Issue 4 9 July 2014 ISSN 2328-370X

I.N.G.A.

Newsletter of the
International Network of
Gelechioid Aficionados

Contents

Gelechioid Aficionados
Margarita G. Ponomarenko, page 2

Chris Grinter: Photographing Microlepidoptera, page 7

Francisco Urra: Oecophoridae research in Chile — a short overview, page 11

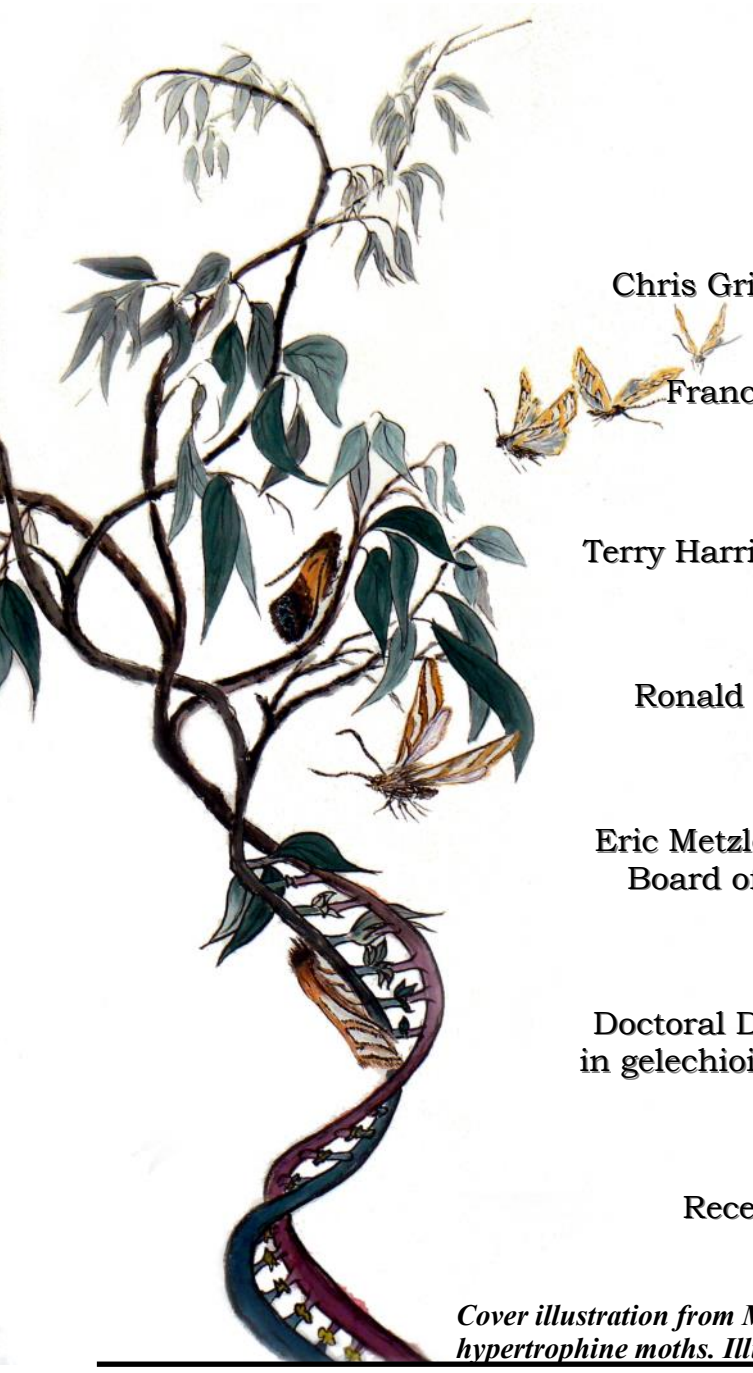
Terry Harrison: Request for Momphidae for Systematics of World Fauna, page 13

Ronald W. Hodges: Observations on the Neotropical Gelechioidea, page 14

Eric Metzler: Sangmi Lee and Todd Gilligan Appointed to Board of Directors of Wedge Entomological Research Foundation, page 15

Doctoral Dissertation on Gelechioidea: Taxon delineation in gelechioid moths: from phylogenetics to DNA barcoding, page 16

Recent Publications on Gelechioidea, page 18



Cover illustration from Mari Kekkonen's dissertation with Australian hypertrophine moths. Illustration by Hannu Kekkonen

Margarita G. Ponomarenko

I have been working as a researcher for more than 25 years, of which more than 20 years have been in the Far Eastern Branch of the Russian Academy of Sciences. I started as young scientist on the Gornotaezhnaya station and after three years continued work in the Institute of Biology and Soil Science. My main investigations have been the moths of the family Gelechiidae. However, since there are few micro-lepidopterologists in Asian Russia, I have expanded the frame of my interests and currently have a series of publications on other groups including Tineidae, Ypsolophidae, Yponomeutidae, Carposinidae, Choreutidae, etc. The focus of my study is functional morphology, evolutionary morphology, faunistics, evolution, phylogeny and systematics.

How did my career as an entomologist begin? In 1986 I graduated from Kherson State Pedagogical Institute in Ukraine, the status of which soon was changed to University. My Diploma thesis was devoted to "Gall forming aphids of the *Acer* and *Populus* from South Ukraine." This group was very interesting for me because aphids are an indispensable model group for evolutionary studies. I had ideas for further research. When I graduated from the Institute with honors, it was recommended that I continue my education. Unfortunately (or perhaps fortunately), I started a post graduate program in the Zoological Institute of Russian Academy of Sciences (ZIN, St. Petersburg) where I was offered the opportunity to study moths of the family Gelechiidae. Selection of this group of moths was made by Professor Doctor of Sciences Vladimir Ivanovich Kuznetsov, a highly skilled specialist in Lepidoptera and my academic adviser. Thus, I began to study Gelechiidae in 1988, and to present it is my most favorite group among micromoths. The requirements for dissertations were very high in Zoological Institute, i.e., a good thesis should be with theoretical conclusions. I had studied not only the complicated morphology of gelechiid moths and faunistic problems, but also became immersed in a problematic and controversial systematics of the family. I mastered laborious methods for studying functional morphology, which has hitherto been regarded as the most perfect tool to clarify the sclerite homology, reconstruction of morphological transformation series, and reflecting the direction of evolution of genital structures. My PhD thesis "Gelechiid moths of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae) of the Russia and adjacent countries" was a result of 5 years of research, which I successfully defended at the Zoological Institute in 1994. After post graduate work, my life unexpectedly changed, I got married and went to the Far East of Russia instead of returning to Ukraine. Now, looking back, I can say that it was undoubtedly a stroke of good fortune, because the fauna of this region allowed many discoveries and achievements in science and in my professional career.

It would be unfair if I had not remembered here those who played an important role in my life. My husband was my constant companion in expeditions and collecting at light in the forest during more than 20 years and my colleague, Dr Evgeny Beljaev, provided much support. The value of this assistance will not require additional elucidation for those who know that large predators, a tiger and two species of bears, live in Russian Far East, and meeting with them has been a very real experience. A great incentive to study gelechiid of tropical regions was offered by Prof. Kyu-Tek Park who encouraged me to examine specimens from Thailand that were in the Natural History Museum

Figure 1. Margarita Ponomarenko in the collection.

Margarita G. Ponomarenko continues

(London). The beginning of our joint work on the Gelechiidae from East and South-East Asia was initiated in 1995 during my first visit to South Korea. This visit was followed by 12 years of fruitful cooperative work, which resulted in a series of papers and a monograph. I feel unpayable, immeasurable debt to Dr Klaus Sattler, whose paternal care and invaluable help supported my research. Thanks to his efforts I had the chance to study the gelechiid collection in the Natural History Museum, which resulted in my second doctoral dissertation "Phylogeny and system of Gelechiid moths of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae). I defended this dissertation in 2006 in the Zoological Institute (St. Petersburg). The dissertation was a result of a 20-years of extensive research of gelechiid moths, including investigations of functional morphology, discussion of evolution of the main branches within family, and a new classification system for the world fauna.

Figure 2. I am in expedition with my cat Tigra, he accompanied me during 10 years.

Among my discoveries I would like to mention one thing only — glands of the genital segment in the males, sclerotized parts of which are interpreted as modified valve. This find was a big surprise for me also, because Lepidoptera has been exhaustively studied anatomically. This discovery stimulated me to revise homology of sclerites and a reconsideration of monophyletic groups in Gelechiidae. In 2007 I was invited to read lectures at the Far Eastern Federal University in the status of Professor, now combined with my main employment in the Institute of Biology and Soil Science. That's my job, and even it is very important in my life, it is not all. What else about me? I have a wonderful daughter, Ekaterina, who recently has defended her PhD thesis at Humboldt University in Berlin. I certainly love to grow flowers and vegetables in the summer cottage and I love cats. One of my favorites named Tiger was constant companion in expeditions for a long time and patiently endured all the hardships of field life.

List of publications

1. Talanov, V.P. and Ponomarenko, M.G. (1988) Aphids – dangerous pest of the poplar. *Regional scientific practical conference "October and Science".* Kherson: 121–122. In Russian.

2. Ponomarenko, M.G. (1989) A review of moths of the genus *Anarsia* Z. (Lepidoptera, Gelechiidae) of the fauna of the USSR. *Entomologicheskoe Obozrenie* 68(3): 628–641. In Russian.

3. Ponomarenko, M.G. (1991) A new genus and new species of gelechiid moths of the subfamily Chelariinae (Lepidoptera, Gelechiidae) from the Far East. *Entomologicheskoe Obozrenie* 70(3): 600–618. In Russian.

4. Ponomarenko, M.G. (1992) Functional morphological analysis of male genitalia of the gelechiid moths of the subfamily Dichomeridinae sensu novo (Lepidoptera, Gelechiidae). *Entomologicheskoe Obozrenie* 71(1): 160–178. In Russian.

5. Ponomarenko, M.G. (1993) *Dendrophilia* gen. n. (Lepidoptera, Gelechiidae) from the Far East with notes on biology of some species of the genus. *Zoologicheskii Zhurnal* (Moscow) 72(4): 58–73. In Russian.

6. Ponomarenko, M.G. (1993) Trophic relationships of caterpillars of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae) of the fauna of Russia and adjacent countries. *A.I.Kurentsov's Annual Memorial Meetings* 4: 41–48. In Rus-

Margarita G. Ponomarenko continues

sian.

7. Ponomarenko, M.G. (1994) Two new species of the genus *Dactylethrella* Fletcher (Lepidoptera, Gelechiidae) from Russian Far East. *Japan Heterocerists' Journal* 176: 7–9.

8. Ponomarenko, M.G. (1995) Review of the genus *Capidentalia* Park (Lepidoptera: Gelechiidae, Dichomeridinae) with the description of two new species. *Actias* 2 (1–2): 45–51.

9. Ponomarenko, M.G. and Park, K.T. (1996). Description of three new species of *Dichomeris* Hübner (Lepidoptera, Gelechiidae) from Korea and Russian Far East. *Korean Journal of Applied Entomology* 35(2): 114–118.

10. Park, K.T. and Ponomarenko, M.G. (1996). The genus *Anarsia* Zeller (Lepidoptera, Gelechiidae) from the Siberia and Far East. *Acta Zoologica Hungarica* 42(1): 73–79.

11. Park, K.T. and Ponomarenko, M.G. (1996). New faunistic data of the Gelechiidae (Lepidoptera) in Korea, with description of two new species of *Anarsia* Zeller. *Korean Journal of Entomology* 26(4): 343–349.

12. Park, K.T. and Ponomarenko, M.G. (1996). Genus *Anarsia* Hübner [*sic*] (Lepidoptera, Gelechiidae) from Thailand, with description of nine new species. *Insecta Koreana* 13: 39 – 58.

13. Ponomarenko, M.G. and Park, K.T. (1997) Notes on some tineids from Korea and Russian Far East, with description of four new species (Lepidoptera, Tineidae). *Korean Journal of Applied Entomology* 35(4): 273–279.

14. Ponomarenko, M.G. (1997) Fam. Heliozelidae. In Lehr, P.A. (Ed.) *Keys to the Insects of the Russian Far East. Trichoptera. Lepidoptera*, 5(1): 271–274. In Russian.

15. Ponomarenko, M.G. (1997) Fam. Tineidae. *Ibid* 5(1): 339 –365. In Russian.

16. Ponomarenko, M.G. (1997) Fam. Ochsenheimeriidae. *Ibid* 5(1): 433–434. In Russian.

17. Ponomarenko, M.G. (1997) Fam. Heliodinidae. *Ibid* 5(1): 468–469. In Russian.

18. Ponomarenko, M.G. (1997) Fam. Glyphipterigidae. *Ibid* 5(1): 474–480. In Russian.

19. Ponomarenko, M.G. (1997) Fam. Schreckensteiniidae. *Ibid* 5(1): 487–489. In Russian.

20. Ponomarenko, M.G. (1997) Phylogeny and taxonomy of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae). *Zoosystematica Rossica* 6(1/2): 305–314.

21. Ponomarenko, M.G. and Park, K.T. (1997) New species of the genus *Scaeosopha* Meyrick (Lepidoptera: Cosmopterigidae, Scaeosophinae) from Korea. *Korean Journal of Applied Entomology* 36(4): 287–289.

22. Ponomarenko, M.G. (1997) Catalogue of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae) of the *Far Eastern Entomologist* 50: 1–67.

23. Ponomarenko, M.G. (1998) New taxonomic data on Dichomeridinae (Lepidoptera, Gelechiidae) from the Russian Far East. *Far Eastern Entomologist* 67: 1–17.

24. Ponomarenko, M.G. (1998) Review of the family Carposinidae (Lepidoptera) from Russian Far East. *Far Eastern Entomologist* 69: 1–12.

25. Park, K.T. and Ponomarenko, M.G. (1998) Two new species of the genus *Dichomeris* from Thailand (Lepidoptera, Gelechiidae). *Species Diversity* 3(2): 163–168.

26. Ponomarenko, M.G. (1999) 41. Подсем. Dichomeridinae. In Lehr, P. A. (Ed.) *Keys to the insects of the Russian Far East. Trichoptera. Lepidoptera* 5(2): 194–257. In Russian.

27. Ponomarenko, M.G. (1999) 45. Сем. Brachodidae (*Atychiidae*). *Ibid* 5(2): 308–309. In Russian.

28. Ponomarenko, M.G. (1999) 47. Сем. Choreutidae. *Ibid* 5 (2): 496–515. In Russian.

29. Ponomarenko, M.G. (1999) 51. Сем. Carposinidae. *Ibid* 5 (2): 579–583. In Russian.

30. Park, K.T. and Ponomarenko, M.G. (1999) Genus *Hypatima* Hübner and allied genera from Thailand (Lepidoptera, Gelechiidae). *Species Diversity* 4: 321–337.

31. Ponomarenko, M.G. and Kuranishi, R.B. (2000) Microlepidoptera (Insecta: Lepidoptera) from the Kamchatka Peninsula and North Kuril Islands in (1996)–(1997). *Natural History Research, Special Issue* 7: 243–252.

32. Ueda, T. and Ponomarenko, M.G. (2000) Two new species of the genus *Faristenia* Ponomarenko, 1991 (Lepidoptera, Gelechiidae) from Japan. *Transactions of the Lepidopterological Society of Japan* 51 (2): 119–126.

33. Ponomarenko, M.G. and Beljaev, E.A. (2000) New species of the genus *Micropterix* Hübner (Lepidoptera, Micropterigidae) from Sikhote–Alin Range. *Tinea* 16(4): 250 –251.

34. Ponomarenko, M.G. (2000) New species and new synonym of the genus *Metanarsia* Staudinger (Lepidoptera, Gelechiidae). *Tinea* 16 (4): 222–225.

35. Ponomarenko, M.G. and Huemer, P. (2001) *Helcystogramma klimeschi* sp. n. (Lepidoptera: Gelechiidae, Dichomeridinae), with notes on related species. *Acta Biologica* 76 (1999): 7–15.

36. Ponomarenko, M.G. (2002) New Palaearctic species of the genus *Anarsia* Zeller, 1839 (Gelechiidae, Lepidoptera). *Far Eastern Entomologist* 115: 1–4.

37. Ponomarenko, M.G. and Mey, W. (2002) On the type material of the species described by H. Christoph from genus *Dichomeris* Hübner (Lepidoptera: Gelechiidae). *Tinea*, 17 (2): 73–80.

38. Ponomarenko, M.G. and M.M. Omelko. (2003) Review of the genus *Acanthophila* Heinemann, 1870 (Lepidoptera, Gelechiidae). *Far Eastern Entomologist* 127: 1–24.

Margarita G. Ponomarenko continues

39. Ponomarenko, M.G. (2004) New synonymy in the genus *Dichomeris* Hübner (Lepidoptera: Gelechiidae). *Tinea* 18 (1): 22–29.

40. Ponomarenko, M.G. and T. Ueda. (2004) New species of the genus *Dichomeris* Hbn. (Lepidoptera, Gelechiidae) from Thailand. *Transactions of the Lepidopterological Society of Japan* 55 (3): 147–159.

41. Ponomarenko, M.G. (2004) Elachistidae. In Dubatolov, V.V. et al., *Biodiversity of the Sokhondo Nature Reserve. Arthropoda*. Novosibirsk–Chita: 188–189. In Russian.

42. Ponomarenko, M.G. (2004) Coleophoridae. *Ibid* 192–194. In Russian.

43. Ponomarenko, M.G. (2004) Gelechiidae. *Ibid* 195–203. In Russian.

44. Ponomarenko, M.G. and Dubatolov, V.V. (2004) Scythrididae. In Dubatolov, V.V. et al. *Biodiversity of the Sokhondo Nature Reserve. Arthropoda*. Novosibirsk–Chita: 194–195. In Russian.

45. Ponomarenko, M.G. (2004) Gelechiid moths of the subfamily Dichomeridinae (Lepidoptera, Gelechiidae): functional morphology, evolution and taxonomy. *A. I. Kurentsov's Annual Memorial Meetings* 15: 5–88. In Russian.

46. Ponomarenko, M.G. (2005) Gelechiid moths (Lepidoptera, Gelechiidae) of the Palaearctica: functional morphology of the male genitalia, phylogeny and taxonomy. *Meetings in memory of N.A. Cholodkovsky* 58(1): 1–139. In Russian.

47. Beljaev, E.A. and Ponomarenko, M.G. (2005) New lepidopterological finds (Lepidoptera: Gelechiidae, Tortricidae, Geometridae) in South of Russian Far East. *Far Eastern Entomologist*, 155: 1–11.

48. Ponomarenko, M.G. (2005) The functional morphological approaches to the phylogeny and classification of the family Gelechiidae (Insecta: Lepidoptera). *Proceedings 5th Asia–Pacific Congress of Entomology*: 72.

49. Ponomarenko, M.G. (2006) The subfamily Dichomeridinae (Lepidoptera, Gelechiidae): the phylogeny, classification and position in the system of Gelechiidae. Entomological Review 85 (2): 275–384.

50. Ponomarenko, M.G., Park, K.T and Bae, Y.S. (2006) Gelechiidae (Lepidoptera) from Mt. Changbai–Shan in China II. *Journal Asia–Pacific Entomology* 9 (2): 107–113.

51. Park, K.T. and Ponomarenko, M.G. (2006) A new species of the genus *Parastenolechia* Kanazawa (Lepidoptera: Gelechiidae) from Korea, with a check list of the genus. *Zootaxa*, 1338: 49–55.

52. Park, K.T. and Ponomarenko, M.G. (2006) New faunistic data for the family Gelechiidae in the Korean peninsula and NE China (Lepidoptera: Gelechiidae). *SHILAP Revista de Lepidopterologia* 34 (135): 275–288.

53. Ponomarenko, M.G. and Park, K.T. (2007) Two new species and a new record of Gelechiidae (Lepidoptera) from Korea. *Zootaxa*. 1437: 55–60.

54. Ponomarenko, M.G. (2007) Gelechiid moths (Lepidoptera: Gelechiidae) of the Bastak Nature Reserve. *Proceedings of the Theoretical and Practical Meetings devoted to 10th anniversary*, Birobidzhan: 98–101. In Russian.

55. Ponomarenko, M.G. (2007) Significance of the functional morphological investigations in phylogenetic and taxonomic analyses in Lepidoptera (based on examples of Gelechiidae). *Proceedings of the XV European Congress of Lepidopterology*. Erkner: 50–51.

56. Park, K.T. and Ponomarenko, M.G. (2007) Two new species of Gelechiidae (Lepidoptera) from Korea, with notes on the taxonomic status of *Telphusa euryzeucta* Meyrick. *Proceedings Entomological Society Washington* 109 (4): 807–812.

57. Park, K.T. and Ponomarenko, M.G. (2007) *Gelechiidae of the Korean Peninsula and Adjacent Territories (Lepidoptera).* Insects of Korea series 12. Center for Insect Systematics, Seoul, Korea. 305 p.

58. Ponomarenko, M.G. (2008) Family Gelechiidae, pp 87–106. In Sinev, S.Y. (Ed.) *Catalogue of the Lepidoptera of Russia*. St. Petersburg-Moscow, KMK Press. 425 p. In Russian.

59. Ponomarenko, M.G. (2008) Functional morphology of the male genitalia in Gelechiidae (Lepidoptera) and its significance for phylogenetic analysis. *Nota Lepidopterologica* 31 (2): 193–212.

60. Zinchenko, Yu.N. and Ponomarenko, M.G. (2008) Moths of the genus *Ypsolopha* Latr. (Lepidoptera: Ypsolophidae) from Prymorye. *A. I. Kurentsov's Annual Memorial Meetings* 19: 35–41. In Russian.

61. Gronina, L.M., Ponomarenko, M.G., and Bulakh, P.P. (2009) *Cicadella viridis* l. (Homoptera: Cicadellidae) on the oats. *Proceedings of the Meetings "Actual problems plant protection."* Ussurijsk: 57–61. In Russian.

62. Ponomarenko, M.G. (2009) Functional morphology of the male genitalia in the gelechiid–moth genera *Holcophora* Stgr., *Ananarsia* Ams., and *Nothris* Hbn. (Lepidoptera, Gelechiidae: Gelechiini, Dichomeridini). *Entomologicheskoe Obozrenie* 88 (1): 135–142. In Russian.

63. Ponomarenko, M.G. (2009) Coleophoroidea, Gelechioidea, p. 251–252. In Storozhenko, S.Yu. (Ed.) *Insects of Lazovsky Nature Reserve*. Vladivostok: Dalnauka. 464 p. In Russian.

64. Dubinina, V.A. and Ponomarenko, M.G. (2009)

Margarita G. Ponomarenko continues

Ecological and faunistic analysis of the Lepidoptera pest species in the main types of agrocenoses of the Sakhalin Island. *A. I. Kurentsov's Annual Memorial Meetings* 20: 157–177. In Russian.

65. Ponomarenko, M.G. (2009) Gelechiid moths of the subfamily Dichomeridinae (Lepidoptera: Gelechiidae) of the World fauna. Vladivostok: Dalnauka: 389 p. In Russian.

66. Dubinina, V.A. and Ponomarenko, M.G. (2009) On the fauna of the microlepidoptera (Lepidoptera) of the Sakhalin Region. *Eurasian entomological journal* 8 (4): 437–440. In Russian.

67. Sohn, J.C., Ponomarenko, M.G., Wu, C.S., Han, H.L. and Wang, X.L. (2010) Descriptions of three new species of *Ypsolopha* Latreille (Lepidoptera: Ypsolophidae) from East Asia, redescription of *Y. contractella* (Caradja), and a checklist of East Asian *Ypsolopha*. *Zootaxa*, 2511: 22–38.

68. Dubinina, V.A. and Ponomarenko, M.G. (2010) Primary lepidopteran pests of the agricultural, fruit and berry plants in agrocenoses of the Sakhalin Island. *A. I. Kurentsov's Annual Memorial Meetings* 21: 109–120. In Russian.

69. Zinchenko, Yu.N. and Ponomarenko, M.G. (2010) Monophyletic groups in the genus *Ypsolopha* Latr. (Lepidoptera: Ypsolophidae). *A.I. Kurentsov's Annual Memorial Meetings* 21: 144–150. In Russian.

70. Dubinina, V.A. and Ponomarenko, M.G. (2010) The white satin moth, *Leucoma salicis* (Linnaeus, 1758) (Lepidoptera: Lymantriidae), is a pest of the poplar in the Sakhalin. *Far Eastern Entomologist* 214: 9–12.

71. Ponomarenko, M.G., Sohn, J.C., Zinchenko, Yu.N., and Wu, C.S. (2011) Five new East-Asian species of the genus *Ypsolopha* Latreille (Lepidoptera: Ypsolophidae). *Zootaxa* 2760: 18–28.

72. Ponomarenko, M.G. and Dubinina, V.A. (2011) New records of the gelechioid moths (Lepidoptera: Gelechioidea) from Sakhalin Island. *Far Eastern Entomologist* 223: 1–7.

73. Ponomarenko, M.G., Zinchenko, Yu.N., and Gershenson, Z.S. (2012) Comparative faunistic analysis of Yponomeutoid moths (Lepidoptera: Yponomeutidae, Plutellidae, Ypsolophidae) of the forest zones of Ukraine and south of the Russian Far East. *A. I. Kurentsov's Annual Memorial Meetings* 23: 65–76. In Russian.

74. Ponomarenko, M.G. (2012) Family Adelidae. In Streltzov, A.N. ((Ed.) *Fauna of Bastak Nature Reserve*. Blagoveshchensk: 71. In Russian.

75. Ponomarenko, M.G. (2012) Family Tineidae. *Ibid* 71–72. In Russian.

76. Ponomarenko, M.G. (2012) Family Psychidae. *Ibid* 72. In Russian.

77. Ponomarenko, M.G. (2012) Family Gracillariidae. *Ibid* 72. In Russian.

78. Ponomarenko, M.G. (2012) Family Acrolepiidae. *Ibid* 75. In Russian.

79. Ponomarenko, M.G. (2012) Family Oecophoridae. *Ibid* 76. In Russian.

80. Ponomarenko, M.G. (2012) Family Blastobasidae. *Ibid* 76. In Russian.

81. Ponomarenko, M.G. (2012) Family Autostichidae. *Ibid* 76–77. In Russian.

82. Ponomarenko, M.G. (2012) Family Amphisbatidae. *Ibid* 77. In Russian.

83. Ponomarenko, M.G. (2012) Family Chrysopeleiidae. *Ibid* 77. In Russian.

84. Ponomarenko, M.G. (2012) Family Gelechiidae. *Ibid* 77–80. In Russian.

85. Ponomarenko, M.G. (2012) Family Carposinidae. *Ibid* 90. In Russian.

86. Zinchenko, Yu.N. and Ponomarenko, M.G. (2012) Family Roeslerstammiidae. A.N. Streltzov ((Ed.) *Fauna of Bastak Nature Reserve*. Blagoveshchensk: 72. In Russian.

87. Zinchenko, Yu.N. and Ponomarenko, M.G. (2012) Family Yponomeutidae. *Ibid* 73–74. In Russian.

88. Zinchenko, Yu.N. and Ponomarenko, M.G. (2012) Family Ypsolophidae. *Ibid* 74–75. In Russian.

89. Zinchenko, Yu.N. and Ponomarenko, M.G. (2012) Family Plutellidae. *Ibid* 75. In Russian.

90. Lvovsky, A.L. and Ponomarenko, M.G. (2012) Family Depressariidae. In Streltzov, A.N. ((Ed.) *Fauna of Bastak Nature Reserve*. Blagoveshchensk: 75–76. In Russian.

91. Ponomarenko, M.G. (2012) Main trends in Evolutionary transformations of the male genitalia in the Amphiesmenoptera. *XIV International Symposium on Trichoptera*: 49.

92. Ponomarenko, M.G. and Zinchenko,Yu.N. (2013) New taxonomic data on the genus *Ypsolopha* Latreille (Lepidoptera, Ypsolophidae) with descriptions of two new species from the Russian Far East. *ZooKeys* 289: 25–39.

93. Ponomarenko, M.G. and Zinchenko,Yu.N. (2013) Microlepidoptera of islands of the Peter the Great Gulf (Lepidoptera): tentative faunistic analysis. In: *A. I.*

Photographing Microlepidoptera

Chris Grinter
Denver Museum of Nature & Science
2001 Colorado Blvd, Denver CO. 80206
cgrinter@gmail.com

Photographing small moths, whether alive in the field or a specimen in a lab, can require a lot of patience but be extremely rewarding. Expensive gear isn't usually required; a high quality image can be obtained with a fairly simple setup and a bit of do-it-yourself. In this article I will share a few of the best techniques I've picked up over time that will hopefully help you the reader and photographer take better images of small moths. I'll focus mostly on specimen photography in the lab and end on a few tips for live specimens in the field.

Cameras & Lenses

Photography can be a slippery slope of exponentially expensive equipment. For a basic high-resolution image a DSLR is the best option. Canon makes gear that in my opinion syncs best to a computer and offers the most flexibility in lens choice. The all-powerful MP-E 65mm 1x – 5x macro lens helps make Canon the default choice for many macrophotographers. My standard setup is a Canon 5d mark 3, MP-E 65mm and MT-24EX twin flash. But any older digital Canon will still get the job done; having a better lens is more important than an expensive body. Additionally, acquiring images greater than 1:1 is possible with extension tubes on any camera with any lens. A good 60 or 100mm lens with a few tubes will help increase magnification on the sensor. The two standard lenses I recommend is the MP -E 65mm (or a 60mm with extension tubes) for tiny insects, and a 100mm for butterfly-sized animals. If you're shooting large Saturniidae then perhaps a 50mm macro would be required, but I almost never need it.

Figure 1. Styrofoam bowl acting as light diffuser. Visionary Digital Passport II setup. Photo by Chris Grinter

Lighting

The most important factor in creating a good image is always lighting. The very bright yet diffuse light required to eliminate shadows takes some rigging and can be done on a budget. Flash is usually required for live subject photography, but is not required in the studio. Directing a steady source of light on the specimen (avoiding incandescent) can take the place of a flash. Ikea has a few LED and Xenon options that provide cheap and bright light sources. For light diffusion in the lab I use a Styrofoam soup bowl or coffee cup by cutting the bottom out and shooting down through the center (Fig. 1). Styrofoam in general is one of my go-to diffuser materials, but similar foam and tracing papers can create comparable effects. One of the most critical things I have found is that the diffuser should be round, corners and edges create odd light shadows. Thinking outside the box, USDA photographer and entomologist Sam Droege (https://www.flickr.com/usgsbiml/) shoots entirely within a foam cooler, bouncing the flash light off of the walls and onto his specimen for spectacular results. In the field I use a twin macro flash by Canon, which also requires a significant amount of diffusion to reduce glare while providing enough illumination. I have a large array of foam and plastic cups that are taped to the end of my lens that create a dome over the subject. Again, a curved surface always seems to produce the best effect. While there are many expensive diffuser options on the market I often find building your own setup and experimenting with materials will give you the best results.

Capturing Gelechioidea

Photographing Microlepidoptera continues

Composition

Lepidoptera are fairly easy to photograph because of their two-dimensional nature. One exposure is all that is required for most well-spread moths, as long as the wings or abdomen aren't distorted or drooping. If you're imaging a specimen at greater than 1x or need to focus on a three dimensional aspect of the animal then focus-stacking will be necessary. Increasing the aperture for a greater depth of field is not an ideal solution for obtaining sharper focus as quality is drastically lost with high aperture values. To retain a perfectly sharp image, you want to try and shoot at the lowest possible aperture (f/4, ISO 100 is my standard when stacking). But at ~f/4 the depth of field is so narrow that a dozen or so images are necessary to complete a stack. Shooting stacks doesn't have to be overly complicated and can even be done by hand (see blog of Piotr Naskrecki at http://thesmallermajority.com/2012/08/21/focus-stacking-of-live-subjects/), but for complex three dimensional objects some type of automation improves image quality drastically.

If only a small part of the specimen is out of focus in your final image then taking one or two additional photos can be done by simply manipulating your focus on the lens or moving the camera up or down very slightly. At an aperture of ~f/8 you should be able to capture most of the range of a moth's wings in 2 -3 images. A program like Zerene Stacker is affordable and very powerful, often rendering hairs and scales better than more expensive competitors. Helicon Focus excels at shiny and smooth objects, and Photoshop can stack a handful of images with decent results. Auto-montage software, while a leader in the field years ago, seems too expensive to be considered for any budget-conscious lab and I am not personally aware of benefits of their program.

Figure 2. **Gnorimoschema** ***sp. (Gelechiidae). Canon 5d ii, MP-E 65mm @ 2x. ISO100. f/8, 1/200. flash fired. Photo by Chris Grinter***

If capturing more than 4 images for a single composition, using an automated system makes life easy (and expensive). The best equipment I have used is manufactured by Visionary Digital. Their lower-end setup (Fig. 1) comes in at a stiff ~$20,000, but includes the camera and high end computer for crunching large images. But many of these components can be assembled for a lower price tag. Picking up a photography copy stand can usually be done for less than $100 and on that stand you can mount the StackShot automated rail manufactured by Cognisys ($550). A stacking program like Zerene has built in tools to control this rail system. Any camera can be mounted to the copy stand and lights of your choice can be easily added.

Composition and the requirements of an image are some of the first things to consider. I prefer the specimen on a simple black (Fig. 2), white, or neutral grey (Fig. 3) background. Black often provides the best contrast for delicate fringe and can make a specimen look very impressive. White and grey are preferred by many journals because it is cheaper to print, but white can wash-out the margins of wings by the time you adequately adjust the lighting on the rest of the moth. Because of this I prefer a light neutral gray to white. Colored backgrounds of any kind should always be avoided. Color gives a false illusion of a middle ground where both fringe and wing pattern is illuminated.

Figure 3. **Chionodes** ***sp. (Gelechiidae). Canon 5d ii, MP-E 65mm @ 2x. ISO100. f/8, 1/200. flash fired. Photo by Chris Grinter***

Photographing Microlepidoptera continues

Figure 4. Top-down into my diffuser showing the black ring that helps to keep the flash from backlighting the specimen. Photo by Chris Grinter

However, it is impossible to correct for color reflections, and the moth will have a false-color hue that can be very misleading.

Arriving at the quality of the image above is not as difficult as it might seem. First the specimen is inspected under a scope for cleaning – stray dust and hairs can be gently removed with a minuten or a fine paintbrush. This cleaning step is much more important when working at higher magnification or with non-lepidoptera. The finished image is a moth floating on a pure black background, ideally without using Photoshop to cut out the moth or drastically alter the background color. To achieve this effect I use a trick of moving the specimen further off the background than the standard distance of a pin will allow. Keeping the final image to a single-shot means shooting at an aperture of > f/8, allowing for the entire wing surface to be in focus. But if the specimen isn't moved, the background begins to come into focus, which creates distracting distortions and a poor quality image.

To raise the specimen higher off the pinning surface I use a combination of pins and wax. A black enamel pin with a tiny ball of wax is sufficient to hold a minuten (Fig. 4, insert). Given the tiny size of the specimen relative to how far it now is off the backdrop you can greatly increase aperture for a single photo without losing the floating effect. For larger or heavier specimens I tape together two pins and hold them in place with a larger dollop of wax. A small wooden dowel or any stable object that will remain hidden under the specimen can be used. This method is stable enough that I have used it to photograph everything from a Nepticulidae up to Saturniidae and Dynastinae beetles (which does involve lots of wax to keep things stable).

Having the flash only hit the top of the specimen and not seep in from below drastically helps highlight the moth and not the background. I cut a ring of black paper that is equal or greater than the height of the wings, thereby preventing light from unintentionally backlighting the specimen (Fig. 4). The flash heads are then pulled close to the Styrofoam cup and shot at a significantly reduced power. I fire multiple test-shots to balance the flash power and aperture before committing to a final image. All of these tricks help to create a very well lit specimen above a solid, out-of-focus, background (Fig. 5).

Post Processing

I shoot my images in RAW format, which allows for greater manipulation of white balance and shadows with

Figure 5.* Ethmia chemsaki*. Single exposure with setup as above. f/10, 1/200, ISO 100 MP-E @ 2x. Photo by Chris Grinter

Photographing Microlepidoptera continues

Figure 6. **Coptotriche mediostriata** ***(Tischeriidae) MP-E65mm @ 2x, ISO100, f/14, 1/80. Twin flash with foam diffusers, fired. Photo by Chris Grinter***

Photoshop and Lightroom. With the Canon EOS Utility (free software with Canon DSLR's), I set images to be automatically imported into Lightroom. There I tend to apply a standard processing: reduce shadows, increase highlights, nudge up the clarity and vibrance a tiny amount. Then I export the photo as a 16bit TIF for final editing in Photoshop. With the aid of the spot healing brush tool you can magically repair wing holes, tears, and missing scales. As a last effort to drop out the black background into a perfectly solid color I adjust the levels. Pulling in the highlights from the right will brighten your moth, and pulling in the shadows from the left will only darken the background, leaving your specimen floating perfectly on black. Importantly, I only adjust the physical appearance of specimens that are not going into a scientific publication where the true appearance of the moth is paramount. Holotypes are especially valuable and no adjustments beyond exposure and levels should ever really be applied.

In the Field

Live microlepidoptera can be difficult to find and photograph in the field. Some of the easiest images come from reared specimens (Fig. 6). Charley Eiseman has many beautiful examples of reared micros shot in a studio setting (see http://bugguide.net/bgimage/user/15010). Here the trick is getting the moth to stand still for a moment, and in the past I have used a refrigerator to chill the animal until it's lethargic. I refrigerated this Tischeriidae until it had flipped itself over and looked dead. 30 seconds of room temp had warmed it up enough to flip over and act normal, before flying off and having to be chased it down in the lab.

Capturing a micro in a natural setting is more difficult and usually involves scaring up a moth from the brush and chasing after it until it settles, and in many cases, only to fly away the instant you pull the trigger on the camera. Or, worse yet, you crawl up to a moth on your belly only to realize you just discovered a small cactus right under you.

Again, lighting is critical. Natural light can be used but is often not ideal for small subjects. In the following image I captured an *Adela trigrapha* in natural light at 100mm (Fig. 7). Use of aperture and a narrow depth of field in this instance is used in an artistic sense, allowing the background and part of the long antennae to be out of focus. While many nature photographers prefer an overcast day for the natural soft lighting effect, full sun is best for adequately lighting tiny insects. Even a little overcast would require use of fill or full flash. Fill flash is achieved by removing the flash from the camera and holding it a distance away from the subject for just a small amount of light to "fill" in the shadows. Full flash is light at a higher power and closer proximity, which usually beautifully lights the subject better but completely drops the background into black.

Digital cameras have made learning photography on your own infinitely easier because you can always delete unsatisfactory images. The most important thing is shooting as many photographs as you can, thinking of what you'd like the image to look like in the end, and experimenting.

Figure 7. **Adela trigrapha** ***(Adelidae) at 100mm, ~f/10. Photo by Chris Grinter***

Oecophoridae research in Chile — a short overview

Francisco Urra
Museo Nacional de Historia Natural, Chile
francisco.urra@mnhn.cl

In Chile, the study of Oecophoridae began with Blanchard (1852), who described the first known species, *Epigraphia albella*. Subsequently, new contributions were made by Zeller (1874), Felder and Rogenhofer (1875), Butler (1883), Meyrick (1931) and Clarke (1965). Clarke (1978) presented the first comprehensive study on this family in Chile. He recognized 38 genera and 64 species based mainly on the wing venation and genital structures. However, several of these genera are now included in Depressariidae, according to recent phylogenetic studies (Mutanen *et al*. 2010, Kaila *et al*. 2011, Heikkilä *et al.* 2013).

During the last two decades, additional new species and genera have been discovered. Heat-Ogden and Parra (2001) described the biology and morphology of a new species, *Afdera jimenae,* whose larvae feed on dead leaves on the sclerophyllous forest floor. Beéche (2003) described two species of *Nagehana* (Clarke), *N. chagualphaga* and *N. elquiensis*, associated with plants of the genus *Puya* (Bromeliaceae), and two years later, he described a new species of *Aliciana* Clarke, *A. longiclasper,* associated with sclerophyllous vegetation of central Chile (Beéche, 2005).

The last two years have been productive in terms of the description of new taxa. Recently, Beéche (2012) revised *Lucyna* Clarke and added the new species *L. trifida*, and Urra (2012) described two new species of *Dita* Clarke, *D. morani* and *D. palmai*. Beéche (2013) described the genus *Quelita* to include two species, *Q. shangrilaensis* and *Q. canela*, from forests of *Nothofagus* (Nothofagaceae). Meanwhile, Urra (2013a) added three monospecific genera, *Glorita*, *Yasnita* and *Pirquelia*, and he (2013b) added *Zulemita*, with two new species, *Z. romeralensis* and *Z. tenensis*, all of them from sclerophyllous forest of central Chile. The latest contribution describes *Aidabella quadrimacula*, a new genus and species of a small grey moth from the same area (Urra, 2014).

Thus, in Chile the Oecophoridae family is currently represented by 56 species grouped in 34 genera. However, as the results of recent studies have contributed sevral new genera and species, the diversity of this family in the country shuld be greater. According to Parra (1995), the microlepidoptera of Chile are poorly known, due to the small number of researchers, low representation in collections, difficulty of working with this kind of material, and because many of these species do not have agricultural importance. Furthermore, many habitats or and areas of Chile have not been studied. This would explain the number of undescribed species and genera from results of recent fieldwork.

Figure 1. Francisco Urra collecting in Chile.

A potentially promising area of study would be central Chile. This area, characterized by a Mediterranean climate (Di Castri and Hajek 1976), is rich in species and plant associations and should be a particularly diverse area for native Lepidoptera. However, the high concentration of human population and the dramatic landscape modification seriously threaten the survival of the native species, so this region is considered in the list of priority sites for biodiversity conservation (Myers *et al.* 2000).

Literature cited

Beéche, M. (2003) Two new species of *Retha* Clarke, 1978

Oecophoridae research in Chile continues

(Lepidoptera: Oecophoridae). *Acta Entomológica Chilena* 27: 37–44.

Beéche, M. (2005) Nueva especie de *Aliciana* Clarke, 1978 (Lepidoptera: Oecophoridae). *Revista Chilena de Entomología* 31: 21–26.

Beéche, M. (2012) Contribution to the knowledge of the species of *Lucyna* (Lepidoptera: Oecophoridae: Oecophorinae). *Revista Chilena de Entomología* 37: 23–36.

Beéche, M. (2013) New genus of Oecophoridae — Oecophorinae from central Chile (Lepidoptera: Gelechioidea). *Revista Chilena de Entomología* 38: 5–16.

Blanchard, E. (1852) Lepidoptera. In: Gay, C. (ed.), *Historia Física y Política de Chile* 7: 106–110.

Butler, A. (1883) Heterocerous Lepidoptera collected in Chile by Thomas Edmunds. *Transactions of the Entomological Society of London* 1883: 49–90.

Clarke, J. F. G. (1965) Microlepidoptera of the Juan Fernandez Islands. *Proceedings of the United States National Museum* 117 (3508): 1–105.

Clarke, J. F. G. (1978) Neotropical Microlepidoptera, XXI: New genera and species of Oecophoridae from Chile. *Smithsonian Contributions to Zoology* 273: 1–80.

Di Castri, F. and Hajek E. (1976) *Bioclimatología de Chile*. Ed. Universidad Católica de Chile, Santiago, Chile, 160 pp.

Felder C. and Rogenhofer A. F. (1875) *Reise der österreichischen Fregatte Novara um die Erde* (Zoologischer Theil) Band 2 (Abtheilung 2): plate 138.

Heat-Ogden, T. and Parra L. (2001) Taxonomy and biology of a new Oecophoridae (Lepidoptera) from central Chile. *Revista Chilena de Historia Natural* 74 (3): 533–538.

Heikkilä, M, Mutanen, M., Kekkonen, M. and Kaila, L. (2013) Morphology reinforces proposed molecular phylogenetic affinities: a revised classification for Gelechioidea (Lepidoptera). *Cladistics* (2013): 1–27.

Kaila, L., Mutanen, M. and Nyman, T. (2011) Phylogeny of the mega-diverse Gelechioidea (Lepidoptera): Adaptations and determinants of success. *Molecular Phylogenetics and Evolution* 61: 801–809.

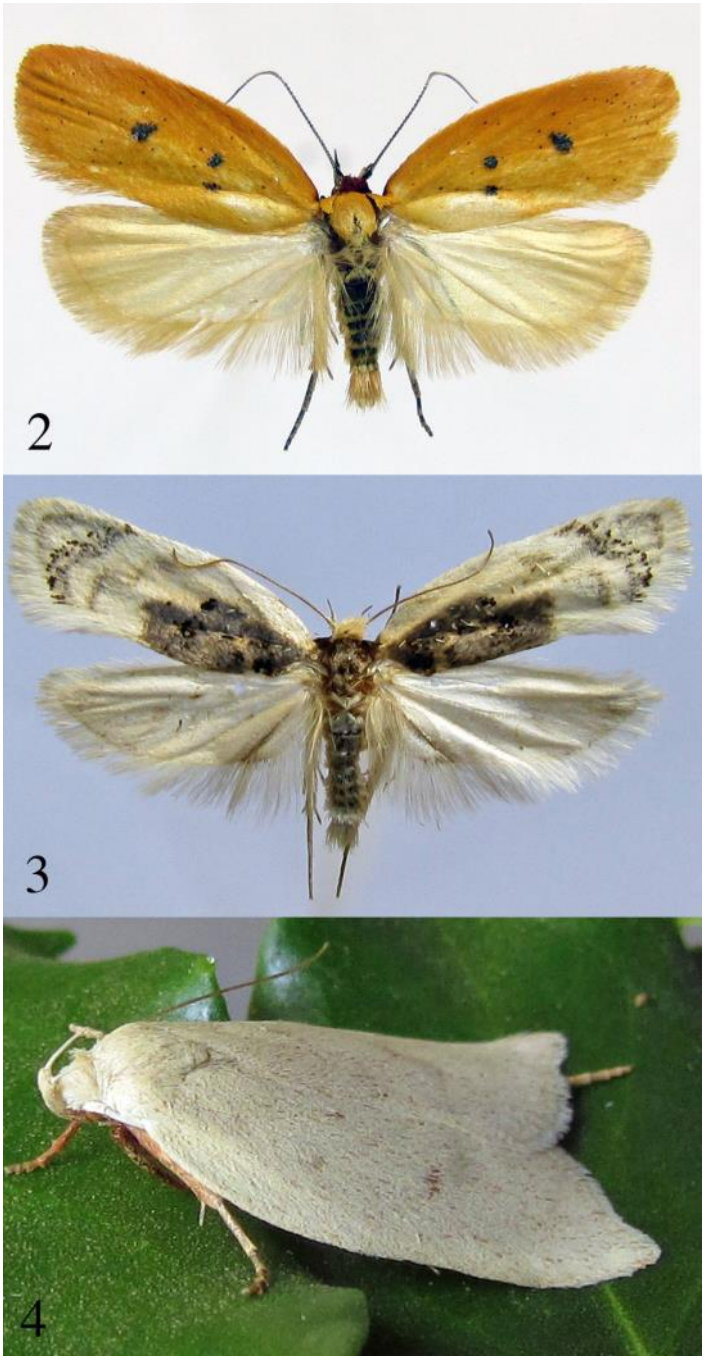
Meyrick, E. (1931) Micro-Lepidoptera from South Chile and Argentina. *Anales del Museo Nacional de Historia Natural* (Buenos Aires), 36: 377–415.

Mutanen, M., Wahlberg, N. and Kaila, L. (2010) Comprehensive gene and taxon coverage elucidates radiation patterns in moths and butterflies. *Proceedings of the Royal Society Biological Sciences* 277: 2839–2848.

Myers, N., Mittermeier, R., Mittermeier, C., Da Fonseca, G. and Kent, J. (2000) Biodiversity hotspots for conservation priorities. *Nature* 403: 853–858.

Parra, L. (1995) Lepidoptera, pp. 269-279. In: Simonetti, J., Arroyo, M., Spotorno, A. and Lozada, E. (eds.), *Diversidad Biológica de Chile.* CONICYT, Santiago, Chile. 364 pp.

Urra, F. (2012) Two new species of the genus *Dita* (Lepidoptera: Oecophoridae). *Revista Chilena de Entomología* 37: 67–73.



Figures 2-4. Selected species of Oecophoridae from Chile: 2,* Aliciana longiclasper *Beeche; 3,* Glorita *new species; 4,* Utilia florinda *Clarke. Photos by Francisco Urra

Oecophoridae research in Chile continues

Urra, F. (2013a) Contribution to knowledge of Oecophoridae (Lepidoptera: Gelechioidea) of central Chile. *Acta Entomológica Chilena* 33(1-2): 31–46.

Urra, F. (2013b) A new genus and two new chilean species of Oecophoridae (Lepidoptera: Gelechioidea). *Revista Chilena de Entomología* 38: 33–40.

Urra, F. (2014) *Aidabella*, Nuevo género de Oecophoridae (Lepidoptera: Gelechioidea) de Chile Central. *Boletín del Museo Nacional de Historia Natural*, *Chile* 63: 33–42.

Zeller, P. (1874) Lepidoptera der Westkiiste Amerikas. *Verhandlungen der Kaiserlich-Koniglichen zoologisch-botanischen Gesellschaft in Wien* 24: 423–441.

Request for Momphidae for Systematics of World Fauna

Dr. Terry Harrison
Department of Entomology
University of Illinois, IL
USA

I have recently become a collaborator on a large-scale study of Momphidae. We plan to combine morphological information with molecular data obtained by using genomics-based tools to generate a comprehensive global phylogeny for the family. This is exciting in that it will provide a definitive phylogenetic framework for descriptive taxonomy of Momphidae, much of which remains to be undertaken.

I am contacting gelechioid specialists/enthusiasts worldwide, in the hope of acquiring recently-collected specimens of as many species of Momphidae as possible, for use in the phylogenetic study. We already have had positive responses from Robert Hoare in New Zealand and Kenji Nishida in Costa Rica, to whom we are extremely grateful. Taxa that are high on our want list include *Mompha millotella* from Madagascar, the larva of which induces a gall on the flower of *Dichaetanthera hirsuta* (Melastomataceae) (see p. 105 of Viette 1955, *Annales de la Société entomologique de France*, 123(1954), 75–114); *Palaeomystella* spp. from South America, which also are melastome feeders (see Becker and Adamski 2008, Revista Brasileira de Entomologia 52(4): 647–657); and *Mompha ludwigiae* from India, which is a leaf miner and shoot feeder on *Ludwigia adscendens* (Onagraceae) (see Bradley et al. 1973, Bulletin of Entomological Research 63(1): 57–64). Also, representatives of the very large North American fauna are actively being sought.

We would like to receive adult Momphidae preserved directly into absolute ethanol, with locality information (latitude/longitude coordinates included if possible) and date of collection, and a determination label if the species is known and has been described; otherwise, please merely assign it a unique species number. Reared moths with information on host plant identity and larval feeding mode are preferred, and we are very interested in receiving associated preserved larvae and pupae if these can be provided. If vials and/or ethanol are needed, we can provide them, and if reimbursement is needed for shipping costs, we can help to cover it. Please send all correspondence to me at tharriso@illinois.edu. Preserved Momphidae should be sent to: Terry Harrison, Department of Entomology, University of Illinois, 320 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801, USA. Many thanks in advance to any and all colleagues who might be able to help us in this project.

Mompha propinquella.
Photo by Biodiversity Institute of Ontario/BOLD
http://www.boldsystems.org/index.php/Taxbrowser_Taxonpage?taxid=197922

Observations on the Neotropical Gelechioidea

Ronald W. Hodges

First and foremost is the lack of material from the Neotropics on which to base meaningful conclusions. Figuratively, the world is wide open for descriptive work; however, description of isolated taxa adds little meaningful information to our knowledge. Comprehensive study of species' complexes, genera, or higher categories is the recommended approach. Vitor Becker (pers. comm.) estimated that less than 10% of the neotropical gelechioid fauna was described.

Vitor Becker has been nearly the only consistent, active collector of micros in this vast, extremely rich area in last 50 years. Dave Adamski, Richard Brown, Jack Clarke, Don Davis, Don Duckworth, and John Heppner have collected in limited areas and for relatively short periods of time. Most type material resides in the BMNH; some is in the USNM. The largest amount of new, unstudied/published material is in Vitor Becker's personal collection. The USNM has significant holdings of unworked material. Thanks to the INBIO project a large amount of material has been collected in Costa Rica. John Rawlings of the Carnegie Museum has collected extensively on Hispaniola. For better or worse, small moths are not collected by lepidopterists or entomologists in general. Unfortunately, there is a positive correlation between size of specimen and frequency of collection. Although many collectors rely on light traps to obtain material, I am leery of light trap collected material because resulting specimens often are partially denuded or worse. Many significant characters can be lost through this collecting technique.

Vitor Becker and Klaus Sattler have assessed the status and generic placement of the gelechiid species' names cited in the checklist of the *Atlas of Neotropical Lepidoptera*, but their conclusions remain unpublished. Jack Clarke's illustration of Meyrick's type specimens in the BMNH is a boon for all of us. Dave Adamski has completed a survey of species of *Glyphidocera* of Costa Rica. Jerry Powell has published on the new World ethmiines. Vitor Becker has studied and published on the stenomid genus *Timocratica*. Bernard Landry has surveyed and published on the microlepidopteran fauna of the Galapagos Islands.

Jack Clarke was particularly interested to learn whether any oecophorid genera were common to Australia/New Zealand and southern South America. Collecting in Chile on two or three trips yielded no genera in common. Don Duckworth's emphasis was on the stenomatines. For them a significant problem relates to the type species of *Stenoma.* The specimen is a female that cannot be assigned with certainty to the concept of *Stenoma* or *Antaeotricha*. The likelihood is that it should be assigned to the current concept of *Antaeotricha*, but without an associated male specimen workers cannot be confident about its placement and thus are reticent to make all the consequent new combinations that would follow should the transfer be made. I question whether *Anacampsis* and *Compsolechia* are separate genera.

I was somewhat startled to learn that two nearly identical specimens of a *Dichomeris*, one from Colombia, the other from Panama proved to have highly distinct male genitalia. So, one should be aware of the possibility that closely similar appearing species may exist on each side of the Isthmus of Panama. In a somewhat perverse way, almost any apparently small, trivial problem may prove far larger than anticipated. This is not meant to discourage study but to alert workers of the circumstance and to allot adequate time for resolution.

Timocratica leucocapna.
Photo by Guanacaste Dry Forest Conservation Fund /BOLD
http://www.boldsystems.org/index.php/TaxBrowser_Taxonpage?taxid=295374

Sangmi Lee and Todd Gilligan Appointed to Board of Directors of Wedge Entomological Research Foundation

Eric H. Metzler

Ron Hodges, President of the Wedge Entomological Research Foundation, has announced the addition of two new members of the Foundation's Board of Directors. Dr. Sangmi Lee and Dr. Todd Gilligan both accepted appointments to the board. The term of each member is 5 years with the option of renewal. The Foundation's principle focus is to publish a series of biosystematics monographs — "The Moths of North America" (MONA).

Ron, a founding member, tracks his involvement in the Foundation back to late 1960s. Ron said "What began as a larval organization eclosed into a mature force in the study of moths of the World. Todd and Sangmi will provide continuity for many years to come."

Sangmi Lee was born and raised in South Korea. She started learning about insects when she was a young girl who chased grasshoppers so she could eat their fried legs. Her fascination with moths led her to concentrate on microlepidoptera during her undergraduate program at Kangwon Nat'l University. As a graduate student of Dr. Kyu-Tek Park, she received her M.Sc. degree with her thesis entitled "Systematics of Subfamily Gelechiinae in Korea." Sangmi received her Ph.D. under Dr. Richard L. Brown at Mississippi State University with her dissertation entitled "Systematics of Holarctic genera of Teleiodini (Lepidoptera: Gelechiidae)."

Sangmi has specialized on Gelechiidae for the past 15 years, and has published 25 scientific papers and 6 non-refereed identification aids on Gelechiidae and other microlepidoptera. She also has made many presentations at regional, national, and international meetings. Since 2002 she has curated and identified gelechiids in many collections in North America, becoming one of the foremost experts in this difficult group. Sangmi developed the most comprehensive website on Gelechiidae which includes a global framework for phylogenetics and classification of Gelechioidea. She contributed educational videos on collecting and dissecting microlepidoptera that are available on YouTube. Sangmi is the Collection Manager of the Hasbrouck Entomology Collection at Arizona State University, since 2012, and she serves as a referee to the Moth Photographs Group (MPG) site for

Figures 1.-2. Todd Gilligan (above) and Sangmi Lee (below) - the new members of the Wedge Foundation Board.

Sangmi Lee and Todd Gilligan continues

identifications of gelechiids.

Todd Gilligan was born and raised in a small town in northern Ohio. He became interested in Lepidoptera at an early age, thanks to his father, who was a high school chemistry teacher. Summers would involve rearing saturniid moths and traveling the state collecting butterflies, moths, and other insects. Todd joined the Ohio Lepidopterists at around age 10, and was very active in that organization for the next 20 years. He began collecting micro moths in the early 1990's during the height of the Ohio Survey of Lepidoptera, and eventually became interested in moths in the family Tortricidae, which remain his specialty. His undergraduate education began at Ohio Northern University and continued at Ohio State University (OSU) where he earned a bachelor's degree in entomology. His original plans to attend graduate school were postponed when his wife moved from Sydney, Australia to Ohio, and he spent the next eight years in the field of computer systems administration. Deciding that studying moths was better than being employed, he left the computer world and returned to OSU to obtain a M.Sc. in entomology. In 2007 he moved with his wife and two dogs to Colorado to pursue a Ph.D. His dissertation at Colorado State University (CSU) focused primarily on the systematics and identification of economically important tortricids.

Todd currently works as a Research Scientist in the Department of Bioagricultural Sciences and Pest Management at CSU. The majority of his research involves producing morphological and molecular identification resources for invasive Lepidoptera in conjunction with the USDA-APHIS-PPQ-S&T Identification Technology Program (ITP) located in Fort Collins. Todd has authored or coauthored more than 20 peer-reviewed publications, including a book on olethreutine moths. He maintains a website dedicated to tortricids and has performed extensive field work across North America, Europe, Australia, and Africa. He received numerous awards for his entomological work, the most notable including CSU's inaugural University Distinguished Professors Scholarship (2012), the Entomological Society of America's John Henry Comstock Award (2011), and the USDA-APHIS-PPQ Deputy Administrator's Safeguarding Award (2011). Todd currently serves as President of the Lepidopterists' Society, and he is webmaster for the Foundation's website.

Everyone is invited to visit the Foundation's website (http://www.wedgefoundation.org). Other board members include: John Brown, Oliver Dominick, Larry Gall, Don Lafontaine, Ron Hodges, Eric Metzler, Jackie Miller, Paul Opler, Kelly Richers, and David Wagner. The Board welcomes communication from all who are interested in the Foundation's activities.

For further information, contact Eric Metzler, metzlere@msu.edu.

Doctoral Dissertation on Gelechioidea

Taxon delineation in gelechioid moths: from phylogenetics to DNA barcoding

Mari Kekkonen, one of the editors of I.N.G.A. newsletter, defended her doctoral thesis at University of Helsinki (Finland) this May. The dissertation was supervised by Dr. Lauri Kaila (Finnish Museum of Natural History) and Dr. Marko Mutanen (University of Oulu), and examined by Dr. Carlos Lopez-Vaamonde (French National Institute for Agricultural Research, France).

Abstract

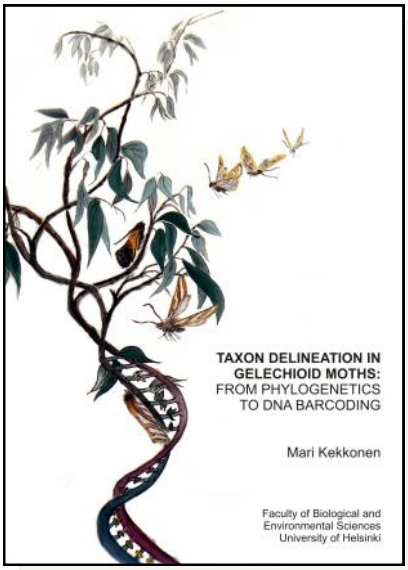
Systematics, phylogenetics and taxonomy are the scientific fields of species discovery, delimitation, description, classification and evolutionary history. The major task of these fields is to form meaningful groups, such as species and higher taxa, based on certain rules and characters. Species and higher taxa create the units of the Linnean hierarchic classification system, which is needed as the basis of all knowledge on biodiversity. Indeed, there is a great need for a complete classification, covering every species on earth, because all subsequent studies and applications are hindered as long as species remain undescribed. However, the estimated count of nine million species on earth, of

Doctoral Dissertation on Gelechioidea

Taxon delineation in gelechioid moths continues

which ca. 86% are currently unknown to science, together with the numerous threats to biodiversity pose a real challenge to taxonomy, and efficient tools and procedures are strongly needed.

In order to be both effective and high-quality, the taxonomic workflow needs to be divided into different steps in the correct sequence. A sampling scheme, the choice of characters and analytical tools are dependent on the phase performed along the workflow. The main aim of Mari Kekkonen's doctoral thesis is to study and conduct different steps along this 'taxonomic flowchart' by using various gelechioid moths as focal species. Specifically, the thesis includes four chapters: a phylogenetic examination of the superfamily Gelechioidea based on combined data of multi-locus DNA and morphology, and three studies focusing on delineation of putative species (i.e., operational taxonomic units, OTUs) based on single-locus DNA barcodes. The delineation studies cover various topics, from testing different OTU delineation methods (BIN, TCS, ABGD, GMYC) with reference species, developing criteria for discordant results and a protocol for associating short sequences from type specimens to delineated groups, to employing the methods, criteria and protocols in practice.



The first chapter presents a phylogenetic hypothesis for the Gelechioidea with the best support for families to date. This was achieved mainly due to the use of both molecular and morphological data. We also provide a new family-level classification with redefined 16 families. The three OTU delineation studies revealed taxon-dependent performance within the four datasets (Finnish Gelechiinae, Australian Elachistinae, Australian Hypertrophinae, European *Elachista dispunctella* complex), but otherwise rather congruent results between the methods. The third chapter provides 120 putative species for poorly-known hypertrophine moths and criteria for evaluating discordant delineation results. Finally, in the last chapter, the *E. dispunctella* group with a high number of poorly-defined species is re-examined based on DNA barcodes from both fresh non-type and old type specimens.

This doctoral thesis is a part of a long-term study of the Hypertrophinae, aiming to provide well-supported phylogeny and species boundaries for the group. The results here not only enhance the study on hypertrophines, but also offer tools to benefit the taxonomic research in general. As a result of the great challenge of taxonomy to describe all species, every new innovation to speed up the workflows without compromising the quality is of crucial importance.

Summary part of the dissertation is freely available from https://helda.helsinki.fi/handle/10138/44985?locale-attribute=en
Printed copy of the whole dissertation is available free of charge from the author on request (mari.kekkonen@helsinki.fi).

Figure 1. Happy and relieved new doctor.

Figure 2. Gelechioidea show performed by the doctoral students of the Finnish Museum of Natural History. Photo by Jadranka Rota

Recent Publications on Gelechioidea

Compiled by Maria Heikkilä & Richard Brown

Articles dealing with pest or biocontrol issues are not included.

Please, see I.N.G.A. issues n. 1-3 for other articles published in 2012 and 2013: http://mississippientomologicalmuseum.org.msstate.edu/Researchtaxapages/Lepidoptera/Gelechioidea/INGA_newsletter.html

Additions 2013

Baldizzone, G. (2013) *Xenopathia novaki* (Rebel, 1891) and *Tecmerium perplexum* (Gozmány, 1957), two newly recorded species for the Italian fauna (Lepidoptera: Blastobasidae). SHILAP Revista de lepidopterología 41(163): 395-398.

Beavan, S.D. & Heckford, R.J. (2013) *Biselachista eleochariella* (Stainton, 1851) (Lepidoptera: Elachistidae): an account of the larval stage. *Entomologist's Gazette* 64, (4): 209-215.

Beavan, S.D. & Heckford, R.J. (2013) *Scythris empetrella* Karsholt & Nielsen (Lep.: Scythrididae) larvae in August. *Entomologist's Record and Journal of Variation* 125(2): 77-78.

Beéche, M. (2013) New genus of Oecophoridae — Oecophorinae from central Chile (Lepidoptera: Gelechioidea). *Revista Chilena de Entomología* 38: 5–16.

Bengtsson, B. Å. (2013) *Scythris richteri* sp. n., a new micromoth from Croatia (Lepidoptera: Scythrididae). *Phegea* 41(1): 7–9.

Budashkin Yu. I. & Zhakov, A.V. (2013) Case-bearer moths (Lepidoptera, Coleophoridae): Contribution to the Ukrainian steppe zone fauna. Third Report. *Ukrainska Entomofaunistika* 4(1): 33-42.

Cock, M.J.W. & Burris, D.H. (2013) Neotropical palm-inflorescence feeding moths (Lepidoptera: Batrachedridae, Blastobasidae, Cosmopterigidae, Gelechiidae, Pyralidae, Tineidae): a review of the literature and new records from Trinidad, West Indies. *Journal of Research on the Lepidoptera* 46: 1–21.

Fazekas, I. & Schreurs, A. (2013) *Depressaria ululana* Rossler, 1866 new species in Hungary. *Microlepidoptera.hu* 6: 3-6.

Guillermet, C. (2013) Contribution on the study of Heterocera on Reunion Island: description of six new species of Cosmopterigidae, Gelechiidae, Tortricidae and Erebidae (Lepidoptera Heterocera). *L'Entomologiste* (Paris) 69 (6): 357-368.

Heckford R.J. & Beavan, S.D. (2013) *Coleophora linosyridella* Fuchs (Lep.: Coleophoridae) discovered new to Devon on *Aster linosyris*, a newly recorded British foodplant. *Entomologist's Record and Journal of Variation* 125(6): 244-248.

Huemer, P., Elsner, G. & Karsholt, O. (2013) Review of the *Eulamprotes wilkella* species-group based on morphology and DNA barcodes, with descriptions of new taxa (Lepidoptera, Gelechiidae). *Zootaxa* 3746 (1): 069–100. http://dx.doi.org/10.11646/zootaxa.3746.1.3

Jaros, J. & Spitzer, K. (2013) The first Czech record of a relict moth, *Coleophora uliginosella* Glitz from peatlands of the Bohemian Forest (Lepidoptera: Coleophoridae). *Silva Gabreta* 19(1): 51-56.

Kameda, M. (2013) Notes *on Depressaria colossella* Caradja (Depressariidae) from Hokkaido. *Yugato* 214: 126-127.

Kim, MY & Lee, SH (2013) A new record of *Coleophora virgaureae* (Lepidoptera: Gelechioidea: Coleophoridae) from Korea. *Korean Journal of Applied Entomology* 52(2): 125-127.

Kusunoki, Y. & Oku, T. (2013) Records and biological notes on the Coleophoridae of northern Japan. *Yugato* 213: 85-95.

Lvovsky, A.L. & Knyazev S.A. (2013) *Agonopterix rotundella* (Lepidoptera, Depressariidae) – a new species to the fauna of Russia. *Amurian Zoological Journal* 2: 151-152.

Nazari, V. (2013) *Gnorimoschema brackenridgiella* (Busck, 1903), A valid species (Lepidoptera: Gelechiidae) *Journal of the Lepidopterists' Society* 67(4): 301–304.

Nupponen, K. & Kullberg, J. (2013) Records of interesting scythridids from Morocco, with description of *Scythris scutulella* Nupponen, sp. n. (Lepidoptera: Scythrididae). *Entomologica Fennica* (24): 234–240.

Schreurs, A. E. P., Stiphout, M. & Groenen, F. (2013) The casebearing moth *Coleophora bornicensis* (Lepidoptera: Coleophoridae) new for the Dutch fauna. *Entomologische Berichten* 73(5): 197–199.

Sachkov, S.A. (2013) New species of scythridid moths (Lepidoptera: Scythrididae) from Southern Siberia. *Nota Lepidopterologica* 36(2): 171-174.

Tabell, J. (2013) *Coleophora alacanta* Tabell, sp n., a new coleophorid moth from southern Spain, with notes on the biology of *C. kahaourella* Toll, 1957 (Lepidoptera: Coleo-

phoridae). SHILAP Revista de lepidopterología 41(164): 479 -488.

Urra, F. (2013) A new Chilean genus of Autostichidae (Lepidoptera: Gelechioidea). *Revista Chilena de Entomologia* 38: 17-22. [in Spanish]

Urra, F. (2013) A new genus and two new chilean species of Oecophoridae (Lepidoptera: Gelechioidea). *Revista Chilena de Entomología* 38: 33–40.

Wakeham-Dawson, A. & Koster, J.C. (2013) Lepidoptera of the Falkland Islands (3): A new and unique species of Momphidae. *Entomologist's Monthly Magazine* 149: 129-133.

Wullaert, S. (2013) *Coleophora vacciniella* (Lepidoptera: Coleophoridae), new to the Belgian fauna. *Phegea* 41(2): 42-44.

2014

Adamski, D., Landry, J.-F., Nazari, V. & Priest, R.J. (2014) Three new species of leaf-mining Gelechiidae (Lepidoptera) from Canada and Northeastern United States. *Journal of the Lepidopterists' Society* 68(2), 101–123.

Bae, Y.-S., Lee, B.-W. & Park, K.-T. (2014) Gelechiid fauna of Baengnyeongdo, Daecheongdo, and Yeonpyeongdo in the West Sea near North Korea, with description of two new species (Lepidoptera, Gelechioidea). *Entomological Research* 44: 17–22. http://dx.doi.org/10.1111/1748-5967.12045

De Prins, W. & De Prins, J. (2014) *Metalampra italica* (Lepidoptera: Oecophoridae), also in Belgium. *Phegea* 42(2): 26–28.

Du, Z.H., Wang, S.X. & Li, H.H. (2014) A review of the genus *Promalactis* Meyrick, 1908 (Lepidoptera: Oecophoridae) from Taiwan, China. *Journal of Natural History* 48 (1/2): 87-108. http://dx.doi.org/10.1080/00222933.2013.791940

Haines, W.P., Schmitz, P. & Rubinoff, D. (2014) Ancient diversification of *Hyposmocoma* moths in Hawaii. *Nature Communications* 20;5:3502. http://dx.doi.org/10.1038/ncomms4502

Harrison, T.L & Berenbaum, M. R. (2014) *Anacampsis rhoifructella* (Clemens): clarification of its identity and larval biology, and differentiation from a similar species, *Anacampsis consonella* (Zeller), revised status (Lepidoptera: Gelechiidae). *Zootaxa* 3794 (4): 545–555. http://dx.doi.org/10.11646/zootaxa.3794.4.5

Heckford, R.J. (2014) *Metalampra italica* Baldizzone, 1977 (Lepidoptera: Oecophoridae) new to the British Isles and an account of its biology. *Entomologist's Gazette* 65(2): 73-86.

Huemer, P., Karsholt; O. & Mutanen, M. (2014) DNA barcoding as a screening tool for cryptic diversity: an example from *Caryocolum*, with description of a new species (Lepidoptera, Gelechiidae). *Zookeys* (404): 91–111. http://dx.doi.org/10.3897/zookeys.404.7234

Huemer, P. & Timossi, G. (2014) *Sattleria* revisited: unexpected cryptic diversity on the Balkan Peninsula and in the south-eastern Alps (Lepidoptera: Gelechiidae). *Zootaxa* 3780 (2): 282–296. http://dx.doi.org/10.11646/zootaxa.3780.2.4

Kim, S., Park, K-T., Heppner, J. B. & Lee, S. (2014) Genus *Promalactis* Meyrick (Lepidoptera: Oecophoridae) in northern Vietnam, Part III: seven new species and four newly recorded species. *Journal of Natural History* (48): 1327-–1346. http://dx.doi.org/10.1080/00222933.2013.862576

King, G. E. & González-Estébanez, F. J. (2014) *Ethmia bipunctella* (Fabricius, 1775) (Lepidoptera: Elachistidae: Ethmiinae) y su fenología en Madrid (centro de la Península Ibérica). *Arquivos Entomolóxicos* 10: 51-55.

Li, H., Yin, A., Bo, C. Li, W. & Lu, Z. (2014) Taxonomic status and morphology of the invasive alien species *Opisina arenosella* Walker (Lepidoptera: Xyloryctidae). *Chinese Journal of Applied Entomology* 51(1): 283–291.

Liu, S. & Wang, S. (2014) The genus *Homaloxestis* Meyrick (Lepidoptera: Lecithoceridae) from China, with descriptions of two new species. *Zootaxa* 3760 (1): 079–088. http://dx.doi.org/10.11646/zootaxa.3760.1.5

Liu, S. & Wang, S. (2014) Taxonomic review of the genus *Spatulignatha* Gozmány, 1978 (Lepidoptera: Lecithocerinae), with descriptions of two new species in China. *Zootaxa* 3793 (3): 361–370. http://dx.doi.org/10.11646/zootaxa.3793.3.4

Liu, S.R. & Wang, S. X. (2014) Two new species of the genus "*Synesarga*" Gozmány, 1978 from China (Lepidoptera: Lecithoceridae). *SHILAP Revista de lepidopterología* 42 (165): 71–76.

Lvovsky, A. L. (2014) A review of Flat Moths of the genus *Exaeretia* Stainton, 1849 (Lepidoptera, Depressariidae) of the fauna of Russia and neighboring countries. *Entomological Review* 94(2): 254–271. http://dx.doi.org/10.1134/S0013873814020158

Metzler, E. H. (2014) The Lepidoptera of White Sands national monument 6: a new species of *Chionodes* Hübner, [1825] (Lepidoptera, Gelechiidae, Gelechiinae) dedicated to Ronald W. Hodges and Elaine R. Snyder Hodges in the year of Ron's 80th birthday, 2014. *Journal of the Lepidopterists' Society* 68(2): 80–84.

Metzler, E. H. (2014) The remarkable endemism of moths at White Sands National Monument in New Mexico, USA, with special emphasis on Gelechioidea (Lepidoptera). *Journal of Asia-Pacific Biodiversity* 7(1): e1-e5. http://dx.doi.org/10.1016/j.japb.2014.02.001

Park, K.-T. (2014) Three hundred and twenty newly described species of Lecithoceridae (Lepidoptera, Gelechioi-

dea) by K.T. Park since 1998, with a tentative catalogue and images of types. *Journal of Asia-Pacific Biodiversity*. Available online 5 May 2014, http://dx.doi.org/10.1016/j.japb.2014.04.001

Park, K.-T. & Kim, M. (2014) Three new species of *Neopectinimura* Park (Lepidoptera: Lecithoceridae) from Papua New Guinea, Indonesia. *Journal of Asia-Pacific Entomology* 17 (1): 53–58. DOI: http://dx.doi.org/10.1016/j.aspen.2013.10.006

Park, K.-T., Kim, M. & Byun, B.-K. (2014) Gelechiidae collected from Is. Ulleung-do in the East Sea, reporting a newly recorded species from Korea and an unknown species. *Korean Journal of Applied Entomology* 30: 1–5.

Urra, F. (2014) *Aidabella*, new genus of Oecophoridae (Lepidoptera: Gelechioidea) from Central Chile. *Boletín del Museo Nacional de Historia Natural*, *Chile* 63: 33–42.

Xu, H.M., Wang, H.S. & Wang, M. (2014) A New Species of the Genus *Synersaga* Gozmány (Lepidoptera, Lecithoceridae) From China. *Florida Entomologist* 97(1):262-265.

Yin, A. H., Wang, S. X., & Park, K.-T. (2014) Review of the genus *Lasiochira* Meyrick, 1931 (Lepidoptera: Oecophoridae). *Zootaxa* 3802 (1): 023–034. http://dx.doi.org/10.11646/zootaxa.3802.1.2

Illustration by Hannu Kekkonen **20**

Corrigendum

The revised classification for Gelechioidea (I.N.G.A. issue 3, December 2013) was missing the subfamily Apatetrinae Meyrick, 1947 from the list of gelechiid subfamilies. We thank Dr. Erik van Nieukerken for noticing this!


New Gelechioidea Publication

A Revised Classification for Gelechioidea

The subfamilies in Gelechiidae Stainton, 1854 (4700 spp.) are:

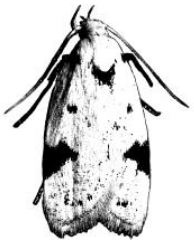
Physoptilinae Meyrick, 1914
Anacampsinae Bruand, 1850
Dichomeridinae Hampson, 1918
Apatetrinae Meyrick, 1947
Thiotrichinae Karsholt et al., 2013
Anomologinae Meyrick, 1926
Gelechiinae Stainton, 1854

The classification is based on the phylogenetic study: Heikkilä, M., Mutanen, M., Kekkonen, M. & Kaila, L. Morphology reinforces proposed molecular phylogenetic affinities: a revised classification for Gelechioidea (Lepidoptera) Cladistics, e-pub ahead of print, DOI: http://dx.doi.org/10.1111/cla.12064.

I.N.G.A. Newsletter

I.N.G.A. is a biannually distributed electronic newsletter with its main focus on different aspects of the superfamily Gelechioidea. Subscription and all contributions are free of charge. All opinions presented here are authors' own and do not represent an official opinion of the newsletter. Guidelines for submission and previous issues of I.N.G.A. can be found from the newsletter's website:

http://mississippientomologicalmuseum.org.msstate.edu/Researchtaxapages/Lepidoptera/Gelechioidea/INGA_newsletter.html



Editorial staff

Dr. Richard Brown (articles etc.)
RBrown @ entomology.msstate.edu

Maria Heikkilä (publication list etc.)
maria.heikkila @ helsinki.fi

Dr. Mari Kekkonen (layout, distribution etc.)
mari.kekkonen @ helsinki.fi

Dr. Sangmi Lee (articles, news etc.)
microlepi @ hotmail.com

Acknowledgements

Chris Grinter, Terry Harrison, Ronald W. Hodges, Eric H. Metzler, Margarita G. Ponomarenko & Francisco Urra kindly assisted with this issue.

Copyright of the original photo of I.N.G.A. logo: Scott Justis

ISSN: 2328-370X (online)