i>Tagiades gana</i> , <i>Satarupa gopala</i> , <i>Darpa striata</i> , <i>D. hanria</i> , <i>Ctenoptilum multiguttatum</i> , <i>C. thwaitesi</i> , <i>Iambrix salsala</i> , <i>Ancistroides nigrita</i> , <i>Stimula swinhoei</i> , <i>Koruthaialos sindu</i> , <i>Erionota acroleuca</i> , <i>Arnetta atkinsoni</i> , <i>Scobura isota</i> , <i>Hyaerotis adrastus</i> , <i>Halpe wantona</i> , <i>Halpe zema</i> , <i>Ampittia dioscorides</i> , <i>Pithauria stramineipennis</i> , <i>Potanthus nestia</i> , <i>Cephrenes acalle</i> , <i>Telicota linna</i> , <i>Baoris pagana</i> , <i>Caltoris cahira</i> , <i>Iton watsonii</i> |
| A <sub>2</sub> | Lianghe Subzone                        | lowlands, hills                            | tropical dry forest, broadleaf forest       | <i>Graphium</i> ( <i>Graphium</i> ) <i>septentriniocolus</i> , <i>Byasa polla</i> , <i>B. latreillei</i> , <i>P. krishna</i> , <i>Chliaria kina</i> , <i>Sinthusa virgo</i> , <i>Heliophorus androcles</i> , <i>Celaenorrhinus leucocera</i> , [other species similar to subzone A <sub>1</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| B              | Hekou-Funing Karst Hills Zone          | lowlands, karst plains and hills           | karst shrubs, coniferous forest             | <i>Euploea tulliolus</i> , <i>Yasoda androconifera</i> , <i>Tajuria maculate</i> , [other species similar to subzone A <sub>1</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| C              | Lincang-Pu'er Median Mountains Zone    | low-median mountains, basin, river valleys | broadleaf forest, coniferous forest         | <i>Bhutanitis lidderdalii</i> , <i>Ideopsis vulgaris</i> , <i>Euploea tulliolus</i> , <i>E. algea</i> , <i>Phalanta alcippe</i> , <i>Cirrochroa aoris</i> , <i>Deudorix epijarbas</i> , <i>Rapala iarbus</i> , <i>Yasoda androconifera</i> , <i>Tajuria maculata</i> , <i>Creon cleobis</i> , <i>Neocheritra fabronia</i> , <i>Arhopala eumolphus</i> , <i>A. paramuta</i> , <i>A. birmana</i> , <i>Flos asoka</i> , <i>Heliophorus indicus</i> , <i>H. kohimensis</i> , <i>Famegana alsulus</i> , <i>Tagiades gana</i> , <i>Astictopterus jama</i> , <i>Notocrypta paralysos</i> , <i>Gangara thyrasis</i> , [other species similar to subzones A <sub>1</sub> and A <sub>2</sub> ]                                                                                      |
| D              | Yuanjiang-Mengzi Red-River Valley Zone | river valley, southern margin of altiplano | savannah shrub and grass, coniferous forest | <i>Meandrusa sciron</i> , <i>Neozephyrus uedai</i> , <i>Burara harisa</i> , <i>B. oedipodea</i> , <i>Hasora badra</i> , <i>Caprona alida</i> , <i>Sarangesa dasahara</i> , <i>Celaenorrhinus leucocera</i> , <i>Mooreana trichoneura</i> , <i>Udaspes folus</i> , <i>Matapa aria</i> , <i>Zographetus satwa</i> , <i>Pithauria murdava</i> , <i>Potanthus pseudomaesa</i> , <i>P. palnia</i> , <i>Telicota ohara</i> , <i>Pelopidas mathias</i> , [other species similar to zone C]                                                                                                                                                                                                                                                                                       |

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| E <sub>1</sub> | Nujiang-Lancangjiang Canyons Subzone | river valleys, high mountains          | broadleaf forest to subalpine coniferous forest and meadow                 | <i>Parnassius orleans</i> , <i>P. imperator</i> , <i>Graphium sikkimica</i> , <i>G. parus</i> , <i>Delias patrua</i> , <i>Aporia hastate</i> , <i>Argynnis sagana</i> , <i>Chrysozephyrus yunnanensis</i> , <i>C. watsoni</i> , <i>Sinthus virgo</i> , <i>Rapala nissa</i> , <i>Lycaena ouang</i> , <i>Heliophorus tamu</i> , <i>Burara vasutana</i> , <i>Choaspes benjaminii</i> , <i>Lobocla simplex</i> , <i>Celaenorrhinus consanguinea</i> , <i>C. victor</i> , <i>Coladenia maeniata</i> , <i>C. uemurai</i> , <i>Gerosis sinica</i> , <i>Pseudocoladenia festa</i> , <i>Erynnis pelias</i> , <i>Pyrgus maculatus</i> , <i>Erionota torus</i> , <i>Aeromachus kali</i> , <i>A. stigmatus</i> , <i>Halpe kumara</i> , <i>H. knyveti</i> , <i>Potanthus flava</i> , <i>P. mara</i> , <i>P. trachala</i> , <i>P. lydius</i> , <i>Polytremis theca</i> , <i>P. nascens</i> , <i>P. micropunctata</i> , <i>P. caerulescens</i> , <i>Tsukiyamaia albimacula</i>                         |
| E <sub>2</sub> | Southern Gaoligongshan Subzone       | lowlands, hills, median mountains      | broadleaf forest, coniferous forest                                        | <i>Cirrochroa aoris</i> , <i>Symbrenthia niphanda</i> , <i>Ypthima parasakra</i> , <i>Chrysozephyrus disparatus</i> , <i>Shirozuozeophyrus paona</i> , <i>Sinthus virgo</i> , <i>Tajuria diaeus</i> , <i>Cheritrella truncipennis</i> , <i>Phengaris xiushani</i> , <i>Lobocla liliana</i> , <i>Coladenia buehneri</i> , <i>Notocrypta feisthamelii</i> , <i>Tsukiyamaia albimacula</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| E <sub>3</sub> | Nujiang-Lancangjiang Valley Subzone  | river valleys, basin, median mountains | broadleaf forest, coniferous forest                                        | <i>Graphium eurys</i> , <i>Chrysozephyrus souleanus</i> , [other species similar to zone C]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| F <sub>1</sub> | Northwest High Mountains Subzone     | river valley, high mountains           | savannah shrub, broadleaf forest to subalpine coniferous forest and meadow | <i>Parnassius epaphus</i> , <i>P. orleans</i> , <i>P. imperator</i> , <i>P. simo</i> , <i>P. acco</i> , <i>P. cephalus</i> , <i>P. szechenyi</i> , <i>Bhutanitis thaidina</i> , <i>B. mansfieldi</i> , <i>Iphiclides podalirius</i> , <i>Graphium parus</i> , <i>Byasa daemonius</i> , <i>Byasa rhadinus</i> , <i>Delias patrua</i> , <i>Aporia procris</i> , <i>A. uedai</i> , <i>A. lhamo</i> , <i>A. bernardi</i> , <i>A. goutellei</i> , <i>A. kamei</i> , <i>A. delavayi</i> , <i>A. hastata</i> , <i>A. nishimurai</i> , <i>A. acraea</i> , <i>A. wolongensis</i> , <i>A. monbeigi</i> , <i>Pieris steinigeri</i> , <i>P. melaina</i> , <i>P. dubernardi</i> , <i>P. wangi</i> , <i>P. davidis</i> , <i>P. venata</i> , <i>P. stotzneri</i> , <i>Anthocharis bieti</i> , <i>Leptidea yunnana</i> , <i>Gonepteryx aspasia</i> , <i>G. chinensis</i> , <i>Argynnis zenobia</i> , <i>A. aglaja</i> , <i>A. nerippe</i> , <i>A. adippe</i> , <i>Issoria eugenia</i> , <i>Melitaea</i> |

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|                |                                      |                                  |                                             | <i>jezebel</i> , <i>M. agar</i> , <i>Melanargia leda</i> , <i>Thecla ohyai</i> , <i>Gonerilia seraphim</i> , <i>Kameiozephyrus neis</i> , <i>Neozephyrus helenae</i> , <i>N. dubernardi</i> , <i>N. uedai</i> , <i>Chrysozephyrus scintillans</i> , <i>C. marginatus</i> , <i>C. meili</i> , <i>C. yunnanensis</i> , <i>C. watsoni</i> , <i>C. disparatus</i> , <i>Shirozuozeophyrus paona</i> , <i>Favonius watanabei</i> , <i>Deudorix repercuta</i> , <i>Tajuria diaeus</i> , <i>Ahlbergia clarolinea</i> , <i>Spindasis rukma</i> , <i>Lycaena pang</i> , <i>Celastrina huegelii</i> , <i>Lobocla proxima</i> , <i>L. simplex</i> , <i>Carterocephalus abax</i> , <i>C. avanti</i> , <i>C. dieckmanni</i> , <i>Udaspes stellatus</i> , <i>Aeromachus catocyanea</i> , <i>A. propinquus</i> , <i>Ampittia virgata</i> , <i>Pithauria linus</i> , <i>Ochlodes sagitta</i> , <i>O. hasegawai</i> |
| F <sub>2</sub> | Jinsha River Valley Subzone          | river valley, median mountains   | savannah shrub and grass, coniferous forest | <i>Lamproptera paracurius</i> , [other species similar to subzone F <sub>1</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| G <sub>1</sub> | Central Yunnan Altiplano Subzone     | altiplano, hills, low mountains  | broadleaf forest, coniferous forest         | <i>Bhutanitis thaidina</i> , <i>Lamproptera paracurius</i> , <i>Graphium leechi</i> , <i>Byasa rhadinus</i> , <i>Ypthima sinica</i> , <i>Teratozephyrus tsukiyamahiroshii</i> , <i>Deudorix epijarbas</i> , <i>D. repercuta</i> , <i>Spindasis rukma</i> , <i>Heliophorus saphiroides</i> , <i>Ctenoptilum vasava</i> , <i>Carterocephalus alcinoides</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| G <sub>2</sub> | Central Yunnan Lake Basin Subzone    | altiplano, lake basins, hills    | broadleaf forest, coniferous forest         | <i>Rapala caerulea</i> , <i>Hasora anura</i> , <i>Choaspes xanthopogon</i> , <i>Daimio tethys</i> , <i>Celaenorrhinus tibetana</i> , <i>Carterocephalus alcinoides</i> , <i>C. alcinus</i> , <i>Aeromachus propinquus</i> , [other species similar to subzone G <sub>1</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| G <sub>3</sub> | East Yunnan Karst Subzone            | karst altiplano, hills           | broadleaf forest, coniferous forest         | <i>Meandrusa sciron</i> , <i>Papilio dialis</i> , <i>Euploea tulliolus</i> , <i>E. Sylvester</i> , <i>Artipe eryx</i> , <i>Tajuria maculate</i> , [other species similar to zone B]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| H              | Northeast Yunnan High Mountains Zone | median-high mountains, altiplano | broadleaf forest, coniferous forest         | <i>Aporia largeateui</i> , <i>Argynnis adippe</i> , <i>Clossiana gong</i> , <i>Melanargia asiatica</i> , <i>M. leda</i> , <i>Fujiokaozephyrus tsangkie</i> , <i>Ahlbergia chalcidis</i> , <i>Satyrium oenone</i> , <i>Taractrocera flavoides</i> , [other species similar to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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|   |                                   |                                   |                                        | subzone G <sub>1</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| I | Northeast Yunnan<br>Lowlands Zone | lowlands, hills, river<br>valleys | broadleaf forest,<br>coniferous forest | <i>Lamproptera paracurius</i> , <i>Graphium mullah</i> , <i>Graphium leechi</i> ,<br><i>Papilio elwesi</i> , <i>Delias berinda</i> , <i>Argynnis zenobia</i> , <i>A. aglaja</i> , <i>A.</i><br><i>nerippe</i> , <i>A. adippe</i> , <i>Symbrenthia brabira</i> , <i>S. sinica</i> , <i>Araschnia doris</i> ,<br><i>Heliophorus saphir</i> , <i>Tongeia filicaudis</i> , <i>Choaspes hemixanthus</i> ,<br><i>Abraximorpha davidii</i> , <i>Daimio tethys</i> , <i>Tagiades menaka</i> ,<br><i>Ctenoptilum vasava</i> , <i>Notocrypta paralysos</i> , <i>Astictopterus jama</i> ,<br><i>Isoteinon lamprospilus</i> , <i>Pithauria linus</i> , <i>Parnara guttata</i> , <i>Pelopidas</i><br><i>mathias</i> , <i>Caltoris cahira</i> |