Scientific Names of Pest Species in Tortricidae (Lepidoptera) Frequently Cited Erroneously in the Entomological Literature

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Abstract. The scientific names of several pest species in the moth family Tortricidae (Lepidoptera) frequently are cited erroneously in contemporary entomological literature. Most misuse stems from the fact that many proposed name changes appear in systematic treatments that are not seen by most members of the general entomological community. Also, there is resistance among some entomologists to conform to recently proposed changes in the scientific names of well-known pest species. Species names discussed in this paper are Brazilian apple leafroller, *Bonagota salubricola* (Meyrick); western black-headed budworm, *Acleris gloverana* (Walsingham); and green budworm, *Choristoneura retiniana* (Walsingham). Generic names discussed include those for false codling moth, *Thaumatotibia leucotreta* (Meyrick); grape berry moth, *Paralobesia viteana* (Clemens); pitch twig moth, *Retinia comstockiana* (Fernald); codling moth, *Cydia pomonella* (Linnaeus); oak leaftier, *Acleris semipurpurana* (Kearfott); and garden tortrix, *Clepsis peritana* (Clemens). Use of the tribe Cochylini also is reviewed.

One of the basic goals of taxonomy and its associated nomenclature is to promote stability in the names of organisms (International Code of Zoological Nomenclature, 1999). However, inherent in taxonomic progress are changes in the names of taxa at almost every level in response to increased understanding of phylogenetic relationships, morphological homology, behavior, etc. Although proposed name changes are rarely greeted with open arms by those in the applied fields, especially for important pests and other commonly cited organisms, it is nonetheless important to recognize these changes and use the most current nomenclature.

Several changes in the nomenclature of the moth family Tortricidae proposed over the past two decades (or more) are based on the discovery of new morphological characters, application of molecular studies, rigorous review of type specimens, and interpretation of the rules of nomenclature. These changes have not been adopted by the majority of researchers whose work is affected by them. Often, this is because proposed changes appeared in obscure or specialized journals or other publications with limited distribution or impact, but resistance to changes in the scientific names of well-known pest species also plays a large role. Name changes rarely are accepted immediately; they frequently require a generation or two to permeate the literature. For example, the subfamilial designation for Olethreutinae (rather than Olethreutidae) was slow to be accepted for many years following Obraztsov's (1959) treatment of the group. They even appear at both taxonomic levels (i.e., Olethreutinae and Olethreutidae) in different papers in the same issue of the *Canadian Entomologist* in the 1980s! (Volume 114 (6), 1982) Olethreutinae gradually was absorbed into the North America literature, especially following publication of the *Check List of the Lepidoptera of America North of Mexico* (Hodges 1983), which has served as a standard for more than 20 years.

During preparation of a world catalog of Tortricidae (Brown 2005), it became obvious to me that several taxonomically correct combinations of important pest species were not in common use in the entomological literature. The purpose of this paper is to point out 10 changes in tortricid nomenclature of economically important species that have not been adopted widely by researchers who publish about these animals. The literature on these species includes studies on their biology, pheromones, behavior, food plants, systematics, and other topics; and I attempt to provide examples from disparate literature sources. Three are species-level corrections; six are generic-level corrections; and one is a tribal-level correction.

Brazilian apple leafroller, *Bonagota salubricola* (Meyrick)

The Brazilian apple leafroller a highly polyphagous species (Brown and Passoa 1998) that has become a serious pest of apples in Brazil. The biology, including parasitoids, has been investigated by Eiras et al. (1994), Para et al. (1995), and Botton et al. (2000, 2002). Pheromones have been studied by Unelius et al. (1996), Park et al. (1998), Eiras et al. (1999), Coracini (2002), Coracini et al. (1999, 2001, 2003), Kovaleski et al. (2003), and Yadav and Reddy (2000); and host specificity has been explored by Bentancourt et al. (2004). The species is recorded from Brazil, Paraguay, Uruguay, and Argentina (Chambon et al. 1997, Razowski and Becker 2000, Brown and Razowski 2003). Over the past 10 years, this species has been referred to as *Phtheochroa cranaodes* Meyrick, *Bonagota cranaodes* (Meyrick), and *Bonagota salubricola* (Meyrick). Although most frequently referred to as *B. cranaodes*, *B. salubricola* is the correct name and Euliini, not Cochylini, is the correct tribal assignment (Razowski 1987a).

Razowski (1987a) described *Bonagota* to accommodate *crana-*

odes, *salubricola*, *melanecta* Meyrick, *bogotana* Walker, and *penthina* Zeller, synonymizing *bogotana* and *penthina*. This arrangement was followed in the *Atlas of Neotropical Lepidoptera* (Powell et al. 1995). Razowski (1999a, b) and Razowski and Becker (2000) subsequently described additional species in the genus. Brown and Razowski (2003) reviewed the taxonomy of the included species, reassigning three to the genus *Apotomops* Powell and Obraztsov and synonymizing *B. cranaodes* with *B. salubricola*.

Eulia salubricola Meyrick 1931 was described from two specimens (one male, one female) from Buenos Aires, Argentina, and *Phtheocrodes cranaodes* Meyrick 1936 from a single male from Tigre, Argentina. Although several workers over the past 50 years have suspected that the two were synonymous, as evidenced by specimen labels of G. F. G. Clarke, an unpublished manuscript by J. Pastrana (Brown 2004), and taxonomic research by Razowski and Becker (2000), the issue was not resolved adequately until Brown and Razowski (2003) examined the types and other specimens from Argentina. They concluded that the two names represent the same species, and *salubricola*, the older name, has priority.

Western black-headed budworm, *Acleris gloverana* (Walsingham)

The western black-headed budworm (*Acleris gloverana*) is an important forest pest of *Larix*, *Tsuga*, *Abies*, *Picea*, and other Pinaceae (e.g., Powell 1964, Shepherd and Gray 1990, Powell and De Benedictis 1996). Its identity was uncertain for almost a century after its original description. Powell (1962) redescribed and illustrated the species and distinguished it from its eastern North American sister species, the black-headed budworm, *Acleris variana* (Fernald), thereby resolving the taxonomic uncertainty. Although published in the *Canadian Entomologist*, a major outlet for forest entomology research, the distinction was overlooked or ignored in most subsequent forest entomology publications (e.g., Prentice 1966, Baker 1972). Although the two names were used incorrectly in much of the forest entomology literature for years, recently their use has been correct more often than not.

Green budworm, *Choristoneura retiniana* (Walsingham)

Use of the binomial *Choristoneura viridis* Freeman for the green budworm gained popularity among forest entomologists probably because the common name matched not only the color of the larvae, but also the scientific name (i.e., *viridis*). The green caterpillars of this species are quite distinct from related species of *Choristoneura*. However, when Freeman (1967) described the species, he was unaware that Obraztsov (1962) previously had named *Choristoneura lindseyana* Obraztsov from the same population as *C. viridis* (i.e., from Modoc County, CA), based on a color morph, the status of which Obraztsov (1962) failed to recognize. Although both names were placed in subjective synonymy with *Choristoneura retiniana* by Powell (1980, 1983, 1996), who described the situation in detail (Powell 1980), *C. viridis* persisted in the literature, in part based on the usefulness of the common name. However, the correct name for the green budworm is *Choristoneura retiniana* (Walsingham).

False codling moth, *Thaumatotibia leucotreta* (Meyrick)

The false codling moth is a widespread, well-known pest of citrus in the Old World, with origins in southern Africa (Catling and Aschenborn 1974; Bradley et al. 1979; Daiber 1979, 1980, 1989; Newton 1988, 1989, 1990; Komai 1999; Begemann and Schoeman 1999; Kroon 1999). Because it is absent from the United States, where it has the potential to inflict major economic damage, considerable effort is expended annually to exclude it.

False codling moth is highly polyphagous, and, in addition to citrus, it is reported from macadamia (*Macadamia* spp.; Proteaceae) (la Croix and Thindwa 1986, Wysoki 1986, la Croix 1990, Chambers et al. 1995), avocado (*Persea americana* Mill.; Lauraceae) (Bradley et al. 1979, Komai 1999), stone fruits (*Prunus* spp.; Rosaceae) (Daiber 1976, Blomefield 1989), guava (*Psidium guajava* L.; Myrtaceae) (Bradley et al. 1979, Komai 1999), oak (*Quercus* spp.; Fagaceae) (Kroon 1999), sugarcane (*Saccharum officinarum* L.; Poaceae) (Komai 1999), corn (*Zea mays* L.; Poaceae) (Bradley et al. 1979, Komai 1999), acacia (*Acacia* spp.; Fabaceae) (Kruger 1998), tea (*Camellia sinensis* (L.) Kuntze; Theaceae) (Bradley et al. 1979, Komai 1999), eugenia (*Eugenia* spp.; Myrtaceae) (Swain and Prinsloo 1986), cotton (*Gossypium herbaceum* L.; Malvaceae) (Bradley et al. 1979, Couilloud 1994, Komai 1999), litchi (*Litchi chinensis* Sonn.; Sapindaceae) (Quilici et al. 1988, Newton and Crause 1990), eggplant (*Solanum melongena* L.; Solanaceae) (MacKay 1959), and many other cultivated plants. It is the most frequently intercepted tortricid moth at ports-of-entry on two solanaceous hosts from Africa: bell peppers (*Capsicum* spp.; Solanaceae) (Malumphy and Robinson 2002, USDA–SELIS 2005) and eggplant (USDA–SELIS 2005).

Although long known as *Cryptophlebia leucotreta* (Meyrick), the species was transferred to the genus *Thaumatotibia* based on convincing morphological characters (Komai 1999). *Thaumatotibia* Zacher 1915, was a "lost" monotypic genus, with the type species *T. roerigii* Zacher 1915; the latter is now considered a junior synonym of *leucotreta*. In a revision of the Palearctic *Grapholita* genus group, Komai (1999) recognized that *Cryptophlebia* encompassed two distinct groups, one of which included *leucotreta* and the other *ombrodelta* (type species of *Cryptophlebia*). Accordingly, he divided *Cryptophlebia* into two genera, *Thaumatotibia* and *Cryptophlebia*. Based on a phylogenetic analysis of the group of genera that includes *Cryptophlebia* and *Thaumatotibia*, Adamski and Brown (2001) hypothesized that the two are not even sister groups; i.e., the New World *Gymnandrosoma* Dyar appears to be the sister group to *Cryptophlebia+Pseudogalleria*. There is little question that *leucotreta* belongs to *Thaumatotibia*, whose distribution and diversity is centered in South Africa and Madagascar.

Grape berry moth, *Paralobesia viteana* (Clemens)

The grape berry moth is one of the most important pests of grapes in the United States, and the American economic literature is replete with studies on its biology and control (e.g., Still 1962; Clark and Dennehy 1988; Hoffman et al. 1992; Nagarkatti et al. 2002; Botero-Garces and Isaacs 2003, 2004a, b; Issacs et al. 2005). In almost all of the applied literature on this species, the incorrect name *Endopiza viteana* Clemens is used.

Clemens (1860) described *viteana* under the heading "*Endopiza*?" Unfortunately, this heading is a misspelling of *Endopisa* Guenée, 1845. Apparently, most early (pre-1900) American entomologists interpreted the spelling error as the serendipitous or accidental designation of a new genus, which led to the adoption of the erroneous combination *Endopiza viteana* for this species. Because of the economic importance of this species, the name became well established in the economic literature. In 1953, the tortricid specialist Nicolas Obraztsov (1953) recognized *Endopisa* Guenée (with its type species *Grapholitha nebritana* Guenée) as a synonym of *Grapholita* (Olethreutinae: Grapholitini), with which the species included in "*Endopiza*" (Olethreutinae: Olethreutini) have little in common. Obraztsov (1953) proposed the replacement name *Paralobesia* for the genus that was conceptually "*Endopiza*," resulting in new combinations for those species formerly treated as *Endopiza*, including *Paralobesia viteana*. Diakonoff (1973) revisited the problem, interpreting Clemens' *Endopiza* as a valid genus (with the type species of *viteana*) rather than a misspelling. Under this interpretation, *Paralobesia* was relegated to the status of a junior

synonym of *Endopiza*; i.e., *Endopiza* is the senior synonym by priority. Consequently *Endopiza* remained in common use in the economic literature and in taxonomic catalogs (e.g., Powell 1983).

According to article 33.3.1 of the International Code of Zoological Nomenclature (1999), misspellings "in prevailing usage" may be preserved; however, it is implicit that the misspelling refers to the same taxon as the correct spelling. In this case, *Endopisa* (the correct spelling) is unquestionably recognized as a synonym of *Grapholita*, so the use of *Endopiza* cannot be preserved. Hence, Obraztsov (1953) was justified in proposing the new generic name, and the correct name of the grape berry moth is *Paralobesia viteana*.

Pitch twig moth - *Retinia comstockiana* (Fernald)

The pitch twig moth and its congeners, collectively known as pitch nodule-makers or pitch-blister moths, are important pests of pine (*Pinus* spp.; Pinaceae), fir (*Abies* spp.; Pinaceae), and Douglas-fir (*Pseudotsuga* spp.; Pinaceae) throughout much of the temperate world (e.g., Fernald, 1879, 1882a, b; Heinrich 1923; Jones and Kimball 1943; Schaffner 1959; Prentice 1966; Miller 1977, 1978; Suzuki and Komai 1984; Komai 1986; Nasu 1991). In the vast majority of the literature—economic, taxonomic, and faunistic—dealing with the Nearctic and eastern Palearctic faunas, the species of this group are assigned to the genus *Petrova* (e.g., Kimball 1965; Satoh and Oku 1974; Chacko 1977; Miller 1977, 1978; van Deusen and Mix 1980; Lapis 1982; Wong et al. 1985), whereas the single European species, *resinella* (L.), is included in the genus *Retinia* (e.g., Agenjo 1964, Bradley et al. 1979, Dai et al. 1988, Razowski 2003).

Although *Retinia* first appeared in the literature (Guenée, 1845) without a description or designation of a type species, tortricid taxonomists accept as valid many genera (e.g., *Dichelia* Guenée, *Oenectra* Guenée, *Pardia* Guenée, *Aterpia* Guenée, *Stictea* Guenée, *Olindia* Guenée, *Dichrorampha* Guenée) described in the same manner or even in the same paper. Hence, broad latitude has been given to genera "proposed" before the development of the International Code. Consequently, *Retinia* must be accepted as a valid generic name if we accept all other (older) similarly "proposed" genera. Because Guenée (1845) merely presented a list of species he included in the genus, typical of the time, the genus lacked a type species. However, Desmarest (1857) indirectly designated "*resinana*" (an unjustified emendation of *resinella* proposed by Fabricius) as the type species of *Retinia*. Although Fernald (1908) subsequently provided a formal designation, with *buoliana* [Denis and Schiffermüller], 1775, as the type, Nye and Fletcher (1991) indicate that Fernald's action was an "invalid designation" because a type species already had been proposed by Desmarest (1857).

Retinia resinella (L.) (from Europe) and *Petrova comstockiana* (Fernald) (from North America), the type species of their respective genera, almost certainly belong in the same genus, and because *Retinia* is the older of the two names (i.e., *Retinia* Guenée, 1845 vs. *Petrova* Heinrich, 1923), it has priority. Although Fernald (1879) described *comstockiana* in the genus "*Retinia*?," Heinrich (1923) did not mention *Retinia* in his description of *Petrova*, for which he designated *comstockiana* as the type species. The synonymy of *Retinia* and *Petrova* was proposed by Leraut (1979) on the basis of adult morphological characters. The characteristic large, rounded, subbasal excavation of the valva and the extremely elongate, digitate socii of the male genitalia are remarkably similar among the European *resinella* and several North American species, such as *comstockiana*, *virginiana* (Busck), and *sabiniana* (Kearfott). Based on the morphological evidence and nomenclatural rules, the correct genus for the pitch nodule-makers is *Retinia*. While *Retinia* already enjoys wide usage in Europe, it has received extremely limited use in North America, except for Miller (1987); the two generic names receive mixed usage in the taxonomic literature of Asia (e.g., Nasu 1991, Liu and Wu 2001).

Codling moth, *Cydia pomonella* (L.)

The correct generic assignment for the codling moth has been detailed several times in the recent literature (e.g., Brown 1979, Wearing et al. 2001), but to exclude it from this review would render it somewhat incomplete. The following paragraph is mostly from Wearing et al. (2001), but see Brown (1979) for additional details.

In much of the early economic and taxonomic literature (~1900-1960) (e.g., Busck 1903b; Simpson 1903a, b; Barnes and McDunnough 1917; Newcomer and Whitcomb 1924; Forbes 1924; MacKay 1959; and many others), the codling moth is referred to as *Carpocapsa pomonella* (L.). Busck (1903b) provided a lengthy discussion of why *Carpocapsa* is the appropriate generic name after he (Busck 1903a) inadvertently used the "incorrect" generic name *Cydia*. During this same time, at least three authors (i.e., Walsingham, 1897, 1914; Fernald 1903; Pierce and Metcalfe 1922) used *pomonella* in combination with the genus *Cydia* (i.e., *Cydia pomonella*), but the latter apparently did not receive widespread support or usage. Kennel (1908) also discussed the problem, but he concluded that *Laspeyresia* was the valid name; his conclusions were followed by Heinrich (1926), Benander (1950), Van Deurs (1956), and others. Obraztsov (1959) convincingly argued that *Carpocapsa* Treitschke, 1829, and *Cydia* Hübner, [1825], are junior synonyms of *Laspeyresia* Hübner, [1825]. The result was that from about 1960 through about 1980, the codling moth most commonly went under the name *Laspeyresia pomonella* (e.g., Kimball 1965, Danilevsky and Kuznetsov 1968, Bentinck and Diakonoff 1968, Arn et al. 1974, Cisneros and Barnes 1974, Ferro and Akre 1975, Phillips and Barnes 1975, Kuznetsov 1978, and many others); and it appeared as though the name had finally stabilized. However, in the 1970s, it was discovered that *Laspeyresia* had been used in 1817, prior to Hübner's ([1825]) description, as an unjustified emendation of *Laspeyria* Germar, 1810, a genus in the Noctuidae (Lepidoptera); both names were coined to honor J. H. Laspeyres, a German lepidopterist. Accordingly, the name *Laspeyresia* must refer to the emendation of the noctuid genus (i.e., the earliest use) and therefore is "unavailable" (i.e., has prior use). Hence, Hübner's *Laspeyresia* as the generic name for a tortricid is simply a primary homonym and therefore requires a replacement name. The next available generic name for *pomonella* is *Cydia*, which is the currently accepted generic name. This controversy led to a petition submitted to the International Commission on Zoological Nomenclature to conserve *Laspeyresia* Hübner (by the suppression of *Cydia*) (Kuznetsov and Kerzhner 1984), but the commission never acted upon it. Since the mid-1980s, based in no small part on the impact of the *Check List of the Lepidoptera of America North of Mexico* (Powell 1983), there has been considerable momentum toward and widespread use of the combination *Cydia pomonella*. Currently there is little deviation from this in the North American literature. However, the combination *Laspeyresia pomonella* is still in rather wide use in the literature of Europe and Asia.

Oak leaftier, *Acleris semipurpurana* (Kearfott)

The oak leaftier (*Acleris semipurpurana*), the blueberry leaftier [*Acleris curvalana* (Kearfott)], and about 18 other species whose distributions include the Nearctic and/or Palearctic regions formerly were treated as members of the genus *Croesia* Hübner, [1825] (e.g., Razowski 1966, 1984; Bradley et al. 1973; Powell 1983; Liu and Bai 1987). Included in the genus are two species that invaded the United States from Europe: *Acleris forsskaleana* (L.) (Klots 1941, Powell and Burns 1971) and *Acleris holmiana* (L.) (Doganlar and Beirne 1978, Mutuura and Munroe 1978). Historically, *Croesia* was

considered distinct from *Acleris* on the basis of the forewing shape (apex more squared) and pattern (mostly lacking the triangular patch from mid-costa), forewing vein R_5 extending to the termen or apex (rather than to the costa), and crochets of the prolegs of the larva uniordinal (rather than biordinal) (Swatschek 1958).

Razowski (1987b) proposed the synonymy of the two and presented a discussion addressing primarily the position of forewing vein R_5 and larval characters, revealing considerable inconsistency and overlap in both of these features among the species included in the two genera. For example, based on larval characters, Swatschek (1958) placed the species *holmiana* L. (a typical *Croesia*) in *Acleris*, and described a typical *Acleris* character state (bisetose SV-group on A8) as present in the species *bergmanniana* L. (another typical *Croesia*). Hence, the larvae do not reliably separate the genera, which is not surprising in Tortricidae.

Although the species formerly included in *Croesia* share very similar facies and forewing shape, the male genitalia show no such similarity. For example, the large upturned socii (extending above the tegumen) of *Croesia bergmanniana* are shared with *Acleris caledoniana* (Stephens), *A. comariana* (Lienig and Zeller), and *A. laterana* (F.), and are not similar to the short, reduced socii of *Croesia holmiana* or the broad, pendant socii of *C. forsskaleana* (L.). The female genitalia of *C. holmiana*, *C. forsskaleana*, and *A. bergmanniana* are similar in the weak development of the lateral or proximal lobes of the sterigma, but it could be argued that those of *Acleris caledoniana* and *A. comariana* (typical species of *Acleris*) represent this character state as well. Hence, although *Croesia* is fairly homogeneous in appearance and in female genitalia, other features such as larval characters, male genitalia structures, and forewing venation are too variable to provide any support for keeping it separate. Although no formal cladistic analysis has been conducted to confirm the synonymy, the evidence presented by Razowski (1987b) appears reliable enough to accept his proposal.

Although the proposed synonymy occurred in 1987, it was overlooked by Brown (2005) who wrote, "Although never formally proposed as a junior synonym of *Acleris*, *Croesia* has been treated as such for at least a decade." The synonymy of *Croesia* and *Acleris* has been adopted in much of the European literature (e.g., Razowski 1996, 2001, 2002); however, it has not been recognized by North American workers (e.g., Ponder and Seabrook 1988, 1991), most likely because it was published in a European journal (Razowski 1987b) with exceedingly limited U.S. distribution.

Garden tortrix, *Clepsis peritana* (Clemens)

The garden tortrix (*Clepsis peritana*) is a common, widespread leafroller ranging from coast to coast in North America (from Nova Scotia to British Columbia), south into Central America and the Caribbean (at least Cuba). It is a well-known pest in fields, greenhouses, and orchards (e.g., Atkins 1958, Freeman 1958, Allen 1959, Powell 1964, Frick and Hawkes 1970), but it also feeds on nonliving and decaying plant material (e.g., Powell 1964). The species *peritana* was assigned incorrectly to the genus *Ptycholoma* by Freeman (1958), and that assignment was followed by MacKay (1962). Even though Powell (1964), Razowski (1979), and others continued to treat it as *Clepsis*, Powell (1983) placed it in *Ptycholoma* in the *Check List of the Lepidoptera America North of Mexico*, certainly influenced by Freeman (1958) and MacKay (1962). Because the checklist became the standard for North American Lepidoptera nomenclature, the species is frequently cited as *Ptycholoma* (=*Clepsis*) *peritana* in some literature and in many sites on the World Wide Web.

Within *Clepsis*, *C. peritana* and relatives (all from the New World) form a compact group of species (Razowski 2002) that bear little superficial resemblance to species of *Ptycholoma*, which are Palearctic in distribution. Furthermore, the male genitalia of *Ptycholoma* are characterized by a narrow distal part of the valva with an undulate, strongly descending costa, unlike that of *Clepsis peritana* and relatives. Based on facies and genital morphology, *peritana* is placed more appropriately in *Clepsis*, where many tortricid workers have treated it over the past 50 years (e.g., Atkins 1958, Powell 1964; Razowski 1979, 2000, 2002; Brown 2005).

Tribe Cochylini

Members of the tortricid tribe Cochylini are well represented in the economic literature because the group includes several agricultural and/or ornamental pests [e.g., banded sunflower moth, *Cochylis hospes* Walsingham; chrysanthemum flower borer, *Lorita scarificata* (Meyrick); pale juniper webworm, *Aethes rutilana* (Hübner)] and a few biological control agents [e.g., *Lorita baccharivora* Pogue, *Agapeta zoegana* L., *Cochylis atricapitana* (Stephens)]. Before about 1980, most tortricid systematists considered the tribe a distinct family: Cochylidae (e.g., Falkovitsh 1963; Razowski 1967a, b, 1968; Bradley et al. 1973) or Phaloniidae (e.g., Westdal 1949; Obraztsov 1967; Clarke 1968). Kuznetsov and Stekolnikov (1973) were the first to treat Cochylini as a subordinate group (i.e., Cochylidii) within Tortricidae; however, because their hypothesized phylogeny met with limited support, the proposed new status of the group was not immediately accepted. For example, in the *Check List of the Lepidoptera of America North of Mexico* (Powell 1983), the group was retained as a distinct family (i.e., Cochylidae).

By the late 1980s, however, momentum was growing to recognize the group as a tribe (e.g., Gibeaux 1985, Pogue and Friedlander 1987, Pogue 1988, Razowski 1989), and by the early 1990s, tortricid workers had reached the general consensus that the group was best considered a tribe within the subfamily Tortricinae (Horak and Brown 1991). With few exceptions, it has been treated as such in almost all taxonomic revisions and systematic treatments since then (e.g., Razowski 1990, 1992, 1993, 1995, 1997; Horak 1998, Metzler 2000; Pogue 2001; Metzler and Sabourin 2002; Sabourin et al. 2002).

However, in much of the economic literature, Cochylini is still referred to as a distinct family or as a subfamily (i.e., Cochylinae) within Tortricidae. For example, the banded sunflower moth (*Cochylis hospes* Waslingham) is nearly always treated as "Cochylidae" (e.g., Barker and Enz 1993, Charlet and Brewer 1995, Barker and Grugel 1996, Barker 1997, Jyoti et al. 1998). Although there have been no phylogenetic analyses or other rigorous study of its relationships to other tortricid tribes, it is widely accepted by tortricid specialists that the group is most appropriately treated as a tribe until its relationships within the family are better understood (Horak 1998).

Acknowledgments

I am exceedingly grateful to Jerry A. Powell (University of California, Berkeley) for suggestions, criticisms, and additions that considerably enhanced the quality and clarity of this paper (however, he should not be held responsible for most of the conclusions drawn). I thank Robert Carlson (USDA, Systematic Entomology Laboratory, Beltsville, MD) for data from the USDA–SELIS database regarding U.S. port-of-entry interceptions of *Thaumatotibia leucotreta*. Józef Razowski (Polish Academy of Sciences, Krakow, Poland) provided assistance with literature regarding the synonymy of *Croesia* and *Acleris*; and F. Christian Thompson (Systematic Entomology Laboratory, USDA, Washington, DC) provided interpretation of the International Code regarding the validity of *Endopiza*. The following people provided helpful comments on the manuscript: Joaquin Baixeras, Institut Cavanilles de Biodiversitata i Biologia Evoluta, Universitat de Valencia, Valencia, España; William E. Miller, University of Minnesota, St. Paul; Gary Miller, Systematic Entomology Laboratory, USDA, Beltsville, MD; Thomas Henry, Systematic Entomology

Laboratory, National Museum of Natural History, Washington, DC; and an anonymous reviewer.

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