

Supplementary documentation on phylogenetic relations used to build the working tree:

'**Non-Ditrysi**' and '**Lowest Ditrysi**' families in the traditional sense were adapted as far as possible after Yen et al (2005), Niehuis et al (2006), Turner et al (2010), Kawahara et al (2011), Grehan (2012), Regier et al (2012a), Sohn et al (2013), Moraes & Duarte M (2014):

- Grehan JR (2012) Morphological evidence for phylogenetic relationships within the Hepialidae (Lepidoptera: Exoporia). Bulletin of the Buffalo Society of Natural Sciences 42: 33-62.
- Kawahara AY, Ohshima I, Kawakita A, Regier JC, Mitter C, Cummings MP, Davis DR, Wagner DL, De Prins J, Lopez-Vaamonde C (2011) Increased gene sampling strengthens support for higher-level groups within leaf-mining moths and relatives (Lepidoptera: Gracillariidae). BMC Evolutionary Biology 11: 182.
- Moraes SS, Duarte M (2014) Phylogeny of Neotropical Castniinae (Lepidoptera: Cossoidea: Castniidae): testing the hypothesis of the mimics as a monophyletic group and implications for the arrangement of the genera. Zoological Journal of the Linnean Society 170: 362-399.
- Niehuis O, Yen SH, Naumann CM, Misof B (2006) Higher phylogeny of zygaenid moths (Insecta : Lepidoptera) inferred from nuclear and mitochondrial sequence data and the evolution of larval cuticular cavities for chemical defence. Molecular Phylogenetics and Evolution 39: 812-829.
- Regier JC, Brown JW, Mitter C, Baixeras J, Cho S, Cummings MP, Zwick A (2012a) A molecular phylogeny for the leaf-roller moths (Lepidoptera: Tortricidae) and its implications for classification and life history evolution. PLoS ONE 7(4): e35574.
- Sohn J-C, Regier JC, Mitter C, Davis D, Landry J-F, Zwick A, Cummings MP (2013) A molecular phylogeny for Yponomeutoidea (Insecta, Lepidoptera, Ditrysia) and its implications for classification, biogeography and the evolution of host plant use. PLoS ONE 8(1): e55066.
- Turner H, Lieshout N, Van Ginkel WE, Menken SBJ (2010) Molecular Phylogeny of the Small Ermine Moth Genus *Yponomeuta* (Lepidoptera, Yponomeutidae) in the Palaearctic. PLoS ONE 5(3): e9933.
- Yen S-H, Robinson GS, Quicke DLJ (2005) The phylogenetic relationships of Chalcosiinae (Lepidoptera, Zygaenoidea, Zygaenidae). Zoological Journal of the Linnean Society 143: 161-341.

**Gelechioidea**, rearranged following Kaila (2004) and Kaila et al (2011):

- Kaila L (2004) Phylogeny of the superfamily Gelechioidea (Lepidoptera: Ditrysia): an exemplar approach. Cladistics 20: 303-340.
- Kaila L, Mutanen M, Nyman T (2011) Phylogeny of the mega-diverse Gelechioidea (Lepidoptera): adaptations and determinants of success. Molecular Phylogenetics and Evolution. 61: 801-809.

The **Geometridae** was partly adapted from Sihvonen et al (2011):

- Sihvonen P, Mutanen M, Kaila L, Brehm G, Hausmann A, Staude HS (2011) Comprehensive Molecular Sampling Yields a Robust Phylogeny for Geometrid Moths (Lepidoptera: Geometridae). PLoS ONE 6(6): e20356.

Parts of the large superfamily **Noctuoidea** were arranged according to Zahiri et al (2010, 2012) with some details on the Arctiinae updated from Zaspel (2014) and Scott (2014):

- Scott CH, Zaspel JRM, Chialvo P, Weller S (2014) A preliminary molecular phylogenetic assessment of the lichen moths (Lepidoptera: Erebidae: Arctiinae: Lithosiini) with comments on palatability and chemical sequestration. *Systematic Entomology* 39: 286-303.
- Zahiri R, Kitching IJ, Lafontaine JD, Mutanen M, Kaila L, Holloway JD, Wahlberg N (2010). A new molecular phylogeny offers hope for a stable family level classification of the Noctuoidea (Lepidoptera). *Zoologica Scripta* 40: 158-173.
- Zahiri R, Holloway JD, Kitching IJ, Lafontaine JD, Mutanen M, Wahlberg N (2012) Molecular phylogenetics of Erebidae (Lepidoptera, Noctuoidea). *Systematic Entomology* 37: 102-124.
- Zaspel JM, Weller SJ, Wardwell CT, Zahiri R, Wahlberg N (2014) Phylogeny and evolution of pharmacophagy in tiger moths (Lepidoptera: Erebidae: Arctiinae). *PLoS ONE* 9(7): e101975. doi:10.1371/journal.pone.0101975.

Different aspects of the relations within the **Papilionoidea** (the most thoroughly worked out taxon) were adapted from the results of Als et al (2004), Wahlberg et al (2005, 2009), Braby et al (2006, 2007), Peña et al (2006, 2011), Fric et al (2007), Warren et al (2008, 2009), Wiemers et al (2009) and Simonsen et al (2010). Some further additional information is quoted in these publications:

- Als TD, Vila R, Kandul NP, Nash DR, Yen SH, Hsu YF, Mignault AA, Boomsma JJ, Pierce NE (2004) The evolution of alternative parasitic life histories in large blue butterflies. *Nature* 432: 386-390.
- Braby MF, Pierce NE, Vila R. (2007) Phylogeny and historical biogeography of the subtribe Aporiina (Lepidoptera : Pieridae): implications for the origin of Australian butterflies. *Biological Journal Linnean Society* 90: 413-440.
- Braby MF, Vila R, Pierce NE (2006) Molecular phylogeny and systematics of the Pieridae (Lepidoptera : Papilionoidea): higher classification and biogeography. *Zoological Journal of the Linnean Society* 147: 238-275.
- Fric Z, Wahlberg N, Pech P, Zrzavy J (2007) Phylogeny and classification of the *Phengaris-Maculinea* clade (Lepidoptera : Lycaenidae): total evidence and phylogenetic species concepts. *Systematic Entomology* 32: 558-567.
- Peña C, Nylin S, Wahlberg N (2011) The radiation of Satyrini butterflies (Nymphalidae: Satyrinae): a challenge for phylogenetic methods. *Zoological Journal of the Linnean Society* 161: 64-87.
- Peña C, Wahlberg N, Weingartner E, Kodandaramaiah U, Nylin S, Freitas AVL, Brower AVZ (2006) Higher level phylogeny of Satyrinae butterflies (Lepidoptera : Nymphalidae) based on DNA sequence data. *Molecular Phylogenetics and Evolution* 40: 29-49.
- Simonsen TJ, Zakharov EV, Djernaes M, Cotton AM, Vane-Wright RI, Sperling FAH (2010) Phylogenetics and divergence times of Papilioninae (Lepidoptera) with special reference to the enigmatic genera *Teinopalpus* and *Meandrusa*. *Cladistics* 26: 1-25.
- Wahlberg N, Braby MF, Brower AVZ, de Jong R, Lee MM, Nylin S, Pierce NE, Sperling FAH, Vila R, Warren AD, Zakharov E (2005) Synergistic effects of combining morphological and molecular data in resolving the phylogeny of butterflies and skippers. *Proceedings of the Royal Society B* 272: 1577-1586.
- Wahlberg N, Leneveu J, Kodandaramaiah U, Peña C, Nylin S, Freitas AVL, Brower AVZ (2009) Nymphalid butterflies diversify following near demise at the Cretaceous/Tertiary boundary. *Proceedings of the Royal Society, B* 276: 4295-4302.

- Warren AD, Ogawa JR, Brower AVZ (2008) Phylogenetic relationships of subfamilies and circumscription of tribes in the family HesperIIDae (Lepidoptera : Hesperioidea). *Cladistics* 24: 642-676.
- Warren AD, Ogawa JR, Brower AVZ (2009) Revised classification of the family HesperIIDae (Lepidoptera: Hesperioidea) based on combined molecular and morphological data. *Systematic Entomology* 34: 467-523.
- Wiemers M, Keller A, Wolf M (2009) ITS2 secondary structure improves phylogeny estimation in a radiation of blue butterflies of the subgenus *Agrodiaetus* (Lepidoptera: *Lycaenidae*: *Polyommatus*). *BMC Evolutionary Biology*, 9: 300. doi:10.1186/1471-2148-9-300.

The structure of the **Pyraloidea** followed Munroe & Solis (1999) as updated by Regier et al (2012b):

- Munroe E, Solis MA (1999) Pyraloidea. In NP Kristensen (ed.). *Lepidoptera, Moths and Butterflies*, Vol. 1, Arthropoda, Insecta, Vol. 4, Part 35, *Handbook of Zoologie* W. de Gruyter, Berlin: pp. 233–256.
- Regier JC, Mitter C, Solis MA, Hayden JE, Landry B, Nuss M, Simonsen TJ, Yen S-H, Zwick A, Cummings MP (2012b) A molecular phylogeny for the pyraloid moths (Lepidoptera: Pyraloidea) and its implications for higher-level classification. *Systematic Entomology* 37: 635-656.

For the **Bombycoidea** the nesting hierarchy derived from Zwick et al (2011) was adopted, complemented with evidence from Kawahara et al (2009) and Regier et al (2000, 2002, 2008):

- Zwick A, Regier JC, Mitter C, Cummings MP (2011) Increased gene sampling yields robust support for higher-level clades within Bombycoidea (Lepidoptera). *Systematic Entomology* 36: 31-43.
- Kawahara AY, Mignault AA, Regier JC, Kitching IJ, Mitter C (2009) Phylogeny and biogeography of hawkmoths (Lepidoptera: Sphingidae): evidence from five nuclear genes. *PLoS One* 4(5): e5719.
- Regier JC, Grant MC, Peigler RS, Mitter C, Cook CP, Rougerie R (2008) Phylogenetic relationships of wild silkmoths (Lepidoptera: Saturniidae) inferred from four protein-coding nuclear genes. *Systematic Entomology* 33: 219-228.
- Regier JC, Mitter C, Peigler RS, Friedlander TP (2000) Phylogenetic relationships in Lasiocampidae (Lepidoptera): Initial evidence from elongation factor-1 alpha sequences. *Insect Systematics and Evolution* 31: 179-186.
- Regier JC, Mitter C, Peigler RS, Friedlander TP (2002) Monophyly, composition, and relationships within Saturniinae (Lepidoptera : Saturniidae): Evidence from two nuclear genes. *Insect Systematics and Evolution* 33: 9-21.