

INSECTA MUNDI

A Journal of World Insect Systematics

0047

World Checklist of Tribe Calpini
(Lepidoptera: Noctuidae: Calpinae)

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Date of Issue: September 26, 2008

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Insecta Mundi 0047: 1-15

Published in 2008 by

Center for Systematic Entomology, Inc.
P. O. Box 141874
Gainesville, FL 32614-1874 U. S. A.
<http://www.centerforsystemicentomology.org/>

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As of 2007, **Insecta Mundi** is published irregularly throughout the year, not as quarterly issues. As manuscripts are completed they are published and given an individual number. Manuscripts must be peer reviewed prior to submission, after which they are again reviewed by the editorial board to insure quality. One author of each submitted manuscript must be a current member of the Center for Systematic Entomology.

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Printed Copy ISSN 0749-6737
On-Line ISSN 1942-1354
CD-ROM ISSN 1942-1362

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Abstract. A preliminary checklist of Calpini is provided, incorporating corrections and changes to publication dates and nomenclature as presented in the checklists of Poole (1989), Fibiger and Lafontaine (2005), and Holloway (2005). *Culasta* Moore is removed from synonymy with *Calyptro* Ochsenheimer. *Eudocima talboti* (Prout) and *Graphigona antica* Walker are placed in synonymy with *E. cajeta* (Cramer) and *G. regina* (Guenée), respectively. *Africalpe* Krüger, *Ferenta* Walker, *Gonodonta* Hübner, *Graphigona* Walker, *Oraesia* Guenée, and *Tetrisia* Walker, are added to the tribe based on shared characters. The genera *Cecharismena* Möschler, *Goniapteryx* Perty, *Pharga* Walker, *Phyprosopus* Grote, *Psammathodoxa* Dyar, and *Radara* Walker are removed and considered *incertae sedis*. *Hemiceratoides* and *Phyllodes* are not considered to be members of Calpini.

Key words. Checklist, fruit-piercing moths, blood-feeding moths.

Introduction

The most recent classification places Calpinae in the family Noctuidae (Goater et al. 2003, Kitching and Rawlins 1998, Fibiger and Lafontaine 2005, Lafontaine and Fibiger 2006, Mitchell et al. 2006). Calpinae now consists of four tribes: Anomini Grote, Calpini Boisduval, Phyllodini Hampson, and Scoliopterygini Herrich-Schäffer (Fibiger and Lafontaine 2005, Lafontaine and Fibiger 2006, Holloway 2005). Calpini are defined by the presence of socketted tearing hooks on the proboscis that are used for piercing the skin of fruits and mammals (Bänziger 1968, 1971, 1979a, 1982, Zaspel et al. 2007, Zaspel 2008, Zaspel in press). Calpini are cosmopolitan; however, many calpine genera have geographic distributions that are more restricted (e.g., *Gonodonta* Hübner, *Graphigona* Walker, *Calyptro* Ochsenheimer). The tribe was recently catalogued by Fibiger and Lafontaine (2005) wherein they assigned genera to the tribe, suggesting Calpini consisted of approximately 200 species in eleven genera. This publication focused on the Palearctic region and was therefore not inclusive of all genera comprising the tribe. In addition, the fruit-piercing genus *Oraesia* Guenée, which has proboscis armature identical to that of *Calyptro* and *Gonodonta*, was excluded while seven genera lacking the diagnostic characteristics of the proboscis were included. The primary objective of the present checklist is to combine the works of Holloway (2005) and Fibiger and Lafontaine (2005) into an updated checklist to complement recent taxonomic studies (Bänziger 1983, Zilli and Hogenes 2002), a survey of calpine proboscis morphology (Zaspel et al. submitted), and phylogenetic research (Zaspel 2008). This checklist also serves to correct minor taxonomic errors in the checklist of Poole (1989).

All original descriptions for each genus, species, subspecies, and their synonyms have been studied. The checklist includes type localities if available, a list of references to the species, and corrections and changes to the nomenclature presented in the checklists of Poole (1989), Fibiger and Lafontaine (2005), and Holloway (2005). Authorship assignments for taxa described in the Lepidoptera Atlas of the “Reise der Novara” follow Nässig and Speidel (2007) and for convenience, are abbreviated “In F.F.R. 1874”.

In summary, the following taxonomic changes are made: *Culasta* Moore is removed from synonymy from *Calyptro* Ochsenheimer. This genus lacks the proboscis characters that define Calpini and is not considered a member; the tribal placement of *Culasta* remains undetermined. *Eudocima talboti* (Prout) is placed in synonymy with *Eudocima cajeta* (Cramer) and *Graphigona antica* Walker is placed in synonymy with *G. regina* (Guenée In Boisduval and Guenée). Four *Eudocima* species, *E. behouneki*, *E. mazzeii*, *E. prolai*, and *E. treadawayi* described by Zilli and Hogenes (2002) are added to the checklist. Although Hilgartner et al. (2007) suggest *Hemiceratoides* Strand is a member of the Calpini, this placement remains uncertain as species in the genus are tear feeders lacking proboscis features found in all

other listed genera of Calpini. *Phyllodes* Boisduval, in tribe Phyllodini, has been associated with members of Calpini (e.g., *Eudocima*) but also with Ophiusini (e.g., *Miniodes* Guenée *In* Boisduval and Guenée) (Holloway 2005). Given the previous associations of *Phyllodes* with both calpine and ophiusine genera we recommend its continued placement in Phyllodini pending further morphological and molecular examination of additional species in the genus. Six genera: *Africalpe* Krüger, *Ferenta* Walker, *Gonodontia* Hübner, *Graphigona* Walker, *Oraesia* Guenée, and *Tetrisia* Walker, are added to Fibiger and Lafontaine's (2005) checklist based on characters of their proboscides. The following genera, previously treated as the tribe Calpini (*sensu* Fibiger and Lafontaine 2005), are removed based on their lack of proboscis characters present in other members of this tribe, and categorized as genera whose tribal placement are as yet undetermined: *Cecharismena* Möschler, *Goniapteryx* Perty, *Pharga* Walker, *Phyprosopus* Grote, *Psammathodoxa* Dyar, and *Radara* Walker.

Checklist

CALPINI

AFRICALPE Krüger, 1939: 348

Type species: *Africalpe intrusa* Krüger, by monotypy.

- A. intrusa* Krüger, 1939 (*Africalpe*) Libya
- A. nubifera* (Hampson, 1907) (*Calpe*) India
- A. vagabunda* (Swinhoe, 1884) (*Oraesia*) Pakistan
 - A. anubis* (Rebel, 1947) (*Pseudocalpe*) Egypt
 - A. anubia* (Poole, 1989); misspelling

CALYPTRA Ochsenheimer, 1816: 78

Type species: *Phalaena thalictri* Borkhausen, by subsequent designation of Duponchel 1826: [3].

- Calpe* Treitschke, 1825
- Hypocalpe* Butler, 1883
- Percalpe* Berio, 1956

- C. albivirgata* (Hampson, 1926) (*Calpe*) China
- C. bicolor* (Moore, 1883) (*Calpe*) India
- C. canadensis* (Bethune, 1865) (*Calpe*) Canada
 - C. purpurascens* (Walker, 1865) (*Plusiodonta*) USA
 - C. sobria* (Walker, 1865) (*Oraesia*) USA
- C. eustrigata* (Hampson, 1926) (*Calpe*) Sri Lanka
- C. fasciata* (Moore, 1882) (*Calpe*) India
 - C. labilis* (Berio, 1970) (*Calpe*) India
- C. fletcheri* (Berio, 1956) (*Calpe*) China
- C. gruesa* (Draudt, 1950) (*Calpe*) China
- C. hokkaidae* (Wileman, 1922) (*Calpe*) Japan
 - C. hokkaido* (Poole, 1989); misspelling
 - C. hoenei* (Berio, 1956) (*Calpe*) China
- C. imperialis* (Grünberg, 1910) (*Calpe*) India
- C. lata* (Butler, 1881) (*Calpe*) Japan
 - C. aureola* (Graeser, 1889) (*Calpe*) Russian Far East
- C. minuticornis* (Guenée *In* Boisduval and Guenée, 1852a) (*Calpe*) Indonesia
 - C. novaeponmeraniae* (Strand, 1919) (*Calpe*) India
- C. nyei* Bänziger, 1979b (*Calyptra*) India
- C. ophideroides* (Guenée *In* Boisduval and Guenée, 1852a) (*Calpe*) East Indies

- C. orthograpta* (Butler, 1886) (*Calpe*) India
C. striata (Poujade, 1887) (*Calpe*) China
C. parva Bänziger, 1979b (*Calyptra*) India
C. pseudobicolor Bänziger, 1979b (*Calyptra*) India
C. subnubila (Prout, 1928) (*Calpe*) Indonesia
C. thalictri (Borkhausen, 1790) (*Phalaena*) Unknown
C. centralalitalica (Dannehl, 1925) (*Calpe*) Unknown
C. pallida (Schwingenschuss, 1938) (*Calpe*) Turkey
C. sodalis (Butler, 1878a) (*Calpe*) Unknown

EUDOCIMA Billberg, 1820: 85

Type species: *Phalaena salaminia* Cramer, by monotypy.

- Elygea* Billberg, 1820
Leptophara Billberg, 1820
Trissophaes Hübner, [1823] 1816
Othreis Hübner, [1823] 1816
Maenas Hübner, [1823] 1816
Rhytia Hübner, [1823] 1816
Acacallis Hübner, [1823] 1816
Ophideres Boisduval, 1832
Acacalis Agassiz, [1847] 1846
Ophioderes Agassiz, [1847] 1846
Othryis Agassiz, [1847] 1846
Khadira Moore, 1881b
Adris Moore, 1881b
Purbia Moore, 1881b
Vandana Moore, 1881b
Argadesa Moore, 1881b
Halastus Butler, 1892
Eumaenas Tams, 1924

- E. anguina* (Schaus, 1911b) (*Trissophaes*) Costa Rica
E. apta (Walker, [1858] 1857b) (*Ophideres*) Brazil
E. aurantia (Moore, 1877) (*Ophideres*) Andaman Islands
E. rutilus (Moore, 1881b) (*Adris*) Sri Lanka
E. bathyglypta (Prout, 1928) (*Othreis*) Indonesia
E. behouneki Zilli and Hogenes, 2002 (*Eudocima*) Philippines
E. boseae (Saalmüller, 1880) (*Ophideres*) Madagascar
E. caesar (Felder, 1861) (*Ophideres*) Indonesia
E. cajeta (Cramer, 1775) (*Phalaena Noctua*) India
E. multiscripta (Walker, [1858] 1857b) (*Ophideres*) Sri Lanka
E. talboti (Prout, 1922) (*Othreis*) Indonesia, NEW SYNONYMY
E. cocalus (Cramer, 1777) (*Phalaena Noctua*) East Indies
E. crepidolata (Lucas, 1894) (*Ophideres*) Australia
E. maculata (Weber, 1801) (*Noctua*) East Indies
E. plana (Walker, [1858] 1857b) (*Ophideres*) Indonesia
E. collusoria (Cramer, 1777) (*Phalaena Noctua*) Unknown
E. colubra (Schaus, 1911b) (*Trissophaes*) Costa Rica
E. discrepans (Walker, [1858] 1857b) (*Ophideres*) Singapore
E. archon (C. and R. Felder, In F.F.R. 1874) (*Ophideres*) Thailand
E. dividens (Walker, [1858] 1857b) (*Ophideres*) Indonesia
E. divitiosa (Walker, 1869b) (*Ophideres*) "Congo"

- E. banakus* (Plötz, 1880) (*Ophideres*) "Upper Guinea"
E. intricatus (Butler, 1892) (*Halastus*) Nigeria
- E. euryzona*** (Hampson, 1926) (*Khadira*) Madagascar
- E. felicia*** (Stoll, 1790) (*Phalaena Noctua*) Unknown
- E. formosa*** (Griveaud and Viette, 1960) (*Khadira*) Madagascar
- E. homaena*** (Hübner, [1823] 1816) (*Othreis*) India
 E. ancilla (Cramer, 1777) (*Phalaena Noctua*) India
 E. bilineosa (Walker, [1858] 1857b) (*Ophideres*) Sri Lanka
 E. strigata (Donovan, 1804) (*Phalaena*) India
- E. hypermnestra*** (Cramer, 1780) (*Phalaena Noctua*) India
- E. imperator*** (Boisduval, 1833) (*Ophideres*) Madagascar
- E. iridescent*** (Lucas, 1894) (*Ophideres*) Australia
 E. pyrocrana (Turner, 1908) (*Ophideres*) Australia
- E. jordani*** (Holland, 1900) (*Ophideres*) Indonesia
- E. kinabaluensis*** (Feige, 1976) (*Othreis*) Borneo
- E. kuehni*** (Pagenstecher, 1886) (*Othreis*) New Guinea
- E. materna*** (Linnaeus, 1767) (*Phalaena Noctua*) "Indiis"
 E. chalcogramma (Walker, 1865) (*Ophideres*) "Zambesi River"
 E. hybrida (Fabricius, 1775) (*Noctua*) India, Australia.
- E. mazzeii*** Zilli and Hogenes, 2002 (*Eudocima*) Philippines
- E. memorans*** (Walker, [1858] 1857b) (*Ophideres*) "West Coast of America"
- E. mionopastea*** (Hampson, 1926) (*Othreis*) Malaysia
- E. muscigera*** (Butler, 1882) (*Purbia*) New Britain
- E. nigricilia*** (Prout, 1924) (*Purbia*) Australia
- E. okurai*** (Okano, 1964) (*Adris*) East-Palearctic
 E. suthepensis Bänziger and Honey, 1984 (*Adris*) Burma
- E. paulii*** (Robinson, 1968) (*Othreis*) Fiji
- E. phalonia*** (Linnaeus, 1763) (*Phalaena Noctua*) Africa
 E. dioscoreae (Fabricius, 1775) (*Noctua*) East Indies
 E. fullonia (Clerck, [1764] 1759) (*Phalaena*) Unknown
 E. oblitterans (Walker, [1858] 1857b) (*Ophideres*) Samoa
 E. pomona (Cramer, 1776) (*Phalaena Noctua*) India
 E. princeps (Boisduval, 1832) (*Ophideres*) New Guinea
- E. pratti*** (Bethune-Baker, 1906) (*Lagoptera*) New Guinea, REVISED STATUS
- E. prattorum*** (Prout, 1922) (*Othreis*) Indonesia
- E. procus*** (Cramer, 1777) (*Phalaena Noctua*) Surinam
 E. columbina (Guenée, *In* Boisduval and Guenée 1852b) (*Ophideres*) Colombia
 E. scabellum (Guenée, *In* Boisduval and Guenée 1852b) (*Ophideres*) Unknown
- E. prolai*** Zilli and Hogenes, 2002 (*Eudocima*) Irian Jaya
- E. salaminia*** (Cramer, 1777) (*Phalaena Noctua*) China
- E. serpentifera*** (Walker, [1858] 1857b) (*Ophideres*) Dominican Republic
- E. sikhimensis*** (Butler, 1895) (*Adris*) Oriental
 E. abathyglypta (Prout, 1928) (*Othreis*) Indonesia
- E. smaragdipicta*** (Walker, [1858] 1857b) (*Ophideres*) Borneo
 E. sultana (Snellen, 1886) (*Ophideres*) Indonesia
- E. splendida*** (Yoshimoto, 1999) (*Othreis*) Oriental
- E. srivijayana*** (Bänziger, 1985) (*Othreis*) Oriental
- E. talboti*** (Prout, 1922) (*Othreis*) Wallacea
- E. toddi*** (Zayas, 1965) (*Othreis*) Cuba
- E. treadawayi*** Zilli and Hogenes, 2002 (*Eudocima*) Philippines
- E. tyrannus*** (Guenée, *In* Boisduval and Guenée 1852b) India
 E. amurensis (Staudinger, 1892) (*Ophideres*) Russian Far East

FERENTA Walker, [1858] 1857a: 961

Type species: *Phalaena stolliana* Stoll, by monotypy.

F. cacica Guenée, *In* Boisduval and Guenée 1852c) (*Ophideres*) Brazil

F. castula (Dognin, 1912) (*Darceta*) Venezuela

F. incaya Hampson, 1926 (*Ferenta*) Peru

F. stollii (Hübner, [1823] 1816) (*Coronis*)

F. stolliana (Stoll, *In* Cramer 1782) (*Phalaena Noctua*) Surinam

GONODONTA Hübner, 1818: 11

Type species: *Gonodonta uncina* Hübner, by subsequent designation of Grote 1902: 472. Revision: Todd 1959:1.

Athysania Hübner, [1823] 1816

Dosa, Walker 1865

G. aequalis Walker, [1858] 1857a (*Gonodonta*) Brazil

G. aeratilinea Todd, 1973 (*Gonodonta*) Peru

G. amianta (Hampson, 1924) (*Athysania*) Guyana

G. biarmata Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Brazil

G. elegans Druce, *In* Godman and Salvin 1889 (*Gonodonta*) Mexico

G. evadens Walker, [1858] 1857a (*Gonodonta*) Galapagos Islands

G. galapagensis Todd, 1959 (*Gonodonta*) Galapagos Islands

G. bidens Geyer, 1832 (*Gonodonta*) Cuba

G. meridionalis Todd, 1959 (*Gonodonta*) Brazil

G. miranda Raymundo, 1908 (*Gonodonta*) Brazil

G. tenebrosa Todd, 1959 (*Gonodonta*) Costa Rica

G. chorinea (Cramer, 1782) (*Phalaena Noctua*) Surinam

G. clotilda (Stoll, 1790) (*Phalaena Noctua*) Surinam

G. clothilda (Poole, 1989); misspelling

G. correcta Walker, [1858] 1857a (*Gonodonta*) Mexico

G. distincta Todd, 1959 (*Gonodonta*) Venezuela

G. ditissima Walker, 1858 (*Gonodonta*) Brazil

G. fernandezi Todd, 1959 (*Gonodonta*) Guyana

G. fulvangula Geyer, 1832 (*Gonodonta*) Uruguay

G. chrysotornus (Hampson, 1926) (*Athysania*) Guyana

G. fulvidens Felder and Rogenhofer, *In* F.F.R. 1874 (*Gonodonta*) Colombia

G. flavidens (Hampson, 1926) (*Athysania*) Brazil

G. holosericea Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Colombia

G. immacula Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Fr. Guiana

G. panoana (Schaus, 1933) (*Athysania*) Brazil

G. incurva (Sepp, 1840) (*Phalaena*) Surinam

G. dentata Felder and Rogenhofer, *In* F.F.R. 1874 (*Gonodonta*) Brazil

G. elaborans Dyar, 1914 (*Gonodonta*) Dominica

G. temperata Walker, [1858] 1857a (*Gonodonta*) Venezuela

G. teretimacula Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Fr. Guiana

G. velata Walker, [1858] 1857a (*Gonodonta*) Unknown

G. indentata (Hampson, 1926) (*Athysania*) Venezuela

G. latimacula Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Colombia

G. lecha Schaus, 1911a (*Gonodonta*) Costa Rica

G. lincus (Cramer, 1775) (*Phalaena Bombyx*) Costa Rica

G. superba Möschler, 1880 (*Gonodonta*) Surinam

- G. maria* Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Brazil
G. avangareza Schaus, 1911a (*Gonodonta*) Costa Rica
- G. mexicana* Schaus, 1901 (*Gonodonta*) Mexico
- G. nitidimacula* Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Ile St. Thomas
- G. nutrix* (Cramer, 1780) (*Phalaena Noctua*) Surinam
G. acmeptera (Sepp, 1848) (*Phalaena*) Surinam
- G. obsesa* (Walker, [1865] 1864) (*Dosa*) Brazil
G. camora (Felder and Rogenhofer, *In* F.F.R. 1874) (*Canodia*) Brazil
- G. paraequalis* Todd, 1959 (*Gonodonta*) Mexico
- G. parens* Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Guadeloupe
G. plumbicincta Dyar, 1912 (*Gonodonta*) Mexico
- G. primulina* Druce, *In* Godman and Salvin 1887 (*Gonodonta*) Guatemala
- G. pseudamianta* Todd, 1959 (*Gonodonta*) Venezuela
- G. pulvrea* Schaus, 1911a (*Gonodonta*) Costa Rica
- G. pyrgo* (Cramer, 1777) (*Phalaena Noctua*) Surinam
G. serix Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Colombia
- G. separans* Walker, [1858] 1857a (*Gonodonta*) Brazil
- G. sicheas* (Cramer, 1777) (*Phalaena Noctua*) Surinam
G. hesione (Drury, 1782) (*Phalaena Noctua*) Brazil
G. uncina Hübner, 1818 (*Gonodonta*) Brazil
- G. sinaldus* Guenée, *In* Boisduval and Guenée 1852a (*Gonodonta*) Colombia
- G. sitia* Schaus, 1911a (*Gonodonta*) Costa Rica
- G. soror* (Cramer, 1780) (*Phalaena Noctua*) Surinam
- G. sphenoستigma* Todd, 1973 (*Gonodonta*) Brazil
- G. syrna* Guenée *In* Boisduval and Guenée 1852a (*Gonodonta*) Fr. Guiana
- G. unica* Neumoegen, 1891 (*Gonodonta*) USA
- G. uxor* (Cramer, 1780) (*Phalaena Noctua*) Surinam
G. marmorata Schaus, 1906 (*Gonodonta*) Mexico
- G. walkeri* Todd, 1959 (*Gonodonta*) Costa Rica

GRAPHIGONA Walker, [1858] 1857b: 1230

Type species: *Ophideres regina* Guenée, by subsequent designation of Berio 1966: 59.

- G. regina* (Guenée *In* Boisduval and Guenée 1852c) (*Ophideres*) Colombia
G. antica Walker [1858] 1857b (*Graphigona*) Brazil, NEW SYNONYMY
G. gubernatrix (Guenée *In* Boisduval and Guenée 1852c) (*Ophideres*) "Tropical America"

ORAESIA Guenée, *In* Boisduval and Guenée, 1852b: 362

Type species: *Noctua emarginata* Fabricius, by subsequent designation of Warren *In* Seitz 1913.

- O. aeneofusa* (Hampson, 1926) (*Calpe*) Panama
- O. albescens* (Seitz, 1940) (*Calpe*) Unknown
- O. argyrolampra* (Hampson, 1926) (*Calpe*) Colombia
- O. argyrosema* (Hampson, 1926) (*Calpe*) Brazil
- O. argyrosigna* (Moore, [1884]) (*Oraesia*) Sri Lanka
- O. basiplaga* (Walker, 1865) (*Calpe*) Dominican Republic
- O. camaguina* Swinhoe, 1918 (*Oraesia*) Philippines
- O. cerne* (Fawcett, 1916) (*Calpe*) Ghana
- O. emarginata* (Fabricius, 1794) (*Noctua*) India
O. alliciens Walker, [1858] 1857a (*Oraesia*) India
- O. metallescens* Guenée, *In* Boisduval and Guenée 1852a (*Oraesia*) Unknown
- O. tentans* Walker, [1858] 1857a (*Oraesia*) India

- O. excavata* (Butler, 1878a) (*Calpe*) Japan
O. excitans Walker, [1858] 1857a (*Oraesia*) Dominican Republic
O. glaucocheila (Hampson, 1926) (*Calpe*) Brazil
O. honesta Walker, [1858] 1857a (*Oraesia*) Dominican Republic
O. igneiceps (Hampson, 1926) (*Calpe*) Br. Guyana
O. nobilis Felder and Rogenhofer, *In F.F.R.* 1874 (*Oraesia*) Brazil
O. pierronii (Mabille, 1880) (*Odontina*) Madagascar
O. provocans Walker, [1858] 1857a (*Oraesia*) South Africa
 O. cuprea Saalmüller, 1891 (*Oraesia*) Madagascar
 O. hartmanni Möschler, 1883 (*Oraesia*) South Africa
O. rectistria Guenée, *In Boisduval and Guenée* 1852a (*Oraesia*) India
O. serpens Schaus, 1898 (*Oraesia*) Mexico
O. striolata Schaus, 1911a (*Oraesia*) Costa Rica
O. stupenda Dognin, 1912 (*Oraesia*) Colombia
O. subucula Dognin, 1910 (*Oraesia*) Paraguay
O. triobliqua (Saalmüller, 1880) (*Odontina*) Madagascar
O. wintgensi (Strand, 1909) (*Calpe*) Rwanda

PLUSIODONTA Guenée, *In Boisduval and Guenée* 1852b: 385

Type species: *Plusiodonta chalsyoides* Guenée, by subsequent designation of Desmarest *In Chenu* 1857: 123.

- Gadera* Walker, [1858] 1857a
Deva Walker, [1858] 1857a
Odontina Guenée, 1862
Tafalla Walker, 1869a
Tinnodoa Nye, 1975

- P. aborta* Dognin, 1910 (*Plusiodonta*) Colombia
P. achalcea Hampson, 1926 (*Plusiodonta*) South Africa
P. amado Barnes, 1907 (*Plusiodonta*) USA
P. arctipennis Butler, 1886 (*Plusiodonta*) Australia
P. auripicta Moore, 1882 (*Plusiodonta*) India
P. basirhabdota Hampson, 1926 (*Plusiodonta*) Kenya
P. casta (Butler, 1878b) (*Platydia*) Japan
P. chalcomera Hampson, 1926 (*Plusiodonta*) Kenya
P. clavifera (Walker, 1869a) (*Tafalla*) Honduras
P. cobaltina Viette, 1956 (*Plusiodonta*) Madagascar
P. coelonota (Kollar and Redtenbacher, 1844) (*Plusia*) India
 P. agens (Felder and Rogenhofer, *In F.F.R.* 1874) (*Plusia*) India
 P. chalsyoides Guenée, *In Boisduval and Guenée* 1852a (*Plusiodonta*) Indonesia
 P. conducens (Walker, [1858] 1857a) (*Deva*) Sri Lanka
P. commoda Walker, 1865 (*Plusiodonta*) Sierra Leone
P. compressipalpis Guenée, *In Boisduval and Guenée* 1852a (*Plusiodonta*) N. America
 P. insignis Walker, 1865 (*Plusiodonta*) USA
 P. suffusa Hill, 1924 (*Plusiodonta*) USA
P. cupristria Kaye, 1922 (*Plusiodonta*) Trinidad
P. dimorpha Robinson, 1975 (*Plusiodonta*) Fiji
P. effulgens Edwards, 1884 (*Plusiodonta*) Mexico
P. euchalcia Hampson, 1926 (*Plusiodonta*) Malawi
P. excavata (Guenée, 1862) (*Odontina*) Unknown
P. gueneei (Viete, 1968) (*Odontina*) Madagascar
P. incitans (Walker, [1858] 1857a) (*Gadera*) Unknown

- P. ionochrota* Hampson, 1926 (*Plusiodonta*) Ghana
P. macra Hampson, 1926 (*Plusiodonta*) Kenya
P. malagassy (Viete, 1968) (*Odontina*) Madagascar
P. megista Hampson, 1926 (*Plusiodonta*) Kenya
P. miranda Schaus, 1911a (*Plusiodonta*) Costa Rica
P. multicolora (Bethune-Baker, 1906) (*Deva*) New Guinea
P. natalensis Walker, 1865 (*Plusiodonta*) South Africa
 P. detracta Walker, 1865 (*Plusiodonta*) South Africa
 P. nummaria Felder and Rogenhofer, *In F.F.R.* 1874 (*Plusiodonta*) South Africa
 P. tripartita Walker, 1865 (*Plusiodonta*) South Africa
P. nictites Hampson, 1902 (*Plusiodonta*) South Africa
P. nitissima Schaus, 1911a (*Plusiodonta*) Costa Rica
P. repellens (Walker, [1858] 1857a) (*Gadera*) Unknown
P. speciosissima (Holland, 1894) (*Deva*) Cameroon
P. stimulans (Walker, [1858] 1857a) (*Deva*) Dominican Republic
P. theresae Holloway, 1979 (*Plusiodonta*) New Caledonia
P. thomae Guenée, *In Boisduval and Guenée* 1852a (*Plusiodonta*) Virgin Islands
P. tripuncta (Bethune-Baker, 1906) (*Marcipa*) New Guinea
P. wahlbergi (Felder and Rogenhofer, *In F.F.R.* 1874) (*Plusia*) South Africa
 P. africana (Holland, 1894) (*Deva*) Gabon

TETRISIA Walker, 1867: 186

Type species: *Tetrisia florigera* Walker, by monotypy.

- T. florigera* Walker, 1867 (*Tetrisia*) Colombia
 T. magnifica (Schaus, 1911b) (*Graphigona*) Costa Rica
 T. roseifera (Felder and Rogenhofer, *In F.F.R.* 1874) (*Graphigona*) Brazil
T. tricolor (Sulzer 1776) [*Phalaena Noctua*] Tropical America

Genus and tribal placement undetermined

1. *Cecharismena* Möschler, 1890
 Cecharismena, Fibiger and Lafontaine 2005; misspelling
2. *Culasta* Moore, 1881a
3. *Goniapteryx* Perty, *In Spix* 1833
4. *Hemiceratooides*, Strand 1911
5. *Hypsoropha* Hübner, 1818
6. *Pharga* Walker, 1863
7. *Phyprosopus* Grote, 1872
8. *Psammathodoxa* Dyar 1921
9. *Radara* Walker, 1862

Acknowledgments

We thank Howard Frank, Ian Kitching, and Martin Honey for helpful comments and corrections to this manuscript. The authors thank Michael Fibiger and Hans Bänziger for numerous helpful discussions about Calpini and related taxa. We also thank the entomology library and collections staff at the British Museum of Natural History and University of Minnesota libraries for their assistance.

Literature cited

- Agassiz, L. [1847] 1846.** Nomenclator zoologici index universalis. Jent and Gassmann; Soldur. 393 p. viii.
- Bänziger, H. 1968.** Preliminary observations on a skin-piercing blood-sucking moth (*Calyptera eustrigata* (Hmps.) (Lep., Noctuidae)) in Malaya. Bulletin of Entomological Research 58: 159-163.
- Bänziger, H. 1971.** Bloodsucking moths of Malaya. Fauna 1: 3-16
- Bänziger, H. 1979a.** Skin-piercing blood-sucking moths II: studies on a further 3 adult *Calyptera* [*Calpe*] sp. (Lepid., Noctuidae). Acta Tropica 36: 23-37
- Bänziger, H. 1979b.** Descriptions of 3 new species of *Calyptera* Ochsenheimer (*Calpe* Treit.) (Lep. Noctuidae). Mitteilungen der Schweizerischen Entomologischen Gesellschaft 52: 107-108.
- Bänziger, H. 1982.** Fruit-piercing moths (Lep., Noctuidae) in Thailand: a general survey and some new perspectives. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 55: 213-240.
- Bänziger, H. 1983.** A taxonomic revision of the fruit-piercing and blood-sucking moth genus *Calyptera* Ochsenheimer = *Calpe* Treitschke (Lepidoptera: Noctuidae). Entomologica Scandinavica 14: 467-491.
- Bänziger, H. 1985.** Description *Othreis srivijayana* n. sp., and notes on related fruit-piercing moths of the Indomalayan region (Lep., Noctuidae). Heterocera Sumatrana 2: 41-48.
- Bänziger, H., and M. R. Honey. 1984.** Description of *Adris suthepensis* n. sp., a suspected fruit-piercing moth (Lepidoptera: Noctuidae) from N. Thailand and contiguous mountain regions. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 57: 173-177.
- Barnes, W. 1907.** New species of North American Lepidoptera. Canadian Entomologist 39: 10-15, 64-68, 93-989.
- Berio, E. 1956.** Appunti su alcune specie del genere *Calpe* Tr. (Lep. Noctuidae). Memorie della Società Entomologica Italiana 35: 109-119.
- Berio, E. 1966.** Nomi generici polispecifici di Noctuidae del globo con scelte di species tipo e osservazioni. Annali del Museo Civico di Storia Naturale Giacomo Doria 76: 42-67.
- Berio, E. 1970.** Diagnosi di nuove species exotiche di Noctuidae (Lepidoptera). Bollettino della Società Entomologica Italiana 102: 21-29.
- Bethune, C. J. S. 1865.** Descriptions of three new species of Canadian nocturnal Lepidoptera. Proceedings of the Entomological Society of Philadelphia 4: 213-215.
- Bethune-Baker, G. T. 1906.** New Noctuidae from British New Guinea. Novitates Zoologicae 13: 191-287.
- Billberg, G. J. 1820.** Enumeratio insectorum in Museo G. J. Billberg. Typis Gadelianus; Stockholm. 138 p. ii.
- Boisduval, J. B. A. D. de. 1832.** Voyage de découvertes de l'Astrolabe exécuté par ordre du Roi, pendant les années 1826-1827-1829 sous de commandement de M.J. Dumont D'Urville. Faune Entomologique d l'Ocean Pacifique. Première Partie, Lépidoptères. J. Tastu; Paris. 267 p.
- Boisduval, J. B. A. D. de. 1833.** Faune Entomologique de Madagascar, Bourbon et Maurice. Lépidoptères. Jules Didot L'aine; Paris. 122 p., 16 pls.
- Boisduval, J. B. A. D. de. 1840.** Genera et index methodicus Europaeorum Lepidopterorum. Roret; Paris. 238 p.
- Boisduval, J. B. A. D. de, and A. Guenée. 1852a.** Histoire naturelle de insectes, species général des Lépidoptères. Tome Cinquième, Noctuélites, Tome 1. Roret; Paris. 407 p.
- Boisduval, J. B. A. D. de, and A. Guenée. 1852b.** Histoire naturelle de insectes, species général des Lépidoptères. Tome Sixième, Noctuélites, Tome 2. Roret; Paris. 443 p.
- Boisduval, J. B. A. D. de, and A. Guenée. 1852c.** Histoire naturelle de insectes, species général des Lépidoptères. Tome Septième, Noctuélites, Tome 3. Roret; Paris. 441 p.
- Borkhausen, M. B. 1790.** Naturgeschichte der europaeischen Schmetterlinge nach systematischer Ordnung. Der Phalaenae erste Horden, die Spinner, Volume 3. Barrentrapp and Wenner; Frankfurt. 475 p.
- Butler, A. G. 1878a.** Descriptions of new species of Heterocera from Japan. Part-II. Noctuites. Annals and Magazine of Natural History, series 5, 1: 77-85, 161-169, 192-204, 287-295.
- Butler, A. G. 1878b.** Illustrations of typical specimens of Lepidoptera Heterocera in the collection of the British Museum, Volume 2. Taylor and Francis; London. 62 p., x, pls.

- Butler, A. G. 1881.** Descriptions of new genera and species of heterocerous Lepidoptera from Japan. *Transactions of the Entomological Society of London* 1881: 1-23, 171-200.
- Butler, A. G. 1882.** Descriptions of new species of Lepidoptera, chiefly from Duke-of-York Island and Great Britain. *Annals and Magazine of Natural History*, series 5, 10: 226-238.
- Butler, A. G. 1883.** On a collection of Indian Lepidoptera received from Lieut. -Colonel Charles Swinhoe; with numerous notes by the collector. *Proceedings of the Zoological Society of London* 1883: 144-175, 1 plate.
- Butler, A. G. 1886.** Descriptions of 21 new genera and 103 new species of Lepidoptera-Heterocera from the Australian region. *Transactions of the Entomological Society of London* 1886: 381-441, 2 pls.
- Butler, A. G. 1892.** On the *Ophideres princeps* of Guenée and its utter dissimilarity in structure and pattern from the *Ophideres princeps* of Boisduval. *Annals and Magazine of Natural History*, series 6, 9: 375-376.
- Butler, A. G. 1895.** *Adris sikhimensis*, a new form of the ophideroid group of noctuid moths. *Annals and Magazine of Natural History*, series 6, 15: 126.
- Chenu, J. 1857.** Encyclopédique d'histoire naturelle ou traité complet de cette science. Papillons nocturnes. Simon Racon et Cie.; Paris. 312 p., [4 unnumbered pages], 40 pls.
- Clerck, C. [1764] 1759.** Icones insectorum rariorum cum nominibus eorum trivialibus, locisque e C. Linnaei. [no publisher given]; Stockholm. pls. 13-55, Sectio Secundo.
- Cramer, P. 1775.** De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa, en America. S. J. Baalde; Amsterdam. Volume 1, p. 1-132.
- Cramer, P. 1776.** De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa, en America. S. J. Baalde; Amsterdam. Volume 2, p. 133-156.
- Cramer, P. 1777.** De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa, en America. S. J. Baalde; Amsterdam. Volume 2, p. 1-151.
- Cramer, P. 1780.** De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa, en America. S. J. Baalde; Amsterdam. Volume 3, p. 129-176.
- Cramer, P. 1782.** De uitlandsche kapellen voorkomende in drie waereld-deelen Asia, Africa, en America. S. J. Baalde; Amsterdam. Volume 4, p. 165-252.
- Dannehl, F. 1925.** Neue Formen und Lokalrassen. *Entomologische Zeitschrift* 39: 5-7, 11-12.
- Dognin, P. 1910.** Hétérocères nouveaux de l'Amérique du Sud. *Mémoires de la Société Entomologique de Belgique* 18: 151-188.
- Dognin, P. 1912.** Hétérocères nouveaux de l'Amérique du Sud. Fascicule VI. Oberthür; Rennes. 51 p.
- Donovan, E. 1804.** An epitome of the natural history of the insects of India, and the islands in the Indian Seas. T. Bensley; London. 70 p., 58 pls.
- Draudt, M. 1950.** Beiträge zur Kenntnis der Agrotiden-Fauna chinas. Aus den Ausbeuten Dr. H. Höne's (Beitrag zur Fauna Sinica). *Mitteilungen der Münchener Entomologischen Gesellschaft* 40: 1-174, 18 pls.
- Drury, D. 1782.** Illustrations of natural history wherein are exhibited upwards of two hundred and forty figures of exotic insects, according to their different genera: very few of which have hitherto been figured by any author, being engraved and coloured from nature, with the greatest accuracy, and under the author's own inspection on fifty copper-plates. Volume 3. B. White; London. 76 p., 50 pls.
- Duponchel, P. A. J. 1826.** Histoire naturelle des Lépidoptères ou Papillons de France. Volume 6. Firmin Didot; Paris. 475 p., pls. 72-100.
- Dyar, H. G. 1912.** Descriptions of new species and genera of Lepidoptera, chiefly from Mexico. *Proceedings of the United States National Museum* 42: 39-106.
- Dyar, H. G. 1914.** Lepidoptera of the Yale-Dominican expedition of 1913. *Proceedings of the United States National Museum* 47: 423-426.
- Dyar, H. G. 1921.** New American Noctuidae and notes (Lepidoptera). *Insecutor Inscitiae Menstruus* 9: 40-45.
- Edwards, H. 1884.** Notes on Mexican Lepidoptera, with descriptions of new species. *Papilio* 4: 75-80.
- Fabricius, J. C. 1775.** Systema entomologiae, sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus. Libraria Kortius; Flensburg. 832 p. + 28 unnumbered pages.

- Fabricius, J. C.** 1794. Entomologiae systematica emendata et aucta, secundum, classes, ordines, genera, species adjectis synonymis, locis, observationibus, descriptionibus. Volume 3, Part 2. C.G. Proft, fil et Soc.; Copenhagen. 349 p.
- Fawcett, J. M.** 1916. Notes on a collection of Heterocera made by Mr. W. Feather in British East Africa, 1911-13. Proceedings of the Zoological Society of London 1916: 707-737, 1 plate.
- Feige R.** 1976. Eine übersehene Noctuidae aus Malaysia: *Othreis kinabaluensis* n. sp. (Lep.). Entomologische Zeitschrift 86: 188-190.
- Felder, C.** 1861. Lepidopterorum amboienesium a Dre. L. Doleschall annis 1856-58 collectorum species novae diagnosibus collustratae a Dre. C. Felder. II. Heterocera. Sitzungsberichte der Kaiserlichen Akademie de Wissenschaften. Mathematisch-Naturwissenschaftliche Classe 43: 26-44.
- Felder, C., R. Felder, and A. F. Rogenhofer.** 1874. "Heft 4" plates 108-120. In: C. Felder, R. Felder, and A. F. Rogenhofer (eds.) ([“1864”] 1865-1875). Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859. Zoologischer Theil, Zweiter Band, Zweite Abtheilung: Lepidoptera. K.-k. Hof- und Staatsdruckerei; Vienna. pls. 1-140 with associated letter press.
- F. F. R.** 1874. Lepidoptera Atlas of the “Reise der Novara. (See Nässig and Speidel 2007).
- Fibiger, M., and D. Lafontaine.** 2005. A review of the higher classification of the Noctuoidea (Lepidoptera) with special reference to the Holarctic fauna. Esperiana Buchreihe zur Entomologie 11: 1-205.
- Geyer, C.** 1832. Zuträge zur Sammlung exotischer Schmetterlinge, bestehend in Bekanntmachung einzelner Geschlechter neuer oder seltener nichteuropäischer Arten. (Fortsebung des Hübner'schen Werkes). Viertes Hundert. J. Hübner; Augsburg. 48 p. figs. 601-800, 33 pls. issued [1826-1832].
- Goater, B., L. Ronkay, and M. Fibiger.** 2003. Catocalinae and Plusiinae. Noctuidae Europeae Vol. 10. Entomological Press; Sorø. 452 p.
- Godman, F. D., and O. Salvin.** 1887. Biologia Centrali-Americanana; or contributions to the knowledge of the fauna of Mexico and Central America. Zoology. Lepidoptera. Heterocera by H. Druce. Volume 1. Taylor and Francis; London. 490 p., pls. 1-64.
- Godman, F. D., and O. Salvin.** 1889. Biologia Centrali-Americanana; or contributions to the knowledge of the fauna of Mexico and Central America. Zoology. Lepidoptera. Heterocera by H. Druce. Volume 1. Taylor and Francis; London. 490 p., pls. 1-64.
- Graeser, L.** 1889. Beiträge zur Kentniss der Lepidopteren-Fauna des Amurlandes. Berliner Entomologische Zeitschrift 33: 251-268.
- Griveaud, P., and P. E. L. Viette.** 1960. Nouvelles espèces malgaches de noctuelles quadrifides (Lepidopteres). Bulletin de l'Academie Malgache, nouvelle serie 38: 53-62, 1 plate.
- Grote, A. R.** 1872. Descriptions of North American Noctuidae, no. 2. Transactions of the American Entomological Society 4: 89-108.
- Grote, A. R.** 1882. New checklist of North American Moths. [no publisher named]; New York. 73 p.
- Grote, A. R.** 1902. Die Gattungsname der europäischer Noctuiden. Allgemeine Zeitschrift für Entomologie 7: 395-400.
- Grünberg, K.** 1910. Eine Lepidoptera-Ausbeute von Kiwu-See. Societas Entomologica 24: 145-148.
- Guenée, A.** 1862. In: L. Maillard. Notes sur l'Île de la Réunion (Bourbon). Annex G. Lépidoptères. Dentu; Paris. 72 p., 2 pls.
- Hampson, G. F.** 1902. The moths of South Africa (Part II). Annals of the South African Museum 2: 255-446.
- Hampson, G. F.** 1907. The moths of India. Supplementary paper to the volumes in “The fauna of British India.” Series III, part III. Journal of the Bombay Natural History Society 17: 447-498, 645-677.
- Hampson, G. F.** 1913. Catalogue of the Lepidoptera Phalaenae of the British Museum, Volume 12. British Museum (Natural History). Taylor and Francis; London. 626 p., pls. 192-221.
- Hampson, G. F.** 1924. Descriptions of new genera and species of Trinidad and other S. American Noctuidae. Annals and Magazine of Natural History, series 9, 13: 425-454.
- Hampson G. F.** 1926. Descriptions of new genera and species of Lepidoptera Phalaenae of the subfamily Noctuinae (Noctuidae) in the British Museum (Natural History). Taylor and Francis; London. 641 p.
- Herrich-Schäffer, G. A. W. [1852] (1843-1856).** Systematische Bearbeitung der Schmetterlinge von Europa, zugleich als Text, Revision und Supplement zu Jakob Hübner's Sammlung europäischer Schmetterlinge. G. J. Manz; Regensburg. 6 vols.

- Hilgartner, R., M. Raoilison, W. Büttiker, D. C. Lees, and H. W. Krenn.** 2007. Malagasy birds as hosts for eye-frequenting moths. *Biology Letters* 3: 117-120.
- Hill, C. A.** 1924. Pacific coast Lepidoptera no. 1 (Noctuidae). Some apparently new species of moths in the family Noctuidae and one saturnid aberration from the southwestern United States. *Bulletin of the Southern California Academy of Sciences* 23: 182-186, 1 plate.
- Holland, W. J.** 1894. New and undescribed genera and species of West African Noctuidae. *Psyche* 7: 7-10, 27-34, 36, 47-50, 67-70, 83-90, 109-128, 141-144, 5 pls.
- Holland, W. J.** 1900. The Lepidoptera of Buru. Part II. Heterocera. *Novitates Zoologicae* 7: 555-591.
- Holloway, J. D.** 1979. A survey of the Lepidoptera, biogeography, and ecology of New Caledonia. W. Junk B.V. Publishers; The Hague. 588 p., 153 text figures, 87 pls.
- Holloway, J. D.** 2005. The Moths of Borneo, Parts 15 & 16 (Noctuidae: Catocalinae), subfamilies Euteliinae, Stictopterinae, Plusiinae, Pantheinae. Southdene Sendirian Berhad; Kuala Lumpur. 529 p.
- Hübner, J.** 1818. *Zutrage zur Sammlung exotischer Schmetterlinge, bestehend in Etundigung einzeiner Fliegmusten neuer oder rarer nichteuropäischer Gattungen. Erstes Hundert.* J. Hübner; Augsburg. 32 p. + 8 unnumbered pages, figures 1-200, 35 pls. published [1808-1818].
- Hübner, J. [1823]** 1816. *Verzeichniss bekannter Schmetterlinge.* J. Hübner; Augsburg. 431 p.
- Kaye, W. J.** 1922. New species of Trinidad moths. *Proceedings of the Zoological Society of London* 1922: 991-998, 1 plate.
- Kitching, I. J., and J. E. Rawlins.** 1998. The Noctuoidea. Lepidoptera, Moths and Butterflies, Vol. 1: Evolution, Systematics and Biogeography. Zoology, Vol. IV. Arthropoda: Insecta. *In: Handbuch der Zoologie/Handbook of Zoology* N. P. Kristensen (ed.). Walter de Gruyter; Berlin. p. 355-401.
- Kollar, V., and L. Redtenbacher.** 1844. Aufzählung und Beschreibung der von Freiherrn Carl v. Hügel auf seiner Reise durch Kaschmir und des Himalaya Gebirge gesammelten Insecten. *In: Kaschmir und das Reich der Siek* C. F. Hügel (ed.). Viertes Band; Stuttgart. p. 393-564, 28 pls.
- Krüger, E.** 1939. Elenco e descrizioni dei Lepidotteri raccolti nella Sirtica occidentale. *Annali del Museo Libico di Storia Naturale* 1: 320-357.
- Lafontaine, D., and M. Fibiger.** 2006. Revised classification of the Noctuoidea (Lepidoptera). *Canadian Entomologist* 138: 610-635.
- Linnaeus, C.** 1763. *Centuria Insectorum Rariorum.* 28. Upsalia. 32 p.
- Linnaeus, C.** 1767. *Systema naturae. Editio duodecima reformata.* Tom. I. Part II. L. Salvius; Stockholm. p. 533-1327, [37 unnumbered pages].
- Lucas, T. P.** 1894. Australian Lepidoptera: Thirty new species. *Transactions of the Natural History Society of Queensland* 1: 103-116.
- Mabille, M. P.** 1880. Diagnoses Lepidopterorum Malgassicorum. *Comptes Rendus des Séances de la Société Entomologique de Belgique* 23: 16-27.
- Mitchell, A., C. Mitter, and J. C. Regier.** 2006. Systematics and evolution of the cutworm moths (Lepidoptera: Noctuidae): evidence from two protein-coding nuclear genes. *Systematic Entomology* 31: 21-46.
- Moore, F.** 1877. The lepidopterous fauna of the Andaman and Nicobar Islands. *Proceedings of the Zoological Society of London* 1877: 580-632, 3 pls.
- Moore, F.** 1881a. Descriptions of new genera and species of Asiatic nocturnal Lepidoptera. *Proceedings of the Zoological Society of London* 1881: 326-380, 2 pls.
- Moore, F.** 1881b. On the genera and species of the lepidopterous subfamily Ophiderinae inhabiting the India region. *Transactions of the Zoological Society of London* 11: 63-76, 3 pls.
- Moore, F.** 1882. Descriptions of new Indian lepidopterous insects from the collection of the Late Mr. W.S. Atkinson. Heterocera (continued) (Cymatophoridae-Herminiidae). Part II. Taylor and Francis; London. 89-198 p., pls. 4-6.
- Moore, F.** 1883. Descriptions of some new genera and Asiatic Lepidoptera Heterocera. *Proceedings of the Zoological Society of London* 1883: 15-30, 2 pls.
- Moore, F. [1884] 1884-1887.** The Lepidoptera of Ceylon. Volume 3. L. Reeve and Co.; London. 578 p., pls. 144-215.
- Möschler, H. B.** 1880. Beiträge zur Schmetterlings-Fauna von Surinam. III. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 30: 379-486, 2 pls.

- Möschler, H. B.** 1883. Beiträge zur Schmetterlinge-Fauna des Kaffernlandes. Verhandlungen der k.k. Zoologisch-Botanischen Gesellschaft in Wien 33: 267-310, 1 plate.
- Möschler, H. B.** 1890. Die Lepidopteren-Fauna der Insel Portorico. Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft 16: 70-360, 1 plate.
- Nässig, W. A., and W. Speidel.** 2007. On the authorships of the Lepidoptera Atlas of the Reise der Novara, with a list of the taxa of Bombycoidea [s. l.] therein described (Insecta, Lepidoptera, Bombycoidea). *Senckenbergiana Biologica* 87: 63-74.
- Neumoegen, B.** 1891. New Rhopalocera and Heterocera. *Canadian Entomologist* 23: 122-126.
- Nye, I. W. B.** 1975. The generic names of the moths of the world. Volume I. Noctuoidea (part): Noctuidae, Agaristidae, and Nolidae. Unwin Brothers Ltd.; London. 568 p., 1 plate.
- Ochsenheimer, F.** 1816. Die Schmetterlinge von Europa. Volume 4. Gerhard Fleischer; Leipzig. 224 p.
- Okano, M.** 1964. New or little known moths from Formosa (5). *Tohoku Konchu (Morioka)* 1: 41-44, 1 plate (4).
- Pagenstecher, A.** 1886. Beiträge zur Lepidopteren-Fauna des malayischen Archipels. III. Jahrbücher des Nassauischen Vereins für Naturkunde 39: 104-194.
- Plötz, C.** 1880. Verzeichniss der vom Prof. Dr. R Bucholz in West-Africa gesammelten Schmetterlinge. (Schluss). *Entomologische Zeitung. Entomologischen Vereine zu Stettin* 41: 76-88.
- Poole, R. W.** 1989. *Lepidopterum Catalogus*, Fascicle 118, Noctuidae. E. J. Brill/Flora Fauna Publications; New York. 1314 p. in 3 parts.
- Poujade, G. A.** 1887. [no title]. *Bulletin de la Société Entomologique de France* 1887: 139.
- Prout, A. E.** 1922. On some apparently new species and forms of Noctuidae. Collected by C., F., and J. Pratt, in the mountains of central Ceram, October, 1919 to February, 1920. *Bulletin of the Hill Museum* 1: 193-251.
- Prout, A. E.** 1924. Some apparently new Noctuidae from Sumatra, New Guinea, Mefor, and Buru. *Bulletin of the Hill Museum* 1: 427-450, 3 pls.
- Prout, A. E.** 1928. Descriptions of some Indo-Australian Noctuidae. *Bulletin of the Hill Museum* 2: 256-270.
- Raymundo, B.** 1908. Lepidopterologia Brasileira una nova borboleta. *O Entomologista Brasileira* 1: 79-80.
- Rebel, H.** 1947. Neue Heteroceren aus Aegypten. *Zeitschrift der Wiener Entomologischen Gesellschaft* 32: 48-60.
- Robinson, G. S.** 1968. Some new species of Lepidoptera from the Fiji Islands. *Entomologist's Record and Journal of Variation* 80: 249-255, 1 plate.
- Robinson, G. S.** 1975. Macrolepidoptera of Fiji and Rotuma. A taxonomic and geographic study. Classey Ltd.; Faringdon. 362 p. 12 maps, 357 pls., 172 text figures, 6 p. index.
- Saalmüller, M.** 1880. Neue Lepidopteren aus Madagascar. *Bericht über die Senckenbergische Naturforschende Gesellschaft* 1879-1880: 258-310.
- Saalmüller, M.** 1891. Lepidopteren von Madagascar. Neue und wenig bekannte Arten zumeist aus der Sammlung der Senckenberg'schen Naturforschenden Gesellschaft zu Frankfurt am Main unter Berücksichtigung der gesammten Lepidopteren-fauna Madagascars. Werner and Winter; Frankfurt am Main. p. 249-531, pls. 7-14.
- Schaus, W.** 1898. New species of Noctuidae from tropical America. *Journal of the New York Entomological Society* 6: 107-120, 138-149.
- Schaus, W.** 1901. New species of Noctuidae from tropical America. *Annals and Magazine of Natural History*, series 7, 8: 38-51, 77-99.
- Schaus, W.** 1906. Descriptions of new South American moths. *Proceedings of the United States National Museum* 30: 85-141.
- Schaus, W.** 1911a. New species of Heterocera from Costa Rica - IV. *Annals and Magazine of Natural History*, series 8, 7: 33-84.
- Schaus 1911b.** New species of Heterocera from Costa Rica - IV. *Annals and Magazine of Natural History*, series 8, 7: 173-193.
- Schaus, W.** 1933. New species of Heterocera in the National Museum, Washington. *Annals and Magazine of Natural History*, series 10, 12: 368-387.

- Schwingenschuss, L.** 1938. A. Sechster Beitrag zur Lepidopterenfauna Inner-Anatoliens. Entomologische Rundschau 55: 181-184, 199-202, 223-226, 299-300, 337-340, 411-412, 454-457.
- Seitz, A.** 1913. Die Gross-Schmetterlinge der Erde. Die Gross Schmetterlinge des amerikanischen Faunengebietes Volume 6. Die amerikanischen Spinner und Schwärmer. Alfred Kernen; Stuttgart. 1452 p., 186 pls.
- Seitz, A.** 1940. Die Gross-Schmetterlinge der Erde. Afrikanischen Faunengebietes. Volume 15. Eulenartige Nachtfalter. Alfred Kernen; Stuttgart. 358 p., 41 pls.
- Sepp, J. C.** 1840. Surinamische Vlinders. Naar Het Leven Geteekend. Sepp and Son; Amsterdam. Part 1: p. 1828-1848, pls. 1-50; Part 2: [1832-1840], p. 109-224, pls. 51-100; Part 3: [1852]-1855, p. 225-328, pls. 101-152.
- Sepp, J. C.** 1848. Surinamische Vlinders. Naar Het Leven Geteekend. Sepp and Son; Amsterdam. Part 1: 1828-1848, pls. 1-50; Part 2: [1832-1840], p. 109-224, pls. 51-100; Part 3: [1852]-1855, p. 225-328, pls. 101-152.
- Snellen, P. C. T.** 1886. Beschrijvingen van nieuwe Oost-Indische Lepidopteren Heterocera. Tijdschrift voor Entomologie 29: 33-50, 2 pls.
- Spix, J. B. de.** 1833. Delectus animalium articulorum, quae in itinere per Brasiliam annis MDCCXCII-MDCCCXX jussu et auspiciis Maximiliani Josephi I. Bavariae Regis augustissimi peracto, etc. Frid. Fleischer; Leipzig. p. 44, 224, 40 pls.
- Staudinger, O.** 1892. Die Macrolepidopteren des Amurgebiets. I. Theil. Rhopalocera, Sphinges, Bombyces, Noctuae. Mémoires sur les Lépidoptères 6: 83-658, 10 pls.
- Stoll, C.** 1790. Aahangsel van het Werk, de Uitlandsche Kapellen, Voorkomende in Drie Waereld-Deelen Asia, Africa, en America. Nic. Th. Gravius; Amsterdam. p. 1-42 [1787]; p. 43-184 [1790].
- Strand, E.** 1909. Lepidoptera aus Deutsch-Ostafrika gesammelt von Herrn Oberleutnant Wintgens. Deutsche Entomologische Zeitschrift Iris 22: 104-121.
- Strand, E.** 1911. Fünf neue exotische Heterocera. Fauna Exotica 1: 41-43.
- Strand, E.** 1919. H. Sauter's Formosa-Ausbeute: Noctuidae I. Archiv für Naturgeschichte 83: 129-162.
- Sulzer, J. H.** 1776. Dr. Sulzer's Abgekürzte Geschichte der Insecten nach dem Linnaeischen [sic] System. Erster Theil, Zurich, 274 p.
- Swinhoe, C.** 1884. On the Lepidoptera collected at Kurrachee. Proceedings of the Zoological Society of London 1884: 503-529.
- Swinhoe, C.** 1918. New species of Indo-Malayan Heterocera, and descriptions of genitalia, with reference to the geographical distribution of species resembling each other. Annals and Magazine of Natural History, series 9, 2: 65-95, 4 pls.
- Tams, W. H. T.** 1924. List of the moths collected in Siam by E.J. Godfrey B. Sc., F.E.S. Journal of the Natural History Society of Siam 6: 229-289, 1 plate.
- Todd, E. L.** 1959. The fruit-piercing moths of the genus *Gonodonta* Hübner (Lepidoptera: Noctuidae). Technical Bulletin No. 1201. Agricultural Research Service United States Department of Agriculture; Washington D.C. 52 p., 12 pls.
- Todd, E. L.** 1973. Two new species of *Gonodonta* Hübner (Lepidoptera: Noctuidae). Proceedings of the Biological Society of Washington 86: 243-246.
- Treitschke, F.** 1825. Die Schmetterlinge von Europa. Volume 5. Abtheilung 2. Gerhard Fleischer; Leipzig. 448 p.
- Turner, A. J.** 1908. New Australian Lepidoptera of the families Noctuidae and Pyralidae. Transactions and Proceedings of the Royal Society of South Australia 32: 55-120.
- Viette, P. E. L.** 1956. Description de nouvelles espèces de noctuelles quadrifies. Mémoires de l'Institut Scientifique de Madagascar, Série E, 7: 117-139.
- Viette, P. E. L.** 1968. Noctuelles quadrifies de Madagascar nouvelles ou peu connus, III. [Lep. Noctuidae]. Lambillionea 67: 9-20.
- Walker, F.** [1858] 1857a. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 12. Edward Newman; London. p. 764-982.
- Walker, F.** [1858] 1857b. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 13. Edward Newman; London. p. 983-1236.
- Walker, F.** 1858. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 15. Edward Newman; London. p. 1521-1888.

- Walker, F.** 1862. Characters of undescribed Lepidoptera in the collection of W.W. Saunders, esq. Transactions of the Entomological Society of London, series 3, 1: 70-128.
- Walker, F.** 1863. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 27. Edward Newman; London. p. 1-286.
- Walker, F.** [1865] 1864. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 31. Edward Newman; London. p. 1-321.
- Walker, F.** 1865. List of the specimens of lepidopterous insects in the collection of the British Museum. Volume 33. Edward Newman; London. p. 707-1120.
- Walker, F.** 1867. Characters of undescribed heterocerous Lepidoptera. Journal of the Proceedings of the Linnean Society 9: 181-199.
- Walker, F.** 1869a. Characters of undescribed Lepidoptera Heterocera. E. W. Janson; London. 112 p.
- Walker, F.** 1869b. In: T. Chapman. On some lepidopterous insects from Congo. Proceedings of the Natural History Society of Glasgow, series 2, 1: 325-378, 3 pls.
- Weber, F.** 1801. Observationes entomologicae, continentis novorum quae condidit generum characteres et nuper detectarum specierum descriptiones. Academicus Novus Kiel. 116 p.
- Wileman, A. E.** 1922. On a new species of genus *Calpe* from Japan. Entomologist 56: 197-199.
- Yoshimoto, H.** 1999. A new species of the genus *Othreis* Hübner (Noctuidae, Ophiderinae) from Myanmar. Transactions of the Lepidopterological Society of Japan 50: 60-62.
- Zaspel, J. M.** 2008. Systematics, biology, and behavior of fruit-piercing and blood-feeding moths in the subfamily Calpinae (Lepidoptera: Noctuidae). Ph.D. dissertation, University of Florida, Gainesville.
- Zaspel, J. M.** [in press]. Skin-piercing and blood-feeding moths. In: Encyclopedia of Entomology J. L. Capinera (ed.). Springer; Dordrecht.
- Zaspel, J. M., V. S. Kononenko, and P. Z. Goldstein.** 2007. Another blood feeder? Experimental feeding by a fruit-piercing moth on human blood in the Primorye Region of Far Eastern Russia. Journal of Insect Behavior 20: 437-451.
- Zaspel, J. M., H. Bänziger, and M. A. Branham [submitted].** A comparative survey of proboscis morphology and associated structures in fruit-piercing and blood-sucking moths in the subfamily Calpinae (Lepidoptera: Noctuidae). Zoomorphology.
- Zayas, F.** 1965. Dos nuevas especies de insectos cubanos de los ordres Lepidoptera (Noctuidae) y Orthoptera (Tettigoniidae). Poeyana, series A, 5: 1-8 figures.
- Zilli, A., and W. Hogenes.** 2002. An annotated list of the fruit-piercing moth genus *Eudocima* Billberg, 1820 (sensu Poole) with descriptions of four new species (Lepidoptera: Noctuidae, Catocalinae). Quadrifina 5: 153-207.

Received July 3, 2008; accepted September 11, 2008.

