LEPIDOPTERA NEWS, 2003 (1-2): 29-30 (2005)

DISTRIBUTION NOTES ON TAIWAN MOTHS, 5. *UDEA STIGMATALIS* (LEPIDOPTERA: PYRALIDAE: PYRAUSTINAE)

J. B. HEPPNER [1]

Florida State Collection of Arthropods, DPI, FDACS, P.O. Box 147100, Gainesville, Florida 32614-7100, USA

ABSTRACT.– Notes are provided on specimens newly recorded from Taiwan of the Japanese species, *Udea stigmatalis* (Wileman). A Taiwan subspecies is described: *Udea stigmatalis tayulingensis* **n. subsp.**

KEYWORDS: Asia, China, East Asia, Japan, Oriental, ***Udea stigmatalis tayulingensis*** n.subsp., taxonomy.

The genus *Udea* includes many species from around the world. For Taiwan, the Taiwan catalog of 1992 (Heppner and Inoue, 1992) listed 5 species then known for the island. Some nomenclatural changes will be noted for some of the species in the catalog update (Heppner, 2005). Herein, collection records from the Taiwan Lepidoptera Survey are recorded for another *Udea* species new for Taiwan, being a high altitude example of the Japanese faunal influence in Taiwan, *Udea stigmatalis* (Wileman, 1911), originally described from Japan. Thus far, all specimens in Taiwan have only been taken at 2000-2570m elevation. Inoue *et al.* (1982) illustrate the species from Japan. The species has until now not been recorded outside of Japan.

All specimens reported on below are from the Taiwan Lepidoptera Survey, currently housed at the Florida State Collection of Arthropods (FSCA), Gainesville, Florida. A new Taiwan subspecies is described for the Taiwan populations of *U. stigmatalis*.

Udea stigmatalis tayulingensis Heppner, **n. subsp.**

Adult similar in size (male 22-24mm wingspan, female 22-26mm) to Japanese specimens, with similar wing maculation: body and forewing coloration fuscous (abdomen paler) with pale irrorations on FW, with basal suffusion of rust-brown to mid-costal region, with 2 irregular fuscous spots about midwing on radius. HW pale translucent white with apical gray area and small subterminal line, plus a small fuscous spot midwing. Female similar but FW spots somewhat larger than in male.

Holotype male: TAIWAN.– Nantou Co.: Tayuling (2570m), 5-9 Jun 1982, J.B.Heppner. Deposited with the National Taiwan Museum, Taipei, Taiwan (on indefinite loan to the Florida State Collection of Arthropods, Gainesville, Florida).

Paratypes (33 ♂, 30 ♀): TAIWAN.– *Hsinchu Co.*: Kuangwu For. Sta. (2000m), 18-25 Aug 1988 (1 ♂), J. B. Heppner & H.-Y. Wang. *Kaohsiung Co.*: Tienchih (2210m), 24 Oct 1984 (7 ♂, 2 ♀), J. B. Heppner & H.-Y. Wang. *Nantou Co.*: Tayuling (2570m), 5-9 Jun 1982 (9 ♂, 7 ♀); 10-14 Jun 1982 (6 ♂, 12 ♀); 15-18 Jun 1982 (9 ♂, 8 ♀), J. B. Heppner. Meifung Hort. Sta. (2100m), 6-10 Sep 1988 (1 ♂, 1 ♀), J. B. Heppner & H.-Y. Wang.

Etymology.– Named after the town of Tayuling, Taiwan.

Distribution.– Japan and Taiwan.

Notes.– The species *U. stigmatalis* seems related to two European species that have some resemblance to it, *Udea prunalis* ([Denis & Schiffermüller]) and *U. inquinatalis* (Lienig & Zeller). Males of the European *U. olivalis* ([Denis & Schiffermüller]) also have some resemblance to *U. stigmatalis*. In all these cases, the European species have some markings that are similar but nonetheless are all gray in general coloration, while *U. stigmatalis* in Japan and Taiwan have shades of brown on the forewings. In Japan, the species is generally somewhat larger than in Taiwan and more brownish overall. The biology of the *U. stigmatalis* remains unknown. *Udea* species in general are known to be leaf-feeders on herbaceous plants, and some species also feed on various hardwood trees.

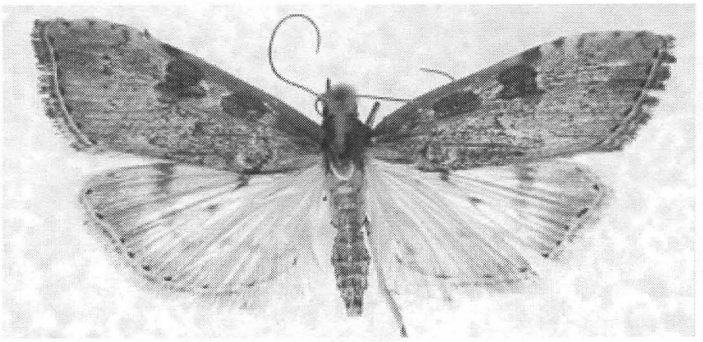


Fig. 1. Paratype female of *Udea stigmatalis tayulingensis*.

1. Contribution No. 998, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv., Gainesville, Florida.

ACKNOWLEDGMENTS

The Taiwan Lepidoptera Survey project began in 1980 with organizational meetings at the National Taiwan Museum (then called the Taiwan Provincial Museum), in Taipei, by J. F. G. Clarke (Smithsonian Institution, Washington, DC), and the first survey trip was by Dr. Don R. Davis, Smithsonian Institution, Washington, DC, in 1981. All subsequent trips were by the author, since 1982, and were primarily funded by two National Science Foundation grants (INT-8119539 and INT-8721716), plus survey grants from the Smithsonian Institution and added support from the Florida State Collection of Arthropods, Division of Plant Industry, Florida Dept. of Agriculture and Consumer Services, Gainesville, Florida. In Taiwan, project support has been primarily from the National Taiwan Museum, Taipei, and the Taiwan Forestry Research Institute, Taipei, and their entomology staffs, as well as a publication grant from the Pacific Cultural Foundation, Taipei. Special thanks to H.-Y. Wang, National Taiwan Museum, for facilitating all field trips in Taiwan since 1982. Principal housing of survey specimens is with the Florida State Collection of Arthropods, Gainesville, Florida, for the study of the collections, plus samples at the Smithsonian Institution and the National Taiwan Museum, Taipei.

REFERENCES

Heppner, J. B.
2005. *Part 1: Introduction and Faunal Synopsis. In* J. B. Heppner and H. Inoue (eds.), *Lepidoptera of Taiwan. Volume 1*. Gainesville: Assoc.

Trop. Lepid. 215+80pp (76 pl.).

Heppner, J. B., and H. Inoue (eds.)
1992. *Lepidoptera of Taiwan. Volume 1. Part 2: Checklist.* Gainesville: Assoc. Trop. Lepid. 276pp.

Inoue, H., S. Sugi, H. Kuroko, S. Moriuti, and A. Kawabe
1982. *Moths of Japan.* Tokyo: Kodansha. 2 v. (392 pl.). [in Japanese]

Wileman, A. E.
1911. New and unrecorded species of Lepidoptera Heterocera from Japan. *Trans. Ent. Soc. London*, 1911:189-407, pl. 30-31.

LEPIDOPTERA NEWS, 2003 (1-2): 31-42 (2005)

PRIMITIVE SEDGE MOTHS FROM NEW ZEALAND AND TASMANIA: TRANSFER OF *PRODITRIX* AND RELATIVES TO ORTHOTELIINAE (LEPIDOPTERA: GLYPHIPTERIGIDAE)

J. B. HEPPNER[1]

Florida State Collection of Arthropods, DPI, FDACS, P.O. Box 147100, Gainesville, Florida 32614-7100, USA

ABSTRACT.– The New Zealand genera, *Charixena* Meyrick, *Doxophyrtis* Meyrick, *Proditrix* Dugdale, *Protosynaema* Meyrick, and *Titanomis* Meyrick, in the past thought to be in Plutellidae or other families, are transferred to subfamily Orthoteliinae of the family Glyphipterigidae as the first non-European Orthoteliinae, a highly significant finding for elucidating the evolution of Glyphipterigidae and the superfamily Yponomeutoidea. *Orthotelia*, previously the only known member of primitive sedge moths (subfamily Orthoteliinae), shows many adult and larval characters that align it with the New Zealand *Proditrix* complex of genera and species. The Southern Hemisphere contingent of Orthoteliinae is seen as a relictual group within Glyphipterigidae, present thus far only in the ancient refugium of New Zealand, with one species in Tasmania. Adults are diurnal or crepuscular. Larvae of Orthoteliinae are borers in monocot hostplants (except for the single species in Tazmania feeding on a lower dicot plant), while most species in the subfamily Glyphipteriginae that are known biologically (95% of species in the family remain unknown biologically) are borers or leafminers, mostly also in monocot hostplants such as sedges and grasses.

KEY WORDS: *Abrenthia*, Acrolophidae, Asia, Australia, biology, Brachodidae, *Carmentina*, *Caunaca*, *Charixena*, China, Choreutidae, cocoon, Colombia, Costa Rica, *Cotaena*, Cyperaceae, *Diploschizia*, *Doxophyrtis*, *Drymoana*, Epacridaceae, Ericales, Europe, Japan, Glyphipteriginae, *Glyphipterix*, Gramineae, *Hierodoris*, hostplants, Immidae, Immoidea, Japan, Lacturidae, larvae, *Lepidotarphius*, morphology, *Neomachlotica*, Neotropical, Noctuidae, Noctuoidea, *Ochsenheimeria*, Ochsenheimeriidae, Oecophoridae, Oriental, *Orthotelia*, Pandanaceae, Palearctic, *Plutella*, Plutellidae, Praydinae, *Prays*, *Proditrix*, *Protosynaema*, Psychidae, pupae, *Sericostola*, Sesioidea, Taiwan, Tasmania, taxonomy, Tineidae, Tineoidea, *Titanomis*, USA, Urodidae, Yponomeutidae, Yponomeutoidea, Ypsolophinae, Zygaenidae, Zygaenoidea.

When the family Glyphipterigidae was first delineated to modern taxonomic standards (Heppner, 1977, 1982a), a number of genera incongruously named or organized within the family by E. Meyrick (1914) were transferred to other families (Heppner, 1982b). Types and descriptions of 272 supposed or historically associated Glyphipterigidae genera were previously studied (Heppner, 1982b), and then transferred to 25 different families as diverse as Psychidae (Tineoidea) and Zygaenidae (Zygaenoidea), even small Noctuidae (Noctuoidea), plus large contingents to Choreutidae and Brachodidae (Sesioidea), and many tropical genera to such families as Attevidae (Yponomeutoidea), Immidae (Immoidea), Lacturidae (Zygaenoidea), and Urodidae (Sesioidea) (Heppner, 1981a, 1982b, 1982c, 1995, 1996; Kyrki, 1988, 1990). Genera remaining in Glyphipterigidae were a fairly homogeneous group that have retained their status (Heppner, 1982a), with the most speciose and worldwide genus being *Glyphipterix* (often misspelled as *Glyphipteryx* in older literature).

It was not until Kyrki (1984) began his studies of Yponomeutidae that this further grouping of unrelated genera was found needing re-study, and where he also had to transfer various genera to other families, although some went to what now can be considered subfamilies of Yponomeutidae, or Plutellidae (e.g., Ypsolophinae). Later, Kyrki and Itämies (1986) discovered in their study of the biology and morphology of the unusual misplaced and monobasic European genus *Orthotelia* Stephens (often misspelled as *Orthotaelia*), that this represented the most primitive sedge moth, and transferred the genus as a new glyphipterigid subfamily, Orthoteliinae. Meyrick's (1895) summary of British Lepidoptera had *Orthotelia* as a genus of Plutellidae, although his concept of this family was equivalent to half of what now are considered part of the superfamily Yponomeutoidea, plus the genera that now are in Choreutidae. Spuler (1910) already had the genus in its own subfamily, Orthoteliinae, but within Plutellidae. Older works, as summarized by Kyrki and Itämies (1986), had *Orthotelia* placed among other groups since Stephens first named the genus in 1829 (the single species was first described in 1794), even as disparate as Gelechiidae and Tineidae, and sometimes in its own monobasic family. None of these works, including later works by Meyrick (1895) and Spuler (1910), made any significant phylogenetic comments about the genus or offered much of a solution as to its affinities, other than a generalized phylogenetic schematic by Meyrick (1895) showing *Orthotelia* basal to lineages to what now are Yponomeutidae and Plutellidae. In his world catalog for the yponomeutid complex, Meyrick (1914) still retained the genus in Plutellidae. *Orthotelia* are larger and different in appearance from typical sedge moths of the subfamily Glyphipteriginae, but conform to the fundamental morphology of the family, as the subfamily Orthoteliinae.

In my earlier paper on generic transfers out of the older concept of Glyphipterigidae (Heppner, 1977), two Meyrick genera from New Zealand, *Charixena* and *Protosynaema*, appeared to belong best in Plutellidae and were retained or transferred to that family based on adult characters. Meyrick had described *Protosynaema* in 1886 (named in 1885) and placed it tentatively in Plutellidae (Meyrick, 1914). *Doxophyrtis* Meyrick (1914) was also described as Plutellidae, but Meyrick stated he thought it was related to Glyphipterigidae. It was not until a paper by Dugdale (1987a), on a new complex of strange New Zealand moths which he named in the new genus *Proditrix* and which he grouped together with some other unusual New Zealand species of related genera described by Meyrick — *Charixena*, *Doxophyrtis*, and *Protosynaema* — that it became evident to me that this group of New Zealand taxa actually represented the first non-European Orthoteliinae.

On adult characters, it could be possible to maintain *Proditrix* and relatives as Plutellidae, as Dugdale (1987a) thought (he used Plutellinae as a subfamily of Yponomeutidae), since to some extent the often plesiomorphic characters partially overlap in the families

[1] Contribution No. 954, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv., Gainesville, FL.

we are discussing, but the larval and pupal morphology, and their biologies, clearly are unknown for Plutellidae. Kyrki (1990) made further studies on possible evolutionary lineages in Yponomeutoidea, based on a cladification of the groups involved, later reviewed by Dugdale *et al.* (1999). All four of these New Zealand genera are borers in the leaf crowns of monocot hostplants (Dugdale, 1987a; Hudson, 1928), something unknown for Plutellidae, which typically are leaf skeletonizers on dicot plants (a small group are flower borers). Although it is not unusual to find strange tropical species that require us to alter the concept of Lepidoptera families, which were originally based mostly on European species, a study of the morphology of these New Zealand species demonstrates that they conform to Orthoteliinae and need a transfer to Glyphipterigidae to join *Orthotelia* as the most primitive of the sedge moths. Table 1 notes the main characters demonstrating the new assignments to Glyphipterigidae for the New Zealand species. Clearly, they represent evolutionary elements that are basal to much of the Yponomeutoidea.

Dugdale (1987a) noted a fauna of 12 species in New Zealand in the *Proditrix* group of genera, plus an undescribed species from Tasmania that he thought was possibly related to *Doxophyrtis*. Together with species Dugdale (1987a) transferred to his new genus, *Proditrix*, the check list below includes all species now transferred to Orthoteliinae, plus the one from Tasmania recently described as another species of *Proditrix* (McQuillan, 2003). Dugdale (1987a) included the New Zealand species, *"Hierodoris" stellata* Philpott, as the 12th member of this group; this species needs further study to confirm its generic placement. The genus *Hierodoris* Meyrick otherwise belongs in Oecophoridae (Dugdale, 1988; Heppner, 1977).

The species *Proditrix tetragona* (Hudson), was originally described in the genus *Titanomis* Meyrick and thought to belong in Tineidae, but Dugdale (1987a) verified this as belonging in his new genus *Proditrix*. The only actual known *Titanomis* species, *Titanomis sisyrota* Meyrick, previously left unclassified (Dugdale, 1988), is also a very rare species from the highlands of New Zealand. This species in the past was referred to Psychidae or even Cossoidea, due to its combination of primitive characters. The original description by Meyrick (1888) tentatively placed the genus in his concept of Anaphoridae (now Acrolophidae), and was maintained there by Dalla Torre and Strand (1929) in their catalog of Psychidae but which then included Anaphorinae. Further notes by Hudson (1928), and the known characters of *T. sisyrota*, lend credence to it also being in Orthoteliinae, and is hereby transferred to the *Proditrix* group. Dugdale (1987a) noted that *Titanomis* has 4-segmented maxillary palpi and lacks ocelli, among other characters now seen as close to *Orthotelia*. The biology and larvae are not known but the noted habitat is similar to that of the other New Zealand Orthoteliinae, namely montane wet grasslands (Hudson, 1928). It is even slightly larger than *P. tetragona* and also appears similar in wing maculation (illustrated by Hudson, 1928).

Whereas the type-species of the genera were examined for adult characters for my generic study of Glyphipterigidae (Heppner, 1977), other species were not all examined. Thus, it remains uncertain if some odd species, like *Protosynaema steropucha* Meyrick (Fig. 9) belong in the genus and in Glyphipterigidae, since the greatly thickened antennae are anomalous for the family. However, based on Dugdale's (1987a) analysis, these species are all placed correctly to genus, and can thus herein be transferred to Orthoteliinae, but perhaps individually needing further study. However, the undescribed species from Tasmania mentioned by Dugdale (1987a) as possibly related to *Doxophyrtis* from New Zealand, and now named as *Proditrix nielseni* McQuillan (2003), feeds on an ericaceous-group tree (family Epacridaceae) and not a monocot, so odd species sometimes do not conform to previous views. Although a few other sedge moths around the world are also known to feed on dicot plants, such as Piperaceae and Urticaceae (Diakonoff, 1986; Heppner, 1982a, in prep. a), most feed on monocots.

Most species in the family are not known biologically, so while the Holarctic and south temperate Glyphipterigidae have so far mainly been recorded on sedges, rushes and grasses, the tropical species that we know biologically thus far feed on more diverse plants, as just noted, but most species remain unknown biologically and detailed larval descriptions are even more scarce. At least for New Zealand Orthoteliinae, most appear to inhabit higher elevations with wet grasslands. The new species from Tasmania likewise occurs in a montane south temperate rainforest habitat (McQuillan, 2003).

As adults, most sedge moths are diurnally active (Heppner, 1981b, 1982a, 1985a, 2004, in prep. a). *Orthotelia* adults fly at dusk according to Kyrki and Itämies (1986). Dugdale (1987a) mentions some of the *Proditrix* species being collected at lights and also in flight traps, but it is likely most of these moths are crepuscular in adult activity. Typical Glyphipteriginae adults can be taken at lights as well, if one is near one of their resting sites at night, even though they are otherwise diurnal in activity. Hudson (1928) also notes species of what now are in the *Proditrix* complex as being taken at lights, but his text is often unclear whether any are also found during the day or at dusk. He notes diurnal activity, however, for the *Protosynaema* species. For *Doxophyrtis*, Hudson (1928) notes adults resting on hostplants during the day but is unclear if they otherwise are active diurnally or only at dusk. His notes on *Charixena* are very detailed about the larval life history, as well as the cocoon, but has no clear notes on adult activity. In Tasmania, McQuillan (2003) found the adults of the new *Proditrix* species there to be unwilling fliers, very sluggish and behaviorally adapted to death feints when disturbed among the leaves of their hostplant, and thus far not taken at lights, but no normal flight activity was recorded for this species.

One reason many of the *Proditrix* complex species seem to be rare may well be that they are active during the day or are crepuscular and are often in remote mountains, and thus not often taken at lights. Most moth collectors in general do not actively search for day-flying or crepuscular moths, if at all.

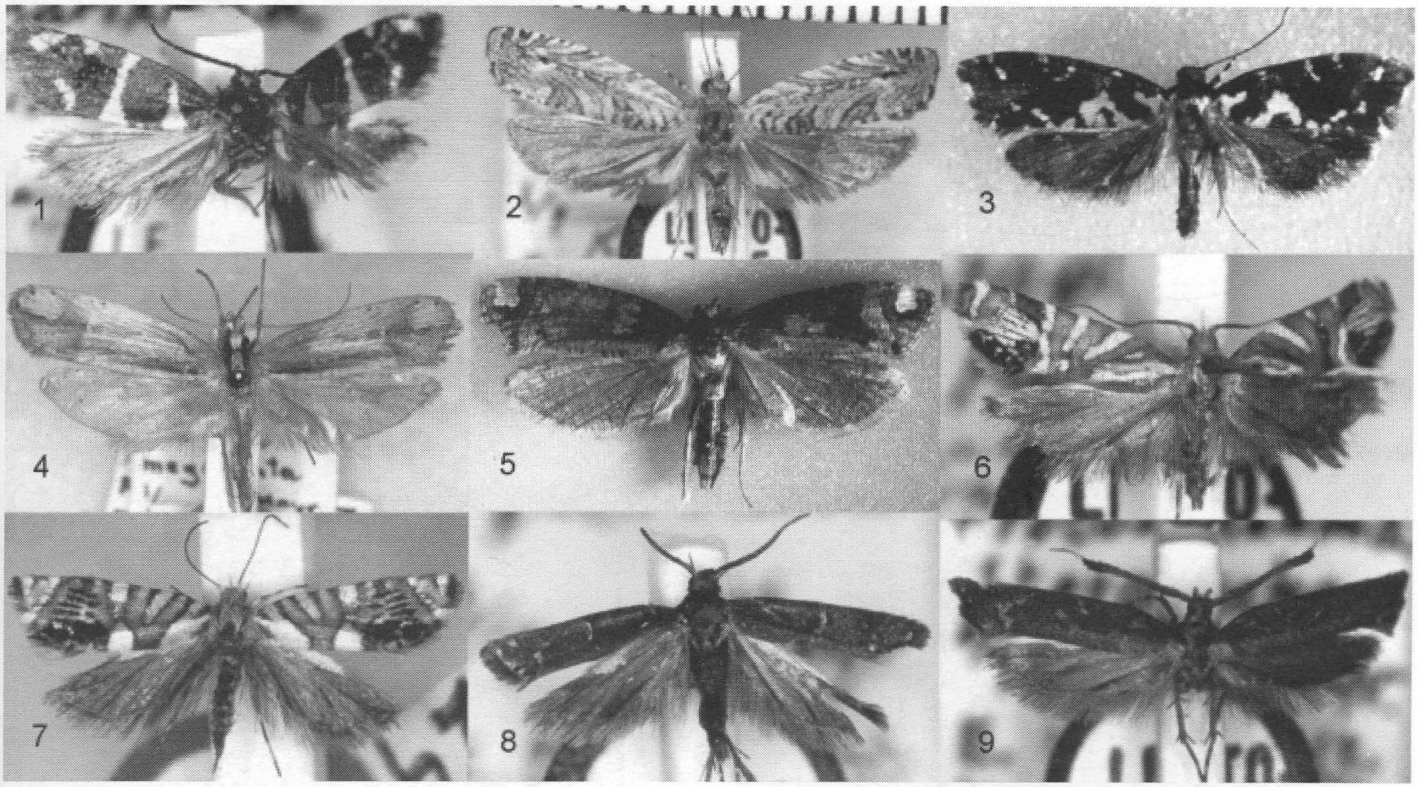


Fig. 1-9. Adults of New Zealand Orthoteliinae: 1. *Charixena iridoxa* (Meyrick), lectotype female (BMNH) (ca. 17mm). 2. *Doxophyrtis hydrocosma* Meyrick, lectotype male (BMNH) (ca. 20mm). 3. *"Hierodoris" stellata* Philpott, holotype male (NMNZ) (ca. 20mm). 4. *Proditrix megalynta* (Meyrick), holotype male (BMNH) (ca. 35mm). 5. *Proditrix tetragona* (Hudson), holotype female (NMNZ) (ca. 55mm). 6. *Protosynaema eratopis* Meyrick, lectotype male (BMNH) (ca. 16mm). 7. *Protosynaema hymenopis* Meyrick, holotype female (BMNH) (ca. 11mm). 8. *Protosynaema quaestuosa* Meyrick, lectotype male (BMNH) (ca. 16mm). 9. *Protosynaema steropucha* Meyrick, lectotype male (BMNH) (ca. 17mm).

ORTHOTELIINAE

ORTHOTELIA Stephens, 1829
TS: *Depressaria venosa* Haworth, 1811
Orthotelia Stephens, 1829, redesc.
Orthotaelia Stephens, 1834, emend.
Agoniopteryx Treitschke, 1835
TS: *Haemylis sparganiella* Treitschke, 1832
Caulobius Duponchel, 1838
TS: *Haemylis sparganiella* Treitschke, 1832

sparganella (Thunberg, 1788) (*Tinea*)	Sweden
sparganella (Thunberg, 1794) (*Tinea*), redesc.	Sweden
venosa (Haworth, 1811) (*Depressaria*)	England
tostella (Hübner, [1824]) (*Tinea*)	Germany
sparganiella (Treitschke, 1832) (*Haemylis*)	?Hungary

TITANOMIS Meyrick, 1888
Titonomis Dalla Torre & Strand, 1929, missp.
TS: *Titanomis sisyrota* Meyrick, 1888

sisyrota Meyrick, 1888	New Zealand

PRODITRIX Dugdale, 1987
TS: *Plutella megalynta* Meyrick, 1915

chionochloae Dugdale, 1987	New Zealand
gahniae Dugdale, 1987	New Zealand
megalynta (Meyrick, 1915) (*Plutella*)	New Zealand
nielseni McQuillan, 2003	Tasmania
tetragona (Hudson, 1918) (*Titanomis*)	New Zealand
tetragma Dugdale, 1999, missp.	

DOXOPHYRTIS Meyrick, 1914
TS: *Doxophyrtis hydrocosma* Meyrick, 1914
Doxophyrtis Meyrick, 1914, nom. nud.

hydrocosma Meyrick 1914	New Zealand
hydrocosma Meyrick, 1914, nom. nud.	

[New genus]
Hierodoris auct.

stellata (Philpott, 1918) (*Hierodoris*)	New Zealand

CHARIXENA Meyrick, 1920
TS: *Philpottia iridoxa* Meyrick, 1916
Philpottia Meyrick, 1916, preocc.
Charixena Meyrick, 1921, redesc.
Charizena [sic] Neave, 1939, missp.

iridoxa (Meyrick, 1916) (*Philpottia*)	New Zealand

PROTOSYNAEMA Meyrick, 1885
Protosynaema Meyrick, 1886
TS: *Protosynaema eratopis* Meyrick, 1886

eratopis Meyrick, 1886	New Zealand
hymenopis Meyrick, 1935	New Zealand
matutina Philpott, 1928	New Zealand
quaestuosa Meyrick, 1924	New Zealand
steropucha Meyrick, 1886	New Zealand

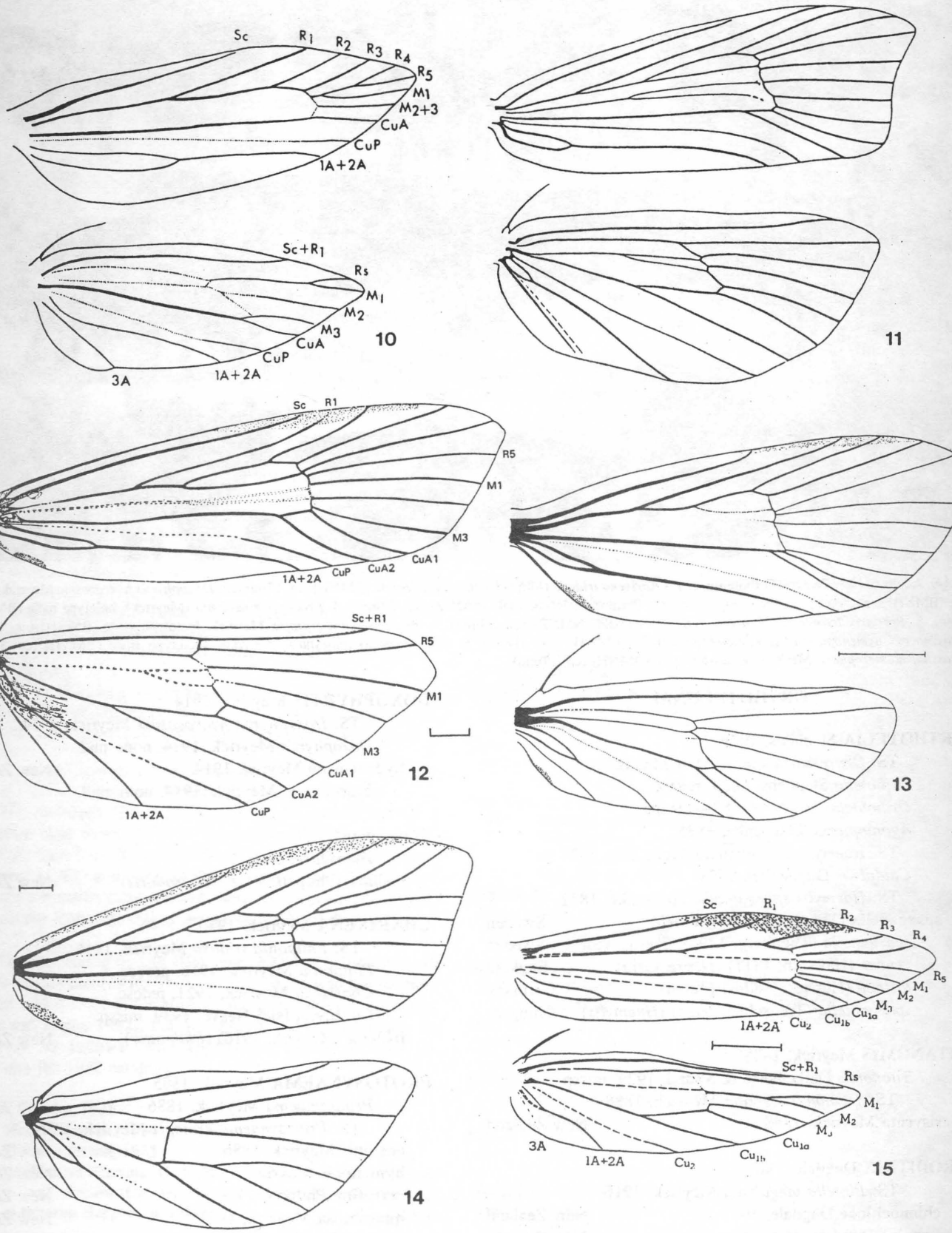


Fig. 10-15. Wing venations (Glyphipterigidae: Orthoteliinae and others as noted): 10) *Ochsenheimeria vacculella* Fischer von Röslerstamm (Ochsenheimeriidae), Europe (after Davis, 1975). 11) *Orthotelia spraganella*, Europe (after Spuler, 1910). 12) *Proditrix megalynta*, New Zealand (after Dugdale, 1987a). 13) *Glyphipterix quadragintapunctata* Dyar (Glyphipteriginae), USA (after Heppner, 1985). 14) *Sericostola rhodanopa* Meyrick (Glyphipteriginae), Colombia (after Heppner, 1990). 15) *Plutella xylostella* (Linnaeus) (Plutellidae), Eurasia (after Moriuti, 1977). Lines equate to 1mm for those figures with a line shown (others to various scales).

TABLE 1. Characters of Orthoteliinae in relation to Ochsenheimeriidae, Glyphipteriginae, and Plutellidae.

	Ocelli	Maxillary Palpi	Pupal Spines	Larval L-Group	Larval anal shield	Larval Prolegs	Larval Crochets	Larval A8 Spiracle	Larval Feeding	R1 spur vein
Ochsenheimeria	+	2	-	3	+	S	U/T1	N	B	--
Orthotelia	-	4	-	2	+	S	U/T2	L	B	--
Titanomis	-	4	?	?	?	?	?	?	?	+
Proditrix	+	3	-	3	+	S	U/P (C)	L	B	+
Glyphipterix	+	2-4	-	2(3)	+	S	U/P	L	B/LM	--
Plutella	+	4	-	3(2)	R	L	U/C	N	LS(FB)	--

Codes
Ocelli: present (+) or absent (-).
Maxillary palpi: number of segments.
Pupal spines: dorsal spination (some dorsal, lateral and ventral ridges may be present in some groups, like *Orthotelia* and *Proditrix*.
Larval L-group (prothoracic): number of setae.
Larval anal shield: dorsal shield present (+) or reduced (R).
Larval prolegs: short (S) or long (L).
Crochets: uniserial (U); transverse bands (T2) or in single row (T1); penellipse (P); circles (C).
A8 spiracle: normal (N) or enlarged (L).
Larval feeding: borers (B) or flower borers (FB); leafminers (LM); leaf skeletonizers (LS).

Characters distinguishing the New Zealand genera from Plutellidae while demonstrating cohesivenesss with Orthoteliinae, in Glyphip-terigidae, are summarized in Table 1. The table treats *Orthotelia*, *Titanomis* (adult characters only), and *Proditrix* in Orthoteliinae, *Glyphipterix* in Glyphipteriginae, plus the outgroups, *Ochsenheimeria* (Ochsenheimeriidae) and *Plutella* (Plutellidae). Information on Ochsenheimeriidae is taken mostly from Davis (1975) and Karsholt and Nielsen (1984); and notes on *Orthotelia* are from Kyrki and Itämies (1986), plus characters noted by Spuler (1910). Notes about Glyphipterigidae are taken from my works (Heppner, 1981b, 1982a, 1985a, 1990, 1998, 2004, in prep.), and from Arita and Heppner (1992) and Diakonoff (1986). Notes on Plutellidae are from Heppner (1998, 2004, in prep. a) and Dugdale *et al.* (1999). Biological data are from these references, as well as from Dugdale (1987a,b), Heppner (1987), Hudson (1928), and McQuillan (2003).

ORTHOTELIINAE

Adult: small to large (11-65mm wingspan); usually winged (rarely with slight female brachyptery). *Head*: vestiture somewhat rough-scaled; ocelli present or absent; chaetosema absent; eyes normal proportion; antenna filiform, sometimes thickened (rarely greatly thickened with scaling); labial palpi generally upcurved, with 2nd segment often tufted and apical segment smoother-scaled and upright; maxillary palpi 3- to 4-segmented and relatively prominent; haustellum present, naked. *Forewing*: elongated with typically oblique termen and tornal angle relatively abrupt; apex acute to rounded; costal margin with pterostigma or vestigial; venation complete and mostly evenly spaced veins, chorda developed and large; discal cell with forked median vein usually evident; venation with R1-R3 to costal margin, R4 to costa or at termen angle, and R5 to termen; median veins unbranched and M3 separate from CuA1, although may be very close at end of discal cell; cubital veins separate; CuP present at wing margin; anal veins present as A1+2 and A3; fringes moderate along termen. *Hindwing*: elongated with relatively acute apex, or somewhat blutned, and rounded tornal angle; venation similar to FW, with all veins present are rather evenly separated; discal cell with weak forked median vein evident; R5 to near apex or at apex, and usually straight from discal cell (rarely offset with R1 midwing spur connection to Sc); median veins separate; M3 separate from CuA1; cubital veins distant at discal cell; CuP present at wing margin; anal veins as A1+2 and A3; finges moderate but sometimes somewhat longer in some genera. *Abdomen*: dorsal spining absent; normal shape, without prominent sexual scaling or prominent choremata except small tufts at male pleural lobes; genitalia with male having pleural lobes configured with termen of abdomen, and female normal.

Larva: typically elongated and slender, with short prolegs; head usually somewhat prognathous; head setae with A1 close to A2, with A3 distant; P1 and P2 about subequal in separation as are A1 and A3; ocelli normal; prothorax with shield developed, L-group setae usually 2-segmented but some are 3-segmented, and SV setae on same pinaculum; abdomen with prolegs reduced or very short, crochets uniserial in transverse bands or small penellipse (rarely somewhat circular), SD1 setae above spiracle, SD2 usually ver small, L1 and L2 setae separate and usually more distant from L3, spiracles enlarged on segment A8 and somewhat higher than remainder of spiracle line along abdomen, D1 setae usually somewhat closer together than D2 or about equidistant. Anal end of abdomen with prominent dorsal shield, often with strongly armed spurs or spines, and A8 with D1 setae more separated than D2 setae, and L1 distant from L2.

Pupa: head often with rasper process or horn-like structures; appendages all evident; spiracles usually somewhat protruded or on small cones; abdomen often roughened but not spined, but sometimes with prominent ridges (both dorsally and ventrally); cremaster with strong spines. Pupa not generally protruded from cocoon at eclosion but sometimes somewhat projected part-way from cocoon (*Orthotelia*).

Cocoon: flattened silken case with ends slit for emergence, or simple tubular silken structure within host stem and with pre-constructed emergence hole.

ADULT CHARACTERS

Among the genera treated, the head includes useful characters like the ocelli and maxillary palpi. All groups in Table 1 have ocelli present except *Orthotelia* and *Titanomis*. For maxillary palpi, the Glyphipterigidae have a range of 2-4 segments, while Ochsenheimeriidae have 2-segmented maxillary palpi and Plutellidae have 4 segments. As in archaic moths, the greater number of maxillary palpal segments is considered to be the primitive state, even though some otherwise ancestral groups can have developed reductions, as has Ochsenheimeriidae (2 segments) among the Yponomeutoidea.

In Glyphipterigidae, the genera vary in the number of segments

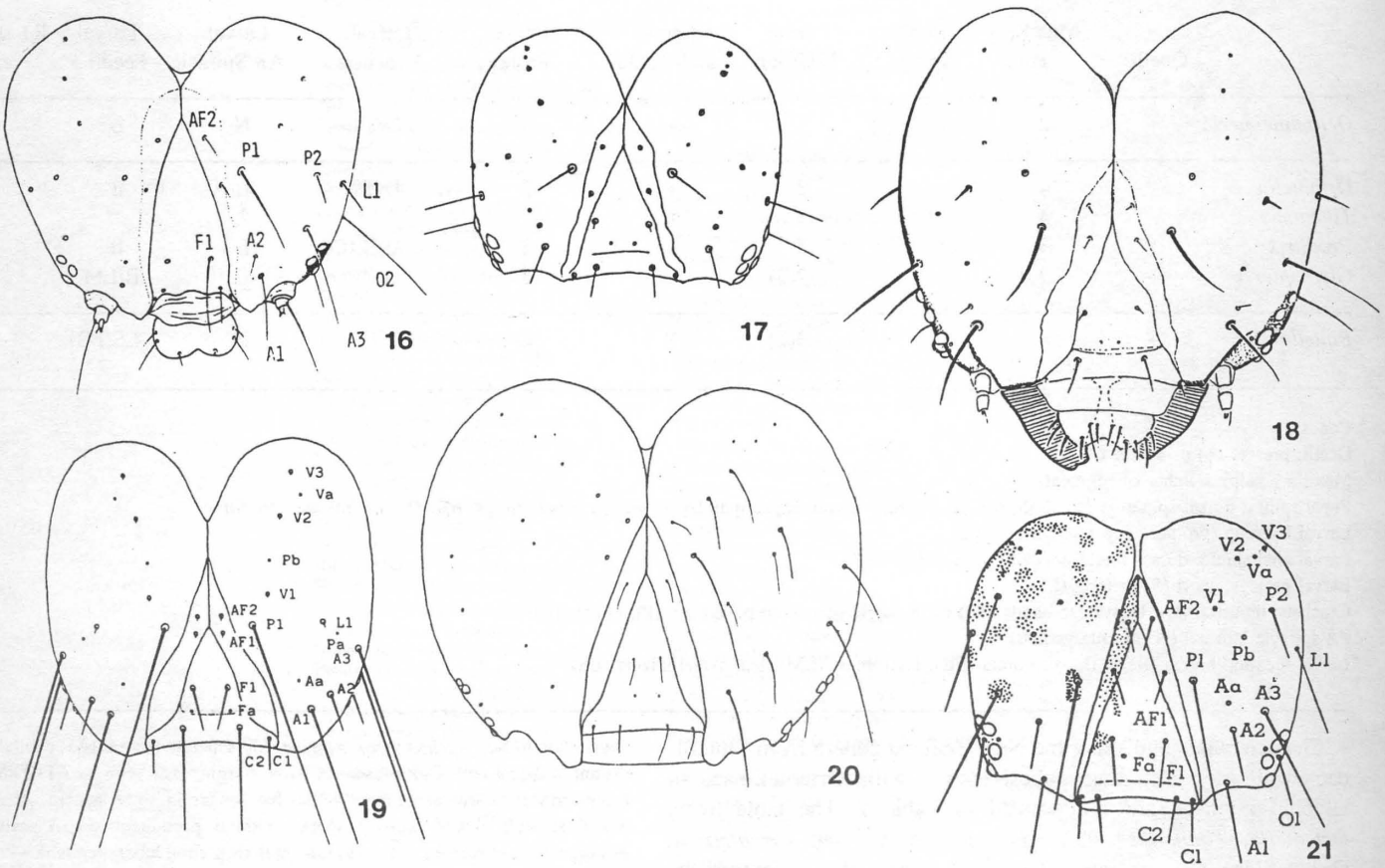


Fig. 16-21. Larval head chaetotaxy (Glyphipterigidae except as noted): 16) *Ochsenheimeria* (Ochsenheimeriidae), Europe (after Davis, 1975). 17) *Orthotelia* (Orthoteliinae), Europe (after Kyrki and Itämies, 1986). 18) *Proditrix megalynta* (Orthoteliinae), New Zealand (after Dugdale, 1987a). 19) *Glyphipterix scirpi* Arita (Glyphipteriginae), Thailand (after Arita, 1995). 20) *Glyphipterix semiflavana* Issiki (Glyphipteriginae), Japan (after Moriuti, 1960). 21) *Plutella xylostella* (Plutellidae), Europe (after Moriuti, 1977). Fig. 19 and 21 with stylized setae as drawn.

in the maxillary palpi from 2 to 4 segments: for example, *Orthotelia* (4), *Titanomis* (4), *Proditrix* (3), *Abrenthia* (3), *Neomachlotica* (3), *Drymoana* (4), *Lepidotarphius* (2), *Carmentina* (2, vestigial), *Sericostola* (2), *Glyphipterix* (2-4), and *Diploschizia* (2). The genus *Orthotelia* is European, *Lepidotarphius* is East Asian (northern China and Japan), *Carmentina* is tropical Oriental, *Proditrix* and relatives are from New Zealand and Tasmania, and *Sericostola* is from Colombia and Costa Rica, while the remainder are Nearctic except for the worldwide genus *Glyphipterix* (Diakonoff, 1986; Heppner, 1981b, 1982a, 1985a, 1990, 1998, 2003, in prep. a,b; Spuler, 1910).

Wing venation of the *Proditrix* group (Dugdale, 1987a) conforms very well with the venation found in *Orthotelia* (Spuler, 1910). The only significant difference is that in *Proditrix* the hindwing Rs (or R5) vein is offset mid-wing by an R1 spur connection (Fig. 12), which is a straight vein in *Orthotelia* (Fig. 11). The radial veins are the same in both wings, while in *Plutella* in the hindwing the first 2 radial veins are typically fused as M1+M2 at the discal cell and split near the termen (Fig. 15); both being separate in Orthoteliinae. The wing venation among Glyphipteriginae genera is more and more specialized in the smaller or more narrow-winged species, while the larger species are less so (Fig. 13-14). Females of *Proditrix megalynta* (Meyrick) are somewhat brachypterous, with shortened and pointed wings (Dugdale, 1987a), which is not evident elsewhere in the Glyphipterigidae.

The R1 hindwing spur vein connection to Sc is a very primitive character in Lepidoptera. Evidently, an ancient character that has been modified in most lepidopterans. One finds this still among some homoneurous archaic moths and also in various isolated genera among higher lepidopterans, as in Tineidae (*Ardiosteres* from Australia), Psychidae (*Homera* from Australia, *Thyridopteryx* from the New World, *Pseudarbela* from Southeast Asia, and many others), many Pyralidae, Urodidae (*Urodus* from the New World), many Zygaenidae, Ratardidae (*Ratarda* from Southeast Asia), and Lasiocampidae (*Heteropacha* from the USA). Otherwise, besides those groups with reduced venation, instead of a mid-wing R1 spur vein some other lepidopterans have retained a basal connection or part of the radius is merged with the Sc vein, as in Prodoxidae (*Tegeticula* from North America), Cecidosidae (*Cecidoses* from Argentina), Oecophoridae (*Thyrocopa* from Hawaii), many Gelechiidae, Attevidae (*Atteva* from the New World), Thyrididae (*Thyris* from Europe), many Pyralidae, Somabrachyidae (*Somabrachys* from North Africa), Megalopygidae (*Megalopyge* from the New World), many Tortricidae, many Geometridae, many Papilionidae, many Drepanidae, Bombycidae (*Bombyx* from Asia), and other Bombycoidea, as well as most Noctuoidea.

Genitalia characters of the *Proditrix* complex are not distinctive in being either Plutellidae or Glyphipterigidae, and certainly can be included in Orthoteliinae without any problem based on genitalia. Even the so-called pleural lobes in males, thought to be an apomor-

phic character for Yponomeutoidea (Kyrki, 1984), are also found in some Pyralidae (Heppner, 1998), although it remains unknown whether these are independently derived in the latter family.

Among Glyphipterigidae in general, the European *Orthotelia sparganella* (Thunberg) is a large species (18-28mm in wingspan) and is very different in appearance from most sedge moths (Kyrki and Itämies, 1986). However, the very large New Zealand species, *Proditrix megalynta* (29-38mm), is rather similar in superficial appearance to *Orthotelia*. The genus *Sericostola* (ca. 34mm), with two species from Colombia and Costa Rica, includes the largest known sedge moths from the New World in the subfamily Glyphipteriginae (Heppner, 1990), although the Neotropical genus *Cotaena* has very heavy-bodied, colorful species that average about 26mm in wingspan (in prep. c), and an undescribed sedge moth (genus uncertain) from Venezuela is about 22mm in wingspan. The largest species in Europe is *Glyphipterix loricatella* (Treitschke), with a wing expanse of 17-21 mm (Diakonoff, 1986; Kun and Szabóky, 2000). *Lepidotarphius perornatella* (Walker), an exceedingly colorful orange and green species from China and Japan (probably introduced to Taiwan with its garden hostplant), averages 13-19mm, and is the largest sedge moth from East Asia (Arita and Heppner, 1992; Diakonoff, 1986; Kodama, 1961).

The newly transferred New Zealand species in Orthoteliinae now are among the largest of all sedge moths, with *Proditrix* species being among the largest known: *P. megalynta* at 29-38mm in wingspan and *P. tetragona* (Hudson) at 44-55mm wingspan (Dugdale, 1987a). The latter species was described by Hudson (1918) and is one of the largest microlepidopterans in New Zealand outside of the Hepialidae. Its long-thought sister species, *Titanomis sisyrota*, is likewise a rare higher altitude (ca. 1000m) moth, known only by a few specmens, and the females are up to 65mm in wingspan, making it the largest known glyphipterigid. The new species from Tasmania, *Proditrix nielseni*, is about the same size, at about 64mm in wingspan (McQuillan, 2003).

Most typical sedge moths, mainly in the genus *Glyphipterix*, average only about 8-10mm in wingspan (Diakonoff, 1986; Heppner, 1982a, 1985a, in prep.). Among the smallest species are *Diploschizia minimella* Heppner, from Florida (ca. 4.5-6mm) (Heppner, 1981b, 1985a), and the Taiwan species *Glyphipterix tona* Arita & Heppner (ca. 5-6mm) (Arita and Heppner, 1992).

Larval characters

The primitive condition in the larvae appears to be 3 lateral (L-group) setae on the prothorax, as in Ochsenheimeriidae: this is 2 in *Orthotelia*, 3 in *Proditrix*, and 2 in other Glyphipterigidae where larvae are known. One New Zealand species of *Glyphipterix*, however, also has 3 L-group prothoracic setae, according to Dugdale (1987b). Plutellidae have 3 lateral prothoracic setae, but a few have only 2 (Praydinae). The bisetose L-group configuration has been thought typical for Glyphipterigidae, but the New Zealand species noted by Dugdale (1987b) as having a vestigial 3rd seta is a key indication that more species in the family may have this character state. We know at most 5% of the species of Glyphipterigidae biologically, and far fewer where the larvae have been described, and most of these are from the Holarctic region, not the tropics where more of the stranger species occur, like *Sericostola* in South America. Thus, having 3 prothoracic L-group setae is likely the ancestral larval state, as evidenced also in the *Proditrix* complex of Orthoteliinae from New Zealand. Unfortunately, as is often the case hindering phylogenetic analyses among the more obscure lepidopterans in the world, the larvae of *Titanomis* remain unknown. Previously, we only had detailed larval chaetotaxy for *Orthotelia* and some Glyphipteriginae (Heppner, 1981b, 1985a, 1987; Kodama, 1961; Kyrki and Itämies, 1986; Moriuti, 1977; Werner, 1958).

Head chaetotaxy among the New Zealand species conform well to *Orthotelia* (Fig. 17-18), while *Glyphipterix* have the setae more varied (Fig. 19-20). However, few species have the larvae known or described, so overall generalities for the family still remain speculative to some extent.

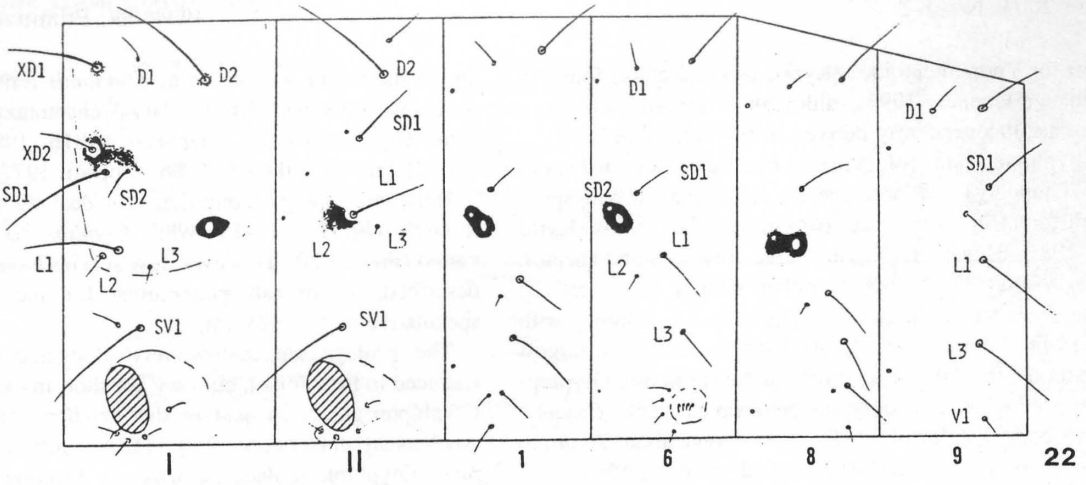
The prolegs are distinctively elongated in most Plutellidae (reduced in Praydinae), but they are short in Ochsenheimeriidae and Glyphipterigidae, as also in the *Proditrix* group of genera. The crochets are uniserial but vary in their configuration: a penellipse in most Glyphipterigidae, likewise in *Proditrix* but slightly more circular in some species, yet transverse bands in *Orthotelia*. Ochsenheimeriidae also have transverse bands but a reduced form with a single row of crochets. Plutellidae have crochets in uniserial circles.

Spiracles on abdominal segment 8 are normal (subequal in size) in Ochsenheimeriidae (Fig. 22) and Plutellidae (Fig. 26). Spiracles are distinctly enlarged in Glyphipterigidae (sometimes only slightly enlarged in some Glyphipterigidae but often very much so and protruded), and the segment 8 spiracles are also shifted somewhat dorso-laterally compared to where the other abdominal segment spiracles are on each abdominal segment (Fig. 23-25) (common to many lepidopteran larvae but more pronounced in Glyphipterigidae). The *Proditrix* group of genera likewise have these apomorphic larval characters. It should be noted that enlarged A8 spiracles are found in various other families of Lepidoptera. However, at least among Yponomeutoidea, this feature is more typical of Glyphipterigidae than for the other yponomeutoid families.

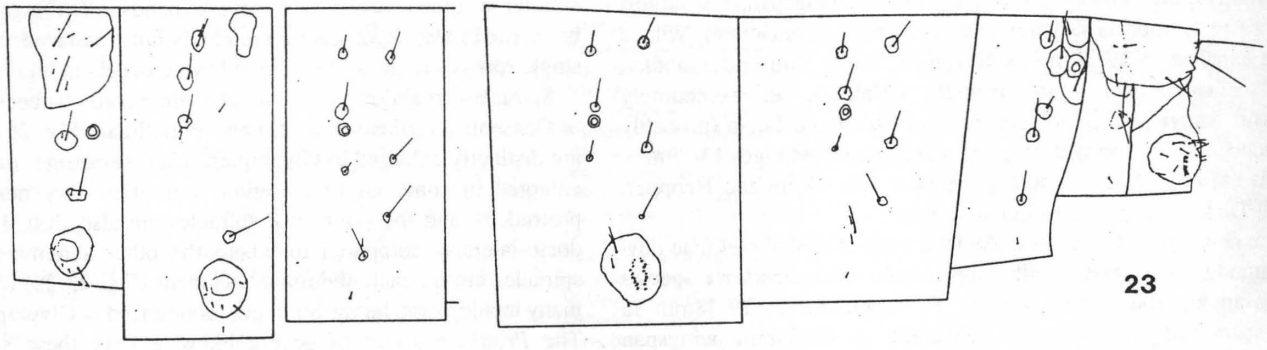
The anal dorsal shield of the larvae is usually well-developed and distinctively shaped in all groups mentioned (Fig. 28-33), while reduced in Plutellidae (Fig. 34). Another useful character for distinguishing Glyphipterigidae from Plutellidae, and one that likewise places the *Proditrix*-complex in Glyphipterigidae, is on the 9th abdominal segment, where in Plutellidae (Fig. 34) the D1 and D2 setae are close together and on merged pinacula, whereas in Glyphipterigidae (Fig. 28-33) they are more separate and on distinct pinacula. Spatulate setae, as in *Proditrix* on the 9th abdominal segment (Fig. 24, 29-30) are also known in larvae of the glyphipterigine genus *Lepidotarphius* (Fig. 25) and likely other genera once more of them are known biologically. In the Tasmanian species, *P. nielseni*, these spatulate setae are missing, however.

Larval feeding is typically as leaf skeletonizers in Plutellidae, as in the well-known diamondback moth, *Plutella xylostella* (Linnaeus), but most Glyphipterigidae are stem borers or borers in seeds, sometimes as leafminers. The *Proditrix* group of genera all are stem borers as far as is known, as are also *Orthotelia* and Ochsenheimeriidae (start as leafminers and then become stem borers). The Tasmanian *P. nielseni* has somewhat modified feeding, in preferring the crown area of leaf buds and then into the leaf axils of the giant leaves of the pandanus-like host it uses. The feeding behavior of stem boring, and the concommitant larval modifications, are particularly striking in not being known in Plutellidae, where the few borers that are known feed only in flower heads (Praydinae). Some works erroneously place Praydinae in Yponomeutidae, instead of Plutellidae (Heppner, 1998, in prep.).

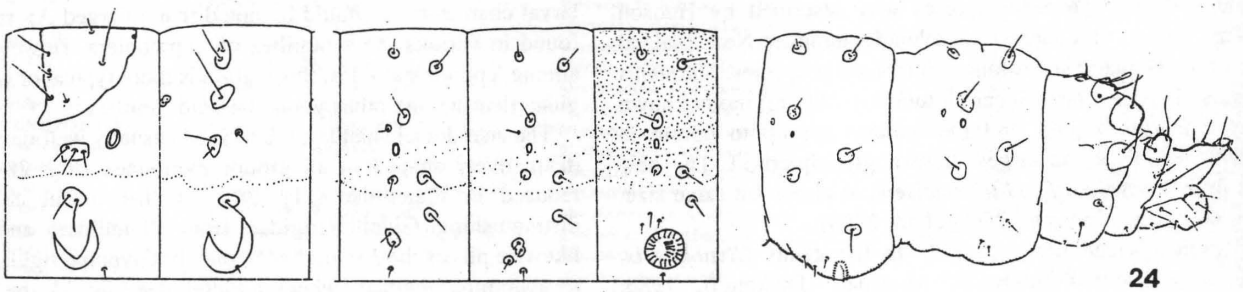
The *Proditrix* complex of species feed on tussock grasses (*Chionochloa* spp.; Gramineae) in New Zealand (Dugdale, 1987a), or other plants with water-holding leaves (the sedges *Carex* sp. and *Gahniae*


XD1
D1
D2
XD2
SD1
SD2
L1
L2
L3
SV1
SD1
V1
I
II
1
6
8
9

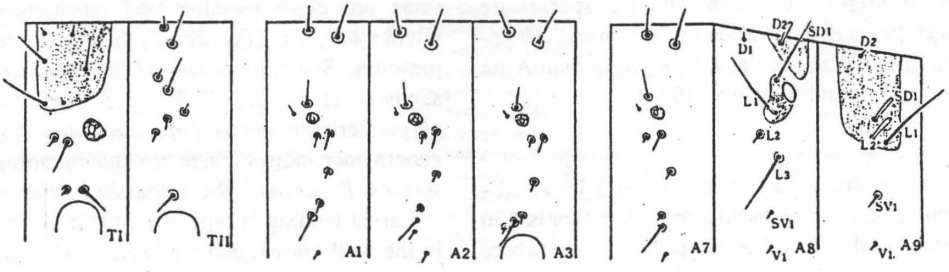
22



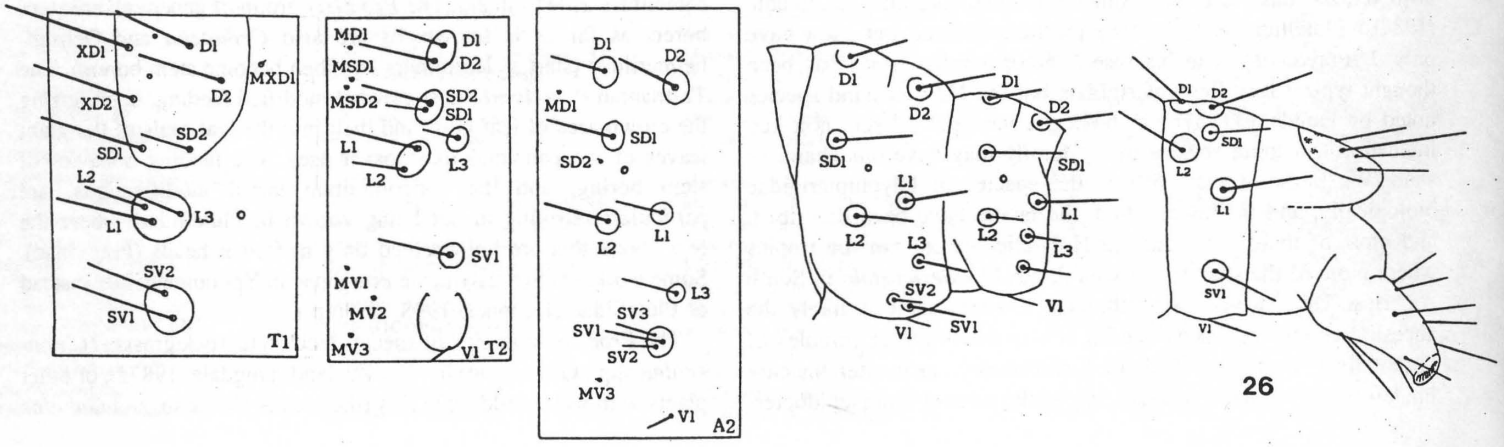
23



24


TI
TII
A1
A2
A3
A7
A8
A9
V1

25


XD1
D1
D2
MXD1
XD2
SD2
SD1
L2
L1
L3
SV2
SV1
T1
MD1
MSD1
MSD2
SD2
SD1
L1
L2
L3
SV1
MV1
MV2
MV3
V1
T2
MD1
SD1
SD2
L1
L2
L3
SV3
SV1
SV2
MV3
V1
A2

26

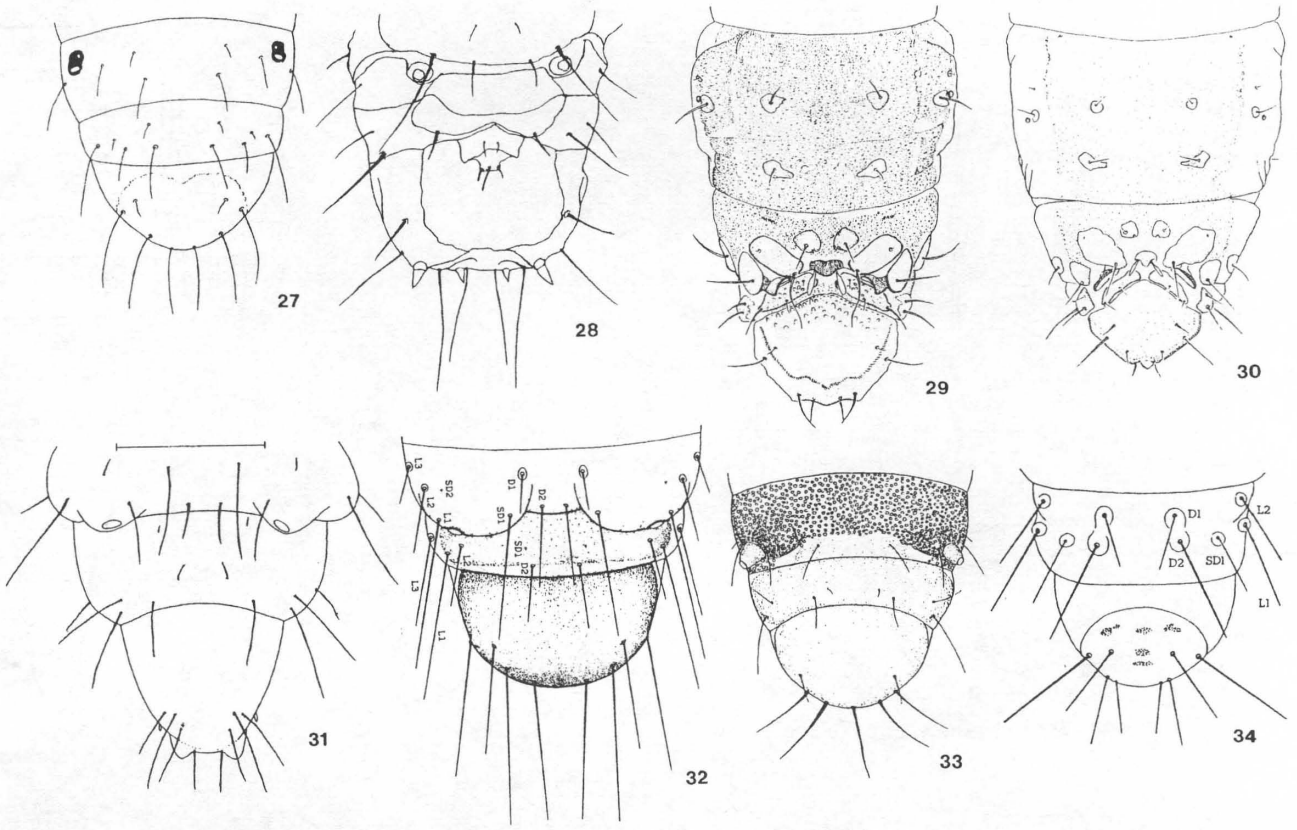


Fig. 27-34. Posterior ends of larvae, segments 8-10 (dorsal view) (Glyphipterigidae except as noted): 27) *Ochsenheimeria* (Ochsenheimeriidae), Europe (after Davis, 1975). 28) *Orthotelia* (Orthoteliinae), Europe (drawn after Kyrki and Itämies, 1986). 29) *Proditrix tetragona* (Orthoteliinae), New Zealand (after Dugdale, 1987a). 30) *Proditrix megalynta* (Orthoteliinae), New Zealand (after Dugdale, 1987a). 31) *Glyphipterix semiflavana* (Glyphipteriginae), Japan (after Moriuti, 1960). 32) *Glyphipterix scirpi* (Glyphipteriginae), Thailand (after Arita, 1995). 33) *Diploschizia habecki* Heppner (Glyphipteriginae), USA (after Heppner, 1981). 34) *Plutella xylostella* (Plutellidae), Europe (after Moriuti, 1977). Fig. 32 and 34 with stylized setae as drawn; Fig. 27 and 31-34 with stylized segmental forms as drawn.

setifolia, in Cyperaceae, the lilies *Astelia cockaynei* and *Collospermum hastatum* in Liliaceae, and *Freycinetia banksii* in Pandanaceae). The Tasmanian species feeds on foliage of a small pandanus-like tree, *Richea pandanifolia* (Epacridaceae), which is an ericaceous-related (Ericales) dicot plant (Dugdale, 1987a; McQuillan, 2003). Some other glyphipterigids around the world also feed on various dicot plants, although most are on sedges and rushes, or grasses. The use of mostly tussock grasses, or other monocots, as hostplants, however, conforms to the hosts of typical New Zealand glyphipterigid moths (genus *Glyphipterix*), which in New Zealand are called tussock moths, or cocksfoot moths, rather than sedge moths. At least some of the species do enough feeding on pasture and range grasses in New Zealand to be considered pests (White, 2002). Hudson (1928) presented most of the known biologies for the species, later elaborated on by Dugdale (1987a) for some of them.

PUPAL CHARACTERS

All genera discussed lack dorsal pupal spines, as is typical for Yponomeutoidea. The large pupae of *Orthotelia* and *Proditrix* do have some abdominal ridges (Fig. 35-36), both dorsally and laterally and even ventrally, but not spines as in Tortricidae and other primitive Microlepidoptera. However, all have the spiracles raised out from the pupal body, even in Plutellidae, but they are reduced in Orthoteliinae and Ochsenheimeriidae (Fig. 35-41). Some Yponomeutidae have this feature of the spiracles even more pronounced.

The few Glyphipteriginae pupae known show advanced characters, such as having the labial palpi exposed away from the labrum (Fig. 37-39), while in Orthoteliinae (Fig. 35) as also in Plutellidae (Fig. 40-41), the labial palpi touch the labrum, but the configuration among the more primitive Glyphipteriginae (e.g., the genera *Carmentina* and *Cotaena*, among others) is not known.

The cocoons in Glyphipterigidae and Plutellidae have rather distinctive filigreed or mesh-work form in an elongated shape. These cocoons are rather delicate silken construction in most sedge moths, but in some genera, like the Neotropical *Cotaena*, the large cocoons are very strongly constructed, yet with an open mesh-work form nonetheless. The only other families that also have such cocoons among the Microlepidoptera are Urodidae, in Sesioidea, and Lacturidae, in Zygaenoidea (some Saturniidae, for example, make unusual filigreed cocoons, among the macro moths). There also are some similar cocoon examples among Acrolepiidae and in the tineoid family Schreckensteiniidae. In Ochsenheimeriidae, the cocoon is a simple silken case but few of the species are known biologically. In the New Zealand *Proditrix* complex, the cocoon is a flattened silken case, open at both ends as small slits in the webbing. The cocoon of *Orthotelia* is a simple form within the host stem, with an external silken flap over a pre-constructed emergence hole.

Fig. 22-26. Larval chaetotaxy (Glyphipterigidae except as noted): 22) *Ochsenheimeria* (Ochsenheimeriidae), Europe (after Davis, 1975). 23) *Orthotelia* (Orthoteliinae), Europe (after Kyrki and Itämies, 1986). 24) *Proditrix tetragona* (Orthoteliinae), New Zealand (after Dugdale, 1987a). 25) *Lepidotarphius perornatella* (Walker) (Glyphipteriginae), Japan (after Kodama, 1961). 26) *Plutella xylostella* (Plutellidae), Europe (after Moriuti, 1977). Fig. 26 with stylized setae as drawn.

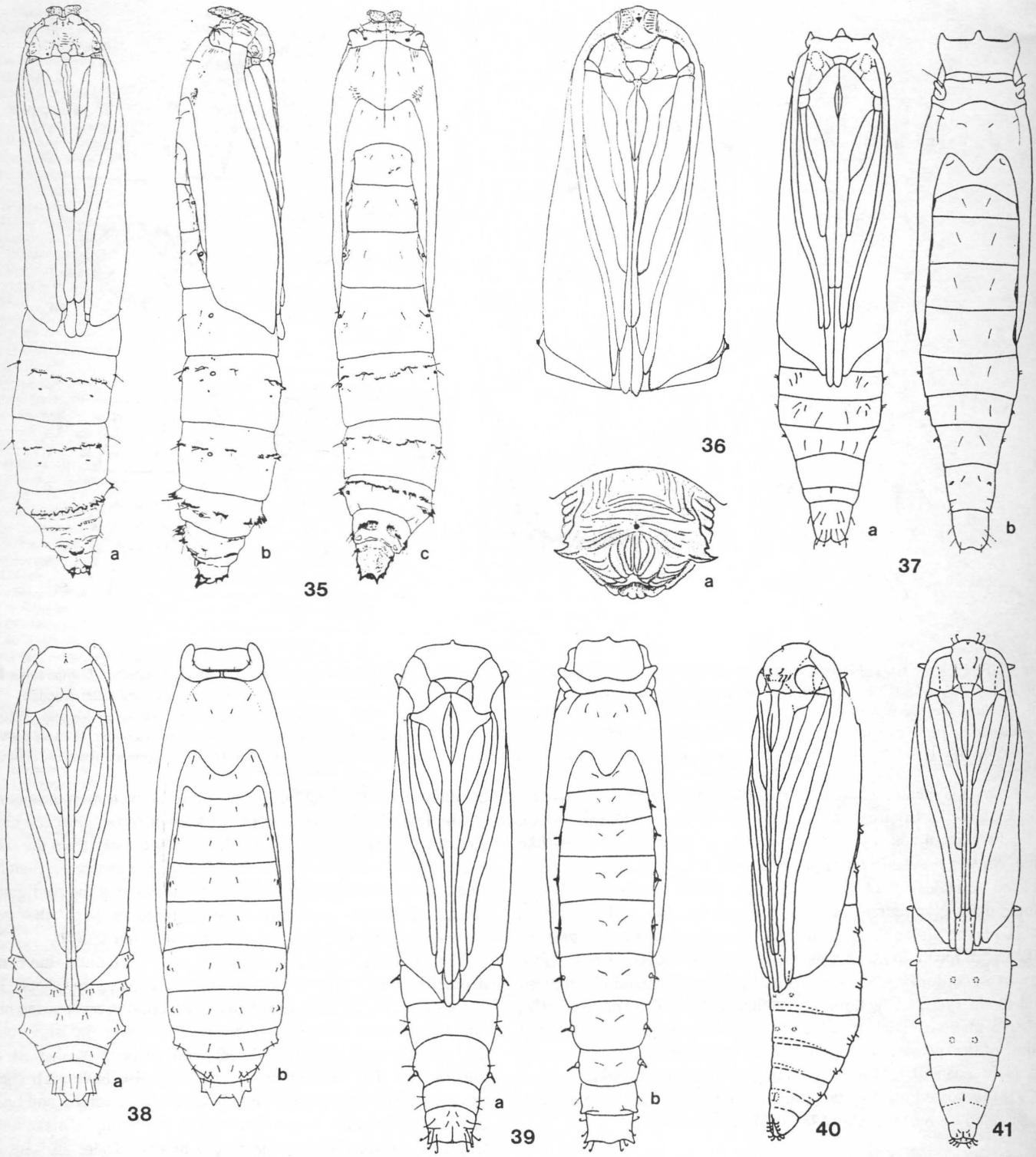


Fig. 35-41. Pupae (Glyphipterigidae except as noted): 35) *Orthotelia* (Orthoteliinae), Europe (after Kyrki and Itämies, 1986) (a, ventral view; b, lateral; c, dorsal). 36) *Proditrix gahniae* (Orthoteliinae), New Zealand (after Dugdale, 1987a) (a, cremaster detail). 37) *Glyphipterix semiflavana* (Glyphipteriginae), Japan (after Moriuti, 1960) (a, ventral; b, dorsal). 38) *Glyphipterix scirpi* (Glyphipteriginae), Thailand (after Arita, 1995) (a, ventral; b, dorsal). 39) *Diploschizia habecki* (Glyphipteriginae), USA (after Heppner, 1981) (a, ventral; b, dorsal). 40) *Plutella xylostella* (Plutellidae), Europe (after Moriuti, 1977) (ventro-lateral view). 41) *Caunaca sera* (Meyrick) (Plutellidae), New Zealand (after Moriuti, 1977) (ventral view).

CONCLUSIONS

As noted above, the range of characters demonstrates that the New Zealand group of genera that Dugdale (1987a) thought to be very odd Plutellidae (or Yponomeutidae), are in fact primitive Glyphipterigidae and conform well to the European subfamily Orthoteliinae, previously a monobasic group with a single odd genus. The south temperate genera related to *Proditrix*, as noted earlier, could be placed in Plutellidae on adult characters, since superficially they look like odd and very large plutellids, but the wealth of characters of the immature stages and the feeding habits clearly show the relationships to orthoteliine Glyphipterigidae. Thus,

they represent the first Southern Hemisphere members of this unusual subfamily, rather than being odd Plutellidae as noted by Dugdale (1987a).

The addition of so many New Zealand species to Orthoteliinae, plus one from Tasmania, is highly significant for the world phylogeny of Glyphipterigidae and Yponomeutoidea, demonstrating that there was a larger ancient fauna of this progenitor group than first thought, and with possibly their last remnants are most prevalent in the isolated faunal refugium that is New Zealand, as also Tasmania, rather than in Europe. The plate showing adults (Fig. 1-9) illustrates most of the New Zealand *Proditrix* complex of species; others are illustrated in Dugdale (1987a) and Hudson (1928).

No species related to the *Proditrix* complex are thus far known for Australia, other than the single species from Tasmania (Dugdale (1987a; McQuillan, 2003), but more may be found in such places as New Caledonia, or even in the high mountains of New Guinea. One can speculate that perhaps more Orthoteliinae also await discovery in remote regions of the Himalayas, in Nepal or southwestern China. None are known from the Himalayan-originating fauna of the high mountains of Taiwan. Survey studies over the past 25 years, as in Nepal and Borneo, have all concentrated on macromoths, so the Microlepidoptera are still relatively unknown for these areas. Thus far, none have been discovered in austral South America (Heppner, in prep. b). The status of some of the other New Zealand Plutellidae need to be re-examined to be certain they are all true Plutellidae, or possibly also members of Orthoteliinae in Glyphipterigidae, or even Glyphipteriginae.

Other Glyphipterigidae may also still remain hidden among the conglomeration of genera and odd species already described in Yponomeutidae and Plutellidae today in most regions of the world. One need only look among the genera and species illustrated by Clarke (1955) of Meyrick types at the Natural History Museum (BMNH), London, to see what appear to be misplaced genera and species, and with some belonging in such families as Lacturidae and Urodidae, but a few even likely candidates for Gelechioidea, and still a few that may also belong in Glyphipterigidae. As noted earlier, my original generic study of what Meyrick had placed in Glyphipterigidae (Heppner, 1977) only treated genera and what species they then included. Thus, Plutellidae and Yponomeutidae were not systematically studied at that time to find odd species or genera that should be in Glyphipterigidae or other families. Even so, since then a few others have been identified and culled out of Yponomeutidae, as for example my placement of *Sericostola* to Glyphipterigidae (Heppner, 1990) and the transfer of the genus *Telosphrantis* to Choreutidae (Heppner, 1985b). Suffice it to say, that all Yponomeutidae and Plutellidae taxa throughout the world require re-checking to verify their family placement, other than those, of course, that are clearly typical for the families such as the type-genera for each family. The significant finding that the odd *Proditrix*-complex, thought to be Plutellidae, is actually part of orthoteliine Glyphipterigidae, demonstrates what may be hidden among all the other odd tropical genera of Yponomeutidae and Plutellidae, and which have important implications on the evolution of the group that should spur on such searches by other interested researchers.

New Zealand harbors an exceedingly rich fauna of Glyphipterigidae, given the size of its landmass, with some 47 species now identified in the family, although most are in the worldwide genus *Glyphipterix* (33 sp. in New Zealand). Likewise, Tasmania has about 7 endemic *Glyphipterix* species (Heppner, 1982a) for its small size, plus the single species of *Proditrix*. Both of these south temperate regions could reasonably have even more species of Glyphipterigidae, once more intensively investigated for the less-collected day-flying moths. This compares with Taiwan, which is more tropical yet has a sedge moth fauna of only 29 species (Arita and Heppner, 1992). Austral South America, previously without any recorded species of Glyphipterigidae, has about 16 species awaiting description (Heppner, in prep. b), the species about equally divided between Chile and Argentina: these are all typical sedge moths in Glyphipteriginae, and no Orthoteliinae have thus far been discovered. The entire continental region of North America, north of Mexico, has only 44 species (Heppner, 1981, 1985a, 1997a,b). All regions of the world need to be investigated more to determine if any further Orthoteliinae are hidden among odd Plutellidae that have not been studied much, as already noted, particularly in Africa, Asia, and possibly even in South America (especially austral South America and in the Andes).

With the presence of at least one New Zealand species in the main glyphipterigid genus *Glyphipterix* having 3 lateral prothoracic setae in the larvae (Dugdale, 1987b), and this being the character state in the *Proditrix* complex, one can see that New Zealand harbors an ancient refugium for the family where many Orthoteliinae are present as a relictual group from the lineage to Glyphipteriginae. Elsewhere, only the single European species of *Orthotelia* remains of this ancient group of species. The isolated southern land of New Zealand is well known as a Gondwanaland distribution refugium for other ancient groups of plants and animals, as are Tasmania, Australia, South Africa, and Chile, all likely places to search for more Orthoteliinae species, possibly hidden among unstudied Plutellidae genera there, or awaiting discovery.

My view is that there is an evolutionary relationship from ancestral Ochsenheimeriidae to the primitive Glyphipterigidae, which is now more evident in this enlarged Orthoteliinae subfamily, as evident in the larval and other characters outlined above. Plutellidae are likely developments from Orthoteliinae ancestors, as are the Glyphipteriginae. One would say that Ochsenheimeriidae and Glyphipterigidae are sister groups in cladistic terms, possibly with this combination being a sister group to Plutellidae and higher Yponomeutoidea. Cladologists may find this paraphyletic, but in a phylogenetic classification (rather than a cladification) this can occur.

ACKNOWLEDGMENTS

Photographs of illustrated species herein were kindly provided by the Entomology Division, Division of Science and Industrial Research (DSIR), Auckland, who have developed and maintain a holotype photograph collection of New Zealand Lepidoptera. The types were photographed by DSIR personnel at the National Museum (NMNZ), Wellington, New Zealand, and the Natural History Museum (BMNH), London, England. Drawn figures are from papers by Arita (1995), Davis (1975), Dugdale (1987a), Heppner (1981b, 1990), Kodama (1961), Kyrki and Itämies (1986), Moriuti (1960, 1977), and Spuler (1910), or modified therefrom. My thanks to Terry Harrison and J. A. Powell for their useful comments and review of the manuscript.

REFERENCES

Arita, Y.

1995. Descriptions of nineteen new species and records of two known species of *Glyphipterix* (Lepidoptera: Glyphipterigidae) from Thailand. In

Microlepidoptera of Thailand, 3:1-31. Osaka: Osaka Pref. Univ.

Arita, Y., and J. B. Heppner

1992. Sedge moths of Taiwan (Lepidoptera: Glyphipterigidae). *Trop. Lepid.* (Gainesville), 3 (Suppl. 2):1-40.

Clarke, J. F. G.

1955. Hyponomeutidae [sic]. In *Catalogue of the Type Specimens of Microlepi-doptera in the British Museum (Natural History) Described by Edward Meyrick*. Vol. 5:259-413. London: Br. Mus. (Nat. Hist.).

Dalla Torre, K. W. von, and E. Strand

1929. Pcychidae. In *Lepidopterorum Catalogus*, 34:1-211. Berlin: W. Junk.

Davis, D. R.

1975. Review of Ochsenheimeriidae and the introduction of the cereal stem moth *Ochsenheimeria vacculella* into the United States (Lepidoptera: Tineoidea). *Smithson. Contr. Zool.* (Washington), 192:1-20.

Diakonoff, A. N.

1986. Glyphipterigidae *auct. sensu lata* (*sensu* Meyrick, 1913). *In* H. G. Amsel *et al.* (eds.), *Microlepidoptera Palaearctic*. Vol. 7. Karlsruhe: G. Braun. 436pp, 175 pl.

Dugdale, J. S.

1987a. *Proditrix*, a new genus for *Titanomis tetragona* Hudson and *Plutella megalynta* Meyrick and allies (Lepidoptera: Yponomeutidae), shoot destroyers of monocotyledons. *New Zealand J. Zool.* (Wellington), 14:99-112.

1987b. [Note]. *In* F. W. Stehr (ed.), Order Lepidoptera, in *Immature Insects [1]*, 399. Dubuque: Kendall-Hunt. 754pp.

1988. Lepidoptera – annotated catalogue, and keys to family-group taxa. In *Fauna New Zealand*, 14:1-262. Wellington: DSIR.

Dugdale, J. S., N. P. Kristensen, G. S. Robinson, and M. J. Scoble

1999. The Yponomeutioidea. *In* N. P. Kristensen (ed.), *Lepidoptera, Moths and Butterflies. Volume 1: Evolution, Systematics, and Biogeography*, 119-130. In *Handbuch der Zoologie. Band IV. Arthropoda: Insecta. Teilband 35*. Berlin: W. De Gruyter. 487pp.

Heppner, J. B.

1977. The status of the Glyphipterigidae and a reassessment of relationships in yponomeutoid families and Ditrysian superfamilies. *J. Lepid. Soc.* (Los Angeles), 31:124-134.

1981a. Family Brachodidae, new status. *In* J. B. Heppner and W. D. Duckworth, Classification of the superfamily Sesioidea (Lepidoptera: Ditrysia), 8-15. *Smithson. Contr. Zool.* (Washington), 314:1-144.

1981b. Revision of the new genus *Diploschizia* (Lepidoptera: Glyphipterigidae) for North America. *Florida Ent.* (Gainesville), 64:309-336.

1982a. Synopsis of the Glyphipterigidae (Lepidoptera: Copromorphoidea) of the world. *Proc. Ent. Soc. Washington*, 84:38-66.

1982b. A world catalog of genera associated with the Glyphipterigidae auctorum (Lepidoptera). *J. New York Ent. Soc.*, 89:220-294.

1982c. Review of the family Immidae with a world checklist (Lepidoptera: Immoidea). *Entomography* (Sacramento), 1:257-279.

1985a. *The Sedge Moths of North America (Lepidoptera: Glyphipterigidae)*. Gainesville: Flora & Fauna Publ. 254pp.

1985b. *Telosphrantis aethiopica* Meyrick transferred to Choreutidae (Lepidoptera). *Proc. Ent. Soc. Washington*, 87:859-863.

1987. [Yponomeutoidea]. *In* F. W. Stehr (ed.), Order Lepidoptera, in *Immature Insects [1]*, 403-411. Dubuque: Kendall-Hunt. 754pp.

1990. *Sericostola* to Glyphipterigidae, with a new species from Costa Rica (Lepidoptera: Copromorphoidea). *Trop. Lepid.* (Gainesville), 1:35-38.

1991. Faunal regions and the diversity of Lepidoptera. *Trop. Lepid.* (Gainesville), 2 (suppl. 1):1-85.

1995. Lacturidae, new family (Lepidoptera: Zygaenoidea). *Trop. Lepid.* (Gainesville), 6:146-148.

1996. Keys to families of Lepidoptera. *Trop. Lepid.* (Gainesville), 4 (Suppl. 3):1-28. (1993)

1997a. New *Glyphipterix* sedge moths from the southeastern United States (Lepidoptera: Glyphipterigidae). *Holarctic Lepid.* (Gainesville), 4:67-69.

1997b. New *Diploschizia* sedge moths from Florida (Lepidoptera: Glyphipterigidae). *Holarctic Lepid.* (Gainesville), 4:70-72.

1998. *Classification of Lepidoptera. Part 1. Introduction*. Gainesville: Assoc. Trop. Lepid. 148pp. (*Holarctic Lepid.* (Gainesville), 5, Suppl. 1).

2004. Butterflies and moths (Lepidoptera). *In* J. L. Capinera (ed.), *Encyclopedia of Entomology*, 387-428. Dordrecht: Kluwer Acad. Publ. 3 v.

in prep. a. *Classification of Lepidoptera. Part 2. Microlepidoptera: Micropterigoidea to Tortricoidea*. Gainesville: Assoc. Trop. Lepid. Pp. 149-330. (*Holarctic Lepid.* (Gainesville), 9, Suppl. 1).

in prep. b. Austral South American sedge moths (Lepidoptera: Glyphipterigidae). *Trop. Lepid.* (Gainesville).

in prep. c. Neotropical sedge moths of the genus *Cotaena* (Lepidoptera: Glyphip-terigidae). *Trop. Lepid.* (Gainesville).

Hudson, G. V.

1918. Descriptions of new species of Lepidoptera from New Zealand. *Ent. Mon. Mag.* (London), 54:61-63.

1928. *The Butterflies and Moths of New Zealand*. Wellington: Ferguson & Osborn. 386pp, 52 pl. + pl. A-K.

1939. *A Supplement to the Butterflies and Moths of New Zealand*. Wellington: Ferguson & Osborn. 387-481pp, pl. 53-62.

Karsholt, O., and E. S. Nielsen

1984. A taxonomic review of the stem moths, *Ochsenheimeria* Hübner, of northern Europe (Lepidoptera: Ochsenheimeriidae). *Ent. Scand.* (Copenhagen), 15:233-247.

Kodama, T.

1961. The larvae of Glyphipterygidae [sic] (Lepidoptera) in Japan (1). *Publ. Ent. Lab. Univ. Osaka Pref.* (Osaka), 6:35-45. [in Japanese]

Kun, A., and C. Szabóky

2000. Rediscovery of *Glyphipterix loricatella* in Hungary (Lepidoptera: Glyphipterigidae). *Holarc. Lepid.* (Gainesville), 6:75-76. (1999)

Kyrki, J.

1984. The Yponomeutidae: a reassessment of the superfamily and its suprageneric groups (Lepidoptera). *Ent. Scand.* (Lund), 15:71-84.

1988. The systematic position of *Wockia* Heinemann, 1870, and related genera (Lepidoptera: Ditrysia: Yponomeutidae auct.). *Nota. Lepid.* (Karlsruhe), 11:45-69.

1990. Tentative reclassification of Holarctic Yponomeutoidea (Lepidoptera). *Nota Lepid.* (Karlsruhe), 13:28-42.

Kyrki, J., and J. Itämies

1986. Immature stages and the systematic position of *Orthotelia sparganella* (Thunberg) (Lepidoptera: Yponomeutoidea). *Syst. Ent.* (London), 11:93-105.

McQuillan, P. B.

2003. The giant Tasmanian 'pandani' moth *Proditrix nielseni*, sp. nov. (Lepidoptera: Yponomeutoidea: Plutelidae s.l.). *Invert. Syst.* (Canberra), 17:59-66.

Meyrick, E.

1885. [Note]. *New Zealand J. Sci.* (Dunedin), 2:591.

1886. Descriptions of New Zealand Microlepidoptera, VIII. Tineina (part). *Trans. New Zealand Inst.* (Wellington), 18:162-183.

1888. Descriptions of New Zealand Tineina. *Trans. New Zealand Inst.* (Wellington), 20:77-106.

1895. *A Handbook of British Lepidoptera*. London: Macmillan. 843pp.

1914. Plutellidae. In *Lepidopterorum Catalogus*, 19:1-64 [part]. Berlin: W. Junk.

Moriuti, S.

1960. Description of the larva and pupa of *Glyphipteryx semiflavana* Issiki (Lepidoptera: Glyphipterygidae). *Kontyû* (Tokyo), 28:16-21.

1977. *Yponomeutidae s. lat. (Insecta: Lepidoptera)*. In *Fauna Japonica*. Tokyo: Keigaku. 327pp, 95 pl.

Philpott, A.

1928. Notes and descriptions of New Zealand Lepidoptera. *Trans. New Zealand Inst.* (Wellington), 59:481-490.

Spuler, A.

1908-10. *Die Schmetterlinge Europa*. Stuttgart: E. Schweizerbart. 3 v, 155 pl.

Werner, K.

1958. Die Larvalsystematik einiger Kleinschmetterlingsfamilien (Hyponomeutidae [sic], Orthoteliidae, Acrolepiidae, Tineidae, Incurvariidae und Adelidae). In *Abhandlungen zur Larvalsystematik der Insekten*, 2:1-145. Berlin: Akad. Verlag.

White, E. G.

2002. *New Zealand Tussock Grassland Moths: a Taxonomic and Ecological Handbook Based on Light-trapping Studies in Canterbury*. Lincoln: Manaaki Whenua Pr. 362pp.

LEPIDOPTERA NEWS, 2003 (1-2): 43-55 (2005)

ADDITIONS TO THE *BIBLIOGRAPHY OF BUTTERFLIES*, IN THE *ATLAS OF NEOTROPICAL LEPIDOPTERA*

No. VI. COMPRISING MOSTLY WORKS PUBLISHED IN 2001

GERARDO LAMAS

Museo Nacional de Historia Natural, Aptdo. 14-0434, Lima, Peru

The fifth set of *Additions* to the annotated *Bibliography of Butterflies* (Lamas, Robbins, and Field, 1995) in the series *Atlas of Neotropical Lepidoptera, Vol. 124*, was published recently (Lamas, 2002, *Lepidoptera News* 2002(1/2): 49-64). The 316 additional references included herein comprise mostly works published in 2001, such as were recorded until December 31st, 2002.

Olaf Mielke, Claus Rasmussen, Julián Salazar, Andrés Angulo, Alessandro Minelli, Keith Willmott, Angel Viloria and Alfredo Ugarte were particularly helpful in providing data on publications omitted previously, and I am most grateful for their kind interest and assistance.

Abad, Reynaldo G.
2001. See Howard, F. W. & R. G. Abad, 2001.

Acuña, Gastón
[1997]. *Rumbo a la Amazonía. Relato de la expedición científica chilena encabezada por el gran naturalista Luis Peña Guzmán, enero a julio 1965.* [Santiago de Chile], Colorama S.A. 246 pp., figs. [general; Peru, Ecuador]

Adalla, C. B.
1990. See Singh, S. R. et al., 1990.

Adams, Michael Jan
2001. See Viloria, A. L. et al., 2001.

Ahrenholz, David Henry
2001. A contribution to riodinid systematics (Lepidoptera: Riodinidae), by Jason P. W. Hall with Keith R. Willmott & Donald J. Harvey, contributors. 1998.- A revision of the genus *Theope*, its systematics and biology (Lepidoptera: Riodinidae: Nymphidiini), by Jason P. W. Hall. 1999. *Journal of the Lepidopterists' Society* 55(1): 44 (21 December) [book reviews]

Alayo, Pastor
1995. *Las mariposas de Cuba*, pp. 186-205, 25 figs. *In*: *Por los Caminos de la Edad de Oro. Tomo III.* La Habana, Editorial Gente Nueva (May) [general]
1997. *Las mariposas de Cuba*. La Habana, Editorial Gente Nueva. 53 pp., 21 figs. (September) [general]

Almeida, Gisele Luziane de
2001. See Duarte, M. et al., 2001.

Altizer, Sonia M.
2001. Migratory behaviour and host-parasite co-evolution in natural populations of Monarch butterflies infected with a protozoan parasite. *Evolutionary Ecology Research* 3(5): 611-632, 4 figs., 9 tabs. (July) [*Danaus plexippus* (Linnaeus); Mexico]

Alves, Sérgio Batista, Solange Aparecida Vieira and Evoneo Berti, Filho
1994. Ocorrência de *Paecilomyces* spp. no Brasil. *Revista de Agricultura* (Piracicaba) 69(1): 113-115, 1 tab. [*Brassolis sophorae* (Linnaeus), *Chlosyne lacinia* (Geyer); pathogens]

Andrade, Miguel Gonzalo
2001. See Tobar, D. et al., 2001.

Andrade, Pablo
2000. See Jiggins, C. D. et al., 2000.

Andresen, Jack, Michael Ferguson, Eugene J. Gerberg, Lear Grimmer, Laurence Hull, Paul Jacques, Andrea Rhodes, Nancy Sefton, and Jim Wood
1976. *A guide to the natural history of the Cayman Islands*. Cayman Islands Conservation Association. 80 pp., figs. [general; host plants]

Appel, Arthur G.
2001. See Mazer, C. L. & A. G. Appel, 2001.

Araújo, Alexandre Fernandes Bamberg de, Denise Cristina Ferreira, and Eliane Aparecida Silva
1987. Borboletas da mata do Carrinho, Uberaba, Minas Gerais. *Anais dos Seminários de Ciências FIUBE* (Uberaba) 1: 55-76, 4 figs., 2 tabs. [general; ecology; mimicry; Brazil]

Araújo, João M. de
1996. See Neves, L. L. de M. et al., 1996.

Austin, George T., and Philip J. DeVries
2001. New Hesperiidae (Lepidoptera) from Costa Rica. *Milwaukee Public Museum Contributions in Biology and Geology* 96: 1-8, 3 figs. (29 October) [*Cyclosemia caerulea, Neochlodes* (new genus) *maculosus*]

Austin, George T., and Andrew D. Warren
2001. Taxonomic notes on some Neotropical skippers (Lepidoptera: Hesperiidae): *Pyrgus, Heliopyrgus*, and *Heliopetes* (Pyrginae). *Dugesiana* 8(1): 1-13, 27 figs.

Bailey, Audette J. A.
1993. See Garraway, E. & A. J. A. Bailey, 1993.
1994. The Blue Swallowtail and other butterflies in Rozelle. *Jamaica Naturalist* 4: 7-9, 10 figs. (December) [general; host plants; behavior; Jamaica]

Balcázar, Manuel A.
1999. See Beutelspacher, C. R. & M. A. Balcázar, 1999.

Bálint, Zsolt
1999. Lepkészeti kutatoúton a perui Andokban [On a trip studying Lepidoptera in the Peruvian Andes]. *Allattani Közlemények* 84: 87-101, 2 tabs. [In Hungarian] [general]
2001. Three new eumaeine species from the Andes (Lepidoptera: Lycaenidae). *Folia entomologica hungarica* 62: 167-175, 9 figs. (31 December) [*Penaincisalia perezi, P. lamasi, Podanotum andrewneildi*; Colombia, Venezuela, Ecuador, Peru]

Bálint, Zsolt, and Dubi Benyamini
2001. Taxonomic notes, faunistics and species descriptions of the austral South American polyommatine lycaenid genus *Pseudolucia* (Lepidoptera: Lycaenidae): the *chilensis* and *collina* species groups. *Annales historico-naturales Musei nationalis hungarici* 93: 107-149, 60 figs., 1 tab. (30 November) [new species, *P. oraria, P. ugartei, P. dubi*; host plants; life histories; behavior; Chile, Argentina]

Bálint, Zsolt, Dubi Benyamini and Kurt Johnson
2001. Species descriptions and miscellaneous notes on the genus *Pseudolucia* (Lepidoptera: Lycaenidae). *Folia entomologica hungarica* 62: 151-165, 35 figs. (31 December) [new species: *P. kechico, P. henyah, P. arauco*; Chile]

Bálint, Zsolt, Crispin S. Guppy, Norbert G. Kondla, Kurt Johnson and Christopher J. Durden
2001. *Plebeius* Kluk, 1780 or *Plebejus* Kluk, 1802? (Lepidoptera:

Lycaenidae). *Folia entomologica hungarica* 62: 177-184, 7 figs. (31 December) [*Danaus, Heliconius, Nymphalis*; nomenclature]

Bálint, Zsolt, and Alfred Moser

2001. Notes on the genus *Paraspiculatus* (Insecta: Lepidoptera: Lycaenidae: Eumaeini) with a synopsis of the taxa occurring in southern Brazil. *Annalen der naturhistorischen Museum Wien* 103(B): 249-262, 25 figs. (December) [new species: *P. vossoroca, P. hannelore*; Colombia, Peru, Bolivia, Paraguay]

Bálint, Zsolt, and Janusz Wojtusiak

[2001]a. *Jagiello molinopampa* gen. et sp. n. from Peru (Lepidoptera: Lycaenidae). *Annales historico-naturales Musei nationalis hungarici* 92: 183-191, 14 figs. ("2000", [after 12 January 2001])

2001b. The genus *Pons* Johnson, 1992 (Lepidoptera: Lycaenidae: Eumaeini). *Genus* 12(3): 373-383, 12 figs., 2 tabs. (30 September) [general; taxonomy; distribution]

Barbosa, Luiz Cláudio de A.

2000. See Paula, V. F. de et al., 2000.

2001. See Paula, V. F. de et al., 2001.

Barish, Leo

1999. Mysteries of a butterfly wing. *Microscope* (Chicago) 47(2): 79-92, 36 figs. [*Morpho*]

Barnett, Adrian

2000. Copy your neighbor. *New Scientist* 167(2255): 34-37, figs. (9 September) [Ithomiinae; mimicry; Ecuador]

Barros-Bellanda, Helen Christina Habenchus, and Fernando Sérgio Zucoloto

2001. Influence of chorion ingestion on the performance of *Ascia monuste* and its association with cannibalism. *Ecological Entomology* 26(6): 557-561, 4 tabs. (December) [host plant; Brazil]

Barth, Rudolf

1962. Aspectos zoogeográficos do Brasil. *Revista brasileira de Geografia* 24: 79-104, 15 figs. (January-March) [general]

1980. Considerações gerais e específicas sobre as glândulas cutâneas sexuais dos lepidopteras [sic]. *Memórias do Instituto Oswaldo Cruz* 75(3/4): 129-140, 6 figs. (July-December) [general; morphology]

Bastos, Cristina Schetino

1996. See Neves, L. L. de M. et al., 1996.

Belicek, Joseph

2001. See Nylin, S. et al., 2001.

Beletsky, Les

2001. See Pearson, D. L. & L. Beletsky, 2001.

Bentancourt, Carlos M., and Iris B. Scatoni

1996. *Lepidópteros de importancia económica. Reconocimiento, biología y daños de las plagas agrícolas y forestales.* Montevideo, Editorial Hemisferio Sur. Vol. 2. [x] + 130 pp., 70 figs., 15 tabs. [general; host plants; Uruguay]

Bercellini, N., and L. Malacalza

1994. Plagas y depredadores en soja en el noroeste de la provincia de Buenos Aires (Arg.). *Turrialba* 44(4): 244-254, 3 figs (October-December) [*Colias lesbia* (Fabricius); host plant]

Benyamini, Dubi

2001a. See Bálint, Z. & D. Benyamini, 2001.

2001b. See Bálint, Z., D. Benyamini et al., 2001.

Berti, Evoneo, Filho

1994. See Alves, S. B. et al., 1994.

Beutelspacher, Carlos Rommel, and Manuel A. Balcázar

1999. Lepidoptera, pp. 83-98. *In*: Deloya, A. & J. E. Valenzuela (Eds.), Catálogo de insectos y ácaros plaga de los cultivos agrícolas de México. *Publicaciones especiales. Sociedad mexicana de Entomología* 1: xii + 174 pp., 1 map [general; host plants]

Bizuet, Y., Moisés Armando Luis and Jorge Enrique Llorente

2001. Mariposas del Parque Nacional El Chico, Hidalgo y sus relaciones biogeográficas con cinco zonas aledañas al Valle de México, México (Lepidoptera: Papilionoidea). *Shilap* 29(114): 145-159, 4 figs., 2 tabs. (30 June) [general]

Bollino, Maurizio

2001a. See Vitale, F. & M. Bollino, 2001a.

2001b. See Vitale, F. & M. Bollino, 2001b.

2001c. See Vitale, F. & M. Bollino, 2001c.

Bollino, Maurizio, and Giovanni Onore

2001. Mariposas del Ecuador. Vol. 10a. Familia: Papilionidae. *Publicación especial. Museo de Zoología. Pontificia Universidad católica del Ecuador* 4: i-ix, 1-179, 228 figs. (June) [general; distribution; host plants]

Bollino, Maurizio, and Julián Adolfo Salazar

2001. Una nuova sottospecie colombiana del genere *Parides* (Lepidoptera: Papilionidae). *Lambillionea* 101(4)(2): 641-645, 4 figs. (December) [*P. anchises nilseni*; ecology; behavior]

Boren, Sarah

1997. See Lovejoy, T. E. et al., 1997.

Borkin, Susan Sullivan

2001. Four wings and a prayer: Caught in the mystery of the Monarch Butterfly, by Sue Halpern. 2001. *News of the Lepidopterists' Society* 43(4): 106-107, 1 fig. (1 December) [*Danaus plexippus* (Linnaeus); Mexico; book review]

Boyd, Brian

1999. See Johnson, K. & B. Boyd, 1999.

Brabant, Ronald

2000. See Maes, J.-M. & R. Brabant, 2000.

2001. [A note]. *Lambillionea* 101(1)(2): 129 (March) [general; Costa Rica]

Brabant, Ronald, and Jean-Michel Maes

2001. Une nouvelle espèce de *Pteronymia* Butler & Druce, 1872 pour le Nicaragua (Lepidoptera, Ithomiidae). *Lambillionea* 101(1)(2): 135-138, 2 figs., 1 tab. (March) [*P. cotytto* (Guérin-Méneville), *P. artena artena* (Hewitson), *P. simplex schausi* Fox, *P. alcmena* (Godman & Salvin)]

Brévignon, Christian

2001a. Le genre *Chlorostrymon* Clench, 1961 en Guadeloupe (Lepidoptera, Lycaenidae, Theclinae). *Lambillionea* 101(4)(1): 561-566, 15 figs., 1 tab., 1 map (December) [general; morphology; taxonomy; behavior]

2001b. *Marpesia petreus* (Cramer, 1776) dans les Petites Antilles (Lepidoptera, Nymphalidae, Biblidinae). *Lambillionea* 101 (4)(1): 574-578, 21 figs. (December) [new subspecies: *M. p. damicorum*; egg, larva, pupa, imago; host plant; behavior; morphology]

Briscoe, Adriana D.

2001. See Hsu, R. et al., 2001.

Brock, James P.

1990. *Origins and phylogeny of butterflies*, pp. 209-233, 5 figs. *In*: Kudrna, O. (Ed.), *Butterflies of Europe. Volume 2. Introduction to Lepidopterology*. Wiesbaden, AULA-Verlag. [general]

Brower, Lincoln Pierson

1972. Misleading butterfly fiction. *BioScience* 27(3): 212. [*Danaus plexippus* (Linnaeus); ecology; Mexico; book review]

2001. Canary in the cornfield: the Monarch and the Bt corn controversy. *Orion* 20(2): 32-41, figs. [*Danaus plexippus* (Linnaeus); conservation; Mexico]

Brown, John Wesley

2001. Presidential address 2000: Nomenclatural nonsense - flying in the face of a farcical code. *Journal of the Lepidopterists' Society* 55(1): 1-7, 7 figs., 4 tabs. (21 December) [general]

Brown, Keith Spalding, Jr.

2001. See Freitas, A. V. L. & K. S. Brown, Jr., 2001.

Brown, Keith Spalding, Jr., and André Victor Lucci Freitas

[2001]. Atlantic forest butterflies: Indicators for landscape conservation. *Biotropica* 32(4b): 934-956, 3 figs., 7 tabs. ("2000", [March 2001]) [general; Brazil]

Bruno, F.

1989. See Racheli, T. & F. Bruno, 1989.

Bürger, Otto Wilhelm Heinrich

1897. Bericht über eine Reise durch Columbien und Venezuela. *Nachrichten von der königlichen Gesellschaft der Wissenschaften zu Göttingen (Mathematisch-physikalische Klasse)* 1897(2): 104-147. [general]

Burger, Joanna, and Michael Gochfeld

2001. Smooth-billed ani (*Crotophaga ani*) predation on butterflies in

Mato Grosso, Brazil: risk decreases with increased group size. *Behavioral Ecology and Sociobiology* 49(6): 482-492, 5 figs., 5 tabs. (3 May) [general]

Burmeister, Karl Hermann Konrad

1859. Physikalische Beschreibung der Gegend von Paraná. *Zeitschrift für allgemeine Erdkunde (Neue Folge)* 6: 429-435. [general; Argentina]

Burns, John McLauren

2001. Valeriana skipper: How its scientific name changed from *Thorybes valeriana* to *Codatractus mysie. American Butterflies* 9(1): 36-37, 4 figs. [Mexico]

Burns, John McLauren, and Daniel H. Janzen

2001. Biodiversity of pyrrhopygine skipper butterflies (Hesperiidae) in the Area de Conservación Guanacaste, Costa Rica. *Journal of the Lepidopterists' Society* 55(1): 15-43, 28 figs., 2 tabs. (21 December) [general; host plants; parasitoids; ecology; taxonomy]

Busoli, Antonio Carlos

1993. See Longhini, L. C. S. B. & A. C. Busoli, 1993.

Calafiori, M. H.

1988. See Pallazini, R. et al., 1988.

Callaghan, Curtis John

2001a. New riodinids from the Central Brazilian plateau (Lepidoptera, Riodinidae). *Revista brasileira de Zoologia* 18(3): 765-778, 45 figs. (30 September) [*Euselasia thucydides truncata, Mesosemia pardalis, Eurybia rubeolata planaltensis, Symmachia basilissa paracatuensis, Thisbe rupestre, Audre drucei nordensis, A. caracensis, Nymphidium caricae goiacensis*; behavior; Argentina]

2001b. The genus *Hypophylla* Boisduval, 1836 (Riodinidae) with descriptions of new taxa. *Journal of the Lepidopterists' Society* 54(4): 119-130, 60 figs. (10 December) [*H. caldensis, H. idae*; behavior; Central America, Colombia, Ecuador]

Callaghan, Curtis John, and Alexandre Soares

2001. A review of the Cinericiiformes section of the genus *Audre* Hemming and the description of a new subspecies (Riodinidae). *Revista brasileira de Zoologia* 18(3): 755-763, 20 figs. (30 September) [*A. guttata jaibensis*; Argentina, Brazil, Uruguay]

Camargo, Amabílio J. A.

2001. See Diniz, I. R. et al., 2001.

Cane, James H.

2000. See Roulston, T. H. & J. H. Cane, 2000.

Cardona, César, and Ashok K. Karel

1990. *Key insects and other invertebrate pests of beans*, pp. 157-191, 9 pls., 1 fig., 2 tabs. *In*: Singh, S. R. (Ed.), *Insect pests of food legumes*. Chichester, John Wiley & Sons. [*Urbanus proteus* (Linnaeus); host plant]

Cardoso, Márcio Zikán

2001. Patterns of pollen collection and flower visitation by *Heliconius* butterflies in southeastern Mexico. *Journal of tropical Ecology* 17(5): 763-768, 1 fig., 1 tab. (September) [general]

Carrera, Paola

2001. See Piñas, F. & P. Carrera, 2001.

Casagrande, Mirna Martins

2001a. See Duarte, M., M. M. Casagrande et al., 2001.

2001b. See Paluch, M. et al., 2001.

2001c. See Duarte, M., G. L. de Almeida et al., 2001.

Cassie, Brian

2001. Two very different butterfly books. *American Butterflies* 9(1): 40-41. [general; book review]

Castillo, Pedro Saúl

2001. Evaluación de las principales plagas del "mangle rojo" (*Rhizophora mangle*), "mangle salado" (*Avicennia germinans*) y "mangle blanco" (*Laguncularia racemosa*) en Tumbes, Perú. *Revista peruana de Entomología* 42: 185-189 ([18 May]) [*Pseudolycaena nellyae* Lamas; host plant]

Castrillo, Geovany

1993. See Rhainds, M. et al., 1993.

Caterino, Michael S., Robert D. Reed, May M. Kuo, and Felix A. H. Sperling

2001. A partitioned likelihood analysis of swallowtail butterfly phylogeny (Lepidoptera: Papilionidae). *Systematic Biology* 50(1): 106-127, 5 figs., 4 tabs. (February) [general]

Cave, Ronald D., and Roberto J. Cordero

1999. Parasitoides de *Leptophobia aripa* (Lepidoptera: Pieridae) en repollo y brócoli en Honduras. *Ceiba* 40(1): 51-55, 3 figs. (5 June) [host plants]

Chang, Belinda S. W.

2001. See Hsu, R. et al., 2001.

Cheverton, Mark R., and Chris D. Thomas

1982. *Cambridge Butterfly Expedition to Central America. Panama 1979. Final Report*. Cambridge, Authors. [2] + 105 pp., figs., tabs., graphs [general; ecology; biogeography; behavior]

Chinchilla, Carlos M.

1993. See Rhainds, M. et al., 1993.

Cock, Matthew J. W.

2000. The skipper butterflies (Hesperiidae) of Trinidad. Part 10, Pyrginae completed, genera groups F and G. *Living World* 1999-2000: 49-71, 37 figs. (August) [general; life histories; host plants]

2001. Notes on butterflies seen or collected on a short visit to Nevis, W.I., including the life history of *Epargyreus zestos* Geyer (Hesperiidae). *Living World* 2001: 27-36, 21 figs. [general; egg, larva, pupa; host plants]

Coe, Rebecca L.

2001. See Jiggins, C. D., R. E. Naisbit et al., 2001.

Cole, Stuart

2001. A visit to the Arima valley, Trinidad. *Bulletin of the amateur Entomologists' Society* 60(438): 180-183 (October) [general]

Colette, Sidonie-Gabrielle [1873-1954]

1936. *Splendeur des papillons*. Paris, Librairie Plon. 12 pp., 12 pls. [general; distribution]

Cordero, Roberto J.

1999. See Cave, R. D. & R. J. Cordero, 1999.

Constantino, Luis Miguel

1996. Ciclos de vida y plantas hospederas de lepidópteros diurnos con potencial económico en condiciones de colinas bajas del Chocó biogeográfico, pp. 75-86, 1 tab. *In*: *Memorias. II Seminario. Investigación y Manejo de Fauna para la Construcción de Sistemas Sostenibles*. Cali. [general; Colombia]

2001a. See Willmott, K. R. et al., 2001.

2001b. See Salazar, J. A. & L. M. Constantino, 2001a.

2001c. See Salazar, J. A. & L. M. Constantino, 2001b.

Corrales, Jorge F.

1999. *Mariposas comunes. Area de Conservación Tempisque. Costa Rica*. Heredia, Instituto Nacional de Biodiversidad. 116 pp., figs., 1 map (December) [general; host plants; behavior]

Corrêa, Claudine A., Bruno E. Irgang and Gilson Rudinei Pires Moreira

2001. Estrutura floral das angiospermas usadas por *Heliconius erato phyllis* (Lepidoptera, Nymphalidae) no Rio Grande do Sul, Brasil. *Iheringia (Zoologia)* 90: 71-84, 42 figs., 2 tabs. (25 May) [ecology; behavior]

Corseuil, Elio

2001. See Teston, J. A. & E. Corseuil, 2001.

Cortés, Raúl Eduardo

1979. Introducción de nuevas plagas de los cultivos. *Idesia* (Arica) 5: 299-308 (June) [*Pieris brassicae* (Linnaeus); host plant; Chile]

Cueva, Eduardo

2000. See Jiggins, C. D. et al., 2000.

Cunningham, Jack

2001. See Mann, D. J. & J. Cunningham, 2001.

D'Abrera, Bernard Laurence

2001. *The Concise Atlas of Butterflies of the World*. Melbourne, Hill House Publications. 353 pp., 150 pls., figs. [general; new genera: *Annamaria* D'Abrera & Bálint, *Lucilda* D'Abrera & Bálint, *Balintus* D'Abrera, *Salazaria* D'Abrera & Bálint, *Riojana* D'Abrera & Bálint, *Gulliveria* D'Abrera & Bálint, *Pedusa* D'Abrera, *Chopinia* D'Abrera]

Darling, Chris

2000. See Williamson, M. & C. Darling, 2000.

De Candido, Robert

2001. See Johnson, K. & R. De Candido, 2001.

Deloya, Aristeo Cuauhtémoc

1992. See Hernández-Baz, F. & A. C. Deloya, 1992.

Demuner, Antônio J.

2000. See Paula, V. F. de et al., 2000.

Descimon, Henri

1985. Observations botaniques en Amérique tropicale. *Bulletin de l'Association des Parcs botaniques de France* 8: 11-22, 8 figs., 2 maps [general; Venezuela, Ecuador]

1986. Observations botaniques en Amérique tropicale. Au Pérou. *Bulletin de l'Association des Parcs botaniques de France* 9: 11-26, 1 map [general]

DeVries, Philip James

2000. *Butterflies*, pp. 559-573, 5 figs., 5 tabs. *In*: Levin, S. A. (Ed.), *Encyclopedia of Biodiversity*. London, Academic Press. 1. ([October])[general]

2001a. See Penz, C. M. & P. J. DeVries, 2001.

2001b. See Austin, G. T. & P. J. DeVries, 2001.

DeVries, Philip James, and Thomas R. Walla

2001. Species diversity and community structure in Neotropical fruit-feeding butterflies. *Biological Journal of the Linnean Society* 74(1): 1-15, 5 figs., 7 tabs. (1 September) [general; Ecuador]

Di Mare, Rocco Alfredo

2001. See Schwartz, G. & R. A. Di Mare, 2001.

Diniz, Ivone Resende, Helena Castanheira Morais, and Amabílio J. A. Camargo

2001. Host plants of lepidopterous caterpillars in the cerrado of the Distrito Federal, Brazil. *Revista brasileira de Entomologia* 45(2): 107-122, 2 tabs. (31 August) [general]

Dixon, Sarah

2000. See Jiggins, C. D. et al., 2000.

[Donovan, Edward]

1813. *Papilio*, pp. [186]-[213]. *In*: Rees, A., *The New Cyclopaedia; or Universal Dictionary of Arts, Sciences, and Literature: Formed upon a more enlarged plan of arrangement than the dictionary of Mr. Chambers; comprehending the various articles of that work, with additions and improvements; together with the new subjects of biography, geography, and history; and adapted to the present state of literature and science*. London, Longman, Hurst, Rees, Orme, and Brown. 26(1): ([27 November]) [one plate on *Papilio* appeared in vol. 2(2), [7 April] 1803] [general]

Duarte, José Araújo, Jr., Francisco de Assis da Silva Roberto, Bruno Rodrigo França, and Bruno Maggi

2001. Levantamento preliminar dos Lepidoptera (Papilionoidea e Hesperioidea) do Parque Estadual Dunas, Natal, Rio Grande do Norte, Brasil. *Entomología y Vectores* 8(3): 365-369 (July-September) [general]

Duarte, Marcelo

2001. See Rocha, C. F. D. da & M. Duarte, 2001.

Duarte, Marcelo, Gisele Luziane de Almeida, Mirna Martins Casagrande, and Olaf Hermann Hendrik Mielke

2001. Notes on the last instar larva and pupa of *Hemiargus hanno* (Stoll) (Lepidoptera, Lycaenidae, Polyommatinae). *Revista brasileira de Zoologia* 18(4): 1097-1105, 20 figs. (31 December) [morphology; behavior; myrmecophily; host plant; Brazil]

Duarte, Marcelo, Mirna Martins Casagrande, and Olaf Hermann Hendrik Mielke

2001. Morfologia externa do adulto de *Hemiargus hanno* (Stoll) (Lepidoptera, Lycaenidae, Polyommatinae, Polyommatini). I. Cabeça. *Revista brasileira de Zoologia* 18(1): 225-238, 14 figs. (30 April) [Brazil]

Dujardin, Francis

1965. Papilionidae. Espèces de France et sous-espèces des Alpes-Maritimes. *Entomops* 1(3): 77-92, figs. (20 December) [*Euryades corethrus* (Boisduval); morphology; taxonomy]

Durden, Christopher J.

2001. See Bálint, Z., C. S. Guppy et al., 2001.

Dyer, Lee A.

2001. In defense of caterpillars. *Natural History* (New York) 110(10): 42-47, figs. (December) [general]

Ehrlich, Paul Ralph

2001. Tropical butterflies: A key model group that can be "completed". *Lepidoptera News* 2001(2): 1, 10-12 (15 November) [general]

Einem, Gerald E.

2001. Behavior of Juno Silverspot, *Dione juno huascama* [sic], larvae: wood eating? *News of the Lepidopterists' Society* 43(4): 114-115, 4 figs. (1 December) [host plant; Mexico]

Elmes, G. W., Jeremy A. Thomas, Miguel L. Munguira and Konrad Fiedler

2001. Larvae of lycaenid butterflies that parasitize ant colonies provide exceptions to normal insect growth rules. *Biological Journal of the Linnean Society* 73(3): 259-278, 2 figs., 3 tabs. (1 July) [*Eumaeus minijas* (Hübner), *E. debora* (Geyer); evolution; Mexico]

Erwin, Nathaniel

1997. See Lovejoy, T. E. et al., 1997.

Fancelli, Marilene, and José Djair Vendramim

1992. Aspectos biológicos de *Ascia monuste orseis* (Godart, 1819) (Lepidoptera, Pieridae) em cultivares de couve. *Anais da Sociedade entomológica do Brasil* 21(3): 357-366, 1 fig., 3 tabs. [life history; Brazil]

Ferguson, Michael

1976. See Andresen, J. et al., 1976.

Fernández, Antonio Jesús

2001. See Fernández, F. et al., 2001.

Fernández, Douglas Manuel

2001. New oviposition and larval hostplant records for twenty-three Cuban butterflies, with observations on the biology and distribution of some species. *Caribbean Journal of Science* 37(1/2): 122-125, 1 tab. (May) [general]

Fernández, Fidel, Aurelio Iñigo Torre and Antonio Jesús Fernández

2001. Las lenguas clásicas en los géneros de los ropalóceros (Lepidoptera). *Boletín de la Sociedad entomológica aragonesa* 29: 111-116 (October) [general; etymology]

Ferreira, Denise Cristina

1987. See Araújo, A. F. de et al., 1987.

Fiedler, Konrad

2001. See Elmes, G. W. et al., 2001.

Fitzgerald, Terrence D.

2001. Nightlife of social caterpillars. *Natural History* (New York) 110(1): 38-43, figs. (February) [*Eucherira socialis* Westwood; behavior; host plant; Mexico]

Forster, Walter

1955. Als Biologe in der bolivianischen Kordillere. *Der Bergsteiger* 23(1): 29-31 (October) [general]

1956. Die Yungas. *Kosmos* (Stuttgart) 52: 514-524, 14 figs. [general; Bolivia]

França, Bruno Rodrigo

2001. See Duarte, J. A., Jr. et al., 2001.

Fratello, Steven A.

2001a. Guyana montane expeditions, II. *Lepidoptera News* 2001(2): 8-9, 1 map (15 November) [general]

2001b. Falls from paradise. *Natural History* (New York) 110(10): 26-28, figs. (December) [general; Guyana]

Freitas, André Victor Lucci

2001a. See Brown, K. S., Jr. & A. V. L. Freitas, [2001].

2001b. See Machado, G. & A. V. L. Freitas, 2001.

Freitas, André Victor Lucci, and Keith Spalding Brown, Jr.

2001. Biology of *Adelpha mythra* feeding on Asteraceae, a novel plant family for the Neotropical Limenitidinae (Nymphalidae), and new data on *Adelpha* "species-group VII". *Journal of the Lepidopterists' Society* 54(3): 97-100, 3 figs., 1 tab. (25 September) [*A. syma* (Godart); eggs, larvae, pupae; host plants; Brazil]

Freitas, André Victor Lucci, and R. R. Ramos

2001. Population biology of *Parides anchises nephalion* (Papilionidae) in a coastal site in Southeast Brazil. *Brazilian Journal of Biology* 61(4): 623-630, 3 figs., 3 tabs. (30 November) [host plant; behavior]

Furtado, Eurides

2001a. *Prepona pheridamas pheridamas* (Cramer) e seus estágios

imaturos (Lepidoptera, Nymphalidae, Charaxinae). *Revista brasileira de Zoologia* 18(3): 689-694, 10 figs. (30 September) [egg, larva, pupa, imago; host plant; behavior; Brazil]

2001b. *Pirascca crocostigma* (Bates, 1868): Notas etológicas e descrição da fêmea (Lepidoptera, Riodinidae). *Lambillionea* 101(4)(2): 638-640, 5 figs. (December) [Brazil]

Gaal, Sabine, and Astrid Keber

1996. *Die Schmetterlingsgattungen* Morpho *und* Heliconius *in Costa Rica*, pp. 77-79, figs. 102-107. *In*: Sehnal, P. & H. Zettel, *Esquinas-Nationalpark. Der Regenwald der Österreicher in Costa Rica*. Wien, Naturhistorisches Museum. [general; host plants; behavior]

Gabriel, Alfred George

[1944?]. *Uncle Dan's book about butterflies*. London, D. Harper & Co., Ltd. 46 pp., figs. [*Caligo prometheus* (Kollar), *Argyrophorus argenteus* Blanchard]

Gaedike, Reinhard

2001. See Taeger, A. & R. Gaedike, 2001.

García, L.

1995. See Ladrón de Guevara, O. et al., 1995.

Garnier, Eric, and Michel Garnier

1999. Voyage entomologique en Equateur (du 8 au 26 octobre 1998). *Bulletin des Lépidoptéristes parisiens* 8(12): 10-11 (April) [general]

Garnier, Michel

1999. See Garnier, E. & M. Garnier, 1999.

Garraway, Eric, and Audette J. A. Bailey

1993. The ecology and conservation biology of Jamaica's endangered giant swallowtail butterfly, *Papilio homerus*. *Jamaica Naturalist* 3: 7-122, figs. (December) [life history; host plant]

Gaston, Kevin J.

1993. Herbivory at the limits. *Trends in Ecology & Evolution* 8(6): 193-194, 1 tab. (June) [general]

Gatschnegg, T.

2001. See Krenn, H. W. et al., 2001.

George, Jean Craighead

1978. My search for secret agent # 25238. *National Wildlife* 16(3): 16-19, figs. ([March]) (*Danaus plexippus* (Linnaeus); migration; Mexico]

Gerberg, Eugene J.

1976. See Andresen, J. et al., 1976.

Gere, Géza

2001. [Faunistic data of lycaenid and riodinid butterflies from Peru (Lepidoptera: Lycaenidae, Riodinidae)]. *Folia entomologica hungarica* 62: 391-393 (31 December) [In Hungarian] [general]

Gilbert, Pamela

2000. *Butterfly collectors and painters. Four centuries of colour plates from The Library Collections of the Natural History Museum, London*. Singapore, Beaumont Publishing Pte Ltd. x + 166 pp., 60 pls., 35 figs. [general; history; bibliography]

Glassberg, Jeffrey

2001a. The pipe-dream project. *American Butterflies* 9(2): 34-41, figs. [*Battus*; host plants; Mexico]

2001b. Cracking the code. *American Butterflies* 9(4): 16-27, figs. [*Hamadryas*; behavior; Mexico]

2001c. *Butterflies through binoculars. The West. A field guide to the butterflies of Western North America*. New York, Oxford University Press. x + 374 pp., figs., maps [general; Mexico]

Gloor, Paul

2001. See Vega, G. & P. Gloor, 2001.

Gochfeld, Michael

2001. See Burger, J. & M. Gochfeld, 2001.

González, Allan

1998. See Soto, G. & A. González, 1998.

Gouillard, Jean

2000. A propos du Monarque américain (*Danaus plexippus*). *Bulletin des Lépidoptéristes parisiens* 9(15): 21 (April) [migration; Mexico]

2001. Le Monarque. *L'Entomologiste* 57(3/4): 97-100 (August) [*Danaus plexippus* (Linnaeus); migration; Mexico]

Gould, Stephen Jay [1941-2002]

1999. *No science without fancy, no art without facts: The lepidoptery of Vladimir Nabokov*, pp. 84-114. *In*: Funke, S., *Vera's Butterflies. First editions by Vladimir Nabokov inscribed to his wife*. New York, Glenn Horowitz Bookseller, Inc. [general]

Grados, Juan

2001. See Lamas, G. & J. Grados, 2001.

Greeney, Harold F., and Nicole M. Gerardo

2001. Descriptions of the immature stages and oviposition behavior of *Pyrrhogyra otolais* (Nymphalidae). *Journal of the Lepidopterists' Society* 54(3): 88-90, 1 fig. (25 September) [egg, larva, pupa; host plant; Ecuador]

Grimmer, Lear

1976. See Andresen, J. et al., 1976.

Guppy, Crispin S.

2001. See Bálint, Z., C. S. Guppy et al., 2001.

Haber, William A.

2000a. See Stevenson, R. & W. A. Haber, 2000a.

2000b. See Stevenson, R. & W. A. Haber, 2000b.

Habib, Mohamed E. M.

2001. See Nogueira, M. D. & M. E. M. Habib, 2001.

Hall, Jason Piers Wilton

2001a. See Willmott, K. R., L. M. Constantino et al., 2001.

2001b. A revision of the new riodinid genus *Dachetola* (Lepidoptera: Riodinidae). *Journal of the New York entomological Society* 109(2): 183-195, 13 figs. [*D. azora* (Godart), *D. virido* (Lathy), *D. caligata* (Stichel), *D. pione* (Bates); taxonomy; Panama, South America]

2001c. See Willmott, K. R., J. P. W. Hall et al., 2001.

Hall, Jason Piers Wilton, and Donald James Harvey

2001a. A reassessment of *Calociasma* with the description of a new genus and a new species (Riodinidae: Nymphidiini). *Journal of the New York entomological Society* 109(2): 196-205, 6 figs. [*Calicosama robbinsi*; taxonomy; morphology; distribution]

2001b. Phylogenetic revision of the *Charis gynaea* group (Lepidoptera: Riodinidae) with comments on historical relationships among Neotropical areas of endemism. *Annals of the entomological Society of America* 94(5): 631-647, 10 figs., 2 tabs. (September) [new species: *C. barnesi, C. callaghani, C. gallardi, C. nicolayi, C. smalli*; taxonomy; biogeography; Central and South America]

2001c. A phylogenetic analysis of the Neotropical riodinid butterfly genera *Juditha, Lemonias, Thisbe* and *Uraneis*, with a revision of *Juditha* (Lepidoptera: Riodinidae: Nymphidiini). *Systematic Entomology* 26(4): 453-490, 16 figs., 2 tabs. (October) [new species: *J. inambari, J. naza, J. caucana*; biogeography; life histories; host plants; ecology; behavior]

Hall, Jason Piers Wilton, and Gerardo Lamas

2001. Five new riodinid species from northwestern dry forest and northeastern Andean cloud forest habitats in Peru (Lepidoptera: Riodinidae). *Revista peruana de Entomología* 42: 9-19, 10 figs. ([18 May]) [*Euselasia perisama, Napaea tumbesia, Lasaia maritima, Symmachia calderoni, Uraneis incubus*; Ecuador]

Halpern, Sue

2001. *Four wings and a prayer. Caught in the mystery of the Monarch Butterfly*. New York, Pantheon Books. [viii] + 213 pp., figs. [*Danaus plexippus* (Linnaeus); ecology; Mexico]

Hanson, Paul

2000. *Lepidoptera: Moths and butterflies. Introduction*, p. 118. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest*. New York, Oxford University Press. [general; Costa Rica]

Hartmann, Thomas, and Ludger Witte

1995. *Chemistry, biology and chemoecology of the pyrrolizidine alkaloids*, pp. 155-233, 10 figs., 2 tabs. *In*: Pelletier, S. W. (Ed.), *Alkaloids: Chemical and Biological Perspectives*. Oxford, Pergamon. 9. [Danainae, Ithomiinae]

Harvey, Donald James

2001a. See Hall, J. P. W. & D. J. Harvey, 2001a.

2001b. See Hall, J. P. W. & D. J. Harvey, 2001b.

2001c. See Hall, J. P. W. & D. J. Harvey, 2001c.

Hasegawa, Hitoshi
1987. See Okumoto, D. et al., 1987.
Haugum, Jan
2001. Verhulst, J.T. (2000): Les *Colias* du Globe. Monograph of the genus *Colias*. *Nachrichten der entomologischer Verein Apollo* (N.F.) 22(1): 12-13 (May) [general; book review]
Henao, Efraín Reinel
2000. See Salazar, J. A. & E. R. Henao, 2000.
Heppner, John Bernhard
2001a. NABA calls collectors immoral. *Lepidoptera News* 2001(3): 3-5 (28 November) [general; conservation]
2001b. Relationship between the giant swallowatil and citrus. *Lepidoptera News* 2001(3): 6 (28 November) [*Papilio cresphontes* Cramer; host plants; distribution; conservation]
2001c. Lepidoptera Museum Collections, 1929-30 by J. D. Gunder. 1. San Diego Natural History Museum. 2. Natural History Museum of Los Angeles County. 3. California Academy of Sciences. *Lepidoptera News* 2001(3): 11-18, figs. (28 November) [general]
2001d. Atlas of North American Lepidoptera. Checklist: Part 1. Papilionidae. *Lepidoptera News* 2001(3): 57-67 (28 November) [general]
Hernández-Baz, Fernando
1991. Lista de tesis sobre lepidópteros (Rhopalocera: Heterocera) de México. *Boletín de la Sociedad mexicana de Lepidopterología (Nueva Serie)* 1: 5-11 (October) [general; bibliography]
1992. See Quiroz, L. N. & F. Hernández-Baz, 1992.
Hernández-Baz, Fernando, and Aristeo Cuauhtémoc Deloya
1992. Observaciones ecológicas de *Pierella luna heracles* Boisduval, 1870 (Lepidoptera: Satyridae) en la selva tropical de Los Tuxtlas, Veracruz, México. *Boletín de la Sociedad mexicana de Lepidopterología (Nueva Serie)* 2: 13-16, 1 fig. (November)
Hodges, Margaret
1993. An unusual butterfly. *Jamaica Naturalist* 3: 25, 1 fig. (December) [*Hypolimnas misippus* (Linnaeus); Jamaica]
Honey, Martin R., and Malcolm J. Scoble
2001. Linnaeus' butterflies (Lepidoptera: Papilionoidea and Hesperioidea). *Zoological Journal of the Linnean Society* 132(3): 277-399, 39 figs. (July) [general; taxonomy; nomenclature]
Howard, Forrest W., and Reynaldo G. Abad
2001. *Defoliators of palms. Lepidoptera*, pp. 34-81, 15 figs. *In*: Howard, F. W., D. Moore, R. M. Giblin-Davis and R. G. Abad, *Insects on palms*. Wallingford, CABI Publishing. [general; host plants]
Hsu, Ruby, Adriana D. Briscoe, Belinda S. W. Chang and Naomi E. Pierce
2001. Molecular evolution of a long wavelength-sensitive opsin in mimetic *Heliconius* butterflies (Lepidoptera: Nymphalidae). *Biological Journal of the Linnean Society* 72(3): 435-447, 6 figs., 4 tabs. [general; Costa Rica, Panama, Ecuador]
Hull, Laurence
1976. See Andresen, J. et al., 1976.
International Commission on Zoological Nomenclature
2001. *Official lists and indexes of names and works in Zoology. Supplement 1986-2000*. London, The International Trust for Zoological Nomenclature. [iv] + 136 pp. [general]
Irgang, Bruno E.
2001. See Corrêa, C. A. et al., 2001.
Isherwood, Isabel
2000. See Jiggins, C. D. et al., 2000.
Jackai, L. E. N.
1990. See Singh, S. R. et al., 1990.
Jacques, Paul
1976. See Andresen, J. et al., 1976.
Janz, Niklas
2001. See Nylin, S. et al., 2001.
Janz, Niklas, Klas Nyblom and Sören Nylin
2001. Evolutionary dynamics of host-plant specialization: a case study of the tribe Nymphalini. *Evolution* 55(4): 783-796, 4 figs., 4 tabs. (14 May) [general]
Janzen, Daniel H.
2001. See Burns, J. M. & D. H. Janzen, 2001.
Jiggins, Chris D.
2001. See Naisbit, R. E. et al., 2001.
Jiggins, Chris D., Pablo Andrade, Eduardo Cueva, Sarah Dixon, Isabel Isherwood and Jake Willis
2000. *Ecuador Nature Guide. Southwest forests. Sozoranga Forest Project*. Edmonton, Lone Pine Publishing. 96 pp., figs. [general]
Jiggins, Chris D., Mauricio Linares, Russell E. Naisbit, Camilo Salazar, Zihen H. Yang and James Louis Borlase Mallet
2001. Sex-linked hybrid sterility in a butterfly. *Evolution* 55(8): 1631-1638, 1 fig., 1 tab. (14 September) [*Heliconius melpomene melpomene* (Linnaeus), *H. m. rosina* Boisduval; host plants; French Guiana, Colombia, Panama]
Jiggins, Chris D., Russell E. Naisbit, Rebecca L. Coe and James Louis Borlase Mallet
2001. Reproductive isolation caused by color pattern mimicry. *Nature* 411(6835): 302-305, 3 figs., 2 tabs. (17 May) [*Heliconius*; Panama, French Guiana]
Johnson, Kurt
2001a. Monarch watch 2000. Monarch experts call Monarch situation in Mexico critical. *Lepidoptera News* 2000(3): 1, 7-10, 6 figs. (31 January) [*Danaus plexippus* (Linnaeus); conservation]
2001b. Some comments on the sociology of lepidopterists. *Lepidoptera News* 2001(3): 7-9 (28 November) [general]
2001c. See Bálint, Z., D. Benyamini et al., 2001.
2001d. See Bálint, Z., C. S. Guppy et al., 2001.
Johnson, Kurt, and Brian Boyd
1999. *Naturally playful: An introduction*, pp. 13-20. *In*: Funke, S., *Vera's Butterflies. First editions by Vladimir Nabokov inscribed to his wife*. New York, Glenn Horowitz Bookseller, Inc. [Lycaenidae]
Johnson, Kurt, and Robert De Candido
2001. Devastating March for Monarchs in Mexico. *News of the Lepidopterists' Society* 43(2): 44-45, 4 figs. (15 June) [*Danaus plexippus* (Linnaeus); ecology; conservation]
Jordan, Heinrich Ernst Karl
1903. See Rothschild, L. W. & H. E. K. Jordan, 1903.
Joron, Mathieu, Ian R. Wynne, Gerardo Lamas, and James Louis Borlase Mallet
2001. Variable selection and the coexistence of multiple mimetic forms of the butterfly *Heliconius numata*. *Evolutionary Ecology* 13(7/8): 721-754, 6 figs., 5 tabs. [Peru]
Källersjö, Mari
2001. See Nylin, S. et al., 2001.
Kapan, Durrell D.
2001. Three-butterfly system provides a field test of Müllerian mimicry. *Nature* 409: 338-340, 3 figs., 1 tab. (18 January) [*Heliconius*; Ecuador]
Karel, Ashok K.
1990. See Cardona, C. & A. K. Karel, 1990.
Keber, Astrid
1996. See Gaal, S. & A. Keber, 1996.
Kemp, Darrell J., and Christer Wiklund
2001. Fighting without weaponry: a review of male-male contest competition in butterflies. *Behavioral Ecology & Sociobiology* 49(6): 429-442, 3 tabs. (3 May) [general]
Kerchache, Jacques
2000. *The hand of nature. Butterflies, beetles and dragonflies*. London, Thames & Hudson. 160 pp., 85 figs. [general]
Keymeulen, A.
2001. Verhulst J., 2000, Les *Colias* du Globe (Monograph of the genus *Colias*). *Linneana Belgica* 18(4): 191 (December) [general; book review]
Knoth, Max Friedrich August [1863-1937]
1918. [A note]. *Internationale entomologische Zeitschrift* 12(1): 7-8 (6 April) [Papilionidae; South America]
Kocher, Scott D., and Ernest H. Williams
2000. The diversity and abundance of North American butterflies vary with habitat disturbance and geography. *Journal of Biogeography* 27: 785-794, 8 figs., 2 tabs. [general; Mexico]
Kondla, Norbert G.

2001. See Bálint, Z., C.S. Guppy et al., 2001.

Konishi, Masayasu

1987. See Okumoto, D. et al., 1987.

Krenn, Harald W., K. P. Zulka and T. Gatschnegg

2001. Proboscis morphology and food preferences in nymphalid butterflies (Lepidoptera: Nymphalidae). *Journal of Zoology* 254(1): 17-26, 3 figs., 4 tabs. (May) [general]

Krizek, George O.

2001. Selective predation on iridescent blue butterflies by birds. *News of the Lepidopterists' Society* 43(1): 5-6, 4 figs. (15 March) [*Archaeoprepona demophoon antimache* (Hübner), *Pseudolycaena damo* (Druce), *Evenus regalis* (Cramer); Mexico]

Kuo, May M.

2001. See Caterino, M. S. et al., 2001.

Kuznetzov, V. I., and A. A. Stekolnikov

2001a. [New approaches to the system of Lepidoptera of World fauna (on the base of the functional morphology of the abdomen)]. *Proceedings of the zoological Institute. Russian Academy of Sciences* 282: 1-462, 151 figs., 2 tabs. (26 April) [In Russian] [general; systematics]

2001b. [Comparative morphology of the male genitalia in the subfamilies Morphinae and Brassolinae and the resurrection of the family Satyridae, status resurr. (Lepidoptera) in new limits]. *Entomologicheskoe Obozrenie* 80(1): 121-136, 12 figs. [In Russian] [*Morpho peleides* Kollar, *Caligo eurilochus* (Cramer), *C. atreus* (Kollar)]

Ladrón de Guevara, O., P. Padilla, L. García, José Manuel Pino and Julieta Ramos

1995. Amino acid determination in some edible Mexican insects. *Amino Acids* 9: 161-172, 3 figs., 5 tabs. [*Aegiale* (*Acentrocneme*) *hesperiaris* (Walker)]

Lamas, Gerardo

2001a. Additions and corrections to the Bibliography of Butterflies, in the Atlas of Neotropical Lepidoptera. IV. Comprising mostly works published in 1999. *Lepidoptera News* 2000(3): 21-35 (31 January) [general]

2001b. See Hall, J. P. W. & G. Lamas, 2001.

2001c. Rediscovery of the holotype of *Calephelis costaricicola* Strand, 1916 (Lepidoptera: Riodinidae). *Revista peruana de Entomología* 42: 20 ([18 May]) [Costa Rica]

2001d. Los Papilionidae y Nymphalidae (Morphinae, Satyrinae, Biblidinae y Heliconiinae) americanos descritos por J. Röber (Lepidoptera). *Revista peruana de Entomología* 42: 27-40 ([18 May]) [general]

2001e. Los Riodinidae, Lycaenidae y Hesperiidae americanos descritos por J. Röber (Lepidoptera). *Revista peruana de Entomología* 42: 41-48 ([18 May]) [general]

2001f. Mariposas de Buenos Aires. *Revista peruana de Entomología* 42: 225-227 ([18 May]) [general; book reviews]

2001g. See Willmott, K. R., J. P. W. Hall et al., 2001.

2001h. See Joron, M. et al., 2001.

Lamas, Gerardo, and Juan Grados

2001. Lepidoptera of two sites in the Northern Cordillera de Vilcabamba, Peru, pp. 147-148, 276-278. *In*: Alonso, L. E., A. Alonso, T. S. Schulenberg & F. Dallmeier (Eds.), Biological and social assessments of the Cordillera de Vilcabamba, Peru. *RAP Working Papers* 12. (June) [general]

Lawrence, C. R.

2001. See Vukusic, P. et al., 2001.

Le Moult, Eugène, and Pierre Réal

1963. *Splendeur et énigmes des* Morpho. Paris, Editions du Cabinet Entomologique Le Moult. [4] pp., 20 pls. [general]

Lendorff, Gertrude [1900-]

1955. *Maria Sibylla Merian 1647-1717 ihr Leben und ihr Werke.* Basel, Gute Schriften. 64 pp., 8 pls., [general; Surinam]

Lewis, Owen T.

2001a. Effect of experimental selective logging on tropical butterflies. *Conservation Biology* 15(2): 389-400, 6 figs., 2 tabs. (April) [general; Belize]

2001b. Selective logging and butterflies in the Chiquibul Forest. *Las Cuevas* 8: 5, 2 figs. (July) [general; Belize]

Linares, Mauricio

2001. See Jiggins, C. D., M. Linares et al., 2001.

Llorente, Jorge Enrique

2001a. See Bizuet, Y. et al., 2001.

2001b. See Monteagudo, D. et al., 2001.

Lötsch, Bernd

1996. *Wege zum Esquinas Regenwald. Eindrücke eines Ökologen*, pp. 112-125, figs. *In*: Sehnal, P. & H. Zettel, *Esquinas-National park. Der Regenwald der Österreicher in Costa Rica.* Wien, Naturhistorisches Museum. [general; butterfly farming]

Longhini, Lázara Catarina Spindola Barbieri, and Antonio Carlos Busoli

1993. Controle integrado de *Brevicoryne brassicae* (L., 1758) (Homoptera, Aphididae) e *Ascia monuste orseis* (Latr., 1819) (Lepidoptera, Pieridae) em couve (*Brassica oleracea* var. *acephala*). *Científica* (São Paulo) 21(2): 231-237, 4 tabs. [Brazil]

López, Carlos

2001. See Salazar, J. A. & C. López, 2001.

Lorković, Zdravko

1990. *The butterfly chromosomes and their application in systematics and phylogeny*, pp. 332-396, pls. 1-2, 36 figs., 1 tab., 1 graph. *In*: Kudrna, O. (Ed.), *Butterflies of Europe. Volume 2. Introduction to lepidopterology.* Wiesbaden, AULA-Verlag. [general]

Lovejoy, Thomas E., Nathaniel Erwin and Sarah Boren

1997. *Insect conservation*, pp. 395-400. *In*: Watt, A. D., N. E. Stork & M. D. Hunter (Eds.), *Forests and insects.* London, Chapman & Hall. [general]

Lozada, José

2001. El Museo de Historia Natural del Colegio de Cristo, Manizales. *Boletín científico. Museo de Historia natural. Universidad de Caldas* 5: 64-65 (January) [general; history; Colombia]

Luis, Moisés Armando

2001a. See Bizuet, Y. et al., 2001.

2001b. See Monteagudo, D. et al., 2001.

Luquet, Gérard-Christian

1995. Les publications scientifiques de Vladimir Nabokov. *Europe* (Paris) 73(791): 144-151. [general]

MacArthur, Kenneth

1975. Monarch reigns supreme. *National Wildlife* 14(1): 42-45, figs. ([November]) [*Danaus plexippus* (Linnaeus); ecology; Mexico]

Machado, Glauco, and André Victor Lucci Freitas

2001. Larval defence against ant predation in the butterfly *Smyrna blomfildia. Ecological Entomology* 26(4): 436-439, 1 fig., 1 tab. (August) [host plant; behavior; Brazil]

Machado, Vera Lígia Letízio

2001. See Vitali-Veiga, M. de J. & V. L. L. Machado, 2001.

Macías, Jorge E.

1991. *Insectos asociados al arbolado urbano en el Distrito Federal, México*, pp. 245-279, 7 figs., 5 tabs. *In*: López-Moreno, I. R. (Ed.), *El arbolado urbano de la zona metropolitana de la Ciudad de México.* México, Universidad Autónoma Metropolitana. [*Papilio multicaudatus* Kirby, *Nymphalis antiopa* (Linnaeus); host plants]

Maes, Jean-Michel

2001. See Brabant, R. & J.-M. Maes, 2001.

Maes, Jean-Michel, and Ronald Brabant

2000. Mariposas de Nicaragua. *Revista nicaragüense de Entomología* 51/54: 3-6 + CD ROM (December) [general]

Maggi, Bruno

2001. See Duarte, J. A., Jr. et al., 2001.

Malacalza, L.

1994. See Bercellini, N. & L. Malacalza, 1994.

Mallet, James Louis Borlase

2001a. Taxonomy and the blues. *Nature* 409: 664-665, 1 fig. (8 February) [Lycaenidae; book review]

2001b. See Jiggins, C. D., R. E. Naisbit et al., 2001.

2001c. Mimicry: An interface between psychology and evolution. *Proceedings of the national Academy of Sciences of the USA* 98(16): 8928-8930 (31 July) [general]

2001d. See Naisbit, R. E. et al., 2001.

2001e. See Jiggins, C. D., M. Linares et al., 2001.
2001f. See Joron, M. et al., 2001.
2001g. Causes and consequences of a lack of coevolution in Müllerian mimicry. *Evolutionary Ecology* 13(7/8): 777-806, 5 figs. [general]
2001h. *Gene flow*, pp. 337-360, 4 figs. *In*: Woiwood, I. P., D. R. Reynolds & C. D. Thomas (Eds.), *Insect movement. Mechanisms and consequences*. Wallingford, CABI Publishing. [*Heliconius*; Ecuador, Peru]

Mann, Darren J., and Jack Cunningham
2001. The Bulow Lepidoptera collection. *Bulletin of the amateur Entomologists' Society* 60(439): 220-230, pl. 1, 1 tab. (December) [general]

Manos-Jones, Maraleen
2000. *The spirit of butterflies. Myth, magic and art*. New York, Harry N. Abrams, Inc. 144 pp., figs. [general]

Marcos, Júlio, Filho
1968. See Nakano, O. et al., 1968.

Martin, Johann Karl Ludwig [1851-]
1887. *Westindische Skizzen. Reise-Erinnerungen*. Leiden, E. J. Brill. vii + 186 pp., 22 pls., 1 map. [general; Surinam, Venezuela; West Indies]

Martins, J. C.
1982. See Vendramim, J. D. & J. C. Martins, 1982.

Masters, Alan R.
2000a. *Transparent butterflies*, pp. 120-121. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest*. New York, Oxford University Press. [Satyrinae, Ithomiinae, *Dismorphia theucharila* (Doubleday); behavior; Costa Rica]
2000b. *Variable chemical defense and mimicry*, pp. 121-122. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest*. New York, Oxford University Press. [general; behavior; Costa Rica]

Matsuka, Hirotaka
1987. See Unno, K. et al., 1987.

Mazer, Cynthia L., and Arthur G. Appel
2001. Water loss and desiccation tolerances of longwing butterflies (Lepidoptera: Nymphalidae). *Environmental Entomology* 30(4): 631-635, 2 figs., 6 tabs. (August) [Heliconiinae]

Merwin, W. S.
1996. The winter palace. *Orion Nature Quarterly* 15(1): 44-53, figs. [*Danaus plexippus* (Linnaeus); ecology; behavior; Mexico]

Mielke, Olaf Hermann Hendrik
2001a. See Duarte, M., M. M. Casagrande et al., 2001.
2001b. See Paluch, M. et al., 2001.
2001c. Estudo cladístico e descrições de tribos em Pyrrhopyginae (Lepidoptera, Hesperiidae). *Revista brasileira de Zoologia* 18(3): 897-905, 8 figs., 1 tab. (30 September) [new tribes: Passovini, Zoniini, Oxynetrini]
2001d. See Duarte, M., G. L. de Almeida et al., 2001.

Milius, Susan
1993. The ups and downs of butterfly wings. *International Wildlife* 23(3): 36-37, figs. ([April]) [general]

Mitis, Heinrich von [1845-1905]
1896. Ueber Varietäten und Aberrationen von Schmetterlingen und deren Bedeutung für die Descendenz-Forschung. *Jahresbericht des wiener entomologischen Vereins* 6: 29-38, pl. 1, fig. 3. [general]

Möhn, Edwin
2001a. Beiträge zur Kenntnis neotropischer Papilionidae (Lepidoptera). Teil 1. *Notes on Papilionidae* 1: 3-10, pls. 1-5 (19 September) [new subspecies: *Battus* (*Battus*) *madyes frankenbachi, B.* (*B*) *m. callangaensis, Heraclides* (*Heraclides*) *paeon marxi, Pterourus* (*Pyrrhosticta*) *zagreus baueri, P.* (*P*). *neyi josianeae*; Peru, Brazil]
2001b. See Racheli, T. & E. Möhn, 2001.

Monteagudo, D., Moisés Armando Luis, Isabel Vargas and Jorge Enrique Llorente
2001. Patrones altitudinales y de diversidad de mariposas en la Sierra Madre del Sur (México) (Lepidoptera: Papilionoidea). *Shilap* 29(115): 207-237, 3 figs., 4 tabs. (30 September) [general]

Morais, Helena Castanheira
2001. See Diniz, I. R. et al., 2001.

Moreira, Gilson Rudinei Pires
2001. See Corrêa, C. A. et al., 2001.

Morel, François
2000. Mimétisme et polymorphisme chez les Heliconiidae. *Bulletin des Lépidoptéristes parisiens* 9(15): 16-20, pl. 4. [general; Ithomiinae; evolution; Neotropics]

Morrone, Juan José
2001. A formal definition of the Paramo-Punan biogeographic subregion and its provinces, based mainly on animal taxa. *Revista del Museo argentino de Ciencias naturales* (nueva serie) 3(1): 1-12, 7 figs. (July) [general]

Moser, Alfred
2001. See Bálint, Z. & A. Moser, 2001.

Münte, R.
1988. See Pallazini, R. et al., 1988.

Mundaca, Nelly
1989. See Neira, M. et al., 1989.

Munguira, Miguel L.
2001. See Elmes, G. W. et al., 2001.

Murray, Debra
2001. Immature stages and biology of *Taygetis* Hübner (Lepidoptera: Nymphalidae). *Proceedings of the entomological Society of Washington* 103(4): 932-945, 17 figs., 1 tab. [*T. mermeria* (Cramer), *T. cleopatra* C. Felder & R. Felder, *T. laches* (Fabricius), *T. thamyra* (Cramer), *T. virgilia* (Cramer); morphology; host plants; Ecuador]

Naisbit, Russell E.
2001a. See Jiggins, C. D., R. E. Naisbitt et al., 2001.
2001b. See Jiggins, C. D., M. Linares et al., 2001.

Naisbit, Russell E., Chris D. Jiggins, and James Louis Borlase Mallet
2001. Disruptive sexual selection against hybrids contributes to speciation between *Heliconius cydno* and *Heliconius melpomene*. *Proceedings of the Royal Society of London* (B)268(1478): 1849-1854, 2 figs., 2 tabs. (7 September) [Panama]

Nakano, Octávio, José R. P. Parra and Júlio Marcos Filho
1968. Ensaio de campo visando o contrôle da broca do abacaxi (*Thecla basilides* Geyer). *O Solo* 60(2): 29-31, 1 tab. (November) [host plant; Brazil]

Neild, Andrew F. E.
2001. A new Venezuelan subspecies of *Morpho theseus* Deyrolle, 1860 with notes on the nomenclature, systematics and type specimens of the species (Lepidoptera: Nymphalidae: Morphinae). *Lambillionea* 101(3)(2): 431-454, 18 figs., 2 maps (September) [*M. t. perlmani*; ecology; distribution]

Neira, Miguel, Jorge Ruff and Nelly Mundaca
1989. Enemigos naturales de *Pieris brassicae* L. (Lepidoptera: Pieridae) en cultivos de crucíferas en Valdivia. *Agro-Ciencia* 5(2): 5-10. [host plants; parasitoids; predator; Chile]

Nekrutenko, Yuri P.
2001a. A catalogue of the type specimens of Riodinidae deposited in the collection of the Staatliches Museum für Tierkunde Dresden (Insecta: Lepidoptera: Rhopalocera). *Entomologische Abhandlungen und Berichte aus dem staatliches Museum für Tierkunde in Dresden* 59(12): 319-323 (25 July) [general]
2001b. A catalogue of the type specimens of Nymphalidae deposited in the collection of the Staatliches Museum für Tierkunde Dresden (Insecta: Lepidoptera: Rhopalocera). *Entomologische Abhandlungen und Berichte aus dem staatliches Museum für Tierkunde in Dresden* 59(13): 325-403 (25 July) [general]
2001c. A catalogue of the type specimens of Papilionidae deposited in the collection of the Staatliches Museum für Tierkunde Dresden (Insecta: Lepidoptera: Rhopalocera). *Entomologische Abhandlungen und Berichte aus dem staatliches Museum für Tierkunde in Dresden* 59(14): 405-453 (25 July) [general]

Neves, Ludmila Lafetá de Melo, Marcelo C. Picanço, Cristina Schetino Bastos, Luiz S. Saraiva, and João M. de Araújo
1996. Resistência de sete clones de couve ao curuquerê (*Ascia monuste orseis*). *Horticultura brasileira* 14(1): 55-58, 3 figs.

(May) [Brazil]

Nielsen, Gregory, Julián Adolfo Salazar and José Ignacio Vargas

2001. Reconocimiento de Rhopalocera en algunas taxocenosis de lepidópteros chocoanos y amazónicos. *Boletín científico. Museo de Historia natural. Universidad de Caldas* 5: 93-110, 6 figs. (January) [new species: *Adelpha palmarensis*; Colombia]

Nijhout, H. Frederik

2001a. Elements of butterfly wing patterns. *Journal of experimental Zoology* 291(3): 213-225, 9 figs. ([24 September]) [general]

2001b. *Origin of butterfly wing patterns*, pp. 511-529, 9 figs. *In*: Wagner, G. P. (Ed.), *The character concept in evolutionary biology*. San Diego, Academic Press. [*Heliconius*; morphology]

Nogueira, Manoel Dias, and Mohamed E. M. Habib

2001. Biologia e controle microbiano de *Urbanus acawoios* (Williams, 1926) (Lepidoptera: Hesperiidae): II. Patologia e susceptibilidade em larvas infectadas por *Bacillus thuringiensis* var. *kurstaki* (H-3a:3b). *Acta amazonica* 31(4): 655-659, 1 fig., 1 tab. (October-December) [host plant; Brazil]

Nolcken, J. H. Wilhelm von [1813-1898]

1871-1872. Reisebriefe. *Stettiner entomologische Zeitung* 32(7/9): 258-267, 309-314 (early June 1871), (10/12): 371-380 (late September 1871); 33(4/6): 123-136 (mid April 1872) [general; St. Thomas, Jamaica, Colombia]

Nyblom, Klas

2001a. See Janz, N. et al., 2001.

2001b. See Nylin, S. et al., 2001.

Nylin, Sören

2001. See Janz, N. et al., 2001.

Nylin, Sören, Klas Nyblom, Fredrik Ronquist, Niklas Janz, Joseph Belicek, and Mari Källersjö

2001. Phylogeny of *Polygonia, Nymphalis* and related butterflies (Lepidoptera: Nymphalidae): a total-evidence analysis. *Zoological Journal of the linnean Society* 132(4): 441-468, 8 figs., 2 tabs. ([23 July]) [general]

Okumoto, Daisaburo, Hitoshi Hasegawa and Masayasu Konishi

1987. [*The butterflies in art*], pp. 59-67, figs. *In*: Igarashi, S. (Ed.), *Butterflies. Papillons*. Tokyo. [In Japanese] [general]

Oliveira, Evandro G.

2001. See Srygley, R. B. & E. G. Oliveira, 2001.

Onore, Giovanni

2001. See Bollino, M. & G. Onore, 2001.

Ordish, George

1975. *The year of the butterfly*. New York, Charles Scribner's Sons. xii + 147 pp., figs. [*Danaus plexippus* (Linnaeus); ecology; Mexico]

Osborn, Frances Rowland, and Fredi Sánchez

2000. Una infección viral en la glándula cervical de larvas de *Dione junio* [sic] (Lepidoptera: Nymphalidae). *Acta científica venezolana* 51: 207-210, 7 figs. [host plant; Venezuela]

Osborne, Juliet L.

2001. See Riley, J. R. & J. L. Osborne, 2001.

Osella, B. Giuseppe

[1981?]. *Farfalle*. Verona, Museo Civico di Storia Naturale. 71 pp., figs. [general]

Pacheco, Héctor Raúl, and Obdulia Vega

2001. La controversia de la mariposa monarca: Un análisis a la luz de las teorías sociales del riesgo. *Convergencia. Revista de Ciencias sociales* (México) 8(26): 145-169 (September-December) [*Danaus plexippus* (Linnaeus); conservation; Mexico]

Padilla, P.

1995. See Ladrón de Guevara, O. et al., 1995.

Pallazini, R., R. Münte and M. H. Calafiori

1988. Parasitoide de ovos de *Brassolis* sp em Espírito Santo do Pinhal - SP. *Ecosistema* 13: 137. [Hymenoptera; Brazil]

Paluch, Márlon, Mirna Martins Casagrande, and Olaf Hermann Hendrik Mielke

2001. Estágios imaturos de *Actinote carycina* Jordan (Lepidoptera, Nymphalidae, Acraeinae). *Revista brasileira de Zoologia* 18(3): 883-896, 18 figs. (30 September) [egg, larva, pupa, imago; host plants; parasitoid; morphology; behavior; Brazil]

Parmesan, Camille

2001. *Coping with modern times? Insect movement and climate changes*, pp. 387-413, 3 figs. *In*: Woiwood, I. P., D. R. Reynolds & C. D. Thomas (Eds.), *Insect movement. Mechanisms and consequences*. Wallingford, CABI Publishing. [*Euphydryas editha* (Boisduval); Mexico]

Parra, José R. P.

1968. See Nakano, O. et al., 1968.

Pasteur, Georges

1984. Les migrations du monarque, Lépidoptère Danaide. *Compte Rendu de la Société de Biogéographie* 60(2): 84 (September) [*Danaus plexippus* (Linnaeus); Mexico]

Paula, Vanderlúcia F. de, Luiz Cláudio de A. Barbosa, Antônio J. Demuner, Dorila Piló-Veloso, and Marcelo C. Picanço

2000. Synthesis and insecticidal activity of new amide derivatives of piperine. *Pest Management Science* 56(2): 168-174, 2 figs., 3 tabs. (12 January) [*Ascia monuste orseis* (Godart); Brazil]

Paula, Vanderlúcia F. de, Luiz Cláudio de A. Barbosa, Marcelo C. Picanço and Dorila Piló-Veloso

2001. Toxicidade de amidas derivadas da piperina para larvas de *Ascia monuste orseis* (Godart) (Lepidoptera, Pieridae). *Revista brasileira de Entomologia* 45(1): 7-10, 3 figs., 4 tabs. (30 June) [host plant; Brazil]

Pearson, David L., and Les Beletsky

2001. *Perú. The Ecotraveller's Wildlife Guide*. San Diego, Academic Press. xiv + 502 pp., 99 pls., figs., maps [general]

Penz, Carla Maria

2001. See Srygley, R. B. & C. M. Penz, 2001.

Penz, Carla Maria, and Philip James DeVries

2001. A phylogenetic reassessment of *Thisbe* and *Uraneis* butterflies (Riodinidae, Nymphidiini). *Contributions in Science. Natural History Museum of Los Angeles County* 485: 1-27, 78 figs. (3 April) [general; new subspecies: *T. irenea branca*; Central and South America]

Picanço, Marcelo C.

1996. See Neves, L. L. de M. et al., 1996.

2000. See Paula, V. F. de et al., 2000.

2001. See Paula, V. F. de et al., 2001.

Piló-Veloso, Dorila

2000. See Paula, V. F. de et al., 2000.

2001. See Paula, V. F. de et al., 2001.

Pino, José Manuel

1995. See Ladrón de Guevara, O. et al., 1995.

2001. See Ramos, J. & J. M. Pino, 2001.

Piñas, Francisco

2001a. El género *Marpesia* (Hübner, 1818) (Lepidoptera: Nymphalidae: Nymphalinae), en Ecuador. *Lepidoptera* (Quito) 7: 1-8, 30 figs. (March) [general]

2001b. El género *Actinote* (Hübner, 1819) (Lepidoptera: Nymphalidae: Nymphalinae), en Ecuador. *Lepidoptera* (Quito) 8: 1-19, 90 figs. (April) [general]

2001c. El género *Phoebis*, Hübner, 1819. (Lepidoptera: Pieridae: Coliadinae), en Ecuador. *Lepidoptera* (Quito) 12: 1-8, 32 figs. (August) [general]

2001d. El género *Lasiophila* Felder, 1859. (Lepidoptera: Nymphalidae: Satyrinae), en Ecuador. *Lepidoptera* (Quito) 15: 1-7, 22 figs. (November) [general]

Piñas, Francisco, and Paola Carrera

2001. Género *Corades* Hewitson, 1849 en el Museo QCAZ (PUCE) - Ecuador (Lepidoptera, Nymphalidae, Satyrinae). *Revista de la pontificia Universidad católica del Ecuador* 66: 75-91, 17 figs. (July) [general]

Piñas, Francisco, and Giovanna Rodríguez

2000. El género *Hamadryas* Hübner, 1806 en Ecuador (Lepidoptera: Nymphalidae: Nymphalinae). *Lepidoptera* (Quito) 3: 1-23, 30 figs. (November) [general]

Poinar, George O., Jr., and Roberta Poinar

1999. *The amber forest. A reconstruction of a vanished world*. Princeton, Princeton University Press. xviii + 239 pp., figs. [Riodinidae; palaentology; Dominican Republic]

Poinar, Roberta

1999. See Poinar, G. O., Jr. & R. Poinar, 1999.

Pringle, [Mike]
2001. See Unwins, M. & [M.] Pringle, 2001.

Purser, Bruce H.
2001a. Diversité exceptionelle et comportement des papillons amazoniens dans la vallée du Palcazu (Pérou central). *Bulletin des Lépidoptéristes parisiens* 10(18): 16-25, 2 pls., 1 map (April) [general]
2001b. Guyane française. Informations pratiques pour un voyage entomologique. *Bulletin des Lépidoptéristes parisiens* 10(29): 63-67 (December) [general]

Pyle, Robert Michael
[1980]. Butterflies: now you see them... *International Wildlife* 11(1): 4-11, figs. ([December]) [general; conservation]
2001. Las Monarcas: Butterflies on thin ice. *Orion* 20(2): 16-25, figs. [*Danaus plexippus* (Linnaeus); conservation; Mexico]

Pyrcz, Tomasz Wilhelm
2001a. See Viloria, A. L. et al., 2001.
2001b. See Viloria, A. L. & T. W. Pyrcz, 2001.

Quiroz, Luis N., and Fernando Hernández-Baz
1992. Depredación de *Phymata fasciata mexicana* Melin (Hemiptera: Phymatidae) sobre *Anartia fatima* Fabr. (Lepidoptera: Nymphalidae) en la región de "Los Tuxtlas", Veracruz, México. *Boletín de la Sociedad mexicana de Lepidopterología (Nueva Serie)* 2: 17-18 (November)

Racheli, Tommaso, and F. Bruno
1989. *Luce ed evoluzione. Guide alle farfalle. Mostra di lepidotteri all'Orto Botanico di Roma.* Roma, Università degli Studi di Roma "La Sapienza". 40 pp., figs. (May) [general]

Racheli, Tommaso, and Edwin Möhn
2001. A new taxon of *Parides erithalion*-complex from Apurímac, South Peru (Lepidoptera, Papilionidae). *Notes on Papilionidae* 1: 11-12, pls. 6-8 (19 September) [*P. e. blanca*]

Ramos, Julieta
1995. See Ladrón de Guevara, O. et al., 1995.

Ramos, Julieta, and José Manuel Pino
2001. Insectos comestibles de Hidalgo, México. *Anales del Instituto de Biología. Universidad nacional autónoma de México (Zoología)* 72(1): 43-84, 1 fig., 5 tabs. (20 July) [general]

Ramos, R. R.
2001. See Freitas, A. V. L. & R. R. Ramos, 2001.

Rangel, J. Orlando
2001. See Tobar, D. et al., 2001.

Rankin, William
1997. On the track of the Monarch butterfly. *National Wildlife* 35(3): 46-51, figs. ([August]) [*Danaus plexippus* (Linnaeus); ecology; Mexico]

Rathcke, Beverly J.
2001. Pollination and predation limit fruit set in a shrub, *Bourreria succulenta* (Boraginaceae), after hurricanes on San Salvador island, Bahamas. *Biotropica* 33(2): 330-338, 2 tabs. (June) [*Calisto herophile apollinis* Bates, *Kricogonia lyside* (Godart)]

Réal, Pierre
1963. See Le Moult, E. & P. Réal, 1963.

Reed, Robert D.
2001. See Caterino, M. S. et al., 2001.

Rhainds, Marc, Carlos M. Chinchilla, and Geovany Castrillo
1993. Desarrollo de un método de muestreo para las larvas de *Opsiphanes cassina* Felder en palma aceitera. *Manejo integrado de Plagas* 30: 15-18, 2 figs., 3 tabs. (December) [host plant; Costa Rica]

Rhodes, Andrea
1976. See Andresen, J. et al., 1976.

Riley, Joseph R., and Juliet L. Osborne
2001. *Flight trajectories of foraging insects: Observations using harmonic radar*, pp. 129-157, 10 figs., 3 tabs. *In*: Woiwood, I. P., D. R. Reynolds & C. D. Thomas (Eds.), *Insect movement. Mechanisms and consequences*. Wallingford, CABI Publishing. [general]

Rivero, Rafael
1963. El nacimiento de una mariposa. *Tricolor* (Caracas) 151: 16-17, 9 figs. [*Danaus plexippus* (Linnaeus); life history]

Robbins, Robert Kanner
2001a. Passion. *News of the Lepidopterists' Society* 43(1): 7 (15 March) [general]
2001b. Building a better butterfly-trap. *News of the Lepidopterists' Society* 43(4): 103, 105, 2 figs. (1 December) [*Thereus ismarus* (Cramer), *Bussa ematheon* (Cramer); behavior; Surinam, Peru, Brazil]

Roberto, Francisco de Assis da Silva
2001. See Duarte, J. A., Jr. et al., 2001.

Rocha, Carlos Frederico Duarte da, and Marcelo Duarte
2001. Territorial-like defensive behavior of floral resources by *Heliconius ethilla narcaea* Godart over *H. sara apseudes* (Hübner) (Lepidoptera, Nymphalidae, Heliconiinae). *Revista brasileira de Zoologia* 18(suppl. 1): 323-328, 2 figs. (16 July) [Brazil]

Rodríguez, Giovanna
2000. See Piñas, F. & G. Rodríguez, 2000.

Romero, Francisco
2001. See Viloria, A. L. et al., 2001.

Ronquist, Fredrik
2001. See Nylin, S. et al., 2001.

Roque, Lázaro
2001. Mariposas (Lepidoptera: Papilionoidea-Hesperioidea) de Pinar del Río. *Cocuyo* 10: 14-16 (January) [general; Cuba]

Ross, Gary Noel
2001a. The Monarch: What's in a name? *News of the Lepidopterists' Society* 43(1): 20-21, 31 (15 March) [*Danaus plexippus* (Linnaeus)]
2001b. Clearwing leks induce jungle fever. *American Butterflies* 9(4): 28-31, 4 figs. [Ithomiinae; behavior; Mexico]

Rothschild, Lionel Walter, and Heinrich Ernst Karl Jordan
1903. Lepidoptera collected by Oscar Neumann in North-East Africa. *Novitates zoologicae* 10(3): 491-542 (20 December) [*Hypanartia*; morphology; taxonomy]

Roulston, T'ai, and James H. Cane
2000. Pollen nutritional content and digestibility for animals. *Plant Systematics and Evolution* 222: 187-209, 1 fig., 2 tabs. [*Heliconius*]

Ruff, Jorge
1989. See Neira, M. et al., 1989.

Salazar, Camilo
2001. See Jiggins, C. D. et al., 2001.

Salazar, Julián Adolfo
2001a. See Vargas, J. I. & J. A. Salazar, 2001.
2001b. Semblanzas lepidopterológicas con E. W. Schmidt-Mumm y su colección de mariposas. *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 26-32, 6 figs. (January) [general; Colombia]
2001c. Nuevas observaciones sobre la concentración de lepidópteros ropalóceros en las cumbres de algunos cerros de Caldas y Antioquia, Colombia (Insecta: Lepidoptera). *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 66-90, 18 figs., 1 tab. (January) [general; behavior]
2001d. See Nielsen, G. et al., 2001.
2001e. Observaciones adicionales de "hilltopp" [sic]. *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 137 (January) [general; behavior; Colombia]
2001f. Revisiones bibliográficas. *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 154-157 (January) [general]
2001g. Las especies de los géneros *Callicore* Hübner, [1819], *Paulogramma* Dillon, 1948 y *Catacore* Dillon, 1948, depositados en la colección E. W. Schmidt-Mumm, Bogotá, Colombia (Lepidoptera: Nymphalidae). *Shilap* 29(114): 179-182 (30 June) [general; Colombia]
2001h. Contribución al conocimiento de los Morphinae colombianos V. Estudio de una población de *Morpho amathonte* (Deyrolle, 1860) y de *Morpho niepelti* Röber, 1927 en el occidente de Colombia (Lepidoptera: Nymphalidae, Morphinae). *Shilap* 29(116): 371-377, 3 figs. (31 December) [host plants; distribution; behavior; conservation]
2001i. See Bollino, M. & J. A. Salazar, 2001.

Salazar, Julián Adolfo, and Luis Miguel Constantino

2001a. Synthesis of the Colombian Charaxidae and description of new genera for South America: *Rydonia, Annagrapha, Pseudocharaxes, Muyshondtia, Zikania* (Lepidoptera, Nymphaloidea). *Lambillionea* 101(2)(suppl. 3): 344-369, 11 figs. (June) [new subspecies: *Pseudocharaxes xenocrates ernestoi*]

2001b. Synthesis of the Colombian Charaxidae and description of new genera for South America: *Rydonia, Annagrapha, Pseudocharaxes, Muyshondtia, Zikania* (Lepidoptera, Nymphaloidea). *Lambillionea* 101(3)(2): 506 (September) [also in *Lambillionea* 101(4): 366, bis (December)] [bibliographic addendum]

Salazar, Julián Adolfo, and Efraín Reinel Henao

2000. *Inventario de lepidópteros de Manizales*, pp. 102-117. *In*: Parra, M. L., J. I. Vargas & M. Tabares, *Mariposas de Manizales*. Manizales, Instituto para la Ciencia (December) [general; Colombia]

Salazar, Julián Adolfo, and Carlos López

2001. Posible homonimia. *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 136-137 (January) [*Gibbossa*, replacement name for *Gibbonota* Salazar & López]

Salazar, Julián Adolfo, and José Ignacio Vargas

2001. Mariposas colombianas II. Sobre estados inmaduros de ropalóceros colombianos: Crisálidas de *Agrias aedon* (Hew.), *Caligo eurilochus* (Cr.), *Thracides phidon* (Cr.), *Adelpha lycorias wallisii* (Dwtz.), *Parides anchises nielseni* (Boll. & Salz.) & *Necyria incendiaria* (Th.). *Boletín científico. Museo de Historia Natural. Universidad de Caldas* 5: 115-124, 6 figs. (January) [host plants]

Salmon, Michael A.

2000. *The Aurelian legacy. British butterflies and their collectors*. Berkeley, University of California Press. 432 pp., frontisp., 41 pls., 162 figs. [general; history]

Sambles, J. Roy

2001. See Vukusic, P. et al., 2001.

Sánchez, Fredi

2000. See Osborn, F. R. & F. Sánchez, 2000.

Sandved, Kjell Bloch

1976. Flap over numerals. *International Wildlife* 6(3): 36-39, figs. ([April]) [general; morphology]

Santos, J. H. Ribeiro dos

1990. See Singh, S. R. et al., 1990.

Saraiva, Luiz S.

1996. See Neves, L. L. de M. et al., 1996.

Sauer, Peter

2001. The Monarch versus the global empire. *Orion* 20(2): 42-48, figs. [*Danaus plexippus* (Linnaeus); conservation; Mexico]

Scatoni, Iris B.

1996. See Bentancourt, C. M. & I. B. Scatoni, 1996.

Schappert, Phillip J.

2001. Butterfly buffet. *Natural History* (New York) 110(6): 46-49, figs. (July-August) [general; behavior; Ecuador, Peru, Costa Rica]

Schmidt, Gerold, and Gerhard Zotz

2000. Herbivory in the epiphyte. *Vriesea sanguinolenta* Cogn. & Marchal (Bromeliaceae). *Journal of tropical Ecology* 16(6): 829-839, 4 figs., 1 tab. (November) [*Napaea eucharila* (Bates); host plant; Panama]

Schwartz, Gustavo, and Rocco Alfredo Di Mare

2001. Diversidade de quinze espécies de borboletas (Lepidoptera, Papilionidae) em sete comunidades de Santa Maria, RS. *Ciência rural* (Santa Maria) 31(1): 49-55, 5 figs., 3 tabs. (January-February) [general; Brazil]

Scoble, Malcolm J.

2001. See Honey, M. R. & M. J. Scoble, 2001.

Scott, James A., and David M. Wright

1990. *Butterfly phylogeny and fossils*, pp. 152-208, 1 fig. *In*: Kudrna, O. (Ed.), *Butterflies of Europe. Volume 2. Introduction to lepidopterology*. Wiesbaden, AULA-Verlag. [general]

Sefton, Nancy

1976. See Andresen, J. et al., 1976.

Sehnal, Peter

1996. *Esquinas-Nationalpark, "Regenwald der Österreicher". Gebietsbeschreibung - Regenwaldbiologie - Naturbeobachtungen*, pp. 80-111, figs. 108-195. *In*: Sehnal, P. & H. Zettel, *Esquinas-Nationalpark. Der Regenwald der Österreicher in Costa Rica*. Wien, Naturhistorisches Museum. [general]

Shapiro, Arthur Maurice

2001. The spirit of butterflies: Myth, magic, and art, by Maraleen Manos-Jones. 2000. *News of the Lepidopterists' Society* 43(1): 16, 27, 1 fig. (15 March) [general; book review]

Silbermann, Gustave Henri Rodolphe

1835. *Enumération des Entomologistes vivans, suivie de notes sur les collections entomologiques des principaux musées d'histoire naturelle d'Europe, sur les sociétés d'Entomologie, sur les recueils périodiques consacrés a l'ètude des insectes, et d'une table alphabétique des résidences des entomologisles* [sic]. Paris, Roret. v + 116.pp. [general]

Silva, Eliane Aparecida

1987. See Araújo, A. F. B. de et al., 1987.

Simon, Hilda

1969. *Milkweed butterflies. Monarchs, models, and mimics*. New York, The Vanguard Press. 120 pp., figs. [general; ecology; behavior]

Singh, S. R., L. E. N. Jackai, J. H. Ribeiro dos Santos, and C. B. Adalla

1990. *Insect pests of cowpea*, pp. 43-89, 11 pls., 11 tabs. *In*: Singh, S. R. (Ed.), *Insect pests of tropical food legumes*. Chichester, John Wiley & Sons. [*Urbanus proteus* (Linnaeus), *Thecla jebus* (Godart); host plant]

Smart, Paul Edgar

1973. *Butterflies presented by Saruman*. London, Saruman Butterflies. 44 pp., figs. (May) [general]

Soares, Alexandre

2001. See Callaghan, C. J. & A. Soares, 2001.

Soto, Gerardo, and Allan González

1998. Estados larvales de lepidópteros asociados con plantas de importancia económica en Costa Rica. *Agronomía costarricense* 22(2): 229-233. [general; host plants]

Sotos, Carmen

1991a. *Iconografía artística de la Real Comisión de Guantánamo*, pp. 123-137, figs. *In*: Higueras, M. D. (Ed.), *Cuba ilustrada. La Real Comisión de Guantánamo 1796-1802. Tomo I*. Madrid, Lunwerg Editores S.A. [general; history]

1991b. *Láminas botánicas y zoológicas de José Guío*, pp. 171-181, figs. *In*: Higueras, M. D. (Ed.), *Cuba ilustrada. La Real Comisión de Guantánamo 1796-1802. Tomo I*. Madrid, Lunwerg Editores S.A. [general; history; iconography]

Speed, Michael P.

2001. See Turner, J. R. G. & M. P. Speed, 2001.

Sperling, Felix A. H.

2001. See Caterino, M. S. et al., 2001.

Srygley, Robert B.

2001a. Compensation for fluctuations in crosswind drift without stationary landmarks in butterflies migrating over seas. *Animal Behaviour* 61(1): 191-203, 6 figs., 4 tabs. (January) [Pieridae, Nymphalidae, Hesperiidae; Colombia]

2001b. Incorporating motion into investigations of mimicry. *Evolutionary Ecology* 13(7/8): 691-708, 2 figs., 2 tabs. [general]

2001c. Sexual differences in tailwind drift compensation in *Phoebis sennae* butterflies (Lepidoptera: Pieridae) migrating over seas. *Behavioral Ecology* 12(5): 607-611, 6 figs. [host plants; behavior; Colombia, Panama]

Srygley, Robert B., and Evandro G. Oliveira

2001. *Orientation mechanisms and migration strategies within the flight boundary layer*, pp. 183-206, 7 figs., 2 tabs. *In*: Woiwood, I. P., D. R. Reynolds & C. D. Thomas (Eds.), *Insect movement. Mechanisms and consequences*. Wallingford, CABI Publishing. [general]

Srygley, Robert B., and Carla Maria Penz

2001. Larval description and hostplant record for *Ithomia diasia* Hewitson (Nymphalidae: Ithomiinae) in Panama. *Journal of the Lepidopterists' Society* 54(4): 145-146, 1 fig., 1 tab. (10

December)

Stekolnikov, A. A.

2001a. See Kuznetzov, V. I. & A. A. Stekolnikov, 2001a.

2001b. See Kuznetzov, V. I. & A. A. Stekolnikov, 2001b.

Stephan, Julius

1908. Nachtflieger unter den Tagfaltern. *Natur und Haus* (Dresden) 17(3): 33-36 (November) [general; behavior]

[1924]. *Schmetterling, liebes, luft'ges, leichtes Ding! Plaudereien und Betrachtungen für Freunde der Falterwelt.* Guben, Albert Koenig. [iv] + 199 pp. [general]

Stevenson, Rob, and William A. Haber

2000a. *Migration of butterflies through Monteverde*, pp. 118-119. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest*. New York, Oxford University Press. [general; Costa Rica]

2000b. Manataria maculata *(Nymphalidae: Satyrinae)*, pp. 119-120. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest*. New York, Oxford University Press. [host plant; behavior; Costa Rica]

Sturm, Helmut

1958. Gehäusebauverhalten einer Hesperiidenraupe. *Verhandlungen der deutschen zoologischen Gesellschaft (Zoologischer Anzeiger, Supplementband)* 21: 259-262, 2 figs. [*Pyrrhopyge charybdis* Doubleday, *P. phidias* (Linnaeus); host plant; Colombia]

2001. El comportamiento de algunos artrópodos colombianos y europeos y su significado evolutivo. *Revista de la Academia colombiana de Ciencias exactas, fisicas y naturales* 25(96): 429-433 (September) [*Pyrrhopyge phidias* (Linnaeus), *P. charybdis* Doubleday; host plant]

Swengel, Ann B.

2001a. NABA 4th of July Butterfly Count Column, News from the 2000 counts. *American Butterflies* 9(2): 50, 1 graph [Mexico]

2001b. The NABA National Butterfly Counts. National fireworks. *American Butterflies* 9(2): 14-23, figs. [general; Mexico]

Taeger, Andreas, and Reinhard Gaedike

2001. On the papers "Systema Glossatorum..." of Fabricius (1807) and "Die neueste Gattungs-Eintheilung der Schmetterlinge..." of Illiger (1807) and the consequences for authorship of several generic names. *Nota lepidopterologica* 24(1/2): 85-88 (10 August) [general]

Teixeira, Dante Martins

1995. *Brasil-Holandês. Dutch Brazil.* Rio de Janeiro, Editora Index. 1: 222 pp., pls., figs; 2: 192 pp., pls.; 3: 144 pp., pls.; 4: 185 pp., pls.; 5: 240 pp., pls. [general; history]

1997. *Dutch Brazil. Volume II. The "Thierbuch" and "Autobiography" of Zacharias Wagner.* Rio de Janeiro, Editora Index. 240 pp., figs. [general; history]

Teston, José Augusto, and Elio Corseuil

2001. Ninfalídeos (Lepidoptera, Nymphalidae) ocorrentes no Rio Grande do Sul, Brasil. Parte I. Danainae e Ithomiinae. *Biociências* (Porto Alegre) 9(1): 51-61 (30 June) [general]

Thomas, Chris D.

1982. See Cheverton, M. R. & C. D. Thomas, 1982.

Thomas, Jeremy A.

2001. See Elmes, G. W. et al., 2001.

Tippenhauer, Louis Gentil [1867-]

1893. *Die Insel Haiti.* Leipzig, F. A. Brockhaus. xviii + 693 pp., 32 pls., figs., tabs. [general; host plants]

Tobar, Diego, J. Orlando Rangel and Miguel Gonzalo Andrade

2001. Las cargas polínicas en las mariposas (Lepidoptera: Rophalocera [sic]) de la parte alta de la cuenca del Río Roble - Quindío - Colombia. *Caldasia* 23(2): 549-557, 3 tabs. (November) [pollination; ecology]

Torre, Aurelio Iñigo

2001. See Fernández, F. et al., 2001.

Turner, John Richard George, and Michael P. Speed

2001. How weird can mimicry get? *Evolutionary Ecology* 13(7/8): 807-827, 1 fig., 1 tab. [general]

Unno, Kazuo, Hirotaka Matsuka and Susumu Yamaguchi

1987. [*In search of the world's most beautiful butterflies*], pp. 39-50, figs. *In*: Igarashi, S. (Ed.), *Butterflies. Papillons*. Tokyo. [In Japanese] [general]

Unwins, Mike, and [Mike] Pringle

2001. Bolivia - Butterflies of the Andes and Amazon basin. *Bulletin of the amateur Entomologists' Society* 60(438): 184 (October) [general]

Vargas, Héctor

1967. Plagas y enfermedades de los cultivos de Azapa. *Revista de la Universidad del Norte* (Arica) 2: 43-64. [*Eudamus proteus* (Linnaeus), *Hylephila* sp., *Leptotes trigemmatus* (Butler); host plants; Chile]

Vargas, Isabel

2001a Zone 11. Mexico & the Caribbean Islands, pp. 65-72. *In*: 2000 Season Summary. *News of the Lepidopterists' Society* 43 (suppl. 1): 1-72 (1 April) [general; St. Croix]

2001b. See Monteagudo, D. et al., 2001.

Vargas, José Ignacio

2001a. See Nielsen, G. et al., 2001.

2001b. See Salazar. J. A. & J. I. Vargas, 2001.

Vargas, José Ignacio, and Julián Adolfo Salazar

2001. Mariposas colombianas I. Sobre un extraordinario híbrido de *Consul fabius cecrops* (Dbl. & Hew.) x *Consul panariste pandrosa* (Niep.) (Lep: Charaxidae). *Boletín científico. Museo de Historia natural. Universidad de Caldas* 5: 22-25, 1 fig. (January)

Vega, Germán, and Paul Gloor

2001. Lista preliminar de las mariposas diurnas (Hesperioidea: [sic] Papilionoidea) de la Zona Protectora El Rodeo, Ciudad Colón, Costa Rica. *Brenesia* 55/56: 101-122, 1 tab. (March-September) [general; host plants; behavior]

Vega, Obdulia

2001. See Pacheco, H. R. & O. Vega, 2001.

Vendramim, José Djair

1992. See Fancelli, M. & J. D. Vendramim, 1992.

Vendramim, José Djair, and J. C. Martins

1982. Aspectos biológicos de *Ascia monuste orseis* (Latreille, 1819) (Lepidoptera-Pieridae) em couve (*Brassica oleracea* L. var. *acephala*). *Poliagro* 4(1/2): 57-65, 4 tabs. [life history; Brazil]

Verhulst, Joseph T.

2000. *Les* Colias *du Globe. Monograph of the genus* Colias. Keltern, Goecke & Evers. *Texte*, 263 pp., figs; *Planches*, pp. 265-308, 183 pls., figs. (August) [general]

2001. Fiches spécifiques des *Colias* Fabricius (*Colias* data sheets) (Lepidoptera, Pieridae) - Quarante-huitième fiche-. *Lambillionea* 101(4)(2): 617-620, 14 figs., 1 map (December) [*C. harfordii* Edwards; Mexico]

Vieira, Solange Aparecida

1994. See Alves, S. B. et al., 1994.

Viloria, Angel Luis, Michael Jan Adams, Tomasz Wilhelm Pyrcz, and Francisco Romero

2001. Noticia histórica sobre satiridos venezolanos coleccionados por Karl Moritz (1797-1866) y discusión de su identidad taxonómica y la distribución de *Pedaliodes pisonia* (Hewitson, 1862) (Lepidoptera: Nymphalidae, Satyrinae). *Shilap* 29(113): 31-42, 6 figs. (30 March) [Venezuela]

Viloria, Angel Luis, and Tomasz Wilhelm Pyrcz

2001. Revalidación y revisión de *Steromapedaliodes* Forster, con descripción de dos especies nuevas (Lepidoptera: Nymphalidae, Satyrinae). *Anartia* 15: 1-22, 13 figs. (April) [*S. sanchezi, S. schuberti*; Venezuela]

Vitale, Fabio, and Maurizio Bollino

2001a. Descrizione di due nuove sottospecie di *Napeogenes cranto* Felder & Felder, 1865 (Lepidoptera: Ithomiidae). *Lambillionea* 101(3)(1): 391-394, 3 figs. (September) [*N. c. browni, N. c. marilenae*; Colombia, Ecuador]

2001b. Note sul genere *Hypomenitis* Fox, 1945, elementi di determinazione e descrizione di nuovi taxa. (Lepidoptera: Ithomiidae). *Lambillionea* 101(4)(1): 551-557, 3 pls. (December) [*H. polissena colombiana, H. lojana, H. theudelina bonita, H. pyrczi*; Colombia, Ecuador, Peru]

2001c. Due nuove *Hyposcada* Godman & Salvin, 1879 dell'Ecuador. (Lepidoptera: Ithomiidae). *Lambillionea* 101(4)(1): 558-560, 1

pl. (December) [*H. lactea, H. illinissa napoensis*; Peru]

Vitali-Veiga, Maria de Jesus, and Vera Lígia Letízio Machado

2001. Entomofauna visitante de *Gleditschia triacanthos* L. - Leguminosae durante o seu período de floração. *Bioikos* (Campinas) 15(1): 29-38, 4 figs., 3 tabs. [general; pollination; Brazil]

Vukusic, Peter, J. Roy Sambles, C. R. Lawrence, and Robin J. Wootton

2001. Now you see it - now you don't. *Nature* (London) 410(6824): 36, 1 fig. (1 March) [*Ancyluris meliboeus* (Fabricius); coloration]

Wahlberg, Niklas

2001. The phylogenetics and biochemistry of host-plant specialization in melitaeine butterflies (Lepidoptera: Nymphalidae). *Evolution* 55(3): 522-537, 4 figs., 3 tabs. (10 April) [general]

Walker, Francis Augustus [1841-1905]

1878. *Catalogue of Lepidoptera Rhopalocera in the collection of the Rev. F. A. Walker, M.A., F.L.S.* London, T. P. Newman. [iv] + 43 pp. [general]

Walla, Thomas R.

2001. See DeVries, P. J. & T. R. Walla, 2001.

Warren, Andrew D.

2001a. A new genus and species of Cyclopidinae from Zamora, Ecuador (Lepidoptera: Hesperiidae). *Boletín científico. Museo de Historia natural. Universidad de Caldas* 5: 138-153, 4 figs., 1 tab. (January) [*Freemania rawlinsi*]

2001b. See Austin, G. T. & A. D. Warren, 2001.

2001c. A replacement name for *Freemania* A. Warren, with notes on the higher classification of the genus (Lepidoptera: Hesperiidae). *Proceedings of the entomological Society of Washington* 103(4): 1028-1029 [*Freemaniana*; Ecuador]

Wetherbee, David Kenneth

1984. *An instant survey of St. Croix, V. I. natural history.* Boston, Author. 77 pp., figs. [general]

Wiklund, Christer

2001. See Kemp, D. J. & C. Wiklund, 2001.

Williams, Ernest H.

2000. See Kocher, S. D. & E. H. Williams, 2000.

2001. Butterflies through binoculars: The West. By Jeffrey Glassberg. 2001. *American Butterflies* 9(3): 46-47, 1 fig. [general; Mexico; book review]

Williams, Theodore

1979. Butterflies are full of surprises. *National Wildlife* 17(5): 20-27, figs. ([July]) [general; ecology; behavior]

Williamson, Michelle, and Chris Darling

2000. *La Ventana in Monteverde: A migration corridor for insects*, p. 438. *In*: Nadkarni, N. M. & N. T. Wheelwright (Eds.), *Monteverde. Ecology and conservation of a tropical cloud forest.* New York, Oxford University Press. [general; behavior; Costa Rica]

Willis, Jake

2000. See Jiggins, C. D. et al., 2000.

Willmott, Keith Richard, Luis Miguel Constantino, and Jason Piers Wilton Hall

2001. A review of *Colobura* (Lepidoptera: Nymphalidae) with comments on larval and adult ecology and description of a sibling species. *Annals of the entomological Society of America* 94(2): 185-196, 8 figs., 1 tab. (March) [*C. annulata*; taxonomy; host plants; distribution; Neotropics]

Willmott, Keith Richard, Jason Piers Wilton Hall, and Gerardo Lamas

2001. Systematics of *Hypanartia* (Lepidoptera: Nymphalidae: Nymphalinae), with a test for geographical speciation mechanisms in the Andes. *Systematic Entomology* 26(4): 369-399, 24 figs., 1 tab. (October) [new taxa: *H. dione disjuncta, H. celestia, H. fassli, H. trimaculata, H. t. autumna, H. cinderella*; biogeography; Neotropics]

Witte, Luger

1995. See Hartmann, T. & L. Witte, 1995.

Wojtusiak, Janusz

[2001]a. See Bálint, Z. & J. Wojtusiak, [2001]a.

2001b. See Bálint, Z. & J. Wojtusiak, 2001b.

Wood, Jim

1976. See Andresen, J. et al., 1976.

Wootton, Robin J.

2001. See Vukusic, P. et al., 2001.

Wright, David M.

1990. See Scott, J. A. & D. M. Wright, 1990.

Wynne, Ian R.

2001. See Joron, M. et al., 2001.

Yamaguchi, Susumu

1987. See Unno, K. et al., 1987.

Yang, Zihen H.

2001. See Jiggins, C. D. et al., 2001.

Yoshimoto, Hiroshi

2001. Generic treatment of the tortoiseshell and its allied jagged nymphalids (Lepidoptera, Nymphalidae, Nymphalinae). *Butterflies* (Tokyo) 28: 40-46, 7 figs., 1 tab. (30 April) [general]

Zamith, Adiel Paes Leme

1962. Anatomia morfológica externa e interna da lagarta, e do adulto da *Brassolis sophorae laurentii* Stichel, 1925. *Anais da Escola de Agricultura "Luiz de Queirós"* 19: 431-451, 3 pls. [Brazil]

Zirlin, Harry

2001. Taxonomists just wa! [sic] have fun. Generically speaking. *American Butterflies* 9(4): 42-45, 2 figs. [general; etymology]

Zotz, Gerhard

1998. Demography of the epiphytic orchid, *Dimerandra emarginata*. *Journal of tropical Ecology* 14(6): 725-741, 8 figs., 4 tabs. (November) [*Cremna thasus* (Stoll); host plant; Panama]

2000. See Schmidt, G. & G. Zotz, 2000.

Zucoloto, Fernando Sérgio

2001. See Barros-Bellanda, H. C. H. & F. S. Zucoloto, 2001.

Zulka, K. P.

2001. See Krenn, H. W. et al., 2001.

LEPIDOPTERA NEWS, 2003 (1-2): 56 (2005)

NOTE

NEUROBATHRA LEAFMINER RECORDS ON *JATROPHA* NEW TO FLORIDA (LEPIDOPTERA: GRACILLARIIDAE)

J. B. HEPPNER [1]

Florida State Collection of Arthropods
FDACS, DPI, P. O. Box 147100, Gainesville, Florida 32614, USA

The leafminer moth, *Neurobathra curcassi* Busck, was originally described from Cuba (Busck, [1934]) from specimens reared on leaves of psychic nut, *Jatropha curcas* (Euphorbiaceae), a somewhat medicinal plant from Mexico and northern South America, and grown throughout the Caribbean. For a number of years (records are from as early as 1975), and possibly longer, a leafminer has been known on *Jatropha* in southern Florida (tentatively noted as "*Caloptilia* sp.") but had not been identified with certainty. Recent studies of available specimens, plus the fact that the Cuban species also mines the leaves of *Jatropha* plants, indicated that the Florida species could be *N. curcassi*. Don Davis (pers. comm.) (Smithsonian Institution, Washington, DC), who is revising the Gracillariidae for North America, notes that two new species of the genus are now known for southern Florida, one of which was reared from *Jatropha* plants, but that *N. curcassi* has not yet been confirmed to be among these new records.

The genus *Neurobathra* contains 3 described species, with two previously being found in the USA, and one of these also in Florida: *N. strigifinitella* (Clemens), a leafminer on oaks. Additionally, we have the two new species already mentioned above. It should be noted that it is conceivable that some of the records below may refer to another species (or that part of the records are mixed), since *N. curcassi* could also be in southernmost Florida, but thus far it has not been confirmed. Thus, the records below most likely are for the new species on *Jatropha* in Florida being described by Davis. While these records cannot be absolutely confirmed as the new species, it may be of interest to note the available DPI records for the leafminer on *Jatropha*. Most of these records refer only to the leafmine, and available specimens of adults lack abdomens, so species confirmation cannot be obtained for these records. Appearances of the adults are similar to *N. curcassi* but genitalic examination is required to determine the exact species.

The exact date of appearance for the species in Florida is not known but likely it is a native species. Rearings from two *Jatropha* species in 1983 were from Pompano Beach (Broward Co.) and Hialeah (Dade Co.); and the earliest records available are from North Miami (1975), Ft. Myers (1976), and Naples (1977, 1979). Inasmuch as these Florida records are so widespread (Miami to Ft. Myers), it is likely that the moth has been in Florida for many years previous to 1975 and is not a recent import from the Caribbean. However, all *Jatropha* species in Florida are naturalized from tropical America. There are about 180 species of *Jatropha* known in tropical America, and three of these occur as far north as southern and western Texas, and may also host *Neurobathra* species as leafminers. The jatropha leafminer from Cuba, *N. curcassi*, has been recorded on 4 or 5 species of *Jatropha*; thus, it may even feed on a number of additional species of the plant genus.

The Florida records are from along both coasts of Florida, from Key Largo to Ft. Pierce (St. Lucie Co.) on the Atlantic Coast, and to Palmetto (Manatee Co.) on the Gulf Coast. This distribution is typical of other moths and tropical plants of the Caribbean that can survive along the Florida coasts as far north to where occasional winter frosts are too severe (the latitude of Tampa Bay) for them to survive, although some tropical species in Florida can go further north on the Atlantic coast as far as Cape Canaveral.

Records of the Florida jatropha leafminer include the following (DPI = Division of Plant Industry records; FSCA = Florida State Collection of Arthropods); all are larval records (DPI), except the FSCA records (from Pompano Beach):

Broward Co.
- Ft. Lauderdale, 21 Nov 1991, ex *Jatropha* sp., L. Ooms (DPI)
- Plantation, 2 Aug 1994, ex *Jatropha integerrima*, K. Vanyo (DPI)
- Pompano Beach, 30 Sep 1983, ex *Jatropha curcas*, D. Leone (DPI/FSCA)

Collier Co.
- Naples, 8 Jun 1979, ex *Jatropha* sp., K. Delate (DPI)
- 11 Aug 1993, ex *Jatropha integerrima*, M. Brodie & R. Buchholz (DPI)
- 18 Nov 1977, ex *Jatropha multifida*, G. Gwin (DPI)

Dade Co.
- Hialeah, 8 Mar 1984, ex *Jatropha integerrima*, L. Chang & L. Davis (DPI)
- 19 Aug 1983, ex *Jatropha curcas*, M. Thurmond (DPI)
- Miami, 14 Mar 1988, ex *Jatropha integerrima*, D. Storch (DPI)
- 23 Mar 1984, ex *Jatropha* sp., P. Perun (DPI)
- 24 Oct 1985, ex *Jatropha curcas*, R. Burns & A. Hamon (DPI)
- North Miami, 9 Jan 1975, ex *Jatropha hastata*, D. E. Sager (DPI)
- North Miami Beach, 23 Sep 1983, ex *Jatropha* sp., P. Perun (DPI)

Lee Co.
- Ft. Myers, 23 Jul 1976, ex *Jatropha* sp., W. T. Walsh (DPI)
- 26 Aug 1987, ex *Jatropha integerrima*, D. L. Warkentin (DPI)

Manatee Co.
- Palmetto, 6 Jul 1995, ex *Jatropha curcas, J. gossypifolia*, M. Runnals (DPI)

Monroe Co.
- Key Largo, 17 May 1978, ex *Jatropha multifida*, P. Chobrda & W. E. Wyles (DPI)

Palm Beach Co.
- Boynton Beach, 27 May 1994, ex *Jatropha integerrima*, S. Cook (DPI)
- Palm Beach Gardens, 6 Jan 1983, ex *Jatropha integerrima*, P. Wright-Koll (DPI)

St. Lucie Co.
- Ft. Pierce, 17 Sep 1983, ex *Jatropha* sp., K. Hibbard (DPI)
- Ft. Pierce, 1 Dec 1983, ex *Jatropha* sp., K. Hibbard (DPI)

Sarasota Co.
- Sarasota, 11 Apr 1980, ex *Jatropha hastata*, J. McFarlin (DPI)

Biology.– Recorded hosts above include *Jatropha* sp., *J. curcas, J. gossypifolia, J. integerrima, J. multifida* (Euphorbiaceae) (*J. hastata* = *J. integerrima*). Larvae mine the leaves.

ACKNOWLEDGMENTS

My thanks to Don R. Davis (Dept. of Entomology, Smithsonian Institution (USNM), Washington, DC) for checking the holotype of *N. curcassi* and other notes on the genus. The field collectors of the Division of Plant Industry (FDACS), with their continued surveying over the years, enabled *Neurobathra* species to be found in Florida; D. Leone and K. Hibbard are especially thanked for their special rearing efforts for this and other leafminers in Florida.

LITERATURE CITED

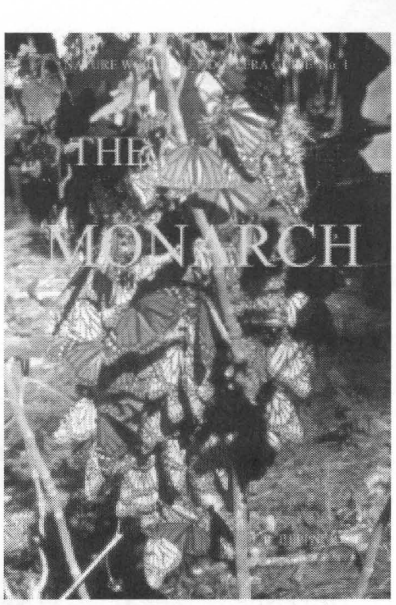
Busck, A.
[1934]. Microlepidoptera of Cuba. *Ent. Amer.* (New York), 13:151-202, pl. 30-36 (1933).

[1] Contribution No. 924, Entomology Section, Bur. Ent. Nema. Plant Path., Div. Plant Industry, Florida Dept. Agric. & Consumer Serv., Gainesville, FL.

THE MONARCH

Danaus plexippus (Linnaeus) (Nymphalidae: Danainae)

by J. B. Heppner



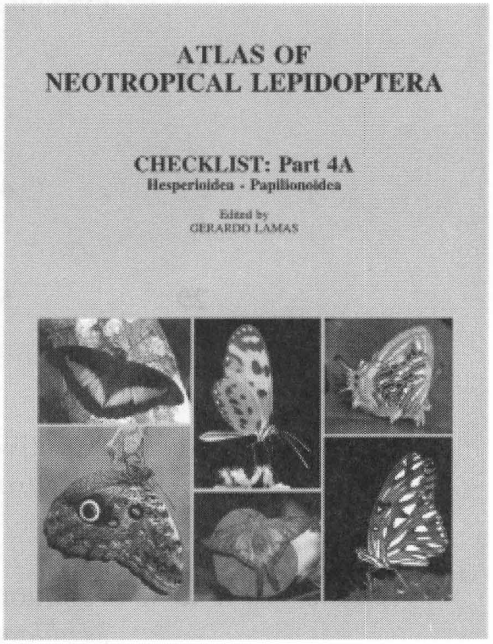
The first in a new series of booklets on various species of moths and butterflies, *The Monarch* tells the life history story of this famous butterfly of North America. The easy-reading text covers the history of the monarch, its distribution, variation, classification, biology and life history, migation and behavior, conservation, and field studies. Extensive coverage is given to the overwintering sites in Mexico and California. Organizations supporting the monarch conservation are listed at the end of the book, along with a bibliography of papers on the monarch and other butterflies. The booklet is illustrated with numerous color photographs, plus maps and other figures. Other titles are planned.

2005. 42pp, full color (6 x 9 in) $7.95 (postpaid in USA)
Orders: Scientific Publishers, P.O. Box 15718, Gainesville, FL 32604

ATLAS OF NEOTROPICAL LEPIDOPTERA

Checklist: Part 4A. Hesperioidea - Papilionoidea

edited by Gerardo Lamas



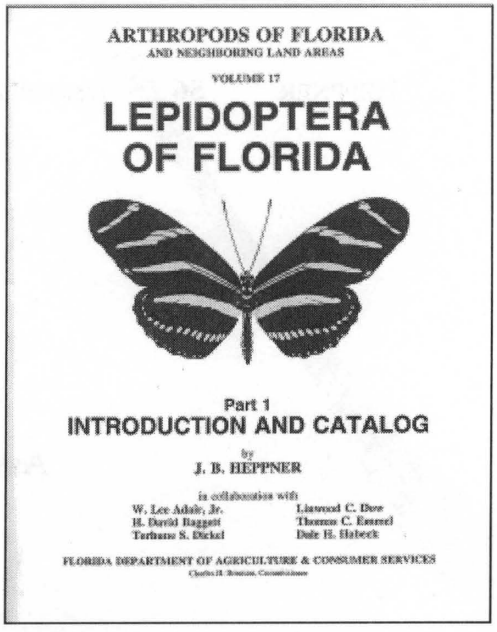
The Neotropical butterflies encompass 7,784 species from the Mexican border south to Patagonia, including the West Indies and Bermuda. The editor and collaborating authors (C. J. Callaghan, M. M. Casagrande, O. H. H. Mielke, T. W. Pyrcz, R. K. Robbins, and A. L. Viloria) have organized this vast fauna into the first comprehensive catalog ever completed. A number of new genera are also described and named in the work for species needing new generic names, and for that section the authors had added help from M. Duarte, J. Y. Miller and L. D. Miller. The index lists over 35,000 names, including all synonyms and form names. The catalog includes the U.S.-Mexican border region, so some North American species are also listed. There are introductory remarks and discussions for some groups.

2004. 36 + 439pp (8-1/2 x 11 in) $95.00 ($3 shipping in USA)
ATL price for members is $35 ($3 shipping in USA)

LEPIDOPTERA OF FLORIDA

Part 1. Introduction and Catalog

by J. B. Heppner



The first new catalog for the Florida fauna since 1965 treats 2,941 species. There are 55 black and white plates illustrating about a third of the species. The introduction includes a history of Lepidoptera studies in Florida, the natural areas of Florida, a gazetteer to Florida place names, and lists of exotic, endemic, pest, beneficial, and stray species, plus erroneous records. There are notes on field techniques and curation, plus basic morphology, a family list and family key, as well as a listing of name changes of species. The main catalog gives the range and months of adult activity, and a complete hostplant record for each species. There is an extensive bibliography and indexes for hostplants, genera and species names of Lepidoptera, and common names. Collaborators for some catalog data include W. L. Adair, Jr., H. D. Baggett, T. S. Dickel, L. C. Dow, T. C. Emmel, and D. H. Habeck.

2003. 670pp. (8-1/2 x 11 in) $55.00 (postpaid in USA)
Payments to Center for Systematic Entomology, Gainesville, FL

ORDERS: above titles can be ordered from ATL, P.O. Box 141210, Gainesville, FL 32614-1210

LEPIDOPTERA NEWS

March / June 2003 No. 1-2

HEPPNER	1	Tribal Classification of the Lepidoptera
HEPPNER	23	Distribution Notes on Taiwan Moths, 2. *Mimicia pseudolibatrix* (Pyralidae: Pyralinae)
	25	3. *Pyrausta mystica* (Pyralidae: Pyraustinae)
	27	4. Genera *Lixa* and *Tamraca* (Pyralidae: Pyralinae)
	29	5. *Udea stigmatalis* (Pyralidae: Pyraustinae)
HEPPNER	31	Primitive Sedge Moths from New Zealand and Tasmania: Transfer of *Proditrix* and Relatives to Orthoteliinae (Glyphipterigidae)
LAMAS	43	Additions to the *Bibliography of Butterflies*, in the *Atlas of Neotropical Lepidoptera*. VI. Comprising mostly Works Published in 2001
HEPPNER	56	*Neurobathra* leafminer records on *Jatropha* new to Florida (Gracillariidae)

Association for Tropical Lepidoptera
P. O. Box 141210
Gainesville, FL 32614-1210
www.troplep.org